

**WSR 20-21-001**  
**PERMANENT RULES**  
**DEPARTMENT OF**  
**SOCIAL AND HEALTH SERVICES**

(Aging and Long-Term Support Administration)

[Filed October 7, 2020, 3:46 p.m., effective November 7, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The department is amending WAC 388-114-0080 to correct a typographical error in the reference to WAC 388-114-0030.

Citation of Rules Affected by this Order: Amending WAC 388-114-0080.

Statutory Authority for Adoption: RCW 74.08.090, 74.09.520.

Adopted under notice filed as WSR 20-08-064 on March 26, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 1, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 1, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: October 7, 2020.

Katherine I. Vasquez  
Rules Coordinator

AMENDATORY SECTION (Amending WSR 17-08-065, filed 3/31/17, effective 5/1/17)

**WAC 388-114-0080 When may the department temporarily approve a client specific increase to an individual provider's work week limit?** (1) The department may temporarily increase an individual provider's work week limit if it determines the increase is necessary:

(a) Due to a lack of available providers who are able to adequately meet a client's care needs, as evaluated by the department in its consideration of:

(i) The overall availability of providers in the geographic region;

(ii) Whether the client has complex medical or behavioral needs;

(iii) Whether the client requires a provider with specific language skills; and

(iv) The client's good faith efforts and cooperation to manage his or her service hours and locate and select additional providers, examples of which may include:

(A) Making schedule adjustments within the work week limits of current providers who are providing services;

(B) Seeking a qualified family or friend to contract as an individual provider;

(C) Utilizing the home care referral registry; and

(D) Requesting a worker through a home care agency, unless doing so would cost more than paying the individual provider overtime;

(b) To protect a client's health and safety, as evaluated by the department in its consideration of:

(i) Whether the request is to approve service hours the individual provider spent caring for the client because of an emergent condition;

(ii) The nature and severity of the emergent condition; and

(iii) Whether the need could have been postponed until another provider could have arrived;

(c) To prevent an increased risk that the client will be unable to remain in a home or community based setting, except in cases where there are additional qualified providers available to select and the client has chosen not to select them; or

(d) To enable a client to assign to an individual provider the same number of hours in months with thirty days as are assigned in months with thirty-one days, provided that:

(i) The client is unable to assign the same number of the hours due to the individual provider's permanent work week limit;

(ii) There is no other qualified provider assigned that can work the hours within his or her permanent work week limit;

(iii) The increase does not result in a monthly total that exceeds the number of hours assigned to an individual provider in a thirty-one day month; and

(iv) The increase does not exceed two and one-half hours per week.

(2) When a client specific increase is no longer approved by the department, the individual provider's work week limit will revert back to the permanent work week limit described in WAC ((~~388-11-0030~~) 388-114-0030).

(3) The department may only approve a client specific work week limit in excess of eighty service hours per week for an individual provider if the client's circumstances meet the criteria set out in WAC 388-440-0001 (1)(a) through (e) and where the department is unaware of any reason that the individual provider will be unable to appropriately meet the needs of the client.

(4) The department will not approve additional service hours to any individual provider's permanent work week limit that would result in a monthly total that exceeds the client's monthly service hours.

(5) The individual provider is not entitled to an administrative hearing under chapter 34.05 RCW regarding the department's decision on whether to approve or continue a client specific temporary increase to the work week limit.

**WSR 20-21-002**  
**PERMANENT RULES**  
**DEPARTMENT OF LICENSING**

[Filed October 8, 2020, 9:22 a.m., effective November 8, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The department of licensing (DOL) is amending rules in chapter 308-20 WAC to provide cosmetology schools flexibility in online training. DOL is moving to permanently allow cosmetology schools to offer fifty percent of their education online, as well as decide which content is better for online and which content is better for in-person.

Citation of Rules Affected by this Order: Amending chapter 308-20 WAC, Cosmetology—Barber—Manicurist—Esthetician rules.

Statutory Authority for Adoption: RCW 18.16.030 and 43.24.023.

Adopted under notice filed as WSR 20-17-131 on August 18, 2020.

A final cost-benefit analysis is available by contacting Cosmetology Program, P.O. Box 9026, Olympia, WA 98507, phone 360-664-6651, fax 360-664-2550, email csap@dol.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 3, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 3, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 8, 2020.

Damon Monroe  
Rules Coordinator

**AMENDATORY SECTION** (Amending WSR 17-19-049, filed 9/12/17, effective 10/13/17)

**WAC 308-20-010 Definitions.** (1) "Chemical compounds formulated for professional use only" are those compounds containing hazardous chemicals in a form not generally sold to the public; including but not limited to, bulk concentrates of permanent wave solution, neutralizers, chemical relaxers, oxidizing agents, flammable substances, facial creams, or approved chemical compounds. These compounds must be designated for use on the hair, face, neck, skin, or scalp.

(2) "Monthly student report" are forms provided by the school, approved by the department, preprinted with the school name. The report must include the month, year and daily activities of the student in each subject, (i.e., number of shampoos, haircuts, perms, colors, etc.) within each course (i.e., barbering, manicuring, cosmetology, hair design, esthetics, master esthetics, or instructor-trainee).

(3) "Completed and graduated" is the completion of the school curriculum and the state approved minimum hourly course of training.

(4) "Apprentice salon/shop" is a location certified by the Washington state apprenticeship and training council, that provides training for individuals accepted into the apprenticeship program. Apprentice salon/shops shall not receive payment from the apprentice for training.

(5) "Apprentice trainer" is a person that is currently licensed and in good standing. This person provides training in a licensed shop approved for the apprenticeship program, who must have received journey level training and have held a license in the curriculum for which he or she is providing training for a minimum of three years.

(6) "Journey level training" is the completion of three years working as a licensed cosmetologist, hair designer, barber, manicurist, esthetician, or master esthetician.

(7) "Completion of the apprenticeship training" is the completion of the apprentice salon/shop curriculum that includes the state approved hourly course of training as described in WAC 308-20-080.

(8) "Monthly apprentice report" forms provided by the apprentice shop, approved by the department, printed with the shop name, for use in recording apprentice training hours and activities.

(9) "Online training" means an approved electronic learning environment through a licensed school in which a student is enrolled. (~~This training is limited to theory only.~~) Online training may be used for up to (~~twenty-five~~) fifty percent of the approved course of study.

(10) "Accreditation" is a status granted to a postsecondary school by one or more of the accrediting organizations recognized and approved by the U.S. Secretary of Education. Accreditation is voluntary and does not imply automatic transfer of credits from one postsecondary school to another.

(11) "Admission requirements" means the specific minimum criteria a school must use when accepting a student into the school.

**AMENDATORY SECTION** (Amending WSR 16-02-033, filed 12/29/15, effective 1/29/16)

**WAC 308-20-090 Student credit for training in a licensed school.** (1) A maximum of twenty students per instructor is required within a licensed school.

(2) Only those hours of instruction a student is given under the direction of a licensed instructor of the licensed school in which the student is enrolled and in the courses listed in WAC 308-20-080 and 308-20-105 or hours earned under WAC 308-20-091 shall be credited toward completion of the course of study required in RCW 18.16.100.

(3) When all of a school's requirements have been met by a student and within thirty days of a student leaving a school, the school shall provide to the student a certified copy of the student's final report and refer the student for examination(s) in a manner and format prescribed by the department.

(4) Students may transfer between the schools and apprenticeship salon/shops licensed under chapter 18.16 RCW and may receive credit toward completion of the curriculum in the new school or apprenticeship salon/shop. In order to enroll a transfer student or apprentice, the new school or apprentice salon/shop shall do the following:

(a) Confirm that the student is available for transfer through the student registration process in a manner and format prescribed by the department;

(b) Evaluate the certified final student report provided by the student or apprentice and compare the report with the new school or apprentice salon/shop curriculum requirements; and

(c) The new school or apprentice salon/shop may accept or reject the final student or apprentice report in part or in total from the previous school or salon/shop and shall prepare a monthly report that documents the amount of instructions being accepted.

(5) Both the transferring and receiving school or salon/shop shall maintain student or apprentice records including the transfer record as required in WAC 308-20-040(4).

(6) Licensed instructors must be physically present where the students are training with the exception of approved online ((theory)) training.

(7) Certified training hours expire three years after the last day of attendance. Any hours earned by a student that are more than three years old are considered by the department to be expired and will not be considered valid towards initial licensure.

(8) Documentation providing evidence of experience as a licensed cosmetologist, hair designer, barber, manicurist, esthetician or master esthetician credited towards instructor training shall be included in the student record as required in WAC 308-20-040(4).

AMENDATORY SECTION (Amending WSR 17-19-049, filed 9/12/17, effective 10/13/17)

**WAC 308-20-573 School catalog, enrollment agreement/contract and cancellation and refund policy minimum requirements.** (1) Each school must publish a catalog that explains its operations and requirements. The catalog must be current, comprehensive, and accurate. The school must provide the following, in some combination of a catalog, brochure, or otherwise written material and disclose that information to each prospective student prior to completing an enrollment agreement. The catalog must include at least the following:

(a) Date of publication;

(b) Names, physical and mailing addresses, and telephone numbers of the school's administrative offices and all supplemental training spaces;

(c) Names and qualifications of faculty. The list must be accurate as of the date of catalog publication. Any changes in faculty must be noted on a catalog correction sheet;

(d) The school calendar, including hours of operation, holidays, courses, or programs as may be appropriate;

(e) Admissions procedures, including policies describing all prerequisites needed by entering students to successfully complete the programs of study in which they are enrolled;

(f) A description of the job placement assistance offered, if any. If no assistance is offered, the school must make that fact known;

(g) The school's policy regarding student conduct, including causes for dismissal and conditions for readmission;

(h) The school's grievance policy. The policy must be preceded by "Nothing in this policy prevents the student from contacting the Department of Licensing at any time with a concern or a complaint.";

(i) The school's policy regarding leave, absences, makeup work (if applicable), and tardiness;

(j) The school's policy regarding standards of progress required for the student;

(k) An accurate description of the school's facilities and equipment available for student use, and the student/teacher ratio;

(l) The total cost of training including registration fee if any, tuition, books, supplies, equipment, and all other charges and expenses necessary;

(m) A description of each program of instruction, including:

(i) Specific program objectives including the job titles for which the program purports to train;

(ii) The number of clock hours of instruction, the method of instruction (e.g., correspondence, classroom, lab, computer assisted), and the average length of time required for successful completion;

(iii) For schools offering online ((theory)) training, instructional sequences must be described in numbers of lessons.

(n) The scope and sequence of courses or programs required to achieve the educational objective;

(o) A statement indicating the type of educational credential that is awarded upon successful completion;

(p) The school's cancellation and refund policy;

(q) The following statement must appear prominently on either the first or last printed page or inside the front or back cover: "This school is licensed under chapter 18.16 RCW. Inquiries, concerns, or complaints regarding this school can be made to the Department of Licensing, (insert mailing address, email or by telephone).";

(r) The availability of financing, if any; and

(s) Supplements or correction sheets for the catalog and other written materials related to enrollment must be filed with the department prior to being used;

(i) The supplement or correction sheet must include its publication date;

(ii) In the event information on a supplement or correction sheet replaces information contained in the catalog, the insert must identify the information it replaces.

(2) An enrollment agreement/contract is any agreement that creates a binding obligation to purchase a course of instruction from a school. Each school must use an enrollment contract or agreement that includes:

(a) The school's cancellation and refund policy, in accordance with chapter 308-20 WAC.

(b) The following statement: This school is licensed under chapter 18.16 RCW. Inquiries, concerns, or complaints regarding this school can be made to the department of licensing, (insert mailing address, email or by telephone).

(c) Information that will clearly and completely define the terms of the agreement between the student and the school. The enrollment agreement must include at least the following:

(i) The name and address of the school and the student;

(ii) The program or course title as it appears in the school's catalog, date training is to begin, and the number of hours or units of instruction or lessons for which the student is enrolled;

(iii) Language explaining that the agreement will be binding only when it has been signed and dated by the student and an authorized representative of the school prior to the time instruction begins; and

(iv) A statement that any changes in the agreement will not be binding on either party unless such changes have been acknowledged in writing by an authorized representative of the school and by the student or the student's parent or guardian if he/she is a minor.

(d) The school must provide all students with a copy of the signed enrollment agreement, and any other documents related to their enrollment.

(3) The official date of termination or withdrawal of a student shall be determined in the following manner:

(a) The date on which the school recorded the student's last day of attendance;

(b) The date on which the student is terminated for a violation of a published school policy which provides for termination.

(4) Tuition/registration fees may be collected in advance of a student signing an enrollment agreement; however, all moneys paid by the student shall be refunded if the student does not sign an enrollment agreement and does not commence participation in the program.

(a) The school must refund all money paid if the applicant is not accepted. This includes instances where a starting class is canceled by the school;

(b) For discontinued programs: If instruction in any program is discontinued after training has begun or if the school moves from one location to another, it must either:

(i) Provide students pro rata refunds of all tuition and fees paid; or

(ii) If the school plans to discontinue a program, it must notify the department and affected students in advance in writing at a minimum of thirty days notice.

### WSR 20-21-008

#### PERMANENT RULES

#### HEALTH CARE AUTHORITY

[Filed October 8, 2020, 4:16 p.m., effective November 8, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The agency is amending subsection (8) of WAC 182-507-0130 to specify circumstances under which an individual may receive additional months of refugee medical assistance benefits. The agency is also making nonsubstantive changes for consistency with other agency rules.

Citation of Rules Affected by this Order: Amending WAC 182-507-0130.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160.

Adopted under notice filed as WSR 20-18-059 on August 31, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal

Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: October 8, 2020.

Wendy Barcus  
Rules Coordinator

**AMENDATORY SECTION** (Amending WSR 12-19-001, filed 9/5/12, effective 10/6/12)

**WAC 182-507-0130 Refugee medical assistance (RMA).** (1) ~~((An individual is))~~ You are eligible for refugee medical assistance (RMA) if all the following conditions are met. ~~((The individual))~~ You:

(a) Meet ~~((s))~~ immigration status requirements of WAC 182-507-0135;

(b) ~~((Has))~~ Have countable resources below one thousand dollars on the date of application;

(c) ~~((Has))~~ Have countable income equal to or below two hundred percent of the federal poverty level (FPL) on the date of application. The following income is not considered when determining eligibility for RMA:

(i) Resettlement cash payments made by the voluntary agency (VOLAG);

(ii) Income of a sponsor is not counted unless the sponsor is also part of ~~((the individual's))~~ your assistance unit; and

(iii) Income received after the date of application.

(d) Provide ~~((s))~~ the name of the VOLAG which helped bring ~~((the individual))~~ you to the United States so that the department of social and health services (DSHS) can promptly notify the VOLAG (or sponsor) about the medical application.

(2) ~~((An individual who))~~ If you receive ~~((s))~~ refugee cash assistance (RCA) ~~((is))~~ you are eligible for RMA as long as ~~((the individual is))~~ you are not otherwise eligible for medicaid or a children's health care program as described in WAC 182-505-0210. ~~((An individual does))~~ You do not have to apply for or receive RCA in order to qualify for RMA.

(3) ~~((An individual is))~~ You are not eligible to receive RMA if ~~((the individual is))~~ you are:

(a) Already eligible for medicaid or a children's health care program as described in WAC 182-505-0210;

(b) A full-time student in an institution of higher education unless the educational activity is part of a DSHS-approved individual responsibility plan (IRP); or

(c) A nonrefugee spouse of a refugee.

(4) If approved for RMA, the agency or its designee issues an approval letter in both English and ~~((the individual's))~~ your primary language. The agency or its designee

also sends a notice every time there are any changes or actions taken which affect ~~((the individual's))~~ your eligibility for RMA.

(5) ~~((An individual))~~ You may be eligible for RMA coverage of medical expenses incurred during the three months prior to the first day of the month of the application. Eligibility determination will be made according to medicaid rules.

(6) If you are a victim of human trafficking you must provide the following documentation and meet the eligibility requirements in subsections (1) and (2) of this section to be eligible for RMA:

(a) Adults, eighteen years of age or older, must provide the original certification letter from the United States Department of Health and Human Services (DHHS). No other documentation is needed. The eight-month eligibility period will be determined based on the entry date on ~~((the individual's))~~ your certification letter;

(b) A child victim under the age of eighteen does not need to be certified. DHHS issues a special letter for children. Children also have to meet income eligibility requirements;

(c) A family member of a certified victim of human trafficking must have a T-2, T-3, T-4, or T-5 visa (derivative T-Visas), and the family member must meet eligibility requirements in subsections (1) and (2) of this section.

(7) The entry date for an asylee is the date that ~~((the individual's))~~ asylum status is granted. For example, ~~((an individual))~~ you entered the United States on December 1, 1999, as a tourist, then applied for asylum on April 1, 2000, interviewed with the asylum office on July 1, 2000, and ~~((was))~~ were granted asylum on September 1, 2000. The date of entry is September 1, 2000, and that is the date used to establish eligibility for RMA.

(8) RMA ends on the last day of the eighth month from the month ~~((the individual))~~ you entered the United States. For example, ~~((an individual who))~~ if you entered the United States on May 28, 2011, ~~((is))~~ you are eligible through the end of December 2011. You may receive RMA benefits for more months if you are in a category of persons for whom the federal Office of Refugee Resettlement has extended the eligibility period.

(9) ~~((An individual))~~ If you are approved for RMA ~~((is))~~ you are continuously eligible through the end of the eighth month after ~~((the individual's))~~ your entry to the United States, regardless of an increase in income.

(10) The agency, or its designee, determines eligibility for medicaid and other medical programs for ~~((an individual's))~~ your spouse when the spouse arrives in the United States. If the spouse is not eligible for medicaid due to ~~((the))~~ your countable income ~~((of the individual))~~, the spouse is still eligible for RMA for eight months following the spouse's entry into the United States.

(11) ~~((An individual who))~~ If you disagree~~((s))~~ with a decision or action taken on the case by the agency, or its designee, ~~((has))~~ you have the right to request a review of the case action(s) or request an administrative hearing (see chapter 182-526 WAC). The request must be received by the agency, or its designee, within ninety days of the date of the decision or action.

**WSR 20-21-010**  
**PERMANENT RULES**  
**DEPARTMENT OF**

**CHILDREN, YOUTH, AND FAMILIES**

[Filed October 8, 2020, 6:17 p.m., effective November 8, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Allow the department to transfer a full child care license to a new licensee in the event of a transfer of ownership of a child care operation; identify criteria the department will consider before transferring a license; and grant administrative hearing rights to appeal the denial of a license transfer.

Citation of Rules Affected by this Order: New WAC 110-300-0011 and 110-305-1001.

Statutory Authority for Adoption: RCW 43.216.065.

Adopted under notice filed as WSR 20-11-009 and 20-18-087 on May 11 and September 1, 2020.

Changes Other than Editing from Proposed to Adopted Version: Changes to WAC 110-305-1001 published as WSR 20-11-009:

- Clarify that an application for transfer must be made using forms and methods prescribed by the department.
- Clarify that the compliance history the department will provide to parties to the transfer is limited to the previous four years.
- Labels identifying parties to the transfer were made consistent.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 2, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 9, 2020.

Brenda Villarreal  
Rules Coordinator

**NEW SECTION**

**WAC 110-300-0011 License transfers.** (1) Pursuant to RCW 43.216.305(1) and subject to this chapter, a full license issued under chapter 43.216 RCW may be transferred to a new licensee in the event of a transfer of ownership of a child care operation. A current licensee or applicant must apply to transfer a license using forms and methods determined by the department.

(2) A full license will remain valid and may be transferred to a new licensee if:

(a) The new licensee meets the requirements in RCW 43.216.305(2); and

(b) The department determines before the license transfer the new licensee's child care operation is substantially similar to or an improvement of the originally licensed child care operation.

(3) To determine whether the new licensee's child care operation is substantially similar to or an improvement of the original child care operation, the department must assess the following factors of the new child care operation:

(a) The physical environment and all anticipated changes or updates;

(b) The qualifications and number of all retained and newly hired staff members;

(c) The program operations and all anticipated changes or updates;

(d) The relation or connection, if any, between the original and new licensee; and

(e) Whether the new child care operation is able to comply with the licensing requirements described in chapter 43.216 RCW, this chapter, and chapter 110-06 WAC.

(4) The department will determine and disclose to the current licensee and new licensee whether the license is in good standing prior to transferring the license.

(5) At the request of the current licensee or the new licensee, the department will disclose the following license information from the last four years to one or both parties:

(a) A description of any valid complaints;

(b) A description of any instances that the department found noncompliance with the requirements contained in chapter 43.216 RCW, this chapter, and chapter 110-06 WAC;

(c) Safety plans (historical or in effect);

(d) Facility licensing compliance agreements (historical or in effect); and

(e) Enforcement actions levied or pending against this license.

(6) The current licensee or new licensee has the right to appeal the department's denial of a license transfer application by requesting an adjudicative proceeding (or "hearing") pursuant to the hearing rules detailed in chapter 110-03 WAC.

#### NEW SECTION

**WAC 110-305-1001 License transfers.** (1) Pursuant to RCW 43.216.305(1) and subject to this chapter, a full license issued under chapter 43.216 RCW may be transferred to a new licensee in the event of a transfer of ownership of a child care operation. A current licensee or applicant must apply to transfer a license using forms and methods determined by the department.

(2) A full license will remain valid and may be transferred to a new licensee if:

(a) The new licensee meets the requirements in RCW 43.216.305(2); and

(b) The department determines before the license transfer the new licensee's child care operation is substantially similar to or an improvement of the originally licensed child care operation.

(3) To determine whether the new licensee's child care operation is substantially similar to or an improvement of the original child care operation, the department must assess the following factors of the new child care operation:

(a) The physical environment and all anticipated changes or updates;

(b) The qualifications and number of all retained and newly hired staff members;

(c) The program operations and all anticipated changes or updates;

(d) The relation or connection, if any, between the original and new licensee; and

(e) Whether the new child care operation is able to comply with the licensing requirements described in chapter 43.216 RCW, this chapter, and chapter 110-06 WAC.

(4) The department will determine and disclose to the current licensee and new licensee whether the license is in good standing prior to transferring the license.

(5) At the request of the current licensee or the new licensee, the department will disclose the following license information from the last four years to one or both parties:

(a) A description of any valid complaints;

(b) A description of any instances that the department found noncompliance with the requirements contained in chapter 43.216 RCW, this chapter, and chapter 110-06 WAC;

(c) Safety plans (historical or in effect);

(d) Facility licensing compliance agreements (historical or in effect); and

(e) Enforcement actions levied or pending against this license.

(6) The current licensee or new licensee has the right to appeal the department's denial of a license transfer application by requesting an adjudicative proceeding (or "hearing") pursuant to the hearing rules detailed in chapter 110-03 WAC.

**WSR 20-21-016  
PERMANENT RULES  
YAKIMA REGIONAL  
CLEAN AIR AGENCY**

[Filed October 9, 2020, 11:05 a.m., effective November 9, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The purpose of the changes are to update the regulation to be current with federal and state rules. In order to accomplish this, Yakima Regional Clean Air Agency (YRCAA) removed/repealed sections of 2002, improved readability, cleaned up spelling and grammar errors, and corrected outdated RCW and WAC references. The YRCAA Regulation 1 will be submitted for inclusion to the state implementation plan (SIP). In addition, chapter 70.94 RCW was renamed chapter 70A.15 RCW after the YRCAA submitted CR-102. Hence, in this CR-103P filing the YRCAA will also change the referenced RCW in the originally submitted YRCAA Regulation 1 to the new chapter 70A.15 RCW.

Citation of Rules Affected by this Order: Amending YRCAA Regulation 1.

Statutory Authority for Adoption: RCW 70.94.141.

Adopted under notice filed as WSR 20-14-122 on June 30, 2020.

Date Adopted: October 8, 2020.

Keith M. Hurley  
Executive Director

**Reviser's note:** The material contained in this filing exceeded the page-count limitations of WAC 1-21-040 for appearance in this issue of the Register. It will appear in the 20-23 issue of the Register.

**WSR 20-21-021**  
**PERMANENT RULES**  
**BUILDING CODE COUNCIL**

[Filed October 9, 2020, 1:57 p.m., effective November 9, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The purpose of the permanent rule making is to adopt changes noted in CR-105 Expedited rule making (WSR 20-15-083).

Citation of Rules Affected by this Order: Amending 8.

Statutory Authority for Adoption: RCW 19.27.031.

Other Authority: RCW 19.27.074.

Adopted under notice filed as WSR 20-15-083 on July 15, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 8, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: September 21, 2020.

Diane Glenn  
Chair

NEW SECTION

**WAC 51-50-0110 Section inspections.**

**110.3.5 Type IV-A, IV-B, and IV-C connection protection inspection.** In buildings of Type IV-A, IV-B, and IV-C construction, where connection fire-resistance ratings are provided by wood cover calculated to meet the requirements of Section 2304.10.1, inspection of the wood cover shall be made after the cover is installed, but before any other coverings or finishes are installed.

**110.3.6 Lath, gypsum board and gypsum panel product inspection.** Lath, gypsum board and gypsum panel product

inspections shall be made after lathing, gypsum board and gypsum panel products, interior and exterior, are in place, but before any plastering is applied or gypsum board and gypsum panel product joints and fasteners are taped and finished.

**EXCEPTION:** Gypsum board and gypsum panel products that are not part of a fire-resistance-rated assembly or a shear assembly.

**110.3.7 Weather-exposed balcony and walking surface waterproofing.** Where balconies or other elevated walking surfaces are exposed to water from direct or blowing rain, snow or irrigation, and the structural framing is protected by an impervious moisture barrier, all elements of the impervious moisture barrier system shall not be concealed until inspected and *approved*.

**EXCEPTION:** Where special inspections are provided in accordance with Section 1705.1.1, Item 3.

**110.3.8 Fire- and smoke-resistant penetrations.** Protection of joints and penetrations in *fire-resistance-rated* assemblies, *smoke barriers* and smoke partitions shall not be concealed from view until inspected and *approved*.

**110.3.9 Energy efficiency inspections.** Inspections shall be made to determine compliance with Chapter 13 and shall include, but not be limited to, inspections for: Envelope insulation *R*- and *U*-values, fenestration *U*-value, duct system *R*-value, and HVAC and water-heating equipment efficiency.

**110.3.10 Other inspections.** In addition to the inspections specified in Sections 110.3.1 through 110.3.8, the *building official* is authorized to make or require other inspections of any construction work to ascertain compliance with the provisions of this code and other laws that are enforced by the department of building safety.

**110.3.11 Special inspections.** For *special inspections*, see Chapter 17.

**110.3.12 Final inspection.** The final inspection shall be made after all work required by the building *permit* is completed.

**110.3.12.1 Flood hazard documentation.** If located in a *flood hazard area*, documentation of the elevation of the lowest floor as required in Section 1612.4 shall be submitted to the *building official* prior to the final inspection.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0308 Section 308—Institutional Group I.**

**308.1.1 Definitions.** The following terms are defined in Chapter 2:

**24-HOUR CARE.**

Custodial Care.

Detoxification Facilities.

Foster Care Facilities.

**HOSPICE CARE CENTER.**

Hospitals and psychiatric hospitals.

Incapable of self-preservation.

Medical care.  
Nursing homes.

**308.2 Institutional Group I-1.** Institutional Group I-1 occupancy shall include buildings, structures or portions thereof for more than sixteen persons, excluding staff, who reside on a twenty-four-hour basis in a supervised environment and receive custodial care. Buildings of Group I-1 shall be classified as one of the occupancy conditions specified in Section ((308.3.1 or 308.3.2)) 308.2.1 or 308.2.2. This group shall include, but not be limited to, the following:

- Alcohol and drug centers;
- Assisted living facilities as licensed by Washington state under chapter 388-78A WAC;
- Congregate care facilities;
- Group homes;
- Halfway houses;
- Residential board and care facilities;
- Social rehabilitation facilities;
- Residential treatment facilities as licensed by Washington state under chapter 246-337 WAC.

**308.2.5 Adult family homes.** Adult family homes licensed by Washington state shall be classified as Group R-3 or shall comply with the *International Residential Code*.

**308.2.6 Licensed care facilities.** Assisted living facilities as licensed by Washington state under chapter 388-78A WAC shall be classified as Group I-1, Condition 2.

Residential treatment facilities licensed by Washington state under chapter 246-337 WAC shall be classified as one or more occupancy types in accordance with chapter 246-337 WAC.

**308.3 Institutional Group I-2.** Institutional Group I-2 occupancy shall include buildings and structures used for *medical care* on a 24-hour basis for more than five persons who are *incapable of self-preservation*. This group shall include, but not be limited to, the following:

- Foster care facilities.
- Detoxification facilities.
- Hospice care centers.
- Hospitals.
- Nursing homes.
- Psychiatric hospitals.

**308.5.5 Family home child care.** Family home child care licensed by Washington state for the care of twelve or fewer children shall be classified as Group R-3 or shall comply with the *International Residential Code*.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0504 Section 504—Building height and number of stories.**

**Table 504.3**  
**Allowable Building Height in Feet Above Grade Plane<sup>a</sup>**

Occupancy Classification	Type of Construction												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A, B, E, F, M, S, U	NS <sup>b</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	270	180	85	85	70	60
H-1, H-2, H-3, H-5	NS <sup>c,d</sup>	UL	160	65	55	65	55	120	90	65	65	50	40
	S												
H-4	NS <sup>c,d</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	140	100	85	85	70	60
I-1 Condition 1, I-3	NS <sup>d,e</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	180	120	85	85	70	60
I-1 Condition 2, I-2	NS <sup>d,e,f</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S <sup>i</sup>	UL	180	85									
I-4	NS <sup>d,g</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S	UL	180	85	75	85	75	270	180	85	85	70	60
R <sup>h</sup>	NS <sup>d</sup>	UL	160	65	55	65	55	65	65	65	65	50	40
	S13D	60	60	60	60	60	60	60	60	60	60	50	40
	S13R	60	60	60	60	60	60	60	60	60	60	60	60
	S	UL	180	85	75	85	75	270	180	85	85	70	60

For SI: 1 foot = 304.8 mm.

UL = Unlimited; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.



- a See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.
- f New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- g For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.
- i I-1, Condition 2 Assisted living facilities licensed in accordance with chapter 388-78A WAC and residential treatment facilities as licensed by Washington state under chapter 246-337 WAC shall be permitted to use the allowable height above grade plane for Group R-2 occupancies.

**Table 504.4**  
**Allowable Number of Stories Above Grade Plane<sup>a,b</sup>**

Occupancy Classification	Type of Construction												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
A-1	NS	UL	5	3	2	3	2	3	3	3	3	2	1
	S	UL	6	4	3	4	3	9	6	4	4	3	2
A-2	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-3	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-4	NS	UL	11	3	2	3	2	3	3	3	3	2	1
	S	UL	12	4	3	4	3	18	12	6	4	3	2
A-5	NS	UL	UL	UL	UL	UL	UL	1	1	1	UL	UL	UL
	S	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL	UL
B	NS	UL	11	5	3	5	3	5	5	5	5	3	2
	S	UL	12	6	4	6	4	18	12	9	6	4	3
E	NS	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	6	4	3	4	3	9	6	4	4	2	2
F-1	NS	UL	11	4	2	3	2	3	3	3	4	2	1
	S	UL	12	5	3	4	3	10	7	5	5	3	2
F-2	NS	UL	11	5	3	4	3	5	5	5	5	3	2
	S	UL	12	6	4	5	4	12	8	6	6	4	3
H-1	NS <sup>c,d</sup>	1	1	1	1	1	1	NP	NP	NP	1	1	NP
	S							1	1	1			
H-2	NS <sup>c,d</sup>	UL	3	2	1	2	1	1	1	1	2	1	1
	S							2	2	2			
H-3	NS <sup>c,d</sup>	UL	6	4	2	4	2	3	3	3	4	2	1
	S							4	4	4			
H-4	NS <sup>c,d</sup>	UL	7	5	3	5	3	5	5	5	5	3	2
	S							8	7	6			
H-5	NS <sup>c,d</sup>	4	4	3	3	3	3	2	2	2	3	3	2
	S							3	3	3			
I-1 Condition 1	NS <sup>d,e</sup>	UL	9	4	3	4	3	4	4	4	4	3	2
	S							10	5	4			

Occupancy Classification	Type of Construction												
	See Footnotes	Type I		Type II		Type III		Type IV				Type V	
		A	B	A	B	A	B	A	B	C	HT	A	B
I-1 Condition 2	NS <sup>d,e</sup>	UL	9	4	3	4	3	3	3	3	4	3	2
	S <sup>i</sup>	UL	10	5				10	6	4			
I-2	NS <sup>d,f</sup>	UL	4	2	1	1	NP	NP	NP	NP	1	1	NP
	S	UL	5	3				7	5	1			
I-3	NS <sup>d,e</sup>	UL	4	2	1	2	1	2	2	2	2	2	1
	S	UL	5	3	2	3	2	7	5	3	3	3	2
I-4	NS <sup>d,g</sup>	UL	5	3	2	3	2	3	3	3	3	1	1
	S	UL	6	4	3	4	3	9	6	4	4	2	2
M	NS	UL	11	4	2	4	2	4	4	4	4	3	1
	S	UL	12	5	3	5	3	12	8	6	5	4	2
R-1h	NS <sup>d</sup>	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4									4	3
	S	UL	12	5	5	5	5	18	12	8	5	4	3
R-2h	NS <sup>d</sup>	UL	11	4	4	4	4	4	4	4	4	3	2
	S13R	4	4	4								4	3
	S	UL	12	5	5	5	5	18	12	8	5	4	3
R-3h	NS <sup>d</sup>	UL	11	4	4	4	4	4	4	4	4	3	3
	S13D	4	4									3	3
	S13R	4	4									4	4
	S	UL	12	5	5	5	5	18	12	5	5	4	4
R-4h	NS <sup>d</sup>	UL	11	4	4	4	4	4	4	4	4	3	2
	S13D	4	4									3	2
	S13R	4	4									4	3
	S	UL	12	5	5	5	5	18	12	5	5	4	3
S-1	NS	UL	11	4	2	3	2	4	4	4	4	3	1
	S	UL	12	5	3	4	3	10	7	5	5	4	2
S-2	NS	UL	11	5	3	4	3	4	4	4	4	4	2
	S	UL	12	6	4	5	4	12	8	5	5	5	3
U	NS	UL	5	4	2	3	2	4	4	4	4	2	1
	S	UL	6	5	3	4	3	9	6	5	5	3	2

UL = Unlimited; NP = Not permitted; NS = Buildings not equipped throughout with an automatic sprinkler system; S = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1; S13R = Buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.

- a See Chapters 4 and 5 for specific exceptions to the allowable height in this chapter.
- b See Section 903.2 for the minimum thresholds for protection by an automatic sprinkler system for specific occupancies.
- c New Group H occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.5.
- d The NS value is only for use in evaluation of existing building height in accordance with the International Existing Building Code.
- e New Group I-1 and I-3 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6. For new Group I-1 occupancies Condition 1, see Exception 1 of Section 903.2.6.
- f New and existing Group I-2 occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.6 and Section 1103.5 of the *International Fire Code*.
- g For new Group I-4 occupancies, see Exceptions 2 and 3 of Section 903.2.6.
- h New Group R occupancies are required to be protected by an automatic sprinkler system in accordance with Section 903.2.8.

- i Group I-1, Condition 2 Assisted living facilities licensed in accordance with chapter 388-78A WAC and residential treatment facilities as licensed by Washington state under chapter 246-337 WAC shall be permitted to use the allowable number of stories for Group R-2 occupancies.

**504.4.1 Stair enclosure pressurization increase.** For Group R-1, R-2, and I-1 Condition 2 Assisted living facilities licensed under chapter 388-78A WAC and residential treatment facilities as licensed by Washington state under chapter 246-337 WAC located in buildings of Type VA construction equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1, the maximum number of stories permitted in Section 504.4 may be increased by one provided the interior exit stairways and ramps are pressurized in accordance with Sections 909.6.3 and 909.20. Legally required standby power shall be provided in accordance with Sections 909.11 and 2702.2.16 for buildings constructed in compliance with this section and be connected to stairway shaft pressurization equipment, elevators and lifts used for accessible means of egress (if provided), elevator hoistway pressurization equipment (if provided) and other life safety equipment as determined by the authority having jurisdiction. For the purposes of this section, legally required standby power shall comply with ~~((2017))~~ 2020 NEC Section 701.12, options ~~((A), (B),))~~ (C), (D), (E), (F), (H) or ~~((G))~~ (J) or subsequent revised section number(s).

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0510 Section 510—Special provisions.**

**510.2 Horizontal building separation allowance.** A building shall be considered as separate and distinct buildings for the purpose of determining area limitations, continuity of fire walls, limitation of number of stories and type of construction where all of the following conditions are met:

1. The buildings are separated with a *horizontal assembly* having a *fire-resistance rating* of not less than 3 hours where vertical offsets are provided as part of a *horizontal assembly*, the vertical offset and the structure supporting the vertical offset shall have a *fire-resistance rating* of not less than 3 hours.

2. The building below the *horizontal assembly* is of Type IA construction.

3. *Shaft, stairway, ramp* and escalator enclosures through the *horizontal assembly* shall have not less than a 2-hour *fire-resistance rating* with opening protective in accordance with Section 716.

EXCEPTION: Where the enclosure walls below the *horizontal assembly* have not less than a 3-hour *fire-resistance rating* with opening protectives in accordance with Section 716, the enclosure walls extending above the *horizontal assembly* shall be permitted to have a 1-hour *fire-resistance rating* provided:

1. The building above the *horizontal assembly* is not required to be of Type I construction.
2. The enclosure connects fewer than four *stories*; and
3. The enclosure opening protective above the *horizontal assembly* have a *fire protection rating* of not less than 1 hour.

4. Interior exit stairways located within the Type IA building are permitted to be of combustible materials where both of the following requirements are met:

4.1. The building above the Type IA building is of Type III, IV, or V construction.

4.2. The stairway located in the Type IA building is enclosed by 3-hour *fire-resistance-rated* construction with opening protectives in accordance with Section 716.

4. The building or buildings above the horizontal assembly shall be permitted to have multiple Group A occupancy uses, each with an occupant load of less than 300, or Group B, Group I-1, Condition 2 licensed care facilities, M, R, or S occupancies.

5. The building below the horizontal assembly shall be protected throughout by an approved automatic sprinkler system in accordance with Section 903.3.1.1, and shall be permitted to be any occupancy allowed by this code except Group H.

6. The maximum building height in feet (mm) shall not exceed the limits set forth in Section 504.3 for the building having the smaller allowable height as measured from the grade plane. Group I-1, Condition 2 licensed care facilities shall be permitted to use the values for maximum height in feet for Group R-2 occupancies.

**510.5 Group R-1 and R-2 buildings of Type IIIA construction.** For buildings of Type IIIA construction in Groups R-1 and R-2, the maximum allowable height in Table 504.3 shall be increased by 10 feet and the maximum allowable number of stories in Table 504.4 shall be increased by one foot where the first floor assembly above the basement has a *fire-resistance rating* of not less than 3 hours and the floor area is subdivided by 2-hour *fire-resistance-rated* fire walls into areas of not more than 3,000 square feet (279 m<sup>2</sup>).

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0602 Section 602—Construction classification.**

**Table 602**  
**Fire-resistance Rating Requirements for Exterior Walls Based on Fire Separation Distance<sup>a,d,g</sup>**

Fire Separation Distance = X (feet)	Type of Construction	Occupancy Group H <sup>c</sup>	Occupancy Group F-1, M, S-1 <sup>f</sup>	Occupancy Group A, B, E, F-2, I, R <sup>i</sup> , S-2, U <sup>h</sup>
X < 5 <sup>b</sup>	All	3	2	1
5 ≤ X < 10	IA, IVA	3	2	1
	Others	2	1	
10 ≤ X < 30	IA, IB, IVA, IVB	2	1	1 <sup>c</sup>
	IIB, VB	1	0	0
	Others	1	1	1 <sup>c</sup>
X ≥ 30	All	0	0	0

For SI: 1 foot = 304.8 mm.

- a Load-bearing exterior walls shall also comply with the fire-resistance rating requirements of Table 601.
- b See Section 706.1.1 for party walls.
- c Open parking garages complying with Section 406 shall not be required to have a fire-resistance rating.
- d The fire-resistance rating of an exterior wall is determined based upon the fire separation distance of the exterior wall and the story in which the wall is located.
- e For special requirements for Group H occupancies, see Section 415.6.
- f For special requirements for Group S aircraft hangars, see Section 412.3.1.
- g Where Table 705.8 permits nonbearing exterior walls with unlimited area of unprotected openings, the required fire-resistance rating for the exterior walls is 0 hours.
- h For a building containing only a Group U occupancy private garage or carport, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.
- i For a Group R-3 building of Type II-B or Type V-B construction, the exterior wall shall not be required to have a fire-resistance rating where the fire separation distance is 5 feet (1523 mm) or greater.

**602.4 Type IV.** Type IV construction is that type of construction in which the building elements are mass timber or non-combustible materials and have fire-resistance ratings in accordance with Table 601. Mass timber elements shall meet the fire-resistance rating requirements of this section based on either the fire-resistance rating of the noncombustible protection, the mass timber, or a combination of both and shall be determined in accordance with Section 703.2 or 703.3. The minimum dimensions and permitted materials for building elements shall comply with the provisions of this section including Section 2304.11. Mass timber elements of Types IV-A, IV-B and IV-C construction shall be protected with noncombustible protection applied directly to the mass timber in accordance with Sections 602.4.1 through 602.4.3. The time assigned to the noncombustible protection shall be determined in accordance with Section 703.8 and comply with 722.7.

Cross-laminated timber shall be labeled as conforming to ANSI/APA PRG 320 as referenced in Section 2303.1.4.

Exterior load-bearing walls and nonload-bearing walls shall be mass timber construction, or shall be of noncombustible construction.

EXCEPTION: Exterior load-bearing walls and nonload-bearing walls of Type IV-HT Construction in accordance with Section 602.4.4.

The interior building elements, including nonload-bearing walls and partitions, shall be of mass timber construction or of noncombustible construction.

EXCEPTION: Interior building elements and nonload-bearing walls and partitions of Type IV-HT Construction in accordance with Section 602.4.4.

Combustible concealed spaces are not permitted except as otherwise indicated in Sections 602.4.1 through 602.4.4. Combustible stud spaces within light frame walls of Type IV-HT construction shall not be considered concealed spaces, but shall comply with Section 718.

In buildings of Type IV-A, IV-B, and IV-C, construction with an occupied floor located more than 75 feet above the lowest level of fire department access, up to and including 12 stories or 180 feet above grade plane, mass timber interior exit and elevator hoistway enclosures shall be protected in accordance with Section 602.4.1.2. In buildings greater than 12 stories or 180 feet above grade plane, interior exit and elevator hoistway enclosures shall be constructed of noncombustible materials.

**602.4.1 Type IV-A.** Building elements in Type IV-A construction shall be protected in accordance with Sections 602.4.1.1 through 602.4.1.6. The required fire-resistance rating of noncombustible elements and protected mass timber elements shall be determined in accordance with Section 703.2 or Section 703.3.

**602.4.1.1 Exterior protection.** The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components

of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m<sup>2</sup>, a total heat release of less than 20 MJ/m<sup>2</sup> and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m<sup>2</sup>.

**602.4.1.2 Interior protection.** Interior faces of all mass timber elements, including the inside faces of exterior mass timber walls and mass timber roofs, shall be protected with materials complying with Section 703.5.

**602.4.1.2.1 Protection time.** Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2), shall be permitted to be used for compliance with Section 722.7.1.

**602.4.1.3 Floors.** The floor assembly shall contain a noncombustible material not less than 1 inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with 602.4.1.2.

**602.4.1.4 Roofs.** The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.1.2. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

**602.4.1.5 Concealed spaces.** Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the *International Mechanical Code*, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

**602.4.1.6 Shafts.** Shafts shall be permitted in accordance with Sections 713 and 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

**602.4.2 Type IV-B.** Building elements in Type IV-B construction shall be protected in accordance with Sections 602.4.2.1 through 602.4.2.6. The required fire-resistance rating of noncombustible elements or mass timber elements shall be determined in accordance with Section 703.2 or 703.3.

**602.4.2.1 Exterior protection.** The outside face of exterior walls of mass timber construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m<sup>2</sup>, a total heat release of less

than 20 MJ/m<sup>2</sup> and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354, and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m<sup>2</sup>.

**602.4.2.2 Interior protection.** Interior faces of all mass timber elements, including the inside face of exterior mass timber walls and mass timber roofs, shall be protected, as required by this section, with materials complying with Section 703.5.

**602.4.2.2.1 Protection time.** Noncombustible protection shall contribute a time equal to or greater than times assigned in Table 722.7.1(1), but not less than 80 minutes. The use of materials and their respective protection contributions listed in Table 722.7.1(2), shall be permitted to be used for compliance with Section 722.7.1.

**602.4.2.2.2 Protected area.** All interior faces of all mass timber elements shall be protected in accordance with Section 602.4.2.2.1, including the inside face of exterior mass timber walls and mass timber roofs.

**EXCEPTION:** Unprotected portions of mass timber ceilings and walls complying with Section 602.4.2.2.4 and the following:

1. Unprotected portions of mass timber ceilings, including attached beams, shall be permitted and shall be limited to an area equal to 20% of the floor area in any dwelling unit or fire area; or
2. Unprotected portions of mass timber walls, including attached columns, shall be permitted and shall be limited to an area equal to 40% of the floor area in any dwelling unit or fire area; or
3. Unprotected portions of both walls and ceilings of mass timber, including attached columns and beams, in any dwelling unit or fire area shall be permitted in accordance with Section 602.4.2.2.3.
4. Mass timber columns and beams which are not an integral portion of walls or ceilings, respectively, shall be permitted to be unprotected without restriction of either aggregate area or separation from one another.

**602.4.2.2.3 Mixed unprotected areas.** In each dwelling unit or fire area, where both portions of ceilings and portions of walls are unprotected, the total allowable unprotected area shall be determined in accordance with Equation 6-1.

(Equation 6-1)

$$(U_{tc}/U_{ac}) + (U_{tw}/U_{aw}) \leq 1$$

where:

- $U_{tc}$  = Total unprotected mass timber ceiling areas;
- $U_{ac}$  = Allowable unprotected mass timber ceiling area conforming to Section 602.4.2.2.2, Exception 1;
- $U_{tw}$  = Total unprotected mass timber wall areas;

Uaw = Allowable unprotected mass timber wall area conforming to Section 602.4.2.2.2, Exception 2.

**602.4.2.2.4 Separation distance between unprotected mass timber elements.** In each dwelling unit or fire area, unprotected portions of mass timber walls and ceilings shall be not less than 15 feet from unprotected portions of other walls and ceilings, measured horizontally along the ceiling and from other unprotected portions of walls measured horizontally along the floor.

**602.4.2.3 Floors.** The floor assembly shall contain a non-combustible material not less than 1 inch in thickness above the mass timber. Floor finishes in accordance with Section 804 shall be permitted on top of the noncombustible material. The underside of floor assemblies shall be protected in accordance with Section 602.4.1.2.

**602.4.2.4 Roofs.** The interior surfaces of roof assemblies shall be protected in accordance with Section 602.4.2.2 except, in nonoccupiable spaces, they shall be treated as a concealed space with no portion left unprotected. Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

**602.4.2.5 Concealed spaces.** Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the *International Mechanical Code*, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected in accordance with Section 602.4.1.2.

**602.4.2.6 Shafts.** Shafts shall be permitted in accordance with Sections 713 and 718. Both the shaft side and room side of mass timber elements shall be protected in accordance with Section 602.4.1.2.

**602.4.3 Type IV-C.** Building elements in Type IV-C construction shall be protected in accordance with Sections 602.4.3.1 through 602.4.3.6. The required fire-resistance rating of building elements shall be determined in accordance with Sections 703.2 or 703.3.

**602.4.3.1 Exterior protection.** The exterior side of walls of combustible construction shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1. All components of the exterior wall covering, shall be of noncombustible material except water resistive barriers having a peak heat release rate of less than 150 kW/m<sup>2</sup>, a total heat release of less than 20 MJ/m<sup>2</sup> and an effective heat of combustion of less than 18 MJ/kg as determined in accordance with ASTM E1354 and having a flame spread index of 25 or less and a smoke-developed index of 450 or less as determined in accordance with ASTM E84 or UL 723. The ASTM E1354 test shall be conducted on specimens at the thickness intended for use, in the horizontal orientation and at an incident radiant heat flux of 50 kW/m<sup>2</sup>.

**602.4.3.2 Interior protection.** Mass timber elements are permitted to be unprotected.

**602.4.3.3 Floors.** Floor finishes in accordance with Section 804 shall be permitted on top of the floor construction.

**602.4.3.4 Roofs.** Roof coverings in accordance with Chapter 15 shall be permitted on the outside surface of the roof assembly.

**602.4.3.5 Concealed spaces.** Concealed spaces shall not contain combustibles other than electrical, mechanical, fire protection, or plumbing materials and equipment permitted in plenums in accordance with Section 602 of the *International Mechanical Code*, and shall comply with all applicable provisions of Section 718. Combustible construction forming concealed spaces shall be protected with noncombustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1.

**602.4.3.6 Shafts.** Shafts shall be permitted in accordance with Sections 713 and 718. Shafts and elevator hoistway and interior exit stairway enclosures shall be protected with non-combustible protection with a minimum assigned time of 40 minutes as determined in Section 722.7.1, on both the inside of the shaft and the outside of the shaft.

**602.4.4 Type IV-HT.** Type IV-HT construction (Heavy Timber, HT) is that type of construction in which the exterior walls are of noncombustible materials and the interior building elements are of solid wood, laminated heavy timber or structural composite lumber (SCL), without concealed spaces. The minimum dimensions for permitted materials including solid timber, glued-laminated timber, structural composite lumber (SCL) and cross-laminated timber (CLT) and details of Type IV construction shall comply with the provisions of this section and Section 2304.11. Exterior walls complying with Section 602.4.4.1 or 602.4.4.2 shall be permitted. Interior walls and partitions not less than 1 hour fire-resistance rating or heavy timber conforming with Section 2304.11.2.2 shall be permitted.

**602.4.4.1 Fire-retardant-treated wood in exterior walls.** Fire-retardant-treated wood framing and sheathing complying with Section 2303.2 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less.

**602.4.4.2 Cross-laminated timber in exterior walls.** Cross-laminated timber complying with Section 2303.1.4 shall be permitted within exterior wall assemblies not less than 6 inches (152 mm) in thickness with a 2-hour rating or less, provided the exterior surface of the cross-laminated timber is protected by one of the following:

1. Fire-retardant-treated wood sheathing complying with Section 2303.2 and not less than 15/32 inch (12 mm) thick;
  2. Gypsum board not less than 1/2 inch (12.7 mm) thick;
- or
3. A noncombustible material.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0603 Section 603—Combustible material in Types I and II construction.**

**603.1 Allowable materials.** Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Sections 603.1.1 through 603.1.3:

1. *Fire-retardant-treated wood* shall be permitted in:

1.1. Nonbearing partitions where the required *fire-resistance rating* is 2 hours or less.

1.2. Nonbearing *exterior walls* where fire-resistance-rated construction is not required.

1.3. Roof construction, including girders, trusses, framing and decking.

EXCEPTION: In buildings of Type I-A construction exceeding two *stories above grade plane*, *fire-retardant-treated wood* is not permitted in roof construction where the vertical distance from the upper floor to the roof is less than 20 feet (6096 mm).

1.4. Balconies, porches, decks and exterior stairways not used as required exits on buildings three stories or less above grade plane. Approved connector shall be in accordance with Section 2304.10.5.

2. Thermal and acoustical insulation, other than foam plastics, having a *flame spread index* of not more than 25.

EXCEPTIONS:

1. Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a *flame spread index* of not more than 100.
2. Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a *flame spread index* of not more than 200.
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B or C classification.
5. *Interior floor finish* and floor covering materials installed in accordance with Section 804.
6. Millwork such as doors, door frames, window sashes and frames.
7. *Interior wall and ceiling finishes* installed in accordance with Section 803.
8. *Trim* installed in accordance with Section 806.
9. Where not installed greater than 15 feet (4572 mm) above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with Section 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a *corridor serving an occupant load* of 30 or more shall be permitted to be constructed of *fire-retardant-treated wood*, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet (1829 mm) in height.
12. Stages and platforms constructed in accordance with Sections 410.2 and 410.3, respectively.
13. Combustible exterior wall coverings, balconies and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.

14. Blocking such as for handrails, millwork, cabinets, and window and door frames.

15. Light-transmitting plastics as permitted by Chapter 26.

16. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.

17. Exterior plastic veneer installed in accordance with Section 2605.2.

18. Nailing or furring strips as permitted by Section 803.15.

19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.

20. Aggregates, component materials and admixtures as permitted by Section 703.2.2.

21. Sprayed fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of *fire-resistance* tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.

22. Materials used to protect penetrations in fire-resistance-rated assemblies in accordance with Section 714.

23. Materials used to protect joints in fire-resistance-rated assemblies in accordance with Section 715.

24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.

25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.

26. Wall construction of freezers and coolers of less than 1,000 square feet (92.9 m<sup>2</sup>), in size, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0705 Section 705—Exterior walls and projections.**

**705.1 General.** Exterior walls and projections shall comply with this section.

**705.2 Projections.** Cornices, roof and eave overhangs, projecting floors above, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1405. Exterior egress balconies and exterior exit stairways and ramps shall comply with Sections 1021 and 1027, respectively. Projections shall not extend any closer to the line used to determine the fire separation distance than shown in Table 705.2.

EXCEPTIONS:

1. Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section for projections between the buildings.
2. Projecting floors complying with Section 705.2.4 are not required to comply with the projection limitations of Table 705.2.

~~((705.2.5))~~ **705.2.4 Projecting floors.** Where the fire separation distance on a lower floor is greater than the fire separation distance on the floor immediately above, the projecting

floor shall have not less than the *fire-resistance rating* as the exterior wall above based on Table 602. The *fire-resistant rating* of the *horizontal* portion shall be continuous to the lower *vertical* wall.

**705.2.5 Bay and oriel windows.** Bay and oriel windows constructed of combustible materials shall conform to the type of construction required for the building to which they are attached.

**EXCEPTION:** Fire-retardant-treated wood shall be permitted on buildings three stories or less above grade plane of Type I, II, III or IV construction.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0903 Section 903—Automatic sprinkler systems.**

**903.2.1.8 Nightclub.** An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code.

**903.2.3 Group E.** An automatic sprinkler system shall be provided for fire areas containing Group E occupancies where the fire area has an occupant load of 51 or more, calculated in accordance with Table 1004.1.2.

**EXCEPTIONS:**

1. Portable school classrooms with an occupant load of 50 or less calculated in accordance with Table 1004.1.2, provided that the aggregate area of any cluster of portable school classrooms does not exceed 6,000 square feet (557 m<sup>2</sup>); and clusters of portable school classrooms shall be separated as required by the building code; or
2. Portable school classrooms with an occupant load from 51 through 98, calculated in accordance with Table 1004.1.2, and provided with two means of direct independent exterior egress from each classroom in accordance with Chapter 10, and one exit from each classroom shall be accessible, provided that the aggregate area of any cluster of portable classrooms does not exceed 6,000 square feet (557 m<sup>2</sup>); and clusters of portable school classrooms shall be separated as required by the building code; or
3. Fire areas containing day care and preschool facilities with a total occupant load of 100 or less located at the level of exit discharge where every room in which care is provided has not fewer than one exit discharge door.

**903.2.6 Group I.** An automatic sprinkler system shall be provided throughout buildings with a Group I fire area.

**EXCEPTIONS:**

1. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in Group I-1 Condition 1 facilities.
2. Where new construction house sixteen persons receiving care, an automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted for Group I-1, Condition 2, assisted living facilities licensed under chapter 388-78A WAC and residential treatment facilities licensed under chapter 246-337 WAC.
3. An automatic sprinkler system installed in accordance with Section 903.3.1.2 shall be permitted in additions to existing buildings where both of the following situations are true:

3.1. The addition is made to a building previously approved as Group LC or Group R-2 that houses either an assisted living facility licensed under chapter 388-78A WAC or residential treatment facility licensed under chapter 246-337 WAC.

3.2. The addition contains spaces for sixteen or fewer persons receiving care.

**903.2.6.1 Group I-4.** An automatic sprinkler system shall be provided in fire areas containing Group I-4 occupancies where the fire area has an occupant load of 51 or more, calculated in accordance with Table 1004.1.2.

**EXCEPTIONS:**

1. An automatic sprinkler system is not required for Group I-4 day care facilities with a total occupant load of 100 or less, and located at the level of exit discharge and where every room where care is provided has not fewer than one exterior exit door.
2. In buildings where Group I-4 day care is provided on levels other than the level of exit discharge, an automatic sprinkler system in accordance with Section 903.3.1.1 shall be installed on the entire floor where care is provided, all floors between the level of care and the level of exit discharge and all floors below the level of exit discharge other than areas classified as an open parking garage.

**903.2.7 Group M.** An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy, where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m<sup>2</sup>).
2. A Group M fire area is located more than three stories above grade plane.
3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m<sup>2</sup>).
4. Where a Group M occupancy that is used for the display and sale of upholstered furniture or mattresses exceeds 5000 square feet (464 m<sup>2</sup>).

**903.2.8 Group R.** An automatic fire sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

**EXCEPTION:** Group R-1 if all of the following conditions apply:

1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
2. The Group R fire area is only one story.
3. The Group R fire area does not include a basement.
4. The Group R fire area is no closer than 30 feet from another structure.
5. Cooking is not allowed within the Group R fire area.
6. The Group R fire area has an occupant load of no more than 8.
7. A hand held (portable) fire extinguisher is in every Group R fire area.

**903.2.9.3 Group ((5-1)) S-1 upholstered furniture and mattresses.** An automatic sprinkler system shall be provided throughout a Group 5-1 fire area where the area used for storage of upholstered furniture exceeds 2,500 square feet (232 m<sup>2</sup>).



EXCEPTION: Self-service storage facilities no greater than one story above grade plane where all storage spaces can be accessed directly from the exterior.

**903.2.11 Specific building areas and hazards.** In all occupancies other than Group U, an automatic sprinkler system shall be installed for building design or hazards in the locations set forth in Sections 903.2.11.1 through 903.2.11.7.

**903.2.11.7 Relocatable buildings within buildings.** Relocatable buildings or structures located within a building with an approved fire sprinkler system shall be provided with fire sprinkler protection within the occupiable space of the building and the space underneath the relocatable building.

EXCEPTIONS:

1. Sprinkler protection is not required underneath the building when the space is separated from the adjacent space by construction resisting the passage of smoke and heat and combustible storage will not be located there.
2. If the building or structure does not have a roof or ceiling obstructing the overhead sprinklers.
3. Construction trailers and temporary offices used during new building construction prior to occupancy.
4. Movable shopping mall kiosks with a roof or canopy dimension of less than 4 feet on the smallest side.

**903.3.5.3 Underground portions of fire protection system water supply piping.** The installation or modification of an underground water main, public or private, supplying a water-based fire protection system shall be in accordance with NFPA 24 and chapter 18.160 RCW. Piping and appurtenances downstream of the first control valve on the lateral or service line from the distribution main to one-foot above finished floor shall be approved by the fire code official. Such underground piping shall be installed by a fire sprinkler system contractor licensed in accordance with chapter 18.160 RCW and holding either a Level U or a Level 3 license. For underground piping supplying systems installed in accordance with Section 903.3.1.2, a Level 2, 3, or U licensed contractor is acceptable.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-0909 Section 909—Smoke control systems.**

~~((909.6.3 Pressurized stairways and elevator hoistways. Where stairways or elevator hoistways are pressurized, such pressurization systems shall comply with the requirements of Section 909.20 of this code for stair pressurization and 909.21 of the *International Building Code and Fire Code* as necessary to determine that the stairway or elevator hoistways meets the pressurization requirements of the code. Stairway and elevator hoistway pressurization systems in high rise buildings, underground buildings, and in airport traffic control towers shall comply with *International Building Code* and *International Fire Code* Sections 909 as smoke control systems.~~

Stairway pressurization systems in other than high rise buildings, underground buildings, or airport traffic control towers are smoke control systems but shall only be required to comply with the following *International Building Code*

~~909 Sections: 909.1, 909.2, 909.3, 909.6 with the exception of Sections 909.6.1, 909.10 with the exception of Sections 909.10.2, 909.11 with the exception of Sections 909.11.1, 909.12 with the exception of Sections 909.12.3.2, 909.13, 909.14, 909.17, 909.18 with the exception of Sections 909.18.2 and 909.18.9, 909.19, 909.20.5 and 909.20.6. Design drawings shall include a description of system operation, the conditions for system testing and the criteria for system acceptance to achieve the code minimum performance of the smoke control system. Stairway pressurization systems shall be maintained in accordance with Section 909.20 of the *International Fire Code*.~~

Elevator hoistway pressurization systems in other than high rise buildings, underground buildings, or airport traffic control towers are smoke control systems but shall only be required to comply with the following *International Building Code* 909 Sections: 909.1, 909.2, 909.3, 909.6 with the exception of Sections 909.6.1, 909.10 with the exception of Sections 909.10.2, 909.11 with the exception of Sections 909.11.1, 909.12 with the exception of Sections 909.12.3.2, 909.13, 909.14, 909.17, 909.18 with the exception of Sections 909.18.2 and 909.18.9, 909.19, and 909.21 with the exception of Sections 909.21.2, 909.21.9, and 909.21.10. Design drawings shall include a description of system operation, the conditions for system testing and the criteria for system acceptance to achieve the code minimum performance of the smoke control system. Elevator hoistway pressurization systems shall be maintained in accordance with Section 909.20 of the *International Fire Code*.)

**909.21.12 Hoistway venting.** Hoistway venting need not be provided for pressurized elevator shafts.

**909.21.13 Machine rooms.** Elevator machine rooms shall be pressurized in accordance with this section unless separated from the hoistway shaft by construction in accordance with Section 707.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1006 Section 1006—Number of exits and exit access doorways.**

Table 1006.2.1

Spaces with One Exit or Exit Access Doorway

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		
		Without Sprinkler System (feet)		With Sprinkler System (feet)
		Occupant Load		
		OL ≤ 30	OL ≥ 30	
A <sup>c</sup> , E <sup>b</sup> , M	49	75	75	75 <sup>a</sup>
B	49	100	75	100 <sup>a</sup>
F	49	75	75	100 <sup>a</sup>
H-1, H-2, H-3	3	NP	NP	25 <sup>b</sup>
H-4, H-5	10	NP	NP	75 <sup>b</sup>
I-1, I-2 <sup>d</sup> , I-4	10	NP	NP	75 <sup>b</sup>
I-3	10	NP	NP	100 <sup>a</sup>
R-1	10	NP	NP	75 <sup>a</sup>
R-2	20	NP	NP	125 <sup>a</sup>
R-3 <sup>e</sup>	20	NP	NP	125 <sup>a,g</sup>
R-4 <sup>e</sup>	20	NP	NP	125 <sup>a,g</sup>
S <sup>f</sup>	29	100	75	100 <sup>a</sup>
U	49	100	75	75 <sup>a</sup>

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

- a Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2. See Section 903 for occupancies where automatic sprinkler systems are permitted in accordance with Section 903.3.1.2.
- b Group H occupancies equipped throughout with an automatic sprinkler system in accordance with Section 903.2.5.
- c For a room or space used for assembly purposes having fixed seating, see Section 1029.8.
- d For the travel distance limitations in Group I-2, see Section 407.4.
- e The common path of egress travel distance shall only apply in a Group R-3 occupancy located in a mixed occupancy building.
- f The length of common path of egress travel distance in a Group S-2 open parking garage shall be not more than 100 feet.
- g For the travel distance limitations in Groups R-3 and R-4 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.3, see Section 1006.2.2.6.
- h Day care facilities, rooms or spaces where care is provided for more than 10 children that are 2 1/2 years of age or less, shall have access to not less than two exits or exit access doorways.

**1006.2.1 Egress based on occupant load and common path of egress travel distance.** Two exits or exit access doorways from any space shall be provided where the design occupant load or the common path of egress travel distance exceeds the values listed in Table 1006.2.1. The cumulative occupant load from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.

- EXCEPTIONS:
- 1. The number of exits from foyers, lobbies, vestibules or similar spaces need not be based on cumulative occupant loads for areas discharging through such spaces, but the capacity of the exits from such spaces shall be based on applicable cumulative occupant loads.
  - 2. Care suites in Group I-2 occupancies complying with Section 407.4.
  - 3. Unoccupied mechanical rooms and penthouses are not required to comply with the common path of egress travel distance measurement.

**1006.2.2.4 Group I-4 means of egress.** This section is not adopted.

~~(1006.2.2.6)~~ **1006.2.2.7 Electrical equipment rooms.** Rooms containing electrical equipment shall be provided with a second exit or exit access doorways as required by NFPA 70 Article 110 where all of the following apply:

- 1. The electrical equipment is rated at 1,200 amperes or more.
- 2. The electrical equipment is over 6 feet (1829 mm) wide.
- 3. The electrical equipment contains overcurrent devices, switching devices or control devices.

**1006.3.3 Single exits.** A single exit or access to a single exit shall be permitted from any story or occupied roof where one of the following conditions exists:

- 1. The occupant load, number of dwelling units and exit access travel distance within the portion of the building served by the single exit do not exceed the values in Table 1006.3.3(1) or 1006.3.3(2).
- 2. Rooms, areas and spaces complying with Section 1006.2.1 with exits that discharge directly to the exterior at

the level of exit discharge, are permitted to have one exit or access to a single exit.

3. Parking garages where vehicles are mechanically parked shall be permitted to have one exit or access to a single exit.

4. Groups R-3 and R-4 occupancies shall be permitted to have one exit or access to a single exit.

5. Individual single-story or multistory dwelling units shall be permitted to have a single exit or access to a single exit from the dwelling unit provided that both of the following criteria are met:

5.1. The dwelling unit complies with Section 1006.2.1 as a space with one means of egress.

5.2. Either the exit from the dwelling unit discharges directly to the exterior at the level of exit discharge, or the exit access outside the dwelling unit's entrance door provides access to not less than two approved independent exits.

**Table 1006.3.3(1)**

**Stories with One Exit or Access to One Exit for R-2 Occupancies**

Story	Occupancy	Maximum Number of Dwelling Units	Maximum Exit Access Travel Distance
Basement, first, second, or third story above grade plane	R-2 <sup>a,b</sup>	4 dwelling units	125 feet
Fourth story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

- a Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1030.
- b This table is used for R-2 occupancies consisting of dwelling units. For R-2 occupancies consisting of sleeping units, use Table 1006.3.3(2).

**Table 1006.3.3(2)**

**Stories with One Exit or Access to One Exit for Other Occupancies**

Story	Occupancy	Maximum Occupant Load per Story	Maximum Exit Access Travel Distance (feet)
First story above or below grade plane	A, B <sup>b</sup> , E, F <sup>b</sup> , M, U	49	75
	H-2, H-3	3	25
	H-4, H-5, I, R-1, R-2 <sup>a,c</sup>	10	75
	S <sup>b,d</sup>	29	75
Second story above grade plane	B, F, M, S <sup>d</sup>	29	75

Story	Occupancy	Maximum Occupant Load per Story	Maximum Exit Access Travel Distance (feet)
Third story above grade plane and higher	NP	NA	NA

For SI: 1 foot = 304.8 mm.

NP = Not Permitted.

NA = Not Applicable.

- a Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1030.
- b Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum exit access travel distance of 100 feet.
- c This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1006.3.3(1).
- d The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1009 Section 1009—Accessible means of egress.**

**1009.1 Accessible means of egress required.** Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress is required by Section 1006.2 or 1006.3 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

- EXCEPTIONS:
1. Accessible means of egress are not required to be provided in existing buildings.
  2. One accessible means of egress is required from an accessible mezzanine level in accordance with Section 1009.3, 1009.4 or 1009.5.
  3. In assembly areas with ramped aisles or stepped aisles, one accessible means of egress is permitted where the common path of egress travel is accessible and meets the requirements in Section 1029.8.
  4. In parking garages, accessible means of egress are not required to serve parking areas that do not contain accessible parking spaces.

**1009.2.1 Elevators required.** In buildings where a required accessible floor or accessible occupied roof is four or more stories above or below a level of exit discharge, not less than one required accessible means of egress shall be an elevator complying with Section 1009.4.

- EXCEPTIONS:
1. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a horizontal exit and located at or above the levels of exit discharge.
  2. In buildings equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the elevator shall not be required on floors provided with a ramp conforming to the provisions of Section 1012.

**1009.8 Two-way communication.** A two-way communication system complying with Sections 1009.8.1 and 1009.8.2 shall be provided at the landing serving each elevator or bank of elevators on each accessible floor that is one or more stories above or below the *level of exit discharge*.

- EXCEPTIONS:
1. Two-way communication systems are not required at the landing serving each elevator or bank of elevators where the two-way communication system is provided within *areas of refuge* in accordance with Section 1009.6.5.
  2. Two-way communication systems are not required on floors provided with *ramps* that provide a direct path of egress travel to grade or the level of exit discharge conforming to the provisions of Section 1012.
  3. Two-way communication systems are not required at the landings serving only service elevators that are not designated as part of the accessible *means of egress* or serve as part of the required *accessible route* into a facility.
  4. Two-way communication systems are not required at the landings serving only freight elevators.
  5. Two-way communication systems are not required at the landing serving a private residence elevator.
  6. Two-way communication systems are not required in Group I-2 or I-3 facilities.

**1009.8.1 System requirements.** Two-way communication systems shall provide communication between each required location and the *fire command center* or a central control point location *approved* by the fire department. Where the central control point is not a *constantly attended location*, a two-way communication system shall have a timed automatic telephone dial-out capability to a monitoring location. The two-way communication system shall include both audible and visible signals. The two-way communication system shall have a battery backup or an approved alternate source of power that is capable of 90 minutes use upon failure of the normal power source.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1019 Section 1019—Exit access stairways and ramps.**

**1019.3 Occupancies other than Groups I-2 and I-3.** In other than Groups I-2 and I-3 occupancies, floor openings containing exit access stairways or ramps shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

- EXCEPTIONS:
1. Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories shall not be open to other stories.
  2. In Group R-1, R-2 or R-3 occupancies, exit access stairways and ramps connecting four stories or less serving and contained within an individual dwelling unit or sleeping unit or live/work unit.
  3. Exit access stairways serving and contained within a Group R-3 congregate residence ((or a Group R-4 facility)) are not required to be enclosed.

4. Exit access stairways and ramps in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or ramp and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to openings that do not connect more than four stories.
5. Exit access stairways and ramps within an atrium complying with the provisions of Section 404.
6. Exit access stairways and ramps in open parking garages that serve only the parking garage.
7. Exit access stairways and ramps serving smoke-protected or open-air assembly seating complying with the exit access travel distance requirements of Section 1029.7.
8. Exit access stairways and ramps between the balcony, gallery or press box and the main assembly floor in occupancies such as theaters, places of religious worship, auditoriums, and sports facilities.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1024 Section 1024—Exit passageways.**

~~(1024.8)~~ **1024.9 Exit passageway exterior walls.** Exterior walls of the exit passageway shall comply with Section 705. Where nonrated walls or unprotected openings enclose the exterior of the exit passageway and the walls or openings are exposed by other parts of the building at an angle of less than 180 degrees (3.14 rad), the building exterior walls within 10 feet (3048 mm) horizontally of a nonrated wall or unprotected opening shall have a *fire-resistance rating* of not less than 1 hour. Openings within such exterior walls shall be protected by opening protectives having a *fire-protection rating* of not less than 3/4 hour. This construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor of the exit passageway, or to the roof line, whichever is lower.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1107 Section 1107—Dwelling units and sleeping units.**

**1107.5.1.1 Accessible units in Group I-1, Condition 1.** In Group I-1, Condition 1, at least 4 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 50 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.4.
  2. In not more than 50 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.5.

**1107.5.1.2 Accessible units in Group I-1, Condition 2.** In Group I-1, Condition 2, at least 10 percent, but not less than

one, of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 90 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.4.
  2. In not more than 90 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.5.

**1107.5.4 Group I-2 rehabilitation facilities. In hospitals and rehabilitation facilities of Group I-2 occupancies that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility, 100 percent of the dwelling units and sleeping units shall be accessible units.**

- EXCEPTIONS:
1. In not more than 50 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.4.
  2. In not more than 50 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.5.

**1107.6.2.2.1 Type A units.** In Group R-2 Occupancies containing more than 10 dwelling units or sleeping units, at least 5 percent, but not less than one, of the units shall be a Type A unit. All units on a site shall be considered to determine the total number of units and the required number of Type A units. Type A units shall be dispersed among the various classes of units, as described in Section 1107.6. Bedrooms in monasteries and convents shall be counted as *sleeping units* for the purpose of determining the number of units. Where the *sleeping units* are grouped into suites, only one *sleeping unit* in each suite shall count towards the number of required *Type A units*.

- EXCEPTIONS:
1. The number of Type A units is permitted to be reduced in accordance with Section 1107.7.
  2. Existing structures on a site shall not contribute to the total number of units on a site.

**1107.5.1 Group I-1.** Accessible units and Type B units shall be provided in Group I-1 occupancies in accordance with Sections 1107.5.1.1 through 1107.5.1.3.

**1107.5.1.1 Accessible units in Group I-1, Condition 1.** In Group I-1, Condition 1, at least 4 percent, but not less than one, of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 50 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2.
  2. In not more than 50 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3.

**1107.5.1.2 Accessible units in Group I-1, Condition 2.** In Group I-1, Condition 2, at least 10 percent, but not less than

one, of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 50 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2.
  2. In not more than 50 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3.

**1107.5.1.3 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.

- EXCEPTION: The number of Type B units is permitted to be reduced in accordance with Section 1107.7.

**1107.5.2 Group I-2 nursing homes.** Accessible units and Type B units shall be provided in nursing homes of Group I-2, Condition 1 occupancies in accordance with Sections 1107.5.2.1 and 1107.5.2.2.

**1107.5.2.1 Accessible units.** At least 50 percent but not less than one of each type of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 90 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2.
  2. In not more than 90 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3.

~~**(1107.5.2.2 Type B units.** In structures with four or more dwelling units or sleeping units intended to be occupied as a residence, every dwelling unit and sleeping unit intended to be occupied as a residence shall be a Type B unit.~~

- EXCEPTION: ~~The number of Type B units is permitted to be reduced in accordance with Section 1107.7.)~~

**1107.5.4 Group I-2 rehabilitation facilities.** In hospitals and rehabilitation facilities of Group I-2 occupancies that specialize in treating conditions that affect mobility, or units within either that specialize in treating conditions that affect mobility, 100 percent of the dwelling units and sleeping units shall be accessible units.

- EXCEPTIONS:
1. In not more than 50 percent of the accessible units, water closets shall not be required to comply with ICC A117.1 where such water closets comply with Section 1109.2.2.
  2. In not more than 50 percent of the accessible units, roll-in-type showers shall not be required to comply with ICC A117.1 where roll-in-type showers comply with Section 1109.2.3.

**1107.6.2.3 Group R-2 other than live/work units, apartment houses, monasteries and convents.** In Group R-2 Occupancies, other than live/work units, apartment houses, monasteries and convents falling within the scope of Sections 1107.6.2.1 and 1107.6.2.2, accessible units and Type B units shall be provided in accordance with Sections 1107.6.2.3.1 and 1107.6.2.3.2. Bedrooms within congregate living facili-

ties shall be counted as sleeping units for the purpose of determining the number of units. Where the sleeping units are grouped into suites, only one sleeping unit in each suite shall be permitted to count towards the number of required accessible units. Accessible units shall be dispersed among the various classes of units, as described in Section 1107.6.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-11090 Section 1109—Other features and facilities.**

**1109.2 Toilet and bathing facilities.** Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1109.2 and 1109.2.3(~~(, 1109.2.4 and 1109.2.5)~~) at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

- EXCEPTIONS:
1. Toilet rooms or bathing rooms accessed only through a private office, not for common or public use and intended for use by a single occupant, shall be permitted to comply with the specific exceptions in ICC A117.1.
  2. This section is not applicable to toilet and bathing rooms that serve dwelling units or sleeping units that are not required to be accessible by Section 1107.
  3. Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible. Where these rooms are designated as gender-neutral, the total number of accessible toilet or bathing rooms shall not be less than the sum of required accessible separate male plus female rooms.
  4. Where no more than one urinal is provided in a toilet room or bathing room, the urinal is not required to be accessible.
  5. Toilet rooms or bathing rooms that are part of critical care or intensive care patient sleeping rooms serving accessible units are not required to be accessible.
  6. Toilet rooms or bathing rooms designed for bariatrics patients are not required to comply with the toilet room and bathing room requirement in ICC A117.1. The sleeping units served by bariatrics toilet or bathing rooms shall not count toward the required number of accessible sleeping units.
  7. Where permitted in Section 1107, in toilet rooms or bathrooms serving accessible units, water closets designed for assisted toileting shall be permitted to comply with Section (~~(1109.2.2)~~) 1109.2.4.
  8. Where permitted in Section 1107, in bathrooms serving accessible units, showers designed for assisted toileting shall be permitted to comply with Section (~~(1109.2.3)~~) 1109.2.5.
  9. Where toilet facilities are primarily for children's use, required accessible water closets, toilet compartments and lavatories shall be permitted to comply with children's provision of ICC A117.1.

~~(1109.2.2)~~ **1109.2.4 Water closets designed for assisted toileting.** Water closets designed for assisted toileting shall

comply with Sections (~~(1109.2.2.1)~~) 1109.2.4.1 through (~~(1109.2.2.6)~~) 1109.2.4.6.

~~(1109.2.2.1)~~ **1109.2.4.1 Location.** The centerline of the water closet shall be 24 inches (610 mm) minimum and 26 inches (660 mm) maximum from one side of the required clearance.

~~(1109.2.2.2)~~ **1109.2.4.2 Clearance.** Clearance around the water closet shall comply with Sections (~~(1109.2.2.2.1)~~) 1109.2.4.2.1 through (~~(1109.2.2.2.3)~~) 1109.2.4.2.3.

~~(1109.2.2.2.1)~~ **1109.2.4.2.1 Clearance width.** Clearance around a water closet shall be 66 inches (1675 mm) minimum in width, measured perpendicular from the side of the clearance that is 24 inches (610 mm) minimum and 26 inches (660 mm) maximum from the water closet centerline.

~~(1109.2.2.2.2)~~ **1109.2.4.2.2 Clearance depth.** Clearance around the water closet shall be 78 inches (1980 mm) minimum in depth, measured perpendicular from the rear wall.

~~(1109.2.2.2.3)~~ **1109.2.4.2.3 Clearance overlap.** The required clearance around the water closet shall be permitted overlaps in accordance with ICC A117.1 Section 604.3.3.

~~(1109.2.2.3)~~ **1109.2.4.3 Height.** The height of the water closet seats shall comply with ICC A117.1 Section 604.4.

~~(1109.2.2.4)~~ **1109.2.4.4 Swing-up grab bars.** The swing-up grab bars shall comply with ICC A117.1 Sections 609.2 and 609.8. Swing-up grab bars shall be provided on both sides of the water closet and shall comply with all of the following:

1. The centerline of the grab bar shall be 14 inches minimum to 16 inches (356 mm to 405 mm) maximum from the centerline of the water closet.
2. The length of the grab bar is 36 inches (915 mm) minimum in length, measured from the rear wall to the end of the grab bar.
3. The top of the grab bar in the down position is 30 inches (760 mm) minimum and 34 inches (865 mm) maximum above the floor.

~~(1109.2.2.5)~~ **1109.2.4.5 Flush controls.** Flush controls shall comply with ICC A117.1 Section 604.6.

~~(1109.2.2.6)~~ **1109.2.4.6 Dispensers.** Toilet paper dispensers shall be mounted on at least one of the swing-up grab bars and the outlet of the dispenser shall be located at 24 inches (610 mm) minimum to 36 inches (915 mm) maximum from the rear wall.

~~(1109.2.3)~~ **1109.2.5 Standard roll-in-type shower compartment designed for assisted bathing.** Standard roll-in-type shower compartments designed for assisted bathing shall comply with Sections (~~(1109.2.3.1)~~) 1109.2.5.1 through (~~(1109.2.3.8)~~) 1109.2.5.8.

~~(1109.2.3.1)~~ **1109.2.5.1 Size.** Standard roll-in-type shower compartments shall have a clear inside dimension of 60 inches (1525 mm) minimum in width and 30 inches (760 mm) minimum in depth, measured at the center point of opposing sides. An entry 60 inches (1525 mm) minimum in width shall be provided.

~~((1109.2.3.2))~~ **1109.2.5.2 Clearance.** A clearance of 60 inches (1525 mm) minimum in length adjacent to the 60 inch (1525 mm) width of the open face of the shower compartment, and 30 inches (760 mm) minimum in depth, shall be provided.

EXCEPTIONS:

1. A lavatory complying with Section 606 shall be permitted at one end of the clearance.
2. Where the shower compartment exceeds minimum sizes, the clear floor space shall be placed adjacent to the grab bars and 30 inches minimum from the back wall.

~~((1109.2.3.3))~~ **1109.2.5.3 Grab bars.** Grab bars shall comply with ICC A117.1 Section 609 and shall be provided in accordance with Sections ~~((1109.2.3.3.1))~~ **1109.2.5.3.1** and ~~((1109.2.3.3.2))~~ **1109.2.5.3.2**. In standard roll-in-type shower compartments, grab bars shall be provided on three walls. Where multiple grab bars are used, required horizontal grab bars shall be installed at the same height above the floor. Grab bars can be separate bars or one continuous bar.

~~((1109.2.3.3.1))~~ **1109.2.5.3.1 Back-wall grab bar.** The back-wall grab bar shall extend the length of the back wall and extend within 6 inches (150 mm) maximum from the two adjacent side walls.

EXCEPTION:

The back wall grab bar shall not be required to exceed 48 inches (1220 mm) in length. The rear grab bar shall be located with one end within 6 inches maximum of a side wall with a grab bar complying with Section ~~((1109.2.3.3.2))~~ **1109.2.5.3.2**.

~~((1109.2.3.3.2))~~ **1109.2.5.3.2 Side-wall grab bars.** The side-wall grab bars shall extend the length of the wall and extend within 6 inches (150 mm) maximum from the adjacent back wall.

EXCEPTIONS:

1. The side-wall grab bar shall not be required to exceed 30 inches (760 mm) in length. The side grab bar shall be located with one end within 6 inches maximum of the back wall with a grab bar complying with Section ~~((1109.2.3.3.1))~~ **1109.2.5.3.1**.
2. Where the side walls are located 72 inches (1830 mm) or greater apart, a grab bar is not required on one of the side walls.

~~((1109.2.3.4))~~ **1109.2.5.4 Seats.** Wall-mounted folding seats shall not be installed.

~~((1109.2.3.5))~~ **1109.2.5.5 Controls and hand showers.** In standard roll-in-type showers, the controls and hand shower shall be located 38 inches (965 mm) minimum and 48 inches (1220 mm) maximum above the shower floor. Controls shall be located to facilitate caregiver access.

~~((1109.2.3.6))~~ **1109.2.5.6 Hand showers.** Hand showers shall comply with ICC A117.1 Section 608.5.

~~((1109.2.3.7))~~ **1109.2.5.7 Thresholds.** Thresholds shall comply with ICC A117.1 Section 608.6.

~~((1109.2.3.8))~~ **1109.2.5.8 Shower enclosures.** Shower compartment enclosures for shower compartments shall comply with ICC A117.1 Section 608.7.

~~((1109.2.3.9))~~ **1109.2.5.9 Water temperature.** Water temperature shall comply with ICC A117.1 Section 608.8.

**1109.5.1 Minimum number.** Not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

EXCEPTIONS:

1. A single drinking fountain with two separate spouts that complies with the requirements for people who use a wheelchair and standing persons shall be permitted to be substituted for two separate drinking fountains.
2. Where drinking fountains are primarily for children's use, drinking fountains for people using wheelchairs shall be permitted to comply with the children's provisions in ICC A117.1 and drinking fountains for standing children shall be permitted to provide the spout at 30 inches (762 mm) minimum above the floor.
3. In all occupancies that require more than two drinking fountains per floor or secured area, bottle filling stations shall be allowed to be substituted in accordance with Section 2902.5.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

### WAC 51-50-1202 Section 1202—Ventilation.

**1202.1 General.** Buildings shall be provided with natural ventilation in accordance with Section 1203.5, or mechanical ventilation in accordance with the *International Mechanical Code. Ambulatory care facilities* and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407 of the *International Mechanical Code*.

**1202.2 Attic spaces.** Enclosed *attics* and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing members shall have cross ventilation for each separate space by ventilation openings protected against the entrance of rain and snow. Blocking and bridging shall be arranged so as not to interfere with the movement of air. An airspace of not less than 1 inch (25 mm) shall be provided between the insulation and the roof sheathing. The net free ventilating area shall not be less than 1/150th of the area of the space ventilated. Ventilators shall be installed in accordance with the manufacturer's installation instructions.

EXCEPTION:

The net free cross-ventilation area shall be permitted to be reduced to 1/300 provided both of the following conditions are met:

1. A Class I or II vapor retarder is installed on the warm-in-winter side of the ceiling.
2. At least 40 percent and not more than 50 percent of the required venting area is provided by ventilators located in the upper portion of the attic or rafter space. Upper ventilators shall be located not more than 3 feet (914 mm) below the ridge or highest point of the space, measured vertically, with the balance of the ventilation provided by eave or cornice vents. Where the location of wall or roof framing members conflicts with the installation of upper ventilators, installation more than 3 feet (914 mm) below the ridge or highest point of the space shall be permitted.

**1202.4 Under-floor ventilation.** The space between the bottom of the floor joists and the earth under any building except spaces occupied by basements or cellars shall be provided with ventilation openings through foundation walls or *exte-*

*rior walls.* Such openings shall be placed so as to provide cross ventilation of the under-floor space. A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped six inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of two inches.

**1202.5 Natural ventilation.** For other than Group R Occupancies, natural ventilation of an occupied space shall be through windows, doors, louvers or other openings to the outdoors. The operating mechanism for such openings shall be provided with ready access so that the openings are readily controllable by the building occupants. Group R Occupancies shall comply with the *International Mechanical Code*.

**~~(1202.6)~~ 1202.7 Radon resistive construction standards.** The criteria of this section establishes minimum radon resistive construction requirements for Group R Occupancies.

**~~(1202.6.1)~~ 1202.7.1 Application.** The requirements of Section 1202.6 shall be adopted and enforced by all jurisdictions of the state according to the following subsections.

**~~(1202.6.1.1)~~ 1202.7.1.1** All jurisdictions of the state shall comply with Section 1202.6.2.

**~~(1202.6.1.2)~~ 1202.7.1.2** Clark, Ferry, Okanogan, Pend Oreille, Skamania, Spokane, and Stevens counties shall also comply with Section 1203.6.3.

**~~(1202.6.2)~~ 1202.7.2 State wide radon requirements.**

**~~(1202.6.2.1)~~ 1202.7.2.1 Crawlspace.** All crawlspaces shall comply with the requirements of this section.

**~~(1202.6.2.2)~~ 1202.7.2.2 Ventilation.** All crawlspaces shall be ventilated as specified in Section 1203.3.

If the installed ventilation in a crawlspace is less than one square foot for each 300 square feet of crawlspace area, or if the crawlspace vents are equipped with operable louvers, a radon vent shall be installed to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with Sections 1203.6.3.2.6 and 1203.6.3.2.7.

**~~(1202.6.2.3)~~ 1202.7.2.3 Crawlspace plenum systems.** In crawlspace plenum systems used for providing supply air for an HVAC system, aggregate, a permanently sealed soil gas retarder membrane and a radon vent pipe shall be installed in accordance with Section 1203.6.3.2. Crawlspace shall not be used for return air plenums.

In addition, an operable radon vent fan shall be installed and activated. The fan shall be located as specified in Section 1203.6.3.2.7. The fan shall be capable of providing at least 100 cfm at 1-inch water column static pressure. The fan shall be controlled by a readily accessible manual switch. The switch shall be labeled "RADON VENT FAN."

**~~(1202.6.3)~~ 1202.7.3 Radon prescriptive requirements.**

**~~(1202.6.3.1)~~ 1202.7.3.1 Scope.** This section applies to those counties specified in Section 1203.6.1.2. This section estab-

lishes prescriptive construction requirements for reducing the potential for radon entry into all Group R Occupancies, and for preparing the building for future mitigation if desired.

In all crawlspaces, except crawlspace plenums used for providing supply air for an HVAC system, a continuous air barrier shall be installed between the crawlspace area and the occupied area to limit air transport between the areas. If a wood sheet subfloor or other material is utilized as an air barrier, in addition to the requirements of Section 502.1.6.2 of the Washington State Energy Code, all joints between sheets shall be sealed.

**~~(1202.6.3.2)~~ 1202.7.3.2 Floors in contact with the earth.**

**~~(1202.6.3.2.1)~~ 1202.7.3.2.1 General.** Concrete slabs that are in direct contact with the building envelope shall comply with the requirements of this section.

EXCEPTION: Concrete slabs located under garages or other than Group R Occupancies need not comply with this chapter.

**~~(1202.6.3.2.2)~~ 1202.7.3.2.2 Aggregate.** A layer of aggregate of 4-inch minimum thickness shall be placed beneath concrete slabs. The aggregate shall be continuous to the extent practical.

**~~(1202.6.3.2.3)~~ 1202.7.3.2.3 Gradation.** Aggregate shall:

1. Comply with ASTM Standard C-33 Standard Specification for Concrete Aggregate and shall be size No. 8 or larger size aggregate as listed in Table 2, Grading Requirements for Course Aggregate; or

2. Meet the 1988 Washington State Department of Transportation Specification 9-03.1 (3) "Coarse Aggregate for Portland Cement Concrete," or any equivalent successor standards. Aggregate size shall be of Grade 8 or larger as listed in Section 9-03.1 (3) C, "Grading"; or

3. Be screened, washed pea gravel free of deleterious substances in a manner consistent with ASTM Standard C-33 with 100 percent passing a 1/2-inch sieve and less than 5 percent passing a No. 16 sieve. Sieve characteristics shall conform to those acceptable under ASTM Standard C-33.

EXCEPTION: Aggregate shall not be required if a substitute material or system, with sufficient load bearing characteristics, and having approved capability to provide equal or superior air flow, is installed.

**~~(1202.6.3.2.4)~~ 1202.7.3.2.4 Soil-gas retarder membrane.**

A soil-gas retarder membrane, consisting of at least one layer of virgin polyethylene with a thickness of at least 6 mil, or equivalent flexible sheet material, shall be either placed directly under all concrete slabs so that the slab is in direct contact with the membrane, or on top of the aggregate with 2 inches minimum of fine sand or pea gravel installed between the concrete slab and membrane. The flexible sheet shall extend to the foundation wall or to the outside edge of the monolithic slab. Seams shall overlap at least 12 inches. The membrane shall also be fitted tightly to all pipes, wires, and other penetrations of the membrane and sealed with an approved sealant or tape. All punctures or tears shall be repaired with the same or approved material and similarly lapped and sealed.

**~~(1202.6.3.2.5)~~ 1202.7.3.2.5 Sealing of penetrations and joints.** All penetrations and joints in concrete slabs or other



floor systems and walls below grade shall be sealed by an approved sealant to create an air barrier to limit the movement of soil-gas into the indoor air.

Sealants shall be approved by the manufacturer for the intended purpose. Sealant joints shall conform to manufacturer's specifications. The sealant shall be placed and tooled in accordance with manufacturer's specifications. There shall be no gaps or voids after the sealant has cured.

**((1202.6.3.2.6)) 1202.7.3.2.6 Radon vent.** One continuous sealed pipe shall run from a point within the aggregate under each concrete slab to a point outside the building. Joints and connections shall be permanently gas tight. The continuous sealed pipe shall interface with the aggregate in the following manner, or by other approved equal method. The pipe shall be permanently connected to a "T" within the aggregate area so that the two end openings of the "T" lie within the aggregate area. A minimum of 5 feet of perforated drain pipe of 3 inches minimum diameter shall join to and extend from the "T." The perforated pipe shall remain in the aggregate area and shall not be capped at the ends. The "T" and its perforated pipe extensions shall be located at least 5 feet horizontally from the exterior perimeter of the aggregate area.

The continuous sealed pipe shall terminate no less than 12 inches above the eave, and more than 10 horizontal feet from a woodstove or fireplace chimney, or operable window. The continuous sealed pipe shall be labeled "radon vent." The label shall be placed so as to remain visible to an occupant.

The minimum pipe diameter shall be 3 inches unless otherwise approved. Acceptable sealed plastic pipe shall be smooth walled, and may include either PVC schedule 40 or ABS schedule of equivalent wall thickness.

The entire sealed pipe system shall be sloped to drain to the subslab aggregate.

The sealed pipe system may pass through an unconditioned attic before exiting the building; but to the extent practicable, the sealed pipe shall be located inside the thermal envelope of the building in order to enhance passive stack venting.

EXCEPTION: A fan for subslab depressurization system includes the following:

1. Soil-gas retarder membrane as specified in Section 1203.6.3.2.4;
2. Sealing of penetrations and joints as specified in Section 1203.6.3.2.5;
3. A 3-inch continuous sealed radon pipe shall run from a point within the aggregate under each concrete slab to a point outside the building;
4. Joints and connections shall be gas tight, and may be of either PVC schedule 40 or ABS schedule of equivalent in wall thickness;
5. A label of "radon vent" shall be placed on the pipe so as to remain visible to an occupant;
6. Fan circuit and wiring as specified in Section 1203.6.3.2.7 and a fan.

If the subslab depressurization system is exhausted through the concrete foundation wall or rim joist, the exhaust terminus shall be a minimum of 6 feet from operable windows or outdoor air intake vents and shall be directed away from operable windows and outdoor air intake vents to prevent radon reentrainment.

**((1202.6.3.2.7)) 1202.7.3.2.7 Fan circuit and wiring and location.** An area for location of an in-line fan shall be provided. The location shall be as close as practicable to the radon vent pipe's point of exit from the building, or shall be outside the building shell; and shall be located so that the fan and all downstream piping is isolated from the indoor air.

Provisions shall be made to allow future activation of an in-line fan on the radon vent pipe without the need to place new wiring. A 110 volt power supply shall be provided at a junction box near the fan location.

**((1202.6.3.2.8)) 1202.7.3.2.8 Separate aggregate areas.** If the 4-inch aggregate area underneath the concrete slab is not continuous, but is separated into distinct isolated aggregate areas by a footing or other barrier, a minimum of one radon vent pipe shall be installed into each separate aggregate area.

EXCEPTION: Separate aggregate areas may be considered a single area if a minimum 3-inch diameter connection joining the separate areas is provided for every 30 feet of barrier separating those areas.

**((1202.6.3.2.9)) 1202.7.3.2.9 Concrete block walls.** Concrete block walls connected to below grade areas shall be considered unsealed surfaces. All openings in concrete block walls that will not remain accessible upon completion of the building shall be sealed at both vertical and horizontal surfaces, in order to create a continuous air barrier to limit the transport of soil-gas into the indoor air.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

### **WAC 51-50-1203 Section 1203—Temperature control.**

**1203.1 Equipment and systems.** Interior spaces intended for human occupancy shall be provided with active or passive space-heating systems capable of maintaining an indoor temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor on the design heating day.

EXCEPTIONS:

1. Interior spaces where the primary purpose of the space is not associated with human comfort.
2. Group F, H, S, or U occupancies.
3. Group R-1 Occupancies not more than 500 square feet.

**((1203.2.1)) 1203.2 Definitions.** For the purposes of this section only, the following definitions apply.

**DESIGNATED AREAS** are those areas designated by a county to be an urban growth area in chapter 36.70A RCW and those areas designated by the U.S. Environmental Protection Agency as being in nonattainment for particulate matter.

**SUBSTANTIALLY REMODELED** means any alteration or restoration of a building exceeding 60 percent of the appraised value of such building within a 12-month period. For the purpose of this section, the appraised value is the estimated cost to replace the building and structure in-kind, based on current replacement costs.

**((1203.2.2)) 1203.3 Primary heating source.** Primary heating sources in all new and substantially remodeled buildings in designated areas shall not be dependent upon wood stoves.

~~(1203.2.3)~~ **1203.4 Solid fuel burning devices.** No new or used solid fuel burning device shall be installed in new or existing buildings unless such device is United States Environmental Protection Agency certified or exempt from certification by the United States Environmental Protection Agency and conforms with RCW 70.94.011, 70.94.450, 70.94.453 and 70.94.457.

- EXCEPTIONS:
1. Wood cook stoves.
  2. Antique wood heaters manufactured prior to 1940.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-1613 Section 1613—Earthquake loads.**

**1613.4 Amendments to ASCE 7.** The provisions of Section 1613.4 shall be permitted as an amendment to the relevant provisions of ASCE 7. The text of ASCE 7 shall be amended as indicated in Sections 1613.4.1 through 1613.4.2.

**1613.4.1 ASCE 7 Section 12.2.5.4.** Amend ASCE 7 Section ~~(12.11.2.2.1)~~ 12.2.5.4 as follows:

**12.2.5.4 Increased structural height limit for steel eccentrically braced frames, steel special concentrically braced frames, steel buckling-restrained braced frames, steel special plate shear walls, and special reinforced concrete shear walls.** The limits on height,  $h_n$ , in Table 12.2-1 are permitted to be increased from 160 ft (50 m) to 240 ft (75 m) for structures assigned to Seismic Design Categories D or E and from 100 ft (30 m) to 160 ft (50 m) for structures assigned to Seismic Design Category F, provided that the seismic force-resisting systems are limited to steel eccentrically braced frames, steel special concentrically braced frames, steel buckling-restrained braced frames, steel special plate shear walls, or special reinforced concrete cast-in-place shear walls and all of the following requirements are met:

1. The structure shall not have an extreme torsional irregularity as defined in Table 12.3-1 (horizontal structural irregularity Type 1b).

2. The steel eccentrically braced frames, steel special concentrically braced frames, steel buckling-restrained braced frames, steel special plate shear walls or special reinforced concrete shear walls in any one plane shall resist no more than 60 percent of the total seismic forces in each direction, neglecting accidental torsional effects.

3. Where floor and roof diaphragms transfer forces from the vertical seismic force-resisting elements above the diaphragm to other vertical force-resisting elements below the diaphragm, these in-plane transfer forces shall be amplified by the overstrength factor,  $\Omega_o$  for the design of the diaphragm flexure, shear, and collectors.

4. The earthquake force demands in foundation mat slabs, grade beams, and pile caps supporting braced frames and/or walls arranged to form a shear-resisting core shall be amplified by 2 for shear and 1.5 for flexure. The redundancy factor,  $\rho$ , applies and shall be the same as that used for the structure in accordance with Section 12.3.4.

5. The earthquake shear force demands in special reinforced concrete shear walls shall be amplified by the overstrength factor,  $\Omega_o$ .

**1613.4.2 ASCE 7 Section 12.6.** Amend ASCE 7 Section 12.6 and Table 12.6-1 to read as follows:

**12.6 ANALYSIS PROCEDURE SELECTION**

**12.6.1 Analysis procedure.** The structural analysis required by Chapter 12 shall consist of one of the types permitted in Table 12.6-1, based on the structure's seismic design category, structural system, dynamic properties, and regularity, or with the approval of the authority having jurisdiction, an alternative generally accepted procedure is permitted to be used. The analysis procedure selected shall be completed in accordance with the requirements of the corresponding section referenced in Table 12.6-1.

**Table 12.6-1**

**Permitted Analytical Procedures**

Seismic Design Category	Structural Characteristics	Equivalent Lateral Force Procedure, Section 12.8 <sup>a</sup>	Modal Response Spectrum Analysis, Section 12.9.1, or Linear Response History Analysis, Section 12.9.2	Nonlinear Response History Procedures, Chapter 16 <sup>a</sup>
B, C	All structures	P	P	P
D, E, F	Risk Category I or II buildings not exceeding two stories above the base	P	P	P
	Structures of light frame construction	P	P	P
	Structures with no structural irregularities and not exceeding 160 ft in structural height	P	P	P

Seismic Design Category	Structural Characteristics	Equivalent Lateral Force Procedure, Section 12.8 <sup>a</sup>	Modal Response Spectrum Analysis, Section 12.9.1, or Linear Response History Analysis, Section 12.9.2	Nonlinear Response History Procedures, Chapter 16 <sup>a</sup>
	Structures exceeding 160 ft in structural height with no structural irregularities and with $T < 3.5T_s$	P	P	P
	Structures not exceeding 160 ft in structural height and having only horizontal irregularities of Type 2, 3, 4, or 5 in Table 12.3-1 or vertical irregularities of Type 4, 5a, or 5b in Table 12.3-2	P	P	P
	All other structures $\leq 240$ ft in height	NP	P	P
	All structures $> 240$ ft in height	NP	NP	P <sup>c</sup>

<sup>a</sup> P: Permitted; NP: Not Permitted;  $T_s = S_{D1}/S_{D5}$ .

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-21070 Section 2107—Allowable stress design.**

**2107.1 General.** The design of masonry structures using *allowable stress design* shall comply with Sections 2106 and the requirements of Chapters 1 through 8 of TMS 402/ACI 530/ASCE 5 except as modified by Sections 2107.2 through ~~(2107.4)~~ 2107.3.

**2107.2 TMS 402/ACI 530/ASCE 5, Section 2.1.8.7.1.1, lap splices.** In lieu of Section 2.1.8.7.1.1, it shall be permitted to design lap splices in accordance with Section 2107.2.1.

**AMENDATORY SECTION** (Amending WSR 13-04-067, filed 2/1/13, effective 7/1/13)

**WAC 51-50-2114 ((Section 2114—Emission standards.)) Reserved.**

~~(2114.1 Emission Standards for Factory-built Fireplaces. No new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558 Standard Test Method for determining particulate matter emission from fires in low mass wood burning fireplaces.~~

~~To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.~~

~~2114.2 Emission Standards for Certified Masonry and Concrete Fireplaces. Masonry and concrete fireplace model~~

~~lines certified to Washington State Building Code Standard 31-2 prior to July 1, 2013, may retain certification provided the design and construction specifications of the fireplace model line internal assembly do not change.))~~

**NEW SECTION**

**WAC 51-50-2115 Section 2115—Emission standards.**

**2115.1 Emission standards for factory-built fireplaces.** No new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558 Standard Test Method for determining particulate matter emission from fires in low mass wood burning fireplaces.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

**2115.2 Emission standards for certified masonry and concrete fireplaces.** Masonry and concrete fireplace model lines certified to Washington State Building Code Standard 31-2 prior to July 1, 2013, may retain certification provided the design and construction specifications of the fireplace model line internal assembly do not change.

**NEW SECTION**

**WAC 51-50-2304 Section 2304—General construction requirements.**

**2304.10 Connectors and fasteners.** Connectors and fasteners shall comply with the applicable provisions of Sections 2304.10.1 through 2304.10.8.

**2304.10.8 Connection fire-resistance rating.** Fire-resistance ratings for connections in Type IV-A, IV-B, or IV-C construction shall be determined by one of the following:

1. Testing in accordance with Section 703.2 where the connection is part of the fire-resistance test.
2. Engineering analysis that demonstrates that the temperature rise at any portion of the connection is limited to an average temperature rise of 250°F (139°C), and a maximum temperature rise of 325°F (181°C), for a time corresponding to the required fire-resistance rating of the structural element being connected. For the purposes of this analysis, the connection includes connectors, fasteners, and portions of wood members included in the structural design of the connection.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-2900 Chapter 29—Plumbing systems.**

**SECTION 2901—GENERAL.**

**2901.1 Scope.** The provisions of this chapter and the state plumbing code shall govern the erection, installation, *alteration*, repairs, relocation, replacement, *addition* to, use or maintenance of plumbing equipment and systems. Toilet and bathing rooms shall be constructed in accordance with Section 1210. Plumbing systems and equipment shall be constructed, installed and maintained in accordance with the state plumbing code.

**2901.2 Health codes.** In food preparation, serving and related storage areas, additional fixture requirements may be dictated by health codes.

**2901.3 Fixed guideway transit and passenger rail systems.** In construction of a fixed guideway and passenger rail system, subject to Section 3114, public plumbing fixtures are not required.

**SECTION 2902—MINIMUM PLUMBING FACILITIES.**

**2902.1 Minimum number of fixtures.** Plumbing fixtures shall be provided in the minimum number shown in Table 2902.1. Uses not shown in Table 2902.1 shall be determined individually by the *building official* based on the occupancy which most nearly resembles the proposed occupancy. The number of occupants shall be determined by this code. Plumbing fixtures need not be provided for unoccupied buildings or facilities.

**2902.1.1 Fixture calculations.** To determine the *occupant load* of each sex, the total *occupant load* shall be divided in half. To determine the required number of fixtures, the fixture ratio or ratios for each fixture type shall be applied to the *occupant load* of each sex in accordance with Table 2902.1. Fractional numbers resulting from applying the fixture ratios of Table 2902.1 shall be rounded up to the next whole number. For calculations involving multiple occupancies, such fractional numbers for each occupancy shall first be summed and then rounded up to the next whole number.

**EXCEPTION:** The total *occupant load* shall not be required to be divided in half where *approved* statistical data indicate a distribution of the sexes of other than 50 percent of each sex.

**2902.1.1.1 Private offices.** Fixtures only accessible to private offices shall not be counted to determine compliance with this section.

**2902.1.1.2 Urinals in men's facilities.** Where urinals in men's facilities are provided, one water closet less than the number specified may be provided for each urinal installed, except the number of water closets in such cases shall not be reduced to less than one quarter (25%) of the minimum specified. For men's facilities serving 26 or more persons, not less than one urinal shall be provided.

**2902.1.1.3 Urinals.** Where urinals are provided in gender-neutral facilities, one water closet less than the number specified may be provided for each urinal installed, except the number of water closets in such cases shall not be reduced less than one quarter (25 percent) of the minimum specified. Facilities serving 26 or more persons, not less than one urinal shall be provided.

**2902.1.4 Family or assisted-use toilet and bath fixtures.** Fixtures located within family or assisted-use toilet and bathing rooms required by Section 1109.2.1 are permitted to be included in the number of required fixtures for either the male or female occupants in assembly and mercantile occupancies.

**2902.2 Separate facilities.** Where plumbing fixtures are required, separate facilities shall be provided for each sex.

- EXCEPTIONS:**
1. Separate facilities shall not be required for *dwelling units* and *sleeping units*.
  2. Separate facilities shall not be required in structures or tenant spaces with a total *occupant load*, including both employees and customers, of 15 or less.
  3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or less.
  4. Separate facilities shall not be required in spaces primarily used for drinking or dining with a total occupant load, including both employees and customers, of 30 or fewer.
  5. Separate facilities shall not be required when gender-neutral facilities are provided in accordance with Section 2902.2.2.

**2902.2.1 Family or assisted-use toilet facilities serving as separate facilities.** Where a building or tenant space requires a separate toilet facility for each sex and each toilet facility is required to have only one water closet, two family or assisted-use toilet facilities shall be permitted to serve as the required separate facilities. Family or assisted-use toilet facilities shall not be required to be identified for exclusive use by either sex as required by Section 2902.4.

**2902.2.2 Gender-neutral facilities.** Gender-neutral toilet facilities, when provided, shall be in accordance with the following:

1. There is no reduction in the number of fixtures required to be provided for male and female in the type of occupancy and in the minimum number shown in Table 2902.1.
2. Gender-neutral multiuser toilet rooms shall have water closets and urinals located in toilet compartments in accordance with ICC A117.1.

3. Gender-neutral multiuser toilet room water closet and urinal compartments shall have full-height walls and a door enclosing the fixture to ensure privacy.

4. Gender-neutral toilet room water closet and urinal compartment doors shall be securable from within the compartment.

5. Gender-neutral toilet rooms provided for the use of multiple occupants, the egress door from the room shall not be lockable from the inside of the room.

6. Compartments shall not be required in a single-occupant toilet room with a lockable door.

**2902.3 Employee and public toilet facilities.** Customers, patrons and visitors shall be provided with public toilet facilities in structures and tenant spaces intended for public utilization. The number of plumbing fixtures located within the required toilet facilities shall be provided in accordance with Section 2902.1 for all users. Employees shall be provided with toilet facilities in all occupancies. Employee toilet facilities shall either be separate or combined employee and public toilet facilities.

EXCEPTION: Public toilet facilities shall not be required in:

1. Open or enclosed parking garages where there are no parking attendants.
2. Structures and tenant spaces intended for quick transactions, including takeout, pickup and drop-off, having a public access area less than or equal to 300 square feet (28 m<sup>2</sup>).
3. Fixed guideway transit and passenger rail systems constructed in accordance with Section 3112.

**2902.3.2 Location of toilet facilities in occupancies other than malls.** In occupancies other than covered and open mall buildings, the required *public* and employee toilet facilities shall be located in each building not more than one story above or below the space required to be provided with toilet facilities, or conveniently in a building adjacent thereto on the same property, and the path of travel to such facilities shall not exceed a distance of 500 feet (152 m).

EXCEPTION: The location and maximum distances of travel to required employee facilities in factory and industrial occupancies are permitted to exceed that required by this section, provided that the location and maximum distance of travel are *approved*.

**2902.3.3 Location of toilet facilities in malls.** In covered and open mall buildings, the required *public* and employee toilet facilities shall be located not more than one story above or below the space required to be provided with toilet facilities, and the path of travel to such facilities shall not exceed a distance of 300 feet (91,440 mm). In mall buildings, the required facilities shall be based on total square footage (m<sup>2</sup>) within a covered mall building or within the perimeter line of an open mall building, and facilities shall be installed in each individual store or in a central toilet area located in accordance with this section. The maximum distance of travel to central toilet facilities in mall buildings shall be measured from the main entrance of any store or tenant space. In mall buildings, where employees' toilet facilities are not provided in the individual store, the maximum distance of travel shall be measured from the employees' work area of the store or tenant space.

**2902.3.4 Pay facilities.** Where pay facilities are installed, such facilities shall be in excess of the required minimum facilities. Required facilities shall be free of charge.

**2902.3.5 Door locking.** Where a toilet room is provided for the use of multiple occupants, the egress door for the room shall not be lockable from the inside of the room. This section does not apply to family or assisted-use toilet rooms.

**2902.3.6 Prohibited toilet room location.** Toilet rooms shall not open directly into a room used for the preparation of food for service to the public.

**2902.4 Signage.** Required public facilities shall be provided with signs that designate the sex for separate facilities or indicate gender-neutral facilities. Signs shall be readily visible and located near the entrance to each toilet facility. Signs for accessible toilet facilities shall comply with Section 1111.

**2902.4.1 Directional signage.** Directional signage indicating the route to the public toilet facilities shall be posted in a lobby, corridor, aisle or similar space, such that the sign can be readily seen from the main entrance to the building or tenant space.

**2902.5 Drinking fountain location.** Drinking fountains shall not be required to be located in individual tenant spaces provided that public drinking fountains are located within a distance of travel of 500 feet of the most remote location in the tenant space and not more than one story above or below the tenant space. Where the tenant space is in a covered or open mall, such distance shall not exceed 300 feet. Drinking fountains shall be located on an accessible route. Drinking fountains shall not be located in toilet rooms.

**2902.5.1 Drinking fountain number.** Occupant loads over 30 shall have one drinking fountain for the first 150 occupants, then one per each additional 500 occupants.

EXCEPTIONS:

1. Sporting facilities with concessions serving drinks shall have one drinking fountain for each 1000 occupants.
2. A drinking fountain need not be provided in a drinking or dining establishment.

**2902.5.2 Multistory buildings.** Drinking fountains shall be provided on each floor having more than 30 occupants in schools, dormitories, auditoriums, theaters, offices and public buildings.

**2902.5.3 Penal institutions.** Penal institutions shall have one drinking fountain on each cell block floor and one on each exercise floor.

**2902.5.4 Bottle filling stations.** Bottle filling stations shall be provided in accordance with Sections 2902.5.4.1 through 2902.5.4.3.

**2902.5.4.1 Group E occupancies.** In Group E occupancies with an occupant load over 30, a minimum of one bottle filling station shall be provided on each floor. This bottle filling station may be integral to a drinking fountain.

**2902.5.4.2 Substitution.** In all occupancies that require more than two drinking fountains per floor or secured area, *bottle*

filling stations shall be permitted to be substituted for up to 50 percent of the required number of drinking fountains.

**2902.5.4.3 Accessibility.** At least one of the required bottle filling stations shall be located in accordance with Section 309 ICC A117.1.

**2902.6 Dwelling units.** Dwelling units shall be provided with a kitchen sink.

~~(2902.8)~~ **2902.7 Water.** Each required sink, lavatory, bathtub and shower stall shall be equipped with hot and cold running water necessary for its normal operation.

**SECTION 2903—RESERVED.**

**SECTION 2904—RESERVED.**

**Table 2902.1**  
**Minimum Number of Required Plumbing Fixtures<sup>a</sup>**  
(See Sections 2902.2 and 2902.3)

No.	Classification	Occupancy	Description	Water Closets		Lavatories		Bathtubs/ Showers
				Male	Female	Male	Female	
1	Assembly	A-1 <sup>d</sup>	Theaters and other buildings for the performing arts and motion pictures	1 per 125	1 per 65	1 per 200		—
		A-2 <sup>d</sup>	Nightclubs, bars, taverns, dance halls and buildings for similar purposes	1 per 40	1 per 40	1 per 75		—
			Restaurants, banquet halls and food courts	1 per 75	1 per 75	1 per 200		—
		A-3 <sup>d</sup>	Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades and gymnasiums	1 per 125	1 per 65	1 per 200		—
			Passenger terminals and transportation facilities	1 per 500	1 per 500	1 per 750		—
			Places of worship and other religious services	1 per 150	1 per 75	1 per 200		—
		A-4	Coliseums, arenas, skating rinks, pools, and tennis courts for indoor sporting events and activities	1 per 75 for first 1,500 and 1 per 120 for remainder exceeding 1,500	1 per 40 for first 1,520 and 1 per 60 for remainder exceeding 1,520	1 per 200	1 per 150	
A-5	Stadiums amusement parks, bleachers and grandstands for outdoor sporting events and activities	1 per 75 for first 1,500 and 1 per 120 for remainder exceeding 1,500	1 per 40 for first 1,520 and 1 per 60 for remainder exceeding 1,520	1 per 200	1 per 150		—	
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for first 50 and 1 per 50 for the remainder exceeding 50		1 per 40 for first 80 and 1 per 80 for remainder exceeding 80		—
3	Educational	E <sup>e</sup>	Educational facilities	1 per 35	1 per 25	1 per 85	1 per 50	—
4	Factory and industrial	F-1 and F-2	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100		1 per 100		Check State (UPC)
5	Institutional	I-1	Residential care	1 per 10		1 per 10		1 per 8
		I-2	Hospitals, ambulatory nursing home care recipient <sup>b</sup>	1 per room <sup>c</sup>		1 per room <sup>c</sup>		1 per 15
			Employees, other than residential care <sup>b</sup>	1 per 25		1 per 35		—

No.	Classification	Occupancy	Description	Water Closets		Lavatories		Bathubs/ Showers
				Male	Female	Male	Female	
			Visitors other than residential care	1 per 75		1 per 100		—
		I-3	Prisons <sup>b</sup>	1 per cell		1 per cell		1 per 15
			Reformatories, detention centers and correctional centers <sup>b</sup>	1 per 15		1 per 15		1 per 15
			Employees <sup>b</sup>	1 per 25		1 per 35		—
		I-4	Adult day care and child day care	1 per 15		1 per 15		1
6	Mercantile	M	Retail stores, service stations, shops, salesrooms, markets and shopping centers	1 per 500		1 per 750		—
7	Residential	R-1	Hotels, motels, boarding houses (transient)	1 per sleeping unit		1 per sleeping unit		1 per sleeping unit
		R-2	Dormitories, fraternities, sororities and boarding houses (not transient)	1 per 10		1 per 10		1 per 8
			Apartment house	1 per dwelling unit		1 per dwelling unit		1 per dwelling unit
		R-3	One- and two-family dwellings	1 per dwelling unit		1 per 10		1 per dwelling unit
			Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8
		R-4	Congregate living facilities with 16 or fewer persons	1 per 10		1 per 10		1 per 8
8	Storage	S-1 S-2	Structures for the storage of goods, warehouses, storehouses and freight depots, low and moderate hazard	1 per 100		1 per 100		Check State (UPC)

- a. The fixtures shown are based on one fixture being the minimum required for the number of persons indicated or any fraction of the number of persons indicated. The number of occupants shall be determined by this code, except with respect to Group E occupancies the provisions of note "e" shall apply.
- b. Toilet facilities for employees shall be separate from facilities for inmates or care recipients.
- c. A single-occupant toilet room with one water closet and one lavatory serving not more than two adjacent patient sleeping units shall be permitted where such room is provided with direct access from each patient sleeping unit and with provisions for privacy.
- d. The occupant load for seasonal outdoor seating and entertainment areas shall be included when determining the minimum number of facilities required.
- e. For Group E occupancies: The number of occupants shall be determined by using a calculation of 100 square feet gross building area per student for the minimum number of plumbing fixtures.

**AMENDATORY SECTION** (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-30050 Section ((30050) 3005—Machine rooms.**

**((30050.2) 3005.2 Temperature control.** Elevator machine rooms, machinery spaces that contain the driving machine, and control rooms or spaces that contain the operation or motion controller for elevator operation shall be provided with an independent dedicated ventilation or air-conditioning system to control the space temperature to protect against the overheating of the electrical equipment. Ventilation systems shall use outdoor make up air pathway that does not rely on transfer air from other building systems. The system shall service the equipment space only, and shall be capable of

maintaining the temperature and humidity within the range established by the manufacturer's specifications. Where no manufacturer specifications are available, the equipment space temperature shall be maintained at no less than fifty-five degrees Fahrenheit and no more than ninety degrees Fahrenheit.

The cooling load for the equipment shall include the BTU output of the elevator operation equipment as specified by the manufacturer based on one hour of continuous operation. The outdoor design temperature for ventilation shall be from the 0.5% column for summer from the Puget Sound Chapter of ASHRAE publication "*Recommended Outdoor Design Temperatures, Washington State.*" The following formula shall be used to calculate flow rate for ventilation:

CFM = BTU output of elevator machine room equipment/[1.08 x (acceptable machine room temp - make up air temp)]

The ventilation or air-conditioning system will be provided with the same source of power (normal, optional standby, legally required standby, or emergency) as the elevator equipment so that the temperature control is available at all times that the elevators have power.

**EXCEPTION:** For buildings four stories or less, natural or mechanical means may be used in lieu of an independent ventilation or air-conditioning system to keep the equipment space ambient air temperature and humidity in the range specified by the elevator equipment manufacturer.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-3500 Chapter 35—Referenced standards.** Add the reference standards as follows:

Standard reference number	Title	Referenced in code section number
ANSI/APA PRG-320-18	Standard for Performance-Rated Cross-Laminated Timber (revised 2018)	602.4, 2303.1.4
NFPA ((430)) 130-17	Standard for Fixed Guideway Transit and Passenger Rail Systems	3101.1, 3114

NEW SECTION

**WAC 51-50-480200 Section 201.3—Definitions.**

**201.3 Terms defined in other codes.** Where terms are not defined in this code and are defined in the other International Codes and the Uniform Plumbing Code, such terms shall have the meanings ascribed to them in those codes.

AMENDATORY SECTION (Amending WSR 10-03-097, filed 1/20/10, effective 7/1/10)

**WAC 51-50-480302 ((Reserved)) Section 302—General Provisions.**

**302.3 Additional codes.** Alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy or relocation, respectively, in this code and the Washington State Energy Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, Uniform Plumbing Code, and International Residential Code. Where provisions of the other codes conflict with provisions of this code, the provisions of this code shall take precedence.

NEW SECTION

**WAC 51-50-480408 Section 408—Plumbing.**

**408.1 Materials.** Plumbing materials and supplies shall not be used for repairs that are prohibited in the Uniform Plumbing Code.

AMENDATORY SECTION (Amending WSR 10-03-097, filed 1/20/10, effective 7/1/10)

**WAC 51-50-480506 ((Reserved)) Section 506—Change of occupancy.**

**506.1.1 Change in the character of use.** A change of occupancy with no change of occupancy classification shall not be made to any structure that will subject the structure to any special provisions of the applicable International Codes and Uniform Plumbing Code, without approval of the code official. Compliance shall be only as necessary to meet the specific provisions and is not intended to require the entire building be brought into compliance.

NEW SECTION

**WAC 51-50-480702 Section 702—Building elements and materials.**

**702.6 Materials and methods.** New work shall comply with the materials and methods requirements in the International Building Code, Washington State Energy Code, International Mechanical Code, and Uniform Plumbing Code, as applicable, that specify material standards, detail of installation and connection, joints, penetrations, and continuity of any element, component, or system in the building.

NEW SECTION

**WAC 51-50-480809 Section 809—Plumbing.**

**809.1 Minimum fixtures.** Where the occupant load of the story is increased by more than 20 percent, plumbing fixtures for the story shall be provided in quantities specified in the International Building Code based on the increased occupant load.

NEW SECTION

**WAC 51-50-481009 Section 1009—Plumbing.**

**1009.1 Increased demand.** Where the occupancy of an existing building or part of an existing building is changed such that the new occupancy is subject to increased or different plumbing fixture requirements or to increased water supply requirements in accordance with the Uniform Plumbing Code, the new occupancy shall comply with the intent of the respective Uniform Plumbing Code provisions.

**1009.2 Food-handling occupancies.** If the new occupancy is a food-handling establishment, all existing sanitary waste lines above the food or drink preparation or storage areas shall be panned or otherwise protected to prevent leaking pipes or condensation on pipes from contaminating food or drink. New drainage lines shall not be installed above such areas and shall be protected in accordance with the Uniform Plumbing Code.



**1009.3 Interceptor required.** If the new occupancy will produce grease or oil-laden wastes, interceptors shall be provided as required in the Uniform Plumbing Code.

**1009.5 Group I-2.** If the occupancy group is changed to Group I-2, the plumbing system shall comply with the applicable requirements of the Uniform Plumbing Code.

AMENDATORY SECTION (Amending WSR 13-04-067, filed 2/1/13, effective 7/1/13)

**WAC 51-50-481101 (~~Chapter 11—Reserved.~~) Section 1101—Change of occupancy classification.**

**1101.1 Scope.** An addition to a building or structure shall comply with the International Codes and Uniform Plumbing Code as adopted for new construction without requiring the existing building or structure to comply with any requirements of those codes or of these provisions, except as required by this chapter. Where an addition impacts the existing building or structure, that portion shall comply with this code.

AMENDATORY SECTION (Amending WSR 20-01-090, filed 12/12/19, effective 7/1/20)

**WAC 51-50-481204 (~~Change of occupancy.~~) Reserved.**

~~((1204.1 General. Historic buildings shall comply with the applicable structural provisions for the work as classified in Chapter 4 or 5.~~

EXCEPTION: The code official shall be authorized to accept existing floors and existing live loads and to approve operational controls that limit the live load on any floor.

~~**1204.10 One-hour fire-resistant assemblies.** Where one-hour fire resistance rated construction is required by these provisions, it need not be provided, regardless of construction or occupancy, where the existing wall and ceiling finish is wood lath or metal lath and plaster.~~

~~**1204.14 Natural light.** When it is determined by the professional responsible for the historical documentation of the project that compliance with the natural light requirements of Section 1011.1 will lead to loss of historic character or historic materials in the building, the existing level of natural lighting shall be considered acceptable.))~~

AMENDATORY SECTION (Amending WSR 10-03-097, filed 1/20/10, effective 7/1/10)

**WAC 51-50-481500 (~~Reserved.~~) Section 1501—General.**

**1501.1 Facilities required.** Sanitary facilities shall be provided during construction or demolition activities in accordance with the Uniform Plumbing Code.

## WSR 20-21-022

### PERMANENT RULES

#### DEPARTMENT OF TRANSPORTATION

[Filed October 9, 2020, 2:32 p.m., effective February 1, 2021]

Effective Date of Rule: February 1, 2021.

Other Findings Required by Other Provisions of Law as Precondition to Adoption or Effectiveness of Rule: At the request of the transportation commission, the definition of the transportation commission has been edited in WAC 468-305-001 reflecting its statutory authority.

Purpose: The effective date for this rule making is changed to February 1, 2021. Rules are needed to define customer requirements to use toll facilities and Washington state department of transportation procedures for processing transactions and penalties. This rule making is required to update specific requirements and procedures that will change when a new toll back office system becomes operational.

Citation of Rules Affected by this Order: Amending WAC 468-305-001, 468-305-100, 468-305-105, 468-305-125, 468-305-131, 468-305-133, 468-305-150, 468-305-160, 468-305-210, 468-305-220, 468-305-300, 468-305-315, 468-305-316, 468-305-320, 468-305-330, 468-305-340, 468-305-400, 468-305-526, 468-305-527, 468-305-528, 468-305-529, 468-305-540, 468-305-570, and 468-305-580.

Statutory Authority for Adoption: RCW 46.63.160(5), 47.01.101(5), 47.56.030(1), and 47.56.795.

Adopted under notice filed as WSR 19-09-069 on April 16, 2019.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 24, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 24, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 9, 2020.

Ashley Holmberg  
Public Records Officer

## WSR 20-21-024

### PERMANENT RULES

#### HEALTH CARE AUTHORITY

[Filed October 9, 2020, 3:14 p.m., effective November 9, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Health care authority (HCA) is establishing rules to comply with ESHB 1109, section 211(47), which provides funding for services identical to those services covered by the Washington state family planning waiver pro-

gram to individuals who: (1) Are age twenty and older; (2) who are at or below two hundred sixty percent of the federal poverty level; (3) who are not covered by public or private insurance; and (4) who need family planning services and are not currently covered by or eligible for another medical assistance program for family planning.

Citation of Rules Affected by this Order: Amending WAC 180-532-510.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160.

Other Authority: ESHB 1109, section 211(47), chapter 415, Laws of 2019, operating budget.

Adopted under notice filed as WSR 20-10-110 on May 6, 2020.

Changes Other than Editing from Proposed to Adopted Version:

Proposed/Adopted	WAC Subsection	Reason
<b>WAC 182-532-510</b>		
Proposed	To be eligible for one of the family planning only programs listed in this section, a client must meet the qualifications for that program.	To define the term "full-scope coverage" HCA added to subsection (2)(a)(v).
Adopted	To be eligible for one of the family planning only programs listed in this section, a client must meet the qualifications for that program. <u>For the purposes of this section, "full-scope coverage" means coverage under either the categorically needy (CN) program, the broadest, most comprehensive scope of health care services covered or the alternative benefits plan (ABP), the same scope of care as CN, applicable to the apple health for adults program.</u>	
<b>WAC 182-532-510 (2)(a)(v)</b>		
Proposed	(v) Have been denied apple health coverage within the last thirty days, unless the applicant: (A) Is age eighteen or younger and seeking services in confidence; (B) Is a domestic violence victim who is seeking services in confidence; or (C) Has an income of one hundred fifty percent to two hundred sixty percent of the federal poverty level, as described in WAC 182-505-0100.	To clarify that clients making an informed choice to not apply for full-scope coverage, including family planning, are eligible for family planning only services.

Proposed/Adopted	WAC Subsection	Reason
Adopted	(v) Have been denied apple health coverage within the last thirty days, unless the applicant: (A) <u>Has made an informed choice to not apply for full-scope coverage, including family planning;</u> (B) Is age eighteen or younger and seeking services in confidence; <del>(B)</del> (C) Is a domestic violence victim who is seeking services in confidence; or <del>(C)</del> (D) Has an income of one hundred fifty percent to two hundred sixty percent of the federal poverty level, as described in WAC 182-505-0100.	

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 1, Repealed 0.

Date Adopted: October 9, 2020.

Wendy Barcus  
Rules Coordinator

**AMENDATORY SECTION** (Amending WSR 19-18-024, filed 8/28/19, effective 10/1/19)

**WAC 182-532-510 Family planning only programs—Eligibility.** To be eligible for one of the family planning only programs listed in this section, a client must meet the qualifications for that program. For the purposes of this section, "full-scope coverage" means coverage under either the categorically needy (CN) program, the broadest, most comprehensive scope of health care services covered or the alternative benefits plan (ABP), the same scope of care as CN, applicable to the apple health for adults program.

(1) **Family planning only - Pregnancy related program.**

(a) To be eligible for family planning only - Pregnancy related services, as defined in WAC 182-532-001, a client must be determined eligible for the Washington apple health for pregnant ((clients)) women program during the preg-

nancy, or determined eligible for a retroactive period covering the end of a pregnancy. See WAC 182-505-0115.

(b) A client is automatically eligible for the family planning only - Pregnancy related program when the client's pregnancy ends.

(c) A client may apply for the family planning only program in subsection (2) of this section up to sixty days before the expiration of the family planning only - Pregnancy related program.

**(2) Family planning only program.**

(a) To be eligible for family planning only services, as defined in WAC 182-532-001, a client must:

~~((i))~~ ~~(Be a United States citizen, U.S. National, or "qualified alien" as described under WAC 182-503-0535;~~

~~((ii))~~ Provide a valid Social Security number (SSN) or proof of application to receive an SSN, be exempt from the requirement to provide an SSN as provided in WAC 182-503-0515, or meet good cause criteria listed in WAC 182-503-0515(2);

~~((iii))~~ (ii) Be a Washington state resident, as described under WAC 182-503-0520;

~~((iv))~~ (iii) Have an income at or below two hundred sixty percent of the federal poverty level, as described under WAC 182-505-0100;

~~((v))~~ (iv) Need family planning services; and

~~((vi))~~ (v) Have been denied apple health coverage within the last thirty days, unless the applicant:

(A) Has made an informed choice to not apply for full-scope coverage, including family planning;

~~(B)~~ (B) Is age eighteen ~~(and)~~ or younger and seeking services in confidence;

~~(C)~~ (C) Is a domestic violence victim who is seeking services in confidence; or

~~(D)~~ (D) Has an income of one hundred fifty percent to two hundred sixty percent of the federal poverty level, as described in WAC 182-505-0100.

(b) A client is not eligible for family planning only medical if the client is:

(i) Pregnant;

(ii) Sterilized;

(iii) Covered under another apple health program that includes family planning services; or

(iv) Covered by concurrent creditable coverage, as defined in RCW 48.66.020, unless they meet criteria in (a) ~~((v))~~ (v) of this subsection.

(c) A client may reapply for coverage under the family planning only program up to sixty days before the expiration of the twelve-month coverage period. The agency does not limit the number of times a client may reapply for coverage.

**WSR 20-21-025**

**PERMANENT RULES**

**EASTERN WASHINGTON UNIVERSITY**

[Filed October 9, 2020, 4:50 p.m., effective November 9, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Revisions are needed to comply with 2SHB 2513, prohibiting the practice of transcript withholding and limiting the practice of registration holds at institutions of

higher education as debt collection practices and to update current practices.

Citation of Rules Affected by this Order: Amending WAC 172-144-140.

Statutory Authority for Adoption: RCW 28B.35.120 (12), 42.56.070.

Adopted under notice filed as WSR 20-07-003 [20-17-003] on August 5, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 9, 2020.

Joseph Fuxa  
Labor Relations Manager

AMENDATORY SECTION (Amending WSR 15-24-047, filed 11/23/15, effective 12/24/15)

**WAC 172-144-140 Collection of outstanding financial obligations.** After making a final determination regarding a person/entity's outstanding financial obligation, if the debtor fails to pay the debt within the time specified by the university, the university may pursue any lawful means to collect the debt. This includes, but is not limited to:

(1) Registration/Transcripts: The university may withhold admission or registration privileges, or conferring of degrees~~(, and the issuance of academic transcripts)~~ for a person who has an outstanding financial obligation to the university, even if the debt has been assigned to another agency, entity, or department. The university will only withhold registration privileges for debts related to tuition, fees, room and board fees, or financial aid funds owed. In accordance with RCW 28B.10.293, prior to any academic term where registration privileges are withheld, the university will provide the student with information about:

(a) The amount of debt owed by the student to the university;

(b) Information on payment of the debt, including who to contact to set up a payment plan; and

(c) Any consequences that will result from nonpayment of the debt.

(2) Collections: If the debt remains unpaid for more than 30 days after notice of the university's final determination, the university may assign the debt to a collection agency in accordance with RCW 19.16.050. If the debt is assigned to a collection agency, the debtor is responsible for all collection fees, which may be based on a percentage up to fifty percent

of the unpaid charges, and all costs and expenses, including attorneys' fees related to collection of the unpaid debt.

(3) **Civil Action:** The university may initiate a civil action against the debtor to recover the debt.

(4) **Travel Costs:** Financial obligations which result from travel advances or travel-related expenditures will be addressed and collected consistent with the office of financial management's policies.

(5) **Other:** The university may pursue any other lawful means of recovering the outstanding financial obligation.

### WSR 20-21-026

#### PERMANENT RULES

#### EASTERN WASHINGTON UNIVERSITY

[Filed October 9, 2020, 4:55 p.m., effective November 9, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Modifications are needed due to changes in employee positions.

Citation of Rules Affected by this Order: Amending WAC 172-90-160.

Statutory Authority for Adoption: RCW 28B.35.120 (12), 42.56.070.

Adopted under notice filed as WSR 20-17-004 on August 5, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 1, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 9, 2020.

Joseph Fuxa  
Policy and Compliance Manager

**AMENDATORY SECTION** (Amending WSR 19-07-045, filed 3/14/19, effective 4/14/19)

**WAC 172-90-160 Academic integrity board review process.** (1) **Initiation:** The AIB review process will be initiated when:

- (a) The instructor or student requests AIB review;
- (b) The instructor refers the matter to the AIB because the instructor and student could not agree to a conference date/time or did not reach an agreement during a conference; or
- (c) The AVP determines that the AIB review process is appropriate to the circumstances.

(2) **Scheduling:** Within five instruction days of determining that an AIB review is in order, the AVP shall schedule a review for the next available meeting of the AIB.

(3) **Notification:** The AVP will notify the student, instructor, and AIB chair. Notification will include:

(a) All information provided by the instructor when the violation was reported and all documents related to the alleged violation. However, any such information and documents that were previously provided to the student are not required to be included in this notification. Also, information and documents should be redacted to the extent their release would compromise test or examination contents or if the documents include other student's education records;

(b) The date/time of the AIB review;

(c) Instructions on how to submit documents, statements, and other materials for consideration by the AIB;

(d) A clear statement that the AIB review is a closed process (no student, instructor or person other than the board is present at the review);

(e) A description of the specific rules governing the AIB review process;

(f) A description of the university's academic integrity rules and processes; and

(g) Contact information for the AVP's office where the student and/or instructor can request further information and assistance. Notifications will strongly encourage the student to contact the AVP to ensure that the student understands the process, the violation, and the potential sanctions.

(4) **Student and instructor response:** The student must prepare a written statement and submit the statement to the AVP's office within three instruction days after receiving the AIB review notice. The student may include any relevant written documentation, written third-party statements, or other evidence deemed relevant to the student's interests. Unless already provided, the instructor should submit the syllabus, the relevant test/assignment, and other materials that are pertinent to the violation to the AVP's office.

(5) **Failure to respond:** If the student does not respond to the notification of the AIB review within three instructional days, the AVP will send another notification to the student. Failure of the student to respond to the second notification within three instruction days will be treated as an admission of responsibility and acceptance of the proposed sanctions. The AVP will coordinate sanctioning with the instructor and/or the AIB as needed. If a recommended sanction requires higher level authority to impose, the AIB will proceed with a hearing.

(6) **Proceedings:** The board's responsibility is to review the statements and other materials provided by each party, review other relevant records, information, or materials, and make a determination as to whether the alleged academic integrity violation occurred. The board primarily reviews written evidence. Neither the student nor the instructor is permitted to attend the AIB review. The board may, at its discretion, consult with the instructor, the student or others as deemed appropriate or necessary. All evidence collected in this process will be made available to the student and/or instructor upon request.

(7) **Sanctions:** The board will determine what, if any, sanctions will be imposed. The board may impose the same

sanctions assigned and/or recommended by the instructor, or may impose greater or lesser sanctions. If the student has any previous violation(s) of academic integrity standards, the AIB may increase the sanction imposed to account for repeat offenses. If the board decides to pursue sanctions that include suspension or expulsion, the board shall initiate an AIB hearing per WAC 172-90-170.

(8) **Conclusion:** The board should conclude its review and issue a decision within thirty days after the violation was initially reported. The AVP shall notify the student and instructor of the board's decisions, along with the right to request reconsideration.

(9) **Requests for review:** Either the student or the instructor may request reconsideration by the ~~((AVP))~~ provost or designee by submitting a request in writing to the ~~((AVP))~~ provost or designee within twenty-one days after the board issues its written decision. The ~~((AVP))~~ provost or designee shall allow the student and the instructor an opportunity to respond in writing to the request for review. The student and instructor's responses, if any, must be submitted within five instructional days of the request for review. After reviewing the responses and materials considered by the board, the ~~((AVP))~~ provost or designee shall issue a decision in writing within twenty days of receipt of the request for review. The decision must include a brief statement of the reasons for the ~~((AVP's))~~ provost or designee decision and notice that judicial review may be available. All decisions of the ~~((AVP))~~ provost or designee are final and no appeals within the university are permitted. Judicial review may be available under chapter 34.05 RCW.

## WSR 20-21-029

### PERMANENT RULES

#### DEPARTMENT OF AGRICULTURE

[Filed October 12, 2020, 6:38 a.m., effective November 12, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: This rule-making order amends chapter 16-233 WAC, Worker protection standards, by making the language and requirements consistent with certain language adopted February 3, 2020, by the department of labor and industries in chapter 296-307 WAC.

Citation of Rules Affected by this Order: Amending WAC 16-233-006, 16-233-016, 16-233-021, 16-233-026, 16-233-031, 16-233-036, 16-233-101, 16-233-111, 16-233-116, 16-233-121, 16-233-126, 16-233-216, 16-233-221, 16-233-301, 16-233-306, 16-233-311, and 16-233-316.

Statutory Authority for Adoption: RCW 15.58.040 and 17.21.030.

Adopted under notice filed as WSR 20-08-133 on April 1, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 17, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 17, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 10, 2020.

Derek I. Sandison  
Director

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-006 Scope and purpose—40 C.F.R., § 170.301.** This ~~((regulation is primarily intended))~~ chapter contains standards designed to reduce the risks of illness or injury ~~((to))~~ resulting from workers' and handlers' ~~((resulting from))~~ occupational exposures to pesticides used in the production of agricultural plants on agricultural establishments and also to reduce the accidental exposure of workers and other persons to such pesticides. It requires ~~((agricultural employers and commercial pesticide handler employers to provide specific information and protections to workers, handlers and other persons when pesticides are used on agricultural establishments in the production of agricultural plants. It also requires handlers to wear the labeling specified clothing and personal protective equipment when performing handler activities, and to take measures to protect workers and other persons during pesticide applications))~~ handlers to wear the label specified clothing and personal protective equipment when performing handler activities, and to take measures to protect workers and other persons during pesticide applications. It also requires workplace practices designed to reduce or eliminate exposure to pesticides and establishes procedures for responding to exposure-related emergencies.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-016 Definitions—40 C.F.R., § 170.305.** Terms used in this chapter have the same meanings they have in the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. In addition, the following terms, when used in this chapter, shall have the following meanings:

(1) "Agricultural emergency" for agricultural emergencies see WAC 16-233-306(3).

(2) "Agricultural employer" means any person who is an owner of, or is responsible for the management or condition of, an agricultural establishment, and who employs any worker or handler.

~~((2))~~ (3) "Agricultural establishment" means any farm, forest operation, or nursery engaged in the outdoor or enclosed space production of agricultural plants. An establishment that is not primarily agricultural is an agricultural establishment if it produces agricultural plants for transplant or use (in part or their entirety) in another location instead of purchasing the agricultural plants.

~~((3))~~ (4) "Agricultural plant" means any plant, or part thereof, grown, maintained, or otherwise produced for commercial purposes, including growing, maintaining or otherwise producing plants for sale or trade, for research or experimental purposes, or for use in part or their entirety in another location. Agricultural plant includes, but is not limited to, grains; fruits and vegetables; wood fiber or timber products; flowering and foliage plants and trees; seedlings and transplants; and turf grass produced for sod. Agricultural plant does not include pasture or rangeland used for grazing.

~~((4))~~ (5) "Application exclusion zone" means the area surrounding the application equipment that must be free of all persons other than appropriately trained and equipped handlers during pesticide applications.

~~((5))~~ (6) "Chemigation" means the application of pesticides through irrigation systems.

~~((6))~~ (7) "Closed system" means an engineering control used while removing pesticide contents from its original container, preventing the pesticide from contacting handlers. It is used to protect handlers or other persons from pesticide exposure hazards when mixing and loading pesticides. When used properly and as intended, water-soluble packaging may qualify as a type of closed system.

~~((7))~~ (8) "Commercial pesticide handler employer" means any person, other than an agricultural employer, who employs any handler to perform handler activities on an agricultural establishment. A labor contractor who does not provide pesticide application services or supervise the performance of handler activities, but merely employs laborers who perform handler activities at the direction of an agricultural or handler employer, is not a commercial pesticide handler employer.

~~((8))~~ (9) "Commercial pesticide handling establishment" means any enterprise, other than an agricultural establishment, that provides pesticide handler or crop advising services to agricultural establishments.

~~((9))~~ (10) "Crop advisor" means any person who is assessing pest numbers, damage, pesticide distribution, or the status or requirements of agricultural plants and who holds a current Washington state department of agriculture commercial consultant license in the agricultural areas in which they are advising. The term does not include any person who is performing hand labor tasks.

~~((10))~~ (11) "Designated representative" means any persons designated in writing by a worker or handler to exercise a right of access on behalf of the worker or handler to request and obtain a copy of the pesticide application and hazard information required by WAC 16-233-021(8) in accordance with WAC 16-233-026(2).

~~((11))~~ (12) "Early entry" means entry by a worker into a treated area on the agricultural establishment after a pesticide application is complete, but before any restricted-entry interval for the pesticide has expired.

~~((12))~~ (13) "Employ" means to obtain, directly or through a labor contractor, the services of a person in exchange for any type of compensation including a salary ~~((or))~~, wages, ~~((including))~~ or piece-rate wages, without regard to who may pay or who may receive the salary or wages. It includes obtaining the services of a self-employed person, an independent contractor, or a person compensated

by a third party, except that it does not include an agricultural employer obtaining the services of a handler through a commercial pesticide handler employer or a commercial pesticide handling establishment.

~~((13))~~ (14) "Enclosed cab" means a cab with a nonporous barrier that totally surrounds the occupant(s) of the cab and prevents ~~((dermat))~~ contact with pesticides that are being applied outside of the cab. Refer to WAC 16-233-316(5).

~~((14))~~ (15) "Enclosed space production" means production of an agricultural plant indoors or in a structure or space that is covered in whole or in part by any nonporous covering or that is covered and enclosed in a way that would obstruct natural airflow, and that is large enough to permit a person to enter. Structures, with a cover that does not have any walls such as shade houses made of fencing or fabric to provide shade on plants that do not obstruct airflow, are not considered enclosed spaces.

~~((15))~~ (16) "Fumigant" means any pesticide product that is a vapor or gas, or forms a vapor or gas upon application, and whose pesticidal action is achieved through the gaseous or vapor state.

~~((16))~~ (17) "Hand labor" means any agricultural activity performed by hand or with hand tools that causes a worker to have substantial contact with surfaces (such as plants, plant parts, or soil) and other surfaces that may contain pesticide residues ~~((, except that))~~. These activities include, but are not limited to, harvesting, detasseling, thinning, weeding, topping, planting, sucker removal, pruning, disbudding, roguing, and packing produce into containers in the field. Hand labor does not include performing crop advisor tasks or operating, moving, or repairing irrigation or watering equipment ~~((or performing crop advisor tasks))~~. For irrigation or watering equipment used during chemigation see handler activities.

~~((17))~~ (18) "Handler" means any person, including a self-employed person, who is employed by an agricultural employer or commercial pesticide handler employer and performs any of the following activities:

- (a) Mixing, loading, or applying pesticides.
- (b) Disposing of pesticides.
- (c) Handling opened containers of pesticides, emptying, triple-rinsing, or cleaning pesticide containers according to pesticide product labeling instructions, or disposing of pesticide containers that have not been cleaned. The term does not include any person who is only handling unopened pesticide containers or pesticide containers that have been emptied or cleaned according to pesticide product labeling instructions.
- (d) Acting as a flagger.
- (e) Cleaning, adjusting, handling, or repairing the parts of mixing, loading, or application equipment that may contain pesticide residues, including irrigation equipment used for chemigation.
- (f) Assisting with the application of pesticides.
- (g) Entering an enclosed space after the application of a pesticide and before the inhalation exposure level listed in the labeling has been reached or one of the ventilation criteria established in WAC 16-233-111 (2)(c) or the labeling has been met to operate ventilation equipment, monitor air levels, or adjust or remove coverings used in fumigation.
- (h) Entering a treated area outdoors after application of any soil fumigant during the labeling-specified entry-

restricted period to adjust or remove coverings used in fumigation.

(i) Performing tasks as a crop advisor during any pesticide application or restricted-entry interval, or before the inhalation exposure level listed in the pesticide product labeling has been reached or one of the ventilation criteria established in WAC 16-233-111 (2)(c) or the pesticide product labeling has been met, and either inhalation exposure levels are below permissible exposure limits (PELs) in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is provided and worn according to the requirements in WAC 296-307-594, Part Y-5 Respirators.

~~((18))~~ (19) "Handler employer" means any person who is self-employed as a handler or who employs any handler.

~~((19))~~ (20) "Immediate family" ~~((is limited to the))~~ includes only spouse, children, stepchildren, foster children, parents, stepparents, foster parents, ((father-in-law, mother-in-law, children, stepchildren, foster children, sons-in-law, daughters-in-law, grandparents, grandchildren,)) brothers, and sisters~~((, brothers-in-law, sisters-in-law, aunts, uncles, nieces, nephews, and first cousins. "First cousin" means the child of a parent's sibling, i.e., the child of an aunt or uncle)).~~

~~((20))~~ (21) "Labor contractor" means a person, other than a commercial pesticide handler employer, who employs workers or handlers to perform tasks on an agricultural establishment for an agricultural employer or a commercial pesticide handler employer.

~~((21))~~ (22) "Outdoor production" means production of an agricultural plant in an outside area that is not enclosed or covered in any way ~~((that would obstruct the natural air flow))~~ by nonporous material. This includes shade houses without sides.

~~((22))~~ (23) "Owner" means any person who has a present possessory interest (e.g., fee, leasehold, rental, or other) in an agricultural establishment. A person who has both leased such agricultural establishment to another person and granted that same person the right and full authority to manage and govern the use of such agricultural establishment is not an owner for purposes of this chapter.

~~((23))~~ (24) "Personal protective equipment" or "PPE" means devices ~~((and)),~~ appliances or apparel that are worn to protect the body from ((contact with)) exposure to safety and health hazards. PPE that protects against chemical hazards such as pesticides or pesticide residues including, but not limited to~~((:))~~ Coveralls, chemical-resistant suits, chemical-resistant gloves, chemical-resistant footwear, respirators, chemical-resistant aprons, chemical-resistant headgear, and protective eyewear.

~~((24))~~ (25) "Restricted-entry interval" or "REI" means the time after the end of a pesticide application during which entry into the treated area is restricted.

~~((25))~~ (26) "Safety data sheet" ~~((has the same meaning as the definition in 29 C.F.R. Sec. 1910.1200(e))~~ or "SDS" means written or printed material concerning a hazardous chemical that is prepared in accordance with WAC 296-901-14014.

~~((26))~~ (27) "Treated area" means any area to which a pesticide is being directed or has been directed.

~~((27))~~ (28) "Use," as in "to use a pesticide" means any of the following:

(a) Pre-application activities including, but not limited to:

(i) Arranging for the application of the pesticide.

(ii) Mixing and loading the pesticide.

(iii) Making necessary preparations for the application of the pesticide, including responsibilities related to worker notification, training of workers or handlers, providing decontamination supplies, providing pesticide safety information and pesticide application and hazard information, use and care of personal protective equipment, providing emergency assistance, and heat stress management.

(b) Application of the pesticide.

(c) Post-application activities intended to reduce the risks of illness and injury resulting from handlers' and workers' occupational exposures to pesticide residues during and after the restricted-entry interval, including responsibilities related to worker notification, training of workers or early-entry workers, providing decontamination supplies, providing pesticide safety information and pesticide application and hazard information, use and care of personal protective equipment, providing emergency assistance, and heat stress management.

(d) Other pesticide-related activities including, but not limited to, transporting or storing pesticides that have been opened, cleaning equipment, and disposing of excess pesticides, spray mix, equipment wash waters, pesticide containers, and other pesticide-containing materials.

~~((28))~~ (29) "Worker" means any person, including a self-employed person, who is employed and performs activities directly relating to the production of agricultural plants on an agricultural establishment.

~~((29))~~ (30) "Worker housing area" means any place or area of land on or near an agricultural establishment where housing or space for housing is provided for workers or handlers by an agricultural employer, owner, labor contractor, or any other person responsible for the recruitment or employment of agricultural workers.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-021 Agricultural employer duties—40 C.F.R., § 170.309.** Agricultural employers must:

(1) Ensure that any pesticide is used in a manner consistent with the pesticide product labeling, including the requirements of this chapter, when applied on the agricultural establishment.

(2) Ensure that each worker and handler subject to this chapter receives the protections required by this chapter.

(3) Ensure that any handler and any early entry worker is at least eighteen years old.

(4) Provide to each person, including labor contractors, who supervises any workers or handlers, information and directions sufficient to ensure that each worker and handler receives the protections required by this chapter. Such information and directions must specify the tasks for which the supervisor is responsible in order to comply with the provisions of this chapter.

(5) Require each person, including labor contractors, who supervises any workers or handlers, to provide sufficient

information and directions to each worker and handler to ensure that they can comply with the provisions of this chapter.

(6) Provide emergency assistance in accordance with this subsection. If there is reason to believe that a worker or handler has experienced a potential pesticide exposure during his or her employment on the agricultural establishment or shows symptoms similar to those associated with acute exposure to pesticides during or within seventy-two hours after his or her employment on the agricultural establishment, and needs emergency medical treatment, the agricultural employer must do all of the following promptly after learning of the possible poisoning or injury:

(a) Make available to that person prompt transportation from the agricultural establishment, including any worker housing area on the establishment, to an operating medical care facility capable of providing emergency medical treatment to a person exposed to pesticides.

(b) Provide all of the following information to the treating medical personnel:

(i) Copies of the applicable ~~((safety data sheet(s)))~~ SDS and the product name(s), EPA registration number(s) and active ingredient(s) for each pesticide product to which the person may have been exposed.

(ii) The circumstances of application or use of the pesticide on the agricultural establishment.

(iii) The circumstances that could have resulted in exposure to the pesticide.

(iv) Antidote, first aid and other medical information from the product labeling.

(7) Ensure that workers or other persons employed or supervised by the agricultural establishment do not clean, repair, or adjust pesticide application equipment, unless trained as a handler under WAC 16-233-201. Before allowing any person not directly employed or supervised by the agricultural establishment to clean, repair, or adjust equipment that has been used to mix, load, transfer, or apply pesticides, the agricultural employer shall assure that pesticide residues have been removed from the equipment if feasible and must provide all of the following information to such person:

(a) Pesticide application equipment may be contaminated with pesticides.

(b) The potentially harmful effects of exposure to pesticides.

(c) Procedures for handling pesticide application equipment and for limiting exposure to pesticide residues.

(d) Personal hygiene practices and decontamination procedures for preventing pesticide exposures and removing pesticide residues.

(8) Display, maintain, and provide access to pesticide safety information and pesticide application and hazard information in accordance with WAC 16-233-026 if workers or handlers are on the establishment and within the last thirty days a pesticide product has been used or a restricted-entry interval for such pesticide has been in effect on the establishment.

(9) Ensure that before a handler uses any equipment for mixing, loading, transferring, or applying pesticides, the handler is instructed in the safe operation of such equipment.

(10) Ensure that before each day of use, equipment used for mixing, loading, transferring, or applying pesticides is inspected for leaks, clogging, and worn or damaged parts, and any damaged equipment is repaired or replaced.

~~(11) ((Ensure that whenever handlers employed by a commercial pesticide handling establishment will be on an agricultural establishment, the handler employer is provided information about, or is aware of,))~~ The agricultural employer must notify a commercial pesticide handler employer (CPHER) of specific locations and descriptions of ((any)) those treated areas ((on the agricultural establishment where a)) and any restrictions on entering the treated areas with restricted-entry intervals ((is)) (REIs) in effect ((that the)) whenever:

(a) A handler employed by a CIPHER will be on the agricultural establishment; and

(b) The CIPHER handler may be in ((f)) or may walk within 1/4 mile of ((, and any restrictions on entering those areas)) any pesticide treated area with restricted-entry interval (REI) in effect.

(12) Ensure that workers do not enter any area on the agricultural establishment where a pesticide has been applied until the applicable pesticide application and hazard information for each pesticide product applied to that area is displayed in accordance with WAC 16-233-026(2), and until after the restricted-entry interval has expired and all treated area warning signs have been removed or covered, except for entry permitted by WAC 16-233-306.

(13) Provide any records or other information required by this section for inspection and copying upon request by an employee of EPA, or any duly authorized representative of the Washington state department of agriculture or department of labor and industries.

(14) Pesticide safety, application, and hazard information must remain legible at all times when the information is required to be displayed. This information must be in accordance with WAC 16-233-026.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-026 Display requirements for pesticide safety information and pesticide application and hazard information—40 C.F.R., § 170.311.** (1) *Display of pesticide safety information.* Whenever pesticide safety information and pesticide application and hazard information are required to be provided under WAC 16-233-021(8), pesticide safety information must be legible and displayed in accordance with this subsection.

(a) *General.* The pesticide safety information must be conveyed in a manner that workers and handlers can understand.

(b) The pesticide safety information must include all of the following points:

(i) Avoid getting on the skin or into the body any pesticides that may be on or in plants, soil, irrigation water, tractors, and other equipment, on used personal protective equipment, or drifting from nearby applications.

(ii) Wash before eating, drinking, using chewing gum or tobacco, or using the toilet.



(iii) Wear work clothing that protects the body from pesticide residues (long-sleeved shirts, long pants, shoes and socks, and a hat or scarf).

(iv) Wash or shower with soap and water, shampoo hair, and put on clean clothes after work.

(v) Wash work clothes separately from other clothes before wearing them again.

(vi) If pesticides are spilled or sprayed on the body use decontamination supplies to wash immediately, or rinse off in the nearest clean water, including springs, streams, lakes or other sources if more readily available than decontamination supplies, and as soon as possible, wash or shower with soap and water, shampoo hair, and change into clean clothes.

(vii) Follow directions about keeping out of treated areas and application exclusion zones.

(viii) Instructions to employees to seek medical attention as soon as possible if they believe they have been poisoned, injured or made ill by pesticides.

(ix) The name, address, and telephone number of a nearby operating medical care facility capable of providing emergency medical treatment. This information must be clearly identified as emergency medical contact information on the display.

(x) The name, address, and telephone number of the Washington state department of agriculture, 1-844-388-2020 and Washington state department of labor and industries, 1-800-4BE-SAFE (1-800-423-7233).

(c) *Changes to pesticide safety information.* The agricultural employer must update the pesticide safety information display within twenty-four hours of notice of any changes to the information required in (b)(ix) of this subsection.

(d) *Location.* The pesticide safety information must be displayed at each of the following sites on the agricultural establishment:

(i) The site selected pursuant to subsection (2)(b) of this section for display of pesticide application and hazard information.

(ii) Anywhere that decontamination supplies must be provided on the agricultural establishment pursuant to WAC 16-233-126, 16-233-221 or 16-233-311, but only when the decontamination supplies are located at permanent sites or being provided at locations and in quantities to meet the requirements for eleven or more workers or handlers.

(e) *Accessibility.* When pesticide safety information is required to be displayed, workers and handlers must be allowed access to the pesticide safety information at all times during normal work hours.

~~((f)) *Legibility.* The pesticide safety information must remain legible at all times when the information is required to be displayed.~~)

(2) *Keeping and displaying pesticide application and hazard information.* Whenever pesticide safety information and pesticide application and hazard information is required to be provided under WAC 16-233-021(8), pesticide application and hazard information for any pesticides that are used on the agricultural establishment must be displayed in a legible manner, retained, and made accessible in accordance with this subsection.

(a) *Content.* The pesticide application and hazard information must include all of the following information for each pesticide product applied:

(i) A copy of the safety data sheet (SDS).

(ii) The name, EPA registration number, and active ingredient(s) of the pesticide product.

(iii) The crop or site treated and the location and description of the treated area.

(iv) The date(s) and times the application started and ended.

(v) The duration of the applicable labeling-specified restricted-entry interval for that application.

(b) *Location.* The pesticide application and hazard information must be displayed at a place on the agricultural establishment where workers and handlers are likely to pass by or congregate and where it can be readily seen and read.

(c) *Accessibility.* When the pesticide application and hazard information is required to be displayed, workers and handlers must be allowed access to the location of the information at all times during normal work hours.

~~(d) *Legibility.* The pesticide application and hazard information must remain legible at all times when the information is required to be displayed.~~

~~((e))~~ *Timing.* The pesticide application and hazard information for each pesticide product applied must be displayed no later than twenty-four hours after the end of the application of the pesticide. The pesticide application and hazard information must be displayed continuously from the beginning of the display period until at least thirty days after the end of the last applicable restricted-entry interval, or until workers or handlers are no longer on the establishment, whichever is earlier.

~~((f))~~ ~~(e)~~ *Record retention.* Whenever pesticide safety information and pesticide application and hazard information is required to be displayed in accordance with this subsection, the agricultural employer must retain the pesticide application and hazard information described in (a) of this subsection on the agricultural establishment for ~~((two))~~ seven years after the date of expiration of the restricted-entry interval applicable to the pesticide application conducted.

~~((g))~~ ~~(f)~~ *Access to pesticide application and hazard information by a worker or handler.*

(i) If a person is or was employed as a worker or handler by an establishment during the period that particular pesticide application and hazard information was required to be displayed and retained ~~((for two years))~~ in accordance with ~~((e))~~ ~~(d)~~ and ~~((f))~~ ~~(e)~~ of this subsection, and the person requests a copy of such application and/or hazard information, or requests access to such application and/or hazard information after it is no longer required to be displayed, the agricultural employer must provide the worker or handler with a copy of or access to all of the requested information within fifteen days of the receipt of any such request. The worker or handler may make the request orally or in writing.

(ii) Whenever a record has been previously provided without cost to a worker or handler or their designated representative, the agricultural employer may charge reasonable, nondiscriminatory administrative costs (*i.e.*, search and copying expenses but not including overhead expenses) for a

request by the worker or handler for additional copies of the record.

~~((h))~~ (g) *Access to pesticide application and hazard information by treating medical personnel.* Any treating medical personnel, or any person acting under the supervision of treating medical personnel, may request, orally or in writing, access to or a copy of any information required to be retained for ~~((two))~~ seven years in ~~((f))~~ (e) of this subsection in order to inform diagnosis or treatment of a worker or handler who was employed on the establishment during the period that the information was required to be displayed. The agricultural employer must promptly provide a copy of or access to all of the requested information applicable to the worker's or handler's time of employment on the establishment after receipt of the request.

~~((f))~~ (h) *Access to pesticide application and hazard information by a designated representative.*

(i) Any worker's or handler's designated representative may request access to or a copy of any information required to be retained for ~~((two))~~ seven years in ~~((f))~~ (e) of this subsection on behalf of a worker or handler employed on the establishment during the period that the information was required to be displayed. The agricultural employer must provide access to or a copy of the requested information applicable to the worker's or handler's time of employment on the establishment within fifteen days after receiving any such request, provided the request meets the requirements specified in ~~((subsection (2)(f)))~~ (h)(ii) of this ~~((section))~~ subsection.

(ii) A request by a designated representative for access to or a copy of any pesticide application and/or hazard information must be in writing and must contain all of the following:

(A) The name of the worker or handler being represented.

(B) A description of the specific information being requested. The description should include the dates of employment of the worker or handler, the date or dates for which the records are requested, type of work conducted by the worker or handler (e.g., planting, harvesting, applying pesticides, mixing or loading pesticides) during the period for which the records are requested, and the specific application and/or hazard information requested.

(C) A written statement clearly designating the representative to request pesticide application and hazard information on the worker's or handler's behalf, bearing the worker's or handler's printed name and signature, the date of the designation, and the printed name and contact information for the designated representative.

(D) If the worker or handler requests that the pesticide application and/or the hazard information be sent, direction for where to send the information (e.g., mailing address or e-mail address).

(iii) If the written request from a designated representative contains all of the necessary information specified in ~~((subsection (2)))~~ (h)(i) and (ii) of this ~~((section))~~ subsection, the employer must provide a copy of or access to all of the requested information applicable to the worker's or handler's time of employment on the establishment to the designated representative within fifteen days of receiving the request.

(iv) Whenever a record has been previously provided without cost to a worker or handler or their designated representative, the agricultural employer may charge reasonable, nondiscriminatory administrative costs (i.e., search and copying expenses but not including overhead expenses) for a request by the designated representative for additional copies of the record.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-031 Commercial pesticide handler employer duties—40 C.F.R., § 170.313.** Commercial pesticide handler employers must:

(1) Ensure that any pesticide is used in a manner consistent with the pesticide product labeling, including the requirements of this chapter, when applied on an agricultural establishment by a handler employed by the commercial pesticide handling establishment.

(2) Ensure each handler employed by the commercial pesticide handling establishment and subject to this chapter receives the protections required by this chapter.

(3) Ensure that any handler employed by the commercial pesticide handling establishment is at least eighteen years old.

(4) Provide to each person, including labor contractors, who supervises any handlers employed by the commercial pesticide handling establishment, information and directions sufficient to ensure that each handler receives the protections required by this chapter. Such information and directions must specify the tasks for which the supervisor is responsible in order to comply with the provisions of this chapter.

(5) Require each person, including labor contractors, who supervises any handlers employed by the commercial pesticide handling establishment, to provide sufficient information and directions to each handler to ensure that the handler can comply with the provisions of this chapter.

(6) Ensure that before any handler employed by the commercial pesticide handling establishment uses any equipment for mixing, loading, transferring, or applying pesticides, the handler is instructed in the safe operation of such equipment.

(7) Ensure that, before each day of use, equipment used by their employees for mixing, loading, transferring, or applying pesticides is inspected for leaks, obstructions, and worn or damaged parts, and any damaged equipment is repaired or is replaced.

(8) Ensure that whenever a handler who is employed by a commercial pesticide handling establishment will be on an agricultural establishment, the handler is provided information about, or is aware of, the specific location and description of any treated areas where a restricted-entry interval is in effect, and the restrictions on entering those areas.

(9) Provide the agricultural employer all of the following information before the application of any pesticide on an agricultural establishment:

(a) Specific location(s) and description of the area(s) to be treated.

(b) The date(s) and start and estimated end times of application.

(c) Product name, EPA registration number, and active ingredient(s).

(d) The labeling-specified restricted-entry interval applicable for the application.

(e) Whether posting, oral notification or both are required under WAC 16-233-121.

(f) Any restrictions or use directions on the pesticide product labeling that must be followed for protection of workers, handlers, or other persons during or after application.

(10) If there are any changes to the information provided in subsection (9)(a), (d), (e), and (f) of this section or if the start time for the application will be earlier than originally forecasted or scheduled, ensure that the agricultural employer is provided updated information prior to the application. If there are any changes to any other information provided pursuant to subsection (9) of this section, the commercial pesticide handler employer must provide updated information to the agricultural employer within two hours after completing the application. Changes to the estimated application end time of less than one hour need not be reported to the agricultural employer.

(11) Provide emergency assistance in accordance with this subsection. If there is reason to believe that a handler employed by the commercial pesticide handling establishment has experienced a potential pesticide exposure during his or her employment by the commercial pesticide handling establishment or shows symptoms similar to those associated with acute exposure to pesticides during or within seventy-two hours after his or her employment by the commercial pesticide handling establishment, and needs emergency medical treatment, the commercial pesticide handler employer must do all of the following promptly after learning of the possible poisoning or injury:

(a) Make available to that person prompt transportation from the commercial pesticide handling establishment, or any agricultural establishment on which that handler may be working on behalf of the commercial pesticide handling establishment, to an operating medical care facility capable of providing emergency medical treatment to a person exposed to pesticides.

(b) Provide all of the following information to the treating medical personnel:

(i) Copies of the applicable safety data sheet(s) (SDS) and the product name(s), EPA registration number(s) and active ingredient(s) for each pesticide product to which the person may have been exposed.

(ii) The circumstances of application or use of the pesticide.

(iii) The circumstances that could have resulted in exposure to the pesticide.

(iv) Antidote, first aid and other medical information from the product labeling.

(12) Ensure that persons directly employed by the commercial pesticide handling establishment do not clean, repair, or adjust pesticide application equipment, unless trained as a handler under WAC 16-233-201. Before allowing any person not directly employed by the commercial pesticide handling establishment to clean, repair, or adjust equipment that has been used to mix, load, transfer, or apply pesticides, the com-

mercial pesticide handler employer shall assure that pesticide residues have been removed from the equipment if feasible and must provide all of the following information to such persons:

(a) Notice that the pesticide application equipment may be contaminated with pesticides.

(b) The potentially harmful effects of exposure to pesticides.

(c) Procedures for handling pesticide application equipment and for limiting exposure to pesticide residues.

(d) Personal hygiene practices and decontamination procedures for preventing pesticide exposures and removing pesticide residues.

(13) Provide any records or other information required by this chapter for inspection and copying upon request by an employee of EPA or any duly authorized representative of the Washington state department of agriculture or the department of labor and industries.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-036 Prohibited actions—40 C.F.R., § 170.315.** No agricultural employer, commercial pesticide handler employer, or other person involved in the use of a pesticide to which this chapter applies, shall intimidate, threaten, coerce, or discriminate against any worker or handler for complying with or attempting to comply with this chapter, or because the worker or handler provided, caused to be provided or is about to provide information to the employer or the EPA or any duly authorized representative of the Washington state department of agriculture, or the department of labor and industries regarding conduct that the worker or handler reasonably believes violates this chapter, has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing concerning compliance with this chapter, or has objected to, or refused to participate in, any activity, policy, practice, or assigned task that the worker or handler reasonably believed to be in violation of this chapter. Any such intimidation, threat, coercion, or discrimination violates the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), Section 12 (a)(2)(G), 7 U.S.C. 136j (a)(2)(G).

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-101 Training requirements for workers—40 C.F.R., § 170.401.** (1) *General requirement.* Before any worker performs any task in a treated area on an agricultural establishment where within the last thirty days a pesticide product has been used or a restricted-entry interval for such pesticide has been in effect, the agricultural employer must ensure that each worker has been trained in accordance with this section within the last twelve months, except as provided in subsection (2) of this section.

(2) *Exceptions.* The following workers need not be trained under this section:

(a) A worker who is currently certified as an applicator of restricted use pesticides under chapter 17.21 RCW.

(b) A worker who has satisfied the handler training requirements in WAC 16-233-201.

(c) A worker who is certified or licensed as a crop advisor by the Washington state department of agriculture under RCW 15.58.230: Provided, That a requirement for such certification or licensing is pesticide safety training that includes all the topics in WAC 16-233-201 (3)(b) or (c) as applicable depending on the date of training.

(3) *Training programs.*

(a) Pesticide safety training must be presented to workers either orally from written materials or audio-visually, at a location that is reasonably free from distraction and conducive to training. All training materials must be EPA-approved. The training must be presented in a manner that the workers can understand, such as through a translator. The training must be conducted by a person who meets the worker trainer requirements of (d) of this subsection, and who must be present during the entire training program and must respond to workers' questions.

(b) The training must include, at a minimum, all of the following topics:

(i) Where and in what form pesticides may be encountered during work activities.

(ii) Hazards of pesticides resulting from toxicity and exposure, including acute and chronic effects, delayed effects, and sensitization.

(iii) Routes through which pesticides can enter the body.

(iv) Signs and symptoms of common types of pesticide poisoning.

(v) Emergency first aid for pesticide injuries or poisonings.

(vi) How to obtain emergency medical care.

(vii) Routine and emergency decontamination procedures, including emergency eye flushing techniques.

(viii) Hazards from chemigation and drift.

(ix) Hazards from pesticide residues on clothing.

(x) Warnings about taking pesticides or pesticide containers home.

(xi) Requirements of this section designed to reduce the risks of illness or injury resulting from workers' occupational exposure to pesticides, including application and entry restrictions, the design of the warning sign, posting of warning signs, oral warnings, the availability of specific information about applications, and the protection against retaliatory acts.

(c) EPA intends to make available to the public training materials that may be used to conduct training conforming to the requirements of this section. Within one hundred eighty-one days after a notice of availability of such training materials appears in the FEDERAL REGISTER, training programs required under this section must include, at a minimum, all of the topics listed in (c)(i) through (xxiii) of this subsection instead of the topics listed in (b)(i) through (xi) of this subsection.

(i) The responsibility of agricultural employers to provide workers and handlers with information and protections designed to reduce work-related pesticide exposures and illnesses. This includes ensuring workers and handlers have been trained on pesticide safety, providing pesticide safety and application and hazard information, decontamination

supplies and emergency medical assistance, and notifying workers of restrictions during applications and on entering pesticide treated areas. A worker or handler may designate in writing a representative to request access to pesticide application and hazard information.

(ii) How to recognize and understand the meaning of the posted warning signs used for notifying workers of restrictions on entering pesticide treated areas on the establishment.

(iii) How to follow directions and/or signs about keeping out of pesticide treated areas subject to a restricted-entry interval and application exclusion zones.

(iv) Where and in what forms pesticides may be encountered during work activities, and potential sources of pesticide exposure on the agricultural establishment. This includes exposure to pesticide residues that may be on or in plants, soil, tractors, application and chemigation equipment, or used personal protective equipment, and that pesticides may drift through the air from nearby applications or be in irrigation water.

(v) Potential hazards from toxicity and exposure that pesticides present to workers and their families, including acute and chronic effects, delayed effects, and sensitization.

(vi) Routes through which pesticides can enter the body.

(vii) Signs and symptoms of common types of pesticide poisoning.

(viii) Emergency first aid for pesticide injuries or poisonings.

(ix) Routine and emergency decontamination procedures, including emergency eye flushing techniques, and if pesticides are spilled or sprayed on the body to use decontamination supplies to wash immediately or rinse off in the nearest clean water, including springs, streams, lakes or other sources if more readily available than decontamination supplies, and as soon as possible, wash or shower with soap and water, shampoo hair, and change into clean clothes.

(x) How and when to obtain emergency medical care.

(xi) When working in pesticide treated areas, wear work clothing that protects the body from pesticide residues and wash hands before eating, drinking, using chewing gum or tobacco, or using the toilet.

(xii) Wash or shower with soap and water, shampoo hair, and change into clean clothes as soon as possible after working in pesticide treated areas.

(xiii) Potential hazards from pesticide residues on clothing.

(xiv) Wash work clothes before wearing them again and wash them separately from other clothes.

(xv) Do not take pesticides or pesticide containers used at work to your home.

(xvi) ~~((Safety data sheets))~~ SDSs provide hazard, emergency medical treatment and other information about the pesticides used on the establishment they may come in contact with. The responsibility of agricultural employers to do all of the following:

(A) Display ~~((safety data sheets))~~ SDSs for all pesticides used on the establishment.

(B) Provide workers and handlers information about the location of the ~~((safety data sheets))~~ SDSs on the establishment.

(C) Provide workers and handlers unimpeded access to safety data sheets during normal work hours.

(xvii) This section prohibits agricultural employers from allowing or directing any worker to mix, load or apply pesticides or assist in the application of pesticides unless the worker has been trained as a handler.

(xviii) The responsibility of agricultural employers to provide specific information to workers before directing them to perform early-entry activities. Workers must be eighteen years old to perform early-entry activities.

(xix) Potential hazards to children and pregnant women from pesticide exposure.

(xx) Keep children and nonworking family members away from pesticide treated areas.

(xxi) After working in pesticide treated areas, remove work boots or shoes before entering your home, and remove work clothes and wash or shower before physical contact with children or family members.

(xxii) How to report suspected pesticide use violations to the Washington state department of agriculture.

(xxiii) This section prohibits agricultural employers from intimidating, threatening, coercing, or discriminating against any worker or handler for complying with or attempting to comply with the requirements of this chapter, or because the worker or handler provided, caused to be provided or is about to provide information to the employer, the EPA or its agents, or any duly authorized representative of the Washington state department of agriculture regarding conduct that the employee reasonably believes violates this chapter, and/or made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing concerning compliance with this chapter.

(d) The person who conducts the training must meet one of the following criteria:

(i) Be currently designated as a trainer of certified applicators or pesticide handlers by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(ii) Have completed a pesticide safety train-the-trainer program approved by the Washington state department of agriculture in accordance with chapters 15.58 and 17.21 RCW; or

(iii) Be currently certified as an applicator of restricted use pesticides under chapter 17.21 RCW.

(4) *Recordkeeping.*

(a) For each worker required to be trained under subsection (1) of this section, the agricultural employer must maintain on the agricultural establishment, for two years from the date of the training, a record documenting each worker's training including all of the following:

(i) The trained worker's printed name and signature.

(ii) The date of the training.

(iii) Information identifying which EPA-approved training materials were used.

(iv) The trainer's name and documentation showing that the trainer met the requirements of subsection (3)(d) of this section at the time of training.

(v) The agricultural employer's name.

(b) An agricultural employer who provides, directly or indirectly, training required under subsection (1) of this sec-

tion must provide to the worker upon request a copy of the record of the training that contains the information required under (a) of this subsection.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-111 Entry restrictions associated with pesticide applications—40 C.F.R., § 170.405.** (1) *Outdoor production pesticide applications.*

(a) ~~((The application exclusion zone))~~ During any outdoor production pesticide application, the agricultural employer must not allow or direct any worker or other person, other than an appropriately trained and equipped handler involved in the application, to enter or to remain in the treated area or an application exclusion zone (AEZ) that is within the boundaries of the establishment until the application is complete.

(b) A summary of outdoor production application exclusion zones (AEZ) can be found in Table 1 and is defined as follows:

(i) The application exclusion zone is the area that extends one hundred feet horizontally from the application equipment in all directions during application when the pesticide is applied by any of the following methods:

(A) Aerially.

(B) Air blast application.

(C) As a spray using a spray quality (droplet spectrum) of smaller than medium (volume median diameter of less than 294 microns).

(D) As a fumigant, smoke, mist, or fog.

(ii) The application exclusion zone is the area that extends twenty-five feet horizontally from the application equipment in all directions during application when the pesticide is applied not as in (a)(i)(A) through (D) of this subsection and is sprayed from a height of greater than twelve inches from the planting medium using a spray quality (droplet spectrum) of medium or larger (volume median diameter of 294 microns or greater).

(iii) There is no application exclusion zone when the pesticide is applied in a manner other than those covered in (a)(i) and (ii) of this subsection.

~~((b))~~ (c) During any outdoor production pesticide application, the agricultural employer must not allow or direct any worker or other person, other than an appropriately trained and equipped handler involved in the application, to enter or to remain in the treated area or an application exclusion zone that is within the boundaries of the establishment until the application is complete.

~~((c))~~ (d) After the application is complete, the area subject to the labeling-specified restricted-entry interval and the post-application entry restrictions specified in WAC 16-233-116 is the treated area.

**Table 1**  
**Entry Restrictions\* - During Outdoor Production**  
**Pesticide Application (AEZ)**

Note: This applies to the area within the boundaries of the establishment, outside establishment boundaries, the handler must suspend application long enough to ensure no contact with any persons within the AEZ (see WAC 16-233-211 (1) and (2)). During pesticide application and after application is complete, pesticide labeling-specified restricted-entry intervals and post-application restrictions apply to the treated area.

<b>*During pesticides being applied:</b> (WAC 16-233-111)	<b>Prohibit workers and any persons, other than appropriately trained and equipped handlers, from being in the AEZ:</b>
(A) Aerially (B) Air blast application (C) As a spray quality (droplet spectrum) of smaller than medium (volume median diameter of less than 294 microns) (D) As a fumigant, smoke, mist, fog, or aerosol	<b>Area that extends 100 feet horizontally in all directions from the application equipment until after the application is complete.</b>
Not applied as (A), (B), (C), or (D) above and: - From a height greater than 12 inches from the planting medium; and - As a spray using a medium or larger spray quality droplet spectrum of volume median diameter of 294 microns or greater.	<b>Area that extends 25 feet horizontally in all directions from the application equipment until after the application is complete.</b>
Otherwise - No AEZ	Follow applicable label directions for restricted-entry intervals.

(2) *Enclosed space production pesticide applications.*

(a) During any enclosed space production pesticide application described in column 1 of ~~((the))~~ Table 2 under (d) of this subsection, the agricultural employer must not allow or direct any worker or other person, other than an appropriately trained and equipped handler involved in the application, to enter or to remain in the application exclusion zone (AEZ) area specified in column 2 of ~~((the))~~ Table 2 under (d) of this subsection during the application and until the time specified in column 3 of ~~((the))~~ Table 2 under (d) of this subsection has expired.

(b) After the time specified in column 3 of ~~((the))~~ Table 2 under (d) of this subsection has expired, the area subject to the labeling-specified restricted-entry interval and the post-application entry restrictions specified in WAC 16-233-116 is the area specified in column 4 of ~~((the))~~ Table 2 under (d) of this subsection.

(c) When column 3 of ~~((the))~~ Table 2 under (d) of this subsection specifies that ventilation criteria must be met, ventilation must continue until the air concentration is measured to be equal to or less than the inhalation exposure level required by the labeling. If no inhalation exposure level is listed on the labeling, ventilation must continue until after one of the following conditions is met:

- (i) Ten air exchanges are completed.

- (ii) Two hours of ventilation using fans or other mechanical ventilating systems.
  - (iii) Four hours of ventilation using vents, windows, or other passive ventilation.
  - (iv) Eleven hours with no ventilation followed by one hour of mechanical ventilation.
  - (v) Eleven hours with no ventilation followed by two hours of passive ventilation.
  - (vi) Twenty-four hours with no ventilation.
- (d) The following table applies to (a), (b), and (c) of this subsection.

**Table ~~((-))~~ 2**  
**Entry Restrictions During Enclosed Space Production**  
**Pesticide Applications**

1. When a pesticide is applied:	2. <b>Prohibit <del>workers and ((other)) any</del> persons, other than appropriately trained and equipped handlers, <del>((are prohibited in))</del> from being in AEZ:</b>	3. Until:	4. After the expiration of time specified in column 3, the area subject to the restricted-entry interval is:
(a) As a fumigant	Entire enclosed space plus any adjacent structure or area that cannot be sealed off from the treated area	The ventilation criteria of subsection (2)(c) of this section are met	No post-application entry restrictions required by WAC 16-233-116 after criteria in column 3 are met
(b) As a  (i) Smoke, or  (ii) Mist, or  (iii) Fog, or  (iv) As a spray using a spray quality (droplet spectrum) of smaller than medium (volume median diameter of less than 294 microns)	Entire enclosed space	The ventilation criteria of subsection (2)(c) of this section are met	Entire enclosed space

1. When a pesticide is applied:	2. <u>Prohibit workers and <del>(other)</del> any persons, other than appropriately trained and equipped handlers, <del>(are prohibited in)</del> from being in AEZ:</u>	3. Until:	4. After the expiration of time specified in column 3, the area subject to the restricted-entry interval is:
(c) Not as in (a) or (b) above, <del>((and for which a respiratory protection device is required for application by the pesticide product labeling))</del> <u>the pesticide product label requires a respirator during application</u>	Entire enclosed space	The ventilation criteria of subsection (2)(c) of this section are met	Treated area
(d) Not as in (a), (b) or (c) above, and:  (i) From a height of greater than 12 inches from the planting medium, or  (ii) As a spray using a spray quality (droplet spectrum) of medium or larger (volume median diameter of 294 microns or greater)	Treated area plus 25 feet in all directions of the treated area, but not outside the enclosed space	Application is complete	Treated area
(e) Otherwise	Treated area	Application is complete	Treated area

**AMENDATORY SECTION** (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-116 Worker entry restrictions after pesticide applications—40 C.F.R., § 170.407.** (1) After the application of any pesticide to an area of outdoor production, the agricultural employer must not allow or direct any worker to enter or to remain in the treated area before the restricted-entry interval specified on the pesticide product labeling has expired and all treated area warning signs have been removed or covered, except for early-entry activities permitted in WAC 16-233-306.

(2) After the application of any pesticide to an area of enclosed space production, the agricultural employer must

not allow or direct any worker to enter or to remain in the areas specified in column 4 of ~~((the))~~ Table 2 in WAC 16-233-111 (2)(d), before the restricted-entry interval specified on the pesticide product labeling has expired and all treated area warning signs have been removed or covered, except for early-entry activities permitted in WAC 16-233-306.

(3) When two or more pesticides are applied to a treated area at the same time, the applicable restricted-entry interval is the longest of all applicable restricted-entry intervals.

(4) When two or more pesticides are applied to a treated area at the same time, the employer must provide and ensure employees, workers, and handlers wear the applicable PPE to protect against all of the pesticides as a mixture and combined product.

**AMENDATORY SECTION** (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-121 Oral and posted notification of worker entry restrictions—40 C.F.R., § 170.409.** (1) *General requirement.* The agricultural employer must notify workers of all entry restrictions required in WAC 16-233-111 and 16-233-116 in accordance with this section.

(a) *Type of notification required:*

(i) *Double notification.* If the pesticide product labeling has a statement requiring both the posting of treated areas and oral notification to workers, the agricultural employer must post signs in accordance with subsection (2) of this section and must also provide oral notification of the application to workers in accordance with subsection (3) of this section.

(ii) *Outdoor production areas subject to restricted-entry intervals greater than forty-eight hours.* If a pesticide with product labeling that requires a restricted-entry interval greater than forty-eight hours is applied to an outdoor production area, the agricultural employer must notify workers of the application by posting warning signs in accordance with subsection (2) of this section.

(iii) *Outdoor production areas subject to restricted-entry intervals equal to or less than forty-eight hours.* If a pesticide with product labeling that requires a restricted-entry interval equal to or less than forty-eight hours is applied to an outdoor production area, the agricultural employer must notify workers of the application either by posting warning signs in accordance with subsection (2) of this section or by providing workers with an oral warning in accordance with subsection (3) of this section.

(iv) *Enclosed space production areas subject to restricted-entry intervals greater than four hours.* If a pesticide with product labeling that requires a restricted-entry interval greater than four hours is applied to an enclosed space production area, the agricultural employer must notify workers of the application by posting warning signs in accordance with subsection (2) of this section.

(v) *Enclosed space production areas subject to restricted-entry intervals equal to or less than four hours.* If a pesticide with product labeling that requires a restricted-entry interval equal to or less than four hours is applied to an enclosed space production area, the agricultural employer must notify workers of the application either by posting warning signs in accordance with subsection (2) of this section.

tion or by providing workers with an oral warning in accordance with subsection (3) of this section.

(b) *Exceptions.* Notification does not need to be given to a worker if the agricultural employer can ensure that one of the following is met:

(i) From the start of the application in an enclosed space production area until the end of any restricted-entry interval, the worker will not enter any part of the entire enclosed structure or space.

(ii) From the start of the application to an outdoor production area until the end of any restricted-entry interval, the worker will not enter, work in, remain in, or pass on foot through the treated area or any area within 1/4 mile of the treated area on the agricultural establishment.

(iii) The worker was involved in the application of the pesticide as a handler, and is aware of all information required in subsection (3)(a) of this section.

(2) *Requirements for posted warning signs.* If notification by posted warning signs is required pursuant to subsection (1) of this section, the agricultural employer must, unless otherwise prescribed by the label, ensure that all warning signs meet the requirements of this subsection. When several contiguous areas are to be treated with pesticides on a rotating or sequential basis, the entire area may be posted. Worker entry is prohibited for the entire area while the signs are posted, except for entry permitted in WAC 16-233-306.

(a) *General.* The warning signs must meet all of the following requirements:

(i) Be one of the three sizes specified in (c) of this subsection and comply with the posting placement and spacing requirements applicable to that sign size.

(ii) Be posted prior to but no earlier than twenty-four hours before the scheduled application of the pesticide.

(iii) Remain posted throughout the application and any restricted-entry interval.

(iv) Be removed or covered within three days after the end of the application or any restricted-entry interval, whichever is later (~~except that signs may remain posted after the restricted-entry interval has expired as long as all of the following conditions are met:~~

~~(A) The agricultural employer instructs any workers on the establishment that may come within 1/4 mile of the treated area not to enter that treated area while the signs are posted.~~

~~(B) The agricultural employer ensures that workers do not enter the treated area while the signs remain posted, other than entry permitted in WAC 16-233-306).~~

(v) Remain visible and legible during the time they are required to be posted.

(b) *Content.*

(i) The warning sign must have a white background. The words "DANGER" and "PELIGRO," plus "PESTICIDES" and "PESTICIDAS," must be at the top of the sign, and the words "KEEP OUT" and "NO ENTRE" must be at the bottom of the sign. Letters for all words must be clearly legible. A circle containing an upraised hand on the left and a stern face on the right must be near the center of the sign. The inside of the circle must be red, except that the hand and a large portion of the face must be in white. The length of the hand must be at least twice the height of the smallest letters. The length of the face must be

only slightly smaller than the hand. Additional information such as the name of the pesticide and the date of application may appear on the warning sign if it does not detract from the size and appearance of the sign or change the meaning of the required information. An example of a warning sign meeting these requirements, other than the size and color requirements, follows:



(ii) The agricultural employer may replace the Spanish language portion of the warning sign with equivalent terms in an alternative non-English language if that alternative language is the language read by the largest group of workers at that agricultural establishment who do not read English. The alternative language sign must be in the same format as the original sign and conform to all other requirements of (b)(i) of this subsection.

(c) *Size and posting.*

(i) The standard sign must be at least fourteen inches by sixteen inches with letters at least one inch in height.

(ii) When posting an outdoor production area using the standard sign, the signs must be visible from all reasonably expected points of worker entry to the treated area, including at least each access road, each border with any worker housing area within one hundred feet of the treated area and each footpath and other walking route that enters the treated area. Where there are no reasonably expected points of worker entry, signs must be posted in the corners of the treated area or in any other location affording maximum visibility.

(iii) When posting an enclosed space production area using the standard sign and the entire structure or space is subject to the labeling-specified restricted-entry interval and the post-application entry restrictions specified in WAC 16-233-116, the signs must be posted so they are visible from all reasonably expected points of worker entry to the structure or space. When posting treated areas in enclosed space production using the standard sign and the treated area only comprises a subsection of the structure or space, the signs must be posted so they are visible from all reasonably expected points of worker entry to the treated area including each aisle or



other walking route that enters the treated area. Where there are no reasonably expected points of worker entry to the treated area, signs must be posted in the corners of the treated area or in any other location affording maximum visibility.

(iv) If a smaller warning sign is used with "DANGER" and "PELIGRO" in letters at least 7/8 inch in height and the remaining letters at least 1/2 inch in height and a red circle at least three inches in diameter containing an upraised hand and a stern face, the signs must be posted no farther than fifty feet apart around the perimeter of the treated area in addition to the locations specified in (c)(ii) or (iii) of this subsection.

(v) If a smaller sign is used with "DANGER" and "PELIGRO" in letters at least 7/16 inch in height and the remaining letters at least 1/4 inch in height and a red circle at least one and a half inches in diameter containing an upraised hand and a stern face, the signs must be posted no farther than twenty-five feet apart around the perimeter of the treated area in addition to the locations specified in (c)(ii) or (iii) of this subsection.

(vi) A sign with "DANGER" and "PELIGRO" in letters less than 7/16 inch in height or with any words in letters less than 1/4 inch in height or a red circle smaller than one and a half inches in diameter containing an upraised hand and a stern face will not satisfy the requirements of this chapter.

(3) *Oral warnings - Requirement.* If oral notification is required pursuant to subsection (1) of this section, the agricultural employer must provide oral warnings to workers in a manner that the workers can understand. If a worker will be on the establishment when an application begins, the warning must be given before the application begins. If a worker arrives on the establishment while an application is taking place or a restricted-entry interval for a pesticide application is in effect, the warning must be given at the beginning of the worker's work period. The warning must include all of the following:

(a) The location(s) and description of any treated area(s) subject to the entry restrictions during and after application specified in WAC 16-233-111 and 16-233-116.

(b) The dates and times during which entry is restricted in any treated area(s) subject to the entry restrictions during and after application specified in WAC 16-233-111 and 16-233-116.

(c) Instructions not to enter the treated area or an application exclusion zone during application, and that entry to the treated area is not allowed until the restricted-entry interval has expired and all treated area warning signs have been removed or covered, except for entry permitted by WAC 16-233-306.

**AMENDATORY SECTION** (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-126 Decontamination supplies for workers—40 C.F.R., § 170.411.** (1) *Requirement.* The agricultural employer must provide decontamination supplies for routine washing and emergency decontamination in accordance with this section for any worker on an agricultural establishment who is performing an activity in an area where a pesticide was applied and who contacts anything that has

been treated with the pesticide including, but not limited to, soil, water, and plants.

(2) *Materials and quantities.* The decontamination supplies required in subsection (1) of this section must provide adequate water at a minimum to include at least one gallon of water per worker at the beginning of each worker's work period for routine washing and emergency decontamination, soap, and single-use towels. The supplies must meet all of the following requirements:

(a) *Water.* At all times when this part requires agricultural employers to make water available to workers, the agricultural employer must ensure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed. If a water source is used for mixing pesticides, it must not be used for decontamination, unless equipped with properly functioning valves or other mechanisms that prevent contamination of the water with pesticides, such as anti-backflow siphons, one-way or check valves, or an air gap sufficient to prevent contamination.

(b) *Soap and single-use towels.* The agricultural employer must provide soap and single-use towels for drying in quantities sufficient to meet the workers' reasonable needs. Hand sanitizing gels and liquids or wet towelettes do not meet the requirement for soap. Wet towelettes do not meet the requirement for single-use towels.

(3) *Timing.*

(a) If any pesticide with a restricted-entry interval greater than four hours was applied, the decontamination supplies must be provided from the time workers first enter the treated area until at least thirty days after the restricted-entry interval expires.

(b) If the only pesticides applied in the treated area are products with restricted-entry intervals of four hours or less, the decontamination supplies must be provided from the time workers first enter the treated area until at least seven days after the restricted-entry interval expires.

(4) *Location.* The decontamination supplies must be located together outside any treated area or area subject to a restricted-entry interval, and must be reasonably accessible to the workers. The decontamination supplies must not be more than 1/4 mile from where workers are working, except that where workers are working more than 1/4 mile from the nearest place of vehicular access or more than 1/4 mile from any nontreated area, the decontamination supplies may be at the nearest place of vehicular access outside any treated area or area subject to a restricted-entry interval.

(5) *Decontamination after early entry activities.* At the end of any exposure period for workers engaged in early entry activities permitted by WAC 16-233-311 and involving contact with anything that has been treated with the pesticide to which the restricted-entry interval applies including, but not limited to, soil, water, air, or surfaces of plants, the agricultural employer shall provide, at the site where the workers remove personal protective equipment, soap, single-use towels, and an adequate amount of water so that the workers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at early entry sites that do not have running water.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-216 Personal protective equipment—40 C.F.R., § 170.507.** (1) *Handler responsibilities.* Any person who performs handler activities involving a pesticide product must use the clothing and personal protective equipment specified on the pesticide product labeling for use of the product, except as provided in WAC 16-233-316.

(2) *Employer responsibilities for providing personal protective equipment.* The handler employer must provide to the handler the personal protective equipment required by the pesticide product labeling in accordance with this section. The handler employer must ensure that the personal protective equipment fits, is clean and in proper operating condition. When two or more pesticides are applied to the treated area at the same time, the employer must ensure employees, workers, and handlers wear the applicable PPE that would protect against all of the pesticides as a mixture and combined product. For the purposes of this section, long-sleeved shirts, short-sleeved shirts, long pants, short pants, shoes, and socks are not considered personal protective equipment, although such work clothing must be worn if required by the pesticide product labeling.

(a) If the pesticide product labeling requires that "chemical-resistant" personal protective equipment be worn, it must be made of material that allows no measurable movement of the pesticide being used through the material during use.

(b) If the pesticide product labeling requires that "waterproof" personal protective equipment be worn, it must be made of material that allows no measurable movement of water or aqueous solutions through the material during use.

(c) If the pesticide product labeling requires that a "chemical-resistant suit" be worn, it must be a loose-fitting, one- or two-piece chemical-resistant garment that covers, at a minimum, the entire body except head, hands, and feet.

(d) If the pesticide product labeling requires that "coveralls" be worn, they must be loose-fitting, one- or two-piece garments that cover, at a minimum, the entire body except head, hands, and feet.

(e) Gloves must be the type specified on the pesticide product labeling.

(i) Gloves made of leather, cotton, or other absorbent materials may not be worn while performing handler activities unless gloves made of these materials are listed as acceptable for such use on the pesticide product labeling.

(ii) Separable glove liners may be worn beneath chemical-resistant gloves, unless the pesticide product labeling specifically prohibits their use. Separable glove liners are defined as separate glove-like hand coverings, made of lightweight material, with or without fingers. Work gloves made from lightweight cotton or poly-type material are considered to be glove liners if worn beneath chemical-resistant gloves. Separable glove liners may not extend outside the chemical-resistant gloves under which they are worn. Chemical-resistant gloves with nonseparable absorbent lining materials are prohibited.

(iii) If used, separable glove liners must be discarded immediately after a total of no more than ten hours of use or within twenty-four hours of when first put on, whichever comes first. The liners must be replaced immediately if

directly contacted by pesticide. Used glove liners must not be reused. Contaminated liners must be disposed of in accordance with any federal, state, or local regulations.

(f) If the pesticide product labeling requires that "chemical-resistant footwear" be worn, one of the following types of footwear must be worn:

(i) Chemical-resistant shoes.

(ii) Chemical-resistant boots.

(iii) Chemical-resistant shoe coverings worn over shoes or boots.

(g) If the pesticide product labeling requires that "protective eyewear" be worn, one of the following types of eyewear must be worn:

(i) Goggles.

(ii) Face shield.

(iii) Safety glasses with front, brow, and temple protection.

(iv) Full-face respirator.

(h) If the pesticide product labeling requires that a "chemical-resistant apron" be worn, a chemical-resistant apron that covers the front of the body from mid-chest to the knees must be worn.

(i) If the pesticide product labeling requires that "chemical-resistant headgear" be worn, it must be either a chemical-resistant hood or a chemical-resistant hat with a wide brim.

(j) The respirator specified by the pesticide product labeling must be used. If the label does not specify the type of respirator to be used, it shall meet the requirements of chapter 296-307 WAC, Part Y-5. Whenever a respirator is required by the pesticide product labeling, the handler employer must ensure that the requirements of (j)(i) through (iii) of this subsection are met before the handler performs any handler activity where the respirator is required to be worn. The respiratory protection requirements of chapter 296-307 WAC, Part Y-5, shall apply. The handler employer must maintain for two years, on the establishment, records documenting the completion of the requirements of (j)(i) through (iii) of this subsection.

(i) The handler employer shall assure that the respirator fits correctly by using the procedures consistent with chapter 296-307 WAC, Part Y-5.

(ii) Handler employers must provide handlers with training in the use of the respirator specified on the pesticide product labeling in a manner that conforms to the provisions of ~~((29 C.F.R. Sec. 1910.134 (k)(1)(i) through (vi)))~~ chapter 296-307 WAC, Part Y-5 Respirators.

(iii) Handler employers must provide handlers with a medical evaluation by a physician or other licensed health care professional that conforms to the provisions of ~~((29 C.F.R. Sec. 1910.134))~~ WAC 296-307-604 to ensure the handler's physical ability to safely wear the respirator specified on the pesticide product labeling.

(3) *Use of personal protective equipment.*

(a) The handler employer must ensure that personal protective equipment is used correctly for its intended purpose and is used according to the manufacturer's instructions.

(b) The handler employer must ensure that, before each day of use, all personal protective equipment is inspected for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(4) *Cleaning and maintenance.*

(a) The handler employer must ensure that all personal protective equipment is cleaned according to the manufacturer's instructions or pesticide product labeling instructions before each day of reuse. In the absence of any such instructions, it must be washed thoroughly in detergent and hot water.

(b) If any personal protective equipment cannot or will not be cleaned properly, the handler employer must ensure the contaminated personal protective equipment is made unusable as apparel or is made unavailable for further use by employees or third parties. The contaminated personal protective equipment must be disposed of in accordance with any applicable laws or regulations. Coveralls or other absorbent materials that have been drenched or heavily contaminated with a pesticide that has the signal word "DANGER" or "WARNING" on the label must not be reused and must be disposed of as specified in this subsection. Handler employers must ensure that any person who handles contaminated personal protective equipment described in this subsection wears the gloves specified on the pesticide product labeling for mixing and loading the product(s) comprising the contaminant(s) on the equipment. If two or more pesticides are included in the contaminants, the gloves worn must meet the requirements for mixing and loading all of the pesticide products.

(c) The handler employer must ensure that contaminated personal protective equipment is kept separate from noncontaminated personal protective equipment, other clothing or laundry and washed separately from any other clothing or laundry.

(d) The handler employer must ensure that all washed personal protective equipment is dried thoroughly before being stored or reused.

(e) The handler employer must ensure that all clean personal protective equipment is stored separately from personal clothing and apart from pesticide-contaminated areas.

(f) The handler employer must ensure that when filtering facepiece respirators are used, they are replaced when one of the following conditions is met:

- (i) When breathing resistance becomes excessive.
- (ii) When the filter element has physical damage or tears.
- (iii) According to manufacturer's recommendations or pesticide product labeling, whichever is more frequent.

(iv) In the absence of any other instructions or indications of service life, at the end of ~~((eight hours of cumulative use))~~ each day's work period.

(g) The handler employer must ensure that when gas- or vapor-removing respirators are used, the gas- or vapor-removing canisters or cartridges are replaced before further respirator use when one of the following conditions is met:

- (i) At the first indication of odor, taste, or irritation.
- (ii) When the maximum use time is reached as determined by a change schedule conforming to the provisions of ~~((29 C.F.R. Sec. 1910.134(d)(3)(iii)(B)(2)))~~ chapter 296-307 WAC, Part Y-5 Respirators.

(iii) When breathing resistance becomes excessive.

(iv) When required according to manufacturer's recommendations or pesticide product labeling instructions, whichever is more frequent.

(v) In the absence of any other instructions or indications of service life, at the end of ~~((eight hours of cumulative use))~~ each day's work period.

(h) The handler employer must inform any person who cleans or launders personal protective equipment of all the following:

(i) That such equipment may be contaminated with pesticides and there are potentially harmful effects from exposure to pesticides.

(ii) The correct way(s) to clean personal protective equipment and how to protect themselves when handling such equipment.

(iii) Proper decontamination procedures that should be followed after handling contaminated personal protective equipment.

(i) The handler employer must ensure that handlers have a place(s) away from pesticide storage and pesticide use areas where they may do all of the following:

(i) Store personal clothing not worn during handling activities.

(ii) Put on personal protective equipment at the start of any exposure period.

(iii) Remove personal protective equipment at the end of any exposure period.

(j) The handler employer must not allow or direct any handler to wear home or to take home employer-provided personal protective equipment contaminated with pesticides.

(5) *Heat-related illness.* Where a pesticide's labeling requires the use of personal protective equipment for a handler activity, the handler employer must ~~((take appropriate measures to prevent))~~ ensure that no handler is allowed or directed to wear personal protective equipment without implementing measures sufficient to prevent heat-related illness and that each handler is instructed in the prevention, recognition, and first-aid treatment of heat-related illness.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-221 Decontamination and eye flushing supplies for handlers—40 C.F.R., § 170.509.** (1) *Requirement.* The handler employer must provide decontamination and eye flushing supplies in accordance with this section for any handler that is performing any handler activity or removing personal protective equipment at the place for changing required in WAC 16-233-216 (4)(i).

(2) *General conditions.* The decontamination supplies required in subsection (1) of this section must include: At the site where handlers remove personal protective equipment, soap, single-use towels, and a sufficient amount of water so that handlers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees ~~((at the beginning of each handler's work period for routine washing and potential emergency decontamination; soap, single-use towels, and clean clothing for use in an emergency))~~ shall be provided at mixing and loading sites that do not have running water. The decontamination and eye flushing supplies required in subsection (1) of this section must meet all of the following requirements:

(a) *Water.* At all times when this section requires handler employers to make water available to handlers for routine washing, emergency decontamination or eye flushing, the handler employer must ensure that it is of a quality and temperature that will not cause illness or injury when it contacts the skin or eyes or if it is swallowed. If a water source is used for mixing pesticides, it must not be used for decontamination or eye flushing supplies, unless equipped with properly functioning valves or other mechanisms that prevent contamination of the water with pesticides, such as anti-backflow siphons, one-way or check valves, or an air gap sufficient to prevent contamination.

(b) *Soap and single-use towels.* The handler employer must provide soap and single-use towels for drying in quantities sufficient to meet the handlers' needs. Hand sanitizing gels and liquids or wet towelettes do not meet the requirement for soap. Wet towelettes do not meet the requirement for single-use towels.

(c) *Clean change of clothing.* The handler employer must provide one clean change of clothing, such as coveralls, for use in an emergency.

(3) *Location.* The decontamination supplies must be located together outside any treated area or area subject to a restricted-entry interval, and must be reasonably accessible to each handler during the handler activity. The decontamination supplies must not be more than 1/4 mile from the handler, except that where the handler activity is more than 1/4 mile from the nearest place of vehicular access or more than 1/4 mile from any nontreated area, the decontamination supplies may be at the nearest place of vehicular access outside any treated area or area subject to a restricted-entry interval.

(a) *Mixing sites.* Decontamination supplies must be provided at any mixing site.

(b) *Exception for pilots.* Decontamination supplies for a pilot who is applying pesticides aerially must be in the aircraft or at the aircraft loading site.

(c) *Exception for treated areas.* The decontamination supplies must be outside any treated area or area subject to a restricted-entry interval, unless the soap, single-use towels, water and clean change of clothing are protected from pesticide contamination in closed containers.

(4) *Emergency eye-flushing.*

(a) Whenever a handler is mixing or loading a pesticide product whose labeling requires protective eyewear for handlers, or is mixing or loading any pesticide using a closed system operating under pressure, the handler employer must provide at each mixing/loading ~~(site)~~ station and handler decontamination sites, immediately available to the handler, at least one plumbed or portable eye wash system that is capable of delivering gently running water at a rate of at least 0.4 gallons (1.5 liters) per minute for at least ~~(+5)~~ fifteen minutes, ~~((or))~~ at least six gallons of water ~~(in containers suitable for providing a gentle eye flush for about fifteen minutes))~~. A plumbed or portable system meeting the above requirements shall be provided at all permanent mixing and loading sites.

(b) Whenever a handler is applying a pesticide product whose labeling requires protective eyewear for handlers, the handler employer must provide at least one pint of water per

handler in portable containers that are immediately available to each handler.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-301 Exemptions—40 C.F.R., § 170.601.**

(1) *Exemption for owners of agricultural establishments and their immediate families.*

(a) On any agricultural establishment where a majority of the establishment is owned by one or more members of the same immediate family, the owner(s) of the establishment are not required to provide the protections of the following sections to themselves or members of their immediate family when they are performing handling activities or tasks related to the production of agricultural plants that would otherwise be covered by this chapter on their own agricultural establishment.

- ~~(i)~~ ~~((WAC 16-233-021(3)-~~
- ~~(ii)))~~ WAC 16-233-021 (6) through (10).
- ~~((iii)))~~ (ii) WAC 16-233-026.
- ~~((iv)))~~ (iii) WAC 16-233-101.
- ~~((v)))~~ (iv) WAC 16-233-106.
- ~~((vi)))~~ (v) WAC 16-233-121.
- ~~((vii)))~~ (vi) WAC 16-233-126 and 16-233-221.
- ~~((viii)))~~ (vii) WAC 16-233-201.
- ~~((ix)))~~ (viii) WAC 16-233-206.
- ~~((x)))~~ (ix) WAC 16-233-211 (3) and (4).
- ~~((xi)))~~ (x) WAC 16-233-216 (3) through (5).
- ~~((xii)))~~ (xi) WAC 16-233-311 (1) through (3) and (5) through (10).

(b) The owners of agricultural establishments must provide all of the applicable protections required by this chapter for any employees or other persons on the establishment that are not members of their immediate family.

(2) *Exemption for certified crop advisors.* Certified crop advisors may make their own determination for the appropriate personal protective equipment for entry into a treated area during a restricted-entry interval and substitute their self-determined set of personal protective equipment for the labeling-required personal protective equipment, and the requirements of WAC 16-233-021 (5) and (6), 16-233-031(11), 16-233-206(1), 16-233-216, and 16-233-221 do not apply to certified crop advisors provided the application is complete and all of the following conditions are met:

(a) The crop advisor is certified or licensed as a crop advisor by the Washington state department of agriculture.

(b) The certification or licensing program requires pesticide safety training that includes all the information in WAC 16-233-201 (3)(b) or (c) as applicable depending on the date of training.

(c) The crop advisor who enters a treated area during a restricted-entry interval only performs crop advising tasks while in the treated area.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-306 Exceptions for entry by workers during restricted-entry intervals—40 C.F.R., § 170.603.**

An agricultural employer may direct workers to enter treated

areas where a restricted-entry interval is in effect to perform certain activities as provided in this section, provided that the agricultural employer ensures all of the applicable conditions of this section and WAC 16-233-311 are met.

(1) *Exception for activities with no contact.* A worker may enter a treated area during a restricted-entry interval if the agricultural employer ensures that all of the following conditions are met:

(a) The worker will have no contact with anything that has been treated with the pesticide to which the restricted-entry interval applies including, but not limited to, soil, water, air, or surfaces of plants. This exception does not allow workers to perform any activities that involve contact with treated surfaces even if workers are wearing personal protective equipment.

(b) No such entry is allowed until any inhalation exposure level listed in the pesticide product labeling has been reached or any ventilation criteria required in WAC 16-233-111 (2)(c) or the pesticide product labeling have been met, and either inhalation exposure levels are below PELs in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is worn according to requirements in WAC 296-307-594, Part Y-5 Respirators.

(2) *Exception for short-term activities.* A worker may enter a treated area during a restricted-entry interval for short-term activities, if the agricultural employer ensures that all of the following requirements are met:

(a) No hand labor activity is performed.

(b) The time in treated areas where a restricted-entry interval is in effect does not exceed one hour in any twenty-four-hour period for any worker.

(c) No such entry is allowed during the first four hours after the application ends.

(d) No such entry is allowed until any inhalation exposure level listed in the pesticide product labeling has been reached or any ventilation criteria required in WAC 16-233-111 (2)(c) or the pesticide product labeling have been met, and either inhalation exposure levels are below PELs in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is worn according to requirements in WAC 296-307-594, Part Y-5 Respirators.

(3) *Exception for an agricultural emergency.*

(a) An agricultural emergency means a sudden occurrence or set of circumstances that the agricultural employer could not have anticipated and over which the agricultural employer has no control, that requires entry into a treated area during a restricted-entry interval, and when no alternative practices would prevent or mitigate a substantial economic loss. A substantial economic loss means a loss in profitability greater than that which would be expected based on the experience and fluctuations of crop yields in previous years. Only losses caused by the agricultural emergency specific to the affected site and geographic area are considered. Losses resulting from mismanagement cannot be included when determining whether a loss is substantial.

(b) A worker may enter a treated area where a restricted-entry interval is in effect in an agricultural emergency to perform tasks necessary to mitigate the effects of the agricultural emergency, including hand labor tasks, if the agricultural employer ensures that all the following criteria are met:

(i) The Washington state department of agriculture declares an agricultural emergency that applies to the treated area, or agricultural employer has determined that the circumstances within the treated area are the same as circumstances the Washington state department of agriculture has previously determined would constitute an agricultural emergency.

(ii) The agricultural employer determines that the agricultural establishment is subject to the circumstances that result in an agricultural emergency meeting the criteria of (a) of this subsection.

(iii) If the labeling of any pesticide product applied to the treated area requires workers to be notified of the location of treated areas by both posting and oral notification, then the agricultural employer must ensure that no individual worker spends more than four hours out of any twenty-four-hour period in treated areas where such a restricted-entry interval is in effect.

(iv) No such entry is allowed during the first four hours after the application ends.

(v) No such entry is allowed until any inhalation exposure level listed in the pesticide product labeling has been reached or any ventilation criteria required in WAC 16-233-111 (2)(c) or the pesticide product labeling have been met, and either inhalation exposure levels are below PELs in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is worn according to requirements in WAC 296-307-594, Part Y-5 Respirators.

(vi) A decontamination site has been provided in accordance with WISHA regulations.

(4) *Exceptions for limited contact and irrigation activities.* A worker may enter a treated area during a restricted-entry interval for limited contact or irrigation activities, if the agricultural employer ensures that all of the following requirements are met:

(a) No hand labor activity is performed.

(b) No worker is allowed in the treated area for more than eight hours in a twenty-four-hour period.

(c) No such entry is allowed during the first four hours after the application ends.

(d) No such entry is allowed until any inhalation exposure level listed in the pesticide product labeling has been reached or any ventilation criteria required in WAC 16-233-111 (2)(c) or the pesticide product labeling have been met, and either inhalation exposure levels are below PELs in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is worn according to requirements in WAC 296-307-594, Part Y-5 Respirators.

(e) The task is one that, if not performed before the restricted-entry interval expires, would cause substantial economic loss, and there are no alternative tasks that would prevent substantial loss.

(f) With the exception of irrigation tasks, the need for the task could not have been foreseen.

(g) The worker has no contact with pesticide-treated surfaces other than minimal contact with feet, lower legs, hands, and forearms.

(h) The labeling of the pesticide product that was applied does not require that workers be notified of the location of treated areas by both posting and oral notification.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-311 Agricultural employer responsibilities to protect workers entering treated areas during a restricted-entry interval—40 C.F.R., § 170.605.** If an agricultural employer directs a worker to perform activities in a treated area where a restricted-entry interval is in effect, all of the following requirements must be met:

(1) The agricultural employer must ensure that the worker is at least eighteen years old.

(2) Prior to early entry, the agricultural employer must provide to each early-entry worker the information described in (a) through (h) of this subsection. The information must be provided orally in a manner that the worker can understand.

(a) Location of early-entry area where work activities are to be performed.

(b) Pesticide(s) applied.

(c) Dates and times that the restricted-entry interval begins and ends.

(d) Which exception in WAC 16-233-306 is the basis for the early entry, and a description of tasks that may be performed under the exception.

(e) Whether contact with treated surfaces is permitted under the exception.

(f) Amount of time the worker is allowed to remain in the treated area.

(g) Personal protective equipment required by the pesticide product labeling for early entry.

(h) Location of the pesticide safety information required in WAC 16-233-026(1) and the location of the decontamination supplies required in subsection (8) of this section.

(3) Prior to early entry, the agricultural employer must ensure that each worker either has read the applicable pesticide product labeling or has been informed, in a manner that the worker can understand, of all labeling requirements and statements related to human hazards or precautions, first aid, and user safety.

(4) The agricultural employer must ensure that each worker who enters a treated area during a restricted-entry interval is provided the personal protective equipment specified in the pesticide product labeling for early entry. The agricultural employer must ensure that the worker uses the personal protective equipment as intended according to manufacturer's instructions and follows any other applicable requirements on the pesticide product labeling. Personal protective equipment must conform to the standards in WAC 16-233-216 (2)(a) through (i).

(5) The agricultural employer must maintain the personal protective equipment in accordance with WAC 16-233-216 (3) and (4).

(6) The agricultural employer must ensure that no worker is allowed or directed to wear personal protective equipment without implementing measures sufficient to prevent heat-related illness and that each worker is instructed in the prevention, recognition, and first-aid treatment of heat-related illness.

(7)(a) The agricultural employer must instruct each worker on the proper use and removal of the personal protective equipment, and as appropriate, on its cleaning, maintenance and disposal. The agricultural employer must not allow

or direct any worker to wear home or to take home employer-provided personal protective equipment contaminated with pesticides.

(b) Each worker is instructed in the prevention, recognition, and first-aid treatment of heat-related illness.

(8) During any early-entry activity, the agricultural employer must provide decontamination supplies in accordance with WAC 16-233-221, except the decontamination supplies must be outside any area being treated with pesticides or subject to a restricted-entry interval, unless the decontamination supplies would otherwise not be reasonably accessible to workers performing early-entry tasks.

(9) If the pesticide product labeling of the product applied requires protective eyewear, the agricultural employer must provide at least one pint of water per worker in portable containers for eyeflushing that is immediately available to each worker who is performing early-entry activities.

(10) At the end of any early-entry activities the agricultural employer must provide, at the site where the workers remove personal protective equipment, soap, single-use towels and an adequate amount of water so that the workers may wash thoroughly. At least ten gallons of water for one employee and twenty gallons of water for two or more employees shall be provided at early entry sites that do not have running water.

AMENDATORY SECTION (Amending WSR 18-01-054, filed 12/13/17, effective 1/13/18)

**WAC 16-233-316 Exceptions to personal protective equipment requirements specified on pesticide product labeling—40 C.F.R., § 170.607.** (1) *Body protection.*

(a) A chemical-resistant suit may be substituted for coveralls. If a chemical-resistant suit is substituted for coveralls, any labeling requirement for an additional layer of clothing beneath the coveralls is waived.

(b) A chemical-resistant suit may be substituted for coveralls and a chemical-resistant apron.

(2) *Boots.* If chemical-resistant footwear with sufficient durability and a tread appropriate for wear in rough terrain is not obtainable, then leather boots may be worn in such terrain.

(3) *Gloves.* If chemical-resistant gloves with sufficient durability and suppleness are not obtainable, then during activities with plants with sharp thorns, leather gloves may be worn over chemical-resistant glove liners. However, once leather gloves are worn for this use, thereafter they must be worn only with chemical-resistant liners and they must not be worn for any other use.

(4) *Closed systems.*

(a) When pesticides are being mixed or loaded using a closed system that meets all of the requirements in (b) of this subsection, and the handler employer meets the requirements in (c) of this subsection, the following exceptions to labeling-specified personal protective equipment are permitted:

(i) Handlers using a closed system to mix or load pesticides with a signal word of "DANGER" or "WARNING" may substitute a long-sleeved shirt, long pants, shoes and socks, chemical-resistant apron, protective eyewear, and any protec-

tive gloves specified on the labeling for handlers for the labeling-specified personal protective equipment.

(ii) Handlers using a closed system to mix or load pesticides other than those specified in (a)(i) of this subsection may substitute protective eyewear, long-sleeved shirt, long pants, and shoes and socks for the labeling-specified personal protective equipment.

(b) The exceptions in (a) of this subsection apply only in the following situations:

(i) Where the closed system removes the pesticide from its original container and transfers the pesticide product through connecting hoses, pipes and couplings that are sufficiently tight to prevent exposure of handlers to the pesticide product, except for the negligible escape associated with normal operation of the system.

(ii) When loading intact, sealed, water soluble packaging into a mixing tank or system. If the integrity of a water soluble packaging is compromised (for example, if the packaging is dissolved, broken, punctured, torn, or in any way allows its contents to escape), it is no longer a closed system and the labeling-specified personal protective equipment must be worn.

(c) The exceptions in (a) of this subsection apply only where the handler employer has satisfied the requirements in WAC 16-233-031 and all of the following conditions:

(i) Each closed system must have written operating instructions that are clearly legible and include: Operating procedures for use, including the safe removal of a probe; maintenance, cleaning and repair; known restrictions or limitations relating to the system, such as incompatible pesticides, sizes (or types) of containers or closures that cannot be handled by the system; any limits on the ability to measure a pesticide; and special procedures or limitations regarding partially filled containers.

(ii) The written operating instructions for the closed system must be available at the mixing or loading site and must be made available to any handlers who use the system.

(iii) Any handler operating the closed system must be trained in its use and operate the closed system in accordance with its written operating instructions.

(iv) The closed system must be cleaned and maintained as specified in the written operating instructions and as needed to make sure the system functions properly.

(v) All personal protective equipment specified in the pesticide product labeling is immediately available to the handler for use in an emergency.

(vi) Protective eyewear must be worn when using closed systems operating under pressure.

#### (5) *Enclosed cabs.*

~~(a) If ((a handler applies a pesticide from inside a vehicle's enclosed cab, and if the conditions listed in (b) of this subsection are met, exceptions to the personal protective equipment requirements specified on the product labeling for applicators are permitted as provided in (c) of this subsection.~~

~~(b) All of the personal protective equipment required by the pesticide product labeling for applicators must be immediately available and stored in a sealed container to prevent contamination. Handlers must wear the applicator personal protective equipment required by the pesticide product labeling if they exit the cab within a treated area during applica-~~

~~tion or when a restricted entry interval is in effect. Once personal protective equipment is worn in a treated area, it must be removed before reentering the cab to prevent contamination of the cab.~~

~~(e) Handlers)) handling tasks are performed from inside a cab that has a nonporous barrier which totally surrounds the occupants of the cab and prevents contact with pesticides outside of the cab, exceptions to personal protective equipment specified on the product labeling for that handling activity are permitted as provided in (a) and (b) of this subsection.~~

~~(b) Persons occupying an enclosed cab shall have all labeling-specified personal protective equipment immediately available and stored in a chemical-resistant container, such as a plastic bag. They shall wear such personal protective equipment if it is necessary to exit the cab within a treated area during application or when a restricted-entry interval is in effect. Once personal protective equipment is worn in the treated area, it must be removed before reentering the cab to prevent contamination of the cab.~~

~~(c) Persons occupying such an enclosed cab may substitute a long-sleeved shirt, long pants, shoes and socks for the labeling-specified personal protective equipment ((for skin and eye protection. If a filtering facepiece respirator (NIOSH approval number prefix TC-84A) or dust/mist filtering respirator is required by the pesticide product labeling for applicators, then that respirator need not be worn inside the enclosed cab if the enclosed cab has a properly functioning air ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions. If any other type of respirator is required by the pesticide labeling for applicators, then that respirator)). If a respiratory protection device is specified on the pesticide product labeling for the handling activity, it must be worn.~~

~~(d) Persons occupying an enclosed cab that has a properly functioning ventilation system which is used and maintained in accordance with the manufacturer's written operating instructions and which is declared in writing by the manufacturer to provide respiratory protection equivalent to or greater than a dust/mist filtering respirator may substitute a long-sleeved shirt, long pants, shoes, and socks for the labeling-specified personal protective equipment. If a respiratory protection device other than a particulate/dust/mist filtering respirator is specified on the pesticide product labeling, it must be worn.~~

#### (6) *Aerial applications.*

(a) *Use of gloves.* The wearing of chemical-resistant gloves when entering or leaving an aircraft used to apply pesticides is optional, unless such gloves are required on the pesticide product labeling. If gloves are brought into the cockpit of an aircraft that has been used to apply pesticides, the gloves shall be kept in an enclosed container to prevent contamination of the inside of the cockpit.

(b) *Open cockpit.* Handlers applying pesticides from an open cockpit aircraft must use the personal protective equipment specified in the pesticide product labeling for use during application, except that chemical-resistant footwear need not be worn. A helmet may be substituted for chemical-resistant headgear. A helmet with a face shield lowered to cover the face may be substituted for protective eyewear.

(c) *Enclosed cockpit.* Persons occupying an enclosed cockpit may substitute a long-sleeved shirt, long pants, shoes, and socks for labeling-specified personal protective equipment.

(7) *Crop advisors.*

(a) Provided the conditions in (b) through (d) of this subsection are met, crop advisors and their employees entering treated areas to perform crop advising tasks while a restricted-entry interval is in effect may substitute either of the following sets of personal protective equipment for the personal protective equipment specified on the pesticide labeling for handler activities:

(i) The personal protective equipment specified on the pesticide product labeling for early entry.

(ii) Coveralls, shoes plus socks and chemical-resistant gloves made of any waterproof material, and eye protection if the pesticide product labeling applied requires protective eye-wear for handlers.

(b) The application has been complete for at least four hours.

(c) No such entry is allowed until any inhalation exposure level listed in the pesticide product labeling has been reached or any ventilation criteria required in WAC 16-233-111 (2)(c) or the pesticide product labeling have been met, and either inhalation exposure levels are below PELs in WAC 296-307-624, Part Y-6 Respiratory hazards, or respiratory protection is provided and worn according to requirements in WAC 296-307-594, Part Y-5 Respirators.

(d) The crop advisor or crop advisor employee who enters a treated area during a restricted-entry interval only performs crop advising tasks while in the treated area.

### WSR 20-21-037

#### PERMANENT RULES

#### HEALTH CARE AUTHORITY

[Filed October 12, 2020, 2:28 p.m., effective November 12, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The agency is amending a rule to include resource standard requirements and adding a new rule to identify rules used to determine allocation or resources.

Citation of Rules Affected by this Order: New WAC 182-512-0950; and amending WAC 182-506-0015.

Statutory Authority for Adoption: RCW 41.05.021, 41.05.160.

Adopted under notice filed as WSR 20-15-078 on July 14, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 1, Amended 0, Repealed 1.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 1, Amended 0, Repealed 1.

Date Adopted: October 12, 2020.

Wendy Barcus  
Rules Coordinator

AMENDATORY SECTION (Amending WSR 14-20-094, filed 9/29/14, effective 10/30/14)

**WAC 182-506-0015 Medical assistance units for non-MAGI-based Washington apple health programs.** This section explains how medical assistance units (MAUs) are constructed for programs not based on modified adjusted gross income (MAGI) methodologies. (MAGI-based programs are described in WAC 182-503-0510.)

(1) An MAU is a person or group of people who must be included together when determining eligibility. MAUs are established based on each person's relationship to other family members and the person's financial responsibility for the other family members. MAUs for non-MAGI-based programs include an applicant and persons financially responsible for the applicant as described in subsection (2) of this section (as limited by subsection (3) of this section).

(2) Financial responsibility applies (~~only to spouses and to parents;~~) as follows:

(a) Married persons(;) living together are financially responsible for each other;

(b) Natural, adoptive, or step-parents are financially responsible for their unmarried, minor children living in the same household;

(c) Minor children are (~~not~~) financially responsible for (~~their parents or for their siblings~~) only themselves;

(d) Married persons(~~financial responsibility~~) not living together are financially responsible for each other to the extent described in WAC 182-512-0960 and chapters 182-513 and 182-515 WAC when (~~not living together because one or both are residing in a medical institution is described in chapter 182-513 WAC~~) one or both are residing in a medical institution, or one or both are applying for or receiving home and community-based services.

(3) The number of persons in the MAU is increased by one for each verified unborn child for each pregnant (~~woman~~) person already included in the MAU under this section.

(4) A separate SSI-related MAU is required for:

(a) SSI recipients, except for spouses who both receive SSI;

(b) SSI-related persons, except spouses whose eligibility is determined as a couple in chapters 182-511, 182-512, and 182-513 WAC;

(c) Institutionalized persons;

(d) The purpose of applying medical income and resource standards for an:

(i) SSI-related applicant whose spouse is not related to SSI or is not applying for SSI-related medical; and

(ii) Ineligible spouse of an SSI recipient.

(~~5) When determining eligibility for an SSI-related medical program, the agency determines how household~~



~~income is allocated and deemed to the SSI-related person according to the rules described in WAC 182-512-0820 and 182-512-0900 through 182-512-0960.))~~

#### NEW SECTION

**WAC 182-512-0950 SSI-related medical—Child-related resource exclusions and allocations.** The agency considers resources of financially responsible people to determine if a portion of the resources must be regarded as available to other household members.

(1) A portion of the resources of a parent or parents is available to the SSI-related child when the child is age seventeen or younger and the parent or parents are:

- (a) Financially responsible for the SSI-related child as described in WAC 182-506-0015;
- (b) The natural, adoptive, or step-parent of the child;
- (c) Living in the same household with the child;
- (d) Not receiving a needs-based payment such as temporary assistance to needy families (TANF), state-funded cash assistance (SFA) or SSI; and
- (e) Not related to SSI or not applying for medical assistance.

(2) Resources that are deemed to the child are that child's resources.

(3) When determining whether a parent's resources are countable, the agency:

- (a) Follows the resource rules described in WAC 182-512-0200 through 182-512-0300; and
- (b) Excludes resources described in WAC 182-512-0350 through 182-512-0550, except for WAC 182-512-0550(16), where instead, the pension funds excluded are those owned by either parent.

(4) In determining eligibility of an SSI-related child, the child's resources include the value of the countable resources of the parent or parents that exceed the resource limit in WAC 182-512-0010 for:

- (a) A person, if one parent lives in the household; or
- (b) A couple, if two parents (or one parent and the spouse of that parent) live in the household.

(5) The SSI-related child is allowed all applicable resource exclusions and disregards described in this chapter from their own resources.

(6) If there is more than one child living in the household, the value of the deemed resources is divided equally among the children.

(7) An SSI-related child's total countable resources are the combination of the value of the deemed resources and the nonexcluded resources of the child.

(8) A child's countable resources are compared with the one-person resource standard under WAC 182-512-0010.

Purpose: Under certain scenarios, transit facilities situated nearby to limited access highway interchanges can create challenges to operational efficiency and maintaining optimal safety performance. Authorizing direct access to ramps for transit buses only can, in some cases, address these issues while also providing for more efficient transit operations. WAC 468-58-080 (1)(a) prohibits any access connections to fully controlled limited access highway ramps. The proposed revision establishes an exception to allow direct ramp access for transit buses at the discretion of the department of transportation.

Citation of Rules Affected by this Order: New WAC 468-58-080 [(1)](e); amending WAC 468-58-080 [(1)](a).

Statutory Authority for Adoption: RCW 47.52.027, 47.01.101.

Adopted under notice filed as WSR 20-18-061 on August 31, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 1, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 13, 2020.

Streator Johnson  
Administrative Risk Manager

AMENDATORY SECTION (Amending WSR 03-11-076, filed 5/20/03, effective 6/20/03)

**WAC 468-58-080 Guides for control of access on crossroads and interchange ramps.** (1) Fully controlled highways, including interstate.

(a) There shall be no connections to abutting property or local service or frontage roads within the full length of any "off" or "on" interchange ramp from a fully controlled limited access highway except as authorized under (e) of this subsection. Such ramp shall be considered to terminate at its intersection with the local road which undercrosses or overcrosses the limited access facility, provided that in urban areas "off" and "on" ramps may be terminated at local streets other than crossroads where necessary to service existing local traffic.

(b) There shall be no direct connections from the limited access facility in rural areas to local service or frontage roads except through interchanges.

(c) In both urban and rural areas access control on a fully controlled highway shall be established along the crossroad at an interchange for a minimum distance of three hundred feet beyond the centerline of the ramp or terminus of transition taper. If a frontage road or local road is located in a gen-

#### WSR 20-21-040

#### PERMANENT RULES

#### DEPARTMENT OF TRANSPORTATION

[Filed October 13, 2020, 8:19 a.m., effective November 13, 2020]

Effective Date of Rule: Thirty-one days after filing.

erally parallel position within three hundred fifty feet of a ramp, access control should be established along the crossroad and in addition for a minimum distance of one hundred thirty feet in all directions from the center of the intersection of the parallel road and crossroad.

(d) Full control of access should be provided along the crossroad from the centerline of a ramp or terminus of a transition taper for a minimum distance of three hundred feet. Upon determination by the department, full control of access may be provided for the first one hundred thirty feet from the centerline of the ramp or terminus of a transition taper and partial control or modified control of access may be provided for the remainder of the distance to the frontage road or local road for a total minimum distance for the two types of control of three hundred feet. Type A, B, C, D, E, and F road approaches, as defined hereafter under subsection (3) of this section, "general," may be permitted on that portion of the crossroad on which partial or modified control of access is established.

(e) Direct ramp access for transit buses may be allowed where solely determined by the department.

(2) Partially controlled highways.

(a) There shall be no connections to abutting property or local service or frontage roads within the full length of any "off" or "on" interchange ramp from a partially controlled limited access highway. Such ramp shall be considered to terminate at its intersection with the local road which undercrosses or overcrosses the limited access facility, provided that in urban areas "off" and "on" ramps may be terminated at local streets other than crossroads where necessary to service existing local traffic.

(b) In both urban and rural areas access control on a partially controlled highway shall be established along the crossroad at an interchange for a minimum distance of three hundred feet beyond the centerline of the ramp or terminus of transition taper. If a frontage road or local road is located in a generally parallel position within three hundred fifty feet of a ramp, access control should be established along the crossroad and in addition for a minimum distance of one hundred thirty feet in all directions from the center of the intersection of the parallel road and crossroad.

(c) Access control limits at the crossroads on a partially controlled highway should be established along the crossroad at a grade intersection for a minimum distance of three hundred feet from the centerline of the nearest directional roadway. If a parallel road is located within three hundred fifty feet of said grade intersection, access control should be established along the crossroad and in addition for a minimum distance of one hundred thirty feet in all directions from the center of the intersection of the parallel road and crossroad. Type D, E, and F approaches may be permitted closer than one hundred thirty feet from the center of the intersection only when they already exist and cannot reasonably be relocated.

(d) Access control limits at intersections on modified control highways should be established along the cross road for a minimum distance of one hundred thirty feet from the centerline of a two-lane highway or for a minimum of one hundred thirty feet from centerline of the nearest directional roadway of a four-lane highway. Type D, E, and F

approaches should be allowed within this area only when no other reasonable alternative is available.

(3) General.

(a) Access control may be increased or decreased beyond or under the minimum requirements to fit local conditions if so determined by the department.

(b) Type A, B, C, D, E, and F approaches are defined as follows:

(i) Type A approach. Type A approach is an off and on approach in legal manner, not to exceed thirty feet in width, for sole purpose of serving a single family residence. It may be reserved by abutting owner for specified use at a point satisfactory to the state at or between designated highway stations.

(ii) Type B approach. Type B approach is an off and on approach in legal manner, not to exceed fifty feet in width, for use necessary to the normal operation of a farm, but not for retail marketing. It may be reserved by abutting owner for specified use at a point satisfactory to the state at or between designated highway stations.

(iii) Type C approach. Type C approach is an off and on approach in legal manner, for special purpose and width to be agreed upon. It may be specified at a point satisfactory to the state at or between designated highway stations.

(iv) Type D approach is an off and on approach in a legal manner not to exceed fifty feet in width for use necessary to the normal operation of a commercial establishment. It may be specified at a point satisfactory to the state at or between designated highway stations.

(v) Type E approach is a separated off and on approach in a legal manner, with each opening not exceeding thirty feet in width, for use necessary to the normal operations of a commercial establishment. It may be specified at a point satisfactory to the state at or between designated highway stations.

(vi) Type F approach is an off and on approach in a legal manner, not to exceed thirty feet in width, for the sole purpose of serving a wireless communication site. It may be specified at a point satisfactory to the state at or between designated highway stations.

The state shall only authorize such approach by the issuance of a nonassignable permit. The permit allows site access for the normal construction, operation and maintenance of the wireless communication site for the permit holder and its contractors but not its subtenants. If a sale or merger occurs that affects an existing wireless communication site, the new wireless communication provider will be authorized to utilize said approach upon the state's receipt of written notice of the sale or merger action. The wireless communication site access permit may be canceled upon written notice for reasons specified in the wireless communication site access permit general provisions. The permit will only be issued if it meets all state criteria, including, but not limited to, design and safety standards.

Only one wireless communication site access user per permit shall be allowed, but more than one permit may be issued for a single Type F approach.

Each permitted access user shall be required to pay to the state five hundred dollars annually in compensation for use of the state-owned access rights, at the time of the issuance of the permit and each year thereafter.

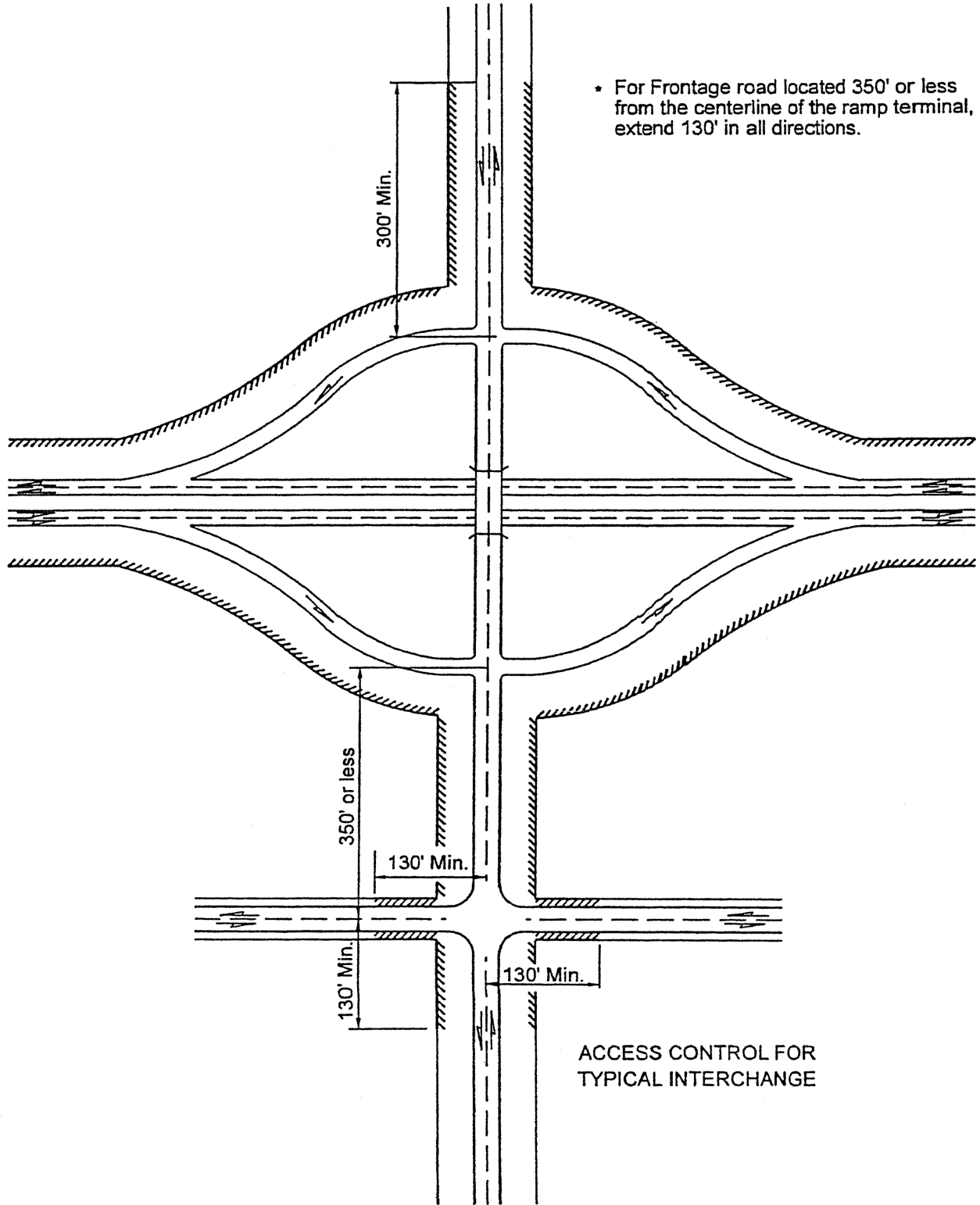
Since the state is the owner of the access, Type F approach permits shall not be issued pursuant to chapter 47.50 RCW and shall not confer a property right upon the permittee(s). An applicant for a Type F approach permit shall pay a nonrefundable access application fee when application is made in the amount of five hundred dollars for investigating, handling and granting the permit.

An application for wireless communication site access permit shall receive a response from the department of transportation within thirty working days from date of receipt of said application.

(c) Under no circumstances will a change in location or width of an approach be permitted unless approved by the secretary. Noncompliance or violation of these conditions will result in the immediate closure of the approach.

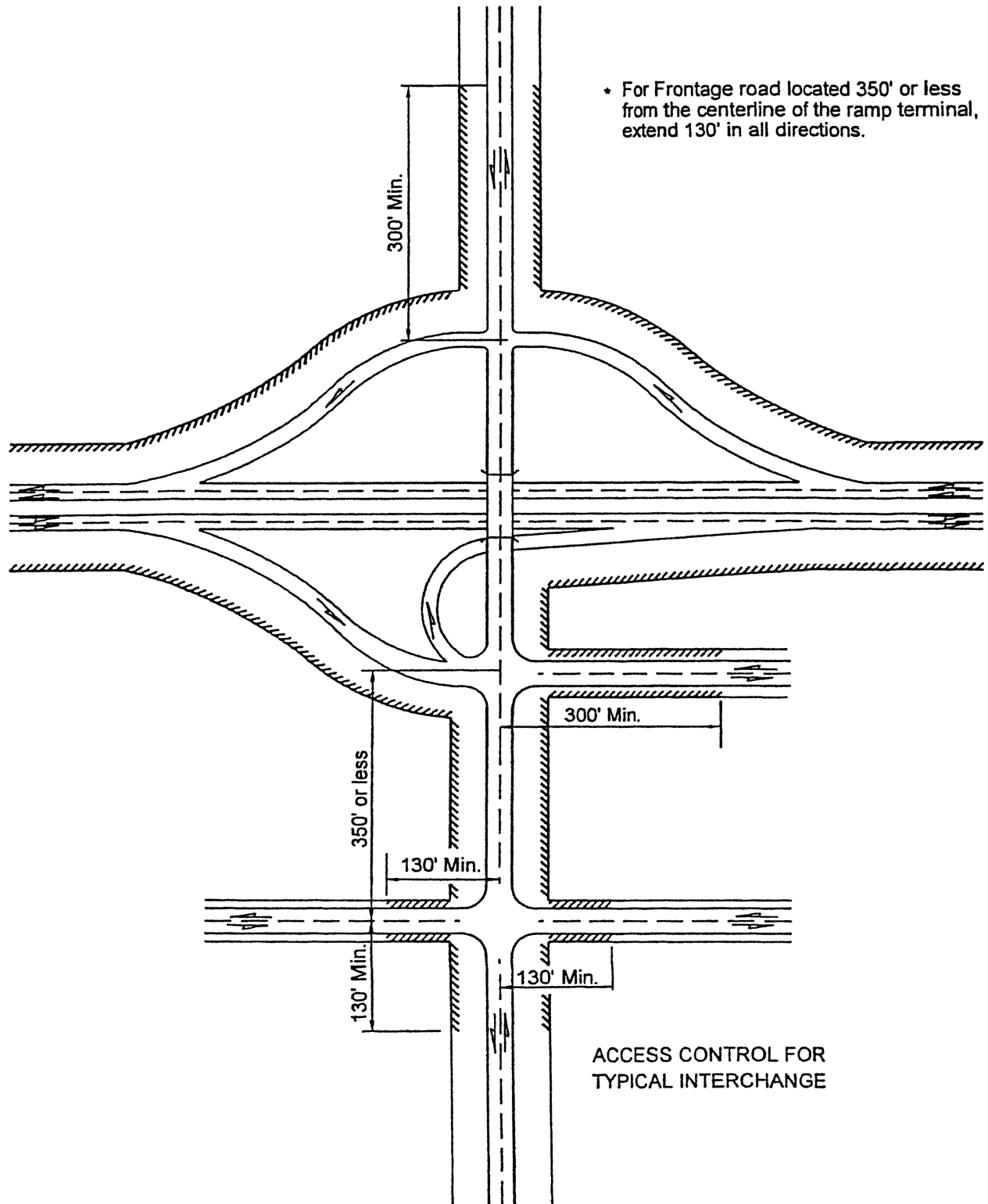
(d) Commercial approaches shall not be permitted within the limits of access control except where modified access control has been approved by the department.

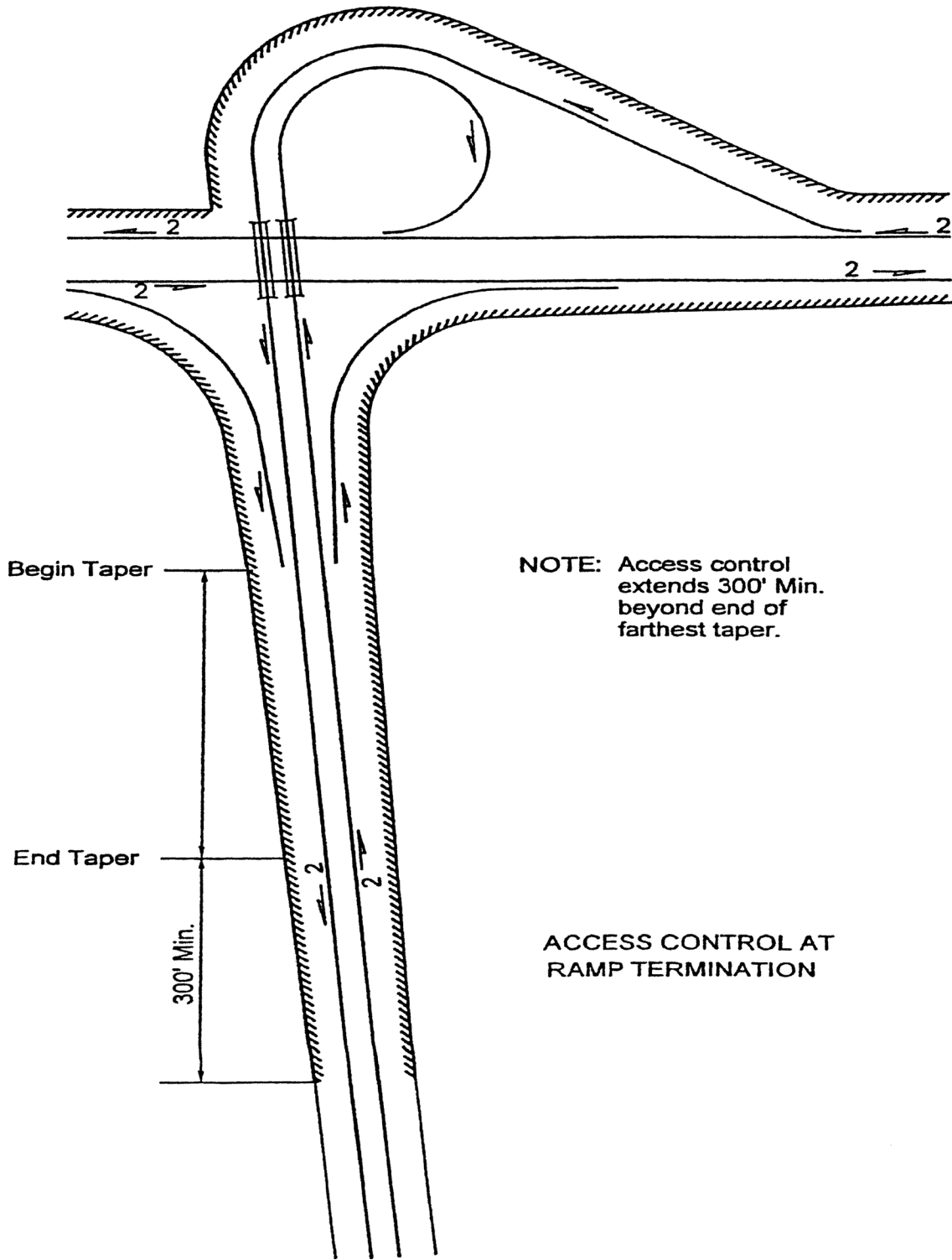
(e) All access control shall be measured from the centerline of the ramps, crossroads or parallel roads or from the terminus of transition tapers. On multiple lane facilities measurement shall be from the centerline of the nearest directional roadway.

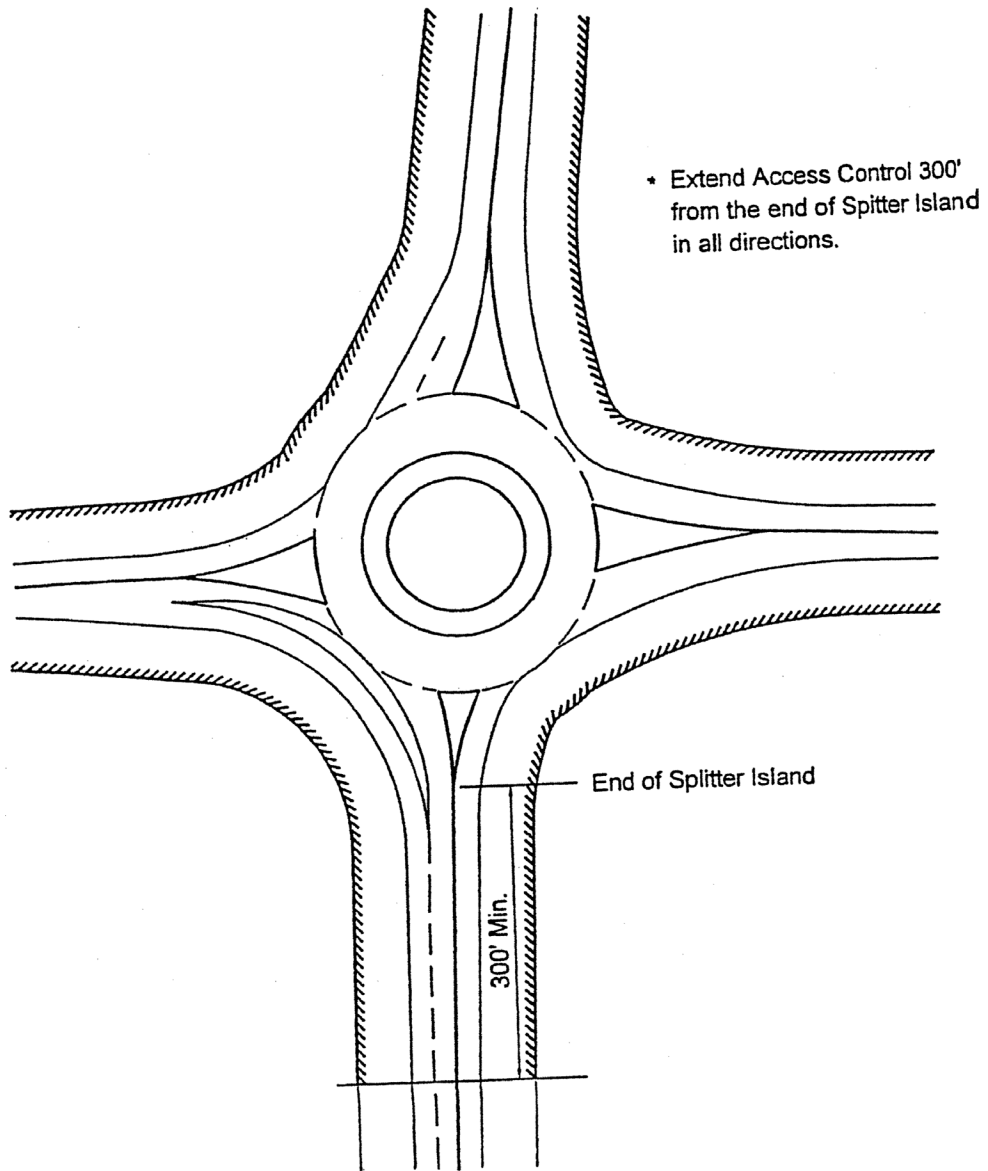


• For Frontage road located 350' or less from the centerline of the ramp terminal, extend 130' in all directions.

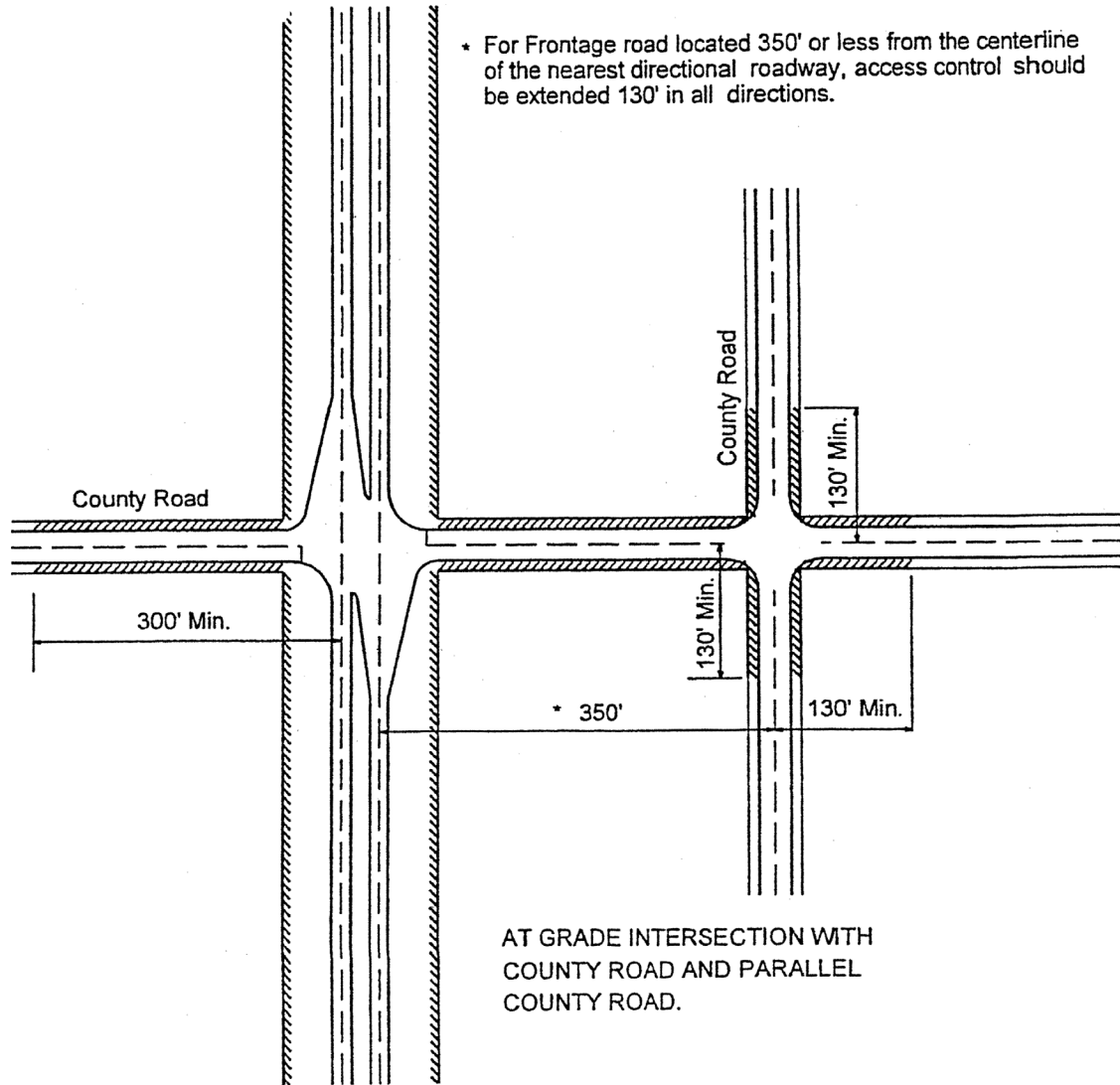
ACCESS CONTROL FOR TYPICAL INTERCHANGE







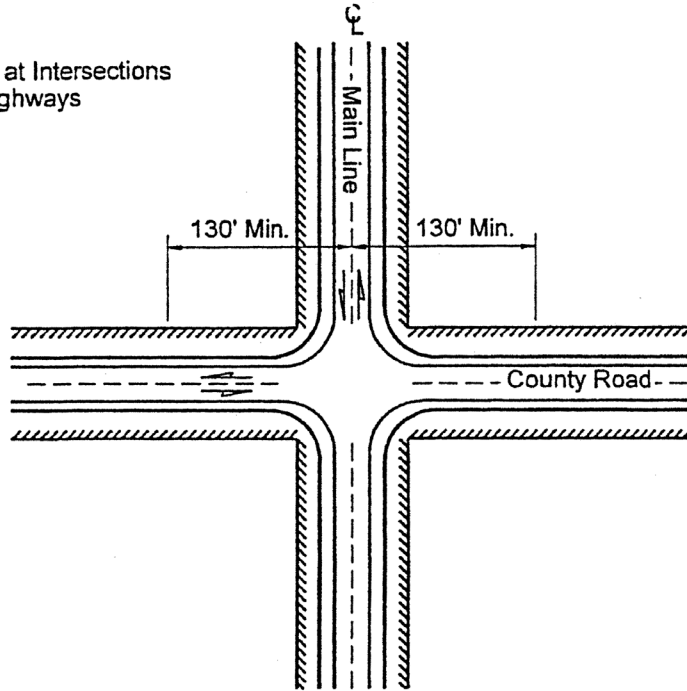
ACCESS CONTROL FOR TYPICAL ROUNDABOUT



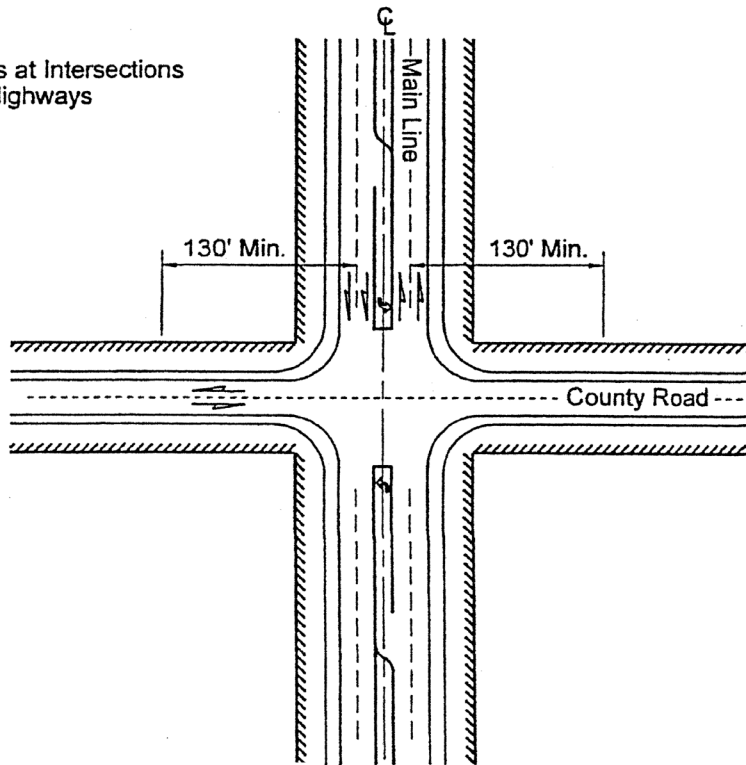
AT GRADE INTERSECTION WITH  
COUNTY ROAD AND PARALLEL  
COUNTY ROAD.



Access Control Limits at Intersections  
Modified Control Highways  
Two-Lane



Access Control Limits at Intersections  
Modified Control Highways  
Multi-Lane



ACCESS CONTROL LIMITS AT INTERSECTIONS

**WSR 20-21-041**  
**PERMANENT RULES**  
**BUILDING CODE COUNCIL**

[Filed October 13, 2020, 8:34 a.m., effective November 13, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The purpose of the permanent rule making is to adopt changes noted in CR-105 Expedited rule making (WSR 20-16-068).

Citation of Rules Affected by this Order: Amending 11.

Statutory Authority for Adoption: RCW 19.27.031.

Other Authority: RCW 19.27.074.

Adopted under notice filed as WSR 20-16-068 on July 29, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 11, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 5, 2020.

Diane Glenn, Chair  
 State Building Code Council

AMENDATORY SECTION (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

**WAC 51-51-0102 Section R102—Applicability.**

**R102.5 Appendices.** Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. An appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW 19.27.060 (1)(a).

EXCEPTIONS: 1. The state building code council has determined that a local ordinance providing specifications for light straw-clay or strawbale construction, or requiring a solar-ready zone or requiring fire sprinklers in accordance with Appendix R, S, U or V of this chapter may be adopted by any local government upon notification of the council.  
 2. Appendix F, Radon Control Methods, and Appendix Q, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

**R102.7.1 Additions, alterations or repairs.** Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. Additions, alterations or repairs and relocations shall not cause an existing structure to become unsafe or adversely affect the performance of the building.

EXCEPTIONS: 1. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for Whole House Ventilation Systems, Section ((M1508)) M1505.4.  
 2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs or basements shall not be required to meet the requirements for radon protection in Section ((R327-F)) R332.1 and Appendix F.

**R102.7.2 Moved buildings.** Buildings or structures moved into or within a jurisdiction shall comply with the provisions of this code, the *International Building Code* (chapter 51-50 WAC), the *International Mechanical Code* (chapter 51-52 WAC), the *International Fire Code* (chapter 51-54A WAC), the *Uniform Plumbing Code and Standards* (chapter 51-56 WAC), and the *Washington State Energy Code* (chapter 51-11R WAC) for new buildings or structures.

EXCEPTION: Group R-3 buildings or structures are not required to comply if:  
 1. The original occupancy classification is not changed; and  
 2. The original building is not substantially remodeled or rehabilitated. For the purposes of this section a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0202 Section R202—Definitions.**

**ADULT FAMILY HOME** means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

((~~BALANCED VENTILATION.~~ This definition is not adopted.))

**BALANCED WHOLE HOUSE VENTILATION.** Balanced whole house ventilation is defined as any combination of concurrently operating residential unit mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total mechanical supply airflow rate. Intermittent dryer exhaust, intermittent range hood exhaust, and intermittent toilet room exhaust airflow rates above the residential dwelling or sleeping unit minimum ventilation rate are exempt from the balanced airflow calculation.

**BATTERY SYSTEM, STATIONARY STORAGE.** This definition is not adopted.

**BUILDING, EXISTING.** A building or structure erected prior to the adoption of this code, or one that has passed a final inspection.

**BUILDING.** Any one- or two-family dwelling or *townhouse*, or portion thereof used or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, or any accessory structure.

**CHILD CARE, FAMILY HOME.** A child care facility, licensed by Washington state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

**CHILD DAY CARE,** shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

**CONDITIONED SPACE.** An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

~~((**DISTRIBUTED VENTILATION SYSTEM.** This definition is not adopted.))~~

**DISTRIBUTED WHOLE HOUSE VENTILATION.** A whole house ventilation system shall be considered distributed when it supplies outdoor air directly (not transfer air) to each dwelling or sleeping unit habitable space (living room, den, office, interior adjoining spaces or bedroom), and exhausts air from all kitchens and bathrooms directly outside.

**DWELLING UNIT.** A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Dwelling units may also include the following uses:

1. Adult family homes, foster family care homes and family day care homes licensed by the Washington state department of social and health services.
2. Offices, mercantile, food preparation for off-site consumption, personal care salons or similar uses which are conducted primarily by the occupants of the dwelling unit and are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet (46.4 m<sup>2</sup>).

**EGRESS ROOF ACCESS WINDOW.** A skylight or roof window designed and installed to satisfy the *Emergency Escape and Rescue Opening* requirements of Section R310.2.

**ENERGY STORAGE SYSTEMS (ESS).** One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

**FIRE SEPARATION DISTANCE.** The distance measured from the foundation wall or face of the wall framing, whichever is closer, to one of the following:

1. To the closest interior lot line; or
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the lot.

The distance shall be measured at a right angle from the wall.

**FLOOR AREA.** The area within the inside perimeter of exterior walls of the building. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.

**LANDING PLATFORM.** A landing provided as the top step of a stairway accessing a *Sleeping Loft*.

**LOCAL EXHAUST.** An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a residential dwelling or sleeping unit.

**LOT.** A measured portion or parcel of land considered as a unit having fixed boundaries.

**LOT LINE.** The line which bounds a plot of ground described as a *lot* in the title to the property.

~~((**MEZZANINE.** An intermediate level or levels between the floor and ceiling of any story.))~~

**MIXED VENTILATION ZONE.** This definition is not adopted.

**SALT WATER COASTAL AREA.** Those areas designated as salt water coastal areas by the local jurisdiction.

**SLEEPING LOFT.** A sleeping space on a floor level located more than 30 inches (726 mm) above the main floor and open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches (2032 mm).

**SMALL BUSINESS.** Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees.

**TOWNHOUSE.** A building that contains three or more attached *townhouse units*.

**TOWNHOUSE UNIT.** A single-family *dwelling unit* in a *townhouse* that extends from foundation to roof and that has a yard or public way on not less than two sides that extends at least 50 percent of the length of each of these two sides.

**WHOLE HOUSE VENTILATION SYSTEM.** A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct means, air from the habitable rooms with outdoor air.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-03100 Section ~~((3100))~~ 310—Emergency escape and rescue openings.**

~~((R310.1))~~ **R310.1 Emergency escape and rescue opening required.** Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court providing an unobstructed path with a width of not less than 36 inches (914 mm) that opens to a public way.

**EXCEPTIONS:**

1. Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m).

2. Where the *dwelling unit* or *townhouse unit* is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:

- 2.1. One means of egress complying with Section R311 and one emergency escape and rescue opening.
- 2.2. Two means of egress complying with Section R311.

**~~(R3100.1.1)~~ R310.1.1 Operational constraints and opening control devices.** Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools, or special knowledge. Window opening control devices on windows serving as a required emergency escape and rescue opening shall be not more than 70 inches (177.8 cm) above the finished floor and shall comply with ASTM F2090.

**~~(R3100.2.4)~~ R310.2.4 Emergency escape and rescue openings under decks and porches.** Emergency escape and rescue openings installed under decks and porches shall be fully openable and provided with an unobstructed pathway of not less than 36 inches (914 mm) in height, 36 inches (914 mm) in width, and no greater than 60 inches (1524 mm) in length that opens to a yard or court. The pathway shall be measured from the exterior face of the glazed opening, or if the glazed opening is in a window well, at the window well wall furthest from the exterior face of the glazed opening.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0314 Section R314—Smoke alarms and heat detection.**

**R314.1 General.** Smoke alarms, heat detectors, and heat alarms shall comply with NFPA 72 and this section.

**R314.1.1 Listings.** Smoke alarms shall be listed in accordance with UL 217. Heat detectors and heat alarms shall be listed for the intended application. Combination smoke and carbon monoxide alarms shall be listed in accordance with UL 217 and UL 2034.

**R314.2 Where required.** Smoke alarms, heat detectors, and heat alarms shall be provided in accordance with this section.

**R314.2.1 New construction.** Smoke alarms shall be provided in *dwelling units*. A heat detector or heat alarm shall be provided in new attached garages.

**R314.2.2 Alterations, repairs and additions.** Where *alterations*, *repairs* or *additions* requiring a permit occur, or where one or more sleeping rooms are added or created in existing dwellings, or where an accessory dwelling unit is created within an existing *dwelling unit*, each *dwelling unit* shall be equipped with smoke alarms as required for new dwellings.

EXCEPTIONS: 1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, the *addition* or replacement of windows or doors, or the addition of a porch or deck are exempt from the requirements of this section.

2. Installation, *alteration* or repairs of plumbing, electrical or mechanical systems are exempt from the requirements of this section.

**R314.2.3 New attached garages.** A heat detector or heat alarm rated for the ambient outdoor temperatures and humidity shall be installed in new garages that are attached to or located under new and existing dwellings. Heat detectors and heat alarms shall be installed in a central location and in accordance with the manufacturer's instructions.

EXCEPTION: Heat detectors and heat alarms shall not be required in dwellings without commercial power.

**R314.3 Location.** Smoke alarms shall be installed in the following locations:

1. In each sleeping room or sleeping loft.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.
4. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section R314.3.
5. In napping areas in a family home child care.

~~(R314.3.1 Installation near cooking appliances. Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section R314.3.~~

- ~~1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking appliance.~~
- ~~2. Ionization smoke alarms with an alarm silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking appliance.~~
- ~~3. Photoelectric smoke alarms shall not be installed less than 6 feet (1828 mm) horizontally from a permanently installed cooking appliance.)~~

**R314.4 Interconnection.** Where more than one smoke alarm is required to be installed within an individual *dwelling unit* in accordance with Section R314.2, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual *dwelling unit*. Where an accessory *dwelling unit* is created within an existing *dwelling unit* all required smoke alarms, in the accessory *dwelling unit* and the primary *dwelling unit*, shall be interconnected in such a manner that the actuation of one alarm will activate all alarms in both the primary *dwelling unit* and the accessory *dwelling unit*. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

EXCEPTION: Smoke alarms and alarms installed to satisfy Section R314.4.1 shall not be required to be interconnected to existing smoke alarms where such existing smoke alarms are not interconnected or where such new smoke alarm or alarm is not capable of being interconnected to the existing smoke alarms.

**R314.4.1 Heat detection interconnection.** Heat detectors and heat alarms shall be connected to an alarm or a smoke alarm that is installed in the *dwelling*. Alarms and smoke alarms that are installed for this purpose shall be located in a hallway, room, or other location that will provide occupant notification.

**R314.6 Power source.** Smoke alarms, heat alarms, and heat detectors shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

EXCEPTIONS: 1. Smoke alarms shall be permitted to be battery operated where installed in buildings without commercial power.  
2. Smoke alarms installed in accordance with Section R314.2.2 shall be permitted to be battery powered.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0315 Section R315—Carbon monoxide alarms.**

~~((R315.1 General. Carbon monoxide alarms shall comply with Section R315.~~

~~**R315.1.1 Listings.** Carbon monoxide alarms shall be listed in accordance with UL 2034. Combination carbon monoxide and smoke alarms shall be listed in accordance with UL 2034 and UL 217.))~~

**R315.2 Where required.** Carbon monoxide alarms shall be provided in accordance with Sections R315.2.1 and R315.2.2.

**R315.2.1 New construction.** For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units and on each level of the dwelling in accordance with the manufacturer's recommendation.

**R315.2.2 Alterations, repairs, and additions.** Existing dwellings shall be equipped with carbon monoxide alarms in accordance with Section R315.2.1. An inspection will occur where alterations, repairs, or additions requiring a permit occur, or where one or more sleeping rooms are added or created.

EXCEPTIONS: 1. Work involving only the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, is exempt from the inspection requirements of this section.

2. Installation, alteration or repairs of nonfuel burning plumbing or mechanical systems or electrical systems are exempt from the inspection requirements of this section.

3. Owner-occupied single-family residences legally occupied before July 26, 2009. RCW 19.27.530 (2)(b).

**R315.3 Location.** Carbon monoxide alarms in dwelling units shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each level of the dwelling and in accordance with the manufacturer's recommendations. Where a fuel burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.

~~((R315.4 Combination alarms. Combination carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms.))~~

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-03240 Section R324—Solar energy systems.**

**R324.3 Photovoltaic systems.** Installation, modification, or alteration of solar photovoltaic power systems shall comply with this section and the *International Fire Code*. Section R104.11 alternate materials and methods of this code shall be considered when approving the installation of solar photovoltaic power systems. Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6 and chapter 19.28 RCW. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

EXCEPTION: Detached, nonhabitable Group U structures shall not be subject to the requirements of this section for structural and fire safety.

**R324.4 Rooftop-mounted photovoltaic systems.** Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

EXCEPTION((S)): The roof structure shall be deemed adequate to support the load of the rooftop solar photovoltaic system if all of the following requirements are met:

1. The solar photovoltaic panel system shall be designed for the wind speed of the local area, and shall be installed per the manufacturer's specifications.
2. The ground snow load does not exceed 70 pounds per square foot.
3. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than 4 pounds per square foot.
4. Photovoltaic modules are not mounted higher than 18 inches above the surface of the roofing to which they are affixed.
5. Supports for solar modules are to be installed to spread the dead load across as many roof-framing members as needed, so that no point load exceeds 50 pounds.

~~((R324.5.1 Photovoltaic shingles. Photovoltaic shingles shall comply with Section R905.16.~~

~~R324.6)~~ **R324.7.1** This section is not adopted.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0325 Section R325—((Reserved)) Mezzanines.**

**R325.1 General.** Mezzanines shall comply with Sections R325 through R325.5. *Habitable attics* shall comply with Section R326.

AMENDATORY SECTION (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

**WAC 51-51-0404 ((Reserved)) Section R404—Foundation and retaining walls.**

**R404.1.3.3.6 Form materials and form ties.** Forms shall be made of wood, steel, aluminum, plastic, a composite of cement and foam insulation, a composite of cement and wood

chips, or other approved material suitable for supporting and containing concrete. Forms shall be positioned and secured before placing concrete and shall provide sufficient strength to contain concrete during the concrete placement operation.

Form ties shall be steel, solid plastic, foam plastic, a composite of cement and wood chips, a composite of cement and foam plastic, or other suitable material capable of resisting the forces created by fluid pressure of fresh concrete.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0507 Section R507—Decks.**

**R507.1 Decks.** Wood-framed decks shall be in accordance with this section. Decks shall be designed for the live load required in Section R301.5 or the ground snow load indicated in Table R301.2(1), whichever is greater. For decks using materials and conditions not prescribed in this section, refer to Section R301.

TABLE R507.3.1

MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD <sup>b</sup> (psf)	TRIBUTARY AREA <sup>c</sup> (sq.ft.)	SOIL BEARING CAPACITY <sup>acd</sup>								
		1500 psf			2000 psf			≥ 3000 psf		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)
60 Live or 70 Ground Snow Load	5	7	8	6	7	8	6	7	8	6
	20	12	14	6	11	13	6	9	10	6
	40	18	20	6	15	17	6	12	14	6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted, extrapolation not permitted.
- b. Reserved.
- c. Footing dimensions shall allow complete bearing of the post.
- d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.
- e. Area, in square feet, of deck surface supported by post and footings.
- f. Minimum thickness shall only apply to plain concrete footings.

**R507.4 Deck posts.** For single-level decks, wood post size shall be in accordance with Table R507.4.

**TABLE R507.4  
DECK POST HEIGHT**

LOADS <sup>b</sup> (psf)	POST SPECIES <sup>c</sup>	POST SIZE <sup>d</sup>	MAXIMUM DECK POST HEIGHT <sup>a</sup> (feet-inches)							
			Tributary Area <sup>g,h</sup> (sq. ft.)							
			20	40	60	80	100	120	140	160
60 Live Load, ≤60 Ground Snow Load	Douglas Fir <sup>e</sup> , Hem-fir <sup>e</sup> , SPF <sup>e</sup>	4 x 4	14-0	10-10	8-7	7-0	5-8	4-1	NP	NP
		4 x 6	14-0	13-10	11-1	9-5	8-2	7-3	6-4	5-4
		6 x 6	14-0	14-0	14-0	14-0	14-0	13-3	10-9	6-11
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	4 x 4	14-0	10-3	7-0	NP	NP	NP	NP	NP
		4 x 6	14-0	13-6	10-6	8-4	5-10	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	11-11	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
70 Ground Snow Load	Douglas Fir <sup>e</sup> , Hem-fir <sup>e</sup> , SPF <sup>e</sup>	4 x 4	14-0	10-1	7-11	6-6	5-3	3-7	NP	NP
		4 x 6	14-0	12-10	10-3	8-9	7-7	6-8	5-10	4-11
		6 x 6	14-0	14-0	14-0	14-0	14-0	12-2	9-9	5-9
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	4 x 4	14-0	9-5	6-5	NP	NP	NP	NP	NP
		4 x 6	14-0	12-6	9-8	7-7	5-3	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	10-8	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 pound per square foot = 0.0479 kPa, NP = Not permitted.

- a. Measured from the underside of the beam to top of footing or pier.
- b. 10 psf dead load. Snow load not assumed to be concurrent with live load.
- c. No. 2 grade, wet service factor included.
- d. Notched deck posts shall be sized to accommodate beam size per in accordance with Section R507.5.2.
- e. Includes incising factor.
- f. Incising factor not included.
- g. Area, in square feet, of deck surface supported by post and footing.
- h. Interpolation permitted. Extrapolation not permitted.

**R507.5 Deck beams.** Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Tables R507.5(1) through R507(4). Beam plies shall be fastened with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the allowable beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

**TABLE R507.5  
MAXIMUM DECK BEAM SPAN - 60 PSF LIVE LOAD or  
70 PSF GROUND SNOW LOAD<sup>c</sup>**

BEAM SPECIES <sup>d</sup>	BEAM SIZE <sup>e</sup>	MAXIMUM BEAM SPAN <sup>a,b,f</sup> (feet-inches)						
		Deck Joist Span <sup>a,i</sup> (feet)						
		6	8	10	12	14	16	18
Douglas fir-larch <sup>g</sup> , Hem-fir <sup>g</sup> , Spruce-pine-fir <sup>g</sup>	1-2×6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2×8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2×10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2×12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2×6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2×8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2×10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2×12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2×6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2×8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2×10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
3-2×12	12-4	10-8	9-7	8-9	8-1	7-7	7-1	
Redwood <sup>h</sup> , Western Cedars <sup>h</sup> , Ponderosa Pine <sup>h</sup> , Red Pine <sup>h</sup>	1-2×6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2×8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2×10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2×12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2×6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2×8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2×10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2×12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2×6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2×8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2×10	10-2	8-10	7-11	7-2	6-8	6-3	5-11
3-2×12	11-10	10-3	9-2	8-4	7-9	7-3	6-10	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation allowed. Extrapolation is not allowed.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at mainspan, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.



**TABLE R507.5(1)**  
**MAXIMUM DECK BEAM SPAN - 40 PSF LIVE LOAD (NOT ADOPTED)**  
**TABLE R507.5(2)**  
**MAXIMUM DECK BEAM SPAN - 50 PSF LIVE LOAD (NOT ADOPTED)**  
**TABLE R507.5(3)**  
**MAXIMUM DECK BEAM SPAN - 60 PSF LIVE LOAD<sup>c</sup>**

BEAM SPECIES <sup>d</sup>	BEAM SIZE <sup>e</sup>	DECK JOIST SPAN <sup>a,i</sup> (feet)						
		6	8	10	12	14	16	18
		MAXIMUM BEAM SPAN <sup>a,b,f</sup> (feet-inches)						
Douglas fir-larch <sup>g</sup> , Spruce-pine-fir <sup>g</sup>	1-2×6	3-8	3-1	2-8	2-4	2-2	2-0	1-10
	1-2×8	5-0	4-1	3-6	3-1	2-10	2-7	2-5
	1-2×10	6-1	5-2	4-6	4-0	3-7	3-4	3-2
	1-2×12	7-1	6-1	5-5	4-10	4-5	4-1	3-10
	2-2×6	5-6	4-9	4-3	3-10	3-5	3-1	2-10
	2-2×8	7-5	6-5	5-9	5-0	4-6	4-1	3-9
	2-2×10	9-0	7-10	7-0	6-4	5-9	5-2	4-10
	2-2×12	10-6	9-1	8-1	7-5	6-10	6-4	5-10
	3-2×6	6-11	6-0	5-4	4-11	4-6	4-2	3-10
	3-2×8	9-3	8-0	7-2	6-6	6-1	5-6	5-0
	3-2×10	11-4	9-10	8-9	8-0	7-5	6-11	6-5
3-2×12	13-2	11-5	10-2	9-4	8-7	8-1	7-7	
Redwood <sup>h</sup> , Western Cedars <sup>h</sup> , Ponderosa Pine <sup>h</sup> , Red Pine <sup>h</sup>	1-2×6	6-9	3-2	2-9	2-5	2-2	2-0	1-11
	1-2×8	4-10	4-2	3-7	3-2	2-11	2-8	2-6
	1-2×10	5-10	5-1	4-6	4-1	3-8	3-5	3-3
	1-2×12	6-10	5-11	5-3	4-10	4-5	4-2	3-11
	2-2×6	5-7	4-10	4-4	3-11	3-6	3-2	2-11
	2-2×8	7-1	6-2	5-6	5-0	4-7	4-2	3-10
	2-2×10	8-8	7-6	6-9	6-2	5-8	5-4	4-11
	2-2×12	10-1	8-9	7-10	7-2	6-7	6-2	5-10
	3-2×6	6-8	6-1	5-5	5-0	4-7	4-3	3-11
	3-2×8	8-9	7-9	6-11	6-4	5-10	5-5	5-2
	3-2×10	10-11	9-5	8-5	7-8	7-2	6-8	6-3
3-2×12	12-8	10-11	9-9	8-11	8-3	7-9	7-3	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.

**TABLE R507.5(4)**  
**MAXIMUM DECK BEAM SPAN - 70 PSF LIVE LOAD<sup>c</sup>**

BEAM SPECIES <sup>d</sup>	BEAM SIZE <sup>e</sup>	DECK JOIST SPAN <sup>a,i</sup> (feet)						
		6	8	10	12	14	16	18
		MAXIMUM BEAM SPAN <sup>a,b,f</sup> (feet-inches)						
Douglas fir-larch <sup>g</sup> , Spruce-pine-fir <sup>g</sup>	1-2×6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2×8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2×10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2×12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2×6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2×8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2×10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2×12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2×6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2×8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2×10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
Redwood <sup>h</sup> , Western Cedars <sup>h</sup> , Ponderosa Pine <sup>h</sup> , Red Pine <sup>h</sup>	1-2×6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2×8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2×10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2×12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2×6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2×8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2×10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2×12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2×6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2×8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2×10	10-2	8-2	7-11	7-2	6-8	6-3	5-11
3-2×12	11-10	10-3	9-2	8-4	7-9	7-3	7	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.

**R507.6 Deck joists.** Maximum allowable spans for wood deck joists, as shown in Figure R507.6, shall be in accordance with Table R507.6. The maximum joist spacing shall be limited by the decking materials in accordance with Table R507.7.

TABLE R507.6  
MAXIMUM DECK JOIST SPANS

((LOAD* (psf)	JOIST SPECIES <sup>b</sup>	JOIST SIZE	ALLOWABLE JOIST SPAN <sup>c</sup> (feet-inches)			MAXIMUM CANTILEVER <sup>d</sup> (feet-inches) ADJACENT JOIST SPAN <sup>e</sup>							
			JOIST SPACING (inches)			JOIST BACK SPAN <sup>e</sup> (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Ground-Snow-Load	Douglas Fir <sup>e</sup> , Hem-fir <sup>e</sup> , SPF <sup>e</sup>	2×6	8-4	7-6	6-2	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2×8	10-11	9-11	8-3	1-0	1-6	2-0	2-2	NP	NP	NP	NP
		2×10	13-11	12-4	10-0	1-0	1-6	2-0	2-6	2-10	NP	NP	NP
		2×12	16-6	14-3	11-8	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	2×6	7-9	7-0	6-2	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	10-2	9-3	7-11	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2×10	13-0	11-9	9-7	1-0	1-6	2-0	2-6	2-7	NP	NP	NP
		2×12	15-9	13-8	11-2	1-0	1-6	2-0	2-6	3-0	3-2	NP	NP
70 Ground-Snow-Load	Douglas Fir <sup>e</sup> , Hem-fir <sup>e</sup> , SPF <sup>e</sup>	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-9	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg, NP = Not permitted.

- a. Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.
- b. No. 2 grade, wet service factor included.
- c. L/Δ = 360 at main span.
- d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
- e. Includes incising factor.
- f. Incising factor not included.
- g. Interpolation permitted. Extrapolation not permitted.))

LOAD <sup>a</sup> (psf)	JOIST SPECIES <sup>b</sup>	JOIST SIZE	ALLOWABLE JOIST SPAN <sup>b,c</sup> (feet-inches)			MAXIMUM CANTILEVER <sup>f,g</sup> (feet-inches)							
			Joist Spacing (inches)			Adjacent Joist Back Span <sup>e</sup> (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Live Load or 70 Ground Snow Load	Douglas fir-larch <sup>e</sup> , Hem-fir <sup>e</sup> , Spruce-pine-fir <sup>e</sup>	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood <sup>f</sup> , West-ern Cedars <sup>f</sup> , Pon-derosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg, NP = Not permitted.

- a. Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.
- b. No. 2 grade, wet service factor included.
- c. L/Δ = 360 at main span.
- d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
- e. Includes incising factor.
- f. Incising factor not included.

g. Interpolation permitted. Extrapolation not permitted.

**R507.9.1.2 Band joist details.** Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or minimum 1-inch (25 mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.

**TABLE R507.9.1.3(1)  
DECK LEDGER CONNECTION TO BAND JOIST**

LOAD <sup>c</sup> (psf)	JOIST SPAN <sup>a</sup> (feet)	ON-CENTER SPACING OF FASTENERS <sup>b</sup> (inches)		
		1/2-inch diameter lag screw with 1/2-inch maximum sheathing <sup>d,e</sup>	1/2-inch diameter bolt with 1/2-inch maximum sheathing <sup>e</sup>	1/2-inch diameter bolt with 1-inch maximum sheathing <sup>f</sup>
60 Live Load or 70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted. Extrapolation is not permitted.
- b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- c. Dead load = 10 psf. Snow load shall not be assumed to act concurrently with live load.
- d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- e. Sheathing shall be wood structural panel or solid sawn lumber.
- f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

**R507.9.2 Deck lateral load connections.** Lateral loads shall be transferred to the ground or to a structure capable of transmitting them to the ground. Where the lateral load connection is provided in accordance with Figure R507.9.2(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.9.2(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

**EXCEPTION:** Decks not more than 30 inches above grade at any point may be unattached.

**TABLE R507.9.1**

**PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger <sup>a</sup>	2 inches <sup>d</sup>	3/4 inch	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Band joist <sup>c</sup>	3/4 inch	2 inches <sup>e</sup>	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

For SI: 1 inch = 25.4 mm.

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1(1).
- b. Maximum 5 inches.
- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from bottom row of lag screws to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).
- e. The 2 inches may be reduced to 3/4 inch when the band joist is directly supported by a mudsill, a header or by double top wall plates.

**TABLE R507.9.3(1)  
DECK LEDGER CONNECTION TO BAND JOIST**

LOAD <sup>c</sup> (psf)	JOIST SPAN <sup>a</sup> (feet)	1/2-inch diameter leg screw with 1/2-inch maximum sheathing <sup>d,e</sup>	1/2-inch diameter bolt with 1/2-inch maximum sheathing <sup>e</sup>	1/2-inch diameter bolt with 1-inch maximum sheathing <sup>f</sup>
		ON-CENTER SPACING OF FASTENERS <sup>b</sup> (inches)		
60 Ground Snow Load	6	25	36	36
	8	18	35	30
	10	15	28	24
	12	12	23	20
	14	10	20	17
	16	9	17	15
	18	8	15	13

LOAD <sup>c</sup> (psf)	JOIST SPAN <sup>a</sup> (feet)	1/2-inch diameter leg screw with 1/2-inch maximum sheathing <sup>d,e</sup>	1/2-inch diameter bolt with 1/2- inch maxi- mum sheathing <sup>e</sup>	1/2-inch diameter bolt with 1-inch maxi- mum sheath- ing <sup>f</sup>
		ON-CENTER SPACING OF FASTENERS <sup>b</sup> (inches)		
70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Legers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- c. Dead Load = 10 psf. Snow load shall not be assumed to act concurrently with live load.
- d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- e. Sheathing shall be wood structural panel or solid sawn lumber.
- f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2 inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

**AMENDATORY SECTION** (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0602 Section R602—Wood wall framing.**

~~((**R602.1.1 Sawn lumber.** Sawn lumber shall be identified by a grade mark of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.))~~

**R602.1.1.1 Used sawn lumber.** Used sawn lumber identified with a grade mark, in good condition and devoid of areas of decay shall be assumed to meet the requirements of Section 602.1.1 or shall comply with the following:

1. Dimensional lumber not identified with a grade mark that has a nominal thickness of 2 inches with a nominal width of 6 inches, or less, shall be assumed to be spruce-pine-fir stud grade and shall have structural properties assigned in accordance with current adopted standards. All other dimensional lumber shall be assumed to be hem-fir No. 2 grade and shall have structural properties assigned in accordance with current adopted standards.

**R602.9 Cripple walls.** Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be

framed of studs having the size required for an additional story.

Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 with a stud height less than 14 inches (356 mm) shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. All cripple walls shall be supported on continuous footings or foundations.

**EXCEPTION:** Footings supporting cripple walls used to support interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for a minimum distance of 4 inches and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.

**R602.10.10 Cripple wall bracing.** Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Section R403.1.2 shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3), and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4), respectively, except the length of the cripple wall bracing shall be multiplied by a factor of 1.15.

Where gypsum wall board is not used on the inside of the cripple wall bracing, the length adjustments for the elimination of the gypsum wallboard, or equivalent, shall be applied as directed in Tables R602.10.3(2) and R602.10.3(4) to the length of cripple wall bracing required. This adjustment shall be taken in addition to the 1.15 increase.

**AMENDATORY SECTION** (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-0703 Section R703—Exterior covering.**

~~((**R703.1 General.** Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section R703.4.))~~

**EXCEPTION:** Log walls designed and constructed in accordance with the provisions of ICC 400.))

**R703.1.1 Water resistance.** The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R702.7 of this code.

**EXCEPTIONS:** 1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.4 or R703.8.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections R703.2 and R703.4, shall not be required for an exterior wall envelope that has been demonstrated to resist wind-driven rain through testing of the exterior wall envelope, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:

2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.

2.2. Exterior wall envelope test assemblies shall be at least 4 feet (1219 mm) by 8 feet (2438 mm) in size.

2.3. Exterior wall assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299Pa).

2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours. The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope; joints at the perimeter of opening penetration; or intersections of terminations with dissimilar materials.

3. The requirement for a means of drainage shall not be construed to mean an air space cavity under the exterior cladding for an exterior wall clad with panel or lapped siding made of plywood, engineered wood, hardboard, or fiber cement. A water-resistive barrier as required by Section R703.2 will be required on exterior walls.

**R703.2 Water-resistive barrier.** Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water resistive barrier behind the exterior wall veneer. Water-resistive barrier materials shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type 1 or 2.
3. ASTM E331 in accordance with Section R703.1.1; or
4. Other approved materials in accordance with the manufacturer's installation instructions.

**R703.4 Flashing.** Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structure framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashing shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

**R703.10.2 Lap siding.** Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. Lap siding shall be lapped a minimum of 1 1/4 inches (32 mm) and lap siding shall be installed in accordance with the manufacturer's installation instructions or shall be designed to comply with Section R703.1. Lap siding courses shall be installed with the fastener heads exposed or concealed, in accordance with Table R703.3(1) or approved manufacturer's instructions.

AMENDATORY SECTION (Amending WSR 13-04-068, filed 2/1/13, effective 7/1/13)

**WAC 51-51-1004 Section R1004—Factory-built fireplaces.**

**R1004.1.1 Emission standards for factory-built fireplaces.** No new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558 Standard Test Method for determining particulate matter emission from fires in ((~~low mass~~)) wood burning fireplaces.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

**R1004.1.2 Emission standards for certified masonry and concrete fireplaces.** Masonry and concrete fireplace model lines certified to Washington State Building Code Standard 31-2 prior to July 1, 2013, may retain certification provided the design and construction specifications of the fireplace model line internal assembly do not change.

NEW SECTION

**WAC 51-51-1503 Section M1503—Domestic cooking exhaust equipment.**

**M1503.2.1 Open-top broiler exhaust.** Domestic open-top broiler units shall be provided with a metal exhaust hood, having a minimum thickness of 0.0157 inch (0.3950 mm) (No. 28 gage). Such hoods shall be installed with a clearance of not less than 1/4 inch (6.4 mm) between the hood and the underside of combustible material or cabinets. A clearance of

not less than 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinets. The hood width shall not be less than the width of the broiler unit and shall extend over the entire unit.

- EXCEPTIONS:
1. Broiler units that incorporate an integral exhaust system, and that are listed and labeled for use without an exhaust hood, shall not be required to have an exhaust hood.
  2. Broiler units permanently installed outside the building envelope and having the cooking surface at least 5 feet below a 1-hour fire resistance rated ceiling shall not be required to have an exhaust hood.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-4400 Referenced standards.**

**ANCE**

**NMX-J-521/2-40-ANCE—2019/CAN/CSA-22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electrical Appliances – Safety-Part 2-40((-Safety)): Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.**  
M1403.1, M1412.1, M1413.1

**ANSI**

**LC 1/CSA 6.26—18: Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)**  
G2414.5.4, G2411.3, G2415.5  
403.5.5

**ASHRAE**

**34—2019: Designation and Safety Classification of Refrigerants**  
M1411.1

**ASTM**

**E2556/E2556M-10: Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.**  
M1411.1

**E2558-2013: Standard Test Method for Determining Particulate Matter Emissions from Fires in Wood-burning Fireplaces**  
R1004.1.1

**CSA**

**CAN/CSA/C22.2 No. 60335-2-40—2012 60335-2-40—2019**

**NMX-J-521/2-40-ANCE—2019/CAN/CSA-C22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electric Appliances, Part 2-40-Safety: Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.**  
M2006.1

**UL**

**UL/CSA/ANCE 60335-2-40—2019 Household and Similar Electrical Appliances Safety-Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers.**

M1403.1, M1412.1, M1413.1

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-60104 Appendix Q—Tiny houses.**

**AQ102 Definitions.**

**EGRESS ROOF ACCESS WINDOW.** See Chapter 2.

**LANDING PLATFORM.** See Chapter 2.

**LOFT.** This definition is not adopted.

**SLEEPING LOFT.** See Chapter 2.

**TINY HOUSE.** A *dwelling unit* that is 400 square feet (37 m<sup>2</sup>) or less in floor area excluding *sleeping lofts*.

**AQ103.1 Minimum ceiling height.** Habitable space in tiny houses shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). Bathrooms, toilet rooms and kitchens shall have a ceiling height of not less than 6 feet 4 inches (1930 mm). Obstructions including, but not limited to, beams, girders, ducts and lighting, shall not extend below these minimum ceiling heights.

EXCEPTION: Ceiling heights in *sleeping lofts* shall be in accordance with Section R326.

~~((AQ103 Ceiling height. This section is not adopted.))~~

**AQ104 Energy conservation.**

**AQ104.1 Air leakage testing.** The air leakage rate for tiny houses shall not exceed 0.30 cfm at 50 Pascals of pressure per foot of the dwelling unit enclosure area. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed after the continuous air barrier, including all penetrations, is completed and sealed.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures.

2. Dampers including exhaust, intake, makeup air, back-draft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.

3. Interior doors, if installed at the time of the test, shall be open.

4. Exterior louvers for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.

5. Heating and cooling systems, if installed at the time of the test, shall be turned off.

6. Supply and return registers, if installed at the time of the test, shall be fully open.

~~((AQ104 Lofts. This section is not adopted.))~~

**AQ104.1.1 Whole house mechanical ventilation.** Where an air leakage rate not exceeding 0.30 cfm per ft of the dwelling unit enclosure area in accordance with Section AQ106.1 is provided, the tiny house shall be provided with whole house mechanical ventilation in accordance with Section M1505.4.

**AQ105 Emergency escape and rescue openings.** This section is not adopted.

**AMENDATORY SECTION** (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

**WAC 51-51-60105 Appendix U—Dwelling unit fire sprinkler systems.** The design and installation of residential fire sprinkler systems shall be in accordance with the 2018 International Residential Code Section P2904 Dwelling Unit Fire Sprinkler Systems.

**P2904.1.1 Required sprinkler locations.** Sprinklers shall be installed to protect all areas of a dwelling unit.

**EXCEPTIONS:**

1. Uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m<sup>2</sup>) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m<sup>2</sup>) in area.
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

**AMENDATORY SECTION** (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

**WAC 51-51-60106 Appendix ((U)) I—Solar-ready provisions—detached one-and two-family dwellings, multiple single-family dwellings (townhouses).** The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

**((U101)) AT101 Scope.**

**((U101.1)) AT101.1 General.** These provisions shall be applicable for new construction where solar-ready provisions are required.

**((U102)) AT102 General definitions.** Solar-ready zone. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar water-heating system.

**((U103)) AT103 Solar ready zone.**

**((U103.1)) AT103.1 General.** New detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m<sup>2</sup>) of roof area oriented between 90 degrees and 270 degrees of true north shall comply with Sections U103.2 through U103.10.

**EXCEPTIONS:**

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section ((U103)) **AT103** are in full or partial shade for more than 70 percent of daylight hours annually.

**((U103.2)) AT103.2 Construction document requirements for solar ready zone.** Construction documents shall indicate the solar ready zone.

**((U103.3)) AT103.3 Solar-ready zone area.** The total solar-ready zone area shall be not less than 300 square feet (27.87 m<sup>2</sup>) exclusive of mandatory access or set back areas as required by this code. New multiple single-family dwellings (townhouses) three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m<sup>2</sup>) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m<sup>2</sup>). The solar-ready zone shall be composed of areas not less than 5 feet (1.52 m) in width and not less than 80 square feet (7.44 m<sup>2</sup>) exclusive of access or set back areas as required in this code or the applicable provisions of the *International Fire Code*. No portion of the solar zone shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north.

**((U103.4)) AT103.4 Obstructions.** Solar-ready zones shall be free from obstructions including, but not limited to, vents, chimneys, and roof-mounted equipment.

**((U103.5)) AT103.5 Shading.** The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east, or west of the solar zone a distance at least two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

**((U103.6)) AT103.6 Capped roof penetration sleeve.** A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone when the solar-ready zone has a roof slope of 2:12 or less. The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter not less than 1 1/4 inches.

**((U103.7)) AT103.7 Roof load documentation.** The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

**((U103.8)) AT103.8 Interconnection pathway.** Construction documents shall indicate pathways for routing of conduit or plumbing from the solar-ready zone to the electrical service panel or service hot water system.

**((U103.9)) AT103.9 Electrical service reserved space.** The main electrical service or feeder panel for each dwelling unit shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.



~~(U103-10)~~ **AT103.10 Construction documentation certificate.** A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

## WSR 20-21-042

### PERMANENT RULES

#### DEPARTMENT OF TRANSPORTATION

[Filed October 13, 2020, 9:29 a.m., effective November 13, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: WAC 468-38-100 Pilot escort vehicle operator requirements, the purpose for this rule change is to allow for online training for pilot/escort operator certification. The current language limits the course to an eight-hour classroom training. The proposal also updates the highly visible safety garment requirements to current specifications for both daytime and nighttime operations.

Citation of Rules Affected by this Order: Amending WAC 468-38-100 (4) and (10).

Statutory Authority for Adoption: RCW 46.44.090, 46.44.093.

Adopted under notice filed as WSR 20-18-042 on August 28, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 2, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 2, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 13, 2020.

Streator Johnson  
Administrative Risk Manager

**AMENDATORY SECTION** (Amending WSR 18-13-029, filed 6/11/18, effective 7/12/18)

**WAC 468-38-100 Pilot/escort vehicle and operator requirements.** (1) A certified pilot/escort operator, acting as a warning necessary to provide safety to the traveling public, must accompany an extra-legal load when:

(a) The vehicle(s) or load exceeds eleven feet in width: Two pilot/escort vehicles are required on two lane highways, one in front and one at the rear.

(b) The vehicle(s) or load exceeds fourteen feet in width: One escort vehicle is required at the rear on multilane highways.

(c) The vehicle(s) or load exceeds twenty feet in width: Two pilot/escort vehicles are required on multilane undivided highways, one in front and one at the rear.

(d) The trailer length, including load, of a tractor/trailer combination exceeds one hundred five feet, or when the rear overhang of a load measured from the center of the rear axle exceeds one-third of the trailer length including load of a tractor/trailer or truck/trailer combination: One pilot/escort vehicle is required at the rear on two-lane highways.

(e) The trailer length, including load, of a tractor/trailer combination exceeds one hundred twenty-five feet: One pilot/escort vehicle is required at the rear on multilane highways.

(f) The front overhang of a load measured from the center of the front steer axle exceeds twenty feet: One pilot/escort vehicle is required at the front on all two-lane highways.

(g) The rear overhang of a load on a single unit vehicle, measured from the center of the rear axle, exceeds twenty feet: One pilot/escort vehicle is required at the rear on two-lane highways.

(h) The height of the vehicle(s) or load exceeds fourteen feet six inches: One pilot/escort vehicle with height measuring device (pole) is required at the front of the movement on all highways.

(i) The vehicle(s) or load exceeds twelve feet in width on a multilane highway and has a height that requires a front pilot/escort vehicle: One rear pilot/escort vehicle is required.

(j) The operator, using rearview mirrors, cannot see two hundred feet to the rear of the vehicle or vehicle combination when measured from either side of the edge of the load or last vehicle in the combination, whichever is larger: One pilot/escort vehicle is required at the rear on all highways.

(k) In the opinion of the department, a pilot/escort vehicle(s) is necessary to protect the traveling public. Assignments of this nature must be authorized through the department's administrator for commercial vehicle services.

**(2) Can a pilot/escort vehicle be temporarily reassigned a position relative to the load during a move?** When road conditions dictate that the use of the pilot/escort vehicle in another position would be more effective, the pilot/escort vehicle may be temporarily reassigned. For example: A pilot/escort vehicle is assigned to the rear of an overlength load on a two-lane highway. The load is about to enter a highway segment that has curves significant enough to cause the vehicle and/or load to encroach on the oncoming lane of traffic. The pilot/escort vehicle may be temporarily reassigned to the front to warn oncoming traffic.

**(3) Can a certified flag person ever substitute for a pilot/escort vehicle?** In subsection (1)(d) and (e) of this section, the special permit may authorize a riding flag person, in lieu of a pilot/escort vehicle, to provide adequate traffic control for the configuration. The flag person is not required to ride in the pilot/escort vehicle but may ride in the transport vehicle with transporter's authorization.

**(4) Must an operator of a pilot/escort vehicle be certified to operate in the state of Washington?** Yes. To help

assure compliance with the rules of this chapter, consistent basic operating procedures are needed for pilot/escort vehicle operators to properly interact with the escorted vehicle and the surrounding traffic. Operators of pilot/escort vehicles, therefore, must be certified as having received department-approved base level training as a pilot/escort vehicle operator and must comply with the following:

(a) A pilot/escort vehicle operator with a Washington state driver's license must have a valid Washington state pilot/escort vehicle operator certificate/card which must be on the operator's person while performing escort vehicle operator duties.

(b) A pilot/escort vehicle operator with a driver's license from a jurisdiction other than the state of Washington may acquire a Washington state escort vehicle operator certificate/card, or operate with a certification from another jurisdiction approved by the department, subject to the periodic review of the issuing jurisdiction's certification program. A current list of approved programs will be maintained by the department's commercial vehicle services office.

(c) A pilot/escort vehicle operator certification does not exempt a pilot/escort operator from complying with all state laws and requirements of the state in which she/he is traveling.

(d) Every applicant for a state of Washington pilot/escort operator certificate shall attend an eight-hour ((classroom)) training course offered and presented by a business, organization, government entity, or individual approved by the department. At the conclusion of the course, the applicant will be eligible to receive the certification card after successfully completing a written test with at least an eighty percent passing score. State of Washington pilot/escort vehicle operator certification cards must be renewed every three years.

**(5) What are the pretrip procedures that must be followed by the operator of a pilot/escort vehicle?**

(a) Discuss with the operator of the extra-legal vehicle the aspects of the move including, but not limited to, the vehicle configuration, the route, and the responsibilities that will be assigned or shared.

(b) Prerun the route, if necessary, to verify acceptable clearances.

(c) Review the special permit conditions with the operator of the extra-legal vehicle. When the permit is a single trip extra-legal permit, displaying routing information, the pilot/escort operator(s) must have a copy of the permit, including all special conditions and attachments.

(d) Determine proper position of required pilot/escort vehicles and set procedures to be used among the operators.

(e) Check mandatory equipment, provided in subsections (9) and (10) of this section. Each operator is responsible for his or her own vehicle.

(f) Check two-way communication system to ensure clear communications between the pilot/escort vehicle(s) and the transport vehicle and predetermine the channel to be used.

(g) Acknowledge that nonemergency electronic communication is prohibited except communication between pilot/escort operator(s) and the transport vehicle during movement.

(h) Adjust mirrors, mount signs and turn on lights, provided in subsections (8)(e) and (9)(a) and (b) of this section.

**(6) What are the responsibilities of the operator of a pilot/escort vehicle when assigned to be in front of the extra-legal movement?** The operator shall:

(a) Provide general warning to oncoming traffic of the presence of the permitted vehicle by use of signs and lights, provided in subsection (9) of this section;

(b) Notify the operator of the extra-legal vehicle, and the operator(s) of any trailing pilot/escort vehicle(s), about any condition that could affect either the safe movement of the extra-legal vehicle or the safety of the traveling public, in sufficient time for the operator of the extra-legal vehicle to take corrective action. Conditions requiring communication include, but are not limited to, road-surface hazards; overhead clearances; obstructions; traffic congestion; pedestrians; etc.;

(c) Provide guidance to the extra-legal vehicle through lane changes, egress from one designated route and access to the next designated route on the approved route itinerary, and around any obstacle;

(d) In the event of traffic buildup behind the extra-legal vehicle, locate a safe place adjacent to the highway where the extra-legal vehicle can make a temporary stop. Notify the operator of the extra-legal vehicle, and the operator(s) of any trailing pilot/escort vehicle(s), in sufficient time for the extra-legal vehicle to move out of the traffic flow into the safe place, allowing the following traffic to pass safely;

(e) In accordance with training, be far enough in front of the extra-legal vehicle to allow time for the extra-legal vehicle to stop or take corrective action as necessary when notified by the front pilot/escort operator. Be far enough in front of the extra-legal vehicle to signal oncoming traffic to stop in a safe and timely manner before entering any narrow structure or otherwise restricted highway where an extra-legal vehicle has entered and must clear before oncoming traffic can enter;

(f) In accordance with training, do not be any farther ahead of the extra-legal vehicle than is reasonably prudent, considering speed of the extra-legal vehicle, other traffic, and highway conditions. Do not exceed a distance between pilot/escort vehicle and extra-legal vehicle that would interfere with maintaining clear two-way radio communication; and

(g) Assist in guidance to a safe place, and/or traffic control, in instances when the extra-legal vehicle becomes disabled.

**(7) What are the responsibilities of the operator of a pilot/escort vehicle when assigned to be at the rear of the extra-legal movement?** The operator shall:

(a) Provide general warning to traffic approaching from the rear of the extra-legal vehicle ahead by use of signs and lights, provided in subsection (9) of this section;

(b) Notify the operator of the extra-legal vehicle, and the operator(s) of any leading pilot/escort vehicle(s), about any condition that could affect either the safe movement of the extra-legal vehicle or the safety of the traveling public, in sufficient time for the operator of the extra-legal vehicle to take corrective action. Conditions requiring communication include, but are not limited to, objects coming loose from the extra-legal vehicle; flat tires on the extra-legal vehicle; rap-

idly approaching traffic or vehicles attempting to pass the extra-legal vehicle; etc.;

(c) Notify the operator of the extra-legal vehicle, and/or the operator of the lead pilot/escort vehicle, about traffic buildup or other delays to normal traffic flow resulting from the extra-legal move;

(d) In the event of traffic buildup behind the extra-legal vehicle, notify the operator of the extra-legal vehicle, and the operator(s) of any pilot/escort vehicle(s) in the lead, and assist the extra-legal vehicle in its move out of the traffic flow into the safe place, allowing the following traffic to pass safely;

(e) In accordance with training, be far enough behind the extra-legal vehicle to provide visual warning to approaching traffic to slow or stop in a timely manner, depending upon the action to be taken by the extra-legal vehicle, or the condition of the highway segment (i.e., limited sight distance, mountainous terrain, narrow corridor, etc.);

(f) Do not follow more closely than is reasonably prudent, considering the speed of the extra-legal vehicle, other traffic, and highway conditions. Do not exceed one-half mile distance between the pilot/escort vehicle and the extra-legal vehicle in order to maintain radio communication, except when necessary to safely travel a long narrow section of highway; and

(g) Pilot/escort operators shall not perform tillerman duties while performing escorting duties. For this section, tillerman refers to an individual that operates the steering of the trailer or trailing unit of the transport vehicle; and

(h) Assist in guidance to a safe place, and/or traffic control, in instances when the extra-legal vehicle becomes disabled.

**(8) What kind of vehicle can be used as a pilot/escort vehicle?** In addition to being in safe and reliable operating condition, the vehicle shall:

(a) Be either a single unit passenger car, including passenger van, or a two-axle truck, including a nonplacarded service truck;

(b) Not exceed a maximum gross vehicle weight or gross weight rating of sixteen thousand pounds;

(c) Have a body width of at least sixty inches but no greater than one hundred two inches;

(d) Not exceed the legal limits of size and weight, as defined in chapter 46.44 RCW;

(e) Be equipped with outside rear-view mirrors, located on each side of the vehicle; and

(f) Not tow a trailer while escorting.

**(9) In addition to equipment required by traffic law, what additional equipment is required on the vehicle when operating as a pilot/escort, and when is it used?**

(a) A minimum of one flashing or rotating amber (yellow) light or strobe, positioned above the roof line, visible from a minimum of five hundred feet to approaching traffic from the front or rear of the vehicle and visible a full three hundred sixty degrees around the pilot/escort vehicle. Light bars, with appropriately colored lights, meeting the visibility minimums are acceptable. Lights must only be activated while escorting an extra-legal vehicle, or when used as traffic warning devices while stopped at the side of the road taking height measurements during the prerunning of a planned

route. The vehicle's headlights must also be activated while escorting an extra-legal vehicle.

(b) A sign reading "OVERSIZE LOAD," measuring at least five feet wide, ten inches high with black lettering at least eight inches high in a one-inch brush stroke on yellow background. The sign shall be mounted over the roof of the vehicle and shall be displayed only while performing as the pilot/escort of an extra-legal load. When the vehicle is not performing as a pilot/escort, the sign must be removed, retracted or otherwise covered.

(c) A two-way radio communications system capable of providing reliable two-way voice communications, at all times, between the operators of the pilot/escort vehicle(s) and the extra-legal vehicle(s).

(d) Nonemergency electronic communications is prohibited except communication between the pilot/escort vehicle(s) and the transport vehicle during movement.

**(10) What additional or specialized equipment must be carried in a pilot/escort vehicle?**

(a) A standard eighteen-inch STOP AND SLOW paddle sign.

(b) Three bi-directional emergency reflective triangles.

(c) A minimum of one five-pound B, C fire extinguisher, or equivalent.

(d) For daytime and nighttime activities, a high visibility safety garment designed according to Class 2/3 specifications in ANSI/ISEA ((107-1999)) 107-2004, American National Standard for High Visibility Safety Apparel, to be worn when performing pilot/escort duties outside of the vehicle. ((The acceptable high visibility colors are fluorescent yellow-green, fluorescent orange-red or fluorescent red.)) The specifications at a minimum will meet the standard in the Manual on Uniform Traffic Control Devices (MUTCD).

(e) A highly visible colored hard hat, also to be worn when performing pilot/escort duties outside of the vehicle, per WAC 296-155-305.

(f) A height-measuring device (pole), which is nonconductive and nondestructive to overhead clearances, when required by the terms of the special permit. The upper portion of a height pole shall be constructed of flexible material to prevent damage to wires, lights, and other overhead objects or structures. The pole may be carried outside of the vehicle when not in use. See also subsection (14) of this section.

(g) First-aid supplies as prescribed in WAC 296-800-15020.

(h) A flashlight in good working order with red nose cone. Additional batteries should also be on hand.

**(11) Can the pilot/escort vehicle carry passengers?** A pilot/escort vehicle may not contain passengers, human or animal, except that:

(a) A certified individual in training status or necessary flag person may be in the vehicle with the approval of the pilot/escort operator.

(b) A service animal may travel in the pilot/escort vehicle but must be located somewhere other than front seat of vehicle.

**(12) Can the pilot/escort vehicle carry any other items, equipment, or load?** Yes, as long as the items, equipment or load have been properly secured; provided that, no

equipment or load may be carried in or on the pilot/escort vehicle that:

(a) Exceeds the height, length, or width of the pilot/escort vehicle, or overhangs the vehicle, or otherwise impairs its immediate recognition as a pilot/escort vehicle by the traveling public;

(b) Obstructs the view of the flashing or rotating amber lights, or "OVERSIZE LOAD" sign on the vehicle;

(c) Causes safety risks; or

(d) Otherwise impairs the performance by the operator or the pilot/escort vehicle of the duties required by these rules.

**(13) Can a pilot/escort vehicle escort more than one extra-legal load at the same time?** No, unless the department determines there are special circumstances that have resulted in an express authorization on the special permit.

**(14) When and how must a pilot/escort vehicle use a height-measuring device?** The height-measuring device (pole) must be used when escorting an extra-legal load in excess of fourteen feet six inches high, unless an alternative authorization has been granted by the department and stated on the special permit. The height pole must extend between three and six inches above the maximum height of the extra-legal vehicle, or load, to compensate for the affect of wind and motion. The height measuring device (pole) shall be mounted on the front of the lead pilot/escort vehicle. When not in the act of escorting an extra-legal height move, or pre-running a route to determine height acceptance, the height pole shall be removed, tied down or otherwise reduced to legal height.

**(15) Do the rules change when a uniformed off-duty law enforcement officer, using official police car or motorcycle, performs the escorting function?** While the spirit of the rules remains the same, specific rules may be modified to fit the situation.

**(16) Are certified pilot/escort vehicle operators required to have commercial auto insurance?** Yes, for hire certified pilot/escort vehicle operators are required to have insurance to conduct the duties associated to this rule:

(a) One hundred thousand dollars for bodily injury to or death of one person in any one accident;

(b) Three hundred thousand dollars for bodily injury to or death of two or more persons in any one accident; and

(c) Fifty thousand dollars for damage to or destruction of property of others in any one accident.

Satisfactory evidence of the insurance shall be carried at all times by the operator of the pilot vehicle, which evidence shall be displayed upon request by a law enforcement officer.

### WSR 20-21-043

#### PERMANENT RULES

#### DEPARTMENT OF TRANSPORTATION

[Filed October 13, 2020, 9:35 a.m., effective November 13, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: WAC 468-38-073 Measurement exclusive devices, measurement exclusive devices at the rear of a vehicle for the purposes of loading and unloading grant an additional two feet beyond legal length. This rule needs clarification to no [not] limit the exclusion to loading and unloading

devices of two feet or less. This change clarifies the intent of the existing rule.

Citation of Rules Affected by this Order: Amending WAC 468-38-073(4).

Statutory Authority for Adoption: RCW 46.44.090, 46.44.093.

Adopted under notice filed as WSR 20-18-043 on August 28, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 1, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 13, 2020.

Streator Johnson  
Administrative Risk Manager

AMENDATORY SECTION (Amending WSR 18-21-168, filed 10/23/18, effective 11/23/18)

**WAC 468-38-073 Measurement exclusive devices. (1) What are the criteria for being a measurement exclusive device?** Generally, measurement exclusive devices are vehicle appurtenances designed and used for reasons of safety, aerodynamics, or efficient vehicle operation. A measurement exclusive device must not carry property, create a space that property could occupy outside of legal or permitted dimensions, or exceed the specific dimensional limitations stated in this section.

**(2) What devices at the front of a single unit vehicle, or power unit in a vehicle combination, are excluded from length determinations?** The following devices have been identified as measurement exclusive when determining length from the front of a single unit vehicle or power unit in a vehicle combination:

(a) Resilient bumpers that do not extend more than six inches from the vehicle;

(b) A fixed step up to three inches deep at the front of an existing automobile transporter until April 29, 2005. It will be the responsibility of the operator of the unit to prove that the step existed prior to April 29, 2002. Such proof can be in the form of a work order for equipment modification, a receipt for purchase and installation of the piece, or any similar type of documentation. After April 29, 2005, the step shall no longer be excluded from a vehicle's length.

**(3) What devices at the front of a semi-trailer or trailer are excluded from length determinations?** The following devices have been identified as measurement exclu-

sive when determining length from the front of a semi-trailer or trailer:

- (a) A device at the front of a trailer chassis to secure containers and prevent movement in transit;
- (b) A front coupler device on a semi-trailer or trailer used in road and rail intermodal operations;
- (c) Aerodynamic devices, air deflector;
- (d) Air compressor;
- (e) Certificate holder (manifest box);
- (f) Door vent hardware;
- (g) Electrical connector;
- (h) Gladhand (air hose connectors joining tractor to trailer);
- (i) Handhold;
- (j) Hazardous materials placards and holders;
- (k) Heater;
- (l) Ladder;
- (m) Nonload carrying tie-down devices on automobile transporters;
- (n) Pickup plate lip (plate at front of trailer to guide fifth wheel under trailer);
- (o) Pump offline on tank trailer;
- (p) Refrigeration unit;
- (q) Removable bulkhead;
- (r) Removable stake;
- (s) Stabilizing jack (antinosedive device);
- (t) Stake pocket;
- (u) Step;
- (v) Tarp basket;
- (w) Tire carrier; and
- (x) Uppercoupler.

**(4) What devices at the rear of a single unit vehicle, semi-trailer or trailer are excluded from length determinations?** The following devices have been identified as measurement exclusive when determining length from the rear of a single unit vehicle, semi-trailer or trailer:

- (a) Aerodynamic devices that extend up to a maximum of five feet beyond the rear of the vehicle, provided such devices have neither the strength, rigidity nor mass to damage a vehicle, or injure a passenger in a vehicle, that strikes a vehicle so equipped from the rear, and provided also that they do not obscure tail lamps, turn signals, marker lamps, identification lamps, or any other required safety devices, such as hazardous materials placards or conspicuity markings (i.e., reflective tape);
- (b) Handhold;
- (c) Hazardous materials placards and holder;
- (d) Ladder;
- (e) Loading and unloading device not to exceed two feet beyond legal length;
- (f) Pintle hook;
- (g) Removable stake;
- (h) Splash and spray suppression device;
- (i) Stake pocket; and
- (j) Step.

**(5) What devices at the side of a vehicle are excluded from width determinations?** The following devices have been identified as measurement exclusive, not to exceed three inches from the side of the vehicle, when determining width of a vehicle:

- (a) Corner cap;
  - (b) Handhold for cab entry/egress;
  - (c) Hazardous materials placards and holder;
  - (d) Lift pad for trailer on flatcar (piggyback) operation;
  - (e) Load induced tire bulge;
  - (f) Rain gutter;
  - (g) Rear and side door hinge and protective hardware;
  - (h) Rearview mirror;
  - (i) Side marker lamp;
  - (j) Splash and spray suppressant device, or component thereof;
  - (k) Structural reinforcement for side doors or intermodal operation (limited to one inch from the side within the three-inch maximum extension);
  - (l) Tarping system for open-top cargo area;
  - (m) Turn signal lamp;
  - (n) Movable device to enclose the cargo area of a flatbed semi-trailer or trailer, usually called "tarping system," where no component part of the system extends more than three inches from the sides or back of the vehicle when the vehicle is in operation. This exclusion applies to all component parts of a tarping system, including the transverse structure at the front of the vehicle to which the sliding walls and roof of the tarp mechanism are attached, provided the structure is not also intended or designed to comply with 49 C.F.R. 393.106, which requires a headerboard strong enough to prevent cargo from penetrating or crushing the cab; the transverse structure may be up to one hundred eight inches wide if properly centered so that neither side extends more than three inches beyond the structural edge of the vehicle. Also excluded from measurement are side rails running the length of the vehicle and rear doors, provided the only function of the latter, like that of the transverse structure at the front of the vehicle, is to seal the cargo area and anchor the sliding walls and roof. On the other hand, a headerboard designed to comply with 49 C.F.R. 393.106 is load bearing and thus limited to one hundred two inches in width. The "wings" designed to close the gap between such a headerboard and the movable walls and roof of a tarping system are width exclusive, provided they are add-on pieces designed to bear only the load of the tarping system itself and are not integral parts of the load-bearing headerboard structure;
  - (o) Tie-down assembly on platform trailer;
  - (p) Wall variation from true flat; and
  - (q) Weevil pins and sockets on a platform or low-bed trailer (pins and sockets located on both sides of a trailer used to guide winch cables when loading skid mounted equipment).
- (6) Are there weight measurement exclusive devices?** Yes. Any vehicle equipped with idle reduction technology, designed to promote reduced fuel usage and emissions from engine idling, may have up to four hundred pounds in total gross, axle, tandem or bridge formula weight exempt (excluded) from the weight measurement. To be eligible for the weight exemption, the vehicle operator must be able to prove:
- (a) By written certification the weight of the idle reduction technology; and
  - (b) By demonstration or certification, that the idle reduction technology is fully functional at all times.

The weight exemption cannot exceed five hundred fifty pounds or the certified weight of the unit, whichever is less.

(7) **Can exclusion allowances be combined to create a larger allowance (i.e., adding a five-foot aerodynamic device to a two-foot loading/unloading device for a total exclusion of seven feet)?** No. Each exclusion allowance is specific to a device and may not be combined with the exclusion allowance for another device.

(8) **Can a device receive exclusion if it is not referenced in law or administrative rule?** If the device meets the criteria in subsection (1) of this section, a request for measurement exclusion may be made to the administrator for commercial vehicle services. If approved for an exclusion allowance, the administrator will provide the requestor a written authorization.

**WSR 20-21-044  
PERMANENT RULES  
OFFICE OF THE**

**INSURANCE COMMISSIONER**

[Insurance Matter R 2020-05—Filed October 13, 2020, 9:40 a.m., effective November 13, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: WAC 284-07-310 to 284-07-400 is the actuarial opinion and memorandum.

Chapter 48.74 RCW, Standard valuation law, makes the NAIC Valuation Manual effective January 1, 2017, as defined in RCW 48.74.015(11). The NAIC Valuation Manual that was effective January 1, 2017, has been updated by the NAIC for 2018 and 2019.

This rule making will update the above WAC with chapter 48.74 RCW and the NAIC Valuation Manual.

Citation of Rules Affected by this Order: Amending WAC 284-07-310, 284-07-330, 284-07-350, 284-07-380, 284-07-390, and 284-07-400.

Statutory Authority for Adoption: RCW 48.02.060, 48.74.025, 48.74.028, 48.74.100, 48.36A.250, 48.36A.260.

Adopted under notice filed as WSR 20-17-034 on August 10, 2020.

A final cost-benefit analysis is available by contacting David Forte, P.O. Box 40260, Olympia, WA 98504-0260, phone 360-725-7042, email DavidF@oic.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 6, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 6, Repealed 0.

Date Adopted: October 13, 2020.

Mike Kreidler  
Insurance Commissioner

AMENDATORY SECTION (Amending WSR 08-01-077, filed 12/17/07, effective 1/17/08)

**WAC 284-07-310 Purpose.** The purpose of this regulation, WAC 284-07-310 through and including WAC 284-07-400, called the actuarial opinion and memorandum regulation, is to prescribe:

(1) Guidelines and standards for statements of actuarial opinion submitted in accordance with the requirements of chapter 48.74 RCW ((48.74.025)), RCW 48.36A.250, 48.36A.260, and for supporting memoranda;

(2) Rules applicable to the appointment of an appointed actuary; and

(3) Guidelines and standards relating to "adequacy of reserves."

AMENDATORY SECTION (Amending WSR 08-01-077, filed 12/17/07, effective 1/17/08)

**WAC 284-07-330 Scope.** (1) This regulation applies to all life insurance companies and fraternal benefit societies doing business in this state, to all life insurance companies and fraternal benefit societies which are authorized to reinsure life insurance, annuities, or disability insurance business in this state; and to all disability insurers that file annual statements on the life and accident and health blank. This regulation requires the appointed actuary to use his or her professional judgment in performing the required asset analysis and developing the actuarial opinion and supporting memoranda, consistent with relevant actuarial standards of practice. The commissioner may specify specific methods of actuarial analysis and actuarial assumptions when, in the commissioner's opinion, such specifications are necessary.

(2) This regulation applies to all annual statements filed with the commissioner on and after December 31, ~~((2007))~~ 2020.

AMENDATORY SECTION (Amending WSR 08-01-077, filed 12/17/07, effective 1/17/08)

**WAC 284-07-350 General requirements.** The statement of ~~((opinion on the adequacy of the reserves and related actuarial items based on an asset adequacy analysis))~~ an appointed actuary, entitled "Statement of Actuarial Opinion," setting forth an opinion relating to reserves and related actuarial items held in support of policies and contracts, in accordance with WAC 284-07-380, ~~((and))~~ must be included with an annual statement. A memorandum in support thereof in accordance with WAC 284-07-390, ~~((are))~~ is required to be available by May 1st each year. The statement of opinion on the adequacy of the reserves and related actuarial items must comply with the requirements of the Valuation Manual, as revised from time to time by the National Association of Insurance Commissioners, and as defined in RCW 48.74.015.

Statement of actuarial opinion:

(1) "Qualified actuary" means an individual who:

(a) Is a member in good standing of the American Academy of Actuaries; and

(b) Is qualified to sign statements of actuarial opinion for life and health insurance company annual statements in accordance with the American Academy of Actuaries qualification standards for actuaries signing such statements or equivalent standards acceptable to the commissioner; and

(c) Is familiar with the valuation requirements applicable to life and health insurance companies; and

(d) Has not been found by the commissioner (or if so found has subsequently been reinstated as a qualified actuary), following appropriate notice to have:

(i) Violated any provision of, or any obligation imposed by, Title 48 RCW or other law or any applicable regulation or order of the commissioner in the course of his or her dealings as a qualified actuary;

(ii) Been found guilty of fraudulent or dishonest practices;

(iii) Demonstrated his or her incompetence, lack of cooperation, or untrustworthiness to act as a qualified actuary;

(iv) Submitted to the commissioner during the past five years, an actuarial opinion or memorandum that the commissioner rejected because it did not meet the provisions of this regulation or standards set by the Actuarial Standards Board; or

(v) Resigned or been removed as an actuary within the past five years as a result of acts or omissions indicated in any adverse report on examination or as a result of failure to adhere to generally acceptable actuarial standards; and

(e) Has not failed to notify the commissioner of any action taken by any commissioner of any other state similar to that under (d) of this subsection.

(f) The commissioner may accept equivalent qualifications in place of those in (a) and (b) of this subsection if the individual has otherwise demonstrated his or her actuarial competence to the satisfaction of the commissioner, and meets the qualifications in (c), (d), and (e) of this subsection.

(2) "Appointed actuary" means a qualified actuary who is appointed or retained to prepare the statement of actuarial opinion required by this regulation; either directly by, or by the authority of, the board of directors through an executive officer of the company.

(a) The company shall give the commissioner (~~timely~~) written notice no more than five business days of the following: The name, title (and, in the case of a consulting actuary, the name of the firm), and manner of appointment or retention of each person appointed or retained by the company as an appointed actuary.

(b) The company must state in its notice that the appointed actuary meets the requirements set forth in subsection (1) of this section.

(c) After the company furnishes the notice, no further notice is required with respect to this person, except the following, if applicable:

(i) The company must give the commissioner timely written notice if the actuary ceases to be appointed or retained as an appointed actuary; and

(ii) The company must give the commissioner timely written notice if the actuary fails to meet the requirements set forth in subsection (2) of this section.

(d) ~~((If any person appointed or retained as an appointed actuary replaces a previously appointed actuary, the notice must include that information and give the reasons for replacement.))~~ If an actuary who was the appointed actuary for the immediately preceding filed actuarial opinion is replaced by an action of the board of directors, the insurer shall within five business days notify the insurance department of the state of domicile of this event. The insurer shall also furnish the domiciliary commissioner with a separate letter within ten business days of the above notification stating whether in the twenty-four months preceding such event there were any material disagreements with the former appointed actuary regarding the content of the opinion. The disagreements required to be reported in response to this paragraph include both those resolved to the former actuary's satisfaction and those not resolved to the former actuary's satisfaction. The insurer shall also in writing request such former actuary to furnish a letter addressed to the insurer stating whether the actuary agrees with the statements contained in the insurer's letter and, if not, stating the reasons for which he/she does not agree. Additionally, the insurer shall furnish such responsive letter from the former actuary to the domiciliary commissioner together with its own.

(3) Standards for asset adequacy analysis: Unless the commissioner approves equivalents in advance, the asset adequacy analysis required by this regulation:

(a) Must conform to the standards of practice as (~~promulgated~~) revised from time to time by the Actuarial Standards Board and to any additional standards under this regulation, and must form the basis of the statement of actuarial opinion in accordance with this regulation; and

(b) Must be based on methods of analysis that are deemed appropriate for such purposes by the Actuarial Standards Board.

(4) Liabilities to be covered:

(a) As required by RCW 48.74.025, the statement of actuarial opinion applies to all in force business on the statement date regardless of when or where issued, including reserves of Exhibits 5, 6, and 7, and claim liabilities in Exhibit 8, Part 1 and equivalent items in the separate account statement or statements.

(b) If the appointed actuary determines as the result of asset adequacy analysis that a reserve should be held in addition to the aggregate reserve held by the company calculated in accordance with methods set forth in RCW 48.74.040, 48.74.070, 48.74.080, and 48.74.090, the company must establish the appropriate additional reserve.

(c) Additional reserves established under (b) of this subsection and deemed not necessary in subsequent years may be released. Any amounts released must be disclosed in the actuarial opinion for the applicable year. The release of these reserves will not be deemed an adoption of a lower standard of valuation.

AMENDATORY SECTION (Amending WSR 08-01-077, filed 12/17/07, effective 1/17/08)

**WAC 284-07-380 Statement of actuarial opinion based on an asset adequacy analysis.** ~~((1) General description:))~~ The statement of actuarial opinion must ~~((include the following:~~

(a) A paragraph identifying the appointed actuary and his or her qualifications (see subsection (2)(a) of this section);

(b) A scope paragraph identifying the subjects on which an opinion is to be expressed and describing the scope of the appointed actuary's work, including a tabulation delineating the reserves and related actuarial items which have been analyzed for asset adequacy and the method of analysis, (see subsection (2)(b) of this section) and identifying the reserves and related actuarial items covered by the opinion which have not been so analyzed;

(c) A reliance paragraph describing those areas, if any, where the appointed actuary has deferred to other experts in developing data, procedures or assumptions, e.g., anticipated cash flows from currently owned assets, including variation in cash flows according to economic scenarios (see subsection (2)(c) of this section), supported by a statement of each expert relied on in the form prescribed by subsection (5) of this section; and

(d) An opinion paragraph expressing the appointed actuary's opinion concerning the adequacy of the supporting assets to mature the liabilities (see subsection (2)(f) of this section).

(e) One or more of the following paragraphs will be needed in individual company cases, as follows:

(i) If the appointed actuary considers it necessary to state a qualification of his or her opinion;

(ii) If the appointed actuary must disclose the method of aggregation for reserves of different products or lines of business for asset adequacy analysis;

(iii) If the appointed actuary must disclose an inconsistency in the method of analysis or basis of asset allocation used at the prior opinion date with that used for this opinion;

(iv) If the appointed actuary must disclose whether additional reserves of the prior opinion date are released as of this opinion date, and the extent of the release; or

(v) If the appointed actuary chooses to add a paragraph briefly describing the assumptions which form the basis for the actuarial opinion.

(2) Recommended language: The following paragraphs must be included in the statement of actuarial opinion in

accordance with this section. Language is that which in typical circumstances shall be included in a statement of actuarial opinion. The language may be modified as needed to meet the circumstances of a particular case, but the appointed actuary must clearly express his or her professional judgment. In any event, the opinion must include all pertinent aspects of the language provided in this section.

(a) ~~The opening paragraph must generally state the appointed actuary's relationship to the company and his or her qualifications to sign the opinion.~~

(i) For a company actuary, the opening paragraph of the actuarial opinion must read substantially as follows:

"I, [name], am [title] of [insurance company name] and a member of the American Academy of Actuaries. I was appointed by, or by the authority of, the Board of Directors of that company to render this opinion as stated in the letter to the Commissioner dated [insert date]. I meet the Academy qualification standards for rendering the opinion and am familiar with the valuation requirements applicable to life and disability insurance companies."

(ii) For a consulting actuary, the opening paragraph must contain a statement substantially similar to the following:

"I, [name], a member of the American Academy of Actuaries, am associated with the firm of [name of consulting firm]. I have been appointed by, or by the authority of, the Board of Directors of [name of company] to render this opinion as stated in the letter to the Commissioner dated [insert date]. I meet the Academy qualification standards for rendering the opinion and am familiar with the valuation requirements applicable to life and disability insurance companies."

(b) The scope paragraph must include a statement substantially similar to the following:

"I have examined the actuarial assumptions and actuarial methods used in determining reserves and related actuarial items listed below, as shown in the annual statement of the company, as prepared for filing with state regulatory officials, as of December 31, 20[ ]. Tabulated below are those reserves and related actuarial items which have been subjected to asset adequacy analysis:

		Asset Adequacy Tested Amounts		Reserves and Liabilities	
		Formula Reserves (1)	Additional Actuarial Reserves (a) (2)	Analysis Method (b) (3)	Other Amount (3)
Statement Item					
<b>Exhibit 5</b>					
A	Life Insurance				
B	Annuities				
C	Supplementary Contracts With Life Contingencies				



<b>Asset Adequacy Tested Amounts</b>		<b>Reserves and Liabilities</b>			
<b>Statement Item</b>	<b>Formula Reserves (1)</b>	<b>Additional Actuarial Reserves (a) (2)</b>	<b>Analysis Method (b)</b>	<b>Other Amount (3)</b>	<b>Total Amount (1) + (2) + (3) (4)</b>
D Accidental Death Benefit					
E Disability - Active					
F Disability - Disabled					
G Miscellaneous					
Total (Exhibit 5 Item 1, Page 3)					
<b>Exhibit 6</b>					
A Active Life Reserve					
B Claim Reserve					
Total (Exhibit 6 Item 2, Page 3)					
<b>Exhibit 7</b>					
Premiums and Other Deposit Funds (Column 6, Line 14)					
Guaranteed Interest Contracts (Column 2, Line 14)					
Annuities Certain (Column 3, Line 14)					
Supplemental Contracts (Column 4, Line 14)					
Dividend Accumulations or Refunds (Column 5, Line 14)					
Total (Exhibit 7, Item 3, Page 3)					
<b>Exhibit 8 Part 1</b>					
1 Life (Page 3, Line 4.1)					
2 Health (Page 3, Line 4.2)					
Total Exhibit 8, Part 1					
Separate Accounts (Page 3 of the Annual Statement of the Separate Accounts, Lines 1 and 2)					
<b>TOTAL RESERVES</b>					

IMR (General Account, Page <u>3</u> , Line <u>9.4</u> )	
IMR (Separate Accounts, Page <u>3</u> , Line <u>3</u> )	
AVR (Page <u>3</u> , Line <u>24.1</u> )	(e)
Net Deferred and Uncollected Premium	

Notes to table of reserves and related actuarial items:  
 Page and line numbers refer to the 2005 blank. Corresponding entries from blanks from later years are to be substituted as appropriate.

- (a) The additional actuarial reserves are the reserves established under WAC 284-07-350 (5)(b).
- (b) The appointed actuary must state the method of analysis, determined in accordance with the standards for asset adequacy analysis referred to in WAC 284-07-350(4), by means of symbols which shall be defined in footnotes to the table.
- (c) Allocated amount of Asset Valuation Reserve (AVR)."
- (e) If the appointed actuary has relied on other experts to develop any portion of the analysis, the reliance paragraph must include a statement substantially similar to the following:

"I have relied on [name], [title] for [e.g., anticipated cash flows from currently owned assets, including variations in cash flows according to economic scenarios, or certain critical aspects of the analysis performed in conjunction with forming my opinion] as certified in the attached statement. I have reviewed the information relied upon for reasonableness."

A statement of reliance on other experts must be accompanied by a statement by each expert in the form prescribed by subsection (5) of this section.

(d) If the appointed actuary has examined the underlying asset and liability records, the reliance paragraph must also include substantially the following statement:

"My examination included a review of the actuarial assumptions, actuarial methods, the underlying basic asset and liability records, and other tests of the actuarial calculations I considered necessary. I also reconciled the underlying basic asset and liability records to [exhibits and schedules listed as applicable] of the company's current annual statement."

(e) If the appointed actuary has not examined the underlying records, but has relied upon listings or summaries of policies in force, or asset records, or both prepared by the company, the reliance paragraph must include a statement substantially similar to the following:

"In forming my opinion on [specify types of reserves] I relied upon data prepared by [name and title of company officer certifying in force records or other data] as certified in the attached statements. I evaluated that data for reasonableness and consistency. I also reconciled that data to [exhibits and schedules to be listed as applicable] of the company's current annual statement. In other respects my examination included review of the actuarial assumptions and actuarial methods used and tests of the actuarial calculations I considered necessary."

The paragraph must be accompanied by a signed statement by each person relied upon based on the form set forth in subsection (5) of this section.

(f) The opinion paragraph must include a statement substantially similar to the following:

"In my opinion the reserves and related actuarial values concerning the statement items identified above:

- (i) Are computed in accordance with presently accepted actuarial standards consistently applied and are fairly stated, in accordance with sound actuarial principles;
- (ii) Are based on actuarial assumptions which produce reserves at least as great as those called for in any contract provision as to reserve basis and method, and are in accordance with all other contract provisions;
- (iii) Meet the requirements of the insurance laws and regulations of the state of [state of domicile] and are at least as great as the minimum aggregate amounts required by the state in which this statement is filed;

- (iv) Are computed on the basis of assumptions consistent with those used in computing the corresponding items in the annual statement of the preceding year-end (with any exceptions noted below);
- (v) Include provision for all actuarial reserves and related statement items which ought to be established.

The reserves and related items, when considered in light of the assets held by the company with respect to such reserves and related actuarial items including, but not limited to, the investment earnings on the assets, and the considerations anticipated to be received and retained under the policies and contracts, make adequate provision, according to presently accepted actuarial standards of practice, for the anticipated cash flows required by the contractual obligations and related expenses of the company.

The actuarial methods, considerations, and analyses used in forming my opinion conform to the appropriate Standards of Practice as promulgated by the Actuarial Standards Board, which standards form the basis of this statement of opinion.

This opinion is updated annually as required by statute. To the best of my knowledge, there have been no material changes from the applicable date of the annual statement to the date of the rendering of this opinion which should be considered in reviewing this opinion.

or

The following material change(s) which occurred between the date of the statement for which this opinion is applicable and the date of this opinion should be considered in reviewing this opinion: (Describe the change or changes.)

The impact of unanticipated events subsequent to the date of this opinion is beyond the scope of this opinion. The analysis of asset adequacy portion of this opinion should be viewed recognizing that the company's future experience may not follow all the assumptions used in the analysis.

\_\_\_\_\_  
Signature of Appointed Actuary

\_\_\_\_\_  
Address of Appointed Actuary

\_\_\_\_\_  
Telephone Number of Appointed Actuary

\_\_\_\_\_  
Date"

(3) Assumptions for new issues: The adoption for new issues or new claims or other new liabilities of an actuarial assumption which differs from a corresponding assumption used for prior new issues or new claims or other new liabilities is not a change in actuarial assumptions within the meaning of this section.

(4) Adverse opinions: If the appointed actuary is unable to form an opinion, then he or she must refuse to issue a statement of actuarial opinion. If the appointed actuary's opinion is adverse or qualified, then he or she must issue an adverse or qualified actuarial opinion explicitly stating the reason(s) for the adverse opinion. This statement must follow the scope paragraph and precede the opinion paragraph.

(5) Reliance on data furnished by other persons: If the appointed actuary does not express an opinion as to the accuracy and completeness of the listings and summaries of policies in force or if the actuary relies on the certification of others on matters concerning the accuracy or completeness of any data underlying the actuarial opinion, or the appropriateness of any other information used by the appointed actuary in forming the actuarial opinion, the actuarial opinion must include the names of the persons the actuary is relying upon and a precise identification of the items subject to reliance. In addition, the persons on whom the appointed actuary relies must provide a certification that precisely identifies the items on which the person is providing information and a statement as to the accuracy, completeness or reasonableness of the items, as applicable. This certification must include the signature, title, company's legal name, address and telephone number of the person providing the certification, and the date on which it is signed. This certification must include the reporting date, the name of the appointed actuary, and must be attached to the opinion, in a form substantially similar to the following:

"I [name of officer], [title], of [name of company], hereby affirm that the listings and summaries of policies and contracts in force as of December 31, 20[ ], and other liabilities prepared for and submitted to [name of appointed actuary] were prepared under my direction and, to the best of my knowledge and belief, are substantially accurate and complete.

\_\_\_\_\_  
Signature of the Officer of the Company

\_\_\_\_\_  
Address of the Officer of the Company

\_\_\_\_\_  
Telephone Number of the Officer of the Company

\_\_\_\_\_  
Date")

comply with VM-30 of the *Valuation Manual*, as revised from time to time by the National Association of Insurance Commissioners, and as defined in RCW 48.74.015.

**AMENDATORY SECTION** (Amending WSR 08-01-077, filed 12/17/07, effective 1/17/08)

**WAC 284-07-390 Description of actuarial memorandum including an asset adequacy analysis and regulatory asset adequacy issues summary.** (1)((a)) In accordance with RCW 48.74.025, the appointed actuary must prepare a memorandum to the company describing the analysis done in

support of his or her opinion regarding the reserves. The memorandum must comply with VM-30 of the *Valuation Manual*, as revised from time to time by the National Association of Insurance Commissioners, and as defined in RCW 48.74.015. The memorandum must be made available for examination by the commissioner upon his or her request but ((will be returned to the company after the examination and)) will not be considered a record of the commissioner or subject to automatic filing with the commissioner.

((b)) In preparing the memorandum, the appointed actuary may rely on, and include as a part of his or her own memorandum, memoranda prepared and signed by other actuaries who are qualified within the meaning of WAC 284-07-350 (2), with respect to the areas covered in such memoranda, and must include a statement to that effect in their memoranda.

(c) If the commissioner requests a memorandum and an adequate memorandum is not provided within ten days after the request, or, if the commissioner finds that the analysis described in the memorandum fails to meet the standards of the Actuarial Standards Board or the standards and requirements of this regulation, the commissioner may designate a qualified actuary to review the opinion and prepare the supporting memorandum required for review. All reasonable and necessary expenses of the independent review must be paid by the company but all expenses related to the review will be directed and controlled by the commissioner.

(d)(i) The reviewing actuary must have the same status as an examiner for purposes of obtaining data from the company and the work papers and documentation of the reviewing actuary must be retained by the commissioner. Information provided by the company to the reviewing actuary and included in the work papers will be considered material provided by the company to the commissioner and will be kept confidential to the same extent as prescribed by law with respect to other material provided by the company to the commissioner.

(ii) The reviewing actuary must not be an employee of a consulting firm involved with the preparation of any prior memorandum or opinion for the company for the current year or any one of the preceding three years.

(e)) (2) In accordance with RCW 48.74.025, the appointed actuary must prepare a regulatory asset adequacy issues summary according to the requirements set forth in ((subsection (3) of this section)) VM-30 of the *Valuation Manual*, as revised from time to time by the National Association of Insurance Commissioners, and as defined in RCW 48.74.015. The regulatory asset adequacy issues summary must be submitted no later than ((March 15)) April 1st of the year following the year for which a statement of actuarial opinion based on asset adequacy is required. Except for a domestic life insurance company, the regulatory asset adequacy issues summary must be submitted only upon request of the commissioner. The regulatory asset adequacy issues summary has the standing of a memorandum in support of the actuarial opinion, and will be kept confidential to the extent and under the conditions provided for in RCW 48.74.025(4).

((2)) When an actuarial opinion is provided, the memorandum must demonstrate that the analysis has been completed in accordance with the standards for asset adequacy set forth in WAC 284-07-350(4) and any additional standards

required by the commissioner. The memorandum must include the following:

(a) For reserves:

(i) Product descriptions including market description, underwriting and other aspects of a risk profile, and the specific risks the appointed actuary deems significant;

(ii) Sources of liabilities in force;

(iii) Reserve methods and bases;

(iv) Investment reserves;

(v) Reinsurance arrangements;

(vi) Identification of any explicit or implied guarantees made by the general account in support of benefits provided through a separate account or under a separate account policy or contract and the methods used by the appointed actuary to provide for the guarantees in the asset adequacy analysis;

(vii) Documentation of assumptions, including comparisons with experience, to test reserves for the following:

(A) Lapse rates, both base and excess;

(B) Interest crediting rate strategy;

(C) Mortality;

(D) Policyholder dividend strategy;

(E) Competitor or market interest rate;

(F) Annuitization rates;

(G) Commissions and expenses; and

(H) Morbidity.

The documentation of the assumptions must allow an actuary reviewing the actuarial memorandum to form a conclusion regarding the reasonableness of the assumptions:

(b) For assets:

(i) Portfolio descriptions, including a risk profile disclosing the quality, distribution, and types of assets;

(ii) Investment and disinvestment assumptions;

(iii) Sources of asset data;

(iv) Asset valuation bases;

(v) Documentation of assumptions made for:

(A) Default costs;

(B) Bond call function;

(C) Mortgage prepayment function;

(D) Determining market value for assets sold due to disinvestment strategy; and

(E) Determining yield on assets acquired through the investment strategy.

The documentation of the assumptions must allow an actuary reviewing the actuarial memorandum to form a conclusion regarding the reasonableness of the assumptions:

(c) Analysis basis:

(i) Methodology;

(ii) Rationale for inclusion or exclusion of different blocks of business and how pertinent risks were analyzed;

(iii) Rationale for degree of rigor in analyzing different blocks of business, including the level of "materiality" that was used in determining how rigorously to analyze different blocks of business;

(iv) Criteria for determining asset adequacy, including the precise basis for determining if assets are adequate to cover reserves under "moderately adverse conditions" or other conditions, as specified in relevant actuarial standards of practice;

(v) Consideration of the impact of federal income taxes; and

(vi) The method of treating reinsurance in the asset adequacy analysis.

(d) Sensitivity testing: Impact of changes in assumptions used in asset adequacy analysis, based on sensitivity tests performed.

(e) Material changes: Summary of material changes in methods, procedures, or assumptions from prior year's asset adequacy analysis.

(f) Results:

(i) Schedules under each required scenario showing the cash flows by each of the major items of income, benefits, and expenses, statutory gains or losses, and statutory balance sheet, as modeled, for each year in the projection period; and

(ii) Summary of results.

(g) Conclusion(s).

(3) The regulatory asset adequacy issues summary must contain the name of the company for which the regulatory asset adequacy issues summary is being supplied and must be signed and dated by the appointed actuary providing the actuarial opinion. The regulatory asset adequacy issues summary must include all of the following:

(a) Descriptions of the scenarios tested, including whether those scenarios are stochastic or deterministic, and the sensitivity testing performed relative to those scenarios.

(i) If certain tests produce negative ending surplus in the aggregate, the actuary must describe those tests and state the amount of additional reserve as of the valuation date that, if held, would eliminate the negative aggregate surplus values.

(ii) The actuary must determine ending surplus values by either:

(A) Extending the projection period until the in force and associated assets and liabilities at the end of the projection period are immaterial; or

(B) Adjusting the surplus amount at the end of the projection period by an amount that appropriately estimates the value that can reasonably be expected to arise from the assets and liabilities remaining in force.

(b) An explanation of the extent to which the appointed actuary uses assumptions in the asset adequacy analysis that are materially different from the assumptions used in the previous asset adequacy analysis.

(c) A description of the amount of reserves and the identity of the product lines that had been subjected to asset adequacy analysis in the prior opinion but were not subject to analysis for the current opinion.

(d) Comments on any interim results that may be of significant concern to the appointed actuary.

(e) The methods used by the actuary to recognize the impact of reinsurance on the company's cash flows, including both assets and liabilities, under each of the scenarios tested.

(f) A paragraph explaining whether the actuary is satisfied that all options whether explicit or embedded, in any asset or liability (including but not limited to those affecting cash flows embedded in fixed income securities) and equity-like features in any investments have been appropriately considered in the asset adequacy analysis.

(4) The memorandum must include a statement substantially similar to the following:

"Actuarial methods, considerations, and analyses used in the preparation of this memorandum conform to the appropri-

ate Standards of Practice as promulgated by the Actuarial Standards Board, which standards form the basis for this memorandum."))

AMENDATORY SECTION (Amending WSR 95-02-036, filed 12/30/94, effective 1/30/95)

**WAC 284-07-400 Additional considerations for analysis.** (1) ((Aggregation: For the asset adequacy analysis for the statement of actuarial opinion provided in accordance with WAC 284-07-380, reserves and assets may be aggregated by either of the following methods:

(a) Aggregate the reserves and related actuarial items, and the supporting assets, for different products or lines of business, before analyzing the adequacy of the combined assets to mature the combined liabilities. The appointed actuary must be satisfied that the assets held in support of the reserves and related actuarial items so aggregated are managed in such a manner that the cash flows from the aggregated assets are available to help mature the liabilities from the blocks of business that have been aggregated.

(b) Aggregate the results of asset adequacy analysis of one or more products or lines of business, the reserves for which prove through analysis to be redundant, with the results of one or more products or lines of business, the reserves for which prove through analysis to be deficient. The appointed actuary must be satisfied that the asset adequacy results for the various products or lines of business for which the results are so aggregated:

(i) Are developed using consistent economic scenarios; or

(ii) Are subject to mutually independent risks, i.e., the likelihood of events impacting the adequacy of the assets supporting the redundant reserves is completely unrelated to the likelihood of events impacting the adequacy of the assets supporting the deficient reserves.

(c) In the event of any aggregation, the actuary must disclose that in his or her opinion such reserves were aggregated on the basis of method (a), (b)(i), or (b)(ii) of this subsection, whichever is applicable, and describe the aggregation in the supporting memorandum.

(2) Selection of assets for analysis: The appointed actuary shall analyze only those assets held in support of the reserves which are the subject for specific analysis, hereafter called "specified reserves." A particular asset or portion thereof supporting a group of specified reserves cannot support any other group of specified reserves. An asset may be allocated over several groups of specified reserves. The annual statement value of the assets held in support of the reserves shall not exceed the annual statement value of the specified reserves, except as provided in subsection (3) of this section. If the method of asset allocation is not consistent from year to year, the extent of its inconsistency should be described in the supporting memorandum.

(3) Use of assets supporting the interest maintenance reserve and the asset valuation reserve:

(i) An appropriate allocation of assets in the amount of the interest maintenance reserve (IMR), whether positive or negative, must be used in any asset adequacy analysis. Analysis of risks regarding asset default may include an appropri-

ate allocation of assets supporting the asset valuation reserve (AVR); these AVR assets may not be applied for any other risks with respect to reserve adequacy. Analysis of these and other risks may include assets supporting other mandatory or voluntary reserves available to the extent not used for risk analysis and reserve support.

(ii) The amount of the assets used for the AVR shall be disclosed in the Table of Reserves and Liabilities of the opinion and in the memorandum.

(iii) The method used for selecting particular assets or allocated portions of assets shall be disclosed in the memorandum.

(4) Required interest scenarios:

(a) For the purpose of performing the asset adequacy analysis required by this regulation, the qualified actuary shall follow standards adopted by the Actuarial Standards Board or equivalent standards approved in advance by the commissioner. In the analysis, the appointed actuary shall consider the effect of at least the following interest rate scenarios:

(i) Level with no deviation;

(ii) Uniformly increasing over ten years at a half percent per year and then level;

(iii) Uniformly increasing at one percent per year over five years and then uniformly decreasing at one percent per year to the original level at the end of ten years and then level;

(iv) An immediate increase of three percent and then level;

(v) Uniformly decreasing over ten years at a half percent per year and then level;

(vi) Uniformly decreasing at one percent per year over five years and then uniformly increasing at one percent per year to the original level at the end of ten years and then level; and

(vii) An immediate decrease of three percent and then level.

(b) For all scenarios used, projected interest rates for a five-year treasury note need not be reduced beyond the point where the five-year treasury note yield would be at fifty percent of its initial level.

(c) The beginning interest rates may be based on interest rates for new investments as of the valuation date similar to recent investments allocated to support the product being tested or be based on an outside index, such as treasury yields, of assets of the appropriate length on a date close to the valuation date.

(d) The method used to determine the beginning yield curve and associated interest rates shall be specifically defined. The beginning yield curve and associated interest rates shall be consistent for all interest rate scenarios.

(5)) Any additional consideration for analysis must be compiled in accordance with VM-30 of the *Valuation Manual*, as revised from time to time by the National Association of Insurance Commissioners, and as defined in RCW 48.74.-015.

(2) Documentation: The appointed actuary shall retain on file, for at least seven years, sufficient documentation so that it will be possible to determine the procedures followed, the analyses performed, the bases for assumptions, and the results obtained.

**WSR 20-21-056**  
**PERMANENT RULES**  
**LIQUOR AND CANNABIS**  
**BOARD**

[Filed October 14, 2020, 10:29 a.m., effective November 14, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: WAC 314-55-013 Voluntary marijuana licensee consultation and education program, the Washington state liquor and cannabis board has adopted a new section of rule to establish a voluntary compliance program for marijuana licensees consistent with the mandates of ESSB 5318 (chapter 394, Laws of 2019), now codified as RCW 69.50-342(3) and 69.50.561.

Citation of Rules Affected by this Order: WAC 314-55-013.

Statutory Authority for Adoption: RCW 69.50.342, 69.50.561.

Adopted under notice filed as WSR 20-16-153 on August 5, 2020.

A final cost-benefit analysis is available by contacting Katherine Hoffman, 1025 Union Avenue S.E., Olympia, WA 98501, phone 360-664-1622, fax 360-664-9689, email rules@lcb.wa.gov, website www.lcb.wa.gov.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 1, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 1, Amended 0, Repealed 0.

Date Adopted: October 14, 2020.

Jane Rushford  
Chair

**NEW SECTION**

**WAC 314-55-013 Voluntary marijuana licensee consultation and education program. (1) Purpose and scope.** The purpose of this section is to:

(a) Establish a program for marijuana licensee consultation and education visits consistent with the requirements of RCW 69.50.342(3) and 69.50.561;

(b) Establish criteria for the provision of advice, consultation, and education visits including, but not limited to, recommendations on abating violations of this chapter;

(c) Ensure that advice, consultation and education visits are distinguished from inspections, technical visits, or investigations, and are limited to interpretation and applicability of standards in this chapter including, but not limited to, the conditions, structures, machines, equipment, apparatus,

devices, materials, methods, means and practices in the licensee's licensed premise; and

(d) Advice, consultation, and educational visits provided under this program do not include business advice concerning issues that may include, but are not limited to, individual business operations, marketing, distribution, financing, profitability, or viability.

**(2) Definitions.**

(a) For purposes of this chapter, "a direct or immediate relationship to public health and safety" or "a direct or immediate risk to public health and safety" means, where the board can prove by a preponderance of the evidence:

(i) Diversion of marijuana product out of the regulated market or sales across state lines;

(ii) Furnishing of marijuana product to persons under twenty-one years of age;

(iii) Diversion of revenue to criminal enterprise, gangs, cartels, or parties not qualified to hold a marijuana license based on criminal history requirements;

(iv) The commission of nonmarijuana-related crimes; or

(v) Knowingly making a misrepresentation of fact to the board, an officer of the board, or an employee of the board related to the conduct or action that is, or is alleged to be, any of the violations identified in (a)(i) through (iv) of this subsection.

(vi) Violations outlined in WAC 314-55-509 (1)(a), (b), and (c), and more fully described in WAC 314-55-520, 314-55-521, and 314-55-522.

(b) The definitions contained in chapters 314-55 WAC and 69.50 RCW also apply to this section.

**(3) Request for consultation.**

(a) A marijuana licensee or their designee may make one request for advice and consultation per year by completing and submitting an application to request consultation through the board's website. Additional requests may be considered at the board's discretion.

(b) A board representative will schedule and complete advice and consultation visits within forty-five calendar days of receipt of the request for consultation.

(i) If the marijuana licensee or designee, or the board representative requires more than forty-five calendar days to schedule and complete the consultation visit, the board representative may extend the completion deadline.

(ii) If the deadline is extended, at the licensee's request, more than sixty days after the board's receipt of the request for consultation, the marijuana licensee must resubmit a request for consultation consistent with this section.

**(4) Advice and consultation services.**

(a) Advice and consultation services offered in connection with a request for consultation do not preclude informal requests, or usual and customary interactions between licensees, the board, or any board staff.

(b) Regulatory issues described in this chapter observed during the course of an advice, consultation, and education visit are not subject to disciplinary action unless the identified issue has a direct or immediate relationship to public health and safety.

(c) Advice, consultation, education, and any written report or documentation provided under this section is lim-

ited to the matters specified in the request for consultation. At the request of the licensee, a consultation may include:

(i) An initial meeting to explain the licensee's rights and obligations;

(ii) A walk-through visit to evaluate the compliance concerns specified in the request for consultation;

(iii) A closing meeting to discuss conditions noted during the initial visit to make recommendations;

(iv) A written report of conditions found in the marijuana licensee's place of business and any recommendations or agreements made; or

(v) A follow-up visit, if appropriate, to ensure that the conditions specified in the request for consultation have been satisfactorily abated.

(d) If an identified condition is not a direct or immediate risk to public health and safety, the condition will be documented in the appropriate database as part of the consultation visit, and will include the following:

(i) A detailed description of the condition that is not in compliance;

(ii) The full text of the specific section or subsection of the statute or rule applicable to the condition that is not in compliance;

(iii) A statement and complete description of the actions and steps the licensee or their designee must take to achieve compliance;

(iv) The date, method of service, name, and signature of the licensee, their designee, or both participating in the visit; and

(v) The date that the licensee or their designee must achieve compliance. This date may be mutually agreed upon by the board representative and the licensee or their designee, and may be based on a variety of factors including, but not limited to, the cost and severity of the conditions to be abated.

(e) A consultation report or notice to correct made by a board representative under this section is not a formal enforcement action.

(f) The board representative will provide the licensee or their designee with instructions regarding how to request an extension of time consistent with subsection (5) of this section.

(g) The board representative may perform a follow-up visit within sixty days of the mutually agreed upon compliance date based on the severity of the conditions described in this section.

**(5) Licensee responsibilities.**

(a) A marijuana licensee or their designee agrees to work with the board representative to schedule a consultation visit at a mutually agreed upon date and time.

(b) A marijuana licensee or their designee agrees to make reasonable efforts to correct or abate all conditions identified in the statement of conditions within the mutually agreed upon date and time.

(c) If a marijuana licensee or their designee is unable to correct or abate all of the conditions identified in the statement of conditions, the licensee or their designee may request an extension of time by submitting a written request. The written request must describe:

(i) The need for the extension;

(ii) Confirmation of the steps taken to abate the conditions described in the statement of conditions; and

(iii) A proposed abatement date.

**WSR 20-21-070**

**PERMANENT RULES**

**EMPLOYMENT SECURITY DEPARTMENT**

[Filed October 16, 2020, 8:08 a.m., effective November 16, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The employment security department (ESD) is implementing public disclosure and privacy rules in accordance with requirements determined by ESB 5439 (chapter 81, Laws of 2019). The rule making repeals WAC 192-15-101, 192-15-020, 192-15-030, 192-15-040, 192-15-050, 192-15-060, 192-15-070, 192-15-080, 192-15-090, 192-15-100, 192-15-110, 192-15-120, 192-15-130, 192-15-140, 192-15-150, 192-15-160, and 192-15-170 regarding public disclosure and privacy of information. Public record disclosure is the subject of a separate rule making, as filed in WSR 19-18-010.

Citation of Rules Affected by this Order: New WAC 192-15-500, 192-15-510, 192-15-520, 192-15-530, 192-15-540 and 192-15-550; and repealing WAC 192-15-101, 192-15-020, 192-15-030, 192-15-040, 192-15-050, 192-15-060, 192-15-070, 192-15-080, 192-15-090, 192-15-100, 192-15-110, 192-15-120, 192-15-130, 192-15-140, 192-15-150, 192-15-160, and 192-15-170.

Statutory Authority for Adoption: RCW 50.12.010 and 50.12.040 provide general rule-making authority to ESD. RCW 50.13.030 provides the department with specific authority to adopt rules interpreting and implementing chapter 50.13 RCW, Records and information—Privacy and confidentiality.

Adopted under notice filed as WSR 20-15-137 on July 21, 2020.

A final cost-benefit analysis is available by contacting Joshua Dye, P.O. Box 9046, Olympia, WA 98507-9046, phone 360-890-3472, TTY 360-507-9890, relay 711, email rules@esd.wa.gov, website www.esd.wa.gov/newsroom/rule-making/other/data-privacy.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 6, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 17.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 6, Amended 0, Repealed 17.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 12, 2020.

Dan Zeitlin  
Policy Director

### Chapter 192-15 WAC

#### ~~((PUBLIC DISCLOSURE AND PRIVACY OF INFORMATION))~~ DATA PRIVACY

##### NEW SECTION

**WAC 192-15-500 Purpose.** Interpret and implement the provisions of chapter 50.13 RCW concerning the privacy and confidentiality of information or records held by the employment security department.

##### NEW SECTION

**WAC 192-15-510 Access to records or information by government agencies.** (1) Applications by government agencies for information or records deemed private and confidential by chapter 50.13 RCW shall be made:

(a) To the public records officer as defined in WAC 192-02-020(2); and

(b) Pursuant to WAC 192-02-060.

(2) If the public records officer:

(a) Is reasonably satisfied that the application meets the requirements of RCW 50.13.060, the department will provide access to the information or records.

(b) Is not reasonably satisfied that the application meets the requirements of RCW 50.13.060, the department may refuse to provide access. The department will provide notification of the denial as prescribed in WAC 192-02-130.

(3) The department shall establish procedures for providing records used for detection of fraud by claimants under various social programs administered by government agencies pursuant to RCW 50.13.060(5). Further investigation of department files concerning these individuals may be accomplished only if the normal requirements of RCW 50.13.060 are met.

(4) The term "other official of the agency" as used in RCW 50.13.060 (1)(b) means an employee who has substantial responsibility for the operation of the requesting agency or for one or more of its programs or administrative units.

##### NEW SECTION

**WAC 192-15-520 Response to subpoenas.** An employee called to testify in a judicial or administrative proceeding shall not disclose information or records deemed private and confidential under chapter 50.13 RCW, unless:

(1) The presiding officer makes a finding that the need for the disclosure outweighs any reasons for the privacy and confidentiality of the records or information; or

(2) The employee is responding to a subpoena or other compulsory process containing a finding by the presiding officer that the need for the disclosure outweighs any reasons for the privacy and confidentiality of the records or information.

##### NEW SECTION

**WAC 192-15-530 Access to records—Operation and management.** (1) The department may provide incidental access to private or confidential information and records by private parties who are assisting the department in such areas as data processing and collection of employment security contributions pursuant to RCW 50.13.080.

(2) Persons provided incidental access to private and confidential records:

(a) Are bound by the rules of confidentiality and privacy applicable to departmental employees;

(b) Will be monitored by the department to ensure that private and confidential information or records are being handled correctly; and

(c) Are subject to any penalties provided under state or federal law for the breach of any confidentiality provision.

##### NEW SECTION

**WAC 192-15-540 Consent to release of records or information.** (1) Consent to release of information or records deemed private and confidential under RCW 50.13.100 shall be liberally interpreted so that the department may release information or records to third parties who supply the department with reasonable written or oral assurances of their identity and the department already has a release on file that meets the requirements of subsection (2) of this section.

(2) The release provided by a third party must include:

(a) Specifically identifying information of the data to be disclosed;

(b) Acknowledgment that department information will be accessed to obtain the information;

(c) The specific purpose or purposes for which the information is sought and a statement that information obtained under the release will only be used for that purpose or purposes;

(d) The parties who may receive the information disclosed;

(e) A written or electronic signature by the individual or employer being represented;

(f) A statement that provides the purpose of the release, which shall be limited to:

(i) Providing a service or benefit to the individual signing the release; or

(ii) Carrying out the administration or evaluation of a public program.

(3) In cases where a certain record contains information about more than one individual or employing unit:

(a) All individuals or employing units concerned must give consent before a record may be released or disclosed to other than the individuals or employing units;

(b) Records for individuals or employing units that give consent may be provided if the records for individuals or employing units that do not give consent are redacted; or

(c) The request may be denied if all individuals and employing units do not provide consent and records are not able to be redacted in order to protect the privacy of individuals or employing units that do not give consent.

(4) An attorney who can provide reasonable written assurance that they represent an interested party, as defined



by WAC 192-04-040, in a proceeding before the appeal tribunal or commissioner, may have access to confidential information or records that are material to the issues in that proceeding.

#### NEW SECTION

**WAC 192-15-550 Disclosure related to employment security programs.** Chapter 50.13 RCW shall not be interpreted to prevent the employment security department from:

(1) Disclosing information in carrying out the department's duties under Title 50 RCW or under any other program for which the department is responsible;

(2) Disclosing information to the unemployment insurance agencies of other states when such disclosure relates to the administration of the unemployment insurance law of the requesting state; or

(3) Disclosing information when such disclosure is required by the federal government in connection with or as a condition of funding for a program being administered by the department.

#### REPEALER

The following sections of the Washington Administrative Code are repealed:

- WAC 192-15-010 Purpose.
- WAC 192-15-020 Definitions.
- WAC 192-15-030 Description of central and field organization of employment security department.
- WAC 192-15-040 Procedures for obtaining public records—Designation of departmental employees responsible for public records.
- WAC 192-15-050 Commissioner's review of denials of public records requests.
- WAC 192-15-060 Access to individual or employing unit records or information by government agencies—RCW 50.13.060.
- WAC 192-15-070 Response to subpoenas—RCW 50.13.070.
- WAC 192-15-080 Access to public records for operation and management purposes—RCW 50.13.080.
- WAC 192-15-090 Consent to release of records or information—RCW 50.13.100.
- WAC 192-15-100 Disclosure related to employment security programs.
- WAC 192-15-110 Public records available.
- WAC 192-15-120 Office hours.
- WAC 192-15-130 Copying.
- WAC 192-15-140 Protection of public records.

- WAC 192-15-150 Records index—Available material.
- WAC 192-15-160 Responsible addressee.
- WAC 192-15-170 Forms.

#### **WSR 20-21-071**

#### **PERMANENT RULES**

#### **EMPLOYMENT SECURITY DEPARTMENT**

[Filed October 16, 2020, 8:11 a.m., effective November 16, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The employment security department (ESD) is seeking to adopt public disclosure and privacy rules. These rules will update the existing procedures governing public records requests made to the department and clarify the operation of the department's public records office under the Public Records Act.

Citation of Rules Affected by this Order: New WAC 192-02-010, 192-02-020, 192-02-030, 192-02-040, 192-02-050, 192-02-060, 192-02-070, 192-02-080, 192-02-090, 192-02-100, 192-02-110, 192-02-120, 192-02-130, 192-02-140, 192-02-150, 192-02-160, 192-02-170, 192-02-180, 192-02-190, 192-02-200, and 192-02-210.

Statutory Authority for Adoption: RCW 50.12.010 and 50.12.040 provide general rule-making authority to ESD. RCW 50.13.030 provides the department with specific authority to adopt rules interpreting and implementing chapter 50.13 RCW. RCW 42.56.100 provides rule-making authority to all agencies regarding public records.

Adopted under notice filed as WSR 20-15-139 on July 21, 2020.

A final cost-benefit analysis is available by contacting Joshua Dye, P.O. Box 9046, Olympia, WA 98507-9046, phone 360-890-3472, TTY 360-507-9890, relay 711, email rules@esd.wa.gov, website www.esd.wa.gov/newsroom/rule-making/other/public-records-procedures.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 21, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 21, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 12, 2020.

Dan Zeitlin  
Policy Director

**Chapter 192-02 WAC**  
**PUBLIC RECORDS REQUESTS**

NEW SECTION

**WAC 192-02-010 Purpose.** The purpose of this chapter is to:

(1) Ensure compliance by the employment security department with the provisions of chapter 42.56 RCW concerning disclosure of public records; and

(2) Inform the public of the procedures used by the department for requesting, producing, and disclosing public records.

NEW SECTION

**WAC 192-02-020 Definitions.** (1) "Public record" includes any writing containing information relating to the conduct of government or the performance of any governmental or proprietary function prepared, owned, used, or retained by the department regardless of physical form or characteristics.

(2) "Public records officer" means the public records officer of the employment security department or the designee of the public records officer.

(3) "Writing" means handwriting, typewriting, printing, photostating, photographing, and every other means of recording any form of communication or representation including, but not limited to, letters, words, pictures, sounds, or symbols, or combination thereof, and all papers, maps, magnetic or paper tapes, photographic films and prints, motion picture, film and video recordings, magnetic or punched cards, discs, drums, diskettes, sound recordings, and other documents including existing data compilations from which information may be obtained or translated.

NEW SECTION

**WAC 192-02-030 Availability of public records.** (1) Public records are available for inspection and copying during normal business hours of the department, as listed on the department's website.

(2) Records must be inspected at the offices of the department.

(3) Many public records are available for inspection and copying on the department's website at any time, at no cost.

NEW SECTION

**WAC 192-02-040 Records index.** (1) The department finds that maintaining an index is unduly burdensome and would interfere with agency operations.

(2) Maintaining an index unduly burdens and interferes with the department's operations since there is no single index of department records, which are stored in multiple locations, and are frequently modified.

NEW SECTION

**WAC 192-02-050 Purpose of requests.** (1) If a request is for a list of individuals, the department may:

(a) Ask the requestor if records are intended for a commercial purpose; and

(b) Require the requestor to provide information about the purpose of the use of the list.

(2) The department should specify on its request form that the department is not authorized to provide public records consisting of a list of individuals for a commercial use under RCW 42.56.070(8).

NEW SECTION

**WAC 192-02-060 Making a request for public records.** (1) To request access to public records of the department, or seek assistance in making such a request, contact the public records officer at:

Public Records Officer  
P.O. Box 9046  
Olympia, WA 98507-9046  
Phone: 1-844-766-8930  
Email: recordsdisclosure@esd.wa.gov

(2) Any person wishing to inspect or copy public records of the department shall make the request in writing to the public records officer through one of the following:

(a) On the department's request form;

(b) Through an online portal designated by the department for this purpose;

(c) By letter mailed to the address listed in subsection (1) of this section;

(d) By email sent to the address listed in subsection (1) of this section; or

(e) By submitting the request in person at the address provided on the department's website.

(3) Public records request should include:

(a) The name of requestor;

(b) The address of requestor;

(c) Other contact information, including telephone number and any email address;

(d) Identification of the public records adequate for the public records officer to locate the records; and

(e) The date and time of day of the request.

(4) If the requestor wishes to have copies of the records made instead of simply inspecting them, the requestor should so indicate and make arrangements to pay for copies of the records or a deposit.

(5) A records request form is available for use by requestors at the office of the public records officer and online at the department's website.

(6) If requestors refuse to identify themselves or provide sufficient contact information, the department will respond to the extent feasible and consistent with the law.

NEW SECTION

**WAC 192-02-070 Records exempt from disclosure.** (1) Some records are exempt from disclosure, in whole or in part.

(2) If the department believes that a record is exempt from disclosure and should be withheld, the public records officer will provide:

- (a) The specific exemption; and
- (b) A written explanation of why the record or a portion of the record is being withheld.
- (3) If only a portion of a record is exempt from disclosure, but the remainder is not exempt, the public records officer will:
  - (a) Redact the exempt portions;
  - (b) Provide the nonexempt portions; and
  - (c) Indicate to the requestor in writing why portions of the record are being redacted.

NEW SECTION

**WAC 192-02-080 Closing withdrawn or abandoned request.** (1) The public records officer may close a request when the requestor:

- (a) Withdraws the request; or
- (b) Fails to:
  - (i) Clarify a request at the direction of the department;
  - (ii) Fulfill the requestor's obligations to inspect the records;
  - (iii) Pay the deposit;
  - (iv) Pay the required fees for an installment;
  - (v) Pay a customized service charge;
  - (vi) Make the final payment for the requested copies.
- (2) The department will indicate to the requestor that the department has closed the request, unless the department has already indicated in previous correspondence that the request would be closed under the circumstances in subsection (1) of this section.

NEW SECTION

**WAC 192-02-090 Later discovered documents.** If, after the department has informed the requestor that it has provided all available records, the department becomes aware of additional responsive documents existing at the time of the request, the department will:

- (1) Promptly inform the requestor of the additional documents; and
- (2) Provide the discovered documents on an expedited basis.

NEW SECTION

**WAC 192-02-100 No duty to create records.** The department is not obligated to create a new record to satisfy a records request.

NEW SECTION

**WAC 192-02-110 Maintaining a log.** The department must maintain a log of public records requests to include:

- (1) The identity of the requestor if provided by the requestor;
- (2) The date the request was received;
- (3) The text of the original request;
- (4) A description of the records redacted or withheld and the reasons therefor; and
- (5) The date of the final disposition of the request.

NEW SECTION

**WAC 192-02-120 Providing records in installments.**

- (1) If applicable, the department may provide:
  - (a) Records on a partial or installment basis as records that are part of a larger set of requested records are assembled or made ready for inspection or disclosure;
  - (b) Links to records on the agency's website as an installment;
  - (c) Installments as the records are assembled; and
  - (d) Records in logical batches.
- (2) The department may choose to only assemble the first installment. If the requestor claims or reviews the first installment, the department will then assemble the next installments.
- (3) The department may assess charges per installment for copies made for the requestor, unless the department is using the flat fee charge provided in RCW 42.56.120.

NEW SECTION

**WAC 192-02-130 Denials of requests.** (1) A denial of a request for records will be accompanied by a written statement of the specific reasons therefor.

- (2) If the department denies a requestor access to public records because it claims the record is exempt in whole or in part from disclosure, the requestor may request the attorney general's office to review the matter, pursuant to RCW 42.56.530. The attorney general has adopted rules on such requests in WAC 44-06-160.

- (3) Any person may obtain court review of denials of public records requests pursuant to RCW 42.56.550.

NEW SECTION

**WAC 192-02-140 Fee schedule.** The fee schedule is available on the department's website.

NEW SECTION

**WAC 192-02-150 Costs—General.** (1) In order to timely implement a fee schedule consistent with the Public Records Act, it is more cost efficient, expeditious, and in the public interest for the department to adopt the state legislature's approved fees and costs for most of the department records, as authorized in RCW 42.56.120 and as published in the agency's fee schedule. Notwithstanding, for unemployment insurance records covered by chapter 192-15 WAC, the department may charge fees for records consistent with state or federal law.

- (2) The department is not calculating actual costs for copying its records because to do so would be unduly burdensome for the following reasons:

- (a) The department does not have the resources to conduct a study to determine actual copying costs for all its records.
- (b) Conducting a study to determine actual copying costs would interfere with other essential department functions.
- (c) Through the legislative process, the public and requestors have commented on and been informed of autho-

rized fees and costs provided in the Public Records Act, including RCW 42.56.120 and other laws.

NEW SECTION

**WAC 192-02-160 Costs—Customized services.** (1) If the department estimates that a request would require the use of information technology expertise to prepare data compilations, or provide customized electronic access services when such compilations and customized access services are not used by the department for other department purposes, the department may impose a customized service charge.

(2) The customized service charge is:

(a) Intended to reimburse the department up to the actual cost of providing the customized services; and

(b) In addition to the charge imposed for providing copies of public records.

(3) The department will:

(a) Notify the requestor of the customized service charge to be applied to the request;

(b) Include:

(i) An explanation of why the customized service charge applies;

(ii) A description of the specific expertise; and

(iii) A reasonable estimate cost of the charge.

(c) Provide the requestor the opportunity to amend the request in order to avoid or reduce the cost of a customized service charge.

NEW SECTION

**WAC 192-02-170 Costs—Inspection.** There is no fee for inspecting public records, including inspecting records on the department's website.

NEW SECTION

**WAC 192-02-180 Costs—Mailing.** The department may charge actual costs of mailing, including the cost of the shipping container.

NEW SECTION

**WAC 192-02-190 Payments.** Payment may be made to the department by:

(1) Check;

(2) Money order; or

(3) Other means as provided by the department.

NEW SECTION

**WAC 192-02-200 Processing payments.** (1) Before beginning to make copies or processing a customized service, the public records officer may require a deposit of up to ten percent of the estimated costs of copying all the records selected by the requestor.

(2) The public records officer may require:

(a) The payment of the remainder of the copying costs before providing all of the records;

(b) The payment of the costs of copying an installment before providing that installment; or

(c) The payment of a customized service charge.

(3) The department will not charge sales tax when it makes copies of public records.

NEW SECTION

**WAC 192-02-210 Fee waivers.** Requestors are required to pay for copies in advance of receiving records. Fee waivers are an exception and are available for some small requests under the conditions set by the department and available on its website.

**WSR 20-21-080**

**PERMANENT RULES**

**BUILDING CODE COUNCIL**

[Filed October 19, 2020, 11:24 a.m., effective February 1, 2021]

Effective Date of Rule: February 1, 2021.

Purpose: To correct various internal references and typographical errors in the 2018 Washington State Energy Code, Commercial, chapter 51-11C WAC.

Citation of Rules Affected by this Order: Amending 41.

Statutory Authority for Adoption: RCW 19.27A.025, 19.27A.045.

Other Authority: Chapter 19.27 RCW.

Adopted under notice filed as WSR 20-12-103 on June 3, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 41, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: September 10, 2020.

Diane Glenn  
Council Chair

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40211 Section C402.1.1—Low energy buildings.**

**C402.1.1 Low energy buildings, semi-heated buildings and greenhouses.** Low energy buildings shall comply with Section C402.1.1.1. Semi-heated buildings and spaces shall comply with Section C402.1.1.2. Greenhouses shall comply with Section C402.1.1.3.

**C402.1.1.1 Low energy buildings.** The following buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this code shall be exempt from all thermal envelope provision of this code:

1. Those that are heated and/or cooled with a peak design rate of energy usage less than 3.4 Btu/h × ft<sup>2</sup> (10.7 W/m<sup>2</sup>) or 1.0 watt/ft<sup>2</sup> (10.7 W/m<sup>2</sup>) of floor area for space conditioning purposes.
2. Those that do not contain *conditioned space*.
3. Unstaffed equipment shelters or cabinets used solely for personal wireless service facilities.

**C402.1.1.2 Semi-heated buildings and spaces.** The building envelope of *semi-heated* buildings, or portions thereof, shall comply with the same requirements as that for conditioned spaces in Section C402, except as modified by this section. The total installed output capacity of mechanical space conditioning systems serving a *semi-heated* building or space shall comply with Section C202. Building envelope assemblies separating conditioned space from *semi-heated space* shall comply with exterior envelope insulation requirements. *Semi-heated spaces* heated by mechanical systems that do not include electric resistance heating equipment are not required to comply with the opaque wall insulation provisions of Section C402.2.3 for walls that separate *semi-heated spaces* from the exterior or low energy spaces. *Semi-heated spaces* shall be calculated separately from other conditioned spaces for compliance purposes. Opaque walls in *semi-heated* spaces shall be calculated as fully code compliant opaque walls for both the target and proposed for the Target UA calculations for Component Performance compliance per Section C402.1.5, and for the Standard Reference Design for Total Building Performance compliance per Section C407. The capacity of heat trace temperature maintenance systems complying with Section C404.7.2 that are provided for freeze protection of piping and equipment only shall not be included in the total installed output capacity of mechanical space conditioning systems.

- EXCEPTION: Building or space may comply as semi-heated when served by one or more of the following system alternatives:
1. Electric infrared heating equipment for localized heating applications.
  2. Heat pumps with cooling capacity permanently disabled, as preapproved by the jurisdiction.

**C402.1.1.3 Greenhouses.** *Greenhouse* structures or areas that comply with all of the following shall be exempt from the building envelope requirements of this code:

1. Exterior opaque envelope assemblies (~~(comply)~~) complying with Sections C402.2 and C402.4.4.
- EXCEPTION: Low energy greenhouses that comply with Section C402.1.1.1.
2. Interior partition building thermal envelope assemblies that separate the *greenhouse* from conditioned space complying with Sections C402.2, C402.4.3 and C402.4.4.
  3. Nonopaque envelope assemblies complying with the thermal envelope requirements in Table C402.1.1.3. The *U*-factor for the nonopaque roof shall be for the roof assembly

or a roof that includes the assembly and an internal curtain system.

EXCEPTION: Unheated *greenhouses*.

4. No mechanical cooling is provided.
5. For heated greenhouses, heating is provided by a radiant heating system, a condensing natural gas-fired or condensing propane-fired heating system, or a heat pump with cooling capacity permanently disabled as preapproved by the jurisdiction.

**Table C402.1.1.3**

**Non-Opaque Thermal Envelope Maximum Requirements**

Component <i>U</i> -Factor BTU/h-ft <sup>2</sup> -°F	Climate Zone 5 and Marine 4
Non-opaque roof	0.5
Non-opaque SEW wall	0.7
Non-opaque N wall	0.6

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40215 Section C402.1.5—Component performance alternative.**

**C402.1.5 Component performance alternative.** Building envelope values and fenestration areas determined in accordance with Equation 4-2 shall be permitted in lieu of compliance with the *U*-factors and *F*-factors in Table C402.1.4 and C402.4 and the maximum allowable fenestration areas in Section C402.4.1.

For buildings with more than one *space conditioning category*, component performance compliance shall be demonstrated separately for each space conditioning category. Interior partition ceilings, walls, fenestration and floors that separate space conditioning areas shall be applied to the component performance calculations for the space conditioning category with the highest level of space conditioning.

**Equation 4-2**

$$\text{Proposed Total UA} \leq \text{Allowable Total UA}$$

**Where:**

- Proposed Total UA** = UA-glaz-prop + UA sky-prop + UA-opaque-prop + FL-slab-prop
- Allowable Total UA** = UA-glaz-allow + UA-glaz-excess + UA sky-allow + UA-sky-excess + UA-opaque-allow + FL-slab-allow
- UA-glaz-prop** = Sum of (proposed *U*-value x proposed area) for each distinct vertical fenestration type, up to code maximum area

<b>UA-sky-prop</b>	= Sum of (proposed <i>U</i> -value x proposed area) for each distinct skylight type, up to the code maximum area
<b>UA-opaque-prop</b>	= Sum of (proposed <i>U</i> -value x proposed area) for each distinct opaque thermal envelope type
<b>FL-slab-prop</b>	= Sum of (proposed <i>F</i> -value x proposed length) for each distinct slab on grade perimeter assembly
<b>UA-glaz-allow</b>	= Sum of (code maximum vertical fenestration <i>U</i> -value from Table C402.4, or Section C402.4.1.1.2 if applicable, x proposed area) for each distinct vertical fenestration type, not to exceed the code maximum area <sup>1</sup>
<b>UA-glaz-excess</b>	= <i>U</i> -value for the proposed wall type from Table C402.4 <sup>2</sup> x vertical fenestration area in excess of the code maximum area
<b>UA-sky-allow</b>	= Sum of (code maximum skylight <i>U</i> -value from Table C402.4 x proposed area) for each distinct skylight type proposed, not to exceed the code maximum area
<b>UA-sky-excess</b>	= <i>U</i> -value for the proposed roof type from Table C402.4 <sup>3</sup> x skylight area in excess of the code maximum area
<b>UA-opaque-allow</b>	= Code maximum opaque envelope <i>U</i> -value from Table C402.1.4 for each opaque door, wall, roof, and floor assembly x proposed area
<b>FL-slab-allow</b>	= Code maximum <i>F</i> -value for each slab-on-grade perimeter assembly x proposed length

**Notes:**

<sup>1</sup> Where multiple vertical fenestration types are proposed and the code maximum area is exceeded, the *U*-value shall be the average Table C402.1.4 *U*-value weighted by the proposed vertical fenestration area of each type.

<sup>2</sup> Where multiple wall types are proposed the *U*-value shall be the average Table C402.1.4 *U*-value weighted by the proposed above grade wall area of each type.

<sup>3</sup> Where multiple roof types are proposed the *U*-value shall be the average Table C402.1.4 *U*-value weighted by the proposed roof area of each type.

**C402.1.5.1 Component *U*-factors.** The *U*-factors for typical construction assemblies are included in Chapter 3 and Appendix A. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 3 or Appendix A, values shall be calculated in accordance with the ASHRAE *Handbook—Fundamentals*, using the framing factors listed in Appendix A.

For envelope assemblies containing metal framing, the *U*-factor shall be determined by one of the following methods:

1. Results of laboratory measurements according to acceptable methods of test.
2. ASHRAE *Handbook—Fundamentals* where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in ASHRAE *Handbook—Fundamentals*.
4. Effective framing/cavity *R*-values as provided in Appendix A.

When return air ceiling plenums are employed, the roof/ceiling assembly shall:

- a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and
- b. For gross area purposes, be based upon the interior face of the upper plenum surface.

5. Tables in ASHRAE 90.1 Normative Appendix A.

6. Calculation method for steel-framed walls in accordance with Section C402.1.4.1 and Table C402.1.4.1.

**C402.1.5.2 SHGC rate calculations.** Fenestration SHGC values for individual components and/or fenestration are permitted to exceed the SHGC values in Table C402.4 and/or the maximum allowable fenestration areas in Section C402.4.1 where the proposed ((values result in SHGC<sub>A,p</sub>)) total SHGC<sub>CxA</sub> less than ((SHGC<sub>A,p</sub>)) the allowable total SHGC<sub>CxA</sub> as determined by Equation((§) 4-3 ((and 4-4)).

**Equation 4-3—SHGC Rate Calculations**

**Proposed Total SHGC<sub>CxA</sub> ≤ Allowable Total SHGC<sub>CxA</sub>**

Where:

Proposed Total SHGC <sub>CxA</sub>	= SHGC <sub>CxA</sub> -glaz-prop + SHGC <sub>CxA</sub> -sky-prop
Allowable Total SHGC <sub>CxA</sub>	= SHGC <sub>CxA</sub> -glaz-allow + SHGC <sub>CxA</sub> -sky-allow
SHGC <sub>CxA</sub> -glaz-prop	= Sum of (proposed SHGCx proposed area) for each distinct vertical fenestration type
SHGC <sub>CxA</sub> -sky-prop	= Sum of (proposed SHGCx proposed area) for each distinct skylight type

- SHGCxA-glaz-allow = Sum of (code maximum vertical fenestration SHGC from Table C402.4, or Section C402.4.1.3 if applicable, x proposed area) for each distinct vertical fenestration type, not to exceed the code maximum area
- SHGCxA-sky-allow = Sum of (code maximum skylight SHGC from Table C402.4x proposed area) for each distinct skylight type, not to exceed the code maximum area

If the proposed vertical fenestration area does not exceed the Vertical Fenestration Area allowed, the target area for each vertical fenestration type shall equal the proposed area. If the proposed vertical fenestration area exceeds the Vertical Fenestration Area allowed, the target area of each vertical fenestration element shall be reduced in the base envelope design by the same percentage and the net area of each above-grade wall type increased proportionately by the same percentage so that the total vertical fenestration area is exactly equal to the Vertical Fenestration Area allowed.

If the proposed skylight area does not exceed the Allowable Skylight Area from Section C402.4.1, the target area shall equal the proposed area. If the proposed skylight area exceeds the Allowable Skylight Area from Section C402.4.1, the area of each skylight element shall be reduced in the base envelope design by the same percentage and the net area of each roof type increased proportionately by the same percentage so that the total skylight area is exactly equal to the allowed percentage per Section C402.3.1 of the gross roof area.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40310 Section C403.1—General.**

**C403.1 General.** Mechanical systems and equipment serving heating, cooling, ventilating, and other needs shall comply with this section.

- EXCEPTIONS:
1. Energy using equipment used by a manufacturing, industrial or commercial process other than for conditioning spaces or maintaining comfort and amenities for the occupants and not otherwise regulated by Section C403.3.2, Tables C403.3.2 (1) through (12) inclusive, Sections ((C403.7.8, C403.9.5)) C403.7.7, C403.9.2.1, C403.10.3, C403.11.2, C403.11.3, C404.2, Table C404.2, C405.8 and C410. *Data center and computer room* HVAC equipment is not covered by this exception.
  2. *Data center systems* are exempt from Sections C403.4 and C403.5.

**C403.1.1 HVAC total system performance ratio (HVAC TSPR).** For systems serving office, retail, library, and education occupancies and buildings, which are subject to the requirements of Section C403.3.5 without exceptions, the *HVAC total system performance ratio (HVAC TSPR)* of the

*proposed design* HVAC system shall be more than or equal to the *HVAC TSPR* of the *standard reference design* as calculated according to Appendix D, Calculation of HVAC Total System Performance Ratio.

- EXCEPTIONS:
1. Buildings with conditioned floor area less than 5,000 square feet.
  2. HVAC systems using district heating water, chilled water or steam.
  3. HVAC systems not included in Table D601.11.1.
  4. HVAC systems with chilled water supplied by absorption chillers, heat recovery chillers, water to water heat pumps, air to water heat pumps, or a combination of air and water cooled chillers on the same chilled water loop.
  5. HVAC systems served by heating water plants that include air to water or water to water heat pumps.
  6. Underfloor air distribution HVAC systems.
  7. Space conditioning systems that do not include *mechanical cooling*.
  8. Alterations to existing buildings that do not substantially replace the entire HVAC system.
  9. HVAC systems meeting all the requirements of the *standard reference design* HVAC system in Table D602.11, Standard Reference Design HVAC Systems.

**C403.1.2 Calculation of heating and cooling loads.** Design loads associated with heating, ventilating and air conditioning of the building shall be determined in accordance with the procedures described in ANSI/ASHRAE/ACCA Standard 183 or by an *approved* equivalent computational procedure, using the design parameters specified in Chapter 3. Heating and cooling loads shall be adjusted to account for load reductions that are achieved where energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE *HVAC Systems and Equipment Handbook* by an *approved* equivalent computational procedure.

**C403.1.3 Data centers.** *Data center systems* shall comply with Sections 6 and 8 of ASHRAE Standard 90.4 with the following changes:

1. Replace design MLC in ASHRAE Standard 90.4 Table 6.2.1.1 "Maximum Design Mechanical Load Component (Design MLC)" with the following per the applicable climate zone:

Zone 4C Design MLC = 0.22    Zone 5B Design MLC = 0.24

2. Replace annualized MLC values of Table 6.2.1.2 "Maximum Annualized Mechanical Load Component (Annualized MLC)" in ASHRAE Standard 90.4 with the following per applicable climate zone:

Zone 4C Annual MLC = 0.18    Zone 5B Annual MLC = 0.17

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-403237 Table C403.3.2(7)—Minimum efficiency requirements—Water chilling packages.**

**Table C403.3.2(7)**  
**Minimum Efficiency Requirements—Water Chilling Packages<sup>a,b</sup>**

Equipment Type	Size Category	Units	Path A		Path B		Test Procedure <sup>c</sup>
			Full Load	IPLV	Full Load	IPLV	
Air-cooled chillers	< 150 tons	EER	≥ 10.100	≥ 13.700	≥ 9.700	≥ 15.800	AHRI 550/590
	≥ 150 tons	EER	≥ 10.100	≥ 14.000	≥ 9.700	≥ 16.100	
Air cooled without condenser, electrically operated	All capacities	EER	Air-cooled chillers without condensers shall be rated with matching condensers and comply with the air-cooled chiller efficiency requirements				
Water cooled, electrically operated, positive displacement	< 75 tons	kW/ton	≤ 0.750	≤ 0.600	≤ 0.780	≤ 0.500	
	≥ 75 tons and < 150 tons	kW/ton	≤ 0.720	≤ 0.560	≤ 0.750	≤ 0.490	
	≥ 150 tons and < 300 tons	kW/ton	≤ 0.660	≤ 0.540	≤ 0.680	≤ 0.440	
	≥ 300 tons and < 600 tons	kW/ton	≤ 0.610	≤ 0.520	≤ 0.625	≤ 0.410	
	≥ 600 tons	kW/ton	≤ 0.560	≤ 0.500	≤ 0.585	≤ 0.380	
Water cooled, electrically operated, centrifugal	< 150 tons	kW/ton	≤ 0.610	≤ 0.550	≤ 0.695	≤ 0.440	
	≥ 150 tons and < 300 tons	kW/ton	≤ 0.610	≤ 0.550	≤ 0.695	≤ 0.400	
	≥ 300 tons and < 400 tons	kW/ton	≤ 0.560	≤ 0.520	≤ 0.595	≤ 0.390	
	≥ 400 tons	kW/ton	≤ 0.560	≤ 0.500	≤ 0.585	≤ 0.380	
Air cooled, absorption single effect	All capacities	COP	≥ 0.600	NR	NA	NA	AHRI 560
Water cooled, absorption single effect	All capacities	COP	≥ 0.700	NR	NA	NA	
Absorption double effect, indirect fired	All capacities	COP	≥ 1.000	≥ 1.050	NA	NA	
Absorption double effect, direct fired	All capacities	COP	≥ 1.000	≥ 1.000	NA	NA	

For SI: 1 ton = 3517 W, 1 British thermal unit per hour = 0.2931 W, °C = [(°F) - 32]/1.8.

NA = Not applicable, not to be used for compliance;

NR = No requirement.

- a The centrifugal chiller equipment requirements, after adjustment in accordance with Section C403.3.2.2 or Section C403.3.2.3, do not apply to chillers used in low-temperature applications where the design leaving fluid temperature is less than 36°F. The requirements do not apply to positive displacement chillers with leaving fluid temperatures less than or equal to 32°F. The requirements do not apply to absorption chillers with design leaving fluid temperatures less than 40°F.
- b Compliance with this standard can be obtained by meeting the minimum requirements of Path A or B. However, both the full load and IPLV shall be met to fulfill the requirements of Path A or B.
- c Chapter 12 of the referenced standard contains a complete specification of the referenced test procedure, including the referenced year version of the test procedure.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.



AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40333 Section C403.3.3—Hot gas bypass.**

**C403.3.3 Hot gas bypass limitation.** Cooling systems shall not use hot gas bypass or other evaporator pressure control systems unless the system is designed with multiple steps of unloading or continuous capacity modulation. The capacity of the hot gas bypass shall be limited as indicated in Table C403.3.3, as limited by Section C403.5.1.

**Table C403.3.3  
Maximum Hot Gas Bypass Capacity**

Rated Capacity	Maximum Hot Gas Bypass Capacity (% of total capacity)
≤ 240,000 Btu/h	50
(≥) ≥ 240,000 Btu/h	25

For SI: 1 British thermal unit per hour = 0.2931 W.

**Table C403.3.5  
Occupancy Classifications Requiring DOAS**

Occupancy Classification <sup>a</sup>	Inclusions	Exempted
A-1	All occupancies not specifically exempted	Television and radio studios
A-2	Casinos (gaming area)	All other A-2 occupancies
A-3	Lecture halls, community halls, exhibition halls, gymnasiums, courtrooms, libraries, places of religious worship	All other A-3 occupancies
A-4, A-5		All occupancies excluded
B	All occupancies not specifically exempted	Food processing establishments including commercial kitchens, restaurants, cafeterias; laboratories for testing and research; data processing facilities and telephone exchanges; air traffic control towers; animal hospitals, kennels, pounds; ambulatory care facilities
F, H, I, R, S, U		All occupancies excluded
E, M	All occupancies included	

a. Occupancy classification from the *International Building Code* Chapter 3.

**C403.3.5.1 Energy recovery ventilation with DOAS.** The DOAS shall include *energy recovery ventilation*. The energy recovery system shall have a 60 percent minimum sensible recovery effectiveness or have 50 percent enthalpy recovery effectiveness in accordance with Section ~~(C403.7.6.1)~~ C403.7.6. For DOAS having a total fan system motor nameplate hp less than 5 hp, total combined fan power shall not exceed 1 W/cfm of outdoor air. For DOAS having a total fan system motor hp greater than or equal to 5 hp, refer to fan power limitations of Section C403.8.1. This fan power restriction applies to each dedicated outdoor air unit in the permitted project, but does not include the fan power associated with the zonal heating/cooling equipment. The airflow rate thresholds for energy recovery requirements in Tables

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40335 Section C403.3.5—Dedicated outdoor air systems.**

**C403.3.5 Dedicated outdoor air systems (DOAS).** For buildings with occupancies as shown in Table C403.3.5, outdoor air shall be provided to each occupied space by a dedicated outdoor air system (DOAS) which delivers 100 percent outdoor air without requiring operation of the heating and cooling system fans for ventilation air delivery.

EXCEPTIONS:

1. Occupied spaces that are not ventilated by a mechanical ventilation system and are only ventilated by a natural ventilation system ~~((per))~~ in accordance with Section 402 of the *International Mechanical Code*.
2. High efficiency variable air volume (VAV) systems complying with Section C403.6.10 for occupancy classifications other than Groups A-1, A-2 and A-3 as specified in Table C403.3.5, and high efficiency VAV systems ~~((empty))~~ complying with Section C403.12 for occupancy classification Groups A-1, A-2 and A-3 as specified in Table C403.3.5. This exception shall not be used as a substitution for a DOAS per Section C406.6.

~~((C403.7.6.1))~~ C403.7.6(1) and ~~((C403.7.6.1))~~ C403.7.6(2) do not apply.

EXCEPTIONS:

1. Occupied spaces with all of the following characteristics: Complying with Section ~~((C403.7.6.1))~~ C403.7.6, served by equipment less than 5000 cfm, with an average occupant load greater than 25 people per 1000 square feet (93 m<sup>2</sup>) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) that include demand control ventilation configured to reduce outdoor air by at least 50 percent below design minimum ventilation rates when the actual occupancy of the space served by the system is less than the design occupancy.

2. Systems installed for the sole purpose of providing makeup air for systems exhausting toxic, flammable, paint, or corrosive fumes or dust, dryer exhaust, or commercial kitchen hoods used for collecting and removing grease vapors and smoke.

**C403.3.5.2 Heating/cooling system fan controls.** Heating and cooling equipment fans, heating and cooling circulation pumps, and terminal unit fans shall cycle off and terminal unit primary cooling air shall be shut off when there is no call for heating or cooling in the zone.

EXCEPTION: Fans used for heating and cooling using less than 0.12 watts per cfm may operate when space temperatures are within the setpoint deadband (Section C403.4.1.2) to provide destratification and air mixing in the space.

**C403.3.5.3 Decoupled DOAS supply air.** The DOAS supply air shall be delivered directly to the occupied space or downstream of the terminal heating and/or cooling coils.

EXCEPTIONS: 1. Active chilled beam systems.  
2. Sensible only cooling terminal units with pressure independent variable airflow regulating devices limiting the DOAS supply air to the greater of latent load or minimum ventilation requirements.  
3. Terminal heating and/or cooling units that comply with the low fan power allowance requirements in the exception of Section C403.3.5.2.

**C403.3.5.4 Impracticality.** Where the code official determines that full compliance with all the requirements of Sections C403.3.5.1 and C403.3.5.2 would be impractical, it is permissible to provide an approved alternate means of compliance that achieves a comparable level of energy efficiency. For the purposes of this section, impractical means that an HVAC system complying with Section C403.3.5 cannot effectively be utilized due to an unusual use or configuration of the building.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40346 Section C403.4.6—Variable flow controls.**

**C403.4.6 Variable flow controls.** Individual pumps required by this code to have variable speed control shall be controlled in one of the following manners:

1. For systems having a combined pump motor horsepower less than or equal to 20 hp (15 kW) and without direct digital control of individual coils, pump speed shall be a function of either:
  - 1.1. Required differential pressure; or
  - 1.2. Reset directly based on zone hydronic demand, or other zone load indicators; or

1.3. Reset directly based on pump power and pump differential pressure( (-)); or

1.4. Reset directly by an integral controller based on the relationship between variable speed controller frequency and power.

2. For systems having a combined pump motor horsepower that exceeds 20 hp (15 kW) or smaller systems with direct digital control, pump speed shall be a function of either:

2.1. The static pressure set point as reset based on the valve requiring the most pressure; or

2.2. Directly controlled based on zone hydronic demand( (-)); or

2.3. Reset directly by an integral controller based on the relationship between variable speed controller frequency and power.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40353 Section C403.5.3—Air economizers.**

**C403.5.3 Air economizers.** Air economizers shall comply with Sections C403.5.3.1 through C403.5.3.5.

**C403.5.3.1 Design capacity.** Air economizer systems shall be configured to modulate *outdoor air* and return air dampers to provide up to 100 percent of the design supply air quantity as *outdoor air* for cooling.

**C403.5.3.2 Control signal.** Economizer controls and dampers shall be configured to sequence the dampers with the mechanical cooling equipment and shall not be controlled by only mixed air temperature. Air economizers on systems with cooling capacity greater than 65,000 Btu/h shall be configured to provide partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.

EXCEPTION: The use of mixed air temperature limit control shall be permitted for systems that are both controlled from space temperature (such as single *zone* systems) and having cooling capacity less than 65,000 Btu/h.

**C403.5.3.3 High-limit shutoff.** Air economizers shall be configured to automatically reduce *outdoor air* intake to the design minimum *outdoor air* quantity when *outdoor air* intake will no longer reduce cooling energy usage. High-limit shutoff control types (~~(for specific climates)~~) shall be chosen from Table C403.5.3.3. High-limit shutoff control settings for these control types shall be those specified in Table C403.5.3.3.

**Table C403.5.3.3 High-Limit Shutoff Control Setting for Air Economizers<sup>b</sup>**

Device Type	Required High Limit (Economizer off when):		Required High Limit For Cycling Fans <sup>c</sup> (Economizer off when):	
	Equation	Description	Equation	Description
Fixed dry-bulb	$T_{OA} > 75^{\circ}\text{F}$	Outdoor air temperature exceeds 75°F	$T_{OA} > 70^{\circ}\text{F}$	Outdoor air temperature exceeds 70°F

Device Type	Required High Limit (Economizer off when):		Required High Limit For Cycling Fans <sup>c</sup> (Economizer off when):	
	Equation	Description	Equation	Description
Differential dry-bulb	$T_{OA} > T_{RA}$	Outdoor air temperature exceeds return air temperature	$T_{OA} > (T_{RA} - 5)$	Outdoor air temperature exceeds return air temperature - 5
Fixed enthalpy with fixed dry-bulb temperatures	$h_{OA} > 28 \text{ Btu/lb}^a$ or $T_{OA} > 75^\circ\text{F}$	Outdoor air enthalpy exceeds 28 Btu/lb of dry air <sup>a</sup> or outdoor air temperature exceeds 75°F	$h_{OA} > 26 \text{ Btu/lb}^a$ or $T_{OA} > 70^\circ\text{F}$	Outdoor air enthalpy exceeds 26 Btu/lb of dry air <sup>d</sup> or outdoor air temperature exceeds 70°F
Differential enthalpy with fixed dry-bulb temperature	$h_{OA} > h_{RA}$ or $T_{OA} > 75^\circ\text{F}$	Outdoor air enthalpy exceeds return air enthalpy or outdoor air temperature exceeds 75°F	$h_{OA} > (h_{RA} - 2)$ or $T_{OA} > 70^\circ\text{F}$	Outdoor air enthalpy exceeds return air enthalpy or outdoor air temperature exceeds 70°F

For SI: °C = (°F - 32) × 5/9, 1 Btu/lb = 2.33 kJ/kg.

<sup>a</sup>At altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 75°F and 50 percent relative humidity. As an example, at approximately 6,000 feet elevation the fixed enthalpy limit is approximately 30.7 Btu/lb.

<sup>b</sup>Devices with selectable setpoints shall be capable of being set to within 2°F and 2 Btu/lb of the setpoint listed.

<sup>c</sup>Where fans cycle on only to provide heating and cooling, limits are adjusted lower to compensate for fan energy use in economizer mode.

<sup>d</sup>For cycling fans at altitudes substantially different than sea level, the fixed enthalpy limit shall be set to the enthalpy value at 70°F and 50 percent relative humidity.

**C403.5.3.4 Relief of excess outdoor air.** Systems shall be capable of relieving excess *outdoor air* during air economizer operation to prevent over-pressurizing the building. The relief air outlet shall be located to avoid recirculation into the building.

**C403.5.3.5 Economizer dampers.** Return, exhaust/relief and outdoor air dampers used in economizers shall comply with Section ((C403.7.9)) C403.7.8.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40354 Section C403.5.4—Waterside economizers.**

**C403.5.4 Waterside economizers.** Waterside economizers shall comply with Sections C403.5.4.1 and C403.5.4.2.

**C403.5.4.1 Design capacity.** Water economizer systems shall be ((capable of cooling)) configured to cool supply air by indirect evaporation and providing up to 100 percent of the expected system cooling load at *outdoor air* temperatures of 50°F dry-bulb (10°C dry-bulb)/45°F wet-bulb (7.2°C wet-bulb) and below.

**EXCEPTION:** Systems where dehumidification requirements cannot be met using outdoor air temperatures of 50°F dry-bulb (10°C dry-bulb)/45°F wet-bulb (7.2°C wet-bulb) and where 100 percent of the expected system cooling load at 45°F dry-bulb (7.2°C dry-bulb)/40°F wet-bulb (4.5°C wet-bulb) is met with evaporative water economizers.

**C403.5.4.2 Maximum pressure drop.** Precooling coils and water-to-water heat exchangers used as part of a water economizer system shall either have a waterside pressure drop of less than 15 feet (4572 mm) of water or a secondary loop shall be created so that the coil or heat exchanger pressure

drop is not seen by the circulating pumps when the system is in the normal cooling (noneconomizer) mode.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40360 Section C403.6—Requirements for mechanical systems serving multiple zones.**

**C403.6 Requirements for mechanical systems serving multiple zones.** Sections C403.6.1 through C403.6.10 shall apply to mechanical systems serving multiple zones.

**C403.6.1 Variable air volume (VAV) and multiple zone systems.** Supply air systems serving multiple zones shall be VAV systems that have zone controls configured to reduce the volume of air that is reheated, recooled or mixed in each *zone* to one of the following:

1. Twenty percent of the zone design peak supply for systems with DDC and 30 percent of the maximum supply air for other systems.

2. Systems with ((DDV)) DDC where items 2.1 through 2.3 apply.

2.1. The airflow rate in the deadband between heating and cooling does not exceed 20 percent of the zone design peak supply rate or higher allowed rates under Items 3, 4, or 5 of this section.

2.2. The first stage of heating modulates the zone supply air temperature setpoint up to a maximum setpoint while the airflow is maintained at the deadband flow rate.

2.3. The second stage of heating modulates the airflow rate from the deadband flow rate up to the heating maximum flow rate that is less than 50 percent of the zone design peak supply rate.

3. The outdoor airflow rate required to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.

4. Any higher rate that can be demonstrated to reduce overall system annual energy use by offsetting reheat/recool energy losses through a reduction in outdoor air intake for the system, as *approved* by the code official.

5. The airflow rates to comply with applicable codes or accreditation standards such as pressure relationships or minimum air change rates.

EXCEPTION: The following individual *zones* or entire air distribution systems are exempted from the requirement for VAV control:

1. *Zones* or supply air systems where not less than 75 percent of the energy for reheating or for providing warm air in mixing systems is provided from a site-recovered source, including condenser heat.
2. Systems that prevent reheating, recooling, mixing or simultaneous supply of air that has been previously cooled, either mechanically or through the use of economizer systems, and air that has been previously mechanically heated.
3. Ventilation systems (~~(empty)~~) **complying** with Section C403.3.5, DOAS, with ventilation rates comply with Section C403.2.2.

**C403.6.2 Single duct variable air volume (VAV) systems, terminal devices.** Single duct VAV systems shall use terminal devices capable of and configured to reduce the supply of primary supply air before reheating or recooling takes place.

**C403.6.3 Dual duct and mixing VAV systems, terminal devices.** Systems that have one warm air duct and one cool air duct shall use terminal devices which are capable of and configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.

**C403.6.4 Supply-air temperature reset controls.** Multiple *zone* HVAC systems shall include controls that automatically reset the supply-air temperature in response to representative building loads, or to outdoor air temperature. The controls shall be configured to reset the supply air temperature at least 25 percent of the difference between the design supply-air temperature and the design room air temperature.

EXCEPTIONS:

1. Systems that prevent reheating, recooling or mixing of heated and cooled supply air.
2. Seventy-five percent of the energy for reheating is from a site-recovered source.
3. Zones with peak supply air quantities of 300 cfm (142 L/s) or less.

**C403.6.5 Multiple-zone VAV system ventilation optimization control.** Multiple-zone VAV systems with direct digital control of individual zone boxes reporting to a central control panel shall have automatic controls configured to reduce outdoor air intake flow below design rates in response to changes in system ventilation efficiency ( $E_v$ ) as defined by the *International Mechanical Code*.

EXCEPTIONS:

1. VAV systems with zonal transfer fans that recirculate air from other zones without directly mixing it with outdoor air, dual-duct dual-fan VAV systems, and VAV systems with fan-powered terminal units.
2. Systems where total design exhaust airflow is more than 70 percent of total design outdoor air intake flow requirements.

**C403.6.6 Parallel-flow fan-powered VAV air terminal control.** Parallel-flow fan-powered VAV air terminals shall have automatic controls configured to:

1. Turn off the terminal fan except when space heating is required or where required for ventilation.

2. Turn on the terminal fan as the first stage of heating before the heating coil is activated.

3. During heating for warmup or setback temperature control, either:

3.1. Operate the terminal fan and heating coil without primary air.

3.2. Reverse the terminal damper logic and provide heating from the central air handler by primary air.

**C403.6.7 Hydronic and multiple-zone HVAC system controls and equipment.** Hydronic and multiple-zone HVAC system controls and equipment shall comply with this section.

For buildings with a total equipment cooling capacity of 300 tons and above, the equipment shall comply with one of the following:

1. No one unit shall have a cooling capacity of more than 2/3 of the total installed cooling equipment capacity;

2. The equipment shall have a variable speed drive; or

3. The equipment shall have multiple compressors.

**C403.6.8 Set points for direct digital control.** For systems with direct digital control of individual *zones* reporting to the central control panel, the static pressure setpoint shall be reset based on the *zone* requiring the most pressure. In such cases, the set point is reset lower until one zone damper is nearly wide open. The direct digital controls shall be capable of monitoring zone damper positions or shall have an alternative method of indicating the need for static pressure that is configured to provide all of the following:

1. Automatically detecting any zone that excessively drives the reset logic.

2. Generating an alarm to the system operational location.

3. Allowing an operator to readily remove one or more zones from the reset algorithm.

**C403.6.9 Static pressure sensor location.** Static pressure sensors used to control VAV fans shall be located such that the controller setpoint is no greater than 1.2 inches w.c. (~~((2099))~~ 299 Pa). Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor shall be located on each major branch to ensure that static pressure can be maintained in each branch.

EXCEPTION: Systems complying with Section C403.6.8.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-403610 Section C403.6.10—High efficiency VAV systems.**

**C403.6.10 High efficiency variable air volume (VAV) systems.** For HVAC systems subject to the requirements of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency multiple-zone VAV system may be provided without a separate parallel DOAS when the system is designed,

installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6):

1. Each VAV system must serve a minimum of 3,000 square feet (278.7 m<sup>2</sup>) and have a minimum of five VAV zones.

2. The VAV systems are provided with airside economizer per Section C403.5 without exceptions.

3. A direct-digital control (DDC) system is provided to control the VAV air handling units and associated terminal units per Section C403.4.11 regardless of sizing thresholds of Table C403.4.11.1.

4. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on feedback from the VAV terminal units as required by Section C403.6.5, without exceptions, and Section C403.7.1 demand controlled ventilation.

5. Multiple-zone VAV systems with a minimum outdoor air requirement of 2,500 cfm (1180 L/s) or greater shall be equipped with a device capable of measuring supply airflow to the VAV terminal units under all load conditions.

6. In addition to meeting the zone isolation requirements of C403.2.1 a single VAV air handling unit shall not serve more than 50,000 square feet (~~((2323))~~ 4645 m<sup>2</sup>) unless a single floor is greater than 50,000 square feet (~~((2323))~~ 4645 m<sup>2</sup>) in which case the air handler is permitted to serve the entire floor.

7. The primary maximum cooling air for the VAV terminal units serving interior cooling load driven zones shall be sized for a supply air temperature that is a minimum of 5°F greater than the supply air temperature for the exterior zones in cooling.

8. Air terminal units with a minimum primary airflow setpoint of 50 percent or greater of the maximum primary airflow setpoint shall be sized with an inlet velocity of no greater than 900 feet per minute.

9. Allowable fan motor horsepower shall not exceed 90 percent of the allowable HVAC *fan system bhp* (Option 2) as defined by Section C403.8.1.1.

10. All fan powered VAV terminal units (series or parallel) shall be provided with electronically commutated motors. The DDC system shall be configured to vary the speed of the motor as a function of the heating and cooling load in the space. Minimum speed shall not be greater than 66 percent of design airflow required for the greater of heating or cooling operation. Minimum speed shall be used during periods of low heating and cooling operation and ventilation-only operation.

EXCEPTION: For series fan powered terminal units where the volume of primary air required to deliver the ventilation requirements at minimum speed exceeds the air that would be delivered at the speed defined above, the minimum speed setpoint shall be configured to exceed the value required to provide the required ventilation air.

11. Fan-powered VAV terminal units shall only be permitted at perimeter zones with an envelope heating load

requirement. All other VAV terminal units shall be single duct terminal units.

EXCEPTION: Fan powered VAV terminal units are allowed at interior spaces with an occupant load greater than or equal to 25 people per 1000 square feet of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) with demand control ventilation in accordance with Section C403.7.1.

12. When in occupied heating or in occupied deadband between heating and cooling all fan powered VAV terminal units shall be configured to reset the primary air supply setpoint, based on the VAV air handling unit outdoor air vent fraction, to the minimum ventilation airflow required per *International Mechanical Code*.

13. Spaces that are larger than 150 square feet (14 m<sup>2</sup>) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m<sup>2</sup>) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:

13.1. A dedicated VAV terminal unit capable of controlling the space temperature and minimum ventilation shall be provided.

13.2. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the VAV terminal unit from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.

13.3. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.

14. Dedicated data centers, computer rooms, electronic equipment rooms, telecom rooms, or other similar spaces with cooling loads greater than 5 watts/sf shall be provided with separate cooling systems to allow the VAV air handlers to turn off during unoccupied hours in the office space and to allow the supply air temperature reset to occur.

EXCEPTION: The VAV air handling unit and VAV terminal units may be used for secondary backup cooling when there is a failure of the primary HVAC system.

Additionally, computer rooms, electronic equipment rooms, telecom rooms, or other similar spaces shall be provided with airside economizer in accordance with Section 403.5 without using the exceptions to Section C403.5.

EXCEPTION: Heat recovery per Exception 9 of Section C403.5 may be in lieu of airside economizer for the separate, independent HVAC system.

15. HVAC system central heating or cooling plant will include a minimum of one of the following options:

15.1. VAV terminal units with hydronic heating coils connected to systems with hot water generation equipment limited to the following types of equipment: Gas-fired hydronic boilers with a thermal efficiency,  $E_t$ , of not less than ~~((90))~~ 92 percent, air-to-water heat pumps or heat recovery chillers. Hydronic heating coils shall be sized for a maximum entering hot water temperature of 120°F (48.9°C) for peak anticipated heating load conditions.

15.2. Chilled water VAV air handling units connected to systems with chilled water generation equipment with IPLV

values more than 25 percent higher than the minimum part load efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20 percent of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20 percent of the total central cooling plant capacity.

16. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:

16.1. The following temperature sensors shall be permanently installed to monitor system operation:

16.1.1. Outside air.

16.1.2. Supply air.

16.1.3. Return air.

16.2. Temperature sensors shall have an accuracy of  $\pm 2^{\circ}\text{F}$  ( $1.1^{\circ}\text{C}$ ) over the range of  $40^{\circ}\text{F}$  to  $80^{\circ}\text{F}$  ( $4^{\circ}\text{C}$  to  $26.7^{\circ}\text{C}$ ).

16.3. The VAV air handling unit controller shall be configured to provide system status by indicating the following:

16.3.1. Free cooling available.

16.3.2. Economizer enabled.

16.3.3. Compressor enabled.

16.3.4. Heating enabled.

16.3.5. Mixed air low limit cycle active.

16.3.6. The current value of each sensor.

16.4. The VAV air handling unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

16.5. The VAV air handling unit shall be configured to report faults to a fault management application (~~accessible~~) able to be accessed by day-to-day operating or service personnel or annunciated locally on zone thermostats.

16.6. The VAV terminal unit shall be configured to report if the VAV inlet valve has failed by performing the following diagnostic check at a maximum interval of once a month:

16.6.1. Command VAV terminal unit primary air inlet valve closed and verify that primary airflow goes to zero.

16.6.2. Command VAV terminal unit primary air inlet valve to design airflow and verify that unit is controlling to within 10 percent of design airflow.

16.7. The VAV terminal unit shall be configured to report and trend when the zone is driving the following VAV air handling unit reset sequences. The building operator shall have the capability to exclude zones used in the reset sequences from the DDC control system graphical user interface:

16.7.1. Supply air temperature setpoint reset to lowest supply air temperature setpoint for cooling operation.

16.7.2. Supply air duct static pressure setpoint reset for the highest duct static pressure setpoint allowable.

16.8. The FDD system shall be configured to detect the following faults:

16.8.1. Air temperature sensor failure/fault.

16.8.2. Not economizing when the unit should be economizing.

16.8.3. Economizing when the unit should not be economizing.

16.8.4. Outdoor air or return air damper not modulating.

16.8.5. Excess outdoor air.

16.8.6. VAV terminal unit primary air valve failure.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40374 Section C403.7.4—HVAC serving guestrooms.**

**C403.7.4 Automatic control of HVAC systems serving guestrooms.** In Group R-1 buildings containing more than 50 guestrooms, each guestroom shall be provided with controls complying with the provisions of Sections C403.7.4.1 and C403.7.4.2. Card key controls comply with these requirements.

**C403.7.4.1 Temperature setpoint controls.** Controls shall be provided on each HVAC system that are capable of and configured to automatically raise the cooling setpoint and lower the heating setpoint by not less than  $4^{\circ}\text{F}$  ( $2^{\circ}\text{C}$ ) from the occupant setpoint within 30 minutes after the occupants have left the guestroom. The controls shall be capable of and configured to automatically raise the cooling setpoint to not lower than  $80^{\circ}\text{F}$  ( $27^{\circ}\text{C}$ ) and lower the heating setpoint to not higher than  $60^{\circ}\text{F}$  ( $16^{\circ}\text{C}$ ) when the guestroom is unrented or has been continuously unoccupied for over 16 hours or a (~~networked guestroom control system~~) networked guestroom control system indicates that the guestroom is unrented and the guestroom is unoccupied for more than 30 minutes. A (~~networked guestroom control system~~) networked guestroom control system that is capable of returning the thermostat setpoints to default occupied setpoints 60 minutes prior to the time a guestroom is scheduled to be occupied is not precluded by this section. Cooling that is capable of limiting relative humidity with a setpoint not lower than 65 percent relative humidity during unoccupied periods is not precluded by this section.

**C403.7.4.2 Ventilation controls.** Controls shall be provided on each HVAC system that are capable of and configured to automatically turn off the ventilation and exhaust fans within 30 minutes of the occupants leaving the guestroom or isolation devices shall be provided to each guestroom that are capable of automatically shutting off the supply of outdoor air to and exhaust air from the guestroom.

**EXCEPTION:** Guestroom ventilation systems are not precluded from having an automatic daily preoccupancy purge cycle that provides daily outdoor air ventilation during unrented periods at the design ventilation rate for 60 minutes, or at a rate and duration equivalent to one air change.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-4039 Section C403.9—Heat rejection and heat recovery equipment.**

**C403.9 Heat rejection and heat recovery equipment.**

**C403.9.1 Heat rejection equipment.** Heat rejection equipment, including air-cooled condensers, dry coolers, open-cir-

cuit cooling towers, closed-circuit cooling towers and evaporative condensers, shall comply with this section.

EXCEPTION: Heat rejection devices where energy usage is included in the equipment efficiency ratings listed in Tables C403.3.2(1)A, C403.3.2(1)B, C403.3.2(1)C, C403.3.2(2), C403.3.2(3), C403.3.2(7) and C403.3.2(9).

Heat rejection equipment shall have a minimum efficiency performance not less than values specified in Table C403.3.2(8).

**C403.9.1.1 Fan speed control.** Each fan powered by an individual motor or array of motors with a connected power, including the motor service factor, totaling 5 hp (3.7 kW) or more shall have controls and devices configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temperature and pressure of the heat rejection device. Fan motor power input shall be not more than 30 percent of design wattage at 50 percent of the design airflow.

EXCEPTIONS: 1. Fans serving multiple refrigerant or fluid cooling circuits.  
2. Condenser fans serving flooded condensers.

**C403.9.1.2 Multiple-cell heat rejection equipment.** Multiple-cell heat rejection equipment with variable speed fan drives shall be controlled to operate the maximum number of fans allowed that comply with the manufacturer's requirements for all system components and so that all fans can operate at the same fan speed required for the instantaneous cooling duty, as opposed to staged (on/off) operation. The minimum fan speed shall be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.

**C403.9.1.3 Limitation on centrifugal fan open-circuit cooling towers.** Centrifugal fan open-circuit cooling towers with a combined rated capacity of 1,100 gpm (4164 L/m) or greater at 95°F (35°C) condenser water return, 85°F (29°C) condenser water supply, and 75°F (24°C) outdoor air wet-bulb temperature shall meet the energy efficiency requirement for axial fan open-circuit cooling towers listed in Table C403.3.2(8).

**C403.9.1.4 Tower flow turndown.** Open-circuit cooling towers used on water-cooled chiller systems that are configured with multiple- or variable-speed condenser water pumps shall be designed so that all open circuit cooling tower cells can be run in parallel with the larger of the flow that is produced by the smallest pump at its minimum expected flow rate or at 50 percent of the design flow for the cell.

## C403.9.2 Heat recovery.

**C403.9.2.1 Heat recovery for service water heating.** Condenser heat recovery shall be installed for heating or reheating of service hot water provided the facility operates 24 hours a day, the total installed heat capacity of water cooled systems exceeds 1,500,000 Btu/hr of heat rejection, and the design service water heating load exceeds 250,000 Btu/hr.

The required heat recovery system shall have the capacity to provide the smaller of:

1. Sixty percent of the peak heat rejection load at design conditions; or
2. The preheating required to raise the peak service hot water draw to 85°F (29°C).

EXCEPTIONS: 1. Facilities that employ condenser heat recovery for space heating or reheat purposes with a heat recovery design exceeding 30 percent of the peak water-cooled condenser load at design conditions.  
2. Facilities that provide 60 percent of their service water heating from ((site-solar-or)) site recovered energy ((or-from-other-sources)).

**C403.9.2.2 Steam condensate systems.** On-site steam heating systems shall have condensate water heat recovery. On-site includes a system that is located within or adjacent to one or more buildings within the boundary of a contiguous area or campus under one ownership and which serves one or more of those buildings.

Buildings using steam generated off-site with steam heating systems which do not have condensate water recovery shall have condensate water recovery.

**C403.9.2.3 Refrigeration condenser heat recovery.** Facilities having food service, meat or deli departments and having 500,000 Btu/h or greater of remote refrigeration condensers shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, space heating or for dehumidification reheat. Facilities having a gross conditioned floor area of 40,000 ft<sup>2</sup> or greater and 1,000,000 Btu/h or greater of remote refrigeration shall have condenser waste heat recovery from freezers and coolers and shall use the waste heat for service water heating, and either for space heating or for dehumidification reheat for maintaining low space humidity.

**C403.9.2.4 Heat recovery for space heating.** A water-source condenser heat recovery system meeting the requirements of Sections C403.9.2.4.1 through C403.9.2.4.4 shall be installed to serve space and ventilation heating systems in new buildings and additions meeting the following criteria:

1. The facility operates greater than 70 hours per week.
2. The sum of all heat rejection equipment capacity serving the new building or addition exceeds 1,500,000 Btu/hr.
3. The sum of zone minimum airflows in all zones with zone reheat coils divided by the conditioned floor area served by those systems is at least 0.45 cfm per square foot.

EXCEPTION: Systems complying with Section C403.3.5, Dedicated outdoor air systems.

**C403.9.2.4.1 Water-to-water heat recovery.** Ninety percent (90%) of the total building space and ventilation heating system design load shall be served by systems that include heat recovery chiller or water-to-water heat pump equipment capable of rejecting heat from the cooling loop to the space and ventilation heating loop as the first stage of heating.

**C403.9.2.4.2 Exhaust heat recovery.** Heat shall be recovered by the heat recovery system from 90 percent of the total building exhaust airflow. The maximum leaving air temperature of exhaust air after heat recovery shall be 55°F dry-bulb when operating at full capacity in heat recovery mode.

EXCEPTIONS: 1. Where energy recovery systems are restricted by Section 514 of the International Mechanical Code to sensible energy, those systems shall not be included in the calculation of total building exhaust airflow.  
 2. Exhaust air systems handling contaminated airstreams that are regulated by applicable codes or accreditation standards and pose a health risk to maintenance personnel to maintain heat recovery devices, those systems shall not be included in the calculation of total building exhaust airflow.

**C403.9.2.4.3 Process heat recovery.** Spaces with year-round cooling loads from lights and equipment of 5 watts and greater per square foot shall be served by water-cooled equipment. Cooling loops serving the water-cooled equipment shall be served by water source heat recovery systems meeting the requirements of Section C403.9.2.4.1. If such spaces are provided with an air or water economizer, the economizer controls shall be configured with an override signal from the building automation system to disable economizer operation during heat recovery mode.

**C403.9.2.4.4 Water-to-water heat recovery sizing.** The minimum total combined capacity of heat recovery chillers or water-to-water heat pumps shall match the total combined capacity of installed equipment sized to meet the requirements of Sections C403.9.2.4.2 and C403.9.2.4.3.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40391 Section C403.10—Construction of HVAC system elements.**

**C403.10 Construction of HVAC system elements.** Ducts, plenums, piping and other elements that are part of an HVAC system shall be constructed and insulated in accordance with Sections C403.10.1 through C403.10.3.1.

**C403.10.1 Duct and plenum insulation and sealing.**

**C403.10.1.1 Ducts conveying outdoor air.** Ducts, shafts and plenums conveying outdoor air from the exterior of the building to the mechanical system shall meet all air leakage and building envelope insulation requirements of Section C402, plus building envelope vapor control requirements from the *International Building Code*, extending continuously from the building exterior to an automatic shutoff damper or heating or cooling equipment. For the purposes of building envelope insulation requirements, duct surfaces shall be insulated with the minimum insulation values in Table C403.10.1.1. Duct surfaces included as part of the building envelope shall not be used in the calculation of maximum glazing area as described in Section C402.4.1.

EXCEPTIONS: 1. Outdoor air ducts serving individual supply air units with less than 2,800 cfm of total supply air capacity, provided these are insulated to the minimum insulation values in Table C403.10.1.1.  
 2. Unheated equipment rooms with combustion air louvers, provided they are isolated from conditioned space at sides, top and bottom of the room with R-11 nominal insulation.

**Table C403.10.1.1  
Outdoor Air Ductwork Insulation**

Duct system	Duct Location and Use	Climate Zone	Airflow	Minimum Installed Duct Insulation R-value <sup>a,b</sup>	Notes
Outdoor Air	Inside conditioned space and upstream of automatic shutoff damper	4C and 5B	≥ 2800 CFM	R-16	See Section C403.10.1.1 for additional requirements
Outdoor Air	Inside conditioned space and downstream of automatic shutoff damper to HVAC unit or room	4C	≥ 2800 CFM	R-8	
Outdoor Air	Inside conditioned space and downstream of automatic shutoff damper to HVAC unit or room	5B	≥ 2800 CFM	R-12	
Outdoor Air	Inside conditioned space	4C and 5B	≤ 2800 CFM	R-7	See Exception 1 to Section C403.10.1.1 for additional details



<sup>a</sup> Insulation *R*-values, measured in h·ft<sup>2</sup>·°F/Btu, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

<sup>b</sup> See *International Mechanical Code* Sections 603.12 and 604 for further details on duct insulation requirements.

**C403.10.1.2 Other supply and return ducts.** All other supply and return air ducts and plenums shall be insulated with a minimum of R-6 insulation where located in unconditioned spaces, and where located outside the building with a minimum of R-8 insulation in Climate Zone 4 and R-12 insulation in Climate Zone 5. Where located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by minimum insulation value as required for exterior walls by Section C402.1.3.

EXCEPTIONS: 1. Where located within equipment.

2. Supply and return ductwork located in unconditioned spaces where the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C) and are insulated in accordance with Table C403.10.1.2.

Where located within conditioned space, supply ducts which convey supply air at temperatures less than 55°F or greater than 105°F shall be insulated with a minimum insulation *R*-value in accordance with Table C403.10.1.2.

EXCEPTION: Ductwork exposed to view within a zone that serves that zone is not required to be insulated.

Where located within conditioned space, return or exhaust air ducts that convey return or exhaust air downstream of an energy recovery media shall be insulated with a minimum insulation *R*-value in accordance with Table C403.10.1.2.

All ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the *International Mechanical Code*.

**Table C403.10.1.2  
Supply, Return, Exhaust and Relief Air Ductwork Insulation**

Duct System	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation <i>R</i> -value <sup>a,b</sup>	Notes
Supply air or return air	Outside the building (outdoors and exposed to weather) <sup>c</sup>	4C	R-8	See Section C403.10.1.2 for details
Supply air or return air	Outside the building (outdoors and exposed to weather) <sup>c</sup>	5B	R-12	See Section C403.10.1.2 for details
Supply air or return air	Unconditioned space (enclosed but not in the building conditioned envelope)	4C and 5B	R-6	See Section C403.10.1.2 for details
Supply air or return air	Unconditioned space where the duct conveys air that is within 15°F of the air temperature of the surrounding unconditioned space	4C and 5B	R-3.3	See IMC Section 603.12 for additional requirements for condensation control at ductwork
Supply air or return air	Where located in a building envelope assembly	4C and 5B	R-16	Duct or plenum is separated from building envelope assembly with the minimum insulation value
Supply air	Within conditioned space where the supply duct conveys air that is less than 55°F or greater than 105°F	4C and 5B	R-3.3	See Section C403.10.1.2 for details

Duct System	Duct Location and Use	Climate Zone	Minimum Installed Duct Insulation R-value <sup>a,b</sup>	Notes
Supply air	Within conditioned space that the duct directly serves where the supply duct conveys air that is less than 55°F or greater than 105°F	4C and 5B	None	See Section C403.10.1.2 for details
Supply air	Within conditioned space where the supply duct conveys air that is 55°F or greater and 105°F or less	4C and 5B	None	
Return or exhaust air	Within conditioned space, downstream of an energy recovery media, upstream of an automatic shutoff damper	4C	R-8	
Return or exhaust air	Within conditioned space, downstream of an energy recovery media, upstream of an automatic shutoff damper	5B	R-12	
Relief or exhaust air	Conditioned space and downstream of an automatic shutoff damper	4C and 5B	R-16	

<sup>a</sup> Insulation R-values, measured in h·ft<sup>2</sup>·°F/Btu, are for the insulation as installed and do not include film resistance. The required minimum thicknesses do not consider water vapor transmission and possible surface condensation. Insulation resistance measured on a horizontal plane in accordance with ASTM C518 at a mean temperature of 75°F at the installed thickness.

<sup>b</sup> See *International Mechanical Code* Sections 603.12 and 604 for further details on duct insulation requirements.

<sup>c</sup> Includes attics above insulated ceilings, parking garages and crawl spaces.

**C403.10.2 Duct construction.** Ductwork shall be constructed and erected in accordance with the *International Mechanical Code*.

**C403.10.2.1 Low-pressure duct systems.** Longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches water gauge (w.g.) (500 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

EXCEPTION: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches water gauge (w.g.) (500 Pa) pressure classification.

**C403.10.2.2 Medium-pressure duct systems.** Ducts and plenums designed to operate at a static pressure greater than 2 inches water gauge (w.g.) (500 Pa) but less than 3 inches w.g. (750 Pa) shall be insulated and sealed in accordance with Section C403.10.1. Pressure classifications specific to the

duct system shall be clearly indicated on the construction documents in accordance with the *International Mechanical Code*.

**C403.10.2.3 High-pressure duct systems.** Ducts designed to operate at static pressures equal to or greater than 3 inches water gauge (w.g.) (750 Pa) shall be insulated and sealed in accordance with Section C403.10.1. In addition, ducts and plenums shall be leak-tested in accordance with the *SMACNA HVAC Air Duct Leakage Test Manual* and shown to have a rate of air leakage (CL) less than or equal to 4.0 as determined in accordance with Equation 4-9.

(Equation 4-9)

$$CL = F/P((0.65))^{0.65}$$

Where:

*F* The measured leakage rate in cfm per 100 square feet of duct surface.

*P* The static pressure of the test.

Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

**C403.10.3 Piping insulation.** All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table C403.10.3.

- EXCEPTIONS:
1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
  2. Factory-installed piping within room fan-coil units and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
  3. Piping that conveys fluids that have a design operating temperature range between 60°F (15°C) and 105°F (41°C).
  4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
  5. Strainers, control valves, and balancing valves associated with piping 1 inch (25 mm) or less in diameter.
  6. Direct buried piping that conveys fluids at or below 60°F (15°C).

**Table C403.10.3**  
**Minimum Pipe Insulation Thickness (thickness in inches)<sup>a</sup>**

Fluid Operating Temperature Range and Usage (°F)	Insulation Conductivity		Nominal Pipe or Tube Size (inches)				
	Conductivity Btu • in. / (h • ft <sup>2</sup> • °F) <sup>b</sup>	Mean Rating Temperature, °F	< 1	1 to < 1-1/2	1-1/2 to < 4	4 to < 8	≥ 8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1.0	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	75	0.5	1.0	1.0	1.0	1.5

- <sup>a</sup> For piping smaller than 1-1/2 inch (38 mm) and located in partitions within *conditioned spaces*, reduction of these thicknesses by 1 inch (25 mm) shall be permitted (before thickness adjustment required in footnote b) but not to a thickness less than 1 inch (25 mm).
- <sup>b</sup> For insulation outside the stated conductivity range, the minimum thickness (*T*) shall be determined as follows:

$$T = r\{(1 + t/r)^{K/k} - 1\}$$

Where:

- T* = Minimum insulation thickness.
- r* = Actual outside radius of pipe.
- t* = Insulation thickness listed in the table for applicable fluid temperature and pipe size.
- K* = Conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature (Btu × in/h × ft<sup>2</sup> × °F).
- k* = The upper value of the conductivity range listed in the table for the applicable fluid temperature.

- <sup>c</sup> For direct-buried heating and hot water system piping, reduction of these thicknesses by 1-1/2 inches (38 mm) shall be permitted (before thickness adjustment required in footnote b but not to thicknesses less than 1 inch (25 mm)).

**C403.10.3.1 Protection of piping insulation.** Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesives tape shall not be permitted.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40392 Section C403.11—Mechanical systems outside the building envelope.**

**C403.11 Mechanical systems located outside of the building thermal envelope.** Mechanical systems providing heat outside of the thermal envelope of a building shall comply with Sections C403.11.1 through C403.11.3.

**C403.11.1 Heating outside a building.** Systems installed to provide heat outside a building shall be radiant systems.

Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically deenergized when no occupants are present.

**C403.11.2 Snow- and ice-melt system controls.** Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls configured to shut off the system when the pavement temperature is above 50°F (10°C) and no precipitation is falling and an automatic control that is configured to ~~((shutoff))~~ **shut off** when the outdoor temperature is above 40°F (4°C) so that the potential for snow or ice accumulation is negligible.

**C403.11.3 Freeze protection system controls.** Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls configured to shut off the systems when outdoor air temperatures are above 40°F (4°C) or when the conditions of the protected fluid will prevent freezing.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40393 Section C403.12—High efficiency single zone VAV systems.**

**C403.12 High efficiency single-zone variable air volume (VAV) systems.** For HVAC systems subject to the require-

ments of Section C403.3.5 but utilizing Exception 2 of that section, a high efficiency single-zone VAV system may be provided without a separate parallel DOAS when the system is designed, installed, and configured to comply with all of the following criteria (this exception shall not be used as a substitution for a DOAS per Section C406.6 or as a modification to the requirements for the *Standard Reference Design* in accordance with Section C407):

1. The single-zone VAV system is provided with airside economizer in accordance with Section C403.3 without exceptions.

2. A direct-digital control (DDC) system is provided to control the system as a single zone in accordance with Section C403.4.11 regardless of sizing thresholds of Table C403.4.11.1.

3. Single-zone VAV systems with a minimum outdoor air requirement of 1,000 cfm (472 L/s) or greater shall be equipped with a device capable of measuring outdoor airflow intake under all load conditions. The system shall be capable of increasing or reducing the outdoor airflow intake based on Section C403.7.1, Demand controlled ventilation.

4. Allowable fan motor horsepower shall not exceed 90 percent of the allowable HVAC fan system bhp (Option 2) as defined by Section C403.8.1.1.

5. Each single-zone VAV system shall be designed to vary the supply fan airflow as a function of heating and cooling load and minimum fan speed shall not be more than the greater of:

5.1. 30 percent of peak design airflow; or

5.2. The required ventilation flow assuming no occupants.

6. Spaces that are larger than 150 square feet (14 m<sup>2</sup>) and with an occupant load greater than or equal to 25 people per 1000 square feet (93 m<sup>2</sup>) of floor area (as established in Table 403.3.1.1 of the *International Mechanical Code*) shall be provided with all of the following features:

6.1. Demand control ventilation (DCV) shall be provided that utilizes a carbon dioxide sensor to reset the ventilation setpoint of the single-zone VAV system from the design minimum to design maximum ventilation rate as required by Chapter 4 of the *International Mechanical Code*.

6.2. Occupancy sensors shall be provided that are configured to reduce the minimum ventilation rate to zero and setback room temperature setpoints by a minimum of 5°F, for both cooling and heating, when the space is unoccupied.

7. Single-zone VAV systems shall comply with one of the following options:

7.1. Single-zone VAV air handling units with a hydronic heating coil connected to systems with hot water generation equipment limited to the following types of equipment: Gas-fired hydronic boilers with a thermal efficiency,  $E_t$ , of not less than 92 percent, air-to-water heat pumps or heat recovery chillers. Hydronic heating coils shall be sized for a maximum entering hot water temperature of 120°F for peak anticipated heating load conditions.

7.2. Single-zone VAV air handling units with a chilled water coil connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than the minimum part load efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test

procedures. Equipment shall be listed in the appropriate certification program to qualify. The smallest chiller or compressor in the central plant shall not exceed 20 percent of the total central plant cooling capacity or the chilled water system shall include thermal storage sized for a minimum of 20 percent of the total central cooling plant capacity.

7.3. Single-zone VAV air handling units with DX cooling, heat pump heating or gas-fired furnace shall comply with the following requirements as applicable:

7.3.1. Have a DX cooling coil with cooling part load efficiency that is a minimum of 15 percent higher than the minimum SEER or IEER listed in Tables C403.3.2(1) and C403.3.2(2).

7.3.2. Have a gas-fired furnace with a thermal efficiency,  $E_t$ , of not less than 90 percent or heat pump with a minimum heating HSPF or COP efficiency that are a minimum of 10 percent higher than the minimum heating efficiency in Tables C403.3.2(1) and C403.3.2(2).

7.3.3. Heating coils or burner output shall be modulating or have a minimum of 2 stages with the first stage being less than 50 percent of total heating capacity. Cooling coils shall be modulating or have a minimum of 2 stages with the first stage being less than 50 percent of the total cooling capacity.

8. The DDC system shall include a fault detection and diagnostics (FDD) system complying with the following:

8.1. The following temperature sensors shall be permanently installed to monitor system operation:

8.1.1. Outside air.

8.1.2. Supply air.

8.1.3. Return air.

8.2. Temperature sensors shall have an accuracy of  $\pm 2^\circ\text{F}$  ( $1.1^\circ\text{C}$ ) over the range of 40°F to 80°F (4°C to 26.7°C).

8.3. The single-zone VAV air handling unit controller shall be configured to provide system status by indicating the following:

8.3.1. Free cooling available.

8.3.2. Economizer enabled.

8.3.3. Compressor enabled.

8.3.4. Heating enabled.

8.3.5. Mixed air low limit cycle active.

8.3.6. The current value of each sensor.

8.4. The single-zone VAV air handling unit controller shall be capable of manually initiating each operating mode so that the operation of compressors, economizers, fans and the heating system can be independently tested and verified.

8.5. The single-zone VAV air handling unit shall be configured to report faults to a fault management application (~~(accessible)~~ **able to be accessed**) by day-to-day operating or service personnel or annunciated locally on zone thermostats.

8.6. The FDD system shall be configured to detect the following faults:

8.6.1. Air temperature sensor failure/fault.

8.6.2. Not economizing when the unit should be economizing.

8.6.3. Economizing when the unit should not be economizing.

8.6.4. Outdoor air or return air damper not modulating.

8.6.5. Excess outdoor air.

**C403.13 Commissioning.** Mechanical systems shall be commissioned in accordance with Section C408.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40402 Section C404.2—Service water-heating equipment performance efficiency.**

**C404.2 Service water-heating equipment performance efficiency.** Water-heating equipment and hot water storage tanks shall meet the requirements of Table C404.2. The efficiency shall be verified through certification and *listed* under an *approved* certification program, or if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Water-heating equipment intended to be used to provide space heating shall meet the applicable provisions of Table C404.2.

**C404.2.1 High input-rated service water heating systems for other than Group R-1 and R-2 occupancies.** In new buildings where the combined input rating of the water-heating equipment installed in a building is equal to or greater than 1,000,000 Btu/h (293 kW), the combined input-capacity-weighted-average efficiency of water-heating equipment shall be no less than the following for each water heating fuel source:

1. Electric: A rated COP of not less than 2.0. For air-source heat pump equipment, the COP rating will be reported at the design leaving heat pump water temperature with an ~~(enter)~~ entering air temperature of 60°F (15.6°C) or less.
2. Fossil Fuel: A rated  $E_t$  of not less than 90 percent as determined by the applicable test procedure in Table C404.2.

EXCEPTIONS:

1. Where not less than 25 percent of the annual service water-heating requirement is provided from any of the following sources:
  - 1.1. Renewable energy generated on-site that is not being used to satisfy another requirement of this code; or
  - 1.2. Site-recovered energy that is not being used to satisfy other requirements of this code.
2. Redundant equipment intended to only operate during equipment failure or periods of extended maintenance.
3. Electric resistance heated systems installed as part of an alteration where the water heating equipment is installed at the grade level in a building with a height of four stories or greater.
4. Hot water heat exchangers used to provide service water heating from a district utility (steam, heating hot water).
5. Water heaters provided as an integral part of equipment intended to only heat or boost the heat of water used by that equipment.
6. For electric heat systems, supplemental water heaters not meeting this criteria that function as auxiliary heating only when the outdoor temperature is below 32°F (0°C) or when a defrost cycle is required are not required to have a rated COP of 2.0. Such systems shall be sized and configured to lock out electric resistance or fossil fuel heating from operation when the outdoor temperature is above 32°F (0°C) unless the system is in defrost operation.

**C404.2.2 High input-rated service water heating system for Group R-1 and R-2 occupancies.** In new buildings with over 1,000,000 Btu/h installed service water heating capacity serving Group R-1 and R-2 occupancies, at least 25 percent of annual water heating energy shall be provided from any combination of the following water heating sources:

1. Renewable energy generated on-site that is not being used to satisfy other requirements of this code; or
2. Site-recovered energy that is not being used to satisfy other requirements of this code.

EXCEPTION:

Compliance with this section is not required if the combined input-capacity-weighted average equipment rating for each service water heating fuel source type is not less than the following:

1. Electric Resistance: An electric resistance water heater with a rating of 105 percent of the rated efficiency of Table C404.2.
2. Electric Heat Pump (10 C.F.R. Part 430): A heat pump water heater rated in accordance with 10 C.F.R. Part 430 with a rating of 105 percent of the rated efficiency of Table C404.2.
3. Electric Heat Pump (not listed in accordance with 10 C.F.R. Part 430): A heat pump water heater not rated in accordance with 10 C.F.R. Part 430 shall have a COP of not less than 2.0. For air-source heat pump equipment the COP rating will be reported at the design leaving heat pump water temperature with an entering air temperature of 60°F (15.6°C) or less. Supplemental water heaters not meeting the above criteria that function as auxiliary heating only when the outdoor temperature is below 32°F (0°C) or when a defrost cycle is required are not required to have a rated COP of 2.0. Such systems shall be sized and configured to lock out electric resistance or fossil fuel heating from operation when the outdoor temperature is above 32°F (0°C) unless the system is in defrost operation.
4. Fossil Fuels: A rated  $E_t$  of not less than 90 percent as determined by the applicable test procedures in Table C404.2.
5. Hot water heat exchangers used to provide service water heating from a district utility (steam, heating hot water).

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-404021 Table C404.2—Minimum performance of water-heating equipment.**

**Table C404.2**  
**Minimum Performance of Water-Heating Equipment**

Equipment Type	Size Category (input)	Subcategory or Rating Condition	Performance Required <sup>a, b</sup>	Test Procedure
Storage water heaters, electric	≤ 12 kW <sup>d</sup>	Tabletop <sup>e</sup> ≥ 20 gal and ≥ 120 gal	0.93 - 0.00132V, EF	DOE 10 C.F.R. Part 430
		Resistance ≥ 20 gal and ≤ 55 gal	0.960 - 0.0003V, EF	
		Grid-enabled <sup>f</sup> > 75 gal and ≤ 120 gal	1.06 - 0.00168V, EF	
	> 12 kW <sup>d</sup>	Resistance	(0.3 + 27)/V <sub>m</sub> , %/h <sup>g</sup>	Section G.2 of ANSI Z21.10.3
	≤ 24 amps and ≤ 250 volts	Heat pump	2.057 - 0.00113V, EF	DOE 10 C.F.R. Part 430
Instantaneous water heaters, electric	All	Resistance	0.93 - 0.00132V, EF	DOE 10 C.F.R. Part 430
Storage water heaters, gas	≤ 75,000 Btu/h	≥ 20 gal and ≤ 55 gal	0.675 - 0.0015V, EF	DOE 10 C.F.R. Part 430
		> 55 gal and ≤ 100 gal	0.8012 - 0.00078V, EF	
	> 75,000 Btu/h	< 4,000 Btu/h/gal	80% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	Section G.1 and G.2 of ANSI Z21.10.3
Instantaneous water heaters, gas	> 50,000 Btu/h and < 200,000 Btu/h	≥ 4,000 (Btu/h)/gal and < 2 gal	0.82 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	≥ 200,000 Btu/h <sup>e</sup>	≥ 4,000 Btu/h/gal and < 10 gal	80% E <sub>t</sub>	Section G.1 and G.2 of ANSI Z21.10.3
	≥ 200,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	
Storage water heaters, oil	≤ 105,000 Btu/h	≥ 20 gal	0.68 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	> 105,000 Btu/h	< 4,000 Btu/h/gal	((78) 80% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	Section G.1 and G.2 of ANSI Z21.10.3
Instantaneous water heaters, oil	≤ 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 2 gal	0.59 - 0.0019V, EF	DOE 10 C.F.R. Part 430
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E <sub>t</sub>	Section G.1 and G.2 of ANSI Z21.10.3
	> 210,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	78% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	
Hot water supply boilers, gas and oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and < 10 gal	80% E <sub>t</sub>	Section G.1 and G.2 of ANSI Z21.10.3
Hot water supply boilers, gas	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and ≥ 10 gal	80% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	
Hot water supply boilers, oil	≥ 300,000 Btu/h and < 12,500,000 Btu/h	≥ 4,000 Btu/h/gal and > 10 gal	78% E <sub>t</sub> (Q/800 + 110√V) SL, Btu/h	
Pool heaters, gas and oil	All	—	82% E <sub>t</sub>	ASHRAE 146
Heat pump pool heaters	All	—	4.0 COP	AHRI 146
Unfired storage tanks	All	—	Minimum insulation requirement R-12.5 (h • ft <sup>2</sup> • °F)/Btu	(none)

For SI: °C = [(°F) - 32]/1.8, 1 British thermal unit per hour = 0.2931 W, 1 gallon = 3.785 L, 1 British thermal unit per hour per gallon = 0.078 W/L.

<sup>a</sup>Energy factor (EF) and thermal efficiency (E<sub>t</sub>) are minimum requirements. In the EF equation, V is the rated volume in gallons.

<sup>b</sup>Standby loss (SL) is the maximum Btu/h based on a nominal 70°F temperature difference between stored water and ambient requirements. In the SL equation, Q is the nameplate input rate in Btu/h. In the SL equation for electric water heaters, V is the rated volume in gallons and V<sub>m</sub> is the measured volume in gallons. In the SL equation for oil and gas water heaters and boilers, V is the rated volume in gallons.

<sup>c</sup>Instantaneous water heaters with input rates below 200,000 Btu/h shall comply with these requirements if the water heater is designed to heat water to temperatures 180°F or higher.

<sup>d</sup>Electric water heaters with an input rating of 12 kW (40,950 Btu/h) or less that are designed to heat water to temperatures of 180°F or greater shall comply with the requirements for electric water heaters that have an input rating greater than 12 kW (40,950 Btu/h).

<sup>e</sup>A tabletop water heater is a water heater that is enclosed in a rectangular cabinet with a flat top surface not more than three feet (0.91 m) in height.

<sup>f</sup>A grid-enabled water heater is an electric resistance water heater that meets all of the following:

1. Has a rated storage tank volume of more than 75 gallons.
  2. Is manufactured on or after April 16, 2015.
  3. Is equipped at the point of manufacture with an activation lock.
  4. Bears a permanent label applied by the manufacturer that complies with all of the following:
    - 4.1. Is made of material not adversely affected by water.
    - 4.2. Is attached by means of nonwater soluble adhesive.
    - 4.3. Advises purchasers and end-users of the intended and appropriate use of the product with the following notice printed in 16.5 point Arial narrow bold font: "IMPORTANT INFORMATION: This water heater is intended only for use as a part of an electric thermal storage or demand response program. It will not provide adequate hot water unless enrolled in such a program and activated by your utility company or another program operator. Confirm the availability of a program in your local area before purchasing or installing this product."
- g%/h is the energy consumed to replace the heat loss from the tank while on standby, expressed as a percentage of the total energy in the stored water per hour.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40406 Section C404.6—Pipe insulation.**

**C404.6 Insulation of piping.** Piping from a water heater to the termination of the heated water fixture supply pipe shall be insulated in accordance with Table C403.10.3. On both the inlet and outlet piping of a storage water heater or heated water storage tank, the piping to a heat trap or the first 8 feet (2438 mm) of piping, whichever is less, shall be insulated. Piping that is heat traced shall be insulated in accordance with Table C403.10.3 or the heat trace manufacturer's instructions. Tubular pipe insulation shall be installed in accordance with the insulation manufacturer's instructions. Pipe insulation shall be continuous, including through hangers and supports, such that thermal bridging is prevented, except where the piping passes through a framing member. The minimum insulation thickness requirements of this section shall not supersede any greater insulation thickness requirements necessary for the protection of piping from freezing temperatures or the protection of personnel against external surface temperatures on the insulation.

- EXCEPTION: Tubular pipe insulation shall not be required on the following:
1. The tubing from the connection at the termination of the fixture supply piping to a plumbing fixture or plumbing appliance.
  2. Valves, pumps, strainers and threaded unions in piping that is 1 inch (25 mm) or less in nominal diameter.
  3. Piping from user-controlled shower and bath mixing valves to the water outlets.
  4. Cold-water piping of a demand recirculation water system.
  5. Tubing from a hot drinking-water heating unit to the water outlet.
  6. Piping at locations where a vertical support of the piping is installed.
  7. Piping surrounded by building insulation with a thermal resistance (*R*-value) of not less than R-3.
  8. Hot water piping that is part of the final pipe run to the plumbing fixture and is not part of the heated-water circulation system circulation path is not required to meet the minimum insulation requirements of Section C404.6.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40502 Section C405.2—Electrical power and lighting systems.**

**C405.2 Lighting controls.** Lighting systems shall be provided with controls that comply with one of the following:

1. Lighting controls as specified in Sections C405.2.1 through ~~((C405.2.8))~~ C405.2.7.
2. Luminaire level lighting controls ~~((LLC))~~ LLLC and lighting controls as specified in Sections C405.2.1, C405.2.3 and C405.2.5. The ~~((LLC))~~ LLLC luminaire shall be independently configured to:
  - 2.1. Monitor occupant activity to brighten or dim lighting when occupied or unoccupied, respectively.
  - 2.2. Monitor ambient light, both electric and daylight, and brighten or dim artificial light to maintain desired light level.
  - 2.3. For each control strategy, configuration and reconfiguration of performance parameters including: Bright and dim setpoints, timeouts, dimming fade rates, sensor sensitivity adjustments, and wireless zoning configuration.

- EXCEPTION: Except for specific application controls required by Section C405.2.5, lighting controls are not required for the following:
1. Areas designated as security or emergency areas that are required to be continuously lighted.
  2. Means of egress illumination serving the exit access that does not exceed 0.02 watts per square foot of building area.
  3. Emergency egress lighting that is normally off.
  4. Industrial or manufacturing process areas, as may be required for production and safety.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405021 Section C405.2.1—Occupant sensor controls.**

**C405.2.1 Occupant sensor controls.** Occupant sensor controls shall be installed to control lights in the following space types:

1. Classrooms/lecture/training rooms.
2. Conference/meeting/multipurpose rooms.
3. Copy/print rooms.
4. Lounges/breakrooms.

5. Enclosed offices.
6. Open plan office areas.
7. Restrooms.
8. Storage rooms.
9. Locker rooms.
10. Other spaces 300 square feet (28 m<sup>2</sup>) or less that are enclosed by floor-to-ceiling height partitions.
11. Warehouse storage areas.
12. Enclosed fire rated stairways.
13. Service corridors.
14. Covered parking areas.

Occupant sensor controls in warehouse storage areas, corridors, and library stacks, shall comply with Section C405.2.1.2. Occupant sensor controls in fire rated stairways shall comply with Section C405.2.1.5. Occupant sensor controls in open plan office areas shall comply with Section C405.2.1.3. Occupant sensor controls in covered parking areas shall comply with Section C405.2.1.4. Occupant sensor controls for all other spaces shall comply with Section C405.2.1.1.

- EXCEPTIONS:
1. Corridors in manufacturing facilities.
  2. General lighting and task lighting in shop and laboratory classrooms.
  3. Digital timer switch controls may be provided in lieu of occupant sensor controls in the following space types ((#)) if under 300 square feet: Copy/print rooms, storage rooms, and janitorial closets. Digital timer switches shall comply with the following:
    - 3.1. Turn lights on or off with operation of a button, switch or other manual means.
    - 3.2. Automatically turn lights off within 15 minutes of the lights being turned on. The means for setting the time delay shall not be visible on the front of the switch.
    - 3.3. The switch shall provide both audible and visual indication of impending time-out of the switch. Audible and visual indication shall be given at least once within 5 minutes of time-out of the switch. Visual indication shall consist of turning the lights momentarily off, and then back on.

**C405.2.1.1 Occupant sensor control function.** Occupant sensor controls shall comply with all of the following:

1. They shall be configured to automatically turn off lights within 20 minutes of all occupants leaving the space.
2. They shall be manual on or configured to automatically turn the lighting on to not more than 50 percent power.

EXCEPTION: Full automatic-on controls shall be permitted to control lighting in public corridors, stairways, restrooms, primary building entrances areas and lobbies, and areas where manual-on operation would endanger the safety or security of the room or building occupants.

3. They shall incorporate a manual control to allow occupants to turn lights off.

**C405.2.1.2 Occupant sensor control function in warehouses, storage areas and service corridors.** Occupant sensor controls shall be configured to comply with all of the following:

1. Automatically reduce lighting power by not less than 50 percent within 20 minutes of all occupants leaving the area.

2. Control lighting in each aisleway and corridor independently, and shall not control lighting beyond the aisleway or corridor being controlled by the sensor.

3. Automatically turn lighting off within 20 minutes of all occupants leaving the space, or comply with Section C405.2.2 to turn lighting off when the building is vacant.

4. Restore lighting to full power when occupants enter the space.

**C405.2.1.3 Occupant sensor control function in open plan office areas.** Occupant sensor controls in open plan office spaces less than 300 square feet (28 m<sup>2</sup>) in area shall comply with Section C405.2.1.1. Occupant sensor controls in all other open plan office spaces shall be configured to comply with all of the following:

1. General lighting is controlled separately in control zones with floor areas not greater than 600 square feet (55 m<sup>2</sup>) within the open plan office space.

2. Automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the open plan office space.

3. General lighting power in each control zone is reduced by not less than 80 percent of the full zone general lighting power within 20 minutes of all occupants leaving that control zone. Control functions that switch control zone lights completely off when the zone is unoccupied meet this requirement.

4. Daylight responsive controls activate open plan office space general lighting or control zone general lighting only when occupancy for the same area is detected.

**C405.2.1.4 Occupant sensor control function in parking garages.** Occupant sensor controls shall be configured to comply with all of the following:

1. Lighting power of each *luminaire* shall be automatically reduced by a minimum of 30 percent when there is no vehicle or pedestrian activity detected within a lighting zone for 20 minutes. Lighting zones for this requirement shall be no larger than 3,600 square feet.

**Exceptions:**

- 1.1. Lighting in daylight transition zones and ramps without parking.

- 1.2. Covered parking garages with a total lighting power less than 0.07 watts per square foot.

2. Where time switch controls in accordance with Section C405.2.2 are not installed, the occupant sensor shall automatically turn all the lighting off within 20 minutes of all occupants leaving the space and restore lighting to full power when occupants enter the space.

**C405.2.1.5 Occupant sensor control function in enclosed fire rated stairways.** Occupant sensor controls shall be configured to automatically reduce lighting power by not less than 50 percent when no occupants have been detected in the stairway for a period not exceeding 20 minutes and restore lighting to full power when occupants enter the stairway. All portions of stairways shall remain illuminated to meet the requirements of Section 1009 of the *International Building Code* when the lighting power is reduced.



AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405025 Section C405.2.5—Additional lighting controls.**

**C405.2.5 Additional lighting controls.** Specific application lighting shall be provided with controls, in addition to controls required by other sections, for the following:

1. The following lighting shall be controlled by an occupant sensor complying with Section C405.2.1.1 or a time switch control complying with Section C405.2.2.1. In addition, a manual control shall be provided to control such lighting separately from the general lighting in the space:

- 1.1. Display and accent.
- 1.2. Lighting in display cases.
- 1.3. Supplemental task lighting, including permanently installed under-shelf or under-cabinet lighting.
- 1.4. Lighting equipment that is for sale or demonstration in lighting education.

2. *Sleeping units* shall have control device(s) or systems configured to automatically switch off all permanently installed luminaires and switched receptacles within 20 minutes after all occupants have left the unit.

EXCEPTIONS: 1. Lighting and switched receptacles controlled by card key controls.  
2. Spaces where patient care is directly provided.

3. Permanently installed luminaires within dwelling units shall be provided with controls complying with either Section C405.2.1.1 or ((C405.2.2.2)) C405.2.3.1.

4. Lighting for nonvisual applications, such as plant growth and food warming, shall be controlled by a dedicated control that is independent of the controls for other lighting within the room or space. Each control zone shall be no greater than the area served by a single luminaire or 4,000 square feet, whichever is larger.

5. Luminaires serving the exit access and providing means of egress illumination required by Section ((1006.1)) 1008.2 of the *International Building Code*, including luminaires that function as both normal and emergency means of egress illumination shall be controlled by a combination of listed emergency relay and occupancy sensors, or signal from another building control system, that automatically shuts off the lighting when the areas served by that illumination are unoccupied.

EXCEPTION: Means of egress illumination serving the exit access that does not exceed 0.02 watts per square foot of building area is exempt from this requirement.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405028 Section ((C405.2.8)) C405.2.7—Area controls.**

**((C405.2.8)) C405.2.7 Area controls.** The maximum lighting power that may be controlled from a single switch or automatic control device shall not exceed that which is provided by a 20 ampere circuit loaded to not more than 80 percent. A master control may be installed provided the individual switches retain their capability to function independently.

Circuit breakers may not be used as the sole means of switching.

EXCEPTION: Areas less than 5 percent of the building footprint for footprints over 100,000 ft<sup>2</sup>.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405051 Section C405.4.1—Total connected interior lighting power.**

**C405.4.1 Total connected interior lighting power.** The total connected interior lighting power shall be determined in accordance with Equation 4-10.

$$\text{TCLP} = [\text{LVL} + \text{BLL} + \text{TRK} + \text{POE} + \text{Other}]$$

**(Equation 4-10)**

Where:

TCLP = Total connected lighting power (watts).

LVL = For luminaires with lamps connected directly to building power, such as line voltage lamps, the rated wattage of the lamp, which must be minimum 60 lumens/watt.

BLL = For luminaires incorporating a ballast or transformer, the rated input wattage of the ballast or transformer when operating the lamp.

TRK = For lighting track, cable conductor, rail conductor and plug-in busway systems that allow the addition and relocation of luminaires without rewiring((-)), the wattage shall be one of the following:

1. The specified wattage of the luminaires, but not less than 16 W/lin. ft. (52 W/lin. m).

2. The wattage limit of the permanent current limiting devices protecting the system.

3. The wattage limit of the transformer supplying the system.

POE = For other modular lighting systems served with power supplied by a driver, power supply for transformer including, but not limited to, low-voltage lighting systems, the wattage of the system shall be the maximum rated input wattage of the driver, power supply or transformed published in the manufacturer's catalogs, as specified by UL 2108 or 8750. For power-over-Ethernet lighting systems, power provided to installed nonlighting devices may be subtracted from the total power rating of the power-over-Ethernet systems.

Other = The wattage of all other luminaires and lighting, sources not covered above and associated with interior lighting verified by data supplied by the manufacturer or other *approved* sources.

The connected power associated with the following lighting equipment is not included in calculating total connected lighting power.

1. Television broadcast lighting for playing areas in sports arenas.

2. Emergency lighting automatically off during normal building operation.

3. Lighting in spaces specifically designed for use by occupants with special lighting needs including those with visual impairment and other medical and age-related issues.

4. Casino gaming areas.

5. General area lighting power in industrial and manufacturing occupancies dedicated to the inspection or quality control of goods and products.

6. Mirror lighting in dressing rooms.

7. Task lighting for medical and dental purposes that is in addition to general lighting and controlled by an independent control device.

8. Display lighting for exhibits in galleries, museums and monuments that is in addition to general lighting and controlled by an independent control device.

9. Lighting for theatrical purposes, including performance, stage, film production and video production.

10. Lighting for photographic processes.

11. Lighting integral to equipment or instrumentation and installed by the manufacturer.

12. Task lighting for plant growth or maintenance where the lamp efficacy is not less than 90 lumens per watt.

13. Advertising signage or directional signage.

14. Lighting for food warming.

15. Lighting equipment that is for sale.

16. Lighting demonstration equipment in lighting education facilities.

17. Lighting *approved* because of safety considerations.

18. Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions.

19. Furniture mounted supplemental task lighting that is controlled by automatic shutoff.

20. Exit signs.

21. Lighting used for aircraft painting.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405054 Table C405.4.2(2)—Interior lighting power allowances—Space-by-space method.**

**Table C405.4.2(2)**

**Interior Lighting Power Allowances—Space-by-Space Method**

Common Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
Atrium - Less than 20 feet in height	0.39
Atrium - 20 to 40 feet in height	0.48
Atrium - Above 40 feet in height	0.60
Audience/seating area - Permanent	
In an auditorium	0.61
In a gymnasium	0.23
In a motion picture theater	0.27
In a penitentiary	0.67
In a performing arts theater	1.16
In a religious building	0.72
In a sports arena	0.33
Otherwise	0.23

Common Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
Banking activity area <sup>a</sup>	0.61
Breakroom (see lounge/breakroom)	
Classroom/lecture hall/training room	
In a penitentiary	0.89
Otherwise	0.71 <sup>m</sup>
Computer room, data center	0.94
Conference/meeting/multipurpose	0.97
Confinement cell	0.70
Copy/print room	0.31
Corridor	
In a facility for the visually impaired (and not used primarily by the staff) <sup>b</sup>	0.71
In a hospital	0.71
In a manufacturing facility	0.41
Otherwise <sup>c</sup>	0.41
Courtroom <sup>c</sup>	1.20
Dining area	
In a penitentiary	0.42
In a facility for the visually impaired (and not used primarily by the staff) <sup>b</sup>	1.27
In a bar/lounge or leisure dining <sup>a</sup>	0.86
In cafeteria or fast food dining	0.40
In a family dining area <sup>a</sup>	0.60
Otherwise	0.43
Electrical/mechanical	0.43
Emergency vehicle garage	0.52
Food preparation	1.09
Guest room <sup>a,b</sup>	0.41
Laboratory	
In or as a classroom	1.11
Otherwise	1.33
Laundry/washing area	0.53
Loading dock, interior	0.88
Lobby <sup>c</sup>	
In a facility for the visually impaired (and not used primarily by the staff) <sup>b</sup>	1.69
For an elevator	0.65
In a hotel	0.51
In a motion picture theater	0.23
In a performing arts theater	1.25

Common Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
Otherwise	0.84
Locker room	0.52
Lounge/breakroom <sup>n</sup>	
In a health care facility <sup>n</sup>	0.42
Otherwise <sup>n</sup>	0.59
Office	
Enclosed ≤ 250	0.74
Enclosed > 250	0.66
Open plan	0.61
Parking area, interior	0.15
Pharmacy area	1.66
Restroom	
In a facility for the visually impaired (and not used primarily by the staff) <sup>b</sup>	1.26
Otherwise <sup>n</sup>	0.63
Sales area	1.05
Seating area, general	0.23
Stairway (see space containing stairway)	
Stairwell <sup>n</sup>	0.49
Storage room	
< 50 ft <sup>2</sup>	0.51
50-100 ft <sup>2</sup>	0.38
All other storage	0.38
Vehicular maintenance	0.60
Workshop	1.26

Building Specific Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
Automotive (see vehicular maintenance)	
Convention center - Exhibit space	0.61
Dormitory living quarters <sup>a,b</sup>	0.50
Facility for the visually impaired <sup>b</sup>	
In a chapel (and not used primarily by the staff) <sup>b</sup>	0.70
In a recreation room (and not used primarily by the staff) <sup>b</sup>	1.77
Fire stations <sup>g</sup>	
Sleeping quarters	0.23
Gymnasium/fitness center	
In an exercise area	0.90
In a playing area	0.85
Health care facility	

Building Specific Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
In an exam/treatment room	1.40
In an imaging room	0.94
In a medical supply room	0.62
In a nursery	0.92
In a nurse's station	1.17
In an operating room	2.26
In a patient room <sup>g</sup>	0.68
In a physical therapy room	0.91
In a recovery room	1.25
Library	
In a reading area <sup>n</sup>	0.31
In the stacks	1.10
Manufacturing facility	
In a detailed manufacturing area	0.80
In an equipment room	0.76
In an extra high bay area (greater than 50-foot floor-to-ceiling height)	1.42
In a high bay area (25 - 50-foot floor-to-ceiling height)	1.24
In a low bay (< 25-foot floor-to-ceiling height)	0.86
Museum	
In a general exhibition area	0.31
In a restoration room	1.10
Performing arts theater dressing/fitting room	0.41
Post office - Sorting area	0.76
Religious buildings	
In a fellowship hall <sup>n</sup>	0.54
In a worship/pulpit/choir area <sup>n</sup>	0.85
Retail facilities	
In a dressing/fitting room	0.51
In a mall concourse	0.82
Sports arena - Playing area	
For a Class 1 facility <sup>i</sup>	2.94
For a Class 2 facility <sup>j</sup>	2.01
For a Class 3 facility <sup>k</sup>	1.30
For a Class 4 facility <sup>l</sup>	0.86
Transportation	
In a baggage/carousel area	0.39
In an airport concourse	0.25

Building Specific Space-by-Space Types <sup>a</sup>	LPD (w/ft <sup>2</sup> )
At a terminal ticket counter <sup>b</sup>	0.51
Warehouse - Storage area	
For medium to bulky palletized items	0.33
For smaller, hand-carried items	0.69

For SI: 1 foot = 304.8 mm, 1 watt per square foot = 11 W/m<sup>2</sup>.

- a In cases where both a common space type and a building area specific space type are listed, the building area specific space type shall apply.
- b A facility for the visually impaired is a facility that is licensed or will be licensed by local or state authorities for senior long-term care, adult daycare, senior support or people with special visual needs.
- c For spaces in which lighting is specified to be installed in addition to, and controlled separately from, the general lighting for the purpose of highlighting art or exhibits, provided that the additional lighting power shall not exceed 0.5 W/ft<sup>2</sup> of such spaces.
- d Reserved.
- e Reserved.
- f Reserved.
- g Where sleeping units are excluded from lighting power calculations by application of Section R404.1, neither the area of the sleeping units nor the wattage of lighting in the sleeping units is counted.
- h Where dwelling units are excluded from lighting power calculations by application of Section R404.1, neither the area of the dwelling units nor the wattage of lighting in the dwelling units is counted.

- i Class I facilities consist of professional facilities; and semiprofessional, collegiate or club facilities with seating for 5,000 or more spectators.
- j Class II facilities consist of collegiate and semiprofessional facilities with seating for fewer than 5,000 spectators; club facilities with seating between 2,000 and 5,000 spectators; and amateur league and high school facilities with seating for more than 2,000 spectators.
- k Class III facilities consist of club, amateur league and high school facilities with seating for 2,000 or fewer spectators.
- l Class IV facilities consist of elementary school and recreational facilities; and amateur league and high school facilities without provisions for spectators.
- m For classrooms, additional lighting power allowance of 4.50 W/linear foot of white or chalk boards for directional lighting dedicated to white or chalk boards.
- n Additional lighting power allowance of 0.30 W/ft<sup>2</sup> for ornamental lighting. Qualifying ornamental lighting includes luminaires such as chandeliers, sconces, lanterns, neon and cold cathode, light emitting diodes, theatrical projectors, moving lights and light color panels when any of those lights are used in a decorative manner that does not serve as display lighting or general lighting.
- (~~e For scientific laboratories, additional lighting power allowance of 0.35 W/ft<sup>2</sup> for specialized task work – lighting that provides for small-scale, cognitive or fast performance visual tasks, lighting required for operating specialized equipment associated with pharmaceutical/laboratorial activities.~~)
- ~~p For offices, additional lighting power allowance of 0.20 W/ft<sup>2</sup> for portable lighting, which includes under shelf or furniture mounted supplemental task lighting qualifies when controlled by a time clock or an occupancy sensor.)~~

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-405064 Table C405.5.3(2)—Individual lighting power allowances for building exteriors.**

**Table C405.5.3(2)  
Lighting Power Allowances for Building Exteriors**

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Base Site Allowance	350 W	400 W	500 W	900 W
<b>Uncovered Parking Areas</b>				
Parking areas and drives	0.03 W/ft <sup>2</sup>	0.04 W/ft <sup>2</sup>	0.06 W/ft <sup>2</sup>	0.08 W/ft <sup>2</sup>
<b>Building Grounds</b>				
Walkways and ramps less than 10 feet wide	0.5 W/linear foot	0.5 W/linear foot	0.6 W/linear foot	0.7 W/linear foot
Walkways and ramps 10 feet wide or greater, plaza areas, special feature areas	0.10 W/ft <sup>2</sup>	0.10 W/ft <sup>2</sup>	0.11 W/ft <sup>2</sup>	0.14 W/ft <sup>2</sup>
Dining areas	0.65 W/ft <sup>2</sup>	0.65 W/ft <sup>2</sup>	0.75 W/ft <sup>2</sup>	0.95 W/ft <sup>2</sup>
Stairways	0.6 W/ft <sup>2</sup>	0.7 W/ft <sup>2</sup>	0.7 W/ft <sup>2</sup>	0.7 W/ft <sup>2</sup>

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Pedestrian tunnels	0.12 W/ft <sup>2</sup>	0.12 W/ft <sup>2</sup>	0.14 W/ft <sup>2</sup>	0.21 W/ft <sup>2</sup>
Landscaping	0.03 W/ft <sup>2</sup>	0.04 W/ft <sup>2</sup>	0.04 W/ft <sup>2</sup>	0.04 W/ft <sup>2</sup>
<b>Building Entrances and Exits</b>				
Pedestrian and vehicular entrances and exits	14 W/linear foot of opening	14 W/linear foot of opening	21 W/linear foot of opening	21 W/linear foot of opening
Entry canopies	0.2 W/ft <sup>2</sup>	0.25 W/ft <sup>2</sup>	0.4 W/ft <sup>2</sup>	0.4 W/ft <sup>2</sup>
Loading docks	0.35 W/ft <sup>2</sup>	0.35 W/ft <sup>2</sup>	0.35 W/ft <sup>2</sup>	0.35 W/ft <sup>2</sup>
<b>Sales Canopies</b>				
Free standing and attached	0.4 W/ft <sup>2</sup>	0.4 W/ft <sup>2</sup>	0.6 W/ft <sup>2</sup>	0.7 W/ft <sup>2</sup>
<b>Outdoor Sales</b>				
Open areas (including vehicle sales lots)	0.2 W/ft <sup>2</sup>	0.2 W/ft <sup>2</sup>	0.35 W/ft <sup>2</sup>	0.5 W/ft <sup>2</sup>

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Street frontage for vehicle sales lots in addition to "open area" allowance	No Allowance	7 W/linear foot	7 W/linear foot	21 W/linear foot

For SI: 1 foot = 304.8 mm, 1 watt per square foot = W/0.0929 m<sup>2</sup>

**Table C405.5.3(3)**

**Individual Lighting Power Allowances for Building Exteriors**

	Lighting Zones			
	Zone 1	Zone 2	Zone 3	Zone 4
Building facades	No allowance	0.075 W/ft <sup>2</sup> of gross above-grade wall area	0.113 W/ft <sup>2</sup> of gross above-grade wall area	0.150 W/ft <sup>2</sup> of gross above-grade wall area
Automated teller machines and night depositories	135W per location plus 45W per additional ATM per location			
Uncovered entrances and gatehouse inspection stations at guarded facilities	0.5 W/ft <sup>2</sup>			
Uncovered loading areas for law enforcement, fire, ambulance and other emergency service vehicles	0.35 W/ft <sup>2</sup>			
Drive-up windows/doors	200 W per drive-through			
Parking near 24-hour retail entrances	400 W per main entry			

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40508 Section C405.8—Electric motors.**

**Table C405.8(1)**

**Minimum Nominal Full-load Efficiency for NEMA Design A, NEMA Design B and IEC Design N Motors (Excluding Fire Pump) Electric Motors at 60 Hz<sup>a,b</sup>**

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016							
	2 pole		4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	77.0	77.0	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	84.0	84.0	86.5	86.5	87.5	86.5	78.5	77.5
2 (1.5)	85.5	85.5	86.5	86.5	88.5	87.5	84.0	86.5

**C405.8 Electric motor efficiency.** All electric motors, fractional or otherwise, shall meet the minimum efficiency requirements of Tables C405.8(1) through C405.8(4) when tested and rated in accordance with DOE 10 C.F.R. 431. The efficiency shall be verified through certification under an approved certification program or, where no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the motor manufacturer.

**EXCEPTION:** The standards in this section shall not apply to the following exempt electric motors.

1. Air-over electric motors.
2. Components sets of an electric motor.
3. Liquid-cooled electric motors.
4. Submersible electric motors.
5. Inverter-only electric motors.

Fractional hp fan motors that are 1/12 hp or greater and less than 1 hp (based on output power) which are not covered by Tables C405.8(3) and C405.8(4) shall be electronically commutated motors or shall have a minimum motor efficiency of 70 percent when rated in accordance with DOE 10 C.F.R. 431. These motors shall also have the means to adjust motor speed for either balancing or remote control. Belt-driven fans may use sheave adjustments for airflow balancing in lieu of a varying motor speed.

- EXCEPTIONS:**
1. Motors that are an integral part of specialized process equipment.
  2. Where the motor is integral to a listed piece of equipment for which no complying motor has been approved.
  3. Motors used as a component of the equipment meeting the minimum efficiency requirements of Section ((C403.2.3)) C403.3.2 and Tables ((C403.2.3)) C403.3.2(1) through ((C403.2.3(10))) C403.3.2(12) provided that the motor input is included when determining the equipment efficiency.
  4. Motors in the airstream within fan-coils and terminal units that operate only when providing heating to the space served.
  5. Fan motors that are not covered by Tables C405.8(1) through C405.8(4) and are used to power heat recovery ventilators, energy recovery ventilators, or local exhaust fans in Group R subject to the efficacy requirements of Section C403.8.4.
  6. Domestic clothes dryer booster fans, range hood exhaust fans, and domestic range booster fans that operate intermittently.
  7. Radon and contaminated soil exhaust fans.
  8. Group R heat recovery ventilator and energy recovery ventilator fans that are less than 400 cfm.

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016							
	2 pole		4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open	Enclosed	Open
3 (2.2)	86.5	85.5	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	88.5	86.5	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	89.5	88.5	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	90.2	89.5	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	91.0	90.2	92.4	93.0	91.7	91.7	89.5	90.2
20 (15)	91.0	91.0	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	91.7	91.7	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	91.7	91.7	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	92.4	92.4	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	93.0	93.0	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	93.6	93.6	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	93.6	93.6	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	94.1	93.6	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.0	94.1	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.0	94.1	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	95.4	95.0	96.2	95.8	95.8	95.4	94.5	94.1
250 (186)	95.8	95.0	96.2	95.8	95.8	95.8	95.0	95.0
300 (224)	95.8	95.4	96.2	95.8	95.8	95.8		
350 (261)	95.8	95.4	96.2	95.8	95.8	95.8		
400 (298)	95.8	95.8	96.2	95.8				
450 (336)	95.8	96.2	96.2	96.2				
500 (373)	95.8	96.2	96.2	96.2				

<sup>a</sup> Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.

- <sup>b</sup> For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:
1. A horsepower at or above the midpoint between the two consecutive horsepower shall be rounded up to the higher of the two horsepower.
  2. A horsepower below the midpoint between the two consecutive horsepower shall be rounded down to the lower of the two horsepower.
  3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula 1 kW = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with 1 or 2, whichever applies.

**Table C405.8(2)**  
**Minimum Nominal Full-load Efficiency for NEMA Design C and IEC Design H Motors at 60 Hz<sup>a,b</sup>**

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016					
	4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
1 (0.75)	85.5	85.5	82.5	82.5	75.5	75.5
1.5 (1.1)	86.5	86.5	87.5	86.5	78.5	77.5
2 (1.5)	86.5	86.5	88.5	87.5	84.0	86.5
3 (2.2)	89.5	89.5	89.5	88.5	85.5	87.5
5 (3.7)	89.5	89.5	89.5	89.5	86.5	88.5
7.5 (5.5)	91.7	91.0	91.0	90.2	86.5	89.5
10 (7.5)	91.7	91.7	91.0	91.7	89.5	90.2
15 (11)	92.4	93.0	91.7	91.7	89.5	90.2

Motor horsepower (Standard kilowatt equivalent)	Nominal full-load efficiency (%) as of June 1, 2016					
	4 pole		6 pole		8 pole	
	Enclosed	Open	Enclosed	Open	Enclosed	Open
20 (15)	93.0	93.0	91.7	92.4	90.2	91.0
25 (18.5)	93.6	93.6	93.0	93.0	90.2	91.0
30 (22)	93.6	94.1	93.0	93.6	91.7	91.7
40 (30)	94.1	94.1	94.1	94.1	91.7	91.7
50 (37)	94.5	94.5	94.1	94.1	92.4	92.4
60 (45)	95.0	95.0	94.5	94.5	92.4	93.0
75 (55)	95.4	95.0	94.5	94.5	93.6	94.1
100 (75)	95.4	95.4	95.0	95.0	93.6	94.1
125 (90)	95.4	95.4	95.0	95.0	94.1	94.1
150 (110)	95.8	95.8	95.8	95.4	94.1	94.1
200 (150)	96.2	95.8	95.8	95.4	94.5	94.1

NR - No requirement.

a Nominal efficiencies shall be established in accordance with DOE 10 C.F.R. 431.

b For purposes of determining the required minimum nominal full-load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in this table, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

1. A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers.
2. A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers.
3. A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula 1 kW = (1/0.746) horsepower. The conversion should be calculated to three significant decimal places, and the resulting horsepower shall be rounded in accordance with 1 or 2, whichever applies.

**Table C405.8(3)**

**Minimum Average Full Load Efficiency for Polyphase Small Electric Motors<sup>a</sup>**

OPEN MOTORS			
NUMBER OF POLES =>	2	4	6
SYNCHRONOUS SPEED (RPM) ==>	3600	1800	1200
MOTOR HORSEPOWER ▼			
0.25	65.6	69.5	67.5
0.33	69.5	73.4	71.4
0.50	73.4	78.2	75.3
0.75	76.8	81.1	81.7
1	77.0	83.5	82.5
1.5	84.0	86.5	83.8
2	85.5	86.5	N/A
3	85.5	86.9	N/A

<sup>a</sup> Average full load efficiencies shall be established in accordance with 10 C.F.R. 431.

**Table C405.8(4)**

**Minimum Average Full Load Efficiency For Capacitor-start Capacitor-run and Capacitor-start Induction-run Small Electric Motors<sup>a</sup>**

OPEN MOTORS			
NUMBER OF POLES =>	2	4	6
SYNCHRONOUS SPEED (RPM) ==>	3600	1800	1200
MOTOR HORSEPOWER ▼			
0.25	66.6	68.5	62.2
0.33	70.5	72.4	66.6
0.50	72.4	76.2	76.2
0.75	76.2	81.8	80.2
1	80.4	82.6	81.1
1.5	81.5	83.8	N/A
2	82.9	84.5	N/A
3	84.1	N/A	N/A

<sup>a</sup> Average full load efficiencies shall be established in accordance with 10 C.F.R. 431.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40511 Section C405.11—Voltage drop in feeders and branch circuits.**

**C405.11 Voltage drop in feeders and branch circuits.** The total voltage drop across the combination of feeders and branch circuits shall not exceed five percent.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40600 Section C406—Efficiency packages.**

**C406.1 Additional energy efficiency credit requirements.** New buildings and changes in space conditioning, change of occupancy and building additions in accordance with Chapter

5 shall comply with sufficient packages from Table C406.1 so as to achieve a minimum number of 6 credits. Each area shall be permitted to apply for different packages provided all areas in the building comply with the requirements for 6 credits. Areas included in the same permit within mixed use buildings shall be permitted to demonstrate compliance by an area weighted average number of credits by building occupancy achieving a minimum number of 6 credits.

- EXCEPTIONS:
1. Low energy spaces in accordance with Section C402.1.1.1 and equipment buildings in accordance with Section C402.1.2 shall comply with sufficient packages from Table C406.1 to achieve a minimum number of 3 credits.
  2. Building additions that have less than 1,000 square feet of conditioned floor area shall comply with sufficient packages from Table C406.1 to achieve a minimum number of 3 credits.

**Table C406.1  
Efficiency Package Credits**

Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
1. More efficient HVAC performance in accordance with Section C406.2	2.0	3.0	3.0	2.0	1.0	2.0
2. Reduced lighting power: Option 1 in accordance with Section C406.3.1	1.0	1.0	2.0	2.0	3.0	2.0
3. Reduced lighting power: Option 2 in accordance with Section C406.3.2 <sup>a</sup>	2.0	3.0	4.0	4.0	6.0	4.0
4. Enhanced lighting controls in accordance with Section C406.4	NA	NA	1.0	1.0	1.0	1.0
5. On-site supply of renewable energy in accordance with C406.5	3.0	3.0	3.0	3.0	3.0	3.0
6. Dedicated outdoor air system in accordance with Section C406.6 <sup>b</sup>	4.0	4.0	4.0	NA	NA	4.0
7. High performance dedicated outdoor air system in accordance with Section C406.7	4.0	4.0	4.0	4.0	4.0	4.0
8. High-efficiency service water heating in accordance with Sections C406.8.1 and C406.8.2	4.0	5.0	NA	NA	NA	8.0
9. High performance service water heating in multi-family buildings in accordance with Section C406.9	7.0	8.0	NA	NA	NA	NA
10. Enhanced envelope performance in accordance with Section C406.10 <sup>c</sup>	3.0	6.0	3.0	3.0	3.0	4.0
11. Reduced air infiltration in accordance with Section C406.11 <sup>c</sup>	1.0	2.0	1.0	1.0	1.0	1.0



Code Section	Commercial Building Occupancy					
	Group R-1	Group R-2	Group B	Group E	Group M	All Other
	Additional Efficiency Credits					
12. Enhanced commercial kitchen equipment in accordance with Section C406.12	5.0	NA	NA	NA	5.0	5.0 (Group A-2 only)

- a Projects using this option may not use Item 2.
- b This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.
- c Buildings or building areas that are exempt from the thermal envelope requirements in accordance with Sections C402.1.1 and C402.1.2, do not qualify for this package.

**C406.1.1 Tenant spaces.** Initial tenant improvement shall comply with sufficient packages from Table C406.1 (~~as~~) to achieve a minimum number of six credits. In buildings with multiple tenant spaces, each tenant space is permitted to apply for different packages provided all areas in the building comply with the requirement for six credits.

**C406.1.1.1 Applicable envelope and on-site renewable energy credits.** Where an entire building or building addition complies with Section C406.5, C406.10 or C406.11, under an initial tenant improvement permit, tenant spaces within the building qualify for the number of credits assigned to the occupancy type of the tenant space in accordance with Table C406.1.

**C406.1.1.2 Applicable HVAC and service water heating credits.** Where HVAC and service water heating systems and services are installed and comply with Section C406.2 or C406.8 under an initial tenant improvement permit, those systems and services shall be considered a part of the tenant space. Tenant spaces qualify for the credits assigned to the occupancy type of the tenant space in accordance with Table C406.1 if the tenant space includes the distribution system and equipment that the central HVAC systems or service water heating systems were designed to support.

EXCEPTION: Previously occupied tenant spaces in existing buildings that comply with this code in accordance with Section C501.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40602 Section C406.2—HVAC option.**

**C406.2 More efficient HVAC equipment and fan performance.** No less than 90 percent of the total HVAC capacity serving the total conditioned floor area of the entire building, building addition or tenant space in accordance with Section C406.1.1 shall comply with Sections C406.2.1 through C406.2.3. For systems required to comply with Section C403.1.1, HVAC total system performance ratio, exceed the minimum requirement by 10 percent.

EXCEPTION: In low energy spaces complying with Section C402.1.1 and semi-heated spaces complying with Section C402.1.1.2, no less than 90 percent of the installed heating capacity is provided by electric infrared or gas-fired radiant heating equipment for localized heating applications. Stand-alone supply, return and exhaust fans shall comply with Section C406.2.3.

**C406.2.1 HVAC system selection.** Equipment installed shall be types that are listed in Tables (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12) or a combination thereof. Electric resistance heating does not meet this requirement.

EXCEPTION: Allowed equipment not listed in Tables (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12):

1. Air-to-water heat pumps.
2. Heat recovery chillers.

**C406.2.2 Minimum equipment efficiency.** Equipment shall exceed the minimum efficiency requirements listed in Tables (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12) by 15 percent, in addition to the requirements of Section C403. Where multiple performance requirements are provided, the equipment shall exceed all requirements by 15 percent.

EXCEPTIONS:

1. Equipment that is larger than the maximum capacity range indicated in Tables (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12) shall utilize the values listed for the largest capacity equipment for the associated equipment type shown in the table.
2. Equipment that complies with the exception to Section C406.2.1 is not required to comply with the minimum equipment efficiency requirement.
3. Compliance may be demonstrated by calculating a total weighted average percentage for all heating and cooling equipment combined. All equipment shall have efficiency that is no less than 5 percent better than the minimum required efficiency in Table (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12), and the resulting weighted average percentage for all equipment performance requirements shall exceed 15 percent. Calculation shall include heating and cooling capacities for all equipment, percentage better or worse than minimum required efficiency per Tables (~~C403.2.3~~) C403.3.2(1) through (~~C403.2.3~~) C403.3.2(12) for each performance requirement (SEER, EER/IEER, COP, HSPF, E<sub>v</sub>, E<sub>c</sub>, and AFUE), and the total weighted average efficiency percentage.
4. Hot water boilers with input capacity greater than 2,500,000 Btu/h shall be considered to comply with this section with a minimum thermal efficiency of 95 percent E<sub>t</sub> in accordance with the test procedure in 10 C.F.R. Part 431.

**C406.2.3 Minimum fan efficiency.** Stand-alone supply, return and exhaust fans designed for operating with motors over 750 watts (1 hp) shall have a fan efficiency grade of not less than FEG 71 as defined in AMCA 205. The total efficiency of the fan at the design point of operation shall be

within 10 percentage points of either the maximum total efficiency of the fan or the static efficiency of the fan.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40603 Section C406.3—LPA option.**

**C406.3 Reduced lighting power.** Interior lighting within the whole building, building addition or tenant space shall comply with Section C406.3.1 or Section C406.3.2. Dwelling units and sleeping units within the building shall comply with Section C406.3.3.

**C406.3.1 Reduced lighting power Option 1.** The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 90 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area for the building types, or 90 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

**C406.3.2 Reduced lighting power Option 2.** The total connected interior lighting power calculated in accordance with Section C405.4.1 shall be 80 percent or less of the lighting power values specified in Table C405.4.2(1) times the floor area of the building types, or 80 percent or less of the total interior lighting power allowance calculated in accordance with Section C405.4.2.

**C406.3.3 Lamp fraction.** No less than 95 percent of the permanently installed light fixtures in dwelling units and sleeping units shall be provided by lamps with a minimum efficacy of 65 lumens per watt.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40606 Section C406.6—DOAS option.**

**C406.6 Dedicated outdoor air system (DOAS).** ~~((Not))~~ No less than 90 percent of the total conditioned floor area of the whole building, building addition or tenant space, excluding floor area of unoccupied spaces that do not require ventilation per the *International Mechanical Code*, shall be served by DOAS installed in accordance with Section C403.3.5. This option is not available to buildings subject to the prescriptive requirements of Section C403.3.5.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40702 Section C407.2—Mandatory requirements.**

**C407.2 Mandatory requirements.** Compliance with this section requires compliance with those sections shown in Table C407.2.

The building permit application for projects utilizing this method shall include in one submittal all building and mechanical drawings and all information necessary to verify that the building envelope and mechanical design for the project corresponds with the annual energy analysis. If credit

is proposed to be taken for lighting energy savings, then an electrical permit application shall also be submitted and approved prior to the issuance of the building permit. If credit is proposed to be taken for energy savings from other components, then the corresponding permit application (e.g., plumbing, boiler, etc.) shall also be submitted and approved prior to the building permit application. Otherwise, components of the project that would not be approved as part of a building permit application shall be modeled the same in both the proposed building and the *standard reference design* and shall comply with the requirements of this code.

**Table C407.2**

**Mandatory Compliance Measures for Total Building Performance Method**

Section	Title	Comments
<b>Envelope</b>		
C402.5	Air leakage	
<b>Mechanical</b>		
C403.1.2	Calculation of heating and cooling loads	
C403.1.3	Data centers	
C403.2	System design	
C403.3.1	Equipment and system sizing	
C403.3.2	HVAC equipment performance requirements	
C403.3.6	Ventilation for Group R occupancy	
C403.4	HVAC system controls	
C403.4.1	Thermostatic controls	Except for C403.4.1.4
C403.4.2	Off-hour controls	Except for Group R
C403.4.7	Combustion heating equipment controls	
C403.4.8	Group R-1 hotel/motel guestrooms	See Section <del>((C403.7.6))</del> C403.7.4
C403.4.9	Group R-2 and R-3 dwelling units	
C403.4.10	Group R-2 sleeping units	
C403.4.11	Direct digital control systems	
C403.5.5	Economizer fault detection and diagnostics (FDD)	
C403.7	Ventilation and exhaust systems	Except for C403.7.6
C403.8	Fan and fan controls	

Section	Title	Comments
C403.9.1.1	Variable flow controls	For cooling tower fans $\geq 7.5$ hp
C403.9.1.2	Limitation on centrifugal fan cooling towers	For open cooling towers
C403.10	Construction of HVAC elements	
C403.11	Mechanical systems located outside of the building thermal envelope	
<b>Service Water Heating</b>		
C404	Service water heating	
<b>Lighting and Electrical</b>		
C405.1	General	
C405.2	Lighting controls	
C405.3	Exit signs	
C405.4	Interior lighting power	
C405.5	Exterior building lighting power	
C405.6	Electrical transformers	
C405.7	Dwelling unit energy consumption	
C405.8	Electric motor efficiency	
C405.9	Vertical and horizontal transportation	
C405.10	Controlled receptacles	
C405.11	Voltage drop in feeders	
<b>Other Requirements</b>		
C407	Total building performance	
C408	System commissioning	
C409	Energy metering	
C410	Refrigeration requirements	
C411	Solar readiness	

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40801 Section C408.1—General.**

**C408.1 General.** A building commissioning process led by a *certified commissioning professional* and functional testing requirements shall be completed for mechanical systems in Section C403; service water heating systems in Section C404; controlled receptacle and lighting control systems in Section C405; equipment, appliances and systems installed to comply with Sections C406 or C407; energy metering in Section C409; and refrigeration systems in Section C410.

**EXCEPTION:** Buildings, or portions thereof, which are exempt from Sections C408.2 through C408.7 may be excluded from the commissioning process.

1. Mechanical systems are exempt from the commissioning process where the ((building's)) installed total mechanical equipment capacity is less than 240,000 Btu/h cooling capacity and less than 300,000 Btu/h heating capacity.

2. Service water heating systems are exempt from the commissioning process in buildings where the largest service water heating system capacity is less than 200,000 Btu/h and where there are no pools or permanent spas.

3. Lighting control systems are exempt from the commissioning process in buildings where both the total installed lighting load is less than 20 kW and the lighting load controlled by occupancy sensors or automatic daylighting controls is less than 10 kW.

4. Refrigeration systems are exempt from the commissioning process in buildings if they are limited to self-contained units.

**C408.1.1 Commissioning in construction documents.** Construction documents shall clearly indicate provisions for commissioning process. The construction documents shall minimally include the following:

1. A narrative description of the activities that will be accomplished during the commissioning process. At a minimum, the commissioning process is required to include:

1.1. Development and execution of the commissioning plan, including all subsections of Section C408.1.2;

1.2. The *certified commissioning professional's* review of the building documentation and close out submittals in accordance with Section C103.6; and

1.3. The commissioning report in accordance with Section C408.1.3.

2. Roles, responsibilities, and required qualifications of the *certified commissioning professional*.

3. A listing of the specific equipment, appliances, or systems to be tested.

**C408.1.2 Commissioning plan.** A commissioning plan shall be developed by the project's *certified commissioning professional* and shall outline the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.

1. A narrative description of the activities that will be accomplished during each phase of commissioning, including the personnel intended to accomplish each of the activities, systems testing and balancing, functional performance testing, and verification of the building documentation requirements in Section C103.6.

2. Roles and responsibilities of the commissioning team, including the name and statement of qualifications of the *certified commissioning professional*.

3. A listing of the specific equipment, appliances or systems to be tested and a description of the tests to be performed.

**C408.1.2.1 In-house commissioning disclosure and conflict management plan.** Where the *certified commissioning professional's* contract or employment is other than directly with the building owner, an in-house commissioning disclosure

sure and conflict management plan shall be a part of the commissioning process. A copy shall be included in the commissioning plan. This plan shall disclose the *certified commissioning professional's* contractual relationship with other team members and provide a conflict management plan demonstrating that the *certified commissioning professional* is free to identify any issues discovered and report directly to the owner.

**C408.1.2.2 Functional performance testing.** Functional performance testing shall be conducted for mechanical systems in Sections C403; service water heating systems in Section C404; controlled receptacles and lighting control systems in Section C405; equipment, appliances, systems installed to comply with Section C406 or C407; energy metering in Section C409; and refrigeration systems in Section C410. Written procedures which clearly describe the individual systematic test procedures, the expected system response or acceptance criteria for each procedure, the actual response or findings, and any pertinent discussion shall be followed. This testing shall include control systems which will be tested to document that control devices, components, equipment, and systems are calibrated and adjusted to operate in accordance with approved construction documents. Testing shall affirm the conditions required within Sections C408.2 through C408.7 under system testing.

**C408.1.2.3 Functional performance testing - Sampling.** For projects with 7 or fewer similar systems, each system shall be tested. For projects with more than 7 systems, testing shall be done for each unique combination of control types. Where multiples of each unique combination of control types exist, no fewer than 20 percent of each combination shall be tested unless the code official or design professional requires a higher percentage to be tested. Where 30 percent or more of the tested system fail, all remaining identical combinations shall be tested.

**C408.1.2.4 Deficiencies.** Deficiencies found during testing shall be resolved including corrections and retesting.

**C408.1.3 Commissioning report.** A commissioning report shall be completed and certified by the *certified commissioning professional* and delivered to the building owner or owner's authorized agent. The report shall be organized with mechanical, service water heating, controlled receptacle and lighting control systems, energy metering, and refrigeration findings in separate sections to allow independent review. The report shall record the activities and results of the commissioning process and be developed from the final commissioning plan with all of its attached appendices. The report shall include:

1. Results of functional performance tests.
2. Disposition of deficiencies found during testing, including details of corrective measures used or proposed.
3. Functional performance test procedures used during the commissioning process including measurable criteria for test acceptance, provided herein for repeatability.
4. Commissioning plan.
5. Testing, adjusting and balancing report.

EXCEPTION: Deferred tests which cannot be performed at the time of report preparation due to climatic conditions.

**C408.1.4. Commissioning process completion requirements.** Prior to the final mechanical, plumbing and electrical inspections or obtaining a certificate of occupancy, the *certified commissioning professional* shall provide evidence of *building commissioning* in accordance with the provisions of this section.

**C408.1.4.1 Commissioning compliance.** Buildings, or portions thereof, shall not be considered acceptable for a final inspection pursuant to Section C104.2.6 until the *code official* has received a letter of transmittal from the building owner acknowledging that the building owner or owner's authorized agent has received the Commissioning Report. Completion of Commissioning Compliance Checklist (Figure C408.1.4.1) is deemed to satisfy this requirement. Phased acceptance of ~~(the)~~ Commissioning Compliance Checklist for portions of the work specific to the trade that is being inspected is permissible where accepted by the *code official* and where the *certified commissioning professional* remains responsible for completion of the commissioning process. If there are unresolved deficiencies when the final inspection is scheduled, the Commissioning Report shall be submitted and shall describe the unresolved deficiencies.

**C408.1.4.2 Copy of report.** The *code official* shall be permitted to require that a copy of the ~~(Preliminary)~~ Commissioning Report be made available for review by the *code official*.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40802 Section C408.2—Mechanical systems commissioning.**

**C408.2 Mechanical ~~(and refrigeration)~~ systems commissioning.** Mechanical ~~(and refrigeration)~~ equipment and controls subject to Section ~~(s)~~ C403 ~~(and C410)~~ shall be included in the commissioning process required by Section C408.1. The commissioning process shall minimally include all energy code requirements for which the code states that equipment or controls shall "be capable of" or "configured to" perform specific functions.

EXCEPTION: Mechanical systems are exempt from the commissioning process where the installed total mechanical equipment capacity is less than 240,000 Btu/h cooling capacity and less than 300,000 Btu/h heating capacity.

**C408.2.1 Reserved.**

**C408.2.2 Systems adjusting and balancing.** HVAC systems shall be balanced in accordance with generally accepted engineering standards. Air and water flow rates shall be measured and adjusted to deliver final flow rates within the tolerances provided in the project specifications. Test and balance activities shall include air system and hydronic system balancing.

**C408.2.2.1 Air systems balancing.** Each supply air outlet and *zone* terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the *International Mechanical Code*. Discharge dampers used for air system balancing are prohibited on constant vol-

ume fans and variable volume fans with motors 10 hp (18.6 kW) and larger. Air systems shall be balanced in a manner to first minimize throttling losses then, for fans with system power of greater than 1 hp (0.74 kW), fan speed shall be adjusted to meet design flow conditions.

EXCEPTION: Fans with fan motors of 1 hp (0.74 kW) or less.

**C408.2.2.2 Hydronic systems balancing.** Individual hydronic heating and cooling coils shall be equipped with means for balancing and measuring flow. Hydronic systems shall be proportionately balanced in a manner to first minimize throttling losses, then the pump impeller shall be trimmed or pump speed shall be adjusted to meet design flow conditions. Each hydronic system shall have either the capability to measure pressure across the pump, or test ports at each side of each pump.

EXCEPTION: The following equipment is not required to be equipped with means for balancing or measuring flow:

1. Pumps with pump motors of 5 hp (3.7 kW) or less.
2. Where throttling results in no greater than five percent of the nameplate horsepower draw above that required if the impeller were trimmed.

**C408.2.3 System testing.** Functional performance testing shall demonstrate the components, systems, and system-to-system interfacing relationships are installed and operate in accordance with approved construction documents. Testing shall include the *sequence of operation*, and be conducted under full-load, part-load and the following conditions:

1. All modes as described in the *sequence of operation*;
2. Redundant or *automatic* back-up mode;
3. Performance of alarms; and
4. Mode of operation upon a loss of power and restoration of power.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-40904 Section C409.4—Measurement devices, data acquisition system and energy display.**

**C409.4 Measurement devices, data acquisition system and energy display.**

**C409.4.1 Meters.** Meters and other measurement devices required by this section shall have local displays or be configured to automatically communicate energy data to a data acquisition system. Source meters may be any digital-type meters. Current sensors or flow meters are allowed for end use metering, provided that they have an accuracy of +/- 5%. All required metering systems and equipment shall provide at least hourly data that is fully integrated into the data acquisition and display system per the requirements of Section C409.

**C409.4.2 Data acquisition system.** The data acquisition system shall store the data from the required meters and other sensing devices in a single database for a minimum of 36 months. For each energy supply and end use category required by C409.2 and C409.3, it shall provide real-time energy consumption data and logged data for any hour, day, month or year.

**C409.4.3 Energy display.** For each building subject to Section C409.2 and C409.3, either a visible display in a location with *ready access*, or a single web page or other electronic document available for access to building management or to a third-party energy data analysis service shall be provided in the building (~~(a)ccessible~~) available for access by building operation and management personnel. The display shall graphically provide the current energy consumption rate for each whole building energy source, plus each end use category, as well as the total and peak values for any day, week, month, and year.

**C409.4.4 Commissioning.** Energy metering and energy consumption management systems shall be commissioned in accordance with Section C408.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-41000 Section C410—Refrigeration system requirements.**

**C410.1 General.** Walk-in coolers, walk-in freezers, refrigerated warehouse coolers, refrigerated warehouse freezers, and refrigerated display cases shall comply with this Section.

Refrigerated warehouse coolers and refrigerated warehouse freezers shall comply with Section C402. Section C402.1.5 Component performance alternative, may be used if granted prior approval by the jurisdiction.

**C410.1.1 Refrigeration equipment performance.** Refrigeration equipment shall have an energy use in kWh/day not greater than the values of Tables C410.1(1) and C410.1(2) when tested and rated in accordance with AHRI Standard 1200. The energy use shall be verified through certification under an approved certification program or, where a certification program does not exist, the energy use shall be supported by data furnished by the equipment manufacturer.

**Table C410.1.1(1)**  
**Minimum Efficiency Requirements: Commercial Refrigeration**

EQUIPMENT TYPE	APPLICATION	ENERGY USE LIMITS (kWh per day) <sup>a</sup>	TEST PROCEDURE
Refrigerator with solid doors	Holding Temperature	$0.10 \times V + 2.04$	AHRI 1200
Refrigerator with transparent doors		$0.12 \times V + 3.34$	
Freezers with solid doors		$0.40 \times V + 1.38$	
Freezers with transparent doors		$0.75 \times V + 4.10$	
Refrigerator/freezers with solid doors		The greater of $0.12 \times V + 3.34$ or $0.70$	
Commercial refrigerators	Pulldown	$0.126 \times V + 3.51$	

<sup>a</sup> V = Volume of the chiller for frozen compartment as defined in AHAM-HRF-1.

**Table C410.1.1(2)**  
**Minimum Efficiency Requirements: Commercial Refrigerators and Freezers**

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh per day) <sup>a,b</sup>	TEST PROCEDURE
Equipment Class <sup>c</sup>	Family Code	Operating Mode	Rating Temperature		
VOP.RC.M	Vertical open	Remote condensing	Medium	$0.82 \times TDA + 4.07$	AHRI 1200
SVO.RC.M	Semivertical open	Remote condensing	Medium	$0.83 \times TDA + 3.18$	
HZO.RC.M	Horizontal open	Remote condensing	Medium	$0.35 \times TDA + 2.88$	
VOP.RC.L	Vertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
HZO.RC.L	Horizontal open	Remote condensing	Low	$0.57 \times TDA + 6.88$	
VCT.RC.M	Vertical transparent door	Remote condensing	Medium	$0.22 \times TDA + 1.95$	
VCT.RC.L	Vertical transparent door	Remote condensing	Low	$0.56 \times TDA + 2.61$	
SOC.RC.M	Service over counter	Remote condensing	Medium	$0.51 \times TDA + 0.11$	
VOP.SC.M	Vertical open	Self-contained	Medium	$1.74 \times TDA + 4.71$	
SVO.SC.M	Semivertical open	Self-contained	Medium	$1.73 \times TDA + 4.59$	
HZO.SC.M	Horizontal open	Self-contained	Medium	$0.77 \times TDA + 5.55$	
HZO.SC.L	Horizontal open	Self-contained	Low	$1.92 \times TDA + 7.08$	
VCT.SC.I	Vertical transparent door	Self-contained	Ice cream	$0.67 \times TDA + 3.29$	
VCS.SC.I	Vertical solid door	Self-contained	Ice cream	$0.38 \times V + 0.88$	
HCT.SC.I	Horizontal transparent door	Self-contained	Ice cream	$0.56 \times TDA + 0.43$	
SVO.RC.L	Semivertical open	Remote condensing	Low	$2.27 \times TDA + 6.85$	
VOP.RC.I	Vertical open	Remote condensing	Ice cream	$2.89 \times TDA + 8.7$	

EQUIPMENT TYPE				ENERGY USE LIMITS (kWh per day) <sup>a,b</sup>	TEST PROCEDURE
Equipment Class <sup>c</sup>	Family Code	Operating Mode	Rating Temperature		
SVO.RC.I	Semivertical open	Remote con- densing	Ice cream	2.89 x TDA + 8.7	
HZO.RC.I	Horizontal open	Remote con- densing	Ice cream	0.72 x TDA + 8.74	
VCT.RC.I	Vertical trans- parent door	Remote con- densing	Ice cream	0.66 x TDA + 3.05	
HCT.RC.M	Horizontal transparent door	Remote con- densing	Medium	0.16 x TDA + 0.13	
HCT.RC.L	Horizontal transparent door	Remote con- densing	Low	0.34 x TDA + 0.26	
HCT.RC.I	Horizontal transparent door	Remote con- densing	Ice cream	0.4 x TDA + 0.31	
VCS.RC.M	Vertical solid door	Remote con- densing	Medium	0.11 x V + 0.26	
VCS.RC.L	Vertical solid door	Remote con- densing	Low	0.23 x V + 0.54	
VCS.RC.I	Vertical solid door	Remote con- densing	Ice cream	0.27 x V + 0.63	
HCS.RC.M	Horizontal solid door	Remote con- densing	Medium	0.11 x V + 0.26	
HCS.RC.L	Horizontal solid door	Remote con- densing	Low	0.23 x V + 0.54	
HCS.RC.I	Horizontal solid door	Remote con- densing	Ice cream	0.27 x V + 0.63	
SOC.RC.L	Service over counter	Remote con- densing	Low	1.08 x TDA + 0.22	
SOC.RC.I	Service over counter	Remote con- densing	Ice cream	1.26 x TDA + 0.26	
VOP.SC.L	Vertical open	Self-contained	Low	4.37 x TDA + 11.82	
VOP.SC.I	Vertical open	Self-contained	Ice cream	5.55 x TDA + 15.02	
SVO.SC.L	Semivertical open	Self-contained	Low	4.34 x TDA + 11.51	
SVO.SC.I	Semivertical open	Self-contained	Ice cream	5.52 x TDA + 14.63	
HZO.SC.I	Horizontal open	Self-contained	Ice cream	2.44 x TDA + 9.0	
SOC.SC.I	Service over counter	Self-contained	Ice cream	1.76 x TDA + 0.36	
HCS.SC.I	Horizontal solid door	Self-contained	Ice cream	0.38 x V + 0.88	

<sup>a</sup> V = Volume of the case, as measured in accordance with Appendix C of AHRI 1200.

<sup>b</sup> TDA = Total display area of the case, as measured in accordance with Appendix D of AHRI 1200.

<sup>c</sup> Equipment class designations consist of a combination [(in sequential order separated by periods (AAA).(BB).(C))] of:

(AAA) An equipment family code where:

VOP = Vertical open

SVO = Semi-vertical open

HZO = Horizontal open

- VCT = Vertical transparent doors
- VCS = Vertical solid doors
- HCT = Horizontal transparent doors
- HCS = Horizontal solid doors
- SOC = Service over counter

(BB) An operating mode code:

- RC = Remote condensing
- SC = Self-contained

(C) A rating temperature code:

- M = Medium temperature (38°F)
- L = Low temperature (0°F)
- I = Ice cream temperature (15°F)

For example, "VOP.RC.M" refers to the "vertical-open, remote-condensing, medium-temperature" equipment class.

**C410.2 Walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers.** *Refrigerated warehouse coolers, refrigerated warehouse freezers, and all walk-in coolers and walk-in freezers including site assembled, site constructed and pre-fabricated units shall comply with the following:*

1. Automatic door-closers shall be provided that fully close walk-in doors that have been closed to within 1 inch (25 mm) of full closure.

EXCEPTION: Automatic closers are not required for doors more than 45 inches (1143 mm) in width or more than 7 feet (2134 mm) in height.

2. Doorways shall be provided with strip doors, curtains, spring-hinged doors or other method of minimizing infiltration when doors are open.

3. *Walk-in coolers and refrigerated warehouse coolers* shall be provided with wall, ceiling, and door insulation of not less than R-25 or have wall, ceiling and door assembly U-factors no greater than U-0.039. *Walk-in freezers and refrigerated warehouse freezers* shall be provided with wall, ceiling and door insulation of not less than R-32 or have wall, ceiling and door assembly U-factors no greater than U-0.030.

EXCEPTION: Insulation is not required for glazed portions of doors or at structural members associated with the walls, ceiling or door frame.

4. The floor of *walk-in coolers* shall be provided with floor insulation of not less than R-25 or have a floor assembly U-factor no greater than U-0.40. The floor of *walk-in freezers* shall be provided with floor insulation of not less than R-28 or have a floor assembly U-factor no greater than U-0.035.

EXCEPTION: Insulation is not required in the floor of a *walk-in cooler* that is mounted directly on a slab on grade.

5. Transparent fixed window and reach-in doors for *walk-in freezers* and windows in *walk-in freezer* doors shall be provided with triple-pane glass, with the interstitial spaces filled with inert gas or be provided with heat-reflective treated glass.

6. Transparent fixed window and reach-in doors for *walk-in coolers* and windows for *walk-in coolers* doors shall be provided with double-pane or triple-pane glass, with interstitial space filled with inert gas, or be provided with heat-reflective treated glass.

7. Evaporator fan motors that are less than 1 hp (0.746 kW) and less than 460 volts shall be provided with electroni-

cally commutated motors, brushless direct-current motors, or 3-phase motors.

8. Condenser fan motors that are less than 1 hp (0.746 kW) shall use electronically commutated motors, permanent split capacitor-type motors or 3-phase motors.

9. Antisweat heaters that are not provided with antisweat heater controls shall have a total door rail, glass and frame heater power draw of not greater than 7.1 W/ft<sup>2</sup> (76 W/m<sup>2</sup>) of door opening for *walk-in freezers* and not greater than 3.0 W/ft<sup>2</sup> (32 W/m<sup>2</sup>) of door opening for *walk-in coolers*.

10. Where antisweat heater controls are provided, they shall be capable of reducing the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.

11. Lights in *walk-in coolers, walk-in freezers, refrigerated warehouse coolers and refrigerated warehouse freezers* shall either be provided with light sources with an efficacy of not less than 40 lumens per watt, including ballast losses, or shall be provided with a device that automatically turns off the lights within 15 minutes of when the *walk-in cooler or walk-in freezer* space is not occupied.

**C410.2.1 Performance standards.** Site-assembled and site-constructed *walk-in coolers and walk-in freezers* shall meet the requirements of Tables C410.2.1.1(1), C410.2.1.1(2), and C410.2.1.1(3).

**Table C410.2.1.1(1)**  
**Walk-in Cooler and Freezer Display Doors Efficiency Requirements**

Class Description	Class	Maximum Energy Consumption (kWh/day) <sup>a</sup>
Display door, medium temperature	DD, M	0.04 x A <sub>dd</sub> + 0.41
Display door, low temperature	DD, L	0.15 x A <sub>dd</sub> + 0.29

<sup>a</sup> A<sub>dd</sub> is the surface area of the display door.



**Table C410.2.1.1(2)**

**Walk-in Cooler and Freezer Nondisplay Doors Efficiency Requirements**

Class Description	Class	Maximum Energy Consumption (kWh/day) <sup>a</sup>
Passage door, medium temperature	PD, M	0.05 x A <sub>nd</sub> + 1.7
Passage door, low temperature	PD, L	0.14 x A <sub>nd</sub> + 4.8
Freight door, medium temperature	FD, M	0.04 x A <sub>nd</sub> + 1.9
Freight door, low temperature	FD, L	0.12 x A <sub>nd</sub> + 5.6

<sup>a</sup> A<sub>nd</sub> is the surface area of the display door.

**Table C410.2.1.1(3)**

**Walk-in Cooler and Freezer Refrigeration Systems Efficiency Requirements**

Class Description	Class	Minimum Annual Walk-in Energy Factor AWEF (Btu/hW-h)
Dedicated condensing, medium temperature, indoor system	DC.M.I	5.61
Dedicated condensing, medium temperature, indoor system, >9,000 Btu/h capacity	DC.M.I, >9,000	5.61
Dedicated condensing, medium temperature, outdoor system	DC.MI	7.60
Dedicated condensing, medium temperature, outdoor system, >9,000 Btu/h capacity	DC.M.I, >9,000	7.60

**C410.2.2 Refrigerated display cases.** Site-assembled or site-constructed refrigerated display cases shall comply with the following:

1. Lighting and glass doors in refrigerated display cases shall be controlled by one of the following:

1.1. Time switch controls to turn off lights during non-business hours. Timed overrides for display cases shall turn the lights on for up to 1 hour and shall automatically time out to turn the lights off.

1.2. Motion sensor controls on each display case section that reduce lighting power by at least 50 percent within 3 minutes after the area within the sensor range is vacated.

2. Low-temperature display cases shall incorporate temperature-based defrost termination control with a time-limit default. The defrost cycle shall terminate first on an upper

temperature limit breach and second upon a time limit breach.

3. Antisweat heater controls shall reduce the energy use of the antisweat heater as a function of the relative humidity in the air outside the door or to the condensation on the inner glass pane.

**C410.3 Refrigeration systems.** Refrigerated display cases, walk-in coolers or walk-in freezers that are served by remote compressor and remote condensers not located in a condensing unit, shall comply with Sections C410.4.1, C410.4.2, and ((C403.9.7)) C403.9.2.3.

EXCEPTION: Systems where the working fluid in the refrigeration cycle goes through both subcritical and supercritical states (transcritical) or that use ammonia refrigerant are exempt.

**C410.3.1 Condensers serving refrigeration systems.** Fan-powered condensers shall comply with the following:

1. The design saturated condensing temperatures for air-cooled condensers shall not exceed the design dry-bulb temperature plus 10°F (5.6°C) for low-temperature refrigeration systems, and the design dry-bulb temperature plus 15°F (8°C) for medium temperature refrigeration systems where the saturated condensing temperature for blend refrigerants shall be determined using the average of liquid and vapor temperatures as converted from the condenser drain pressure.

2. Condenser fan motors that are less than 1 hp (0.75 kW) shall use electronically commutated motors, permanent split-capacitor-type motors or 3-phase motors.

3. Condenser fans for air-cooled condensers, evaporatively cooled condensers, air- or water-cooled fluid coolers or cooling towers shall reduce fan motor demand to not more than 30 percent of design wattage at 50 percent of design air volume, and incorporate one of the following continuous variable speed fan control approaches:

3.1. Refrigeration system condenser control for air-cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient dry-bulb temperature.

3.2. Refrigeration system condenser control for evaporatively cooled condensers shall use variable setpoint control logic to reset the condensing temperature setpoint in response to ambient wet-bulb temperature.

4. Multiple fan condensers shall be controlled in unison.

5. The minimum condensing temperature setpoint shall be not greater than 70°F (21°C).

**C410.3.2 Compressor systems.** Refrigeration compressor systems shall comply with the following:

1. Compressors and multiple-compressor system suction groups shall include control systems that use floating suction pressure control logic to reset the target suction pressure temperature based on the temperature requirements of the attached refrigeration display cases or walk-ins.

EXCEPTION: Controls are not required for the following:

1. Single-compressor systems that do not have variable capacity capability.

2. Suction groups that have a design saturated suction temperature of 30°F (-1.1°C) or higher, suction groups that comprise the high stage of a two-stage or cascade system, or suction groups that primarily serve chillers for secondary cooling fluids.

2. Liquid subcooling shall be provided for all low-temperature compressor systems with a design cooling capacity equal to or greater than 100,000 Btu/hr (29.3 kW) with a design-saturated suction temperature of -10°F (-23°C) or lower. The subcooled liquid temperature shall be controlled at a maximum temperature setpoint of 50°F (10°C) at the exit of the subcooler using either compressor economizer (inter-stage) ports or a separate compressor suction group operating at a saturated suction temperature of 18°F (-7.8°C) or higher.

2.1. Insulation for liquid lines with a fluid operating temperature less than 60°F (15.6°C) shall comply with Table C403.2.10.

3. Compressors that incorporate internal or external crankcase heaters shall provide a means to cycle the heaters off during compressor operation.

**C410.4 Commissioning.** Refrigeration systems shall be commissioned in accordance with Section C408.

EXCEPTION: Self-contained units.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-50000 Chapter 5 [CE]—Existing buildings.**

### C501 General.

**C501.1 Scope.** The provisions of this chapter shall control the *alteration, repair, addition* and change of occupancy of existing buildings and structures.

**C501.2 Existing buildings.** Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

**C501.3 Maintenance.** Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems which are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

**C501.4 Compliance.** *Alterations, repairs, additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations, repairs, additions* and changes of occupancy or relocation, respectively, in this code and in the *International Building Code, International Existing Building Code, Inter-*

*national Fire Code, International Fuel Gas Code, International Mechanical Code, Uniform Plumbing Code, and NFPA 70.*

**C501.4.1 U-factor requirements for additions and alterations.** For existing building projects where an *addition or building envelope alteration* area is combined with existing-to-remain building areas to demonstrate compliance with this code as a whole building, the *U*-factors applied to existing-to-remain envelope assemblies shall be in accordance with record documents.

EXCEPTION: If accurate record documents are not available, *U*-factors for the existing envelope assemblies may be in accordance with the edition of the Washington State Energy Code that was in effect at the time the building was permitted, or as approved by the *code official*.

**C501.4.2 Calculations of mechanical heating and cooling loads for alterations.** For the installation of new or replacement mechanical equipment that serves existing building areas, design loads associated with heating, cooling and ventilation of the existing building areas served shall be determined in accordance with Section C403.1.2.

*R*-values and *U*-factors used to determine existing thermal envelope performance for the purpose of calculating design loads shall be in accordance with record documents or existing conditions.

EXCEPTION((S)): ((+)) If accurate record documents are not available, *R*-values and *U*-factors used to determine existing building thermal envelope performance may be in accordance with the edition of the Washington State Energy Code that was in effect at the time the building was permitted, or as approved by the code official.

((2- *R*-values and *U*-factors for the existing envelope assemblies as approved by the *code official*..))

**C501.5 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

**C501.6 Historic buildings.** The building official may modify the specific requirements of this code for historic buildings and require alternate provisions which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings or structures that are listed in the state or national register of historic places; designated as a historic property under local or state designation law or survey; certified as a contributing resource with a national register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the national or state registers of historic places either individually or as a contributing building to a historic district by the state historic preservation officer or the keeper of the national register of historic places.

**C501.7 Commissioning.** Existing building systems shall be commissioned in accordance with Section C408. For the purposes of meeting the commissioning thresholds in Section

C408.1, only the new and altered system capacities are considered when determining whether the project is exempt from some portion of the commissioning process.

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-50300 Section C503—Alterations.**

**C503.1 General.** Alterations to any building or structure shall comply with the requirements of Section C503 and the code for new construction. Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall be such that the existing building or structure is no less conforming with the provisions of this code than the existing building or structure was prior to the alteration.

**EXCEPTION:** The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Surface applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.
3. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are insulated to full depth with insulation having a minimum nominal value of R-3.0 per inch installed per Section C402.
4. Construction where the existing roof, wall or floor cavity is not exposed.
5. *Roof recover*.
6. *Air barriers* shall not be required for *roof recover* and roof replacement where the *alterations* or renovations to the building do not include *alterations*, renovations or *repairs* to the remainder of the building envelope.
7. Replacement of existing doors that separate conditioned space from the exterior shall not require the installation of a vestibule or revolving door, provided however that an existing vestibule that separates a conditioned space from the exterior shall not be removed.

**C503.2 Change in space conditioning.** Any low energy space in accordance with Section C402.1.1.1 that is altered to become *conditioned space* or *semi-heated space* shall be brought into full compliance with this code. Any semi-heated space in accordance with Section C402.1.1.2 that is altered to become conditioned space shall be ~~((required to be))~~ brought into full compliance with this code.

For buildings with more than one space conditioning category, the interior partition walls, ceilings, floors and fenestration that separate space conditioning areas shall comply with the thermal envelope requirements per the area with the highest level of space conditioning.

A change in space conditioning project shall be deemed to comply with this code if the project area alone complies or

if the existing building and the project area combined comply with this code as a whole building.

**EXCEPTION:** Buildings or spaces that were permitted prior to the 2009 Washington state energy code, or were originally permitted as unconditioned, may comply with this section as follows:

1. Where the component performance alternative in Section C402.1.5 is used to demonstrate compliance with this Section, the Proposed Total UA is allowed to be up to 110 percent of the Allowable Total UA. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.
2. Where total building performance in accordance with Section C407 is used to demonstrate compliance with this Section, the total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed by Section C407.3. This exception may be applied to the project area alone, or to the existing building and project area combined as a whole building.

**C503.3 Building envelope.** New building envelope assemblies that are part of the alteration shall comply with Sections C402.1 through C402.5 as applicable.

**EXCEPTION:** Air leakage testing is not required for alterations and repairs, unless the project includes a change in space conditioning according to Section C503.2 or a change of occupancy or use according to Section C505.1.

**C503.3.1 Roof replacement.** *Roof replacements* shall comply with Table C402.1.3 or C402.1.4 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck.

**C503.3.2 Vertical fenestration.** The addition of *vertical fenestration* that results in a total building vertical fenestration area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. The addition of *vertical fenestration* that result in a total building vertical fenestration area greater than specified in Section C402.4.1 shall comply with one of the following:

1. Vertical fenestration alternate in accordance with Section C402.1.3 for the new vertical fenestration added.
2. Vertical fenestration alternate in accordance with Section C402.4.1.1 for the area adjacent to the new vertical fenestration added.
3. Existing building and alteration area are combined to demonstrate compliance with the component performance alternate in accordance with Section C402.1.5 for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

4. Total building performance in accordance with Section C407 for the whole building. The total annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

**EXCEPTION:** Additional envelope upgrades are included in the project so the addition of vertical fenestration does not cause a reduction in overall building energy efficiency, as approved by the *code official*.

**C503.3.2.1 Application to replacement fenestration products.** Where some or all of an existing *fenestration* unit is replaced with a new *fenestration* product, including sash and glazing, the replacement *fenestration* unit shall meet the applicable requirements for *U*-factor and *SHGC* in Table C402.4.

**EXCEPTION:** An area-weighted average of the *U*-factor of replacement fenestration products being installed in the building for each fenestration product category listed in Table C402.4 shall be permitted to satisfy the *U*-factor requirements for each fenestration product category listed in Table C402.4. Individual fenestration products from different product categories listed in Table C402.4 shall not be combined in calculating the area-weighted average *U*-factor.

**C503.3.3 Skylight area.** The addition of *skylights* that results in a total building skylight area less than or equal to that specified in Section C402.4.1 shall comply with Section C402.4. The addition of *skylights* that results in a total building skylight area greater than that specified in Section C402.4.1 shall comply with one of the following:

1. Existing building and alteration area are combined to demonstrate compliance with the component performance alternative with target area adjustment in accordance with Section C402.1.5 for the whole building. The Proposed Total UA is allowed to be up to 110 percent of the Allowed Total UA.

2. Total building performance in accordance with Section C407 for the whole building. The annual carbon emissions from energy consumption of the proposed design is allowed to be up to 110 percent of the annual carbon emissions from energy consumption allowed in accordance with Section C407.3.

**EXCEPTION:** Additional envelope upgrades are included in the project so the addition of skylights does not cause a reduction in overall building energy efficiency, as approved by the *code official*.

**C503.4 Mechanical systems.** Those parts of systems which are altered or replaced shall comply with Section C403. Additions or alterations shall not be made to an existing mechanical system that will cause the existing mechanical system to become out of compliance.

**EXCEPTIONS:**

- Existing mechanical systems which are altered or where parts of the systems are replaced are not required to be modified to comply with Section C403.3.5 as long as mechanical cooling capacity is not added to a system that did not have cooling capacity prior to the alteration.
- Alternate mechanical system designs that are not in full compliance with this code may be approved when the code official determines that existing building constraints including, but not limited to, available mechanical space, limitations of the existing structure, or proximity to adjacent air intakes or exhausts makes full compliance impractical. Alternate designs shall include additional energy saving strategies not prescriptively required by this code for the scope of the project including, but not limited to, demand control ventilation, energy recovery, or increased mechanical cooling or heating equipment efficiency above that required by Tables C403.3.2(1) through C403.3.2(12).

3. Only those components of existing HVAC systems that are altered or replaced shall be required to meet the requirements of Section C403.8.1, Allowable fan motor horsepower. Components replaced or altered shall not exceed the fan power limitation pressure drop adjustment values in Table C403.8.1(2) at design conditions. Section C403.8.1 does not require the removal and replacement of existing system ductwork.

**C503.4.1 New mechanical systems.** All new mechanical systems in existing buildings, including packaged unitary equipment and packaged split systems, shall comply with Section C403.

**C503.4.2 Addition of cooling capacity.** Where mechanical cooling is added to a space that was not previously cooled, the mechanical system shall comply with either Section C403.3.5 or C403.5.

**EXCEPTIONS:**

- Qualifying small equipment: Economizers are not required for cooling units and split systems serving one zone with a total cooling capacity rated in accordance with Section C403.3.2 of less than 33,000 Btu/h (hereafter referred to as qualifying small systems) provided that these are high-efficiency cooling equipment with SEER and EER values more than 15 percent higher than minimum efficiencies listed in Tables C403.3.2 (1) through (3), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all qualifying small equipment without economizers shall not exceed 72,000 Btu/h per building, or 5 percent of the building total air economizer capacity, whichever is greater.

Notes and exclusions for Exception 1:

- The portion of the equipment serving Group R occupancies is not included in determining the total capacity of all units without economizers in a building.
- Redundant units are not counted in the capacity limitations.
- This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for Total Building Performance in accordance with Section C407.
- This exception shall not be used for unitary cooling equipment installed outdoors or in a mechanical room adjacent to the outdoors.

2. Chilled water terminal units connected to systems with chilled water generation equipment with IPLV values more than 25 percent higher than minimum part load equipment efficiencies listed in Table C403.3.2(7), in the appropriate size category, using the same test procedures. Equipment shall be listed in the appropriate certification program to qualify for this exception. The total capacity of all systems without economizers shall not exceed 480,000 Btu/h per building, or 20 percent of the building total air economizer capacity, whichever is greater.

Notes and exclusions for Exception 2:

- The portion of the equipment serving Group R occupancy is not included in determining the total capacity of all units without economizers in a building.
- This exception shall not be used for the initial tenant improvement of a shell-and-core building or space, or for total building performance in accordance with Section C407.

**C503.4.3 Alterations or replacement of existing cooling systems.** Alterations to, or replacement of, existing mechanical cooling systems shall not decrease the building total economizer capacity unless the system complies with either Section C403.3.5 or C403.5. System alterations or replacement shall comply with Table C503.4 when the individual cooling unit capacity and the building total capacity of all cooling equipment without economizer do not comply with Section C403.3.5 or C403.5.

**C503.4.4 Controls for cooling equipment replacement.** When space cooling equipment is replaced, controls shall comply with all requirements under Section C403.3.5 and related subsections, and Section C403.5.1 for integrated economizer control.

**C503.4.5 Cooling equipment relocation.** Existing equipment currently in use may be relocated within the same floor or same tenant space if removed and reinstalled within the same permit.

**Table C503.4  
Economizer Compliance Options for Mechanical Alterations**

	<b>Option A</b>	<b>Option B (alternate to A)</b>	<b>Option C (alternate to A)</b>	<b>Option D (alternate to A)</b>
<b>Unit Type</b>	<b>Any alteration with new or replacement equipment</b>	<b>Replacement unit of the same type with the same or smaller output capacity</b>	<b>Replacement unit of the same type with a larger output capacity</b>	<b>New equipment added to existing system or replacement unit of a different type</b>
1. Packaged Units	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
2. Split Systems	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 60,000 Btuh, comply with two of two measures: 1. Efficiency: + 10% <sup>e</sup> 2. Economizer: shall not decrease existing economizer capability	For units ≤ 60,000 Btuh replacing unit installed prior to 1991 comply with at least one of two measures: 1. Efficiency: + 10% <sup>e</sup> 2. Economizer: 50% <sup>f</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
		For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	
3. Water Source Heat Pump	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For units ≤ 72,000 Btuh, comply with at least two of three measures: 1. Efficiency: +10% <sup>e</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup>	For units ≤ 72,000 Btuh, comply with at least three of three measures: 1. Efficiency: +10% <sup>e</sup> 2. Flow control valve <sup>g</sup> 3. Economizer: 50% <sup>f</sup> (except for certain pre-1991 systems <sup>q</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )
		For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	For all other capacities: Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	
4. Water Economizer using Air-Cooled Heat Rejection Equipment (Dry Cooler)	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 5% <sup>d</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
5. Air-Handling Unit (including fan coil units) where the system has an air-cooled chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> )
6. Air-Handling Unit (including fan coil units) and Water-cooled Process Equipment, where the system has a water-cooled chiller <sup>10</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>j</sup> )	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup> (except for certain pre-1991 systems <sup>q</sup> and certain 1991-2016 systems <sup>j</sup> )
7. Cooling Tower	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	No requirements	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>

	Option A	Option B (alternate to A)	Option C (alternate to A)	Option D (alternate to A)
Unit Type	Any alteration with new or replacement equipment	Replacement unit of the same type with the same or smaller output capacity	Replacement unit of the same type with a larger output capacity	New equipment added to existing system or replacement unit of a different type
8. Air-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: + 10% <sup>k</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. + 10% <sup>k,l</sup> and 2. Multistage compressor(s) Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>
9. Water-Cooled Chiller	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>	Efficiency: Comply with at least one of two measures: 1. Part load IPLV + 15% <sup>n</sup> or 2. Plate frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: Comply with two of two measures: 1. Part load IPLV + 15% <sup>n</sup> 2. Plate-frame heat exchanger <sup>o</sup> Economizer: shall not decrease existing economizer capacity	Efficiency: min. <sup>a</sup> Economizer: C403.5 <sup>b</sup>

- <sup>a</sup> Minimum equipment efficiency shall comply with Section C403.3.2 and Tables C403.3.2(1) through C403.3.2(12).
- <sup>b</sup> All separate new equipment and replacement equipment shall have air economizer complying with Section C403.5 including both the individual unit size limits and the total building capacity limits on units without economizer. It is acceptable to comply using one of the exceptions to Section C403.5.
- <sup>c</sup> Reserved.
- <sup>d</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 5% better than the requirements in Tables C403.3.2(1) and C403.3.2(2) (1.05 x values in Tables C403.3.2(1) and C403.3.2(2)).
- <sup>e</sup> Equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(1)A and C403.3.2(2) (1.10 x values in Tables C403.3.2(1)A and C403.3.2(2)).
- <sup>f</sup> Minimum of 50% air economizer that is ducted in a fully enclosed path directly to every heat pump unit in each zone, except that ducts may terminate within 12 inches of the intake to an HVAC unit provided that they are physically fastened so that the outside air duct is directed into the unit intake. If this is an increase in the amount of outside air supplied to this unit, the outside air supply system shall be configured to provide this additional outside air and be equipped with economizer control.
- <sup>g</sup> Water-source heat pump systems shall have a flow control valve to eliminate flow through the heat pumps that are not in operation and variable speed pumping control complying with Section C403.4.3 for that heat pump.
  - When the total capacity of all units with flow control valves exceeds 15% of the total system capacity, a variable frequency drive shall be installed on the main loop pump.
  - As an alternate to this requirement, the capacity-weighted average cooling system efficiency shall be 5% better than the requirements in footnote <sup>e</sup> for water-source heat pumps (i.e., a minimum of 15% greater than the requirements in Table C403.3.2(2)).
- <sup>h</sup> Water economizer equipment shall have a capacity-weighted average cooling system efficiency that is 10% better than the requirements in Tables C403.3.2(8) and C403.3.2(9) (1.10 x values in Tables C403.3.2(8) and C403.3.2(9)).
- <sup>i</sup> Air economizer is not required for systems installed with water economizer plate and frame heat exchanger complying with previous codes between 1991 and June 2016, provided that the total fan coil load does not exceed the existing or added capacity of the heat exchangers.
- <sup>j</sup> For water-cooled process equipment where the manufacturers specifications require colder temperatures than available with waterside economizer, that portion of the load is exempt from the economizer requirements.
- <sup>k</sup> The air-cooled chiller shall have an IPLV efficiency that is a minimum of 10% greater than the IPLV requirements in EER in Table C403.3.2(7)(1.10 x IPLV values in EER in Table C403.3.2(7)).
- <sup>l</sup> The air-cooled chiller shall be multistage with a minimum of two compressors.
- <sup>m</sup> The water-cooled chiller shall have full load and part load IPLV efficiency that is a minimum of 5% greater than the IPLV requirements in Table C403.2.3(7).
- <sup>n</sup> The water-cooled chiller shall have an IPLV value that is a minimum of 15% lower than the IPLV requirements in Table C403.2.3(7) (1.15 x IPLV values in Table C403.2.3(7)). Water-cooled centrifugal chillers designed for nonstandard conditions shall have an NPLV value that is at least 15% lower than the adjusted maximum NPLV rating in kW per ton defined in Section C403.3.2.1 (1.15 x NPLV).
- <sup>o</sup> Economizer cooling shall be provided by adding a plate-frame heat exchanger on the waterside with a capacity that is a minimum of 20% of the chiller capacity at standard AHRI rating conditions.
- <sup>p</sup> Reserved.
- <sup>q</sup> Systems installed prior to 1991 without fully utilized capacity are allowed to comply with Option B, provided that the individual unit cooling capacity does not exceed 90,000 Btuh.

**C503.5 Service hot water systems.** New service hot water systems that are part of the alteration shall comply with Section C404.

**C503.6 Lighting, controlled receptacles and motors.** Alterations or the addition of lighting, electric receptacles and motors shall comply with Sections C503.6.1 through C503.6.6.

**C503.6.1 Luminaire additions and alterations.** Alterations that add or replace 50 percent or more of the luminaires in a space enclosed by walls or ceiling-height partitions, replace 50 percent or more of parking garage luminaires, or replace 50 percent or more of the total installed wattage of exterior luminaires shall comply with Sections C405.4 and C405.5. Where less than 50 percent of the fixtures in an interior space enclosed by walls or ceiling-height partitions or in a parking garage are added or replaced, or less than 50 percent of the installed exterior wattage is replaced, the installed lighting wattage shall be maintained or reduced.

**C503.6.2 Rewiring and recircuiting.** Where new wiring is being installed to serve added fixtures and/or fixtures are being relocated to a new circuit, controls shall comply with Sections C405.2.1, C405.2.3, C405.2.4, C405.2.5, ((~~C405.2.7~~)) C405.2.6, and as applicable C408.3. New lighting control devices shall comply with the requirements of Section C405.2.

**C503.6.3 New or moved lighting panel.** Where a new lighting panel (or a moved lighting panel) with all new raceway and conductor wiring from the panel to the fixtures is being installed, controls shall also comply with, in addition to the requirements of Section C503.6.2, all remaining requirements in Sections C405.2 and C408.3.

**C503.6.4 Newly-created rooms.** Where new walls or ceiling-height partitions are added to an existing space and create a new enclosed space, but the lighting fixtures are not being changed, other than being relocated, the new enclosed space shall have controls that comply with Sections C405.2.1, C405.2.2, C405.2.3, C405.2.4, C405.2.5 and C408.3.

**C503.6.5 Motors.** Those motors which are altered or replaced shall comply with Section C405.8.

**C503.6.6 Controlled receptacles.** Where electric receptacles are added or replaced, controlled receptacles shall be provided in accordance with Section C405.10.

- EXCEPTIONS:
1. Where an alteration project impacts an area smaller than 5,000 square feet, controlled receptacles are not required.
  2. Where existing systems furniture or partial-height relocatable office cubical partitions are reconfigured or relocated within the same area, controlled receptacles are not required in the existing systems furniture or office cubicle partitions.
  3. Where new or altered receptacles meet the exception to Section C405.10, they are not required to be controlled receptacles or be located within 12 inches of non-controlled receptacles.

**C503.7 Refrigeration systems.** Those parts of systems which are altered or replaced shall comply with Section C410. Additions or alterations shall not be made to an existing refrigerated space or system that will cause the existing mechanical system to become out of compliance. All new refrigerated spaces or systems in existing buildings, including refrigerated display cases, shall comply with Section C410.

AMENDATORY SECTION (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-60000 Chapter 6 [CE]—Referenced standards.** This chapter lists the standards that are referenced in various sections of this document. The standards are listed herein by the promulgating agency of the standard, the standard identification, the effective date and title, and the section or sections of this document that reference the standard. The application of the referenced standards shall be as specified in Section C106.

<b>AAMA</b>	American Architectural Manufacturers Association 1827 Walden Office Square Suite 550 Schaumburg, IL 60173-4268	
Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A C440—17	North American Fenestration Standard/Specifications for Windows, Doors and Unit Skylights .....	Table (( <del>C402.4.2</del> )) <u>C402.4.1.1.2</u>
<b>AHAM</b>	Association of Home Appliance Manufacturers 1111 19th Street, N.W., Suite 402 Washington, D.C. 20036	
Standard reference number	Title	Referenced in code section number
ANSI/AHAM RAC-1—2008	Room Air Conditioners .....	Table C403.3.2(3)

AHAM HRF-1—2017	Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers	.....	Table C410.1(1)
<b>AHRI</b>	Air Conditioning, Heating, and Refrigeration Institute 4100 North Fairfax Drive, Suite 200 Arlington, VA 22203		
Standard reference number	Title		Referenced in code section number
ISO/AHRI/ASHRAE 13256-1 (2017)	Water-source Heat Pumps - Testing and Rating for Performance - Part 1: Water-to-air and Brine-to-air Heat Pumps	.....	Table C403.3.2(2)
ISO/AHRI/ASHRAE 13256-2 (2017)	Water-source Heat Pumps - Testing and Rating for Performance - Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	Table C403.3.2(2)
210/240—2016	Unitary Air Conditioning and Air-source Heat Pump Equipment	.....	Table C403.3.2(1), Table C403.3.2(2)
310/380—2014	Standard for Packaged Terminal Air Conditioners and Heat Pumps	.....	Table C403.3.2(3)
340/360—2015	Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment	.....	Table C403.3.2(1), Table C403.3.2(2)
365—2009	Commercial and Industrial Unitary Air-conditioning Condensing Units	.....	Table C403.3.2(1), Table C403.3.2(6)
390—2015	Performance Rating of Single Package Vertical Air Conditioners and Heat Pumps	.....	Table C403.3.2(3)
400—2015	Liquid to Liquid Heat Exchangers with Addendum 2	.....	Table C403.3.2(9)
440—08	Room Fan Coil	.....	(( <del>C403.2.8</del> )) <u>C403.10.3</u>
460—05	Performance Rating Remote Mechanical Draft Air-cooled Refrigerant Condensers	.....	Table C403.3.2(8)
550/590—2015	Water Chilling Packages Using the Vapor Compression Cycle—with Addenda	.....	(( <del>C403.2.3.1</del> ; <del>Table C403.2.3(7)</del> ; <del>Table C406.2(6)</del> )) <u>C403.3.2.1</u> , <u>Table C403.3.2(7)</u>
560—00	Absorption Water Chilling and Water-heating Packages	.....	Table (( <del>C403.2.3</del> )) <u>C403.3.2(7)</u>
920—2015	Performance Rating of DX-Dedicated Outdoor Air System Units	.....	C202, Table C403.3.2(11), Table C403.3.2(12)
1160—2014	Performance Rating of Heat Pump Pool Heaters	.....	Table C404.2
1200—2013	Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets	.....	C410.1, Table C410.1(1), Table C410.1(2)
<b>AMCA</b>	Air Movement and Control Association International 30 West University Drive		



Arlington Heights, IL 60004-1806		
Standard reference number	Title	Referenced in code section number
205—12	Energy Efficiency Classification for Fans .....	C403.8.3
220—8 (2012)	Laboratory Methods for Testing Air Curtain Units for Aerodynamic Performance Rating .....	C402.5.7
500D—12	Laboratory Methods for Testing Dampers for Rating .....	C402.4.5.1, C402.4.5.2
<b>ANSI</b>	American National Standards Institute 25 West 43rd Street Fourth Floor New York, NY 10036	
Standard reference number	Title	Referenced in code section number
ANSI/ASME A17.1—2010	Safety code for elevators and escalators .....	C405.12.1
Z21.10.3/CSA 4.3—11	Gas Water Heaters, Volume III—Storage Water Heaters with Input Ratings Above 75,000 Btu per Hour, Circulating Tank and Instantaneous .....	Table C404.2
Z21.47/CSA 2.3—12	Gas-fired Central Furnaces .....	Table C403.3.2(4)
Z83.8/CSA 2.6—09	Gas Unit Heaters, Gas Packaged Heaters, Gas Utility Heaters and Gas-fired Duct Furnaces .....	Table C403.3.2(4)
<b>APSP</b>	The Association of Pool and Spa Professionals 2111 Eisenhower Avenue Alexandria, VA 22314	
Standard reference number	Title	Referenced in code section number
14—2014	American National Standards for Portable Electric Spa Efficiency .....	C404.12
<b>ASHRAE</b>	American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. 1791 Tullie Circle, N.E. Atlanta, GA 30329-2305	
Standard reference number	Title	Referenced in code section number
<b>ANSI/ASHRAE/ACCA</b>		
Standard 127-2007	Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners .....	Table C403.3.2(9)
Standard 183—2007	Peak Cooling and Heating Load Calculations in Buildings, Except Low-rise Residential Buildings .....	C403.1.2
ASHRAE—2016	ASHRAE HVAC Systems and Equipment Handbook—2016 .....	C403.1.2
ISO/AHRI/ASHRAE 13256-1 (2011)	Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps .....	Table C403.3.2(2)
ISO/AHRI/ASHRAE		

13256-2 (2011)	Water-source Heat Pumps—Testing and Rating for Performance—Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	Table C403.3.2(2)
90.1—2016	Energy Standard for Buildings Except Low-rise Residential Buildings (ANSI/ASHRAE/IESNA 90.1—2010)	.....	Table C402.1.3, Table C402.1.4, C406.2
90.4—2016	Energy Standard for Data Centers	.....	C403.1.3
146—2011	Testing and Rating Pool Heaters	.....	Table C404.2
<b>ASME</b>	American Society of Mechanical Engineers Two Park Avenue New York, NY 10016-5990		
Standard reference number	Title		Referenced in code section number
ASME A17.1/CSA B44—2016	Safety Code for Elevators and Escalators	.....	C405.9.2
<b>ASTM</b>	ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2859		
Standard reference number	Title		Referenced in code section number
C 90—14	Specification for Load-bearing Concrete Masonry Units	.....	Table C402.1.3
C1363—11	Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus	.....	C303.1.4.1, Table C402.1.4
C 1371—15	Standard Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emisometers	.....	Table C402.4
C 1549—09	Standard Test Method for Determination of Solar Reflectance Near Ambient Temperature Using A Portable Solar Reflectometer	.....	Table C402.4
D 1003—13	Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics	.....	C402.4.2.2
E 283—04 (2012)	Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen	.....	<del>((C402.5.1.2.2))</del> <u>C402.5.8</u>
E 408—13	Test Methods for Total Normal Emittance of Surfaces Using Inspection-meter Techniques	.....	Table C402.4
E 779—10	Standard Test Method for Determining Air Leakage Rate by Fan Pressurization	.....	C402.5.1.2.3
E 903—12	Standard Test Method Solar Absorptance, Reflectance and Transmittance of Materials Using Integrating Spheres (Withdrawn 2005)	.....	Table C402.4
E 1677—11	Standard Specification for an Air-retarder (AR) Material or System for Low-rise Framed Building Walls	.....	C402.5.1.2.2

E 1918—06 (2015)	Standard Test Method for Measuring Solar Reflectance of Horizontal or Low-sloped Surfaces in the Field	.....	Table C402.4
E 1980—11	Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-sloped Opaque Surfaces	.....	Table C402.2.1.1
E 2178—13	Standard Test Method for Air Permanence of Building Materials	.....	C402.4
E 2357—11	Standard Test Method for Determining Air Leakage of Air Barrier Assemblies	.....	C402.5.1.2.2
<b>CSA</b>	Canadian Standards Association 5060 Spectrum Way Mississauga, Ontario, Canada L4W 5N6		
Standard reference number	Title		Referenced in code section number
AAMA/WDMA/CSA 101/I.S.2/A440—11	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights	.....	Table C402.4.2
<b>CTI</b>	Cooling Technology Institute 2611 FM 1960 West, Suite A-101 Houston, TX 77068		
Standard reference number	Title		Referenced in code section number
ATC 105 (00)	Acceptance Test Code for Water Cooling Tower	.....	Table C403.3.2(8)
ATC 105S—11	Acceptance Test Code for Closed Circuit Cooling Towers	.....	Table C403.3.2(8)
ATC 106—11	Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers	.....	Table C403.3.2(8)
STD 201—11	Standard for Certification of Water Cooling Towers Thermal Performances	.....	Table C403.3.2(8)
<b>DASMA</b>	Door and Access Systems Manufacturers Association 1300 Sumner Avenue Cleveland, OH 44115-2851		
Standard reference number	Title		Referenced in code section number
105—92 (R2004)—13	Test Method for Thermal Transmittance and Air Infiltration of Garage Doors	.....	Table C402.4.2
<b>DOE</b>	U.S. Department of Energy c/o Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402-9325		
Standard reference number	Title		Referenced in code section number
10 C.F.R., Part 430—2015	Energy Conservation Program for Consumer Products:		

	Test Procedures and Certification and Enforcement Requirement for Plumbing Products; and Certification and Enforcement Requirements for Residential Appliances; Final Rule	.....	Table C403.3.2(4), Table C403.3.2(5), Table C404.2
10 C.F.R., Part 430, Subpart B, Appendix N—2015	Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers	.....	C202
10 C.F.R., Part 431—2015	Energy Efficiency Program for Certain Commercial and Industrial Equipment: Test Procedures and Efficiency Standards; Final Rules	.....	Table C403.3.2(5), Table C406.2(5)
NAECA 87—(88)	National Appliance Energy Conservation Act 1987 [(Public Law 100-12 (with Amendments of 1988-P.L. 100-357)]	.....	Tables C403.3.2 (1), (2), (4)
<b>IAPMO</b>	International Association of Plumbing and Mechanical Officials 4755 E. Philadelphia Street Ontario, CA 91761		
Standard reference number	Title		Referenced in code section number
UPC—2015	Uniform Plumbing Code	.....	C201.3, C501.4
<b>ICC</b>	International Code Council, Inc. 500 New Jersey Avenue, N.W., 6th Floor Washington, D.C. 20001		
Standard reference number	Title		Referenced in code section number
IBC—15	International Building Code	.....	C201.3, C303.2, C402.4.3
IFC—15	International Fire Code	.....	C201.3, C501.4
IFGC—15	International Fuel Gas Code	.....	C201.3, C501.4
IMC—15	International Mechanical Code	.....	C106.3, C201.3, C402.5.3, C403.2.2.1, C403.2.2.2, C403.3.5, C403.3.5.1, C403.6.1, C403.6.5, C403.6.10, C403.7.1, C403.7.2, C403.7.5, C403.7.5.1, C403.7.6, C403.7.7.3, C403.7.8.1, C403.7.8.4, C403.8.4, C403.8.5.1, Table C403.10.1, C403.10.1.2, Table C403.10.1.2, C403.10.2.2, C403.12, C406.6, C408.2.2.1, C501.4
<b>IEEE</b>	The Institute of Electrical and Electronic Engineers, Inc. 3 Park Avenue New York, NY 10016		
Standard reference number	Title		Referenced in code section number

IEEE 515.1—2012	IEEE Standard for the Testing, Design, Installation and Maintenance of Electrical Resistance Trace Heating for Commercial Applications	.....	C404.6.2
<b>IESNA</b>	<p>Illuminating Engineering Society of North America</p> <p>120 Wall Street, 17th Floor</p> <p>New York, NY 10005-4001</p>		
Standard reference number	Title		Referenced in code section number
ANSI/ASHRAE/IESNA 90.1—( <del>2013</del> ) <u>2016</u>	Energy Standard for Buildings Except Low-rise Residential Buildings	.....	Table C402.1.3, Table C402.1.4, Table C407.5.1
<b>ISO</b>	<p>International Organization for Standardization</p> <p>1, rue de Varembe, Case postale 56, CH-1211</p> <p>Geneva, Switzerland</p>		
Standard reference number	Title		Referenced in code section number
ISO/AHRI/ASHRAE 13256-1 ( <del>(2014)</del> ) <u>2017</u>	Water-source Heat Pumps—Testing and Rating for Performance—Part 1: Water-to-air and Brine-to-air Heat Pumps	.....	C403.3.2(2)
ISO/AHRI/ASHRAE 13256-2 ( <del>(2014)</del> ) <u>2017</u>	Water-Source Heat Pumps—Testing and Rating for Performance—Part 2: Water-to-water and Brine-to-water Heat Pumps	.....	C403.3.2(2)
<b>NEMA</b>	<p>National Electric Manufacturers Association</p> <p>1300 North 17th Street</p> <p>Suite 1752</p> <p>Rossllyn, VA 22209</p>		
Standard reference number	Title		Referenced in code section number
TP-1-2002	Guide for Determining Energy Efficiency for Distribution Transformers	.....	C405.9
MGI— 2014	Motors and Generators	.....	C202
<b>NFRC</b>	<p>National Fenestration Rating Council, Inc.</p> <p>6305 Ivy Lane, Suite 140</p> <p>Greenbelt, MD 20770</p>		
Standard reference number	Title		Referenced in code section number
100—2017	Procedure for Determining Fenestration Product U-factors	.....	C303.1.2, C402.2.2
200—2017	Procedure for Determining Fenestration Product Solar Heat Gain Coefficients and Visible Transmittance at Normal Incidence	.....	C303.1.3, C402.4.1.1
202—2017	Procedure for Determining Fenestration Product Visible Transmittance at Normal Incidence	.....	C202
NFRC 203—2017	Procedure for Determining Visible Transmittance of Tubular Daylighting Devices	.....	C202, C402.4.2
400—2017	Procedure for Determining Fenestration Product Air Leakage	.....	Table C402.4.2

<b>SMACNA</b>	Sheet Metal and Air Conditioning Contractors National Association, Inc. 4021 Lafayette Center Drive Chantilly, VA 20151-1209	
Standard reference number	Title	Referenced in code section number
SMACNA—2012	HVAC Air Duct Leakage Test Manual . . . . .	C403.10.2.3
<b>UL</b>	Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062-2096	
Standard reference number	Title	Referenced in code section number
710—12	Exhaust Hoods for Commercial Cooking Equipment . . . . .	<del>((C403.2.8))</del> C403.7.5
727—06	Oil-fired Central Furnaces—with Revisions through April 2010 . . . . .	Table C403.3.2(4)
731—95	Oil-fired Unit Heaters—with Revisions through April 2010 . . . . .	Table C403.3.2(4)
<b>US-FTC</b>	United States-Federal Trade Commission 600 Pennsylvania Avenue N.W. Washington, D.C. 20580	
Standard reference number	Title	Referenced in code section number
C.F.R. Title 16 (2015)	R-value Rule . . . . .	C303.1.4
<b>WDMA</b>	Window and Door Manufacturers Association 1400 East Touhy Avenue, Suite 470 Des Plaines, IL 60018	
Standard reference number	Title	Referenced in code section number
AAMA/WDMA/CSA 101/1.S.2/A440—17	North American Fenestration Standard/Specification for Windows, Doors and Unit Skylights . . . . .	Table C402.4.2

**Reviser's note:** The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear in the Register pursuant to the requirements of RCW 34.08.040.

**AMENDATORY SECTION** (Amending WSR 19-24-040, filed 11/26/19, effective 7/1/20)

**WAC 51-11C-80500 Appendix D—Calculation of HVAC total system performance ratio.**

**D101 Scope.** This appendix establishes criteria for demonstrating compliance using the *HVAC total system performance ratio (HVAC TSPR)* for systems serving office, retail, library and education occupancies and buildings, which are subject to the requirements of Section C403.3.5 without exceptions. Those HVAC systems shall comply with Section C403 and this appendix as required by Section C403.1.1.

**D201 Compliance.** Compliance based on *HVAC total system performance ratio* requires that the provisions of Section C403.3 are met and the *HVAC total system performance ratio* of the *proposed design* is more than or equal to the *HVAC total system performance ratio* of the *standard reference design*. The *HVAC TSPR* is calculated according to the following formula:

HVAC TSPR = annual heating and cooling load/annual carbon emissions from energy consumption of the building HVAC systems

Where:

Annual carbon emissions from energy consumption of the building HVAC systems = sum of the annual carbon emissions in pounds for heating, cooling, fans, energy recovery, pumps, and heat rejection calculated by multiplying site energy consumption by the carbon emission factors from Table C407.1

Annual heating and cooling load = sum of the annual heating and cooling loads met by the building HVAC system in thousands of Btus.

**Table C407.1 (Reprinted from Chapter 4)  
Carbon Emissions Factors**

Type	CO2e (lb/unit)	Unit
Electricity	0.70	kWh
Natural gas	11.70	Therm
Oil	19.2	Gallon
Propane	10.5	Gallon
Other <sup>a</sup>	195.00	mmBtu
On-site renewable energy	0.00	

<sup>a</sup> District energy systems may use alternative emissions factors supported by calculations approved by the *code official*.

**D300 Simulation program.**

**D301 General.**

**D302 Calculation of the HVAC TSPR for the *Standard Reference Design*.** The simulation program shall calculate the HVAC TSPR based only on the input for the *proposed design* and the requirements of this appendix. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design*.

**D303 Specific approval.** Performance analysis tools meeting the applicable subsections of Appendix D and tested according to ASHRAE Standard 140 shall be permitted to be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall be permitted to approve tools for a specified application or limited scope.

**D400 Climatic data.** The simulation program shall perform the simulation using hourly values of climatic data, such as temperature and humidity, using TMY3 data for the site as specified here: <https://buildingenergyscore.energy.gov/resources>

**D500 Documentation.** Documentation conforming to the provisions of this section shall be provided to the *code official*.

**D501 Compliance report.** Building permit submittals shall include:

1. A report produced by the simulation software that includes the following:

- 1.1 Address of the building.
- 1.2 Name of individual completing the compliance report.
- 1.3 Name and version of the compliance software tool.
- 1.4 The dimensions, floor heights and number of floors for each *block*.
- 1.5 By *block*, the *U*-factor, *C*-factor, or *F*-factor for each simulated opaque envelope component and the *U*-factor and SHGC for each fenestration component.
- 1.6 By *block* or by surface for each block, the fenestration area.
- 1.7 By *block*, a list of the HVAC equipment simulated in the proposed design including the equipment type, fuel type, equipment efficiencies and system controls.
- 1.8 The *HVAC total system performance ratio* for both the *standard reference design* and the *proposed design*.

2. A mapping of the actual building HVAC component characteristics and those simulated in the *proposed design* showing how individual pieces of HVAC equipment identified above have been combined into average inputs ((~~and~~)) as required by Section D601.11 including:

- 2.1 Fans.
- 2.2 Hydronic pumps.
- 2.3 Air handlers.
- 2.4 Packaged cooling equipment.
- 2.5 Furnaces.
- 2.6 Heat pumps.
- 2.7 Boilers.
- 2.8 Chillers.
- 2.9 Cooling towers.
- 2.10 Electric resistance coils.
- 2.11 Condensing units.
- 2.12 Motors for fans and pumps.
- 2.13 Energy recovery devices.

For each piece of equipment identified above, include the following as applicable:

- 2.14 Equipment name or tag consistent with that found on the design documents.
- 2.15 Efficiency level.
- 2.16 Capacity.
- 2.17 Input power for fans and pumps.

3. Floor plan of the building identifying how portions of the building are assigned to the simulated *blocks* and areas of the building that are not covered under the requirements of Section C403.1.1.

**D600 Calculation procedure.** Except as specified by this appendix, the *standard reference design* and *proposed design* shall be configured and analyzed using identical methods and techniques.

**D601 Simulation of the proposed building design.** The *proposed design* shall be configured and analyzed as specified in this section.

**D601.1 Utility rates.** For the purpose of calculating the *HVAC TSPR* the following simple utility rate determined by the Washington state department of commerce shall be used:

- \$0.112/kWh of electricity.
- \$1.158/therm of fossil fuel.

**D601.2 Block geometry.** The geometry of buildings shall be configured using one or more *blocks*. Each *block* shall define attributes including *block* dimensions, number of floors, floor to floor height and floor to ceiling height. Simulation software may allow the use of simplified shapes (such as rectangle, L shape, H shape, U shape or T shape) to represent *blocks*. Where actual building shape does not match these predefined shapes, simplifications are permitted providing the following requirements are met:

1. The conditioned floor area and volume of each block shall match the *proposed design* within 10 percent.
2. The area of each exterior envelope component from Table C402.1.4 is accounted for within 10 percent of the actual design.
3. The area of vertical fenestration and skylights is accounted for within 10 percent of the actual design.
4. The orientation of each component in 2 and 3 above is accounted for within 45 degrees of the actual design.

The creation of additional *blocks* may be necessary to meet these requirements.

EXCEPTION: Portions of the building that are unconditioned or served by systems not covered by the requirements of Section C403.1.1 shall be omitted.

**D601.2.1 Number of blocks.** One or more *blocks* may be required per building based on the following restrictions:

1. Each *block* can have only one occupancy type (office, library, education or retail). Therefore, at least one single *block* shall be created for each unique use type.
2. Each *block* can be served by only one type of HVAC system. Therefore, a single *block* shall be created for each unique HVAC system and use type combination. Multiple HVAC units of the same type may be represented in one *block*. Table D601.10.2 provides directions for combining multiple HVAC units or components of the same type into a single *block*.
3. Each *block* can have a single definition of floor to floor or floor to ceiling heights. Where floor heights differ by more than 2 feet, unique *blocks* should be created for the floors with varying heights.
4. Each *block* can include either above grade or below grade floors. For buildings with both above grade and below grade floors, separate *blocks* should be created for each. For buildings with floors partially above grade and partially below grade, if the total wall area of the floor(s) in consideration is greater than or equal to 50 percent above grade, then it should be simulated as a completely above grade *block*, otherwise it should be simulated as a below grade *block*.
5. Each wall on a façade of a *block* shall have similar vertical fenestration. The product of the *proposed design U-factor* times the area of windows (UA) on each façade of a given floor cannot differ by more than 15 percent of the average UA for that façade in each *block*. The product of the *proposed design SHGC* times the area of windows (USHGC) on each façade of a given floor cannot differ by more than 15 percent of the average USHGC for that façade in each *block*. If either

of these conditions are not met, additional *blocks* shall be created consisting of floors with similar fenestration.

6. For a building model with multiple *blocks*, the *blocks* should be configured together to have the same adjacencies as the actual building design.

**D601.3 Thermal zoning.** Each floor in a *block* shall be modeled as a single thermal zone or as five thermal zones consisting of four perimeter zones and a core zone. Below grade floors shall be modeled as a single thermal *block*. If any façade in the *block* is less than 45 feet in length, there shall only be a single thermal zone per floor. Otherwise each floor shall be modeled with 5 thermal zones. A perimeter zone shall be created extending from each façade to a depth of 15 feet. Where facades intersect, the zone boundary shall be formed by a 45 degree angle with the 2 facades. The remaining area or each floor shall be modeled as a core zone with no exterior walls.

**D601.4 Occupancy.**

**D601.4.1 Occupancy type.** The occupancy type for each *block* shall be consistent with the building area type as determined in accordance with Section C405.4.2.1. Portions of the building that are building area types other than office, school (education), library, or retail shall not be included in the simulation.

**D601.4.2 Occupancy schedule, density, and heat gain.** The occupant density, heat gain, and schedule shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C.

**D601.5 Envelope components.**

**D601.5.1 Roofs.** Roofs will be modeled with insulation above a steel roof deck. The roof *U-factor* and area shall be modeled as in the proposed design. If different roof thermal properties are present in a single block, an area weighted *U-factor* shall be used. Roof solar absorbance shall be modeled at 0.70 and emittance at 0.90.

**D601.5.2 Above grade walls.** Walls will be modeled as steel frame construction. The *U-factor* and area of above grade walls shall be modeled as in the *proposed design*. If different wall constructions exist on the façade of a *block* an area-weighted *U-factor* shall be used.

**D601.5.3 Below grade walls.** The *C-factor* and area of below grade walls shall be modeled as in the *proposed design*. If different slab on grade floor constructions exist in a *block*, an area-weighted *C-factor* shall be used.

**D601.5.4 Above grade exterior floors.** Exterior floors shall be modeled as steel frame. The *U-factor* and area of floors shall be modeled as in the *proposed design*. If different wall constructions exist in the block an area-weighted *U-factor* shall be used.

**D601.5.5 Slab on grade floors.** The *F-factor* and area of slab on grade floors shall be modeled as in the *proposed design*. If different below grade wall constructions exist in a *block*, an area-weighted *F-factor* shall be used.



**D601.5.6 Vertical fenestration.** The window area and area weighted *U*-factor and SHGC shall be modeled for each façade based on the *proposed design*. Each exterior surface in a *block* must comply with Section D601.2.1 item 5. Windows will be combined in to a single window centered on each façade based on the area and sill height input by the user.

**D601.5.7 Skylights.** The skylight area and area weighted *U*-factor and SHGC shall be modeled for each floor based the *proposed design*. Skylights will be combined in to a single skylight centered on the roof of each zone based on the area and sill height input by the user.

**D601.6 Lighting.** Interior lighting power density shall be equal to the allowance in Table C405.4.2(1) for office, retail, library, or school. The lighting schedule shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C. The impact of lighting controls is assumed to be captured by the lighting schedule and no explicit controls shall be modeled. Exterior lighting shall not be modeled.

**D601.7 Miscellaneous equipment.** The miscellaneous equipment schedule and power shall be for office, retail, library, or school as specified by ASHRAE Standard 90.1 Normative Appendix C. The impact of miscellaneous equipment controls is assumed to be captured by the equipment schedule and no explicit controls shall be modeled.

**D601.8 Elevators.** Elevators shall not be modeled.

**D601.9 Service water heating equipment.** Service water heating shall not be modeled.

**D601.10 On-site renewable energy systems.** On-site renewable energy systems shall not be modeled.

**D601.11 HVAC equipment.** HVAC systems shall meet the requirements of Section C403.

**D601.11.1 Supported HVAC systems.** At a minimum, the HVAC systems shown in Table D601.11.1 shall be supported by the simulation program.

**Table D601.11.1**

**Proposed Building HVAC Systems Supported by HVAC TSPR Simulation Software**

System No.	System Name	System Abbreviation
1	Packaged Terminal Air Conditioner	PTAC

**Table D601.11.2  
Proposed Building System Parameters**

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
HVAC System Type	System Type	User Defined	Selected from Table D601.11.1	All

System No.	System Name	System Abbreviation
2	Packaged Terminal Air Heat Pump	PTHP
3	Packaged Single Zone Gas Furnace	PSZGF
4	Packaged Single Zone Heat Pump (air to air only)	PSZHP
5	Variable Refrigerant Flow (air cooled only)	VRF
6	Four Pipe Fan Coil	FPFC
7	Water Source Heat Pump	WSHP
8	Ground Source Heat Pump	GSHP
9	Packaged Variable Air Volume (dx cooling)	PVAV
10	Variable Air Volume (hydronic cooling)	VAV
11	Variable Air Volume with Fan Powered Terminal Units	VAVFPTU
12	Dedicated Outdoor Air System (in conjunction with systems 1-8)	DOAS

**D601.11.2 Proposed building HVAC system simulation.** The HVAC systems shall be modeled as in the *proposed design* with clarifications and simplifications as described in Table D601.11.2. System parameters not described in the following sections shall be simulated to meet the minimum requirements of Section C403. All zones within a *block* shall be served by the same HVAC system type as described in Section D601.2.1 item 2. Where multiple system components serve a block, average values weighed by the appropriate metric as described in this section shall be used. Heat loss from ducts and pipes shall not be modeled.

**EXCEPTION:** Where the building permit applies to only a portion of an HVAC system and remaining components will be designed under a future building permit, the future components shall be modeled to meet, but not exceed, the requirements of Section C403.

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
System Sizing	Design Day Information	Fixed	99.6 percent heating design and 1 percent dry-bulb and 1 percent wet-bulb cooling design	All
	Zone Coil Capacity	Fixed	Sizing factors used are 1.25 for heating equipment and 1.15 for cooling equipment	All
	Supply Airflow	Fixed	Based on a supply-air-to-room-air temperature <i>set-point</i> difference of 20°F	1-11
		Fixed	Equal to required outdoor air ventilation	12
Outdoor Ventilation Air	Outdoor Ventilation Air Flow Rate	Fixed	As specified in ASHRAE Standard 90.1 Normative Appendix C, adjusted for proposed DCV control	All
System Operation	Space Temperature Setpoints	Fixed	As specified in ASHRAE Standard 90.1 Normative Appendix C	1-11
	Fan Operation - Occupied	User Defined	Runs continuously during occupied hours or cycled to meet load	1-11
	Fan Operation - Occupied	Fixed	Fan runs continuously during occupied hours	12
	Fan Operation - Night Cycle	Fixed	Fan cycles on to meet setback temperatures	1-11
Packaged Equipment Efficiency	DX Cooling Efficiency	User Defined	Cooling COP without fan energy calculated in accordance with ASHRAE Standard 90.1 Section 11.5.2c. <sup>b</sup>	1, 2, 3, 4, 5, 7, 8, 9, 11, 12
	Heat Pump Efficiency	User Defined	Heating COP without fan energy calculated in accordance with ASHRAE Standard 90.1 Section 11.5.2c. <sup>c</sup>	2, 4, 5, 7, 8
	Furnace Efficiency	User Defined	Furnace thermal efficiency <sup>c</sup>	3, 11
Heat Pump Supplemental Heat	Control	Fixed	Supplemental electric heat locked out above 40°F. Runs in conjunction with compressor between 40°F and 0°F.	2, 4
System Fan Power	Design Fan Power (W/cfm)	User Defined	Input electric power for all fans is required to operate at <i>fan system design conditions</i> divided by the supply airflow rate	All
	Single Zone System Fan Power During Deadband (W/cfm)	User Defined	W/cfm during deadband for VAV or multispeed single zone fans	3, 4, 5, 6, 7, 8

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
Variable Air Volume Systems	Part Load Fan Controls	User Defined	VFD included. User specifies presence of static pressure reset	9, 10, 11
	Supply Air Temperature Controls	User Defined	If not SAT reset constant at 55°F. SAT reset results in 60°F SAT during low load conditions	9, 10, 11
	Minimum Terminal Unit Airflow Percentage	User Defined	Average minimum terminal unit airflow percentage for <i>block</i> weighted by cfm	9, 10, 11
	Terminal Unit Heating Source	User Defined	Electric or hydronic	9, 10, 11
	Fan Powered Terminal Unit (FPTU) Type	User Defined	Series or parallel FPTU	11
	Parallel FPTU Fan	Fixed	Sized for 50 percent peak primary air at 0.35 W/cfm	11
	Series FPTU Fan	Fixed	Sized for 50 percent peak primary air at 0.35 W/cfm	11
Economizer	Economizer Presence	User Defined	Yes or No	3, 4, 9, 10, 11
	Economizer High Limit	Fixed	75°F fixed dry-bulb	3, 4, 9, 10, 11
Energy Recovery	Sensible Effectiveness	User Defined	Heat exchanger sensible effectiveness at design heating and cooling conditions	3, 4, 9, 10, 11, 12
	Latent Effectiveness	User Defined	Heat exchanger latent effectiveness at design heating and cooling conditions	3, 4, 9, 10, 11, 12
	Economizer Bypass	User Defined	If ERV is bypassed during economizer conditions	3, 4, 9, 10, 11, 12
	Energy Recovery Temp Control	User Defined	If bypass, target supply air temperature	3, 4, 9, 10, 11, 12
	Fan Power Reduction during Bypass (W/cfm)	User Defined	If ERV system include bypass, static pressure setpoint and variable speed fan, fan power can be reduced during economizer conditions	3, 4, 9, 10, 11, 12
Demand Controlled Ventilation	DCV Application	User Defined	Percent of block floor area under DCV control	3, 4, 9, 10, 11, 12
DOAS	DOAS Fan Power W/cfm	User Defined	Fan input power in W/cfm of supply airflow <sup>a</sup>	12
	DOAS Supplemental Heating and Cooling	User Defined	Heating source, cooling source	12
	DOAS Supply Air Temperature Control	User Defined	SAT setpoint if DOAS includes supplemental heating or cooling and active temperature controls	12
Heating Plant	Boiler Efficiency <sup>d</sup>	User Defined	Boiler thermal efficiency	1, 6, 7, 9, 10, 11, 12
	Heating Water Pump Power (W/gpm)	User Defined	Pump input W/gpm heating water flow	1, 6, 7, 9, 10, 11, 12
	Heating Water Loop Temperature	Fixed	180°F supply, 130°F return	1, 6, 9, 10, 11

Category	Parameter	Fixed or User Defined	Required	Applicable Systems
Chilled Water Plant	Chiller Compressor Type	User Defined	Screw/scroll, centrifugal or reciprocating	6,10, 11, 12
	Chiller Condenser Type	User Defined	Air cooled or water cooled	6, 10, 11, 12
	Chiller Full Load Efficiency <sup>d</sup>	User Defined	Chiller COP	6, 10, 11, 12
	Chilled Water Loop Configuration	User Defined	Variable flow primary only, constant flow primary - variable flow secondary	6, 10, 11, 12
	Chilled Water Pump Power (W/gpm)	User Defined	Pump input W/gpm chilled water flow	6, 10, 11, 12
	Chilled Water Temperature Reset Included	User Defined	Yes/No	6, 10, 11, 12
	Chilled Water Temperature Reset Schedule (if included)	Fixed	Outdoor air reset: CHW supply temperature of 44°F at 80°F outdoor air dry-bulb and above, CHW supply temperature of 54°F at 60°F outdoor air dry-bulb temperature and below, ramped linearly between	6, 10, 11, 12
	Condenser Water Pump Power (W/gpm)	User Defined	Pump input W/gpm condenser water flow	6, 7, 8, 9, 10, 11, 12
	Condenser Water Pump Control	User Defined	Constant speed or variable speed	6, 7, 10, 11, 12
	Cooling Tower Efficiency	User Defined	gpm/hp tower fan	6, 10, 11, 12
Cooling Tower	Cooling Tower Fan Control	User Defined	Constant or variable speed	6, 10, 11, 12
	Cooling Tower Approach and Range	User Defined	Design cooling tower approach and range temperature	6, 10, 11, 12
Heat Pump Loop Flow Control	Loop Flow and Heat Pump Control Valve	Fixed	Two position valve with VFD on pump. Loop flow at 3 gpm/ton	7, 8
Heat Pump Loop Temperature Control		Fixed	Set to maintain temperature between 50°F and 70°F	7
GLHP Well Field		Fixed	Bore depth = 250 feet Bore length 200 feet/ton for greater of cooling or heating load Bore spacing = 15 feet Bore diameter = 5 inches 3/4 inch Polyethylene pipe Ground and grout conductivity = 4.8 Btu-in/h-ft <sup>2</sup> -°F	8

<sup>a</sup> Where multiple fan systems serve a single *block*, fan power is based on weighted average using on supply air cfm.

<sup>b</sup> Where multiple cooling systems serve a single *block*, COP is based on a weighted average using cooling capacity.

<sup>c</sup> Where multiple heating systems serve a single *block*, thermal efficiency or heating COP is based on a weighted average using heating capacity.

<sup>d</sup> Where multiple boilers or chillers serve a heating water or chilled water loop, efficiency is based on a weighted average for using heating or cooling capacity.

**D602 Simulation of the standard reference design.** The *standard reference design* shall be configured and analyzed as specified in this section.

**D602.1 Utility rates.** Same as proposed.

**D602.2 Blocks.** Same as proposed.

**D602.3 Thermal zoning.** Same as proposed.

**D602.4 Occupancy type, schedule, density, and heat gain.** Same as proposed.

**D602.5 Envelope components.** Same as proposed.

**D602.6 Lighting.** Same as proposed.

**D602.7 Miscellaneous equipment.** Same as proposed.

**D602.8 Elevators.** Not modeled. Same as proposed.

**D602.9 Service water heating equipment.** Not modeled. Same as proposed.

**D602.10 On-site renewable energy systems.** Not modeled. Same as proposed.

**D602.11 HVAC equipment.** The *standard reference design* HVAC equipment consists of separate space conditioning systems and dedicated outside air systems as described in Table D602.11 for the appropriate building occupancies.

**Table D602.11**  
**Standard Reference Design HVAC Systems**

Parameter	Building Type			
	Large Office <sup>a</sup>	Small Office and Libraries <sup>a</sup>	Retail	School
System Type	Water-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump
Fan Control <sup>b</sup>	Cycle on Load	Cycle on Load	Cycle on Load	Cycle on Load
Space Condition Fan Power (W/cfm)	0.528	0.528	0.522	0.528
Heating/Cooling Sizing Factor <sup>c</sup>	1.25/1.15	1.25/1.15	1.25/1.15	1.25/1.15
Supplemental Heating Availability	NA	<40°F	<40°F	<40°F
Modeled cooling COP (Net of Fan) <sup>d</sup>	4.46	3.83	4.25	3.83
Modeled heating COP (Net of Fan) <sup>d</sup>	4.61	3.81	3.57	3.81
Cooling Source	DX (Heat Pump)	DX (Heat Pump)	DX (Heat Pump)	DX (Heat Pump)
Heat Source	Heat Pump	Heat Pump	Heat Pump	Heat Pump
OSA Economizer <sup>e</sup>	No	No	Yes	Yes
Occupied Ventilation Source <sup>f</sup>	DOAS	DOAS	DOAS	DOAS
DOAS Fan Power (W/cfm of Outside Air)	0.819	0.819	0.730	0.742
DOAS Temperature Control <sup>g, h</sup>	Bypass	Wild	Bypass	Bypass
ERV Efficiency (Sensible Only)	70 percent	70 percent	70 percent	70 percent

Parameter	Building Type			
	Large Office <sup>a</sup>	Small Office and Libraries <sup>a</sup>	Retail	School
System Type	Water-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump	Packaged air-source Heat Pump
WSHP Loop Heat Rejection	Cooling Tower <sup>i</sup>	NA	NA	NA
WSHP Loop Heat Source	Gas Boiler <sup>j</sup>	NA	NA	NA
WSHP Loop Temperature Control <sup>k</sup>	50°F to 70°F	NA	NA	NA
WSHP Circulation Pump W/gpm <sup>l</sup>	16	NA	NA	NA
WSHP Loop Pumping Control <sup>m</sup>	HP Valves & Pump VSD	NA	NA	NA

<sup>a</sup> Offices less than 50,000 square feet use "Small Office" parameters; otherwise use "Large Office" parameters.

<sup>b</sup> Space conditioning system shall cycle on to meet heating and cooling setpoint schedules as specified in ASHRAE Standard 90.1 Normative Appendix C. One space conditioning system is modeled in each zone. Conditioning system fan operation is not necessary for ventilation delivery.

<sup>c</sup> The equipment capacities (i.e., system coil capacities) for the *standard reference design* building design shall be based on design day sizing runs and shall be oversized by 15 percent for cooling and 25 percent for heating.

<sup>d</sup> COPs shown are direct heating or cooling performance and do not include fan energy use. See ASHRAE 90.1 Appendix G (G3.1.2.1) for separation of fan from COP in packaged equipment for units where the efficiency rating includes fan energy (e.g., SEER, EER, HSPF, COP).

<sup>e</sup> Economizer on space conditioning systems shall be simulated when outdoor air conditions allow free cooling. Economizer high limit shall be based on differential dry-bulb control. DOAS system continues to operate during economizer mode.

<sup>f</sup> Airflow equal to the outside air ventilation requirements is supplied and exhausted through a separate DOAS system including a supply fan, exhaust fan and sensible only heat exchanger. No additional heating or cooling shall be provided by the DOAS. A single DOAS system will be provided for each *block*. The DOAS supply and return fans shall run whenever the HVAC system is scheduled to operate in accordance with ASHRAE 90.1 Normative Appendix C.

<sup>g</sup> "Wild" DOAS control indicates no active control of the supply air temperature leaving the DOAS system. Temperature will fluctuate based only on entering and leaving conditions and the effectiveness of ERV.

<sup>h</sup> "Bypass" DOAS control includes modulating dampers to bypass ERV with the intent to maintain supply air temperature at a maximum of 60°F when outside air is below 75°F. Once outside air is above 75°F, bypass dampers will be fully closed.

<sup>i</sup> Includes a single axial fan cooling tower with variable speed fans at 40.2 gpm/hp, sized for an approach of 10°F and a range of 10°F.

<sup>j</sup> Includes a single natural draft boiler with 80 percent  $E_f$ .

<sup>k</sup> Loop boiler and heat rejection shall be controlled to maintain loop temperature entering heat pumps between 50°F and 70°F.

<sup>l</sup> Pump motor input power shall be 16 W/gpm.

<sup>m</sup> Loop flow shall be variable with variable speed drive pump and unit fluid flow shutoff at each heat pump when its compressor cycles off.

**WSR 20-21-081  
PERMANENT RULES  
BUILDING CODE COUNCIL**

[Filed October 19, 2020, 11:25 a.m., effective February 1, 2021]

Effective Date of Rule: February 1, 2021.

Purpose: To correct various internal references and typographical errors in the 2018 Washington State Energy Code, Residential, chapter 51-11R WAC.

Citation of Rules Affected by this Order: Amending 17.

Statutory Authority for Adoption: RCW 19.27A.045.

Other Authority: Chapter 19.27A RCW.

Adopted under notice filed as WSR 20-12-102 on June 3, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 17, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: September 10, 2020.

Diane Glenn  
Council Chair

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-10400 Section R104—Inspections.**

**R104.1 General.** Construction or work for which a permit is required shall be subject to inspection by the *code official* or his or her designated agent, and such construction or work shall remain visible and able to be accessed for inspection purposes until *approved*. It shall be the duty of the permit applicant to cause the work to remain visible and able to be accessed for inspection purposes. Neither the *code official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material, product, system or building component required to allow inspection to validate compliance with this code.

**R104.2 Required inspections.** The *code official* or his or her designated agent, upon notification, shall make the inspections set forth in Sections R104.2.1 through R104.2.5.

**R104.2.1 Footing and foundation inspection.** Inspections associated with footings and foundations shall verify compliance with the code as to *R*-value, location, thickness, depth of burial and protection of insulation as required by the code and approved plans and specifications.

**R104.2.2 Framing and rough-in inspection.** Inspections at framing and rough-in shall be made before application of interior finish and shall verify compliance with the code as to types of insulation and corresponding *R*-values and their correct location and proper installation; fenestration properties (*U*-factor and SHGC) and proper installation; and air leakage controls as required by the code and approved plans and specifications.

**R104.2.2.1 Wall insulation inspection.** The ~~((building))~~ *code official*, upon notification, shall make a wall insulation inspection in addition to those inspections required in Section R109 of the International Residential Code. This inspection shall be made after all wall and cavity insulation is in place and prior to cover.

**R104.2.3 Plumbing rough-in inspection.** Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding *R*-values and protection, and required controls.

**R104.2.4 Mechanical rough-in inspection.** Inspections at mechanical rough-in shall verify compliance as required by the code and approved plans and specifications as to installed HVAC equipment type and size, required controls, system insulation and corresponding *R*-value, system air leakage control, programmable thermostats, dampers, whole-house ventilation and minimum fan efficiency.

EXCEPTION: Systems serving multiple dwelling units shall be inspected in accordance with Section C104.2.4.

**R104.2.5 Final inspection.** The building shall have a final inspection and not be occupied until *approved*.

**R104.3 Reinspection.** A building shall be reinspected when determined necessary by the *code official*.

**R104.4 Approved inspection agencies.** The *code official* is authorized to accept reports of third-party inspection agencies not affiliated with the building design or construction, provided such agencies are *approved* as to qualifications and reliability relevant to the building components and systems they are inspecting.

**R104.5 Inspection requests.** It shall be the duty of the holder of the permit or their duly authorized agent to notify the *code official* when work is ready for inspection. It shall be the duty of the permit holder to provide access to and means for inspections of such work that are required by this code.

**R104.6 Reinspection and testing.** Where any work or installation does not pass an initial test or inspection, the necessary corrections shall be made so as to achieve compliance with this code. The work or installation shall then be resubmitted to the *code official* for inspection and testing.

**R104.7 Approval.** After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

**R104.7.1 Revocation.** The *code official* is authorized to, in writing, suspend or revoke a notice of approval issued under the provisions of this code wherever the certificate is issued in error, or on the basis of incorrect information supplied, or where it is determined that the building or structure, premise, or portion thereof is in violation of any ordinance or regulation or any of the provisions of this code.

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-20215 Section R202.15—O.**

**OPAQUE DOOR.** A door that is not less than 50 percent opaque in surface area.

~~((PILOT LIGHT, CONTINUOUSLY BURNING. A small gas flame used to ignite gas at a larger burning. Once lit, a continuous pilot light remains in operation until manually interrupted. Pilot light ignition systems with the ability to switch between intermittent and continuous mode are considered continuous. PILOT LIGHT, INTERMITTENT. A pilot which is automatically ignited when an appliance is called on to operate and which remains continuously ignited during each period of main burner operation. The pilot is automatically extinguished when each main burner operating cycle is completed.~~

~~PILOT LIGHT, INTERRUPTED. A pilot which is automatically ignited prior to the admission of fuel to the main burner and which is automatically extinguished after the main flame is established.~~

~~PILOT LIGHT, ON DEMAND. A pilot which, once placed into operation, is intended to remain ignited for a predetermined period of time following an automatic or manual operation of the main burner gas valve.))~~

AMENDATORY SECTION (Amending WSR 13-04-055, filed 2/1/13, effective 7/1/13)

**WAC 51-11R-20216 Section R202.16—P. PILOT LIGHT, CONTINUOUSLY BURNING.** A small gas flame used to ignite gas at a larger burning. Once lit, a continuous pilot

light remains in operation until manually interrupted. Pilot light ignition systems with the ability to switch between intermittent and continuous mode are considered continuous.

**PILOT LIGHT, INTERMITTENT.** A pilot which is automatically ignited when an appliance is called on to operate and which remains continuously ignited during each period of main burner operation. The pilot is automatically extinguished when each main burner operating cycle is completed.

**PILOT LIGHT, INTERRUPTED.** A pilot which is automatically ignited prior to the admission of fuel to the main burner and which is automatically extinguished after the main flame is established.

**PILOT LIGHT, ON-DEMAND.** A pilot which, once placed into operation, is intended to remain ignited for a predetermined period of time following an automatic or manual operation of the main burner gas valve.

**PROPOSED DESIGN.** A description of the proposed building used to estimate annual energy use for determining compliance based on total building performance.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-30310 Section R303.1—Identification.**

**R303.1 Identification.** Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

**R303.1.1 Building thermal envelope insulation.** An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification. For sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and *R*-value of installed thickness shall be *listed* on the certification. For insulated siding, the *R*-value shall be labeled on the product's package and shall be listed on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

**EXCEPTION:** For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.5 of the *International Building Code* or Table R906.2 of the *International Residential Code*.

**R303.1.1.1 Blown or sprayed roof/ceiling insulation.** The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m<sup>2</sup>) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers a minimum of 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-

value shall be *listed* on certification provided by the insulation installer.

**((EXCEPTION:** For roof insulation installed above the deck, the *R*-value shall be labeled as required by the material standards specified in Table 1508.5 of the *International Building Code* or Table R906.2 of the *International Residential Code*.)

**R303.1.2 Insulation mark installation.** Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

**R303.1.3 Fenestration product rating.** *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100.

**EXCEPTION:** Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

*U*-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table R303.1.3(1), R303.1.3(2) or R303.1.3(4). The solar heat gain coefficient (SHGC) and visible transmittance (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table R303.1.3(3).

**EXCEPTIONS:**

1. Units without NFRC ratings produced by a *small business* may be assigned default *U*-factors from Table R303.1.3(5) for vertical fenestration.
2. Owner-built, nonoperable wood frame window consisting of a double pane unit with low-*e* (*E* = 0.04 or less), 1/2-inch air space with argon fill.

**R303.1.4 Insulation product rating.** The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (C.F.R. Title 16, Part 460) in units of h × ft<sup>2</sup> × °F/Btu at a mean temperature of 75°F (24°C).

**R303.1.4.1 Insulated siding.** The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C1363. Installation for testing shall be in accordance with the manufacturer's installation instructions.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-30311 Table R303.1.3(1)—Default glazed fenestration *U*-factor.**

**TABLE R303.1.3(1)  
DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT *U*-FACTOR**

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT See Table R303.1.3(4)
Metal	1.20	0.80	
Metal with Thermal Break <sup>a</sup>	1.10	0.65	



FRAME TYPE	SINGLE PANE	DOUBLE PANE	
Nonmetal or Metal Clad	0.95	0.55	
Glazed Block	0.60		

<sup>a</sup> Metal Thermal Break = A metal thermal break framed window shall incorporate the following minimum design characteristics:

- 1) The thermal conductivity of the thermal break material shall be not more than 3.6 Btu-in/h/ft<sup>2</sup>/°F;
- 2) The thermal break material must produce a gap in the frame material of not less than 0.210 inches; and

3) All metal framing members of the products exposed to interior and exterior air shall incorporate a thermal break meeting the criteria in ((a) and b)) 1) and 2) above.

AMENDATORY SECTION (Amending WSR 13-04-055, filed 2/1/13, effective 7/1/13)

**WAC 51-11R-30314 Table R303.1.3(4)—Default U-factors for skylights.**

**TABLE R303.1.3(4)  
DEFAULT U-FACTORS FOR SKYLIGHTS**

Fenestration Type	Frame Type			
	Aluminum Without Thermal Break	Aluminum With Thermal Break	Reinforced Vinyl/Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/Vinyl Without Reinforcing
Single Glazing glass acrylic/polycarb	U-1.58	U-1.51	U-1.40	U-1.18
	U-1.52	U-1.45	U-1.34	U-1.11
Double Glazing air argon	U-1.05	U-0.89	U-0.84	U-0.67
	U-1.02	U-0.86	U-0.80	U-0.64
Double Glazing, e = 0.20 air argon	U-0.96	U-0.80	U-0.75	U-0.59
	U-0.91	U-0.75	U-0.70	U-0.54
Double Glazing, e = 0.10 air argon	U-0.94	U-0.79	U-0.74	U-0.58
	U-0.89	U-0.73	U-0.68	U-0.52
Double Glazing, e = 0.05 air argon	U-0.93	U-0.78	U-0.73	U-0.56
	U-0.87	U-0.71	U-0.66	U-0.50
Triple Glazing air argon	U-0.90	U-0.70	U-0.67	U-0.51
	U-0.87	U-0.69	U-0.64	U-0.48
Triple Glazing, e = 0.20 air argon	U-0.86	U-0.68	U-0.63	U-0.47
	U-0.82	U-0.63	U-0.59	U-0.43
Triple Glazing, e = 0.20 on 2 surfaces air argon	U-0.82	U-0.64	U-0.60	U-0.44
	U-0.79	U-0.60	U-0.56	U-0.40
Triple Glazing, e = 0.10 on 2 surfaces air argon	U-0.81	U-0.62	U-0.58	U-0.42
	U-0.77	U-0.58	U-0.54	U-0.38

Fenestration Type	Frame Type			
	Aluminum Without Thermal Break	Aluminum With Thermal Break	Reinforced Vinyl/Aluminum-Clad Wood or Vinyl	Wood or Vinyl-Clad Wood/Vinyl Without Reinforcing
Quadruple Glazing, e = 0.10 on 2 surfaces				
air	U-0.78	U-0.59	U-0.55	U-0.39
argon	U-0.74	U-0.56	U-0.52	U-0.36
krypton	U-0.70	U-0.52	U-0.48	U-0.32

Notes for Table R303.1.3(4)

1. U-factors are applicable to ((both)) glass and plastic, flat and domed units, all spacers and gaps.
2. Emissivities shall be less than or equal to the value specified.
3. Gap fill shall be assumed to be air unless there is a minimum of 90% argon or krypton.
4. Aluminum frame with thermal break is as defined in footnote 1 to Table R303.1.3(1).

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40220 Section R402.2—Specific insulation requirements.**

**R402.2 Specific insulation requirements.** In addition to the requirements of Section R402.1, insulation shall meet the specific requirements of Sections R402.2.1 through R402.2.11.

**R402.2.1 Ceilings with attic spaces.** Where Section R402.1.1 would require R-49 in the ceiling, installing R-38 over 100 percent of the ceiling area requiring insulation shall be deemed to satisfy the requirement for R-49 wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section R402.1.3 and the total UA alternative in Section R402.1.4.

**R402.2.1.1 Loose insulation in attic spaces.** Open-blown or poured loose fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3 feet in 12 and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge.

**R402.2.3 Eave baffle.** For air permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain an opening equal to or greater than the size of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material.

**R402.2.4 Access hatches and doors.** Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living

space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

EXCEPTION: Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R402.1.1.

**R402.2.5 Mass walls.** Mass walls, where used as a component of the thermal envelope of a building, shall be one of the following:

1. Constructed of above-grade walls of concrete block, concrete, insulated concrete form, masonry cavity, brick (but not brick veneer), adobe, compressed earth block, rammed earth, mass timber, solid timber or solid logs.

2. Any other wall having a heat capacity greater than or equal to 6 Btu/ft<sup>2</sup> x °F (123 kJ/m<sup>2</sup> x K).

**R402.2.6 Steel-frame ceilings, walls, and floors.** Steel-frame ceilings, walls, and floors shall comply with the U-factor requirements of Table R402.1.3.

**R402.2.7 Floors.** Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. Insulation supports shall be installed so spacing is no more than 24 inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

- EXCEPTIONS:
1. The floor framing cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum Wood Frame Wall R-value in Table R402.1.1 and extends from the bottom to the top of all perimeter floor framing members.
  2. When foundation vents are not placed so that the top of the vent is below the lower surface of the floor insulation, a permanently attached baffle shall be installed at an angle of 30° from horizontal, to divert air flow below the lower surface of the floor insulation.
  3. Substantial contact with the surface being insulated is not required in enclosed floor/ceiling assemblies containing ducts where full R-value insulation is installed between the duct and the exterior surface.

**R402.2.8 Below-grade walls.** Below-grade exterior wall insulation used on the exterior (cold) side of the wall shall extend from the top of the below-grade wall to the top of the footing and shall be approved for below-grade use. Above-grade insulation shall be protected. Insulation used on the interior (warm) side of the wall shall extend from the top of the below-grade wall to the below-grade floor level and shall include R-5 rigid board providing a thermal break between the concrete wall and the slab.

**R402.2.9 Slab-on-grade floors.** The minimum thermal resistance (*R*-value) of the insulation around the perimeter of unheated or heated slab-on-grade floors shall be as specified in Table C402.1.1. The insulation shall be placed on the outside of the foundation or on the inside of the foundation wall. The insulation shall extend downward from the top of the slab for a minimum distance as shown in the table or to the top of the footing, whichever is less, or downward to at least the bottom of the slab and then horizontally to the interior or exterior for the total distance shown in the table. A two-inch by two-inch (maximum) pressure treated nailer may be placed at the finished floor elevation for attachment of interior finish materials. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil.

**R402.2.9.1 Heated slab-on-grade floors.** The entire area of a heated slab-on-grade floor shall be thermally isolated from the soil with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. If a soil gas control system is present below the heated slab-on-grade floor, which results in increased convective flow below the heated slab-on-grade floor, the heated slab-on-grade floor shall be thermally isolated from the sub-slab gravel layer. R-10 heated slab-on-grade floor insulation is required for all compliance paths.

**R402.2.10 (~~Reserved~~**

**~~R402.2.11~~) Masonry veneer.** Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40240 Section R402.4—Air leakage.**

**R402.4 Air leakage.** The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.4.

**R402.4.1 Building thermal envelope.** The *building thermal envelope* shall comply with Sections R402.4.1.1 and R402.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

**R402.4.1.1 Installation.** The components of the *building thermal envelope* as listed in Table R402.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table R402.4.1.1, as applicable to the method of construction. Where required by the *code official*, an *approved* third party shall inspect all components and verify compliance.

**R402.4.1.2 Testing.** The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 5 air changes per hour. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals). For this test only, the volume of the home shall be the conditioned floor area in ft<sup>2</sup> (m<sup>2</sup>) multiplied by 8.5 feet (2.6 m). Where required by the *code official*, testing shall be conducted by an *approved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*. Once visual inspection has confirmed sealing (see Table R402.4.1.1), operable windows and doors manufactured by *small business* shall be permitted to be sealed off at the frame prior to the test.

**EXCEPTION:** For dwelling units that are accessed directly from the outdoors, other than detached one family dwellings and townhouses, an air leakage rate not exceeding 0.4 cfm per square foot of the dwelling unit enclosure area shall be an allowable alternative. Testing shall be conducted with a blower door at a pressure of 0.2 inches w.g. (50 Pascals) in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827. For the purpose of this test only, the enclosure area is to be calculated as the perimeter of the dwelling unit, measured to the outside face of the exterior walls, and the centerline of party walls, times 8.5 feet, plus the ceiling and floor area. Doors and windows of adjacent dwelling units (including top and bottom units) shall be open to the outside during the test. This exception is not permitted for dwelling units that are accessed from corridors or other enclosed common areas.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures;
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures;
3. Interior doors, if installed at the time of the test, shall be open, access hatches to conditioned crawl spaces and conditioned attics shall be open;
4. Exterior or interior terminations for continuous ventilation systems and heat recovery ventilators shall be sealed;
5. Heating and cooling systems, if installed at the time of the test, shall be turned off; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

**EXCEPTIONS:**

1. Additions less than 500 square feet of conditioned floor area.
2. Additions tested with the existing home having a combined maximum air leakage rate of 7 air changes per hour. To qualify for this exception, the date of construction of the existing house must be prior to the 2009 Washington State Energy Code.

**R402.4.2 Fireplaces.** New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. When using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. Where using

tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907.

**R402.4.2.1 Gas fireplace efficiency.** All vented gas fireplace heaters rated to ANSI Z21.88 shall be listed and labeled with a fireplace efficiency (FE) rating of 50 percent or greater in accordance with CSA P.4.1. Vented gas fireplaces (decorative appliances) certified to ANSI Z21.50 shall be listed and labeled, including their FE ratings, in accordance with CSA P.4.1.

**R402.4.3 Air leakage of fenestration.** Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m<sup>2</sup>), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m<sup>2</sup>), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and *listed and labeled* by the manufacturer.

- EXCEPTIONS:
1. Field-fabricated fenestration products (windows, skylights and doors).
  2. Custom exterior fenestration products manufactured by a small business provided they meet the applicable provisions of Chapter 24 of the *International Building Code*. Once visual inspection has confirmed the presence of a gasket, operable windows and doors manufactured by *small business* shall be permitted to be sealed off at the frame prior to the test.

**R402.4.4 Combustion air openings.** In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion, space conditioning fuel burning appliances, the appliances and combustion air openings shall be located outside of the building thermal envelope, or enclosed in a room isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table R402.1.1, where the walls, floors and ceilings shall meet the minimum of the below-grade wall R-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section R403. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.

- EXCEPTIONS:
1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.
  2. Fireplaces and stoves complying with Section R402.4.2 and Section R1006 of the *International Residential Code*.

**R402.4.5 Recessed lighting.** Recessed luminaires installed in the *building thermal envelope* shall be Type IC-rated and certified under ASTM E283 as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested at a 1.57 psf (75 Pa) pressure differential and shall have a label attached showing compliance with this test method. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40351 Table R403.6.1—Mechanical ventilation system fan efficacy.**

**TABLE R403.6.1**  
**MECHANICAL VENTILATION SYSTEM FAN EFFICACY<sup>a</sup>**

Fan Location	Air Flow Rate Minimum (cfm)	Minimum Efficacy (cfm/watt)	Air Flow Rate Maximum (cfm)
HRV or ERV	Any	1.2 cfm/watt	Any
Range hoods	Any	2.8	Any
In-line fan	Any	2.8	Any
Bathroom, utility room	10	1.4	< 90
Bathroom, utility room	90	2.8	Any

For SI: 1 cfm = 28.3 L/min.

a. When tested in accordance with HVI Standard 916.

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40360 Section R403.7—Equipment sizing.**

**R403.7 Equipment sizing and efficiency rating.** Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies. The output capacity of heating and cooling equipment shall not be greater than that of the smallest available equipment size that exceeds the loads calculated, including allowable oversizing limits. Equipment shall meet the minimum federal efficiency standards as referenced in Tables ((~~C403.2.3(1)~~, ~~C403.2.3(2)~~, ~~C403.2.3(3)~~, ~~C403.2.3(4)~~, ~~C403.2.3(5)~~, ~~C403.2.3(6)~~, ~~C403.2.3(7)~~, ~~C403.2.3(8)~~ and ~~C403.2.3(9)~~)) C403.3.2(1), C403.3.2(2), C403.3.2(3), C403.3.2(4), C403.3.2(5), C403.3.2(6), C403.3.2(7), C403.3.2(8) and C403.3.2(9) and tested and rated in accordance with the applicable test procedure.

**R403.7.1 Electric resistance zone heated units.** All detached one- and two-family dwellings and multiple single-family dwellings (townhouses) up to three stories in height above grade plane using electric zonal heating as the primary heat source shall install an inverter-driven ductless mini-split heat pump in the largest zone in the dwelling. Building permit drawings shall specify the heating equipment type and location of the heating system.

EXCEPTION: Total installed heating capacity of 2 kW per dwelling unit or less.

AMENDATORY SECTION (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40530 Section R405.3—Performance-based compliance.**

**R405.3 Performance-based compliance.** Compliance based on simulated energy performance requires that a proposed residence (*proposed design*) be shown to have an annual energy consumption based on carbon emissions of the fuels and energy use in the proposed building. Carbon emissions for both the standard reference design and the proposed

design shall be calculated using Table R405.3. Energy use derived from simulation analysis shall be expressed in pounds of carbon ((and)) per square foot of *conditioned floor area* as follows:

1. For structures less than 1,500 square feet of conditioned floor area, the annual carbon emissions shall be less than or equal to 73 percent of the annual carbon emissions of the *standard reference design*.
2. For structures 1,500 to 5,000 square feet of conditioned floor area, the annual carbon emissions shall be no more than 56 percent of the *standard reference design*.
3. For structures over 5,000 square feet of conditioned floor area, the annual carbon emissions shall be no more than 50 percent of the *standard reference design*.
4. For structures serving Group R-2 occupancies, the annual carbon emissions shall be less than or equal to 70 percent of the annual energy consumption of the *standard reference design*.

**TABLE R405.3  
CARBON EMISSIONS FACTORS**

Type	CO2e (lb/unit)	Unit
Electricity	0.80	kWh
Natural gas	11.7	Therm
Oil	19.2	Gallon
Propane	10.5	Gallon
Other <sup>a</sup>	195.00	mmBtu
On-site renewable energy	0.00	

<sup>a</sup> District energy systems may use alternative emission factors supported by calculations *approved* by the *code official*.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40551 Table R405.5.2(1)—Specifications for the standard reference and proposed designs.**

**TABLE R405.5.2(1)  
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS**

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Above-grade walls	Type: Mass wall if proposed wall is mass; otherwise wood frame. Gross area: Same as proposed U-factor: From Table R402.1.3 Solar absorptance = 0.75 <del>((Remittance))</del> <u>Emittance</u> = 0.90	As proposed As proposed As proposed As proposed As proposed
Below-grade walls	Type: Same as proposed Gross area: Same as proposed U-factor: From Table R402.1.3, with insulation layer on interior side of walls.	As proposed As proposed As proposed
Above-grade floors	Type: Wood frame Gross area: Same as proposed U-factor: From Table R402.1.3	As proposed As proposed As proposed
Ceilings	Type: Wood frame Gross area: Same as proposed U-factor: From Table R402.1.3	As proposed As proposed As proposed
Roofs	Type: Composition shingle on wood sheathing Gross area: Same as proposed Solar absorptance = 0.75 Emittance = 0.90	As proposed As proposed As proposed As proposed
Attics	Type: Vented with aperture = 1 ft <sup>2</sup> per 300 ft <sup>2</sup> ceiling area	As proposed
Foundations	Type: Same as proposed foundation wall area above and below-grade Soil characteristics: Same as proposed.	As proposed As proposed
Opaque doors	Area: 40 ft <sup>2</sup> Orientation: North U-factor: Same as fenestration from Table R402.1.3.	As proposed As proposed As proposed

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Vertical fenestration other than opaque doors <sup>a</sup>	Total area <sup>b</sup> = (a) The proposed glazing area; where proposed glazing area is less than 15% of the conditioned floor area. (b) 15% of the conditioned floor area; where the proposed glazing area is 15% or more of the conditioned floor area.	As proposed
	Orientation: Equally distributed to four cardinal compass orientations (N, E, S & W).	As proposed
	<i>U</i> -factor: From Table R402.1.3	As proposed
	SHGC: From Table R402.1.1 except that for climates with no requirement (NR) SHGC = 0.40 shall be used.	As proposed
	Interior shade fraction: 0.92 - (0.21 × SHGC for the standard reference design) External shading: None	0.92 - (0.21 × SHGC as proposed) As proposed
Skylights	None	As proposed
Air exchange rate	Air leakage rate of 5 air changes per hour at a pressure of 0.2 inches w.g. (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ where: <i>CFA</i> = conditioned floor area <i>N<sub>br</sub></i> = number of bedrooms - Energy recovery shall not be assumed for mechanical ventilation.	As proposed <sup>a</sup> . The mechanical ventilation rate <sup>b</sup> shall be in addition to the air leakage rate and shall be as proposed.
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: $kWh/yr = (1e_f) \times (0.0876 \times CFA + 65.7 \times (N_{br} + 1))$ where: <i>e<sub>f</sub></i> = the minimum exhaust fan efficacy from Table R403.6.1 corresponding to a flow rate of $0.01 \times CFA + 7.5 \times (N_{br} + 1)$ <i>CFA</i> = conditioned floor area <i>N<sub>br</sub></i> = number of bedrooms	As proposed
Internal gains	$IGain = 17,900 + 23.8 \times CFA + 4104 \times N_{br}$ (Btu/day per dwelling unit)	Same as standard reference design
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area.	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element <sup>c</sup> but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80% of floor area covered by R-2 carpet and pad, and 20% of floor directly exposed to room air.	As proposed
	For masonry basement walls, as proposed, but with insulation required by Table R402.1.3 located on the interior side of the walls.	As proposed
	For other walls, for ceilings, floors, and interior walls, wood frame construction.	As proposed

BUILDING COMPONENT	STANDARD REFERENCE DESIGN	PROPOSED DESIGN
Heating systems <sup>d, e</sup>	Where the proposed design utilizes electric heating without a heat pump the standard reference design shall be an air source heat pump meeting the requirements of Section C403 of the WSEC—Commercial Provisions. For all other systems, the same system type as proposed, and the same system efficiency required by prevailing minimum federal standard. Capacity: Sized in accordance with Section R403.6	As proposed
Cooling systems <sup>d, f</sup>	Same system type as proposed. Same system efficiency as required by prevailing minimum federal standard. Capacity: Sized in accordance with Section R403.6.	As proposed
Service water heating <sup>d, e, f, g</sup>	Same system type as proposed. Same system efficiency as required by prevailing minimum federal standard. Use: Same as proposed design	As proposed gal/day = 30 + (10 × N <sub>br</sub> )
Thermal distribution systems	Duct insulation: From Section R403.3.3. A thermal distribution system efficiency (DSE) of 0.93 shall be applied to both the heating and cooling system efficiencies for all systems.  <b>Exception:</b> For nonducted heating and cooling systems that do not have a fan, the standard reference design distribution system efficiency ( <del>(DSE)</del> ) DSE shall be 1.	As specified in Table R405.5.2(2).
Thermostat	Type: Manual, cooling temperature setpoint = 75°F; Heating temperature setpoint = 72°F	Same as standard reference

For SI: 1 square foot = 0.93 m<sup>2</sup>, 1 British thermal unit = 1055 J, 1 pound per square foot = 4.88 kg/m<sup>2</sup>, 1 gallon (U.S.) = 3.785 L, °C = (°F-3)/1.8, 1 degree = 0.79 rad

- a Where required by the *code official*, testing shall be conducted by an *approved party*. Hourly calculations as specified in the ASHRAE *Handbook of Fundamentals*, or the equivalent, shall be used to determine the energy loads resulting from infiltration.
- b The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE *Handbook of Fundamentals*, page 26.24 and the "Whole-house Ventilation" provisions of 2001 ASHRAE *Handbook of Fundamentals*, page 26.19 for intermittent mechanical ventilation.
- c Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
- d For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- e For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- f For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.
- g For a proposed design with a nonstorage-type water heater, a 40-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a 40-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.
- h For residences with conditioned basements, R-2 and R-4 residences and townhouses, the following formula shall be used to determine fenestration area:

$$AF = A_s \times FA \times F$$

Where:

AF = Total fenestration area.

A<sub>s</sub> = Standard reference design total fenestration area.

FA = (Above-grade thermal boundary gross wall area)/(above-grade boundary wall area + 0.5 x below-grade boundary wall area).

$F = \frac{\text{(Above-grade thermal boundary wall area)}}{\text{(above-grade thermal boundary wall area + common wall area)}} \text{ or } 0.56, \text{ whichever is greater.}$

and where:

Thermal boundary wall is any wall that separates conditioned space from unconditioned space or ambient conditions.

Above-grade thermal boundary wall is any thermal boundary wall component not in contact with soil.

Below-grade boundary wall is any thermal boundary wall in soil contact.

Common wall area is the area of walls shared with an adjoining dwelling unit.

$L$  and  $CFA$  are in the same units.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-40700 Section R407—Certified passive house.**

**R407.1 General.** Projects shall comply with Section R407.2 or R407.3.

**R407.2 Passive House Institute U.S. (PHIUS).** Projects shall comply with PHIUS+ 2018 Passive Building Standard, including its USDOE Energy Star and Zero Energy Ready Home co-requisites, and performance calculations by PHIUS-approved software. Projects shall also comply with the provisions of Table R405.2.

**R407.2.1 PHIUS documentation.** Prior to the issuance of a building permit, the following items must be provided to the ~~((building))~~ *code official*:

1. A list of compliance features.
2. A PHIUS precertification letter.

Prior to the issuance of a certificate of occupancy, the following item must be provided to the ~~((building))~~ *code official*:

1. A PHIUS+ 2018 (or later) project certificate.

**R407.3 Passive House Institute (PHI).** Projects shall comply with Low Energy Building Standard, version 9f or later, including performance calculations by PHI-approved software. Projects shall also comply with the provisions of Section R401 through R404.

**R407.3.1 PHI documentation.** Prior to the issuance of a building permit, the following items must be provided to the ~~((building))~~ *code official*:

1. A list of compliance features.
2. A statement from a passive house certifier that the modeled energy performance is congruent with the plans and specifications, and that the modeled performance meets said standard.

Prior to the issuance of a certificate of occupancy, the following item must be provided to the ~~((building))~~ *code official*:

1. A PHI Low Energy Building project certificate.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-50100 Section R501—General.**

**R501.1 Scope.** The provisions of this chapter shall control the alteration, repair, addition and change of occupancy of existing buildings and structures.

**R501.1.1 Additions, alterations, or repairs.** Additions, alterations, or repairs to an existing building, building system or portion thereof shall comply with Sections R502, R503 or R504. Unaltered portions of the existing building or building supply system shall not be required to comply with this code.

**R501.1.2 Thermostats for accessory dwelling units.** Where a separate dwelling unit, that provides independent facilities for living, sleeping, cooking, bathing and sanitation, is established within or attached to an existing dwelling unit, the heating and cooling for the newly-created dwelling unit shall be controllable with a separate programmable thermostat in accordance with Section R403.1.1.

**R501.2 Existing buildings.** Except as specified in this chapter, this code shall not be used to require the removal, alteration or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

**R501.3 Maintenance.** Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems that are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

**R501.4 Compliance.** Alterations, repairs, additions and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for alterations, repairs, additions and changes of occupancy or relocation, respectively, in this code and the *International Residential Code, International Building Code, International Existing Building Code, International Fire Code, International Fuel Gas Code, International Mechanical Code, Uniform Plumbing Code, International Property Maintenance Code,* and NFPA 70.

**R501.5 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs, provided hazards to life, health or property are not created. Hazardous materials shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

**R501.6 Historic buildings.** The ~~((building))~~ *code official* may modify the specific requirements of this code for historic



buildings and require alternate provisions which will result in a reasonable degree of energy efficiency. This modification may be allowed for those buildings or structures that are listed in the state or national register of historic places; designated as a historic property under local or state designation law or survey; certified as a contributing resource with a national register listed or locally designated historic district; or with an opinion or certification that the property is eligible to be listed on the national or state register of historic places either individually or as a contributing building to a historic district by the state historic preservation officer or the keeper of the *National Register of Historic Places*.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-50300 Section R503—Alterations.**

**R503.1 General.** Alterations to any building or structure shall comply with the requirements of the code for new construction. Alterations shall be such that the existing building or structure is no less conforming to the provisions of this code than the existing building or structure was prior to the alteration.

Alterations to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this code. Alterations shall not create an unsafe or hazardous condition or overload existing building systems.

Alterations shall be such that the existing building or structure uses no more energy than the existing building or structure prior to the alteration. Alterations to existing buildings shall comply with Sections R503.1.1 through R503.2.

The *code official* may approve designs of alterations which do not fully conform to all of the requirements of this code where in the opinion of the ~~((building))~~ *code official* full compliance is physically impossible and/or economically impractical and:

The alteration improves the energy efficiency of the building; or

The alteration is energy efficient and is necessary for the health, safety, and welfare of the general public.

**R503.1.1 Building envelope.** Building envelope assemblies that are part of the alteration shall comply with Section R402.1.1 or R402.1.4, Sections R402.2.1 through R402.2.11, R402.3.1, R402.3.2, R402.4.3, and R402.4.4.

EXCEPTION: The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation. 2 x 4 framed walls shall be insulated to a minimum of R-15 and 2 x 6 framed walls shall be insulated to a minimum of R-21.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof recover.

5. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.

6. Surface-applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing fenestration to be replaced.

**R503.1.1.1 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC in Table R402.1.1. Where more than one replacement fenestration unit is being installed, an area-weighted average of the *U*-factor and SHGC of all replacement fenestration shall be permitted to be used to demonstrate compliance.

**R503.1.2 Heating and cooling systems.** New heating, cooling and duct systems that are part of the alteration shall comply with Section R403.

EXCEPTIONS:

1. Where ducts from an existing heating and cooling system are extended, duct systems with less than 40 linear feet in unconditioned spaces shall not be required to be tested in accordance with Section R403.2.2.
2. Existing duct systems constructed, insulated or sealed with asbestos.

**R503.1.3 Service hot water systems.** New service hot water systems that are part of the alteration shall comply with Section R403.5.

**R503.1.4 Lighting.** New lighting systems that are part of the alteration shall comply with Section R404.1.

EXCEPTION: Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.

**R503.2 Change in space conditioning.** Any nonconditioned or low-energy space that is altered to become conditioned space shall be required to be brought into full compliance with this code.

EXCEPTION: Where the simulated performance option in Section R405 is used to comply with this section, the annual energy use of the proposed design is permitted to be 110 percent of the annual energy use otherwise allowed by Section R405.3.

**AMENDATORY SECTION** (Amending WSR 16-02-127, filed 1/6/16, effective 7/1/16)

**WAC 51-11R-50400 Section R504—Repairs.**

**R504.1 General.** Buildings, structures and parts thereof shall be repaired in compliance with Section R501.3 and this section. Work on nondamaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to the requirements for alterations in this chapter. Routine maintenance required by Section R501.3, ordinary repairs exempt from permit, and abatement of wear due to normal service conditions shall not be subject to the requirements for repairs in this section.

The *code official* may approve designs of repairs which do not fully conform with all of the requirements of this code where in the opinion of the ((building)) *code official* full compliance is physically impossible and/or economically impractical and:

1. The repair improves the energy efficiency of the building; or
2. The repair is energy efficient and is necessary for the health, safety, and welfare of the general public.

**R504.2 Application.** For the purposes of this code, the following shall be considered repairs.

1. Glass only replacements in an existing sash and frame.
2. Roof repairs.
3. Repairs where only the bulb and/or ballast within the existing luminaires in a space are replaced provided that the replacement does not increase the installed interior lighting power.

**AMENDATORY SECTION** (Amending WSR 20-01-047, filed 12/9/19, effective 7/1/20)

**WAC 51-11R-59000 Appendix RB—Optional energy efficiency measures—Two step.** Building owners may choose to use this appendix to achieve an additional 12 percent savings in building energy use. The number of additional energy efficiency credits required by Section R406.3 would be increased by the following amounts:

- 2.0 credit for each new single-family, two-family and townhouse dwelling unit.
- 1.0 credit for each new dwelling unit within an R-2 occupancy building.
- 1.0 credit for each addition smaller than 500 square feet to a single-family, two-family or townhouse dwelling unit.
- 1.5 credit for each addition of 500 square feet or larger to a single-family, two-family or townhouse dwelling unit.

Where Section R405, Simulated performance alternative, is used, the maximum allowable energy consumption shall be ((92)) 84 percent of the value calculated according to Section R405.3.

### WSR 20-21-083

#### PERMANENT RULES

#### DEPARTMENT OF COMMERCE

[Filed October 19, 2020, 4:39 p.m., effective November 19, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: Updating chapter 194-24 WAC to include standards, testing methods, listing requirements, and marking requirements for air compressors, portable air conditioners [conditioners], and uninterruptable power supplies; to define distribute, and manufacturer; to provide for enforcement of violations, assessment of civil penalties, and review of penalty decisions for appliance standards; and to modify marking and listing requirements for residential ventilating fans.

Citation of Rules Affected by this Order: New WAC 194-24-185, 194-24-190 and 194-24-195; and amending WAC 194-24-030, 194-24-070, and 194-24-150.

Statutory Authority for Adoption: RCW 19.260.070, 19.260.040.

Adopted under notice filed as WSR 20-17-130 on August 18, 2020.

Changes Other than Editing from Proposed to Adopted Version: Commerce is withdrawing the proposed amendment to WAC 194-24-180.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 3, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 2, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 2, 2020.

Dave Pringle  
Policy Advisor

**AMENDATORY SECTION** (Amending WSR 20-03-013, filed 1/6/20, effective 2/6/20)

**WAC 194-24-030 Definitions.** The definitions in chapter 19.260 RCW apply throughout this chapter.

(1) The following terms have the same meaning as used in the California Rule:

- (a) Showerheads;
- (b) Tub spout diverters;
- (c) Showerhead tub spout diverter combinations;
- (d) Lavatory faucets and replacement aerators;
- (e) Kitchen faucets and replacement aerators;
- (f) Public lavatory faucets and replacement aerators;
- (g) Urinals;
- (h) Water closets; and
- (i) Computers and computer monitors.

(2) "California Rule" means Title 20, Article 4, California Code of Regulations, in effect on January 2019, revised September 2019.

(3) "MAEDbS" means the modernized appliance efficiency database system established pursuant to section 1606 (c) of the California Rule and maintained by the California energy commission.

(4) "Distribute" means to import, consign, buy or sell for resale, offer for sale, sell, barter, exchange, install for compensation or otherwise supply a product subject to the standards in this chapter or chapter 19.260 RCW.

(5) "Distributor" means a person who distributes.

(6) "Manufacturer" has the same meaning as used in the California Rule.

AMENDATORY SECTION (Amending WSR 20-03-013, filed 1/6/20, effective 2/6/20)

**WAC 194-24-070 (~~Penalties for noncompliance.~~)**  
**Violations, assessment of civil penalties, and review of penalty decisions.** (~~In applying the penalty provision in RCW 19.260.070(6), the department may consider each unit of a noncompliant product to be a separate violation.~~) (1) First violations (notice of violation): When the department has determined that a manufacturer or distributor has violated chapter 19.260 RCW or this chapter, the director or their designee will issue a warning in the form of a notice of violation (NOV) for the first violation. The NOV will specify the time by which the manufacturer or distributor must cure the violation. If compliance is not achieved by the date established in the NOV, the department may consider the manufacturer's or distributor's continued noncompliance to constitute a subsequent violation.

(2) Repeat violations (notice of repeat violation and intent to assess penalties): If the department determines that the person receiving the NOV has committed a subsequent violation of chapter 19.260 RCW, the director or their designee may issue a notice of repeat violation and intent to assess penalties (NOI). The NOI informs the manufacturer or distributor of the portions of chapter 19.260 RCW and this chapter that have been violated and will include a description of how penalties will be calculated. A manufacturer or distributor receiving an NOI has twenty-five days from the date notice is given to request an administrative hearing by following the process specified on the NOI. If the request for hearing is not timely filed with the department, the manufacturer or distributor waives its right to a hearing and the director or their designee may issue a final order assessing penalties described in the NOI.

(3) Penalty assessment: Repeat violations are subject to a civil penalty of not more than two hundred fifty dollars a day, and the department may consider each unit of a noncompliant product to be a separate violation.

(4) Unpaid penalties: Interest will accrue on civil penalties pursuant to RCW 43.17.240 if and when the debt becomes past due. If a penalty has not been paid by the due date, the department may assign the debt to a collection agency as authorized by RCW 19.16.500 or take other action to pursue collection as authorized by law. If referred to a collection agency, the department may add a reasonable fee, payable by the debtor, to the outstanding debt for the collection agency fee.

(5) Administrative hearings: After receiving a timely request for an administrative hearing, the department may refer the matter to the office of administrative hearings (OAH). Administrative hearings will be conducted in accordance with the Administrative Procedure Act, chapter 34.05 RCW, the model rules of procedure, chapter 10-08 WAC, and the procedural rules adopted in this section. In the case of a conflict between the model rules of procedure and the procedural rules adopted in this section, the procedural rules adopted in this section take precedence.

(6) Initial orders to become final orders. Initial orders issued by the presiding officer will become final without further agency action unless, within twenty days:

(a) The director determines that the initial order should be reviewed; or

(b) A party to the proceeding files a petition for administrative review of the initial order. Upon occurrence of either event, notice shall be given to all parties to the proceeding.

(7) Reply to a petition for review. If a timely petition for review of an initial order is filed, other parties to the proceeding may file a reply to the petition for review. The reply shall be filed with the office where the petition for review was filed within twenty days of the date of service of the petition and copies shall be served upon all other parties or their representatives at the time the reply is filed.

(8) Agency review of an initial order. If the director determines the initial order should be reviewed or a petition for administrative review has been timely filed, the director may do one or more of the following: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director or their designee shall issue a final order that can affirm, modify, or reverse the initial order. The final order will be served on all parties.

(9) Judicial review: A final order entered pursuant to this section is subject to judicial review pursuant to RCW 34.05.510 through 34.05.598.

AMENDATORY SECTION (Amending WSR 20-03-013, filed 1/6/20, effective 2/6/20)

**WAC 194-24-150 Residential ventilating fans.** (1) **Scope.** This rule applies to new residential ventilating fans manufactured on or after January 1, 2021.

(2) **Standard.** Residential ventilating fans must meet the requirements included in the scope of the Environmental Protection Agency ENERGY STAR® program product specification for residential ventilating fans, version 3.2.

(3) **Testing.** Residential ventilating fans must meet the testing requirements included in the scope of the Environmental Protection Agency ENERGY STAR® program product specification for residential ventilating fans, version 3.2.

(4) **Listing.** (~~Each manufacturer must cause to be listed each residential ventilating fan, by model number, in the ENERGY STAR® product database.~~) There is no listing requirement for this product.

(5) **Marking.** (~~Every unit of every residential ventilating fan must have an ENERGY STAR® label.~~) There is no marking requirement for this product.

#### NEW SECTION

**WAC 194-24-185 Air compressors.** (1) **Scope.** This rule applies to new air compressors manufactured on or after January 1, 2022, through January 9, 2025.

(2) **Standard.** Air compressors that meet the twelve criteria listed on page 350 to 351 of the "energy conservation standards for air compressors" final rule issued by the United States Department of Energy on December 5, 2016, must

meet the requirements in Table 1 on page 352 in accordance with the instructions on page 353.

(3) **Testing.** Air compressors must meet the test criteria as measured in accordance with the "uniform test method for certain air compressors" under 10 C.F.R. Part 431 (Appendix A to Subpart T) as in effect on July 3, 2017.

(4) **Listing.** Each manufacturer must cause to be listed each air compressor, by model number, in MAEDbS.

(5) **Marking.** Every unit of every air compressor must comply with the requirements of Section 1607 of the California Rule.

NEW SECTION

**WAC 194-24-190 Portable air conditioners.** (1)

**Scope.** This rule applies to new portable air conditioners manufactured on or after February 1, 2022, through January 9, 2025.

(2) **Standard.** Portable air conditioners must have a combined energy efficiency ratio that is greater than or equal to:

$$1.04 \times \frac{SACC}{(3.7117 \times SACC^{0.6384})}$$

where "SACC" is seasonally adjusted cooling capacity in British thermal unit/hour (Btu/hr).

(3) **Testing.** Portable air conditioners must meet the testing criteria as measured in accordance with the test methods prescribed in 10 C.F.R. Section 430.23 (Appendix CC to Subpart B of Part 430) in effect as of January 3, 2017, as updated by the correction notice at 84 Fed. Reg. 5346 (February 21, 2019).

(4) **Listing.** Each manufacturer must cause to be listed each portable air conditioner, by model number, in MAEDbS.

(5) **Marking.** Every unit of every portable air conditioner must comply with the requirements of Section 1607 of the California Rule.

NEW SECTION

**WAC 194-24-195 Uninterruptible power supplies.**

(1) **Scope.** This rule applies to new uninterruptible power supplies manufactured on or after January 1, 2021, through January 9, 2022.

(2) **Standard.** Uninterruptible power supplies that utilize a NEMA 1-15P or 5-15P input plug and have an AC output must have an average load adjusted efficiency that meets or exceeds the values shown on page 193 of the prepublication final rule "Energy Conservation Program: Energy Conservation Standards for Uninterruptible Power Supplies" issued by the United States Department of Energy on December 28, 2016.

(3) **Testing.** Uninterruptible power supplies must meet the testing criteria as measured in accordance with the test methods prescribed in Appendix Y to Subpart B of Part 430 of Title 10 of the Code of Federal Regulations "Uniform Test Method for Measuring the Energy Consumption of Battery Chargers" in effect as of January 11, 2017.

(4) **Listing.** There is no listing requirement for this product.

(5) **Marking.** There is no marking requirement for this product.

**WSR 20-21-085**

**PERMANENT RULES**

**WASHINGTON STATE PATROL**

[Filed October 20, 2020, 8:06 a.m., effective November 20, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: To update the address of the location of the Washington state patrol headquarters and to update methods of requesting a public disclosure request to the Washington state patrol.

Citation of Rules Affected by this Order: Amending WAC 446-10-030 and 446-10-050.

Statutory Authority for Adoption: RCW 42.56.040 and 42.56.570.

Adopted under notice filed as WSR 20-15-133 on July 21, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 2, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 2, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 20, 2020.

John R. Batiste  
Chief

AMENDATORY SECTION (Amending WSR 08-20-074, filed 9/26/08, effective 10/27/08)

**WAC 446-10-030 Description of central and field organizations of the Washington state patrol.**

(1) The Washington state patrol is a law enforcement agency. The Washington state patrol is headquartered in the (~~General Administration~~) Helen Sommers Building, (~~210~~) 106 - 11th Avenue S.W., Olympia, Washington 98504. The department has eight district headquarters with working addresses as follows:

- District I - 2502 112th Street East, Tacoma 98445-5104
- District II - 2803 - 156th Avenue S. E., Bellevue 98007

District	III	- 2715 Rudkin Road, Union Gap 98903
District	IV	- West 6403 Rowand Road, Spokane 99204-5300
District	V	- 11018 N.E. 51st Circle, Vancouver 98682-3812
District	VI	- 2822 Euclid Avenue, Wenatchee 98801-5916
District	VII	- 2700 116th Street N.E., Marysville 98271-9425
District	VIII	- 4811 Werner Road, Bremerton 98312-3333

(2) Any person wishing to request access to public records of the Washington state patrol, or seeking assistance in making such a request, shall contact the public records officer of the Washington state patrol:

Public Records Officer  
Washington State Patrol  
P.O. Box 42631  
Olympia, WA 98504  
Phone: 360-596-4137  
Fax: 360-596-4153  
Email: pubrecs@wsp.wa.gov

Information is also available at the Washington state patrol's website at <http://www.wsp.wa.gov/>.

(3) The public records officer shall oversee compliance with the act, but another Washington state patrol staff member may process the request. Therefore, these rules shall refer to the public records officer "or designee." The public records officer or designee and the Washington state patrol shall provide the "fullest assistance" to requestors; create and maintain for use by the public and Washington state patrol officials an index to public records of the Washington state patrol; ensure that public records are protected from damage or disorganization; and prevent fulfilling public records requests from causing excessive interference with essential functions of the Washington state patrol.

AMENDATORY SECTION (Amending WSR 07-04-039, filed 1/30/07, effective 3/2/07)

**WAC 446-10-050 Availability of public records.** (1) **Hours for inspection of records.** Public records are available for inspection and copying during normal business hours of the Washington state patrol; 8:00 a.m. to noon, and 1:00 p.m. to 4:00 p.m., Monday through Friday, excluding legal holidays. Records must be inspected at the offices of the Washington state patrol.

(2) **Records index.** An index of public records is available for use by members of the public. The index includes a list of current manuals of the Washington state patrol, a current list of laws, other than those listed in chapter 42.56 RCW, that exempts or prohibits disclosure of specific information or records, and current *Washington Administrative Code* agency rules. The index may be accessed online at

[www.wsp.wa.gov/](http://www.wsp.wa.gov/), or at any public Washington state patrol office.

(3) **Organization of records.** The Washington state patrol shall maintain its records in a reasonably organized manner. The Washington state patrol shall take reasonable actions to protect records from damage and disorganization. A requestor shall not take Washington state patrol records from Washington state patrol offices without the permission of the public records officer or designee. Records may be available on the Washington state patrol website at [www.wsp.wa.gov/](http://www.wsp.wa.gov/). Requestors are encouraged to view the documents available on the web site prior to submitting a records request.

(4) **Making a request for public records.**

(a) Any person wishing to inspect or obtain copies of public records of the Washington state patrol ~~((shall))~~ can make ~~((the))~~ their request ~~((in writing using the Washington state patrol request form, or by letter, fax, or email addressed to the public records officer))~~ by:

• Using the Washington state patrol online portal at [www.wsp.wa.gov/](http://www.wsp.wa.gov/); or

• Submitting a request form ([www.wsp.wa.gov/](http://www.wsp.wa.gov/)); or

• A letter; or

• Email to [pubrecs@wsp.wa.gov](mailto:pubrecs@wsp.wa.gov).

(b) Each request should include the following information:

• Name of requestor;

• Address of requestor;

• Other contact information, including telephone number and/or any email address; and

• Identification of the public records adequate for the public records officer or designee to locate the records.

~~((b))~~ (c) If the requestor wishes to inspect rather than obtain copies of records, they shall indicate this preference in their request. Pursuant to WAC 446-10-090, standard photocopies shall be provided at fifteen cents per page, plus postage.

~~((c))~~ A form is available for use by requestors online at [www.wsp.wa.gov/](http://www.wsp.wa.gov/).

**WSR 20-21-091**

**PERMANENT RULES**

**DEPARTMENT OF**

**LABOR AND INDUSTRIES**

[Filed October 20, 2020, 11:00 a.m., effective November 20, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: eRules Phase 10: Chapter 296-307 WAC, Safety standards for agriculture, Parts B through H, J through N, P through Y-10.

This rule making is part of the division of occupational safety and health (DOSH) eRules project. This rule making does not add or change any requirements; the purpose is to provide consistency in formatting, design and accessibility to the rules via mobile electronic devices.

This rule making accomplishes the following:

- Consistent format for all DOSH rules.
- Easy to access rules for smart phone and tablet users.

- Easy navigation in PDF files provided through bookmarks in the rules.
- Easier referencing by replacing bullets and dashes with numbers and letters.
- Enhanced rule update efficiency for customers through electronic postings.

See below for a list of updates being adopted.

#### Amended Sections:

#### **WAC 296-307-030 (Part B) through 296-307-10025 (Part H), WAC 296-307-145 (Part J) through 296-307-24036 (Part N), and WAC 296-307-280 (Part P) through 296-307-70480 (Part Y-10).**

- Changed "you" to "the employer" or "the operator" where applicable.
- Changed "you have" to "the employer has" where applicable.
- Changed bullets and other symbols to letters or numbers where applicable.
- Changed "shall" to "must" where applicable.
- Removed numbers and quotation marks from all defined words.
- Removed words/phrases such as "means," "as defined" or "is an" from all applicable definitions and replaced it with a period, making all definitions complete sentences.
- Website addresses and links corrected, where needed.
- Updated titles of WAC sections to remove question format.

#### **WAC 296-307-039 First-aid rule summary.**

- Updated titles of WAC sections embedded in the WAC to agree with updated titles noted.

#### **WAC 296-307-03905 Make sure that first-aid trained personnel are available to provide quick and effective first aid.**

- This WAC had language from 29 C.F.R. 1910.151(b) embedded. Updated the language to agree with the C.F.R. as currently written.

#### **WAC 296-307-05505 Use of orchard ladders.**

- Rearranged order of items. Prohibited behaviors are now listed together, and at the beginning of the section. Previously, prohibited behaviors were numbered 1 and 4, and are now 1 and 2.

#### **WAC 296-307-085 Requirements for ROPS to be provided for material handling equipment.**

- The WAC had language from OSHA 1928.52 C.F.R. embedded. Updated the language to agree with the C.F.R. as currently written.

#### **WAC 296-307-18010 Guarding constant-running drives.**

- Definition of "constant-running drives" moved from end of section to beginning for better understanding.

#### **WAC 296-307-24012 Maintenance of potable water supply.**

- Rearranged order of items.
- Prohibited behavior is now listed at the beginning of the section. Previously, prohibited behavior was the last item in the list.

Citation of Rules Affected by this Order: Amending WAC 296-307-030, 296-307-033, 296-307-036, 296-307-039, 296-307-03905, 296-307-03920, 296-307-03930, 296-307-03935, 296-307-03940, 296-307-03945, 296-307-045, 296-307-050, 296-307-05501, 296-307-05503, 296-307-05505, 296-307-05507, 296-307-060, 296-307-061, 296-307-065, 296-307-07001, 296-307-07003, 296-307-07005, 296-307-07007, 296-307-07009, 296-307-07011, 296-307-07013, 296-307-073, 296-307-076, 296-307-08003, 296-307-08006, 296-307-08009, 296-307-08012, 296-307-08015, 296-307-08018, 296-307-08021, 296-307-085, 296-307-090, 296-307-09503, 296-307-09506, 296-307-09509, 296-307-09512, 296-307-09515, 296-307-09518, 296-307-09710, 296-307-09720, 296-307-10005, 296-307-10010, 296-307-10015, 296-307-10020, 296-307-10025, 296-307-14505, 296-307-148, 296-307-14805, 296-307-14810, 296-307-14815, 296-307-14820, 296-307-14825, 296-307-14830, 296-307-14835, 296-307-14840, 296-307-14845, 296-307-15003, 296-307-15006, 296-307-15009, 296-307-15012, 296-307-16101, 296-307-16103, 296-307-16104, 296-307-16120, 296-307-16125, 296-307-16130, 296-307-16135, 296-307-16140, 296-307-16145, 296-307-16147, 296-307-16150, 296-307-16155, 296-307-16160, 296-307-16165, 296-307-16170, 296-307-16175, 296-307-16180, 296-307-16190, 296-307-18005, 296-307-18010, 296-307-18015, 296-307-18020, 296-307-18025, 296-307-18503, 296-307-18506, 296-307-18509, 296-307-18512, 296-307-18515, 296-307-19003, 296-307-19006, 296-307-19009, 296-307-19012, 296-307-19015, 296-307-19018, 296-307-195, 296-307-20005, 296-307-20010, 296-307-20505, 296-307-20510, 296-307-20515, 296-307-22003, 296-307-22006, 296-307-22009, 296-307-22012, 296-307-22015, 296-307-22503, 296-307-22506, 296-307-22509, 296-307-230, 296-307-232, 296-307-24001, 296-307-24003, 296-307-24006, 296-307-24009, 296-307-24012, 296-307-24015, 296-307-24018, 296-307-24021, 296-307-24024, 296-307-24027, 296-307-24030, 296-307-24033, 296-307-24036, 296-307-28002, 296-307-28004, 296-307-28006, 296-307-28014, 296-307-28016, 296-307-28018, 296-307-28020, 296-307-28022, 296-307-28024, 296-307-28026, 296-307-28028, 296-307-28030, 296-307-28032, 296-307-28034, 296-307-28036, 296-307-28038, 296-307-28040, 296-307-28042, 296-307-28044, 296-307-28046, 296-307-28048, 296-307-28050, 296-307-28052, 296-307-28054, 296-307-28056, 296-307-28058, 296-307-28060, 296-307-28062, 296-307-28064, 296-307-28066, 296-307-28068, 296-307-29005, 296-307-29010, 296-307-30003, 296-307-30006, 296-307-30009, 296-307-30012, 296-307-30015, 296-307-30018, 296-307-30021, 296-307-32001, 296-307-32003, 296-307-32005, 296-307-32007, 296-307-32009, 296-307-32011, 296-307-32013, 296-307-32015, 296-307-32017, 296-307-32019, 296-307-32021, 296-307-32023, 296-307-32025, 296-307-32027, 296-307-32029, 296-307-32031, 296-307-32033, 296-307-32035, 296-307-32037, 296-307-32039, 296-307-32041, 296-307-33001, 296-307-33003, 296-307-33005, 296-307-33007, 296-307-33009,

296-307-33011, 296-307-34003, 296-307-34006, 296-307-34009, 296-307-34012, 296-307-34015, 296-307-34018, 296-307-34021, 296-307-34503, 296-307-34506, 296-307-34509, 296-307-34512, 296-307-34515, 296-307-35003, 296-307-35006, 296-307-35009, 296-307-35012, 296-307-35015, 296-307-35018, 296-307-36005, 296-307-36010, 296-307-36203, 296-307-36206, 296-307-36209, 296-307-36212, 296-307-36215, 296-307-36218, 296-307-36221, 296-307-36224, 296-307-36227, 296-307-36230, 296-307-36403, 296-307-36406, 296-307-36409, 296-307-36412, 296-307-36415, 296-307-36418, 296-307-36421, 296-307-36603, 296-307-36606, 296-307-36609, 296-307-36612, 296-307-36615, 296-307-36618, 296-307-36621, 296-307-36624, 296-307-36627, 296-307-36630, 296-307-36633, 296-307-36636, 296-307-36803, 296-307-36806, 296-307-36809, 296-307-36812, 296-307-36815, 296-307-36818, 296-307-36821, 296-307-36824, 296-307-36827, 296-307-36830, 296-307-36833, 296-307-36836, 296-307-36839, 296-307-36842, 296-307-36845, 296-307-36848, 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Statutory Authority for Adoption: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.

Adopted under notice filed as WSR 20-16-142 on August 4, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 668, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 668, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 20, 2020.

Joel Sacks  
Director

**AMENDATORY SECTION** (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

**WAC 296-307-030** (~~What are the~~) **Required elements of an accident prevention program**(?). (1) (~~You~~) The employer must instruct all employees in safe working practices at the beginning of employment. (~~Your~~) Instruction must be tailored to the types of hazards to which employees are exposed.

(2) (~~You~~) The employer must develop a written accident prevention program tailored to the needs of (~~your~~) the employer's agricultural operation and to the types of hazards involved.

(3) (~~Your~~) The employer's accident prevention program must contain at least the following elements:

- (a) How, when, and where to report injuries and illnesses, and the location of first-aid facilities.
- (b) How to report unsafe conditions and practices.
- (c) The use and care of personal protective equipment.
- (d) What to do in emergencies. See WAC 296-307-35015 for emergency action plan requirements.

(e) Identification of hazardous chemicals or materials and the instruction for their safe use.

(f) An on-the-job review of the practices necessary to perform job assignments in a safe and healthful manner.

(4) At least once a month, (~~you~~) the employer must conduct a walk-around safety inspection of active job sites, the materials and equipment involved, and operating procedures. A representative chosen by employees must be invited and allowed to accompany (~~you~~) the employer.

**Note:** Additional requirements in Part G-1, WAC 296-307-097, Outdoor heat exposure, may apply. Employers may address their outdoor heat exposure safety program either in their written accident prevention program (APP) or as a stand-alone written document. See Part G-1.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-033** **Requirements for how often** (~~must~~) **safety meetings must be held**(?). (1) Foreman-crew safety meetings:

(a) Must be held at least monthly; or

(b) Whenever there are significant changes in job assignments.

(c) These meetings must be tailored to the particular operation or activity occurring at the time.

(2) The meeting minutes must document subjects discussed and attendance.

(3) Short-term operations that last less than one month, such as harvesting, do not require foreman-crew safety meetings but only require initial safety orientation for the operations.

(4) (~~You~~) The employer must maintain copies of the minutes of each foreman-crew safety meeting at the location where the majority of employees report to work each day.

(5) (~~You~~) The employer must retain minutes of foreman-crew safety meetings for one year and be able to show us copies if we ask to see them.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-036** (~~What~~) **Items to go on the safety bulletin board**(?). (1) (~~You~~) The employer must provide a bulletin board or posting area large enough to display the required safety and health poster, "Job Safety and Health Protection" (F416-081-000), and other safety education material.

(2) The bulletin board must be readily visible in a place where employees gather during some part of the work day. (For example, at the entrance to a field, a parking area, or in a farm building.)

(3) If for any reason any employee is unable to read the notices posted on the bulletin board, (~~you~~) the employer must ensure that the message of the required poster explaining employee rights is communicated to the employee in terms he or she understands. This same requirement applies to variance applications, denials or grants, and to any other notice affecting the employee's rights under WISHA.

(4) Posting must be in the employees' language.



AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-039 First-aid rule summary.** ~~((You must:))~~  
**Employer's responsibility:** Make sure first-aid trained personnel are available to provide quick and effective first aid.

~~((You must:))  
 Make sure that first-aid trained personnel are available to provide quick and effective first aid.  
 WAC 296-307-03905.  
 Make sure appropriate first-aid supplies are readily available.  
 WAC 296-307-03920.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Make sure that first-aid trained personnel are available to provide quick and effective first aid.</u>	<u>WAC 296-307-03905</u>
<u>Make sure appropriate first-aid supplies are readily available.</u>	<u>WAC 296-307-03920</u>

- Notes:**
- ((\*) 1. Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC .
  - ((\*) 2. Additional requirements relating to first aid are also located in the following sections:
  - ((-) a. WAC 296-307-07013(12), ~~((What))~~ Rules that apply to vehicles used to transport employees(?).
  - ((-) b. WAC 296-307-16175, First-aid ~~((requirements for operators of temporary worker housing))~~ and safety.
  - ((-) c. WAC 296-307-16380, First-aid requirements for operators of cherry harvest camps.

Definitions:

**First aid:** The extent of treatment ~~((you))~~ the employer would expect from a person trained in basic first aid, using supplies from a first-aid kit.

**Emergency medical service:** Medical treatment and care given at the scene of any medical emergency or while transporting any victim to a medical facility.

~~((You))~~ The employer can get copies of these rules by calling 1-800-4BE SAFE (1-800-423-7233), or by going to <http://www.lni.wa.gov>.

AMENDATORY SECTION (Amending WSR 04-07-160, filed 3/23/04, effective 5/1/04)

**WAC 296-307-03905 Make sure that first-aid trained personnel are available to provide quick and effective first aid.**

~~((You must:))~~  
The employer must comply with the first-aid training requirements of 29 C.F.R. 1910.151(b) which states:

"In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first-aid supplies shall be readily available."

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-03920 Make sure appropriate first-aid supplies are readily available.** ~~((You must:))~~  
 (\*) (1) The employer must make sure first-aid supplies are readily available. (See first-aid kit table.)

((\*) (2) The employer must make sure first-aid supplies ~~((at your))~~ in workplace are appropriate to:  
~~((You))~~ (a) The employer's occupational setting.  
 ((-) (b) The response time of ~~((you))~~ the employer's emergency medical services.

**First-Aid Kit Table**

Number of employees normally assigned to worksite	Minimum first-aid supplies required at worksite
1 - 15 Employees	1 First-aid kit
16 - 30 Employees	2 First-aid kits
31 - 50 Employees	3 First-aid kits

- Notes:**
- ((\*) 1. First-aid kits from ~~((you))~~ a local retailer or safety supplier should be adequate for most nonindustrial employers.
  - ((\*) 2. The following is a list of suggested items for ~~((you))~~ the first-aid kit:
    - ((-) a. 1 absorbent compress, 4 x 8 inches.
    - ((-) b. 16 adhesive bandages, 1 x 3 inches.
    - ((-) c. 1 adhesive tape, 5 yards long.
    - ((-) d. 10 antiseptic single-use packages, 0.5 g application.
    - ((-) e. 6 burn treatment single-use packages, 0.5 g application.
    - ((-) f. 1 eye covering (for two eyes).
    - ((-) g. 1 eye wash, 1 fluid ounce.
    - ((-) h. 4 sterile pads, 3 x 3 inches.
    - ((-) i. 2 pair of medical exam gloves.
    - ((-) j. 1 triangular bandage, 39 x 39 x 55 inches.
  - 3. Optional first-aid kit contents:
    - ((-) a. Bandage compresses, 2 x 2 inches, 3 x 3 inches and 5 x 5 inches.
    - ((-) b. Self-activating cold packs, 4 x 5 inches.
    - ((-) c. Roller bandages, 6 yards long.
    - ((-) d. Mouth-to-mouth barrier for CPR.
  - ((\*) 4. Kits should be checked at least weekly to ensure adequate number of needed items are available.
  - ((\*) 5. Kits may be carried in any motor vehicle that is used near the crew.

~~((You must:))~~  
 (\*) (3) The employer must make sure that first-aid supplies are:

- ((-) (a) Easily accessible to all ~~((you))~~ employees.
- ((-) (b) Stored in containers that protect them from damage, deterioration, or contamination. Containers must be clearly marked, not locked, and may be sealed.
- ((-) (c) Able to be moved to the location of an injured or acutely ill worker.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-03930 Make sure emergency washing facilities are functional and readily accessible.**

~~((You must:~~

•)) (1) The employer must provide an emergency shower:

((-) (a) When there is potential for major portions of an employee's body to contact corrosives, strong irritants, or toxic chemicals.

((-) (b) That delivers water to cascade over the user's entire body at a minimum rate of 20 gallons (75 liters) per minute for fifteen minutes or more.

((\*) (2) The employer must provide an emergency eye-wash:

((-) (a) When there is potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals.

((-) (b) That irrigates and flushes both eyes simultaneously while the user holds their eyes open.

((-) (c) With an on-off valve that activates in one second or less and remains on without user assistance until intentionally turned off.

((-) (d) That delivers at least 0.4 gallons (1.5 liters) of water per minute for fifteen minutes or more.

**Note:** Chemicals that require emergency washing facilities:

((\*) ~~You~~) 1. The employer can determine whether chemicals in (~~your~~) the workplace require emergency washing facilities by looking at the material safety data sheet (MSDS) or similar documents. The MSDS contains information about first-aid requirements and emergency flushing of skin or eyes.

((\*) 2. For chemicals developed in the workplace, the following resources provide information about first-aid requirements:

((-) a. NIOSH Pocket Guide to Chemical Hazards;

((-) b. \*DHHS (NIOSH) Publication No. 97-140;

((-\*) ~~http://www.cdc.gov/niosh/npg/ggdstart.html~~) c.

<https://www.cdc.gov/niosh/npg>;

((-) d. Threshold Limit Values for Chemical Substances and Physical Agents American Conference of Governmental Industrial Hygienists (ACGIH).

~~((You must:~~

•)) (3) The employer must make sure emergency washing facilities:

((-) (a) Are located so that it takes no more than ten seconds to reach;

((-) (b) Are kept free of obstacles blocking their use;

((-) (c) Function correctly; and

((-) (d) Provide the quality and quantity of water that is satisfactory for emergency washing purposes.

**Notes:** ((\*) 1. If water in emergency washing facilities is allowed to freeze, they will not function correctly. Precautions need to be taken to prevent this from happening.

((\*) 2. The travel distance to an emergency washing facility should be no more than fifty feet (15.25 meters).

((\*) 3. For further information on the design, installation, and maintenance of emergency washing facilities, see American National Standards Institute (ANSI) publication Z358.1 - 1998, *Emergency Eyewash and Shower Equipment*. Emergency washing facilities that are designed to meet ANSI Z358.1 - 1998 also meet the requirements of this standard. The ANSI standard can be obtained from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

**Reference:** ((\*) Training in the location and use of (~~your~~) the employer's emergency washing facilities is required under the employer chemical hazard communication rule, WAC 296-307-550, and the accident prevention program rule, WAC 296-307-030.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-03935 Inspect and activate (~~your~~) emergency washing facilities.**

~~((You must:~~

•)) (1) The employer must make sure all plumbed emergency washing facilities are inspected once a year to make sure they function correctly.

**Note:** Inspections should include:

((\*) 1. Examination of the piping.

((\*) 2. Making sure that water is available at the appropriate temperature and quality.

((\*) 3. Activation to check that the valves and other hardware work properly.

((\*) 4. Checking the water flow rate.

~~((You must:~~

•)) (2) The employer must make sure plumbed emergency eyewashes and hand-held drench hoses are activated weekly to check the proper functioning of the valves, hardware, and availability of water.

((\*) (3) The employer must make sure all self-contained eyewash equipment and personal eyewash units are inspected and maintained according to manufacturer instructions.

((-) (a) Inspections to check proper operation must be done once a year.

((-) (b) Sealed personal eyewashes must be replaced after the manufacturer's expiration date.

**Note:** Most manufacturers recommend replacing fluid in open self-contained eyewashes every six months. The period for sealed containers is typically two years.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-03940 Make sure supplemental flushing equipment provides sufficient water.**

**Note:** Supplemental flushing equipment cannot be used in place of required emergency showers or eyewashes.

~~((You must:~~

•)) (1) The employer must make sure hand-held drench hoses deliver at least 3.0 gallons (11.4 liters) of water per minute for fifteen minutes or more.

**Note:** Why use a drench hose? A drench hose is useful when:

((\*) 1. The spill is small and does not require an emergency shower.

((\*) 2. Used with a shower for local rinsing, particularly on the lower extremities.

~~((You must:~~

•)) (2) The employer must make sure personal eyewash equipment delivers only clean water or other medically approved eye flushing solutions.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-03945 Definitions.**

**Corrosive** (as used in first aid, WAC 296-307-039((~~is~~))). A substance that causes destruction of living tissue by chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

**Emergency washing facilities.** Emergency washing facilities are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

**Hand-held drench hoses.** Hand-held drench hoses are single-headed emergency washing devices connected to a flexible hose that can be used to irrigate and flush the face or other body parts.

**Personal eyewash units.** Personal eyewash units are portable, supplementary units that support plumbed units or self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

**Strong irritant** (as used in first aid, WAC 296-307-039((~~is~~))). A chemical that is not corrosive, but causes a strong, temporary inflammatory effect on living tissue by chemical action at the site of contact.

**Toxic chemical** (as used in first aid, WAC 296-307-039((~~is~~))). A chemical that produces serious injury or illness when absorbed through any body surface.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-045 ((~~What are the~~)) Requirements ((~~of the~~)) for safe place standard((~~?~~)).** (1) ((~~You~~)) The employer must furnish to each employee a place of employment free from recognized controllable hazards likely to cause serious injury or death.

(2) ((~~You~~)) The employer must furnish and require employees to use any safety devices and safeguards that are needed to control recognized hazards. All agricultural methods, operations, and processes must be designed to promote the safety and health of employees.

(3) ((~~You~~)) The employer must not require an employee to engage in any duty or enter any place that is not safe.

(4) The following are prohibited:

(a) Removing, displacing, damaging, destroying or carrying off any safety device, safeguard, notice or warning intended for use in any place of employment.

(b) Interfering in any way with the use of any safety device, method or process adopted for the protection of any employee.

(5) Intoxicating beverages or narcotics in or around worksites.

Employees under the influence of alcohol or narcotics are prohibited from the worksite.

**Exception:** This rule does not apply to anyone taking prescription drugs and/or narcotics as directed by a physician providing such use does not endanger the employee or others.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-050 ((~~What~~)) Requirements that apply to hand tools((~~?~~)).** (1) Using hoes with handles less than four feet long or any hand tool used for weeding or thinning crops in a stooped position, is prohibited.

(2) ((~~You~~)) The employer must ensure that hand tools are in good condition. Using defective hand tools is prohibited.

(3) ((~~You~~)) The employer must ensure that hand tools are stored safely when not in use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-05501 ((~~How must ladders be cared for and maintained?~~)) Ladder care and maintenance.** (1) Ladders must be checked for defects before use, and thoroughly inspected periodically. Ladders ((~~shall~~)) must be inspected immediately in the following situations:

(a) If a ladder tips over, inspect for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(b) If a ladder is exposed to excessive heat, inspect visually for damage and test for deflection and strength characteristics. If ((~~you are~~)) the employer is unsure about the ladder's condition, seek help from the manufacturer.

(2) Ladders must be maintained in good condition at all times. Joints between steps and side rails must be tight. All hardware and fittings must be securely attached, and the moveable parts must operate freely without binding or with too much play.

(3) Defective ladders must be withdrawn from service for repair or destruction and tagged as "Dangerous—Do not use."

(4) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment must not be used; improvised repairs must not be made.

(5) Ladders must be handled with care. Avoid unnecessary dropping, jarring, or misuse.

(6) Ladder storage must:

(a) Protect the ladder when not in use;

(b) Provide sufficient support to prevent excessive sagging;

(c) Provide ease of access or inspection; and

(d) Prevent danger of accidents when withdrawing a ladder for use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-05503 ((~~How must an employer instruct employees to use ladders?~~)) Instructing employees on the use of ladders.** (1) At the beginning of employment, ((~~you~~)) the employer must provide employees with orientation and training on the proper use of ladders, including how to set a ladder and properly dismount with a full load.

(2) To prevent ladder upset, ((~~you~~)) the employer must instruct employees to avoid overreaching while standing on the ladder.

(3) ~~((You))~~ The employer must instruct employees that before climbing ladders; rungs, shoes, and boots must be clean of substances that would make them hazardous.

(4) Employees must not climb up or down ladders while carrying tools or materials that interfere with the free use of both hands.

(5) Ladders must not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(6) Stepladders must not be used as single ladders.

(7) When working from a ladder over twenty-five feet from the ground or floor, the ladder must be secured at both top and bottom. When work on a ladder over twenty-five feet from the ground or floor requires the use of both hands, a safety belt must be worn and the safety lanyard secured to the ladder.

(8) Portable ladders must be placed so that the side rails have a secure footing. The top rest for portable rung and cleat ladders must be reasonably rigid and strong enough to support the applied load. The top of the ladder must be placed with the two rails supported, unless equipped with a single support attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(9) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-05505 ~~((How must))~~ Use of orchard ladders ~~((be used?))~~** (1) Orchard ladders longer than sixteen feet are prohibited.

(2) Standing on the top two steps of the orchard ladder is prohibited.

(3) Employers must instruct employees to not stand on the top two steps (the top cap and the next step down) of orchard ladders.

~~((3))~~ (4) Employers must instruct employees to not step off the ladder onto branches of trees except onto the main crotch.

~~((4) Standing on the top two steps of the orchard ladder is prohibited.)~~

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-05507 ~~((What other))~~ Ladder requirements ~~((apply to ladders?))~~** (1) Ladders made by fastening cleats across a single rail are prohibited.

(2) Wood ladders, when not in use, should be stored where they will not be exposed to the elements, but where there is good ventilation. They must be stored away from radiators, stoves, steam pipes, or other excessive heat or dampness.

(3) Wooden ladders should be kept coated with a suitable protective material. Painted ladders are acceptable if the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and if the ladders are not for resale.

(4) A ladder must have feet that are appropriate for the surface on which it will be used.

For example: A ladder used on a slippery surface must have steel points or other nonslip material on its feet.

(5) Ladders must not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(6) Ladder safety devices may be used on tower, water tank and chimney ladders over twenty feet long in place of cage protection. No landing platform is required in these cases. All ladder safety devices such as lifebelts, friction brakes, and sliding attachments must meet the design requirements of the ladders that they serve.

(7) See chapter 296-307 WAC Part K for requirements related to working near overhead lines.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-060 ~~((What))~~ Requirements that apply to job-made ladders~~((?))~~** ~~((A"))~~ **Job-made ladder~~((is))~~** ~~((A))~~ a ladder that ~~((you or your))~~ the employer or employees build.

Job-made ladders must meet the following requirements:

(1) All cleats must be made of one-by-four-inch nominal lumber, or stronger.

(2) Cleats must be inset into the edges of side rails to a depth of one-half inch, or filler blocks must be used on the rails between the cleats.

(3) Each cleat must be fastened to each rail with three 8d common wire nails or other fasteners of equal strength.

(4) Cleats must be uniformly spaced approximately 12 inches from the top of one cleat to the top of the next.

(5) Side rails must be continuous, unless splices develop the full strength of a continuous rail of equal length.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-061 ~~((What))~~ Requirements that apply to working around bins, bunkers, hoppers, tanks, pits, and trenches~~((?))~~** (1) Employees must be prohibited from entering any bin, bunker, hopper, or similar area when loose materials (such as chips, sand, grain, gravel, sawdust, etc.) may collapse, unless the employee wears a safety belt with a lifeline attached and is attended by a helper.

**Note:** Silage pits are exempt from this section.

**Reference:** For requirements relating to confined spaces, see WAC 296-307-642 through 296-307-656.

(2) When employees are required to work in a trench or a pit 4 feet deep or more, the trench or the pit must be shored or sloped according to the following table:

SOIL OR ROCK TYPE MAXIMUM ALLOWABLE	SLOPES (H:V) (1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP (2)
STABLE ROCK	VERTICAL (90°)
TYPE A	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

- 1 Numbers in parentheses next to maximum allowable slopes are angles in degrees from the horizontal. Angles have been rounded off.
- 2 Sloping or benching for excavations greater than 20 feet deep must be designed by a registered professional engineer.

(3) Each soil and rock deposit must be classified by a competent person as Stable Rock, Type A, B, or C according to the definitions in WAC 296-155-66401.

~~(b)~~**Competent person**~~(“means”)~~. Someone who is able to identify working conditions that are hazardous to employees, and has authority to take prompt action to eliminate the hazards.

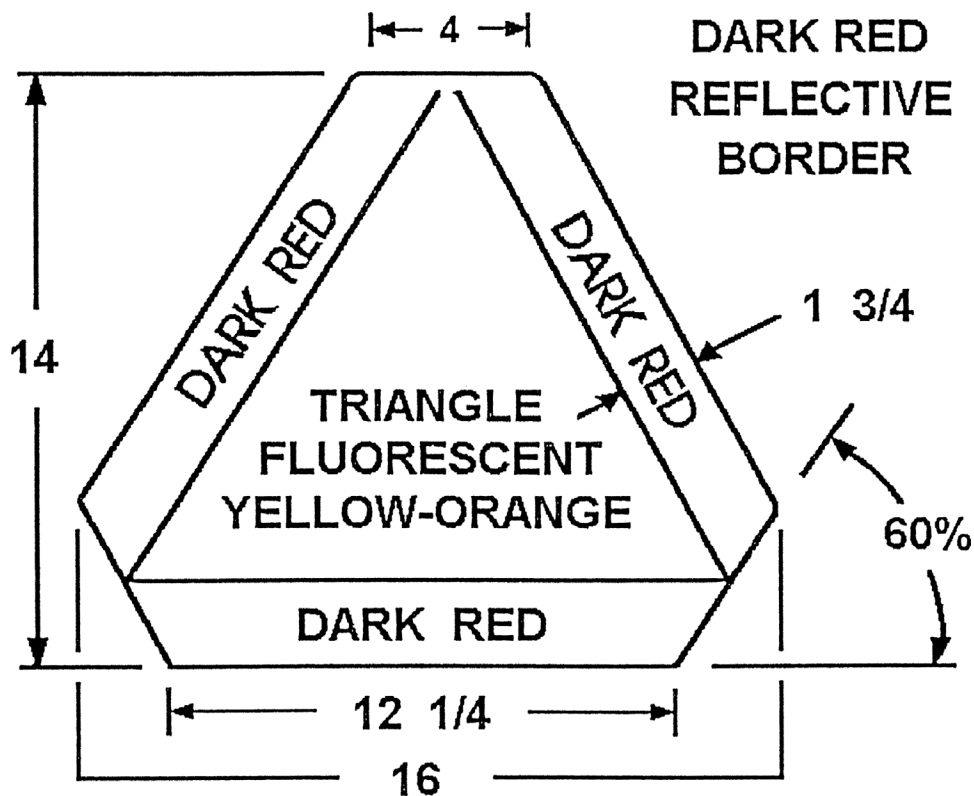
(4) Classification of the deposits must be based on the results of at least one visual and at least one manual analysis. The analyses must be conducted by a competent person using tests in recognized methods of soil classification and testing such as those adopted by the American Society for Testing

Materials, or the U.S. Department of Agriculture textural classification system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-065** ~~(“How must”)~~ **Identification of slow-moving vehicles** ~~(“be marked?”)~~. (1) ~~(You)~~ The employer must ensure that all farm tractors and other slow-moving farm vehicles and equipment used on public roads have lamps, reflectors, and a slow-moving vehicle emblem. From one-half hour after sunset to one-half hour before sunrise, slow-moving vehicles must have lights and reflectors.

(2) The slow-moving vehicle emblem is a fluorescent yellow-orange triangle with a dark red reflective border. (See figure.) The emblem must be used on public roads only by vehicles designed to move slowly (25 M.P.H. or less).



AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07001** ~~(“How must”)~~ **Motor vehicle** ~~(“be maintained?”)~~ **maintenance.** (1) ~~(You)~~ The employer must maintain all motor vehicles and their parts in good repair and safe condition.

(2) ~~(You)~~ The employer must not use tires that are worn beyond the point of safety.

(3) Employees must report to ~~(you)~~ the employer any motor vehicle or other farm equipment that is in unsafe operating condition. ~~(You)~~ The employer must ensure that the vehicle or equipment is removed from service and repaired before use.

(4) Before an employee performs service or repair work under hydraulic or mechanical raised dump truck beds, blades, discs, or other equipment, the raised portion of the equipment must be manually pinned or blocked to prevent falling.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07003** ~~(“How must”)~~ **Motor vehicle** ~~(“be operated?”)~~ **operation.** (1) Vehicles must be driven at safe operating speed.

(2) Truck drivers must operate equipment at a safe speed for roadway conditions.

(3) When an employee backing a truck has obstructed vision, the employee must be assisted by a signaler. The signaler must have a clear view of the rear of the truck and the operator of the truck.

(4) Truck drivers must sound their horn before starting to back, and intermittently while backing.

(5) Shut off motors before refueling. Take care to prevent fuel from spilling on hot parts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07005 (~~(Who may)~~) Qualifications to operate motor vehicle((s?))**. Only qualified drivers may operate motor vehicles and must have a current motor vehicle operator's license.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07007 (~~(What)~~) Requirements that apply to motor vehicle brakes((?))**. (1) (~~(You)~~) The employer must ensure that motor vehicles have brakes that will safely hold the maximum load on maximum grades.

(2) Trucks parked on an incline must have the steered wheels turned into the curb and must have at least one "driver" wheel chocked on each side, independent of the braking system.

**Exception:** If the truck has a functioning secondary braking system, the turned wheels and chock are not required.

(3) (~~(You)~~) The employer must ensure that trailers have working air brakes, or another approved type. Air must be cut into the trailer brake system at the time that the trailer is coupled to the truck.

(4) The driver must test truck and trailer brakes before driving down a steep grade.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07009 (~~(How must motor vehicles be loaded and unloaded?)~~) Loading and unloading motor vehicles**. (1) (~~(You)~~) The employer must ensure that employees load and unload motor vehicles safely.

(2) All loads transported on trucks or truck and trailer combinations must be properly secured and distributed. Loads must not exceed the safe operating load for the roadway condition and the capacity of the bridges, trestles, and other structures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-07011 (~~(What)~~) Required safety equipment ((must)) for motor vehicles ((have?))**. All motor vehicles must have standard lights, horn, flags, flares, and other safety equipment that conforms to the state of Washington motor vehicles laws.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-07013 (~~(What)~~) Rules that apply to vehicles used to transport employees((?))**. (~~(You)~~) The employer must ensure that motor vehicles used regularly to transport employees meet the following requirements:

(1) The vehicles are well equipped, covered against the weather, and maintained in good mechanical condition at all times.

(2) A sufficient number of properly secured seats are provided in each vehicle to accommodate the number of employees transported. When emergency conditions make it necessary to transport more employees than the seating capacity can accommodate, all employees must ride within the vehicle. No employee may ride on fenders or running boards of the vehicle.

(3) No employees may ride in or on any vehicle with their legs hanging over the end or sides. All trucks without tail gates should have safety bars.

(4) The vehicles have storage strong enough to retain sharp tools that could present a hazard to employees being transported.

(5) All dump-trucks used to transport employees have an adequate safety chain or locking device to ensure that the body of the truck is not raised while employees are riding in it.

(6) Explosives or highly inflammable materials are not carried in or on the vehicle while it is used to transport employees.

(7) Exhaust systems are installed and maintained in proper condition, and are designed to eliminate the employee exposure to exhaust gases and fumes.

(8) Within the cab, crew trucks must carry only the number of passengers for which they are designed. In any seating arrangement, the driver must be able to maintain full freedom of motion. The driver's normal vision must be free from obstruction by passengers or the seating arrangement.

(9) All enclosed crew trucks have an emergency exit in addition to the regular entrance.

(10) Trucks used for hauling gravel may be used as crew trucks if they meet the following requirements:

(a) Steps in proper places;

(b) Wooden floors;

(c) Securely fastened seats;

(d) Truck is properly covered; and

(e) Compliance with all other general regulations covering crew trucks.

(11) Half-ton vehicles must haul no more than six persons including driver. Three-quarter-ton vehicles must haul no more than eight persons including driver.

(12) The vehicle is equipped with the first-aid supplies required by WAC 296-307-03920, two blankets, and a fire extinguisher.

**Note:** Additional requirements relating to first aid are located in WAC 296-307-039.

(13) Heating units with open fires are not used in vehicles transporting crews.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-073 ((What)) Requirements that apply to changing and charging, and storage of batteries((?)).** (1) Battery changing installations must be located in areas designated for that purpose.

(2) Facilities must be provided for:

((\*) (a) Flushing and neutralizing spilled electrolyte;

((\*) (b) Fire protection;

((\*) (c) Protecting charging apparatus from damage by trucks; and

((\*) (d) Adequate ventilation of fumes from gassing batteries.

(3) Racks used to support batteries should be made of or covered with materials that will not create sparks.

(4) A conveyor, overhead hoist, or equivalent material handling equipment must be provided for handling batteries.

(5) Reinstalled batteries must be properly positioned and secured in the vehicle.

(6) A carboy tilter or siphon must be provided for handling electrolyte.

(7) When mixing water and acid for charging batteries, pour acid into water; do not pour water into acid.

(8) Vehicles must be properly positioned and the brake applied before attempting to change or charge batteries.

(9) When charging batteries, the vent caps should be kept in place to avoid electrolyte spray. ((You)) The employer must ensure that vent caps function. The battery (or compartment) cover(s) must be open for cooling.

(10) Precautions ((shall)) must be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(11) Tools and other metallic objects must be kept away from the tops of uncovered batteries.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-076 ((How must)) Guarding farm field equipment ((be guarded?)). ((=)) Farm field equipment((= means)).** Tractors or implements, including self-propelled implements, used in agricultural operations.

(1) All power transmission components must be guarded according to WAC 296-307-280.

(2) The manufacturer's instruction manual, if published by the manufacturer and currently available, must be the source of information for the safe operation and maintenance of field equipment.

(3) ((You)) The employer must ensure that all power takeoff shafts, including rear, mid-mounted or side-mounted shafts, are guarded by a master shield, as follows:

(a) The rear power takeoff has a master shield. The master shield is strong enough to prevent permanent deformation of the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(b) Power takeoff driven equipment is guarded to prevent employee contact with rotating members of the power drive system. When the tractor master shield must be removed to use specific power takeoff driven equipment, the equipment must provide protection from the part of the tractor power takeoff shaft that protrudes from the tractor.

(c) Signs are placed at prominent locations on the tractor and on power takeoff driven equipment requiring that safety shields are kept in place.

(4) The following functional components must be shielded to a degree consistent with the intended function and operator's vision of the component((-

)):

(a) Snapping or husking rolls;

((\*) (b) Straw spreaders and choppers;

((\*) (c) Cutterbars;

((\*) (d) Flail rotors;

((\*) (e) Rotary beaters;

((\*) (f) Mixing augers;

((\*) (g) Feed rolls;

((\*) (h) Conveying augers;

((\*) (i) Rotary tillers; and

((\*) (j) Similar units that must be exposed for proper function.

(5) Where removing a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, ((you)) the employer must provide, in the immediate area:

(a) A safety sign warning the employee to look and listen for evidence of rotation and to wait until all components have stopped before removing the guard or access door.

(b) A readily visible or audible warning of rotation on equipment manufactured after October 25, 1976.

(6) If the mounting steps or ladder and the handholds of the propelling vehicle are made inaccessible by installation of other equipment, other steps and handholds must be provided on the equipment.

(7) ((You)) The employer must ensure that the operator's steps and platform have a slip-resistant covering to minimize the possibility of slipping.

(8) Powered machines not driven by an individual motor must have a clutch or other effective means of stopping.

(9) All friction clutches must have sufficient clearance and be kept adjusted to prevent drag or creeping when disengaged.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-08003 ((Which)) Agricultural tractors ((are)) covered by this section((?)).** All agricultural tractors manufactured after October 25, 1976, must meet the requirements of WAC 296-307-080. An agricultural tractor manufactured on or before October 25, 1976, must meet the requirements of WAC 296-307-080 if:

(1) The tractor was built or sold with rollover protective structures (ROPS) as an optional accessory; or

(2) According to the manufacturer, the tractor was designed to accommodate the addition of ROPS.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-08006 ((What)) Definitions that apply to rollover protective structures (ROPS) for agricultural tractors((?)). ((=)) Agricultural tractor((= means)).** A two-wheel-drive or four-wheel-drive vehicle, or a track vehicle of

more than twenty net engine horsepower, designed to furnish the power to pull, carry, propel, or drive implements that are designed for agriculture. All human-powered implements are excluded.

~~((1))~~ **Low profile tractor**~~((1 means))~~. A wheel or track-equipped vehicle with the following characteristics:

~~((2))~~ **(a)** The front wheel spacing is equal to the rear wheel spacing, as measured between the centerlines of the wheels;

~~((3))~~ **(b)** The clearance from the bottom of the tractor chassis to the ground is eighteen inches or less;

~~((4))~~ **(c)** The highest point of the hood is sixty inches or less~~((5))~~; and

~~((6))~~ **(d)** The tractor is designed so that the operator straddles the transmission when seated.

AMENDATORY SECTION (Amending WSR 02-12-098, filed 6/5/02, effective 8/1/02)

**WAC 296-307-08009** ~~((What))~~ **Requirements that apply to the testing and performance of ROPS used on agricultural tractors**~~((2))~~. ~~((You))~~ The employer must provide a rollover protective structure (ROPS) for each employee-operated tractor that is covered by WAC 296-307-080. ROPS used on wheel-type tractors must meet the test and performance requirements of OSHA 1928.51 C.F.R. Protective frames for wheel type agricultural tractors, and ROPS used on track-type tractors must meet the test and performance requirements of SAE Standard J334a (July 1970) and the portions of SAE Standard J167 (1971) pertaining to overhead protection requirements.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-08012** ~~((What))~~ **Requirements that apply to seatbelts used with ROPS on agricultural tractors**~~((2))~~. (1) Where ROPS are required by WAC 296-307-080, ~~((you))~~ the employer must:

(a) Provide each tractor with a seatbelt;

(b) Require that each employee use the seatbelt while the tractor is moving; and

(c) Require that each employee tighten the seatbelt sufficiently to confine the employee to the ROPS protected area.

(2) Each seatbelt and seatbelt anchorage must meet the requirements of ANSI/SAE J800 April 1986, Motor Vehicle Seat Belt Assemblies.

(a) Where a suspended seat is used, the seatbelt must be fastened to the movable portion of the seat.

(b) The seatbelt webbing material must be at least as resistant to acids, alkalis, mildew, aging, moisture and sunlight as untreated polyester fiber.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-08015** ~~((When are))~~ **ROPS** ~~((not required on))~~ **requirements that apply to agricultural tractors**~~((2))~~. ROPS are not required on agricultural tractors that are used as follows:

(1) Low profile tractors used in orchards, vineyards or hop yards where the vertical clearance requirements would substantially interfere with normal operations, and for work related to these uses.

(2) Low profile tractors while used inside a farm building or greenhouse in which the vertical clearance is insufficient to allow a ROPS equipped tractor to operate.

(3) Tractors while used with mounted equipment that is incompatible with ROPS (for example, cornpickers, cotton strippers, vegetable pickers, and fruit harvesters).

(4) Track-type agricultural tractors whose overall width (measured between the outside edges of the tracks) is at least three times the height of the rated center of gravity, and whose rated maximum speed in forward or reverse is not greater than seven miles per hour, when used only for tillage or harvesting operations, and which:

(a) Does not involve operating on slopes in excess of forty percent from horizontal; and

(b) Does not involve operating on piled crop products or residue (for example: Silage in stacks or pits); and

(c) Does not involve operating in close proximity to irrigation ditches, streams or other excavations more than two feet deep that contain slopes of more than forty percent from horizontal; and

(d) Does not involve construction-type operation, such as bulldozing, grading, or land clearing.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-08018** ~~((What))~~ **Required employee training** ~~((requirements))~~ **that apply to ROPS used on agricultural tractors**~~((2))~~. (1) ~~((You))~~ The employer must ensure that every employee who operates an agricultural tractor is informed of the operating practices listed below and of any other practices dictated by the work environment. ~~((You))~~ The employer must provide the information at the time of initial assignment and at least annually thereafter.

#### EXHIBIT A

#### EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten ~~((you))~~ the seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments and holes.
3. Reduce speed when turning, crossing slopes and on rough, slick or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where ~~((you are))~~ going, especially at row ends, on roads and around trees.
6. Passengers, other than persons required for instruction or machine operation, ~~((shall))~~ must not be permitted to ride on equipment unless a passenger seat or other protective device is provided.
7. Operate the tractor smoothly—no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.



9. When tractor is stopped, set brakes securely and use park lock if available.

(2) ~~((You))~~ The employer must ensure that every employee who operates an agriculture tractor is trained specifically in the operation of the tractor to be used. The training must include an orientation of the operator to the topographical features of the land where the tractor will be operated. Training must emphasize safe operating practices to avoid rollover.

(3) The tractor training program must be described in the written accident prevention program required by WAC 296-307-030.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-08021 (~~What other~~) Requirements that apply to ROPS used on agricultural tractors((?)).** (1) ~~((You))~~ The employer must ensure that batteries, fuel tanks, oil reservoirs, and coolant systems are constructed and located or sealed to ensure that no spillage comes in contact with the operator in the event of an upset.

(2) All sharp edges and corners at the operator's station must be designed to minimize operator injury in the event of an upset.

(3) When ROPS are removed, they must be remounted to meet the requirements of WAC 296-307-080.

(4) ~~((You))~~ The employer must ensure that each ROPS has a label, permanently affixed to the structure, that states:

- (a) Manufacturer's or fabricator's name and address;
- (b) ROPS model number, if any;
- (c) Tractor makes, models, or series numbers that the structure is designed to fit; and
- (d) That the ROPS model was tested in accordance with the requirements of this section.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-085 (~~When must~~) Requirements for ROPS to be provided for material handling equipment((?)).** (1) This section applies to the following types of material handling equipment: Rubber-tired, self-propelled scrapers; rubber-tired front-end loaders; rubber-tired dozers; wheel-type agricultural and industrial tractors; crawler tractors; crawler-type loaders; and motor graders, with or without attachments, that are used in agricultural work. This section does not apply to side-boom pipelaying tractors.

(2) ~~((You))~~ The employer must ensure that material handling equipment manufactured on or after October 25, 1976, is equipped with ROPS that meet the minimum performance standards of WAC 296-307-08009.

(3) ROPS and supporting attachments must meet the minimum performance standards of OSHA 1928.52 C.F.R., Protective Frames for Wheel Type Agricultural Tractors-Test Procedures and Performance Requirements, or must be designed, fabricated, and installed in a manner that will support, based on the ultimate strength of the metal, at least two times the weight of the prime mover applied at the point of impact.

(a) The ROPS must be designed to minimize the likelihood of a complete overturn and to minimize the possibility of the operator being crushed in a rollover.

(b) The design must provide a vertical clearance of at least fifty-two inches from the work deck to the ROPS at the entrance.

(4) When ROPS are removed, they must be remounted so as to meet the requirements of this section.

(5) Each ROPS must have a label, permanently affixed to the structure, that states:

- (a) Manufacturer's or fabricator's name and address;
- (b) ROPS model number, if any;
- (c) Tractor makes, models, or series numbers that the structure is designed to fit; and
- (d) That the ROPS model was tested in accordance with the requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-090 (~~What~~) Requirements that apply to overhead protection for operators of agricultural and industrial tractors((?)).** This section applies to wheel-type agricultural tractors used in construction work and to wheel-type industrial tractors used in agriculture work.

(1) If grid or mesh is used for overhead protection, the largest permissible opening is 1.5 in. (38 mm.) in diameter. The overhead protection must not be installed in such a way as to become a hazard in the case of upset.

(2) All equipment used in site clearing operations must have rollover guards meeting the requirements of this chapter. ~~((You))~~ The employer must ensure that rider-operated equipment is equipped with an overhead and rear canopy guard meeting the following requirements:

(a) The overhead covering is at least eighth-inch steel plate or quarter-inch woven wire mesh with openings no greater than one inch, or equivalent.

(b) The opening in the rear of the canopy structure is covered with not less than quarter-inch woven wire mesh with openings no greater than one inch.

(3) Overhead protection that meets the provisions of SAE Standard J334 (July 1970) for rubber-tired dozers and rubber-tired loaders also meets the requirements of this standard.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-09503 (~~What does this section cover?~~) Scope.** WAC 296-307-095 applies to any agricultural employer with one or more employees engaged in any hand-labor operations in the field.

**Exception:** WAC 296-307-09515 (handwashing facilities) and 296-307-09518 (toilet facilities) do not apply if ~~((you))~~ employees:

- (1) Are engaged in field activities for the production of grains, livestock, or livestock feed; or
- (2) Use vehicles, machinery, or animals as part of their field activities and, when needed, can transport themselves to and from toilet and handwashing facilities.

AMENDATORY SECTION (Amending WSR 12-24-071, filed 12/4/12, effective 1/4/13)

**WAC 296-307-09506** (~~(What)~~) **Definitions that apply to this section**(~~(?)~~). (~~(")~~) **Accessible**(~~(" means)~~). A maximum of one-quarter mile or five minutes travel time from the worksite.

(~~(")~~) **Hand-labor operations**(~~(" means)~~). Agricultural operations performed by hand or with hand tools.

For example: The hand cultivation, weeding, planting or harvesting of vegetables, nuts, fruit, seedlings or other crops, including mushrooms, and hand packing into containers.

**Exception:** Hand-labor does not include logging operations, the care or feeding of livestock, or hand-labor operations in permanent structures (e.g., canning facilities or packing houses).

(~~(")~~) **Handwashing facility**(~~(" means)~~). A facility that meets the requirements of WAC 296-307-09515 and is approved by the local health authority.

(~~(")~~) **Potable water**(~~(" means)~~). Water that is suitable for drinking by the public and meets the requirements of chapter 246-290 or 246-291 WAC.

(~~(")~~) **Toilet**(~~(" means)~~). A fixed or portable facility designed for the purpose of adequate collection and containment of both defecation and urination. "Toilet" includes biological, chemical, flush, and combustion toilets, or sanitary outhouses.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-09509** (~~(What orientation must employers provide for)~~) **Required field sanitation**(~~(?)~~) **training**. (~~(You)~~) **The employer** must provide each employee with verbal orientation on field sanitation facilities. The orientation must be understandable to each employee and must include:

(1) The location of potable water supplies and the importance of drinking water frequently, especially on hot days;

(2) Identification of all nonpotable water at the worksite and prohibition of the use of nonpotable water for sanitation purposes with an explanation of the hazards associated with using nonpotable water;

(3) The location of handwashing facilities and the importance of handwashing:

(a) Before and after using the toilet; and

(b) Before eating and smoking; and

(4) The location of toilet facilities; an explanation that facilities are for employee convenience and health considerations; the necessity to keep them sanitary; and that using the fields, orchards, or forests is not an option.

AMENDATORY SECTION (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

**WAC 296-307-09512** (~~(What)~~) **The employer must provide potable water sources** (~~(must an employer provide?)~~). (~~(You)~~) **The employer** must provide potable water for employees engaged in hand-labor operations in the field, without cost to the employee. Potable water must meet the following requirements:

(1) Potable water is in locations that are accessible to all employees.

(2) Potable water containers are refilled daily or more often as necessary.

(3) Potable water dispensers are designed, constructed, and serviced so that sanitary conditions are maintained. They are closeable and equipped with a tap.

(4) Open containers such as barrels, pails, or tanks for drinking water from which water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(5) Any container used to distribute drinking water is clearly marked in English and with the appropriate international symbol describing its contents.

(6) Any container used to distribute drinking water is only used for that purpose.

(7) Potable water is suitably cool and provided in sufficient amounts, taking into account the air temperature, humidity, and the nature of the work performed, to meet employees' needs.

**Note:** Suitably cool water should be sixty degrees Fahrenheit or less. During hot weather, employees may require up to three gallons of water per day. Additional requirements may be found in the outdoor heat exposure standard in Part G-1, WAC 296-307-09740 Drinking water, which applies between May 1st and September 30th of each year.

(8) The use of common drinking cups or dippers is prohibited. Water is dispensed in single-use drinking cups, personal containers, or by water fountains.

(~~(")~~) **Single-use drinking cups**(~~(" means)~~). Containers of any type or size, disposable or not, and including personal containers if the choice to use a personal container is made by the employee, not the employer.

(9) Employees must be prohibited from drinking from irrigation ditches, creeks or rivers. Potable water must meet the quality standards for drinking purposes of the state or local authority, or must meet quality standards of the United States Environmental Protection Agency's National Interim—Primary Drinking Water Regulations, published in 40 C.F.R. Part 141 and 40 C.F.R. 147.2400.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-09515** (~~(What)~~) **Handwashing facilities** (~~(must an employer provide?)~~). (~~(You)~~) **The employer** must provide handwashing facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Handwashing facilities must meet the following requirements:

(1) One handwashing facility with a tap and an adequate supply of water, soap, single-use hand towels, and either a basin or other suitable container for washing is provided for each twenty employees or fraction of twenty.

**Note:** Nonpotable water must not be used for washing any part of a person, except as permitted by the local health authority.

(2) Each facility has running water.

(3) Each facility has a dispenser containing handsoap or a similar cleansing agent.

(4) Each facility has individual single-use hand towels.

(5) Facilities are maintained in a clean and sanitary condition according to appropriate public health sanitation practices.

(6) Waste receptacles are provided. Disposal of wastes from the facilities does not create a hazard nor cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Handwashing facilities are near toilet facilities and within one-quarter mile of each employee's worksite in the field.

**Exception:** Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-09518 ((What)) Toilet facilities ((must an employer provide?)).** ((You)) The employer must provide toilet facilities for employees engaged in hand-labor operations in the field, without cost to the employee. Toilet facilities must meet the following requirements:

(1) One toilet facility is provided for each twenty employees or fraction of twenty.

(2) ((You)) The employer must ensure, at the beginning of each day, that the toilets are inspected. If any toilet facility fails to meet the requirements of this section, immediate corrective action is taken. Inspections are documented and the record maintained at the worksite for at least seventy-two hours.

(3) Toilet facilities are adequately ventilated; appropriately screened, and have self-closing doors that can be closed and latched from the inside. Toilet facilities are constructed to ensure privacy.

(4) Facilities are maintained in a clean, sanitary, and functional condition and according to appropriate public health sanitation practices.

(5) Toilets are supplied with toilet paper.

(6) Disposal of wastes from the facilities does not create a hazard or cause an unsanitary condition.

(7) Employees are allowed reasonable time during the work period to use the facilities.

(8) Facilities are near handwashing facilities and within one-quarter mile of each employee's worksite in the field.

**Exception:** Where it is not feasible to locate facilities as required above, the facilities must be located at the point of closest vehicular access.

**AMENDATORY SECTION** (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

**WAC 296-307-09710 Scope and purpose.** (1) WAC 296-307-097 through 296-307-09760 applies to all employers with employees performing work in an outdoor environment.

(2) The requirements of WAC 296-307-097 through 296-307-09760 apply to outdoor work environments from May 1 through September 30, annually, only when employ-

ees are exposed to outdoor heat at or above an applicable temperature listed in Table 1.

**Table 1**

To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

Outdoor Temperature Action Levels

All other clothing	89°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°

**Note:** There is no requirement to maintain temperature records. The temperatures in Table 1 were developed based on Washington state data and are not applicable to other states.

(3) WAC 296-307-097 through 296-307-09760 does not apply to incidental exposure which exists when an employee is not required to perform a work activity outdoors for more than fifteen minutes in any sixty-minute period. This exception may be applied every hour during the work shift.

(4) WAC 296-307-097 through 296-307-09760 supplement all industry-specific standards with related requirements. Where the requirements under these sections provide more specific or greater protection than the industry-specific standards, the employer ((shall)) must comply with the requirements under these sections. Additional related requirements are found in chapter 296-305 WAC, Safety standards for firefighters and chapter 296-307 WAC, Safety standards for agriculture.

**AMENDATORY SECTION** (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

**WAC 296-307-09720 Definitions.** ((+)) **Acclimatization ((means)).** The body's temporary adaptation to work in heat that occurs as a person is exposed to it over time.

((2)) **Double-layer woven clothing ((means)).** Clothing worn in two layers allowing air to reach the skin. For example, coveralls worn on top of regular work clothes.

((3)) **Drinking water ((means)).** Potable water that is suitable to drink. Drinking water packaged as a consumer product and electrolyte-replenishing beverages (i.e., sports drinks) that do not contain caffeine are acceptable.

((4)) **Engineering controls ((means)).** The use of devices to reduce exposure and aid cooling (i.e., air conditioning).

((5)) **Environmental factors for heat-related illness ((means)).** Working conditions that increase susceptibility for heat-related illness such as air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload (i.e., heavy, medium, or low) and duration, and personal protective equipment worn by employees. Measurement of environmental factors is not required by WAC 296-307-097.

((6)) **Heat-related illness ((means)).** A medical condition resulting from the body's inability to cope with a partic-

ular heat load, and includes, but is not limited to, heat cramps, heat rash, heat exhaustion, fainting, and heat stroke.

~~((7))~~ **Outdoor environment** ~~((means))~~. An environment where work activities are conducted outside. Work environments such as inside vehicle cabs, sheds, and tents or other structures may be considered an outdoor environment if the environmental factors affecting temperature are not managed by engineering controls. Construction activity is considered to be work in an indoor environment when performed inside a structure after the outside walls and roof are erected.

~~((8))~~ **Vapor barrier clothing** ~~((means))~~. Clothing that significantly inhibits or completely prevents sweat produced by the body from evaporating into the outside air. Such clothing includes encapsulating suits, various forms of chemical resistant suits used for PPE, and other forms of nonbreathing clothing.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-10005** ~~((Who must provide))~~ **Personal protective equipment** ~~((?))~~. (1) ~~((You))~~ The employer must ensure that employees are protected from injury or impairment of any bodily function that might occur through absorption, inhalation or physical contact of any substance, vapor, radiation, or physical hazard. Wherever appropriate, ~~((you))~~ the employer must ensure that employees use protective clothing; respiratory devices; shields; barriers; and adequate protective equipment for eyes, face, head, and extremities.

(2) ~~((You))~~ The employer must provide personal protective equipment at no cost to employees, including replacement due to normal wear and tear. The equipment must be maintained in sanitary and reliable condition.

**Exception:** ~~((You))~~ The employer may require employees to provide their own normal work clothing, including long-sleeved shirts, long-legged pants, and socks.

(3) If employees provide their own protective equipment, then ~~((you))~~ the employer must ensure that the equipment is adequate, properly maintained, and sanitary.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-10010** ~~((What))~~ **Requirements that apply to eye protection** ~~((?))~~. ~~((You))~~ The employer must require eye protection wherever employees are exposed to flying objects, welding or cutting glare, injurious liquids, or injurious radiation. Eye protectors must meet the criteria of the American National Standard for Occupational and Educational Eye and Face Protection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-10015** ~~((How must))~~ **Requirements for personal protective equipment** ~~((be used?))~~. (1) ~~((You))~~ The employer must ensure that employees use personal protective equipment according to the manufacturer's instructions.

(2) ~~((You))~~ The employer must ensure that, before each use, employees inspect all personal protective equipment for leaks, holes, tears, or worn places, and any damaged equipment is repaired or discarded.

(3) The employee must use personal protective equipment according to instructions and training received.

(4) The employee shall notify ~~((you))~~ the employer of any defects in personal protective equipment or when the equipment becomes contaminated.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-10020** ~~((What must an employer do to prevent))~~ **Preventing heat-related** ~~((illness?))~~ **illnesses**. ~~((You))~~ The employer must take appropriate measures to prevent heat-related illness that may be caused by employees wearing any required personal protective equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-10025** ~~((What instruction on))~~ **Training for personal protective equipment** ~~((must an employer give to employees?))~~. ~~((You))~~ The employer must instruct each employee in the proper use of personal protective equipment. The instruction must include any special limitations or precautions indicated by the manufacturer.

AMENDATORY SECTION (Amending WSR 04-13-129, filed 6/22/04, effective 8/1/04)

**WAC 296-307-14505** ~~((What records must an employer keep))~~ **Recordkeeping for pesticide applications** ~~((?))~~. (1) If ~~((you apply))~~ the employer applies pesticides, or ~~((have))~~ has pesticides applied ~~((for you))~~, related to the production of an agricultural crop, ~~((you))~~ the employer must keep records for each application. The records must include the following:

(a) The address or exact location where the pesticide was applied or stored;

**Note:** If ~~((you apply))~~ the employer applies pesticides to one acre or more, the location must be shown on the map on the required form for at least the first application.

(b) The year, month, day, and time the pesticide was applied or stored;

(c) The product name on the registered label and the United States Environmental Protection Agency registration number, if applicable, of the pesticide that was applied or stored;

(d) The crop or site to which the pesticide was applied (application crop or site);

(e) The amount of pesticide applied per acre, or other appropriate measure;

(f) The concentration of pesticide applied;

(g) The total area to which pesticide was applied;

(h) If applicable, the licensed applicator's name, address, and telephone number and the name of the individual(s) making the application;

(i) The direction and estimated velocity of the wind at the time the pesticide was applied;

**Exception:** Wind information does not have to be recorded for applications of baits in bait stations and pesticide applications within structures.

(j) Any other reasonable information required by the department.

(2) A commercial pesticide applicator must provide a copy of the pesticide application records to the owner or lessee of the lands to which the pesticide is applied. Pesticide application records may be provided on any form that includes all required information.

(3) ~~((You))~~ The employer must update records on the same day that a pesticide is applied. ~~((You))~~ The employer may use a copy as the record of the pesticide application. ~~((You))~~ The employer must maintain the records for at least seven years after the date of the application.

(4) ~~((You))~~ The employer must ensure that pesticide application records are readily accessible to employees and their designated representatives in a central location in the workplace. The records must be available beginning on the day the application is made and for at least thirty days after. ~~((You))~~ The employee may view the pesticide application records and make ~~((your))~~ their own record from that information.

(5) New or newly assigned employees must be made aware of the accessibility of the application records before working with pesticides or in an area containing pesticides.

(6) When storing pesticides, ~~((you))~~ the employer must, at least once a year, perform an inventory of the pesticides stored in any work area.

(7) The pesticide inventory records must include the following information:

(a) The location where the pesticide is stored;

(b) The year, month, day, and time the pesticide was first stored;

(c) The product name used on the registered label and the United States Environmental Protection Agency registration number, if applicable, of the pesticide that is stored; and

(d) The amount of pesticide in storage at the time of the inventory.

(8) ~~((You))~~ The employer must maintain a record of pesticide purchases made between the annual inventory dates.

(a) Instead of this purchase record, ~~((you))~~ the employer may obtain from distributors from whom ~~((you buy))~~ pesticides are purchased, a statement obligating the distributor to maintain the purchase records on ~~((your))~~ the employer's behalf to meet the requirements of this section.

(b) ~~((We))~~ The department may require ~~((you))~~ the employer to submit all purchase records covering the purchases during a specified period of time or in a specified geographical area.

(9) When ~~((you))~~ the employer ends all pesticide activities, ~~((you))~~ the employer must file the records with ~~((us))~~ the department. Anyone who succeeds or replaces ~~((you))~~ the employer must retain the records required by this section, but that person is not liable for any violations ~~((you))~~ the employer commits.

(10) ~~((You))~~ The employer must ensure that the records required under this section are readily accessible to ~~((us))~~ the

department of labor and industries for inspection. ~~((You))~~ The employer must also provide copies of the records on request, to:

(a) An employee or the employee's designated representative in the case of an industrial insurance claim filed under Title 51 RCW with the department of labor and industries;

(b) Treating health care personnel; or

(c) The pesticide incident reporting and tracking review panel.

(11) The designated representative or treating health care personnel are not required to identify the employee represented or treated.

(12) ~~((We))~~ The department of labor and industries will keep the name of any affected employee confidential according to RCW 49.17.080(1).

(13) When treating health care personnel request records under this section, and the record is required to determine treatment, ~~((you))~~ the employer must provide copies of the record immediately. Information for treating health care personnel must be made immediately available by telephone, if requested, with a copy of the records provided within twenty-four hours. For all other requests, ~~((you))~~ the employer must provide copies of the records within seventy-two hours.

(14) If requested, ~~((you))~~ the employer must provide copies of records on a form provided by the department.

(15) If ~~((you))~~ the employer suspects that an employee is ill or injured because of an exposure to one or more pesticides, ~~((you))~~ the employer must immediately provide the employee with a copy of the relevant pesticide application records.

(16) If ~~((you))~~ the employer refuses to provide a copy of a requested record, the ~~((requester))~~ requestor may notify the department of the request and ~~((your))~~ the employer's refusal.

(a) Within seven working days, ~~((we))~~ the department of labor and industries will request that ~~((you))~~ the employer provide ~~((us))~~ the department with all pertinent copies of the records, except that in a medical emergency ~~((we))~~ the department will request within two working days.

(b) ~~((You))~~ The employer must provide copies of the records to ~~((us))~~ the department within twenty-four hours after we request.

(17) ~~((We))~~ The department of labor and industries will inspect for the records required under this section as part of any on-site inspection of a workplace conducted under this chapter or chapter 49.17 RCW. ~~((We))~~ The department will determine, during the inspection, whether the records are readily transferable to a form adopted by the department, and readily accessible to employees. However, ~~((your))~~ the employer's records will not be inspected more than once in any calendar year, unless a previous inspection has found recordkeeping violations. If recordkeeping violations are found, ~~((we))~~ the department may conduct reasonable multiple inspections, according to department rules. Nothing in this section limits ~~((our))~~ the department's inspection of records pertaining to pesticide-related injuries, illnesses, fatalities, accidents, or complaints.

(18) If ~~((you))~~ the employer fails to maintain the records, or provide access to or copies of the records required under this section, ~~((you))~~ the employer will be subject to penalties authorized under RCW 49.17.180.

(19) The department of labor and industries and the department of agriculture will jointly adopt by rule, forms that satisfy the information requirements of this section and RCW 17.21.100. Pesticide application record forms can be found in chapter 16-228 WAC, General pesticide rules.

AMENDATORY SECTION (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

**WAC 296-307-148 Scope and summary.**

~~((You))~~ **Employer responsibility:**

To implement a monitoring program for ~~((you))~~ employees who, as part of their job duties, **handle** category I or II organophosphate or N-methyl-carbamate pesticides with the words "DANGER" or "WARNING" on the label.

**Definition:**

~~((The terms))~~ **Handle and handler ~~((refer to))~~. Employees who are engaged in the job duties listed in the definition of "handler" contained in WAC 296-307-11005, Pesticides (worker protection standard).**

**IMPORTANT:**

Whenever there is reason to believe that an employee has been poisoned or injured by exposure to pesticides while on the job, ~~((you need))~~ the employer needs to provide the medical services required by WAC 296-307-13055.

~~((You must:~~

~~Maintain handling records for covered pesticides  
WAC 296-307-14805.~~

~~Implement a medical monitoring program  
WAC 296-307-14810.~~

~~Identify a physician or licensed health care professional  
WAC 296-307-14815.~~

~~Make cholinesterase testing available  
WAC 296-307-14820.~~

~~Respond to depressed cholinesterase levels  
WAC 296-307-14825.~~

~~Provide medical removal protection benefits  
WAC 296-307-14830.~~

~~Maintain records  
WAC 296-307-14835.~~

~~Provide training  
WAC 296-307-14840.~~

~~Implementation plan  
WAC 296-307-14845.)~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Maintain handling records for covered pesticides</u>	<u>WAC 296-307-14805</u>
<u>Implement a medical monitoring program</u>	<u>WAC 296-307-14810</u>
<u>Identify a physician or licensed health care professional</u>	<u>WAC 296-307-14815</u>
<u>Make cholinesterase testing available</u>	<u>WAC 296-307-14820</u>
<u>Respond to depressed cholinesterase levels</u>	<u>WAC 296-307-14825</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Provide medical removal protection benefits</u>	<u>WAC 296-307-14830</u>
<u>Maintain records</u>	<u>WAC 296-307-14835</u>
<u>Provide training</u>	<u>WAC 296-307-14840</u>
<u>Implementation plan</u>	<u>WAC 296-307-14845</u>

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14805 Maintain handling records for covered pesticides.**

~~((You must:~~

~~\*)~~ **(1) The employer must** maintain accurate records of all time that each employee spends handling category I or II organophosphate or N-methyl-carbamate pesticides (this includes employees who do not meet the handling hour thresholds in WAC 296-307-14810).

~~((\*)~~ **(2) The employer must** provide a completed CHOLINESTERASE MONITORING HANDLING HOURS REPORT (F413-065-000) to the physician or other licensed health care professional (LHCP) for each employee receiving a periodic cholinesterase blood test and make sure the report is submitted to the laboratory with each periodic cholinesterase test.

~~((\*)~~ **(3) The employer must** provide the employee with a copy of the CHOLINESTERASE MONITORING HANDLING HOURS REPORT upon request.

~~((\*)~~ **(4) The employer must** retain pesticide handling records for seven years.

~~((\*)~~ **(5) The employer must** make sure that pesticide-handling records are readily accessible to employees, their designated representatives, and treating health care professionals.

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14810 Implement a medical monitoring program.**

~~((You must:~~

~~\*)~~ **The employer must** implement a medical monitoring program for ~~((you))~~ their employees who handle or will be expected to handle category I or II organophosphate or N-methyl-carbamate pesticides for thirty or more hours in any consecutive thirty-day period.

**Notes:** ~~((You do))~~ **1. The employer does** not need to count time spent mixing and loading using closed systems (as defined in WAC 296-307-13045 (4)(d)) in determining the need for periodic testing. Closed cabs are not "closed systems." Time using closed systems is still counted for purposes of establishing coverage under this rule and determining the need for obtaining baseline cholinesterase levels.

~~((\*)~~ **2. The first thirty consecutive day period** begins on the first day of handling organophosphate or N-methyl-carbamate pesticides after obtaining the baseline cholinesterase test.

((\*) 3. There is nothing in this rule that prohibits employers from providing cholinesterase monitoring to employees who handle organophosphate or N-methyl-carbamate pesticides for fewer than thirty hours in any consecutive thirty-day period.

**AMENDATORY SECTION** (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14815 Identify a physician or other licensed health care professional.**

~~((You must:~~

\*) (1) The employer must identify a physician or other licensed health care professional (LHCP) who will:

((-) (a) Provide baseline and periodic cholinesterase testing through the department of health public health laboratory or a laboratory approved by the department of labor and industries.

((-) (b) Interpret cholinesterase tests.

((-) (c) Provide (~~you~~) the employer with a written recommendation for each employee's blood test and evaluation.

((\*) (2) The employer must obtain the LHCP's written recommendation for each employee's blood test and evaluation (including baseline tests) and make sure that the employee receives a copy of the LHCP's written recommendation, either through (~~you~~) the employer or directly through the LHCP, within five business days after (~~you~~) the employer receives the recommendation.

((\*) (3) The employer must make sure the LHCP's written recommendation for each employee's blood test and evaluation is limited to the following information:

((-) (a) The employee's cholinesterase status based on the LHCP's evaluation.

((-) (b) Identification of changes in cholinesterase levels requiring a work practice evaluation for the employee.

((-) (c) Identification of changes in cholinesterase levels requiring the employee to be removed from handling and other exposure to organophosphate and N-methyl-carbamate pesticides.

((-) (d) Guidance on medical monitoring.

((-) (e) Any other relevant information concerning an employee's workplace exposure to organophosphate and N-methyl-carbamate pesticides.

**Note:** All testing for an employee should be conducted through the same laboratory. This will allow for accurate comparison between baseline and periodic tests.

~~((You must:~~

\*) (4) The employer must instruct the LHCP to NOT reveal in writing or in any other communication with (~~you~~) the employer any other personally identifiable medical information.

**Note:** If the LHCP written recommendation contains specific findings or diagnoses unrelated to occupational exposure, (~~you~~) the employer should send it back and obtain a revised version without the additional information.

~~((You must:~~

\*) (5) The employer must make sure the LHCP is familiar with the requirements of this rule (for example, by providing a copy of the rule or by confirming that the provider has attended training on the rule).

((\*) (6) The employer must post the name, address, and telephone number of the LHCP (~~you have~~) the employer has identified at the locations where employees usually start their work day.

((\*) (7) The employer must make sure written recommendations from the LHCP are maintained for seven years.

**Note:** (~~You~~) The employer may only obtain the employee's actual test results if the employee provides the LHCP with written consent to share these results with (~~you~~) the employer.

**AMENDATORY SECTION** (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14820 Make cholinesterase testing available.**

~~((You must:~~

\*) (1) The employer must make medical monitoring available to employees who will meet the handling hour threshold of thirty or more hours in any consecutive thirty-day period (WAC 296-307-14810) at no cost and at a reasonable time and place, as follows:

((-) (a) Provide annual baseline red blood cell (RBC) and serum cholinesterase tests that are taken at least thirty days after the employee last handled organophosphate or N-methyl-carbamate pesticides.

((-) (b) Provide periodic RBC and serum cholinesterase testing:

((\*) (i) Within three days after the end of each thirty-day period where the employee meets the handling hour threshold in WAC 296-307-14810; however, testing is not required more often than every thirty days;

OR

((\*) (ii) At least every thirty days for those employees who may meet the handling hour threshold in WAC 296-307-14810.

((-) (c) Follow the recommendations of the LHCP regarding continued employee pesticide handling or removal from handling until a thirty-day exposure free baseline can be established.

**Exemption:** (~~You do~~) The employer does not need to provide baseline or periodic testing for those employees whose work exposure is limited to handling only N-methyl-carbamate pesticides.

**Notes:** ((\*) 1. For employees who have had exposure to organophosphate or N-methyl-carbamate pesticides in the thirty days prior to the test obtain a working baseline. For example, a worker who initially declines cholinesterase testing and later chooses to participate in testing would obtain a "working baseline."  
((\*) 2. For new employees, the LHCP may accept previous baselines, if they are obtained according to this rule.

~~((You must:~~

\*) (2) The employer must obtain a signed declination statement from the LHCP for each employee who declines cholinesterase testing.

((-) (a) Employees may decline cholinesterase testing only after they receive training about cholinesterase inhibiting pesticides and discuss the risks and benefits of participation with the LHCP.

((-)) (b) An employee may change his or her mind and elect to participate or decline to continue participation in the testing program at any time.

((\*) (3) The employer must make sure the employee receives a copy of the signed declination statement, either through ~~((you))~~ the employer or directly through the LHCP, within five business days after ~~((you))~~ the employer receives the declination statement.

**Note:** If employers discourage participation in cholinesterase monitoring, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing, instituting proceedings, or testifying prohibited—Procedure—Remedy.

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14825 Respond to depressed cholinesterase levels.**

~~((You must:))~~

~~(\*)~~ The employer must respond to an employee's depressed cholinesterase levels by:

((-)) (1) Taking the actions required in Table 1;

**AND**

((-)) (2) Following any additional occupational health recommendations from the LHCP.

**Table 1**

**Required Responses to an Employee's Depressed Cholinesterase Levels**

When:	Action to be taken:	Methods:
An employee's RBC or serum cholinesterase levels fall more than twenty percent below the baseline	Evaluate the employee's workplace and work practices to identify and correct potential sources of pesticide exposure	Review:
		<ul style="list-style-type: none"> <li>Personal protective equipment (PPE) and its condition</li> </ul>
		<ul style="list-style-type: none"> <li>Employees' PPE usage</li> </ul>
		<ul style="list-style-type: none"> <li>General sanitation and decontamination practices and availability of decontamination facilities required by WAC 296-307-13050</li> </ul>
		<ul style="list-style-type: none"> <li>Pesticide handling practices</li> </ul>
		<ul style="list-style-type: none"> <li>Pesticide label requirements</li> </ul>

When:	Action to be taken:	Methods:
An employee's RBC cholinesterase level falls thirty percent or more from the baseline	Remove the employee from handling and other work exposures to organophosphate and N-methyl-carbamate pesticides such as thinning and harvesting in recently treated areas	<ul style="list-style-type: none"> <li>When available, provide the employee with other duties that do not include handling and other work exposures to organophosphate and N-methyl-carbamate pesticides</li> </ul>
<b>OR</b>	<b>AND</b>	<ul style="list-style-type: none"> <li>Provide medical monitoring and cholinesterase testing as recommended by the LHCP</li> </ul>
An employee's serum cholinesterase level falls forty percent or more from the baseline	Evaluate the employee's work practices to identify and correct potential sources of pesticide exposure	<ul style="list-style-type: none"> <li>Provide salary and benefits as if employee was continuing pesticide application activities</li> </ul>
A removed employee's cholinesterase levels return to twenty percent or less below baseline	The employee may return to handling class I and II organophosphate and N-methyl-carbamate pesticides	Continue periodic cholinesterase monitoring

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

**WAC 296-307-14830 Provide medical removal protection benefits.**

~~((You must:))~~

~~(\*)~~ (1) The employer must provide medical removal protection benefits for a maximum of three months on each occasion:

((-)) (a) An employee is temporarily removed from work due to depressed cholinesterase levels;

**OR**

((-)) (b) Assigned to other duties due to depressed cholinesterase levels.

((\*) (2) The employer must provide medical removal protection benefits that include maintenance of the same pay, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to organophosphate or N-methyl-carbamate pesticides or otherwise limited.

**Note:** The following are examples of how a worker's pay could be maintained while medically removed from exposure to cholinesterase-inhibiting pesticides:

((\*) 1. A removed worker is assigned to work eight hours a day but the employer's pesticide handlers are working ten hours a day. The removed worker would be paid for ten hours at the handler's pay rate.



((\*) 2. The farmer pays workers two dollars more per hour when they are handling organophosphate or N-methyl-carbamate pesticides. The removed worker will be paid this premium when the pesticides are being handled on the farm; however, the worker will be paid at their usual pay rate when the pesticides are not being handled on the farm.

**AMENDATORY SECTION** (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

**WAC 296-307-14835 Maintain records.**

~~((You must:~~

\*) (1) The employer must make sure that the following records are maintained:

((-) (a) The name, address, and telephone number of the physician or LHCP.

((-) (b) Written recommendations and opinions received from the physician or LHCP.

((-) (c) Findings of all work practice investigations.

((-) (d) Dates when employees were medically removed from their duties and dates when employees are returned to duties that include handling organophosphate or N-methyl-carbamate pesticides.

((-) (e) Signed declination statements.

((\*) (2) The employer must maintain records for seven years.

((\*) (3) The employer must make sure that all records are readily accessible to the employee and his or her designated representative.

**AMENDATORY SECTION** (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

**WAC 296-307-14840 Provide training.**

~~((You must:~~

\*) The employer must make sure employees have received training before initial medical monitoring. The training must include at least the following:

((-) (1) The human health hazards and physical symptoms of overexposure to organophosphate and N-methyl-carbamate cholinesterase-inhibiting pesticides.

((-) (2) The purpose and requirements for medical monitoring.

**Note:** Training required by this rule may be combined with other pesticide handler training as required by WAC 296-307-13025, Pesticide safety training—Standards for pesticide handlers.

**AMENDATORY SECTION** (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

**WAC 296-307-14845 Implementation plan.** The department will implement and complete an evaluation of this rule by doing the following:

((\*) (1) Organize a scientific team to oversee collection and analysis of data collected during 2004 and 2005. L&I will select representatives of the University of Washington, Washington State University, as well as other interested members of the academic and scientific communities, to participate on the team. The team will provide an initial analysis of testing data and any appropriate recommendations directly to L&I and to the cholinesterase monitoring advisory com-

mittee by November 1, 2004, and a further analysis and any appropriate recommendations by November 1, 2005. A final report and recommendations will be completed by September 30, 2006.

((\*) (2) Establish a cholinesterase stakeholder advisory committee to evaluate issues related to rule implementation and provide recommendations to the department regarding implementation of the rule and any possible modifications to it. L&I will invite representatives of growers, labor and other affected state agencies to participate on the advisory committee. The committee will have an opportunity to comment on the analysis completed by the scientific team and to make any appropriate recommendations before December 1, 2004, and again before December 1, 2005. In addition, the committee will review the scientific committee's final report and recommendations and provide advice to L&I prior to December 1, 2006.

((\*) (3) Review reports from the scientific team and stakeholder advisory committee, and other relevant information and make modifications to the rule as appropriate.

((\*) (4) Make efforts to defray the costs of medical testing during 2004.

((\*) (5) Prepare and distribute provider guidelines.

((\*) (6) Develop and make available a model employee training program.

((\*) (7) Publish a list of trained providers and certified laboratories on the internet.

((\*) (8) Coordinate recordkeeping requirements with the department of agriculture.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-15003** (~~What does this section cover?~~) **Scope.** WAC 296-307-150 does not apply to the construction, reconstruction, operation, or maintenance of overhead electrical conductors (and their supporting structures and associated equipment) by authorized and qualified electrical employees. It also does not apply to authorized and qualified employees engaged in the construction, reconstruction, operations and maintenance of overhead electrical circuits or conductors (and their supporting structures and associated equipment) of rail transportation systems, or electrical generating, transmission, distribution, and communication systems.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-15006** (~~What~~) **Clearance and safeguards** (~~are~~) **required to protect employees working near overhead lines** (~~?~~). (1) All exposed overhead conductors must be isolated from accidental contact by employees or equipment.

(2) Irrigation pipe must not be stored within one hundred feet of overhead conductors.

(3) Upending irrigation pipe within one hundred feet of overhead conductors is prohibited.

(4) Water and irrigation systems, and other devices that discharge a conductive liquid, must be set up and operated so that the discharge from the system is directed more than ten

feet away from overhead high-voltage lines, and avoids contact with any exposed electrical power conductor.

(5) Employees are prohibited from entering or working in proximity to high-voltage lines, unless there are guards to prevent accidental contact.

**Note:** Voltage 600V and higher is considered high voltage.

(6) The following are prohibited if it is possible to bring these objects within ten feet of high-voltage lines:

(a) Operating, erecting, or transporting tools, equipment, or a moving part;

(b) Handling, transporting, or storing materials; or

(c) Moving a building near high-voltage lines.

(7) Equipment or machines must be operated near power lines according to the following:

(a) For lines rated 50 kv. or below, minimum clearance between the lines and any part of the object must be ten feet;

(b) For lines rated over 50 kv. minimum clearance between the lines and any part of the object must be ten feet plus four tenths of an inch for each 1 kv., over 50 kv., or twice the length of the line insulator but never less than ten feet;

(c) In transit, the clearance must be a minimum of four feet for voltages less than 50 kv., ten feet for voltages over 50 kv. up to and including 345 kv., and sixteen feet for voltages up to and including 750 kv.;

(d) ~~((You are))~~ The employer must designate someone to observe clearance and give warning for operations where it is difficult for the operator to see well enough to maintain the necessary clearance.

**Exception:** ~~((You are))~~ The employer is exempt from this requirement if electrical distribution and transmission lines have been deenergized and visibly grounded at point of work; or if insulating barriers, not a part of or an attachment to the equipment or machinery, have been erected to prevent physical contact with the lines.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-15009** ~~((What))~~ **Signs** ~~((must))~~ **an employer must post to warn employees working near overhead lines** ~~((?))~~ ~~((You are))~~ The employer must post and maintain in plain view of the operator on each derrick, power-shovel, drilling-rig, hay loader, hay stacker, or similar apparatus with parts that are capable of vertical, lateral or swinging motion, a durable warning sign legible at twelve feet that says, "unlawful to operate this equipment within ten feet of high-voltage lines."

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-15012** ~~((When must an))~~ **The employer must notify the utility** ~~((of))~~ **when employees are working near overhead lines** ~~((?))~~. The employer must notify the operator of high-voltage lines when any operations are to be performed, tools or materials handled, or equipment is to be moved or operated within ten feet of any high-voltage line. All required safety measures must be completed before proceeding with any work that would reduce the clearance requirements of this section.

## Part L

### Temporary Worker Housing (TWH)

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16101 Purpose and applicability.** (1) Purpose. This part is adopted by the Washington state department of labor and industries to implement the provisions of chapter 49.17 RCW and establish minimum health and safety requirements for temporary worker housing and cherry harvest camps.

(2) Applicability. This part applies to:

(a) Temporary worker housing, including cherry harvest camps, provided by agricultural employers or operators in the state of Washington; and

(b) Operators of temporary worker housing ~~((shall))~~ must be licensed under this chapter if the housing meets the criteria identified in WAC 296-307-161.

For licensing requirements, see WAC 246-358-025, Licensure. For self-survey requirements, see WAC 246-358-027, Requirements for self-survey program. For enforcement requirements, see WAC 246-358-028, Enforcement.

**Note:** The requirements in this part only apply to residents of the TWH facility who are also employees of the TWH facility owner. Requirements that would apply to other TWH residents, such as family members, who are not employees of the TWH facility owner, are in chapter 246-358 WAC, Temporary worker housing.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16103 Definitions.** The following definitions apply throughout this chapter unless the context clearly indicates otherwise:

**Agricultural employee.** Any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

**Agricultural employer.** Any person engaged in agricultural activity, including the growing, producing, or harvesting of farm or nursery products, or engaged in the forestation or reforestation of lands, which includes, but is not limited to, the planting, transplanting, tubing, precommercial thinning, and thinning of trees and seedlings, the clearing, piling, and disposal of brush and slash, the harvest of Christmas trees, and other related activities.

**Bathing facility.** An enclosed area provided by the operator for workers to bathe or shower, and may be located within a family shelter or a common facility.

**Building.** Any structure used or intended by the operator to be used by workers for cooking, eating, sleeping, sanitation, or other facilities.

**Cherry harvest camp.** A place where housing and related facilities are provided to agricultural employees by agricultural employers or TWH operators for their use while employed for the harvest of cherries in the state of Washington. Cherry harvest camps are the only TWH site allowing tents.

**Common.** A shared facility provided by the operator for all workers of the TWH.

**Common areas.** Housing areas shared or used by one or more families or unrelated individuals.

**Current certificate (first aid).** A first-aid training certificate that has not expired.

**Dining hall.** A cafeteria-type eating place with food furnished by and prepared under the direction of the operator for consumption, with or without charge, by workers.

**Drinking fountain.** A fixture equal to a nationally recognized standard or a designed-to-drain faucet, which provides potable drinking water under pressure. A "drinking fountain" does not mean a bubble-type water dispenser.

**Dwelling unit.** A shelter, building, or portion of a building, which may include cooking and eating facilities, that are:

(a) Provided and designated by the operator as either a sleeping area, living area, or both, for occupants; and

(b) Physically separated from other sleeping and common areas. "Physically separated" means a physical wall separating rooms.

**Family shelter.** A dwelling unit with sleeping facilities for up to fifteen workers that may include toilet or cooking facilities. If services such as bathing, food-handling, or toilet facilities are provided in the family shelter, they are for the sole use of the occupants of the family shelter.

**First-aid trained.** The person holds a current certificate of first-aid training.

**Floor space.** The area within a dwelling unit with a minimum ceiling height of seven feet.

**Food-handling facility.** An enclosed area provided by the operator for workers to prepare their own food, and may be within a family shelter or common facility.

**Group A public water system.** A public water system as defined and referenced under WAC 246-290-020.

**Group B public water system.** A public water system that is not a Group A public water system, and is defined and referenced under WAC 246-291-050.

**Habitable room.** A room or space in a structure used for living, sleeping, eating, or cooking. Bathing facilities, toilet facilities, closets, halls, storage or utility space, and similar areas are not considered habitable rooms.

**Health officer.** The individual appointed as such for a local health department under chapter 70.05 RCW or appointed as the director of public health of a combined city-county health department under chapter 70.08 RCW.

**Livestock.** Horses, cows, pigs, sheep, goats, poultry, etc.

**Livestock operation.** Any place, establishment, or facility consisting of pens or other enclosures in which livestock is kept for purposes including, but not limited to, feeding, milking, slaughter, watering, weighing, sorting, receiving, and shipping. Livestock operations include, among other things, dairy farms, corrals, slaughterhouses, feedlots, and stockyards. Operations where livestock can roam on a pasture over a distance may be treated as outside the definition.

**MSPA.** The Migrant and Seasonal Agricultural Worker Protection Act (96 Stat. 2583; 29 U.S.C. Sec. 1801 et seq.).

**Occupant.** A temporary employee or a person who resides with a temporary worker at the TWH or camp.

**Operating license or license.** A document issued annually by the department of health.

**Operator.** A person holding legal title to the land on which the TWH or camp is located. However, if the legal title and the right to possession are in different persons, "operator" means a person having the lawful control or supervision over the TWH.

**Recreational park trailers.** A trailer-type unit that is primarily designed to provide temporary living quarters for recreational, camping, or seasonal use, that meets the following criteria:

(a) Built on a single chassis, mounted on wheels;

(b) Having a gross trailer area not exceeding 400 square feet (37.15 square meters) in the set-up mode;

(c) Certified by the manufacturer as complying with ANSI A119.5; and

(d) Chapter 296-150P WAC.

**Recreational vehicle.** A vehicular-type unit that is compliant with chapter 296-150R WAC and primarily designed as temporary living quarters for recreational camping, travel, or seasonal use that either has its own motive of power or is mounted on, or towed by, another vehicle. Recreational vehicles include: Camping trailers, fifth-wheel trailers, motor homes, travel trailers, and truck campers, but does not include pickup trucks with camper shells, canopies, or other similar coverings.

**Refuse.** Solid wastes, rubbish, or garbage.

**Temporary worker or worker.** An agricultural employee employed intermittently and not residing year-round at the same TWH site.

**TWH, temporary worker housing or housing.** A place, area, or piece of land where sleeping places or housing sites are provided by an agricultural employer for agricultural employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees for temporary, seasonal occupancy. TWH includes cherry harvest camps.

**Tent.** An enclosure or shelter constructed of fabric or pliable material composed of rigid framework to support tensioned membrane that provides the weather barrier.

**WISHA.** The Washington Industrial Safety and Health Act, chapter 49.17 RCW, administered by the Washington state department of labor and industries.

**Worker-supplied housing.** Housing owned by the worker and made available to the same worker on the operator's TWH site. Worker-supplied housing includes recreational park trailers, recreational vehicles, tents, or other structures that meet the requirements of this chapter.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16104 Technical assistance—Notice of violation.** (1) The department of health or the department of labor and industries may provide technical assistance to assist in compliance with this chapter if requested by an operator.

(2) The department of labor and industries will only provide technical assistance to cherry harvest camps if requested by an operator.

(3) During a consultative technical assistance visit, or within a reasonable time thereafter, the department ((shall))

must inform the owner or operator of the TWH on any violations of law or agency rules as follows:

- (a) A description of the condition that is not in compliance and the text of the specific section or subsection of the applicable law or rule;
- (b) A statement of what is required to achieve compliance;
- (c) The date by which the agency requires compliance to be achieved;
- (d) Notice of the means to contact any technical assistance services provided by the agency or others; and
- (e) Notice of when, where, and to whom a request to extend the time to achieve compliance for good cause may be filed with the agency.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16120 Variance and procedure.** (1) Conditions may exist in operations that a state standard will not have practical use. The director of the department of labor and industries may issue a variance from the requirements of the standard when another means of providing equal protection is provided. The substitute means must provide equal protection in accordance with the requirements of chapter 49.17 RCW and chapter 296-900 WAC, Administrative rules.

(2) A temporary variance may be requested under chapter 296-900 WAC, Administrative rules, when an operator cannot comply with new requirements by the effective date(s) of this chapter because:

- (a) The construction or alteration to a building cannot be completed in time;
  - (b) Materials or equipment are not available; or
  - (c) Professional or technical assistance is not available.
- (3) Applications for variances will be reviewed and may be investigated by the department of labor and industries and the department of health. Variances granted will be limited to the specific case or cases covered in the application and may be revoked for cause. The variance must remain prominently posted on the premises while in effect.

(4) Variance application forms may be obtained from the Department of Labor and Industries, P.O. Box 44650, Olympia, Washington 98504-4650 or the Department of Health, P.O. Box 47852, Olympia, Washington 98504-7852, upon request. Requests for variances from safety and health standards (~~shall~~) must be made in writing to the director or the assistant director, Department of Labor and Industries, P.O. Box 44650, Olympia, Washington 98504-4650. (Reference RCW 49.17.080 and 49.17.090.)

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16125 Temporary worker housing sites and cherry harvest campsites.** (~~The operator must.~~)

- (1) The operator must locate and operate a TWH site to prevent a health or safety hazard that is:
  - (a) Adequately drained and any drainage from and through the TWH must not endanger any domestic or public water supply;

- (b) Free from periodic flooding and depressions in which water may become a nuisance;

- (c) At least two hundred feet from a swamp, pool, sink hole, or other surface collection of water unless there is a mosquito prevention program for those areas;

- (d) Large enough to prevent overcrowding of necessary structures. The principal housing area for sleeping and for food preparation and eating must be at least five hundred feet from where livestock are kept; and

- (e) The grounds and open areas surrounding the shelters must be in a clean and sanitary condition.

- (2) The operator must ensure the principal TWH area for sleeping and for food preparation and eating are at least five hundred feet from where livestock are kept or congregate.

- (3) The operator must ensure the TWH grounds and open areas surrounding the buildings are kept in a clean and sanitary condition free from refuse.

- (4) The operator must ensure all worker-supplied housing is maintained in good working condition.

- (5) The operator must restrict the number of occupants in the TWH to the capacity as determined by the department of health.

- (6) When closing housing permanently or for the season:
  - (a) The operator must dispose of all refuse to prevent nuisance; and

- (b) The operator must leave the grounds and buildings in a clean and sanitary condition.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16130 Water supply.** (~~The operator must.~~)

- (1) The operator must provide a safe and reliable supply of drinking water from an approved Group A or Group B public water system meeting the requirements of:

- (a) WAC 246-358-025 (2)(d), chapters 246-290 and 246-291 WAC; or

- (b) Local board of health rules.

- (2) The operator must ensure that the distribution lines are able to maintain the working pressure of the water piping system at not less than twenty pounds per square inch after allowing for friction and other pressure losses.

- (3) When water is not piped to each dwelling unit, the operator must provide cold, potable, running water under pressure within one hundred feet of each dwelling unit.

- (4) When water sources are not available in each individual dwelling unit or tent, the operator must provide one or more drinking fountains for each one hundred occupants or fraction thereof. The use of common drinking cups or containers from which water is dipped or poured is prohibited.

- (5) The operator must provide an adequate supply of hot and cold running water under pressure in bathing, food-handling, and laundry facilities.

- (6) The operator must provide an automatically controlled hot water supply of one hundred to one hundred twenty degrees Fahrenheit in bathing, food-handling, and laundry facilities.

- (7) When water within one hundred feet of a dwelling unit is unsafe for drinking purposes and accessible to work-

ers, the operator must post a sign by each nonpotable water source that:

- (a) Reads "Do not drink. Do not use for washing. Do not use for preparing food.";
- (b) Is printed in English and in the native language of the workers;
- (c) Is printed on material colored to indicate unsafe; and
- (d) Is marked with easily understood pictures or symbols.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16135 Sewage disposal.** (~~The operator must:~~)

- (1) The operator must provide sewage disposal systems in accordance with local health jurisdictions.
- (2) The operator must connect all drain, waste, and vent systems from buildings to:
  - (a) Public sewers, if available; or
  - (b) Approved on-site sewage disposal systems that are designed, constructed, and maintained as required in chapters 246-272A and 173-240 WAC, and local ordinances.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16140 Electricity and lighting.** (~~The operator must ensure that:~~)

- (1) The operator must ensure that electricity is supplied to all dwelling units, family shelters, and common facilities, except chemical toilets;
- (2) The operator must ensure that all electrical wiring, fixtures, and electrical equipment must:
  - (a) Comply with the electric standards of the department of labor and industries regulations, chapters 19.28 RCW, 296-46B WAC, and local ordinances; and
  - (b) Be maintained in a safe condition.
- (3) The operator must ensure that each habitable room must have at least:
  - (a) One ceiling-type light fixture; and
  - (b) At least one separate floor-type or wall-type convenience outlet.
- (4) The operator must ensure that laundry, toilet facilities, and bathing facilities have at least one ceiling-type or wall-type light fixture;
- (5) The operator must ensure that general lighting and task lighting within all facilities is adequate to carry on normal daily activities;
- (6) The operator must ensure that adequate lighting is provided for safe passage for workers to handwashing sinks and toilets. Lighting requirements may be met by natural or artificial means;
- (7) For lighting requirements in tents, please see WAC 296-307-16147.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16145 Building requirements and maintenance.** (~~An operator must:~~)

(1) An operator must construct, if provided TWH dwelling units, including common facilities, which must meet the following requirements:

- (a) Protect against the elements;
  - (b) The State Building Code, chapter 19.27 RCW, or TWH construction standard, chapter 246-359 WAC; and
  - (c) State and local ordinances, codes, and regulations.
- (2) An operator must prevent condensation in dwelling units and common facilities to the degree that it does not contribute to a health risk or safety issue to occupants.
- (3) An operator must prevent mold in dwelling units and common facilities.

(4) An operator must provide a locking mechanism on the exterior door(s) of each family shelter. The mechanism must not prevent egress and must be easily opened from the inside without use of a key or special knowledge.

(5) An operator must provide a locking mechanism on all bedroom doors, excluding doors to bedrooms housing more than fifteen occupants. The mechanism must not prevent egress and must be easily opened from the inside without use of a key or special knowledge.

(6) An operator must provide a locking mechanism on:

- (a) Each toilet stall door, if provided; and
- (b) Each shower stall door, if provided.

(7) An operator must identify each dwelling unit and space used for shelter by posting a number at each site.

(8) An operator must maintain buildings in good repair and sanitary condition.

(9) An operator must comply with all applicable state and federal laws and rules for lead based paint. For more information on lead, go to (<http://www.lni.wa.gov/Safety/Topics/AtoZ/Lead/Default.asp>) <http://www.lni.wa.gov/Safety/Topics/AtoZ/Lead>.

(10) An operator must provide exits that are unobstructed and remain free of any material or matter where its presence would obstruct or render the exit hazardous.

(11) An operator must provide habitable rooms with:

- (a) Windows covering a total area equal to at least one-tenth of the total floor space; and
- (b) At least one-half of each window can be opened to the outside for ventilation; or
- (c) Mechanical ventilation in accordance with applicable standards from the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE).

(12) An operator must provide each room used for sleeping purposes with:

- (a) At least fifty square feet of floor space for each worker, not including any floor space in any portion of a room less than seven feet from the finished floor to the finished ceiling; and
- (b) Windows covering a total area equal to at least one-tenth of the floor space within the surrounding walls of the sleep room.

(13) An operator must provide each room used for sleeping and cooking purposes:

- (a) Meet the requirements of subsection (12) of this section;
- (b) At least one hundred square feet of floor space per temporary worker; and

(c) For a family shelter constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, one hundred square feet of floor space per temporary worker is required by January 1, 2019. Upon the operator's request, the department of health may grant an extension(s) for up to three additional years. Requests must:

(i) Include a schedule and work plan for achieving compliance;

(ii) Be on a form provided by the department of health; and

(iii) Be submitted to the department of health prior to January 1, 2019.

(14) An operator must ensure wooden floors are at least one foot above ground level or meet the requirements in the State Building Code, chapter 19.27 RCW or Temporary worker housing construction standard, chapter 246-359 WAC.

(15) An operator must provide sixteen-mesh screening on all exterior openings and screen doors with self-closing devices.

(16) An operator must provide and maintain screen doors on all exterior entrances that:

(a) Have self-closing devices; and

(b) Close without gaps that would allow entry of pests.

(17) An operator must install all heating, cooking, and water heating equipment according to state and local ordinances, codes, and regulations and maintain in a safe condition.

(18) An operator must provide habitable rooms with equipment capable of maintaining a temperature of at least seventy degrees Fahrenheit during cold weather.

(19) An operator must ensure that all recreational vehicles and park trailers meet the requirements as defined in this chapter.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16147 Tents.** (1) Each tent must be constructed to sleep no more than fifteen workers.

(2) Tents must provide protection from the elements, insects, and animals.

(3) Structural stability and floors.

(a) Tents and their supporting framework must be adequately braced and anchored to prevent weather related collapse. Documentation of the structural stability must be furnished to the department of health.

(b) Floors must be smooth, sloped from a raised center towards the lower outer edges. Floors must be without breaks or holes to provide a hard, stable walking surface. Nonridged flooring supported by grass, dirt, soil, gravel, or other uneven surfaces is not acceptable. Floors that are constructed of wood or concrete must comply with the building code, chapter 19.27 RCW and this chapter.

(c) Floor systems must be designed to prevent the entrance of snakes, rodents, and other nuisances.

(4) Flame-retardant treatments.

(a) The sidewalls, drops, and tops of tents (~~((shall))~~ must be composed of flame-resistant material or treated with a flame-retardant in an approved manner.

(b) Floor coverings, which are integral to the tent, and the bunting, (~~((shall))~~ must be composed of flame-resistant material or treated with a flame retardant in an approved manner and in accordance with Uniform Building Code, Standard 31.1.

(c) All tents must have a permanently affixed label bearing the following information:

(i) Identification of tent size and fabric or material type;

(ii) For flame-resistant materials, the necessary information to determine compliance with this section and National Fire Protection Association Standard 701, Standard Methods of Fire Tests for Flame-resistant Textiles and Films;

(iii) For flame-retardant materials, the date that the tent was last treated with an approved flame-retardant;

(iv) The trade name and type of flame-retardant used in the flame-retardant treatment; and

(v) The name of the person and firm that applied the flame-retardant.

(5) Means of egress.

(a) Tents must have a primary entrance door. At least one door must lead to the outside of the tent. The door must not be obstructed in any manner and must remain free of any material or matter where its presence would obstruct or render the exit hazardous.

(b) The area designated for refuge must be accessible and remain clear of storage materials or hazards.

(c) If food-handling facilities are provided in tents, or the tent occupancy capacity is for ten or more workers, a window must be located opposite the door and must have a means to open the window or provide an easily opened space, for example, a zipper which opens downward to the floor, must be provided.

(6) Floor area. (~~((The operator must:))~~)

(a) If food-handling facilities are provided in the tent, the operator must provide an additional twenty square feet of floor space;

(b) The operator must provide at least fifty square feet of floor space for each worker in rooms used for sleeping purposes.

(7) Ceiling height.

(a) A ceiling height of at least seven feet is required in fifty percent of the total floor area.

(b) No portion of the tent measuring less than six feet from the flooring to the ceiling will be included in any computation of the floor area.

(8) Windows and ventilation.

(a) Provide a window area equal to one-tenth of the total floor area in each habitable room which opens at least half-way or more directly to the outside for cross-ventilation and has a minimum of sixteen-mesh screens on all exterior openings.

(b) The windows must have weather-resistant flaps, which will cover the window area and a means of fastening the flaps to provide protection from the elements and allow privacy for the workers.

(9) Electrical and lighting. (~~((The operator must ensure that:))~~)

(a) The operator must ensure that electricity is supplied to all tents used as habitable room.

(b) The operator must ensure that all electrical wiring, fixtures and electrical equipment must comply with the electrical standards of the department of labor and industries regulations, chapter 19.28 RCW, and local ordinances, and be maintained in a safe condition.

(c) The operator must ensure that each tent used as a habitable room has at least one ceiling-type light fixture and at least one separate floor-type or wall-type convenience outlet.

(d) If cooking is provided in the tent, the operator must ensure that appropriate wiring and electrical equipment is provided.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16150 Laundry facilities.** ((An operator must:))

(1) An operator must provide laundry facilities that include:

- (a) One laundry tray or tub or one mechanical washing machine for every thirty occupants;
- (b) Adequate facilities for drying clothes; and
- (c) Sloped, coved floors of nonslip impervious materials with screened floor drains.

(2) An operator must maintain laundry facilities in a clean and sanitary condition.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16155 Handwashing and bathing facilities.** ((An operator must:))

(1) An operator must provide handwashing and bathing facilities adequate for the maximum capacity of the TWH according to Table 1 of WAC 296-307-16115.

(2) An operator must meet the following general requirements for all handwashing and bathing facilities:

- (a) Provide cleanable, nonabsorbent waste containers;
- (b) Provide all showers, baths, or shower rooms with screened floor drains to remove waste water;
- (c) Maintain fixtures and drains in good working order;
- (d) Separate showers with partitions or walls.
- (i) Partitions and walls must ensure privacy and be smooth, cleanable, and nonabsorbent.

(ii) For a bathing facility constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, partitions or walls are required by January 1, 2017.

(e) All showers separated by partitions must ensure privacy.

(3) An operator must meet the following requirements for common facilities:

(a) One handwash sink for every six occupants. Of these handwash sinks, locate adjacent to toilets at least one handwash sink for every fifteen occupants;

(b) One showerhead for every ten occupants;

(c) One "service sink" in each building used for common laundry, handwashing, or bathing;

(d) Sloped, coved floors of nonslip impervious materials with floor drains;

(e) Shower and bathing facilities must provide privacy from the opposite sex and the public;

(f) Maintain common bathing and handwashing facilities in a clean and sanitary condition, cleaned at least daily; and

(g) Bathing and shower facilities must be available at all times during operation of the TWH.

(4) An operator must meet the following requirements for family shelters:

(a) At least one handwash sink per family shelter. If an operator provides a family shelter with toilet facilities, at least one handwash sink located in the toilet room or immediately adjacent to the toilet room; and

(b) Request occupants in family shelters to maintain bathing and handwashing facilities in a clean and sanitary condition.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16160 Toilet facilities.** ((The operator must:))

(1) The operator must provide toilet facilities adequate for the maximum capacity of the TWH according to Table 1 of WAC 296-307-16115.

(2) The operator must not provide or allow the use of pit privies.

(3) The operator must fill abandoned pit privies with earth.

(4) The operator must meet the following general requirements for all toilet facilities:

(a) Provide flush toilets unless chemical toilets are specifically approved by the department of health according to requirements in chapter 246-272 WAC;

(b) Flush toilets, chemical toilets, and urinals must not be located in any sleeping room, dining room, cooking or food-handling facility or in any tent;

(c) Toilet rooms must be provided with:

(i) Handwashing sinks located in or immediately adjacent to the toilet room;

(ii) Either a window of at least six square feet opening directly to the outside or adequate ventilation;

(iii) Sixteen-mesh screens on all outside openings;

(iv) Fixtures maintained in good working order, including toilet(s) and sink(s); and

(v) Drains maintained in good working order, including floor drains with screens.

(d) When chemical toilets are approved, they must be:

(i) Located at least fifty feet from any dwelling unit or food-handling facility;

(ii) Maintained by a licensed waste disposal company;

(iii) Comply with local ordinances; and

(iv) Located immediately adjacent to a handwash sink(s); and

(e) When urinals are provided:

(i) There must be one urinal or two linear feet of urinal trough for each twenty-five men;

(ii) The floors and the walls surrounding a urinal and extending out at least fifteen inches on all sides must be constructed of materials which will not be adversely affected by moisture; and

(iii) The urinal must have an adequate water flush.

(5) The operator must meet the following requirements for common toilet facilities:

(a) Where common toilet facilities are provided, the number of toilets for each sex must be based on the maximum number of occupants of that sex which the camp is designed to house at any one time, in the ratio of one such toilet for every fifteen occupants, with a minimum of two toilets according to Table 1 of WAC 296-307-16115;

(b) Locate toilet rooms so that:

(i) Toilets are within two hundred feet of the door of each sleeping room; and

(ii) No person has to pass through a sleeping room to reach a toilet room.

(c) Maintain toilets in a clean and sanitary condition, cleaned at least daily;

(d) Provide each toilet compartment with an adequate supply of toilet paper at all times;

(e) Separate toilets by partitions or walls. For the purposes of this section, partitions do not include curtains.

(i) Partitions and walls must ensure privacy, and must have smooth, cleanable, and nonabsorbent surfaces;

(ii) For a common toilet facility constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, partitions or walls are required by January 1, 2017.

(f) Ensure the area surrounding common toilet facilities are adequately lighted; and

(g) When common facilities will be used for both men and women:

(i) Provide separate toilet rooms for each sex with a minimum of one toilet room for each sex and meet the required ratio as defined in (a) of this subsection;

(ii) Identify each room for "men" and "women" with signs printed in English and in the native language of the persons occupying the camp, or identified with easily understood pictures or symbols; and

(iii) Separate facilities by solid walls or partitions extending from the floor to the roof or ceiling when facilities for each sex are located in the same building.

(6) The operator must meet the following requirements for family shelters if common toilet facilities are not provided:

(a) One toilet for each individual family shelter;

(b) Ensure toilet facilities are cleaned prior to occupancy; and

(c) Request occupants to maintain the facilities in a clean and sanitary condition.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16165 Cooking and food-handling facilities.** ((The operator must:))

(1) The operator must provide sanitary facilities for storing and preparing food;

(2) ((Provided)) The operator must provide all food-handling facilities with:

(a) Covered and enclosed or screened cooking and food-handling facilities for all occupants;

(b) Covered and enclosed or screened eating facilities with adequate tables and seating for the occupants;

(c) If provided, hotplates that meet WAC 296-307-16140 (2);

(d) A sink with hot and cold running potable water under pressure;

(e) At least two cubic feet of dry food storage space per occupant;

(f) Nonabsorbent, and easily cleanable food preparation surfaces situated off the floor;

(g) Mechanical refrigeration conveniently located and able to maintain a temperature of forty degrees Fahrenheit or below, with at least two cubic feet of storage space per occupant;

(h) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;

(i) Nonabsorbent, easily cleanable floors;

(j) Adequate ventilation for cooking facilities; and

(k) Cooking facilities, including fixtures and drains, maintained in good working order.

(3) In common food-handling facilities, the operator must provide:

(a) A room, building, or space within a building adequate in size, separate from any sleeping quarters or tent for workers to prepare and cook their own food;

(b) No direct openings to living or sleeping areas from the common food-handling facility;

(c) An operable cook stove or electric hotplate with four cooking surfaces for every ten workers through any combination of cooking surfaces including burners, one foot in length of burner surface, microwave ovens, stove ovens, or convection ovens.

(4) In family shelter food-handling facilities, the operator ((shall)) must provide an operable cook stove or electric hotplate with four cooking surfaces for every ten workers through any combination of cooking surfaces including burners, one foot in length of burner surface, microwave ovens, stove ovens, or convection ovens.

(5) The operator must ensure that common dining hall facilities comply with chapter 246-215 WAC, Food service.

**AMENDATORY SECTION** (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16170 Cots, beds, bedding, and personal storage.** ((The operator must:))

(1) The operator must provide beds, cots, or bunks in good condition for the maximum occupancy approved by the department of health for operator-supplied housing;

(2) The operator must allow the use of cots in tents for cherry harvest camps only. Cots must be sturdy and stable and without:

(a) Visible mold;

(b) Rips or tears;

(c) Insect infestation;

(d) Stains from bodily fluids; and

(e) Rodents or rodent droppings.

(3) In TWH other than cherry harvest camps, the operator must provide beds and bunks with clean mattresses in good repair and without:

(a) Mold;

(b) Rips or tears;



- (c) Insect infestation;
- (d) Stains from bodily fluids; or
- (e) Rodents or rodent droppings.

(4) If provided by the operator, the operator must maintain bedding(, if provided by the operator,) in a clean and sanitary condition;

(5) The operator must locate all beds, cots, and bedding at least thirty-six inches from cooking surfaces;

(6) The operator must provide a minimum of twelve inches of clearance between each cot, bed or bunk and the floor;

(7) The operator must allow space to separate beds or cots laterally and end-to-end by at least thirty-six inches when single beds or cots are used;

(8) The operator must meet the following requirements when bunk beds are used:

(a) Allow space to separate beds laterally and end-to-end by at least forty-eight inches;

(b) Maintain a minimum space of twenty-seven inches between the upper and lower bunks; and

(c) Prohibit triple bunks.

(9) The operator must provide all occupants suitable storage space for clothing and personal articles. Storage space must be located in the occupant's room used for sleeping;

(10) Effective January 1, 2017, for each temporary worker housed in a common sleeping facility, the operator must provide suitable storage space that must:

(a) Ensure all or a portion of the storage space is enclosed and lockable;

(b) Be anchored in a manner which adequately prevents the storage space from being removed from the building; and

(c) Be accessible to the temporary worker.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16175 First aid and safety.** ((The operator must:))

(1) The operator must comply with chapters 15.58 and 17.21 RCW and chapters 16-228 and 296-307 WAC, Parts I and J, and pesticide label instructions when using pesticides in and around the TWH;

(2) The operator must prohibit, in the TWH area, the use, storage, or mixing of flammable, volatile, or toxic substances other than those intended for household use;

(3) The operator must provide readily accessible first-aid equipment;

(4) The operator must ensure that a first-aid trained person is readily accessible to administer first aid at all times;

(5) The operator must remove unused refrigerator units or other appliances to prevent access by children.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

**WAC 296-307-16180 Refuse (waste) disposal.** ((The operator must:))

(1) The operator must comply with local sanitation codes for removing and disposing of refuse from TWH areas;

(2) The operator must protect against rodent harborage, insect breeding, and other health hazards while storing, collecting, transporting, and disposing of refuse;

(3) The operator must store refuse in fly-tight, rodent-tight, impervious, and cleanable or reusable containers or in single-use containers;

(4) The operator must keep refuse containers clean;

(5) The operator must provide at least one reusable container for each dwelling unit that is:

(a) Located within one hundred feet of each dwelling unit;

(b) Placed on a solid, flat, and level stand made of wood, metal, or concrete; and

(c) Secured to prevent falling over or spilling.

(6) The operator must empty refuse containers at least twice each week, and when full.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

**WAC 296-307-16190 Disease prevention and control.** ((The operator must:))

(1) The operator must report immediately to the local health officer the name and address of any individual in the camp known to have or suspected of having a communicable disease;

(2) The operator must report immediately to the local health officer:

(a) Suspected food poisoning;

(b) An unusual prevalence of fever, diarrhea, sore throat, vomiting, or jaundice;

(c) Productive cough; or

(d) When weight loss is a prominent symptom among workers.

(3) The operator must prohibit any individual with a communicable disease from preparing, cooking, serving, or handling food, foodstuffs, or materials in dining halls.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18005 ((How must)) Guarding fan blades ((be guarded?)).** ((You)) The employer must guard the blades of a fan located less than seven feet above the floor or working level. The guard must have maximum openings of one-half inch.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18010 ((How must)) Guarding constant-running drives ((be guarded?)).** Constant-running drives. Drives that continue to rotate when the engine is running and all clutches are disengaged.

Shields, guards, and access doors that will prevent accidental contact with rotating machine parts on constant-running drives must be in place when the machine is running.

**Exception:** This requirement does not apply to combines when guards could create fire hazards.

~~("Constant running drives" means drives that continue to rotate when the engine is running and all clutches are disengaged.)~~

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18015** ~~((What))~~ **Training** ~~((must))~~ **an employer must provide for employees who use agricultural equipment** ~~((?))~~. At the time of initial assignment and at least annually thereafter, ~~((you))~~ **the employer** must instruct every employee in the safe operation and servicing of all equipment that the employee will use, including at least the following:

(1) Keep all guards in place when the machine is in operation.

(2) Only persons required for instruction or machine operation may ride on equipment, unless a passenger seat or other protective device is provided.

(3) Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning, or unlogging the equipment.

**Exception:** When the machine must be running to be properly serviced or maintained, ~~((you))~~ **the employer** must instruct employees in the steps and procedures necessary to safely service or maintain the equipment.

(4) Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

(5) Lock out electrical power before performing maintenance or service on farmstead equipment.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18020** ~~((What requirements apply to))~~ **Machine controls** ~~((?))~~. (1) If machine operation requires the presence of an operator on the machine, a "stop button" must be provided on the machine within reach of the operator.

(2) Power control devices must be marked to indicate the function and machine they control. "On" and "off" must be marked.

(3) "Stop" buttons must be red or orange. Each machine must have one or more stop buttons according to the working position of the operators.

(4) Power control devices must be located or guarded to prevent unexpected or accidental movement of the control. "Start" buttons must be recessed.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18025** ~~((How must))~~ **Steam pipe** ~~((s be guarded?))~~ **guarding**. (1) All steam pipes or pipes hot enough to burn a person (other than coil pipes, radiators for heating rooms or buildings, or pipes on portable steam engines and boilers) must be guarded with a standard safe-guard, unless guarded by location.

(2) All exposed hot pipes within seven feet of the floor or working platform, or within fifteen inches measured horizon-

tally from stairways, ramps, or fixed ladders, must be covered with insulating material or be guarded to prevent contact.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18503** ~~((What general requirements apply to))~~ **Powered saws** ~~((?))~~. (1) ~~((You))~~ **The employer** must ensure that all cracked saw blades are removed from service, except as indicated in WAC 296-307-18515(6).

(2) Inserting a wedge between a saw disk and its collar to form a "wobble saw" for rabbeting or dadoing is prohibited.

**Exception:** This does not apply to properly designed adjustable rabbeting blades.

(3) ~~((You))~~ **The employer** must provide and ensure that employees use push sticks or push blocks in sizes and types suitable for the work to be done.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18506** ~~((How must))~~ **Guarding band saws** ~~((be guarded?))~~. (1) ~~((You))~~ **The employer** must ensure that all band wheels are completely encased or guarded on both sides. Guards must be constructed of at least No. 14 U.S. gauge metal, nominal two-inch wood material, or mesh or perforated metal of at least U.S. gauge No. 20 with maximum openings of three-eighths inch.

(2) ~~((You))~~ **The employer** must ensure that all nonworking portions of the band saw blade are enclosed or guarded. The working side of the blade between the guide and the table may be left open to work on the stock.

(3) ~~((You))~~ **The employer** must ensure that the guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard protects the saw blade at the front and outer side.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18509** ~~((How must))~~ **Guarding radial arm saws** ~~((be guarded?))~~. (1) ~~((You))~~ **The employer** must ensure that the upper hood completely encloses the upper portion of the blade, including the end of the saw arbor. The upper hood must be constructed to protect the operator from flying material, and to deflect sawdust. The sides of the lower exposed portion of the blade must be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock. ~~((You))~~ **The employer** may use an alternative lower blade guard if it provides equivalent protection.

(2) ~~((You))~~ **The employer** must provide an adjustable stop to prevent the forward travel of the blade beyond the position necessary to complete the cut.

(3) ~~((You))~~ **The employer** must equip a radial arm-saw with a mechanism to return the saw and keep it in position at the back of the table or behind the rip fence.

For example: ~~((You))~~ **The employer** may use a counter-weight or a saw retractor device, or tilt the front of the radial arm saw unit up enough to maintain the blade at the back of

the table or behind the rip fence when the pull handle is released by the operator.

(4) ~~((You))~~ The employer must ensure that ripping and ploughing are permitted only against the direction in which the saw turns. Mark the direction of the saw rotation on the hood, and attach a permanent warning sign to the rear of the guard that prohibits ripping or ploughing from that position. (Where the blade teeth exit the upper hood when set up for ripping would be the rear of the saw in this case.) Each radial arm saw used for ripping must be provided with antikickback fingers or dogs to prevent the saw from throwing the material or stock back at the operator.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18512** ~~((How must))~~ **Guarding table saws** ~~((be guarded?))~~. (1) ~~((You))~~ The employer must ensure that each circular blade table saw used for ripping or cross-cutting is guarded by a standard hood that covers the saw blade above the material completely at all times during the cut. The hood must adjust itself automatically to the thickness of, and must remain in contact with, the material being cut.

**Exception:** When finished surfaces of stock may be marred by the guard, it may be raised slightly to avoid contact. The hood must be designed to protect the operator from flying material.

(2) ~~((You))~~ The employer must ensure that any table saw used for ripping has antikickback fingers or dogs and a spreader.

(3) While used for rabbeting, ploughing, grooving or dadoing a table saw may be used without an antikickback device and a spreader. Upon completion, the antikickback device and spreader must be replaced immediately.

(4) ~~((You))~~ The employer must ensure that the part of the table saw that is beneath the table is fully guarded to prevent employee contact with the portion of the blade below the table.

(5) Power transmission components of table saws must be guarded according to WAC 296-307-280.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-18515** ~~((How must))~~ **Guarding circular fuel-wood saws** ~~((be guarded?))~~. (1) ~~((You))~~ The employer must ensure that fuel-wood saws are guarded by a standard guard that completely encloses the blade to the depth of the teeth, except for the area where material is fed into the blade.

(2) ~~((You))~~ The employer must ensure that the tables of fuel-wood saws is constructed so that material being sawed is supported on both sides of the blade.

(3) ~~((You))~~ The employer must provide a mechanism that will prevent the leading edge of the saw from passing the front edge of the table or roll case.

(4) ~~((You))~~ The employer must provide tilting tables of fuel-wood saws with a backrest for the full length of the table. The backrest must extend upward from the table platform at least to the height of the saw opening. An opening in a back-

rest must be a maximum of two inches. The backrest frame and filler must be constructed of material strong and rigid enough to prevent distortion under normal use.

(5) Power transmission components of fuel-wood saws must be guarded according to WAC 296-307-280.

(6) When a circular fuel-wood saw blade develops a crack, ~~((you))~~ the employer must discontinue its use until properly repaired, according to the following measurements.

Length of crack	Diameter of saw in inches
1/2"	12"
1"	24"
1-1/2"	36"

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-19003** ~~((What))~~ **Definitions that apply to this section** ~~((?))~~. ~~(( ))~~ **Abrasive wheel** ~~((means))~~. A cutting tool consisting of abrasive grains held together by organic or inorganic bonds. This includes diamond and reinforced wheels.

~~(( ))~~ **Flanges** ~~((means))~~. Collars, discs, or plates between which wheels are mounted. Also referred to as adapter, sleeve, or back.

~~(( ))~~ **Mounted wheels** ~~((means))~~. Wheels of various dimensions that are usually 2 inches in diameter or smaller. They can be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels.

~~(( ))~~ **Off-hand grinding** ~~((means))~~. Grinding material or a part that is held in the operator's hand.

~~(( ))~~ **Portable grinding** ~~((means))~~. The grinding machine is hand-held and may be easily moved from one location to another.

~~(( ))~~ **Reinforced wheels** ~~((means))~~. A class of organic wheels that contain strengthening fabric or filament. "Reinforced" does not mean wheels using such mechanical additions as steel rings, steel cup backs, or wire or tape winding.

~~(( ))~~ **Safety guard** ~~((means))~~. An enclosure designed to restrain the pieces of the grinding wheel and protect the operator in the event that the wheel is broken in operation.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-19006** ~~((What rules apply to))~~ **Guarding abrasive wheels** ~~((?))~~. (1) Abrasive wheels must be used only on machines provided with safety guards.

**Exception:** This requirement does not apply to the following:

~~((a))~~ 1. Wheels used for internal work while the wheel is within the work being ground.

~~((b))~~ 2. Mounted wheels 2 inches and smaller in diameter, used in portable operations.

~~((c))~~ 3. Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.

~~((d))~~ 4. Specially shaped "sickle grinding" wheels mounted in mandrel-type bench or floor stands.

(2) The safety guard must cover the spindle end, nut, and flange projections.

**Exceptions:** ((a)) 1. When the work provides protection to the operator, the spindle end, nut, and outer flange may be exposed. When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.

((b)) 2. The spindle end, nut, and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels.

((c)) 3. The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) The guard must cover the sides and periphery of the wheel.

**Exceptions:** ((a)) 1. Bench and floor stands((:));

((b)) a. The maximum permissible angle of exposure is 90°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.

((c)) b. Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure must not exceed 125°. This exposure must begin at a point not more than 65° above the horizontal plane of the wheel spindle.

((d)) 2. Swing-frame grinders may only be exposed on the bottom half; the top half of the wheel must be enclosed at all times.

((e)) 3. Where the work is applied to the top of the wheel, the exposure of the grinding wheel periphery must not exceed 60°.

((f)) 4. When the work entirely covers the side of the wheel, the side covers of the guard may be omitted.

(4) The safety guard must be mounted to maintain proper alignment with the wheel, and the strength of the fastenings must exceed the strength of the guard.

(5) Take care to see that the safety guard is properly positioned before starting the mounted wheel.

(6) Abrasive wheel machinery guards must meet the design specifications of ANSI B7.1-1970.

(7) Exception: WAC 296-307-19006 does not apply to natural sandstone wheels and metal, wooden, cloth, or paper discs, with a layer of abrasive on the surface.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-19009 ((What are)) The use, mounting, and guarding rules for abrasive wheels((?)).** (1) Immediately before mounting, the operator must closely inspect and sound (ring test) all wheels to make sure they are not damaged. Before mounting the wheel, the operator must check the spindle speed of the machine to be certain that it does not exceed the maximum operating speed marked on the wheel.

((=))**Ring test((= means)).** To tap the wheel gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels.

(2) Grinding wheels must fit freely on the spindle and remain free under all grinding conditions. The wheel hole must be made suitably oversized to ensure that heat and pressure do not create a hazard.

(3) All contact surfaces of wheels, blotters, and flanges must be flat and free of foreign matter.

(4) Bushings used in the wheel hole must not exceed the width of the wheel and must not contact the flanges.

(5) On offhand grinding machines, work rests must be used to support the work. The work rest must be rigid and adjustable to compensate for wheel wear. Work rests must be kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from jamming between the wheel and the rest. The work rest must be securely clamped after each adjustment and ((shall)) must not be adjusted with the wheel in motion.

(6) Goggles or face shields must be used when grinding.

(7) Nonportable grinding machines must be securely mounted on substantial floors, benches, foundations, or other adequate structures.

(8) After mounting, abrasive wheels must be run at operating speed with the safety guard in place and properly adjusted, or in a protected enclosure for at least one minute before applying work. During this time, no one may stand in front of or in line with the wheel.

(9) Grinders or abrasive wheels that vibrate or are out of balance must be repaired before use.

(10) Abrasive wheels not designed for the machine or guard must not be mounted on a grinder.

(11) Side grinding must only be performed with wheels designed for this purpose.

**Note:** Light grinding on the side of straight wheels is permitted only when very delicate pressure is applied.

(12) Where the operator may stand in front of the opening, safety guards must be adjustable to compensate for wheel wear. The distance between the wheel periphery and the adjustable tongue or the guard above the wheel must not exceed one-quarter inch.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-19012 ((What requirements apply to)) Flanges((?)).** (1) Grinding machines must have flanges.

(2) All abrasive wheels must be mounted between flanges that are at least one-third the diameter of the wheel. Regardless of flange type used, the wheel must always be guarded. Blotters must be used according to this section.

(3) Design and material requirements include:

(a) Flanges must be designed to transmit the driving torque from the spindle to the grinding wheel.

(b) Flanges must be made of steel, cast iron, or other material of equal or greater strength and rigidity.

(4) An abrasive wheel that is designed to be held by flanges must not be operated without them. Except for those types requiring flanges of a special design, flanges must be at least one-third the diameter of the wheel.

(5) Facings of compressible material (blotters) must be inserted between the abrasive wheel and flanges to ensure uniform distribution of flange pressure.

(6) All flanges must be maintained in good condition. When the bearing surfaces become damaged, they should be trued or refaced. When refacing or truing, exercise care to

make sure that proper relief and rigidity is maintained before starting the wheel.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-19015 (~~(How must)~~) Guarding vertical portable grinders (~~(be guarded?)~~).** Safety guards on right angle head or vertical portable grinders must have a maximum exposure angle of 180°, and the guard must be between the operator and the wheel during use. The guard must be adjusted so that pieces of an accidentally broken wheel will be deflected away from the operator.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-19018 (~~(How must)~~) Guarding other portable grinders (~~(be guarded?)~~).** Other portable grinding machines must be guarded so that only the bottom half of the wheel is exposed. The top half of the wheel must be enclosed at all times.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-195 (~~(What rules apply to)~~) Grounding and "dead man" controls for hand-held portable power tools(~~(?)~~).** (1) Each hand-held, power-driven tool must have a "dead man" control, such as a spring-actuated switch, valve, or equivalent device, so that the power will be automatically shut off whenever the operator releases the control.

(2) The frames and all exposed, noncurrent-carrying metal parts of portable electric machinery, operated at more than fifty volts to ground, must be grounded. Other hand-held portable motors driving electric tools must be grounded if they operate at more than fifty volts to ground. The ground must use a separate ground wire and polarized plug and receptacle.

**Exception:** Double insulated tools that are designed and used according to the requirements of Article 250-45 of the National Electrical Code (1971 edition) are exempt from the grounding requirements.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-20005 (~~(May)~~) Compressed air (~~(be used)~~) for cleaning(~~(?)~~).** Using compressed air for cleaning purposes is prohibited, except where the pressure is reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-20010 (~~(What requirements apply to)~~) Compressed air tools(~~(?)~~).** (1) When using compressed air tools, use care to prevent the tool from being shot from the gun.

(2) When momentarily out of use, the gun should be laid so that the tool cannot fly out if the pressure is accidentally released. When not in use, all tools should be removed from the gun.

(3) When disconnecting a compressed air tool from the air line, first shut off the pressure and then operate the tool to release the pressure remaining in the hose.

(4) Compressed air hose or guns must not be pointed at or brought into contact with the body of any person.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-20505 (~~(What requirements apply to)~~) Guarding portable powered tools(~~(?)~~).** (1) All portable, power-driven circular saws with a blade diameter greater than 2 inches must have guards above and below the base plate or shoe.

(a) The upper guard must cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts.

(b) The lower guard must cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work.

(c) When the tool is withdrawn from the work, the lower guard must automatically and instantly return to covering position.

(2) Portable belt sanding machines must have guards at each nip point where the sanding belt runs onto a pulley. These guards must prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt must be guarded against accidental contact.

(3) Portable electric powered tools must meet the electrical requirements of chapter 296-307 WAC Part T.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-20510 (~~(What requirements apply to)~~) Switches and controls on portable powered tools(~~(?)~~).** (1) The following powered tools must have a constant pressure switch or control that will shut off the power when the pressure is released:

(~~(\*)~~) (a) All hand-held powered circular saws with a blade diameter-greater than 2 inches;

(~~(\*)~~) (b) Electric, hydraulic or pneumatic chain saws; and

(~~(\*)~~) (c) Percussion tools without positive accessory holding means.

All hand-held gasoline powered chain saws must have a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

(2) The following powered tools must have a constant pressure switch or control:

(~~(\*)~~) (a) All hand-held powered drills, tappers, fastener drivers, and horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter;

(~~(\*)~~) (b) Disc sanders with discs greater than 2 inches in diameter;

(~~(\*)~~) (c) Belt sanders;

(~~(\*)~~) (d) Reciprocating saws;

((\*) (e) Saber, scroll, and jig saws with blade shanks greater than a nominal 1/4 inch; and

((\*) (f) Other similarly operating powered tools.

These tools may have a lock-on control if they can be turned off by a single motion of the same finger or fingers that turn it on.

(3) The following powered tools must have either a positive on-off control, or other controls as described above:

((\*) (a) All other hand-held powered tools, including:

((\*) (b) Platen sanders;

((\*) (c) Grinders with wheels 2 inches in diameter or less;

((\*) (d) Disc sanders with discs 2 inches in diameter or less;

((\*) (e) Routers;

((\*) (f) Planers;

((\*) (g) Laminate trimmers;

((\*) (h) Nibblers;

((\*) (i) Shears; and

((\*) (j) Saber, scroll, and jig saws with blade shanks a nominal 1/4 inch wide or less.

((\*) (i) Saber, scroll, and jig saws with nonstandard blade holders may use blades with shanks that are nonuniform in width, if the narrowest portion of the blade shank is an integral part in mounting the blade.

((\*) (ii) Blade shank width must be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

((\*) (iii) "Nominal" in this section means +0.05 inch.

(4) The operating control on hand-held power tools must be located to minimize the possibility of accidental operation that would constitute a hazard to employees.

**Exception:** This section does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal care appliances, or to fixed machinery.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-20515 (~~What requirements apply to~~) Pneumatic powered tools and hose((?)).** (1) The operating trigger on portable pneumatic powered tools must be located to minimize the possibility of accidental operation and arranged to close the air inlet valve automatically when the operator removes pressure.

(2) A tool retainer must be installed on each tool that would otherwise be ejected from the hose.

(3) Hose and hose connections used for conducting compressed air to utilization equipment must be designed for the pressure and service to which they are subjected.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22003 (~~What~~) Definitions that apply to this section((?)).** ((<sup>2</sup>))Blade tip circle(("means)). The path described by the outermost point of the blade as it rotates about its shaft axis.

((<sup>2</sup>))Catcher assembly(("means)). A part that provides a means for collecting grass clippings or debris.

((<sup>2</sup>))Deadman control(("means)). A control designed to automatically interrupt power to a drive when the operator releases the control.

((<sup>2</sup>))Guard(("means)). A part for shielding a hazardous area of a machine.

((<sup>2</sup>))Lowest blade position(("means)). The lowest blade position when the mower is not in use.

((<sup>2</sup>))Operator area((<sup>2</sup>) (walk-behind mowers) ("means)). A circular area behind the mower that is no smaller than 30 inches in diameter, the center of which is 30 inches behind the nearest blade tip circle.

((<sup>2</sup>))Power reel mower(("means)). A lawn-cutting machine with a power source that rotates one or more helically formed blades about a horizontal axis and creates a shearing action with a stationary cutter bar or bed knife.

((<sup>2</sup>))Power rotary mower(("means)). A lawn-cutting machine with a power source that rotates one or more cutting blades about a vertical axis.

((<sup>2</sup>))Riding mower(("means)). A powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

((<sup>2</sup>))Sulky type mower(("means)). A walk-behind mower that has been converted to a riding mower by the addition of a sulky.

((<sup>2</sup>))Walk-behind mower(("means)). A mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22006 (~~What are the general~~) Guarding (~~requirements for~~) power lawnmowers((?)).** (1) Walk-behind, riding-rotary, and reel power lawnmowers designed for use by employees must meet the design specifications in ANSI B71.1-1968.

**Exception:** These specifications do not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.

(2) All power-driven chains, belts, and gears must be positioned or guarded to prevent accidental contact with the operator during normal starting, mounting, and operation of the machine.

(3) The motor must have a shutoff device that requires manual and intentional reactivation to restart the motor.

(4) All positions of the operating controls must be clearly identified.

(5) The words, "Caution — Be sure the operating control(s) is in neutral before starting the engine," or similar wording must be clearly visible at an engine starting control point on self-propelled mowers.

(6) All power lawn mowers must be used according to the manufacturer's instructions.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22009 (~~What rules apply to~~) Walk-behind and riding rotary mowers((?)).** (1) The mower

blade must be enclosed except on the bottom and the enclosure must extend to or below the lowest blade position.

(2) Guards that must be removed to install a catcher assembly must meet the following requirements:

(a) Warning instructions are attached to the mower near the opening stating that the mower must not be used without either the catcher assembly or the guard in place.

(b) The mower is used only with either the catcher assembly or the guard in place.

(c) The catcher assembly is properly and completely installed.

(3) The word "caution" or stronger wording must be placed on the mower at or near each discharge opening.

(4) Blade(s) must stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-22012 (~~What rules apply to~~) Walk-behind rotary mowers((?)).** (1) The horizontal angle of the grass discharge opening(s) in the blade enclosure must not contact the operator area.

(2) There must be one of the following at all grass discharge openings:

(a) A minimum of 3 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(3) The highest point(s) on the blade enclosure front, except discharge-openings, must be a maximum of 1-1/4 inches above the lowest blade position. Mowers with a swingover handle are considered to have no front in the blade enclosure and therefore must comply with WAC 296-307-22009(1).

(4) The mower handle must be fastened to the mower to prevent loss of control by unintentional uncoupling while in operation.

(5) Mower handles must be locked in the normal operating position(s) so that they cannot be accidentally disengaged during normal mower operation.

(6) A swingover handle must meet the requirements of this section.

(7) Wheel drive disengaging controls, except deadman controls, must move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls may operate in any direction to disengage the drive.

(8) ((You)) The employer must ensure that each walk-behind rotary mower has a positive constant-pressure device that requires the operator to hold the device in the "on" position to operate the mower. Using rope or string or other material to tie the constant pressure device in the "on" position is prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22015 (~~What rules apply to~~) Riding rotary mowers((?)).** (1) The highest point(s) of all openings in the blade enclosure front must be a maximum of 1 1/4 inches above the lowest blade position.

(2) Opening(s) must not allow grass or debris to discharge directly toward the operator seated in normal operator position.

(3) There must be one of the following at all grass discharge openings:

(a) A minimum of 6 inches between the end of the discharge chute and the blade tip circle; or

(b) A rigid bar fastened across the discharge opening secured to prevent removal without the use of tools. The bottom of the bar must be no higher than the bottom edge of the blade enclosure.

(4) Mowers must have stops to prevent jackknifing or locking of the steering mechanism.

(5) The mower must have brakes.

(6) Hand-operated wheel drive disengaging controls must move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls must be depressed to disengage the drive. Deadman controls, both hand and foot operated, may operate in any direction to disengage the drive.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22503 (~~What~~) Definitions that apply to this section((?)).** ((<sup>u</sup>)) Jack((<sup>u</sup> means)), An appliance for lifting and lowering or moving horizontally a load using a pushing force.

**Note:** Jack types include lever and ratchet, screw, and hydraulic.

((<sup>u</sup>)) Rating((<sup>u</sup> means)), The maximum working load for which a jack is designed to lift the load safely throughout its travel.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-22506 (~~How shall~~) The rated load must be marked on a jack((?)).** (1) The operator must make sure that the jack used has a load rating sufficient to lift and sustain the load.

(2) The rated load must be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means.

**Note:** ((You)) The operator should follow the manufacturer's specifications to raise the rated load of a jack.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-22509 (~~What rules apply to the~~) Operation and maintenance of jacks((?)).** (1) If the foundation is not firm, ((you)) the operator must block the base of the jack. If the cap might slip, ((you)) the operator must place a block in between the cap and the load.

(2) The operator must watch the stop indicator, which must be kept clean, in order to determine the limit of travel. The indicated limit must not be overrun.

(3) After the load has been raised, it must immediately be cribbed, blocked, or otherwise secured. Working under a load raised only with jacks is prohibited.

(4) Hydraulic jacks exposed to freezing temperatures must be supplied with an adequate antifreeze liquid.

(5) All jacks must be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by the manufacturer should be used.

(6) ~~((Y0u))~~ The operator must ensure that each jack is thoroughly inspected according to the service conditions and at least:

(a) For constant or intermittent use at one locality, once every 6 months;

(b) For jacks sent out of shop for special work, when sent out and when returned;

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(7) Repair or replacement parts must be examined for possible defects.

(8) Jacks that are out of order must be tagged, and not be used until repaired.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-230** ~~((What are the))~~ General requirements for materials handling and storage ~~((?))~~. (1) Safe clearances of three feet must be allowed for aisles, loading docks, doorways, and wherever turns or passage must be made. Passageways must be kept clear and in good repair, with no obstructions.

(2) Bags, bales, boxes, and other containers stored in tiers must be made secure against sliding or collapse.

(3) Storage areas must be kept free from any accumulation of materials that could cause tripping, fire, or explosion.

(4) Employees must be instructed in proper lifting or moving techniques and methods. Mechanical devices or assistance in lifting must be used when moving heavy objects.

(5) When removing material stored in piles, employees must remove material in a manner that maintains the stability of the pile and prevents collapse.

(6) Storage areas must have proper drainage.

(7) ~~((Y0u))~~ The employer must provide clearance signs to warn of clearance limits.

(8) For powered industrial truck (forklift) requirements, see WAC 296-307-520.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-232** ~~((What requirements apply to))~~ Conveyors ~~((?))~~. Conveyors must be constructed, operated, and maintained according to ANSI B 20.1-1957.

(1) When the return strand of a conveyor operates within seven feet of the floor, there must also be a trough strong enough to carry the weight resulting from a broken chain.

(2) If the strands are over a passageway, a means must be provided to catch and support the ends of the chain in the event of a break.

(3) When the working strand of a conveyor crosses within three feet of the floor level in passageways, a bridge must be provided for employees to cross over the conveyor.

(4) Whenever conveyors pass adjacent to or over working areas or passageways, protective guards must be installed. These guards must be designed to catch and hold any load or materials that may fall off or dislodge and injure an employee.

(5) Employees must be prohibited from walking on the rolls of roller-type conveyors. If employees must walk on roller-type conveyors because of an emergency, the conveyor must be shut off first.

(6) Guards, screens, or barricades that are strong enough to prevent material from falling must be installed on all sides of the shaftway of elevator-type conveyors except at openings where material is loaded or unloaded. Automatic shaftway gates or suitable barriers must be installed at each floor level where material is loaded or unloaded from the platform.

(7) Conveyors must have an emergency stopping device that can be reached from the conveyor. The device must be located near the material entrance to each chopper, mulcher, saw, or similar equipment. The device must be located so that it can stop the conveyor before an employee enters the point of operation of the machine fed by the conveyor.

**Exception:** The emergency stopping device is not required where the conveyor leading into the equipment is under constant control of an operator with full view of the material entrance and the conveyor is located where the operator cannot fall onto it.

(8) Where conveyors are over seven feet high, means must be provided to safely permit essential inspection and maintenance operations.

(9) Any part showing signs of significant wear must be inspected carefully and replaced before it creates a hazard.

(10) Replacement parts must be equal to or exceed the manufacturer's specifications.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24001** ~~((Must an))~~ The employer must comply with state health regulations ~~((?))~~. ~~((Y0u))~~ The employer must comply with the rules and regulations of the state board of health governing sanitation in the workplace. We enforce these regulations according to RCW 43.20.050.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-24003** ~~((What does this section cover?))~~ Scope. WAC 296-307-240 covers sanitation for employees who normally work in fixed, indoor places of agricultural employment.

~~((A-))~~ Fixed, indoor workplace ~~((-is))~~. One where the employees perform a majority of their duties at that site.

This does not cover field employees who only occasionally enter a shop or other farm building as part of their normal



duties. Field employees are covered by the field sanitation requirements of WAC 296-307-095.

This section does not cover measures for the control of toxic materials.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24006** ~~((What))~~ **Definitions that apply to this section** ~~((?))~~, ~~((=))~~ **Lavatory** ~~((= means))~~, A basin used exclusively for washing hands, arms, face, and head.

~~((=))~~ **Personal service room** ~~((= means))~~, A room used for activities not directly connected with the business function of the employer. Such activities include, but are not limited to, first aid, medical services, dressing, showering, toilet use, washing, and eating.

~~((=))~~ **Potable water** ~~((= means))~~, Water that meets state or local quality standards for drinking water, or water that meets the quality standards of the Environmental Protection Agency's "National Interim Primary Drinking Water Regulations," published in 40 C.F.R., Part 141, and 40 C.F.R. 147.2400.

~~((=))~~ **Toilet facility** ~~((= means))~~, A fixture maintained within a toilet room for the purpose of defecation or urination, or both.

~~((=))~~ **Toilet room** ~~((= means))~~, A room maintained within or on the premises of any place of employment, containing toilet facilities for employee use.

~~((=))~~ **Toxic material** ~~((= means))~~, A material that exceeds a regulatory limit (such as in chapter 296-62 WAC), or toxicity that causes or is likely to cause death or serious physical harm.

~~((=))~~ **Urinal** ~~((= means))~~, A toilet facility maintained within a toilet room for the sole purpose of urination.

~~((=))~~ **Water closet** ~~((= means))~~, A toilet facility maintained within a toilet room for the purpose of both defecation and urination and which is flushed with water.

~~((=))~~ **Wet process** ~~((= means))~~, Any process or operation in a workroom that normally results in walking or standing surfaces becoming wet.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24009** ~~((What))~~ **Housekeeping requirements that apply to fixed, indoor workplaces** ~~((?))~~, (1) ~~((You))~~ The employer must ensure that all places of employment are kept clean to the extent that the work allows.

(2) ~~((You))~~ The employer must ensure that the floor of every workroom is kept as dry as possible. Where wet processes are used, ~~((you))~~ the employer must maintain drainage. ~~((You))~~ The employer must provide false floors, platforms, mats, or other dry standing places where practical, or provide appropriate waterproof footwear.

(3) To facilitate cleaning, every floor, working place, and passageway must be kept free from protruding nails, splinters, loose boards and unnecessary holes and openings.

(4) Cleaning and sweeping must be done to minimize dust in the air and when practical, done outside of working hours.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24012** ~~((How must the))~~ **Maintenance of potable water supply** ~~((be maintained?))~~, (1) ~~((You))~~ A common drinking cup and other common utensils are prohibited.

(2) The employer must provide potable water in all places of employment, for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, and for personal service rooms.

~~((=))~~ (3) Potable drinking water dispensers must be maintained in sanitary condition, be closeable, and have a tap.

~~((=))~~ (4) Open containers for drinking water from which the water must be dipped or poured, even if fitted with a cover, are prohibited.

~~((=))~~ ~~(4) A common drinking cup and other common utensils are prohibited.~~

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24015** ~~((How must the))~~ **Maintenance of nonpotable water supply** ~~((be maintained?))~~, (1) ~~((You))~~ The employer must ensure that nonpotable water is marked as unsafe and is not used for drinking, washing of the person, cooking, washing food, washing cooking or eating utensils, washing food preparation or processing premises, or personal service rooms, or for washing clothes.

(2) Nonpotable water used for cleaning any other work premises must be free of concentrations of chemicals, fecal coliform, or other substances that could create unsanitary conditions or be harmful to employees.

(3) Nonpotable water systems or systems carrying any other nonpotable substance must be constructed to prevent backflow or backsiphonage into a potable water system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24018** ~~((What))~~ **Toilet facilities** ~~((must an employer provide?))~~, (1) ~~((You))~~ The employer must provide toilet facilities, with separate toilet rooms for each sex, according to the requirements in the table below. ~~((You))~~ The employer must provide facilities for each sex based on the number of employees of that sex for whom facilities are furnished.

(2) Where single-occupancy rooms have more than one toilet facility, only one facility in each toilet room counts toward these requirements.

In this table, "number of employees" means the maximum number of employees present at any one time on a regular shift.

Number of employees	Minimum number of water closets
1 to 15	1
16 to 35	2

Number of employees	Minimum number of water closets
36 to 55	3
56 to 80	4
81 to 110	5
111 to 150	6
Over 150	One additional fixture for each additional 40 employees

(3) Where toilet rooms are occupied by one person at a time, can be locked from the inside, and contain at least one water closet, separate toilet rooms for each sex need not be provided.

(4) Where toilet facilities will not be used by women, urinals may be provided instead of water closets, except that the number of water closets must not be less than 2/3 of the minimum specified.

(5) The sewage disposal method must not endanger the health of employees.

(6) Toilet paper with holder must be provided for every water closet.

(7) Each water closet must occupy a separate compartment with a door and walls or partitions between fixtures high enough to ensure privacy.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24021** ~~((What)) Employer provided washing facilities ((must an employer provide?)).~~ ~~((You))~~ The employer must provide facilities for maintaining personal cleanliness in the workplace. The facilities must be convenient for employees and maintained in a sanitary condition.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24024** ~~((What requirements apply to))~~ Lavatories ~~((?)).~~ (1) ~~((You))~~ The employer must ensure that lavatories are available in all workplaces.

(2) Each lavatory must have hot and cold running water, or tepid running water.

(3) ~~((You))~~ The employer must provide hand soap or similar cleansing agent.

(4) ~~((You))~~ The employer must provide individual hand towels, warm air blowers, or clean individual sections of continuous cloth toweling convenient to the lavatories.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24027** ~~((When must an))~~ Employer ~~((provide))~~ provided change rooms ~~((?)).~~ (1) Whenever employees are required by a WISHA standard to wear protective clothing because of the possibility of contamination with toxic materials, ~~((you))~~ the employer must provide change

rooms with separate storage facilities for street clothes and for the protective clothing.

(2) If ~~((you))~~ the employer provides work clothes for employees, they must be dry.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24030** ~~((What requirements apply to))~~ Consumption of food and beverages in the workplace ~~((?)).~~ (1) This section applies to workplaces where employees may consume food, beverages, or both on the premises.

(2) No employee may consume food or beverages in a toilet room nor in any area exposed to a toxic material.

(3) If ~~((your))~~ the workplace exposes employees to injurious dusts or other toxic materials, ~~((you))~~ the employer must provide a separate lunchroom unless it is convenient for employees to lunch away from the premises. The size of the lunchroom must be based on the maximum number of persons using the room at one time, according to the following table.

Number of persons	Square feet per person
25 and less	13
26 - 74	12
75 - 149	11
150 and over	10

(4) ~~((You))~~ The employer must provide receptacles of smooth, corrosion resistant, easily cleanable, or disposable materials for the disposal of waste food. ~~((You))~~ The employer must provide enough receptacles to encourage their use and to prevent overfilling. Receptacles must be emptied at least once a working day and maintained in sanitary condition. Receptacles must have a solid tight-fitting cover unless sanitary condition can be maintained without a cover.

(5) No food or beverages may be stored in toilet rooms or in an area exposed to toxic material.

(6) All employee food service facilities and operations must follow sound hygienic principles. If all or part of the food service is provided, the food dispensed must be wholesome and free from spoilage. Food must be processed, prepared, handled, and stored so as to prevent contamination.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24033** ~~((How must waste be stored and removed?))~~ Waste storage and removal. (1) ~~((You))~~ The employer must ensure that any receptacle used for waste or garbage that may rot is constructed so that it does not leak and can be thoroughly cleaned and maintained in a sanitary condition. A receptacle must have a solid tight-fitting cover, unless it can be maintained in a sanitary condition without a cover. Receptacles designed to maintain sanitary condition may be used in place of this requirement.

(2) All sweepings, solid or liquid wastes, refuse, and garbage must be removed to avoid creating a health menace, and as often as necessary to maintain the workplace in a sanitary condition.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-24036** (~~When must an~~) **Employer** (~~have a~~) **vermin control programs**(~~?~~). Every building with personal service, food preparation, or eating rooms must be constructed, equipped, and maintained to restrict infestation by rodents, insects, and other vermin. (~~You~~) The employer must have a continuing and effective extermination program where vermin are present.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28002** (~~What~~) **Power transmission belts** (~~are~~) **covered by this section**(~~?~~). WAC 296-307-280 covers all types and shapes of power transmission belts.

**Exception:** The following power transmission belts are exempt from WAC 296-307-280 when operating at 250 feet per minute or less:

- (1) Flat belts that are one inch wide or less.
- (2) Flat belts that are 2" wide or less and are free from metal lacings or fasteners.
- (3) Round belts that are 1/2" in diameter or less.
- (4) Single strand V-belts that are 13/32" wide or less.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28004** (~~What does "~~) **Definition of guarded by location**(~~" mean?~~) (~~"~~) **Guarded by location**(~~" means~~). That the location of a component eliminates potential hazards. A component seven feet or more above a working surface is considered guarded by location.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28006** (~~What~~) **General requirements that apply to machine guarding**(~~?~~). (1) All power transmission components must be guarded according to the requirements of this section.

(2) (~~You~~) The employer must protect employees from coming into contact with moving machinery parts by:

- (a) A guard or shield or guarding by location; or
- (b) A guardrail or fence whenever a guard or shield or guarding by location is infeasible.
- (3) Strength and design of guards.
  - (a) Guards must be designed and located to prevent inadvertent contact with the hazard.
  - (b) Unless otherwise specified, each guard and its supports must be strong enough to withstand the force that a 250 pound person would exert leaning on or falling against the guard.
  - (c) Guards must be securely fastened to the equipment or building.

(4) A guard or shield on stationary equipment must be provided at the mesh point or pinch point where the chain or belt contacts the sprocket or pulley.

(5) Machines that will throw stock, material, or objects must be covered or provided with a device designed and constructed to minimize this action. (Machines such as rip saws, rotary mowers and beaters, rotary tillers are included in this classification.)

(6) For requirements relating to the control of hazardous energy (lockout-tagout) see WAC 296-307-320.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28014** (~~What~~) **Requirements that apply to prime-mover guards**(~~?~~). (~~"~~) **Flywheels**(~~"~~). Include flywheels, balance wheels, and flywheel pulleys mounted and revolving on crankshaft of engine or other shafting.

(~~"~~) **Prime movers**(~~"~~). Include steam, gas, oil, and air engines, motors, steam and hydraulic turbines, and other equipment used as a source of power.

(1) Unless guarded by location, flywheels must be guarded according to the following requirements:

(a) Guard enclosures are made of sheet, perforated, or expanded metal, or woven wire.

(b) Guard rails are between 15 and 20 inches from the rim. When a flywheel extends into a pit or is within 12 inches of the floor, a standard toeboard is provided.

(c) When the upper rim of a flywheel extends through a working floor, it is surrounded by a guardrail and toeboard.

(d) Exception: When a flywheel with a smooth rim 5 feet or less in diameter cannot be guarded by the above methods, (~~you~~) the employer must guard by meeting the following requirements:

On the exposed side, cover the flywheel spokes with a disk that makes a smooth surface and edge, and provides for inspection. (~~You~~) The employer may leave an open space, less than 4 inches wide, between the outside edge of the disk and the rim of the wheel, to turn the wheel over. If (~~you use~~) a disk is used, keys or other projections left uncovered by the projections (~~shall~~) must be cut off or covered.

**Note:** This exception does not apply to flywheels with solid web centers.

(e) At the flywheel of a gas or oil engine, (~~you~~) the employer may provide an adjustable guard for starting the engine or for running adjustment. A slot opening for a jack bar is permitted.

(f) For flywheels above working areas, (~~you~~) the employer must install guards that are strong enough to hold the weight of the flywheel if the shaft or wheel mounting fails.

(2) Cranks and connecting rods, when exposed to contact, must be guarded according to WAC 296-307-28046 and 296-307-28048, or by a guardrail according to WAC 296-307-28060.

(3) Tail rods or extension piston rods must be guarded according to WAC 296-307-28046 and 296-307-28048, or by a guardrail on the sides and end, with a clearance of between 15 and 20 inches when rod is fully extended.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28016** (~~What requirements apply to~~) **Guarding shafting**(~~(?)~~). Revolving shafts must be guarded by a standard safeguard unless guarded by location.

(1) All shafting must be secured against excessive end movement.

(2) Guarding horizontal shafting.

(a) Unless guarded by location, all exposed parts of horizontal shafting, must be enclosed in a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires.

(b) Shafting under bench machines must be enclosed by a guard that covers the shafting completely or by a trough that covers the sides and top or sides and bottom of the shafting as location requires. The sides of the trough must extend to at least 6 inches from the underside of table. If shafting is near the floor, the trough must extend to at least 6 inches from the floor. In every case, the sides of trough must extend at least 2 inches beyond the shafting or projection.

**Exception:** Maintenance runways are exempt from this requirement. "Maintenance runway" means any permanent runway or platform used for oiling, maintenance, running adjustment, or repair work, but not for passageway.

(3) Unless guarded by location, vertical and inclined shafting must be enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

**Exception:** Maintenance runways are exempt from this requirement.

(4) Projecting shaft ends.

(a) Projecting shaft ends must have a smooth edge and end and must not project more than one-half the diameter of the shaft unless guarded by nonrotating caps or safety sleeves.

(b) Unused keyways must be filled up or covered.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28018** (~~What requirements apply to~~) **Guarding pulleys**(~~(?)~~). (1) Unless guarded by location, pulleys must be guarded according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060. Pulleys serving as balance wheels (e.g., punch presses) on which the point of contact between belt and pulley is more than 6 feet 6 inches from the floor or platform may be guarded with a disk covering the spokes.

(2) If the distance to the nearest fixed pulley, clutch, or hanger is equal to or less than the width of the belt, then ~~((you))~~ **the employer** must provide a guide to prevent the belt from leaving the pulley on the side where insufficient clearance exists.

(3) Where there are overhanging pulleys on line, jack, or countershafts with no bearing between the pulley and the outer end of the shaft, ~~((you))~~ **the employer** should provide a guide to prevent the belt from running off the pulley.

(4) Pulleys with cracks, or pieces broken out of rims are prohibited.

(5) Pulleys must be designed and balanced for the operating speed.

(6) Composition or laminated wood pulleys must not be installed where they are likely to deteriorate.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28020** (~~What requirements apply to~~) **Guarding horizontal belt, rope, and chain drives**(~~(?)~~). ~~(( ))~~**Belts**(~~(( ))~~). Include all power transmission belts, such as flat belts, round belts, V-belts, etc., unless otherwise specified.

(1) Where both runs of horizontal belts are 7 feet or less from the floor level, the guard must extend to at least 15 inches above the belt or to a standard height. (See Table P-1.)

**Exception:** Where both runs of a horizontal belt are 42 inches or less from the floor, the belt must be fully enclosed according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060.

(2) In power development rooms, a guardrail may be used instead of the guard.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28022** (~~What requirements apply to~~) **Guarding overhead horizontal belt, rope, and chain drives**(~~(?)~~). (1) Unless guarded by location, overhead horizontal belts must be guarded on the sides and bottom according to WAC 296-307-28054.

(2) Unless guarded by location, horizontal overhead belts must be guarded for their entire length when:

(a) Located over passageways or work places and traveling 1,800 feet or more per minute.

(b) The center to center distance between pulleys is 10 feet or more.

(c) The belt is 8 inches wide or more.

(3) Where the upper and lower runs of horizontal belts are located so that employees can pass between them, the passage must be either:

(a) Completely barred according to WAC 296-307-28046 and 296-307-28050 through 296-307-28060; or

(b) In a passage that employees must use, there must be a platform over the lower run guarded on either side by a railing that is completely filled in with wire mesh or other filler, or by a solid barrier. The upper run must be guarded to prevent contact by the employee or by objects carried by the employee.

(4) Overhead chain and link belt drives must be guarded according to the same requirements as overhead horizontal belts.

(5) American or continuous system rope drives located where the condition of the rope (particularly the splice) cannot be constantly and conveniently observed, must have an alarm (preferably electric-bell type) that will warn when the rope begins to fray.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28024 (~~What requirements apply to~~) Guarding vertical and inclined belts(?)** (1) Vertical and inclined belts must be guarded according to WAC 296-307-28044 and 296-307-28050 through 296-307-28060.

(2) All guards for inclined belts must provide a minimum clearance of 7 feet between belt and floor at any point outside of the guard.

(3) A vertical or inclined belt may be guarded with a nip-point belt and pulley guard, if it is:

- (a) 2-1/2 inches wide or less;
- (b) Running at a speed of less than one thousand feet per minute; and
- (c) Free from metal lacings or fastenings.

(~~(4)~~) **Nip-point belt and pulley guard**(~~"means"~~), A device that encloses the pulley and has rounded or rolled edge slots through which the belt passes.

(4) Vertical belts running over a lower pulley more than seven feet above floor or platform must be guarded according to the same requirements as horizontal overhead belts, if the belt is:

- (a) Located over passageways or work places and traveling 1,800 feet or more per minute;
- (b) Eight inches wider or more.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28026 (~~What requirements apply to~~) Guarding cone-pulley belts(?)** (1) The cone belt and pulley must have a belt shifter that adequately guards the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point must be protected by a vertical guard in front of the pulley that extends at least to the top of the largest step of the cone.

(~~(2)~~) **Belt shifter**(~~"means"~~), A device for mechanically shifting belts from tight to loose pulleys or vice versa, or for shifting belts on cones of speed pulleys.

(2) If the belt is endless or laced with rawhide laces, and no belt shifter is used, the belt may be guarded according to the following:

- (a) The nip point of the belt and pulley is protected by a nip point guard in front of the cone;
- (b) The guard extends at least to the top of the largest step of the cone; and
- (c) The guard is formed to show the contour of the cone.

(3) If the cone is less than 3 feet from the floor or working platform, the cone pulley and belt must be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28028 (~~What requirements apply to~~) Guarding belt tighteners(?)** (1) Suspended counterbalanced belt tighteners and all components must be substantially constructed and securely fastened. The bearings must

be securely capped. (~~You~~) The employer must provide a mechanism to prevent the tightener from falling in case the belt breaks.

(2) Unless guarded by location, suspended counterweights must be encased to prevent accident.

(3) Belt tighteners used for starting and stopping machinery, unless held by gravity in the "off" or "out of service" position, must have a mechanism that will hold the belt tightener away from the belt when not in use. The mechanism must automatically grip, latch or otherwise fasten itself to and hold the belt tightener in "off" or "out of service" position until released by hand.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28030 (~~What requirements apply to~~) Guarding gears, sprockets, and chains(?)** (1) Gears must be guarded by one of the following methods:

- (a) A complete enclosure; or
- (b) A standard guard according to WAC 296-307-28050 through 296-307-28060, at least 7 feet high extending 6 inches above the mesh point of the gears; or
- (c) A band guard covering the face of gear. The guard must have flanges extended inward beyond the root of the teeth on the exposed side or sides. If a part of the train of gears guarded by a band guard is less than 6 feet from the floor, the gear must be guarded by a disk guard or by a complete enclosure at least 6 feet tall.

(2) Hand-operated gears used only to adjust hand-powered machine parts may be unguarded. However, we recommend guarding these gears.

(3) Unless guarded by location, all sprocket wheels and chains must be enclosed. Where the drive extends over other machine or working areas, (~~you~~) the employer must provide protection against falling parts.

**Exception:** This section does not apply to manually operated sprockets.

(4) When gears require frequent oiling, (~~you~~) the employer must provide openings with hinged or sliding closing covers. All points not readily accessible must have oil feed tubes if lubricant is added while machinery is in motion.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28032 (~~What requirements apply to~~) Guarding friction drives(?)** When exposed to contact, the driving point of all friction drives must be guarded. All arm or spoke friction drives and all web friction drives with holes in the web must be entirely enclosed. When exposed to contact, all projecting belts on friction drives must be guarded.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28034 (~~What requirements apply to~~) Guarding keys, set screws, and other projections(?)** (1) All projecting keys, set screws, and other projections in

revolving parts must be removed, or made flush, or guarded by metal covers.

(2) Projections, such as exposed bolts, keys, or set screws that are part of sprockets, grooved pulleys or pulleys on stationary equipment must be shielded unless guarded by location.

**Exception:** This section does not apply to keys or set screws within gear or sprocket casings or other enclosures, nor to keys, set screws, or oilcups in hubs of pulleys less than 20 inches in diameter where they are within the plane of the rim of the pulley.

**Note:** We recommend that you not use projecting set screws or oilcups in any revolving pulley or part of machinery.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28036** (~~What requirements apply to~~) **Guarding collars and couplings**(~~(?)~~). (1) All revolving collars, including split collars, must be cylindrical.

(2) Screws or bolts used in collars must not project beyond the largest periphery of the collar.

~~((?)~~) (3) Shaft couplings must be constructed to prevent hazard from bolts, nuts, set screws, or revolving surfaces. Bolts, nuts, and set screws are permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or where they do not extend beyond the flange of the coupling.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28038** (~~Must~~) **Self-lubricating bearings** (~~be used?~~). (~~We recommend that you~~) The department recommends the employer use self-lubricating bearings. All drip cups and pans must be securely fastened.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28040** (~~What requirements apply to~~) **Guarding clutches, cutoff couplings, and clutch pulleys**(~~(?)~~). (1) Unless guarded by location, clutches, cutoff couplings, or clutch pulleys with projecting parts must be enclosed by a stationary guard constructed according to WAC 296-307-28046. (~~You~~) The employer may use a "U" type guard.

(2) In engineer rooms, a guardrail, preferably with toe-board, may be used instead of the guard if the room is only occupied by engineer room attendants.

(3) A bearing support next to a friction clutch or cutoff coupling must have self-lubricating bearings that require infrequent maintenance.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28042** (~~What requirements apply to~~) **Guarding belt shifters, clutches, shippers, poles, perches, and fasteners**(~~(?)~~). (~~(=)~~) **Belt pole**(~~(=)~~) (sometimes called a (~~(=)~~) **belt shipper**(~~(=)~~) or (~~(=)~~) **shipper pole**(~~(=)~~ means)). A

device used in shifting belts on and off fixed pulleys on line or countershaft where there are no loose pulleys.

(1) Tight and loose pulleys must have a permanent belt shifter with a mechanical means to prevent the belt from creeping from loose to tight pulley.

(2) Belt shifter and clutch handles must be rounded. They must be as far as possible from danger of accidental contact, but within easy reach of the operator. Where belt shifters are not directly over a machine or bench, the handles must be cut off 6 feet 6 inches above floor level.

(3) All belt and clutch shifters of the same type in each shop should move in the same direction to stop machines, i.e., either all right or all left.

**Exception:** This requirement does not apply to a friction clutch on a countershaft carrying two clutch pulleys with open and crossed belts. In this case the shifter handle has three positions and the machine is at a standstill when the clutch handle is in the neutral or center position.

(4) When belt poles must be used as a substitute for mechanical shifters, they must be big enough for employees to grasp them securely. Poles must be smooth and preferably of straight grain hardwood, such as ash or hickory. The edges of rectangular poles should be rounded. Poles should extend from the top of the pulley to within approximately 40 inches of the floor or working platform.

(5) Where loose pulleys or idlers are not practical, belt perches such as brackets, rollers, etc., must be used to keep idle belts away from the shafts. Perches should be substantial and designed for safe belt shifting.

(6) Belts that must be shifted by hand and belts within seven feet of the floor or working platform that are not guarded according to WAC 296-307-28046 must not be fastened with metal, nor with any other fastening that creates a hazard.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28044** (~~What materials must be used for~~) **Materials required to use standard guards**(~~(?)~~). (1) Standard guards must be made of the following materials:

- (a) Expanded metal;
- (b) Perforated or solid sheet metal;
- (c) Wire mesh on a frame of angle iron; or
- (d) Iron pipe securely fastened to the floor or the frame of the machine.

(2) Wire mesh should have wires that are securely fastened at every cross point either by welding, soldering, or galvanizing.

**Exception:** Diamond or square wire mesh made of No. 14 gauge wire, 3/4-inch mesh or heavier is exempt from this requirement.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28046** (~~How must~~) **Manufacturing standard guards** (~~be manufactured?~~). (1) Guards must be free from burrs, sharp edges, and sharp corners.

(2) Expanded metal, sheet or perforated metal, and wire mesh must be securely fastened to the frame by one of the following methods:

(a) Rivets or bolts spaced not more than five inches center to center. In case of expanded metal or wire mesh, metal strips or clips must be used to form a washer for rivets or bolts.

(b) Welding to frame every four inches.

(c) Weaving through channel or angle frame, or, if No. 14 gauge 3/4-inch mesh or heavier is used, by bending entirely around rod frames.

(d) To fill openings in pipe railing with expanded metal, wire mesh, or sheet metal, make the filler material into panels with rolled edges or edges bound with "V" or "U" edging. The edging must be of at least No. 24 gauge sheet metal fastened to the panels with bolts or rivets spaced a maximum of 5 inches center to center. The bound panels must be fastened to the railing by sheet-metal clips spaced a maximum of 5 inches center to center.

(e) Diamond or square mesh made of crimped wire fastened into channels, angle iron, or round-iron frames may also be used as a filler in guards. Size of mesh must correspond to Table P-1.

(3) Where guard design requires filler material greater than 12 square feet, additional frame members must be provided to ensure that the panel area is a maximum of 12 square feet.

(4) All joints of framework must be as strong as the material of the frame.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28048 (~~What requirements apply to~~) Disk, shield, and U-guards(?)**. (1) A disk guard must have a sheet-metal disk of at least No. 22 gauge fastened by U-bolts or rivets to the spokes of pulleys, flywheels, or gears. To prevent contact with sharp edges of the disk, the edge must be rolled or wired. In all cases, the nuts must have locknuts on the unexposed side of the wheel.

(2) A shield guard must have a frame filled in with wire mesh or expanded, perforated, or solid sheet metal.

(3) If the shield area is less than six square feet, the wire mesh or expanded metal may be fastened in a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or a metal construction of equivalent strength. Metal shields may have edges entirely rolled around a 3/8-inch solid iron rod.

(4) A U-guard consisting of a flat surface with edge members must cover the under surface and lower edge of a belt, multiple chain, or rope drive. It must be constructed of materials specified in Table P-1, and must meet the requirements of WAC 296-307-28054 through 296-307-28058. Edges must be smooth and, if the size of the guard requires, be reinforced by rolling, wiring, or by binding with angle or flat iron.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28050 (~~What~~) Materials (~~(must be)~~) used for guards(?)**. The materials and dimensions specified in this section apply to all guards. The materials and dimensions specified are minimum requirements. (~~(You)~~) The employer may choose to provide stronger guards.

**Exception:** Horizontal overhead belts, rope, cable, or chain guards more than 7 feet above floor, or platform must meet the requirements outlined in Table P-2.

(1) The framework of all guards must have minimum dimensions of 1-inch by 1-inch by 1/8-inch for angle iron, 3/4-inch inside diameter for metal pipe, or metal construction of equivalent strength.

**Exception:** Guards thirty inches tall or less with a total surface area of ten square feet or less may have a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron, or metal construction of equivalent strength. The filling material must correspond to the requirements of Table 1.

(a) All guards must be rigidly braced every 3 feet of their height to some fixed part of machinery or building structure. Where a guard is exposed to contact with moving equipment additional strength may be necessary.

(b) The framework for all guards fastened to the floor or working platform and without other support or bracing must consist of 1-1/2-inch by 1-1/2-inch by 1/8-inch angle iron, metal pipe of 1-1/2-inch inside diameter, or metal construction of equivalent strength. All rectangular guards must have at least four upright frame members that extend to the floor and are securely fastened. Cylindrical guards must have at least three supporting members that extend to the floor.

(2) Where guards are exposed to unusual wear, deterioration, or impact, heavier material and construction should be used to protect against the specific hazards involved.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28052 (~~When may~~) Wood guards (~~(be used?)~~)**. Wood guards may be used where fumes would cause rapid deterioration of metal guards and outdoors where extreme cold or extreme heat make metal guards and railings undesirable.

(1) Wood must be sound, tough, and without loose knots.

(2) Guards must be made of planed lumber not less than 1-inch rough board measure, with rounded edges and corners.

(3) Wood guards must be securely fastened together with wood screws, hardwood dowel pins, bolts, or rivets.

(4) Wood guards must be equal in strength and rigidity to metal guards specified in WAC 296-307-28050 and Table P-1.

**Note:** Requirements for the construction of standard wood railings are in WAC 296-307-28060.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28054 ((What)) Materials ((may be)) used for guarding horizontal overhead belts((?)).** (1) Guards for horizontal overhead belts must run the entire length of the belt and follow the line of the pulley to the ceiling or extend to the nearest wall.

**Exception:** Where belts are located so that it is impractical to extend the guard to wall or ceiling, the guard must completely enclose the top and bottom runs of the belt and the face of pulleys.

(2) The guard and its supporting parts must be securely fastened to the wall or ceiling by gimlet-point lag screws or through bolts. In masonry, expansion bolts must be used. We recommend using bolts placed horizontally through floor beams or ceiling rafters.

(3) When necessary, suitable reinforcement must be provided for the ceiling rafters or overhead floor beams to sustain safely the weight and stress imposed by the guard.

(4) The interior surface of all guards must be smooth and free from projections.

**Exception:** Where construction demands it, protruding shallow roundhead rivets may be used.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28056 ((What)) Clearance ((must be)) maintained between guards and power transmission machinery((?)).** (1) Overhead belt guards must be at least one-quarter wider than the belt they protect, with a maximum clearance of 6 inches on each side. Overhead rope-drive and block and roller-chain-drive guards must be at least ~~((six))~~ 6 inches wider than the drive on each side.

(2) Overhead silent chain-drive guards with the chain held on sprockets must have side clearance of:

(a) On drives of 20-inch centers or less, at least 1/4 inch from the nearest moving chain part, and

(b) On drives of over 20-inch centers, a minimum of 1/2 inch from the nearest moving chain part.

(3) Table 2 gives the sizes of materials and construction specifications for guards for belts that are 10 inches wide or more. All materials for overhead belt guards must be at least the size specified in Table 2 for belts 10 to 14 inches wide, even if the overhead belt is less than 10 inches wide. However, No. 20 gauge sheet metal may be used as a filler on guards for belts less than 10 inches wide. Expanded metal, because of the sharp edges, should not be used as a filler in horizontal belt guards.

(4) For clearance between guards and belts, ropes, or chains see Table P-2.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28058 ((How must)) Construction of overhead rope and chain-drive guards ((be constructed?)).** (1) Overhead-rope and chain-drive guard construction must meet the requirements for overhead-belt guard construction of similar width.

**Exception:** The filler material must be solid, according to Table P-2, unless fire hazard demands the use of open construction.

(2) A side guard member of the same solid filling material should extend 2 inches above the level of the lower run of the rope or chain drive and 2 inches within the periphery of the pulleys that the guard encloses, forming a trough.

(3) The side filler members should be reinforced on the edges with 1-1/2-inch by 1/4-inch flat steel, riveted to the filling material at 8 inch centers or less. The reinforcing strip should be fastened or bolted to all guard supporting members with at least one 3/8-inch rivet or bolt at each intersection, and the ends should be secured to the ceiling with lag screws or bolts.

(4) The filling material must be fastened to the framework of the guard and the filler supports by 3/16-inch rivets spaced on 4-inch centers. Measure the width of a multiple drive from the outside of the first to the outside of the last rope or chain in the group accommodated by the pulley.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-28060 ((What)) Materials ((must be)) used for guardrails and toeboards((?)).** (1) A guardrail used to guard power transmission parts must be 42 inches tall, with a midrail between the top rail and the floor.

(2) Posts must be 8 feet apart or less. They must be permanent and substantial, smooth, and free from protruding nails, bolts, and splinters. If made of pipe, the post must be at least 1-1/4 inches inside diameter. If posts are made of metal shapes or bars, the section must be as strong as posts made of 1-1/2 by 1-1/2 by 3/16-inch angle iron. If posts are made of wood, the posts must be at least 2 by 4 inches. The upper rail must be 2 by 4 inches, or two 1 by 4 inch strips, one at the top and one at the side of the posts. The midrail must be at least 1 by 4 inches.

(3) The rails (metal shapes, metal bars, or wood), should be on the side of the posts that gives the best protection and support. Where panels are fitted with expanded metal or wire mesh (as noted in Table 1) the middle rails may be omitted. Where guard is exposed to contact with moving equipment, additional strength may be necessary.

(4) Toeboards must be at least 4 inches tall, of wood, metal, or metal grill of a maximum 1-inch mesh. Toeboards at flywheel pits should be placed as close to edge of the pit as possible.



Table P-1  
TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points (inches)	Largest mesh or opening allowable (inches)	Minimum gauge (U.S. Standard) or thickness (inches)	Minimum height of guard from floor or platform level (feet)
<i>Woven wire</i>	Under 2	3/8	No. 16	7
	2-4	1/2	No. 16	7
	Under 4	1/2	No. 16	7
	4-15	2	No. 12	7
<i>Expanded metal</i>	Under 4	1/2	No. 18	7
	4-15	2	No. 13	7
<i>Perforated metal</i>	Under 4	1/2	No. 20	7
	4-15	2	No. 14	7
<i>Sheet metal</i>	Under 4		No. 22	7
	4-15		No. 22	7
<i>Wood or metal strip crossed</i>	Under 4	3/8	Wood 3/4 Metal No. 16	7
	4-15	2	Wood 3/4 Metal No. 16	7
<i>Wood or metal strip not crossed</i>	Under 4	1/2 width	Wood 3/4 Metal No. 16	7
	4-15	1 width	Wood 3/4 Metal No. 16	7
<i>Standard rail</i>	Min. 15 Max. 20			

Table P-2  
HORIZONTAL OVERHEAD BELTS, ROPES, AND CHAINS  
7 FEET OR MORE ABOVE FLOOR OR PLATFORM

	Width 0"-14" inclusive	Material
<b>MEMBERS</b>		
Framework	1 1/2" x 1 1/2" x 1/4"	Angle iron
Filler (belt guards)	1 1/2" x 3/16"	Flat iron
Filler and vertical side member	No. 20 A.W.G.	Solid sheet metal
Filler supports	2" x 5/16" flat iron	Flat and angle
Guard supports	2" x 5/16"	Flat iron
<b>FASTENINGS</b>		
Filler supports to framework	(2) 3/16"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	3/16"	Rivets spaced
Guard supports to framework	(2) 3/6"	Rivets or bolts
Guard and supports to overheard ceiling	1/4" x 3 1/2" lag screws or 1/2" bolts	Lag screws or bolts
<b>DETAILS-SPACING, ETC.</b>		
Width of guards	One-quarter wider than belt, rope, or chain drive	
Spacing between filler supports	20" center to center	
Spacing between filler flats (belt guards)	2" apart	

	Width 0"-14" inclusive	Material
Spacing between guard supports	36" center to center	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 20 A.W.G.	Solid or perforated
Woven Wire, 2" mesh	No. 12 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Up to 15' inclusive	Over 40'
Clearance from belt, or chain to guard	16"	120"
	Width over 14" to 24" inclusive	Material
MEMBERS		
Framework	2" x 2" x 5/16"	Angle iron
Filler (belt guards)	2" x 3/16"	Flat iron
Filler and vertical side member	No. 18 A.W.G.	Solid sheet metal
Filler supports	2" x 3/8" flat iron	Flat and angle
Guard supports	2" x 3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(2) 3/6"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets
Filler to frame and supports (chain guards)	8" centers on sides and 4" centers on bottom	
Guard supports to framework	(2) 7/16"	Rivets or bolts
Guard and supports to overheard ceiling	5/8" x 4" lag screws or 5/8" bolts	Lag screws or bolts
DETAILS-SPACING, ETC.		
Width of guards		
Spacing between filler supports	16" C. to C	
Spacing between filler flats (belt guards)	2 1/2" apart	
Spacing between guard supports	36" C. to C	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 10 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 15' to 25'	Over 40' inclusive
Clearance from belt/chain to guard	10"	20"
	Width over 24"	Material
MEMBERS		
Framework	3" x 3" x 3/8"	Angle iron
Filler (belt guards)	2" x 5/16"	Flat iron
Filler and vertical side member	No. A.W.G.	Solid sheet metal
Filler supports	2 1/2" x 2 1/2" x 1/4" angle	Flat and angle
Guard supports	2 1/2" x 3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(3) 1/2"	Rivets
Filler flats to supports (belt guards)	(2) 3/8"	Flush rivets
Filler to frame and supports (chain guards)		

	Width 0"-14" inclusive	Material
Guard supports to frame work	(2) 5/8"	Rivets or bolts
Guard and supports to overhead ceiling	3/4" x 6" lag screws or 3/4" bolt	Lag screws or bolts
DETAILS-SPACING, ETC.		
Width of guards		
Spacing between filler supports		16" C. to C.
Spacing between filler flats (belt guards)		4" apart
Spacing between guard supports		36" C. to C.
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards	No. 18 A.W.G.	Solid or perforated
Woven wire, 2" mesh	No. 8 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts	Over 25' to 40' inclusive	Over 40'
Clearance from belt, or chain to guard	15"	20"

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28062 ((How must)) Shafting ((be maintained?)) maintenance.** (1) Shafting must be kept in alignment, and free from rust and excess oil or grease.

(2) Where explosives, explosive dusts, flammable vapors or flammable liquids exist, guards must take into account the hazard of static sparks from shafting.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28064 ((How must)) Pulley((s be maintained?)) maintenance.** (1) Pulleys must be kept in proper alignment to prevent belts from running off.

(2) Any pulley carrying a nonshifting belt should have a crowned face.

(3) Cast-iron pulleys should be tested frequently with a hammer to detect cracks in rim or spokes. The sound is different depending on whether the belt is or is not on the pulley.

(4) Split pulleys should be inspected to be sure that all bolts holding together the sections of the pulley are tight.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28066 ((How must belts be maintained?)) Belt maintenance.** (1) Quarter-twist belts without an idler can be used on drives running in one direction only. They will run off a pulley when direction is reversed.

(2) ((You)) The employer must inspect belts, lacings, and fasteners to be sure they are kept in good repair.

(3) Dressing should not be applied when the belt or rope is in motion; but, when necessary, it should be applied where belts or rope leave the pulley, not where they approach. The same precautions apply to lubricating chains. In the case of V-belts, belt dressing is neither necessary nor advisable.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-28068 ((How must)) Maintenance for other equipment ((be maintained?)).** (1) ((You)) The employer must inspect all power-transmission equipment at least every sixty days and ensure that it is kept in good working condition at all times.

(2) Bearings must be kept in alignment and properly adjusted.

(3) Hangers must be inspected to ensure that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

(4) The oilers must wear tightfitting clothing and should use cans with long spouts to keep their hands out of danger. Machinery must be oiled when not in motion, wherever possible.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-29005 ((What)) Requirements that apply to auger conveying equipment((?)).** ((=)) Augers ((= means)). Screw conveyors and related accessories designed primarily for conveying agricultural materials on farms.

(1) Power take-off shafts must be guarded according to WAC 296-307-28046.

(2) All augers must be covered or guarded when exposed to contact.

(3) ((You)) The employer must ensure that each sweep auger has its top half shielded by a guard. All guard openings must be no larger than 4 3/4 inches across.

(4) ((You)) The employer must ensure that the exposed auger at the hopper and the intake is guarded or designed to prevent accidental contact with the rotating inlet area. The guard must extend at least 2 1/2 inches above and below the exposed auger. Openings in the guard, for the free flow of material, must be no larger than 4 3/4 inches across and must be strong enough to support 250 pounds at mid span.

(5) The hand raising winch must have a control that will hold the auger at any angle, and that will only respond to the

control. ~~((You))~~ The employer must ensure that the operator is able to lower the auger without disengaging the control. The maximum force required on the handle to raise or lower the auger manually must be 50 pounds.

(6) The wire rope lifting pulleys must be grooved to fit the wire rope used.

(7) In order to avoid separation, ~~((you))~~ the employer must provide a positive restraint between the auger tube and the under-carriage lifting arm. ~~((You))~~ The employer must provide stops that restrict the maximum raised angle and minimum lowered angle.

(8) Wire ropes (cables) must be rust resistant and selected for the design load and service intended.

(9) ~~((You))~~ The employer must provide the auger operator with service and operation instructions that include safe operation and servicing practices.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-29010** ~~((What))~~ Other requirements that apply to auger conveying equipment manufactured after October 25, 1976 ~~((?))~~ The employer must ensure that auger conveying equipment manufactured after October 25, 1976, is guarded as follows:

(1) Sweep-arm material-gathering mechanisms used on the top surface of materials within silo structures are guarded. The lower or leading edge of the guard is no more than 12 inches above the material surface and no less than 6 inches in front of the leading edge of the rotating member of the gathering mechanism. The guard is parallel to and extends the fullest practical length of the material gathering mechanism.

(2) Exposed auger flighting on portable grain augers is guarded with either grating type guards or solid baffle style covers as follows:

(a) The largest dimensions or openings in grating type guards through which materials flow is 4-3/4 inches. The opening area is a maximum of 10 square inches. The opening is least 2-1/2 inches from the rotating flighting.

(b) Slotted openings in solid baffle style covers are a maximum of 1-1/2 inches wide, or less than 3-1/2 inches from the exposed flighting.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-30003** ~~((What does this section cover?))~~ Scope. WAC 296-307-300 applies to the guarding and care of farmstead equipment.

~~((" means))~~ Farmstead equipment ~~((" means))~~ Agricultural equipment normally used in a stationary manner. This includes, but is not limited to, materials handling equipment and accessories for such equipment whether or not the equipment is an integral part of a building.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-30006** ~~((How must))~~ Guarding power takeoff shafts of farmstead equipment ~~((be guarded?))~~ The employer must ensure that all power takeoff

shafts, including rear-mounted, mid-mounted or side-mounted shafts, are guarded either by a master shield or by other protective guarding. The master shield must be strong enough to prevent damaging the shield when a 250-pound operator mounts or dismounts the tractor using the shield as a step.

(2) Power takeoff driven equipment must be guarded to prevent employee contact with rotating parts of the power drive system. Where power takeoff driven equipment requires removal of the tractor master shield, the equipment must also include protection from any portion of the tractor power takeoff shaft that protrudes from the tractor.

(3) Signs must be placed at prominent locations on power takeoff driven equipment specifying that power drive system safety shields must be kept in place.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-30009** ~~((How must))~~ Guarding other power transmission components of farmstead equipment ~~((be guarded?))~~ The employer must ensure that all power transmission parts must be guarded according to WAC 296-307-280.

(2) Smooth shafts and shaft ends (without any projecting bolts, keys, or set screws) may be unguarded if they:

(a) Revolve at less than 10 RPM; and

(b) Are part of feed handling equipment used on the top surface of materials in bulk storage facilities.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-30012** ~~((How must))~~ Guarding functional components of farmstead equipment ~~((be guarded?))~~ The employer must ensure that all functional components must be shielded to a degree consistent with the intended function and operator's vision of the component:

~~((•))~~ (1) Snapping or husking rolls;

~~((•))~~ (2) Straw spreaders and choppers;

~~((•))~~ (3) Cutterbars;

~~((•))~~ (4) Flail rotors;

~~((•))~~ (5) Rotary beaters;

~~((•))~~ (6) Mixing augers;

~~((•))~~ (7) Feed rolls;

~~((•))~~ (8) Rotary tillers; and

~~((•))~~ (9) Similar units that must be exposed for proper function.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-30015** ~~((When may))~~ Removing guards ~~((be removed))~~ on farmstead equipment ~~((?))~~ The employer must ensure that all guards, shields and access doors must be in place when the equipment is in operation.

(2) Where removal of a guard or access door will expose an employee to any component that continues to rotate after the power is disengaged, ~~((you))~~ the employer must provide in the immediate area, a safety sign warning the employee:

(a) To look and listen for evidence of rotation; and

(b) To refrain from removing the guard or access door until all components have stopped.

(3) On equipment manufactured after October 25, 1976, a readily visible or audible warning of rotation is required.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-30018 ((What) Requirements that apply to electrical control used for maintaining and servicing farmstead equipment((?)).** (1) ~~((You))~~ The employer must ensure that only the employee maintaining or servicing equipment has control of the electrical power source by:

(a) Providing an exclusive, positive locking means on the main switch that can be operated only by the employee performing the maintenance or service; or

(b) For material handling equipment in a bulk storage structure, by providing on the equipment an electrical or mechanical means to disconnect the power. Minimum lock-out means must meet the requirements of WAC 296-307-320.

(2) All circuit protection devices, including those that are an integral part of a motor, must have a manual reset, except where:

(a) A manual reset is infeasible because of the nature of the operation, distances involved, and the amount of time normally spent by employees in the area of the affected equipment;

(b) An electrical disconnect switch is available to the employee within fifteen feet of the equipment being maintained or serviced; and

(c) A sign, prominently posted near each hazardous component, warns the employee that unless the electrical disconnect switch is utilized, the motor could automatically reset while the employee is working on the hazardous component.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-30021 ((What) Additional guarding requirements that apply to farmstead equipment((?)).** (1) ~~((You))~~ The employer must ensure that carton or bag stitching machines are properly safeguarded to prevent anyone from coming in contact with the stitching head and other pinch or nip points.

(2) The point of operation of all machines must be guarded. The guard must be designed and constructed to prevent the operator from having any part of the body in the danger zone during the operating cycle.

**Note:** The distance from the point-of-operation guards to the danger line depends on the size of the opening. The required distances are outlined in the table below:

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
1/2 to 1 1/2	1/4
1 1/2 to 2 1/2	3/8
2 1/2 to 3 1/2	1/2

Guarding line or distance of opening from point of operation hazard (inches)	Maximum width of opening (inches)
3 1/2 to 5 1/2	5/8
5 1/2 to 6 1/2	3/4
6 1/2 to 7 1/2	7/8
7 1/2 to 12 1/2	1 1/4
12 1/2 to 15 1/2	1 1/2
15 1/2 to 17 1/2	1 7/8
17 1/2 to 31 1/2	2 1/8

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32001 ((What does this section cover?)) Scope.** (1) WAC 296-307-320 covers the servicing and maintenance of machines and equipment in which the unexpected start up of the machine or equipment or release of stored energy could cause injury to employees. This standard establishes minimum performance requirements for the control of such hazardous energy.

(2) Normal production operations are not covered by this standard. Servicing and/or maintenance that takes place during normal production operations is covered by this standard only if:

(a) An employee is required to remove or bypass a guard or other safety device; or

(b) An employee is required to place a body part into a point of operation or where an associated danger zone exists during a machine operating cycle.

**Exception:** Minor servicing activities, that take place during normal production operations, are not covered by this standard if they are routine, repetitive, and integral to the use of the equipment for production, provided that the work is performed using alternative measures that provide effective protection.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32003 ((When does this section not apply?)) Operations not in scope.** (1) WAC 296-307-320 does not apply to work on cord and plug connected electric equipment when:

(a) Unexpected energization or start up of the equipment is controlled by unplugging the equipment from the energy source; and

(b) The plug is under the exclusive control of the employee performing the servicing or maintenance.

(2) WAC 296-307-320 does not apply to hot tap operations involving transmission and distribution systems for substances such as gas, steam, water, or petroleum products when they are performed on pressurized pipelines, when:

(a) Continuity of service is essential;

(b) Shutdown of the system is impractical; and

(c) Documented procedures are followed, and special equipment is used that will provide proven effective protection for employees.

(3) WAC 296-307-320 does not cover exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations. These hazards are covered in chapter 296-307 WAC Part T.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32005 (~~What~~) Definitions that apply to this section(2).** ~~(<sup>(1)</sup>)~~ **Affected employee(~~"means"~~).** An employee who uses a machine or equipment while it is serviced or maintained under lockout or tagout, or who works where such servicing or maintenance is being performed.

~~(<sup>(1)</sup>)~~ **Authorized employee(~~"means"~~).** A person who locks out or tags out machines or equipment in order to perform servicing or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this part.

~~(<sup>(1)</sup>)~~ **Capable of being locked out(~~"means"~~).** An energy isolating device that has a hasp or other means for a lock to be affixed, or has a locking mechanism built into it. It also means that the device can be locked out without dismantling, rebuilding, or replacing the energy isolating device or permanently altering its energy control capability.

~~(<sup>(1)</sup>)~~ **Energized(~~"means"~~).** Connected to an energy source or containing residual or stored energy.

~~(<sup>(1)</sup>)~~ **Energy isolating device(~~"means"~~).** A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

- ~~(<sup>(1)</sup>)~~ (a) A manually operated electrical circuit breaker;
- ~~(<sup>(1)</sup>)~~ (b) A disconnect switch;
- ~~(<sup>(1)</sup>)~~ (c) A manually operated switch with conductors of circuit that can be disconnected from all ungrounded supply conductors and allows no pole to operate independently;
- ~~(<sup>(1)</sup>)~~ (d) A line valve;
- ~~(<sup>(1)</sup>)~~ (e) A block; and
- ~~(<sup>(1)</sup>)~~ (f) Any similar device used to block or isolate energy.

Push buttons, selector switches, and other control circuit devices are not energy isolating devices.

~~(<sup>(1)</sup>)~~ **Energy source(~~"means"~~).** Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, including gravity.

~~(<sup>(1)</sup>)~~ **Hot tap(~~"means"~~).** A procedure used in repair, maintenance, and service activities that involves welding on a piece of equipment (pipelines, vessels, or tanks) under pressure, in order to install connections or accessories. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

~~(<sup>(1)</sup>)~~ **Lockout(~~"means"~~).** Placing a lockout device on an energy isolating device, in accordance with an established procedure, to ensure that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

~~(<sup>(1)</sup>)~~ **Lockout device(~~"means"~~).** A device with a positive means such as a lock (key or combination type) to hold an energy isolating device in the safe position and prevents the energizing of a machine or equipment. Blank flanges and bolted slip blinds are included.

~~(<sup>(1)</sup>)~~ **Normal production operations(~~"means"~~).** Using a machine or equipment for its intended production function.

~~(<sup>(1)</sup>)~~ **Servicing and/or maintenance(~~"means"~~).** Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or unjamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energization or start up of the equipment or release of hazardous energy.

~~(<sup>(1)</sup>)~~ **Setting up(~~"means"~~).** Any work performed to prepare a machine or equipment to perform its normal production operation.

~~(<sup>(1)</sup>)~~ **Tagout(~~"means"~~).** Placing a tagout device on an energy isolating device, according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

~~(<sup>(1)</sup>)~~ **Tagout device(~~"means"~~).** A prominent warning device, such as a tag and attachment, that can be securely fastened to an energy isolating device according to an established procedure, to indicate that the energy isolating device and the equipment being controlled must not be operated until the tagout device is removed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32007 (~~What are the~~) Required elements of an energy control program(2).** ~~(~~you~~)~~ The employer must establish a written energy control program consisting of:

- ~~(<sup>(1)</sup>)~~ (1) An energy control procedure;
- ~~(<sup>(1)</sup>)~~ (2) Employee training; and
- ~~(<sup>(1)</sup>)~~ (3) Periodic inspections.

The purpose of the program is to ensure that before any employee services or maintains a machine or equipment where the unexpected energizing, start up, or release of stored energy could occur and cause injury, the machine or equipment is isolated from the energy source, and rendered inoperative.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32009 (~~How does an employer determine~~) Employer requirements for determining when to use lockout vs. tagout(2).** (1) If an energy isolating device is not capable of being locked out, ~~(~~you~~)~~ the employer's energy control program must use a tagout system.

(2) If an energy isolating device is capable of being locked out, ~~(~~you~~)~~ the employer's energy control program must use lockout unless a tagout system will provide full employee protection according to WAC 296-307-32011.

(3) Whenever major replacement or major repair, renovation, or modification of a machine or equipment is per-

formed, and whenever new machines or equipment are installed, energy isolating devices for such machines or equipment must be designed to accept a lockout device.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32011 ((What)) Requirements that must be met to substitute tagout for lockout((?)).** (1) ((You)) The employer must ensure that when a tagout device is used on an energy isolating device that is capable of being locked out, the tagout device is attached at the same location that the lockout device would have been attached. ((You)) The employer must also ensure that the tagout program will provide safety that is equivalent to a lockout program.

(2) To demonstrate that a tagout program provides safety that is equivalent to a lockout program, ((you)) the employer must demonstrate full compliance with all tagout requirements and any other measures necessary to provide equivalent safety. Other measures include:

- (a) Implementing additional safety measures such as the removal of an isolating circuit element;
- (b) Blocking a controlling switch;
- (c) Opening an extra disconnecting device; or
- (d) Removing a valve handle to reduce the likelihood of inadvertent energization.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32013 ((What are the)) Required elements ((of)) for energy control procedures((?)).** (1) ((You)) The employer must develop, document, and use procedures to control potentially hazardous energy when employees are engaged in activities covered by this section.

**Exception:** ((You are)) The employer is exempt from documenting procedures for a particular machine or equipment only when all of the following elements exist:

- (a) The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down that could endanger employees;
- (b) The machine or equipment has a single energy source that can be readily identified and isolated;
- (c) The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
- (d) The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- (e) A single lockout device will achieve lockout;
- (f) The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
- (g) The servicing or maintenance does not create hazards for other employees; and
- (h) The worksite has experienced no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

(2) The procedures must clearly and specifically outline the scope, purpose, authorization, rules, and techniques for

the control of hazardous energy, and the means to enforce compliance including, but not limited to, the following:

- (a) A specific statement of the intended use of the procedure;
- (b) Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy;
- (c) Specific procedural steps for the placement, removal, and transfer of lockout devices or tagout devices and the responsibility for them; and
- (d) Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32015 ((What)) Requirements that apply to lockout and tagout devices and materials((?)).** (1) ((You)) The employer must provide locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware for isolating, securing, or blocking machines or equipment from energy sources.

(2) Lockout and tagout devices must be singularly identified; must be the only device(s) used for controlling energy; must not be used for other purposes.

(3) Lockout and tagout devices must be durable and meet the following requirements:

(a) Lockout and tagout devices must be able to withstand the environment to which they are exposed for the maximum period of time that exposure is expected.

(b) Tagout devices must be constructed and printed so that exposure to weather conditions or wet and damp locations will not deteriorate the tag or make the tag's message illegible.

(c) Tags must not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.

(4) Lockout and tagout devices must be the same within the facility in at least color, shape, or size. Also, tagout devices must have the same print and format.

(5) Lockout and tagout devices must be substantial and meet the following requirements:

(a) Lockout devices must be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.

(b) Tagout devices and their means of attachment must be substantial enough to prevent accidental removal. Tagout device attachment means must be single-use, attachable by hand, self-locking, releasable with an unlocking strength of at least 50 pounds, and having the general design and basic characteristics of being at least equivalent to a one-piece, all-environment-tolerant nylon cable tie.

(c) Lockout and tagout devices must indicate the name of employee applying the device(s).

(6) Tagout devices must warn against hazardous conditions if the machine or equipment is energized and must include a message such as: "Do not start," "do not open," "do not close," "do not energize," "do not operate."

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32017** ~~((How often must))~~ **Inspecting the energy control procedure** ~~((be inspected?))~~. (1) ~~((You))~~ The employer must conduct an inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this standard are followed.

(a) An authorized employee, other than the one(s) using the energy control procedure, must perform the inspection.

(b) The inspection must be conducted to correct any deviations or inadequacies identified.

(c) Where lockout is used for energy control, the inspection must include a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure.

(d) Where tagout is used for energy control, the inspection must include a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure, and the elements of WAC 296-307-32021.

(2) ~~((You))~~ The employer must certify that the inspections have been performed. The certification must identify the machine or equipment on which the energy control procedure was being used, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32019** ~~((What))~~ **General requirements that apply to energy control program training and communication** ~~((?))~~. ~~((You))~~ The employer must provide training to ensure that employees understand the purpose and function of the energy control program, and that employees have the knowledge and skills required for the safe application, use, and removal of the energy controls. The training must include the following:

(1) Each authorized employee must receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control.

(2) Each affected employee must be instructed in the purpose and use of the energy control procedure.

(3) All other employees who work in an area where energy control procedures must be used, must be instructed about the procedure and the prohibition against attempting to restart or reenergize machines or equipment that are locked out or tagged out.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32021** ~~((What))~~ **Additional requirements that apply to tagout training and communication** ~~((?))~~. When tagout systems are used, employees must also be trained in the following limitations of tags:

(1) Tags are warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.

(2) When a tag is attached to an energy isolating means, it is not to be removed without approval of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.

(3) Tags must be legible and understandable by all authorized, affected, and other employees working in the area.

(4) Tags and their means of attachment must be made of materials that will withstand the environmental conditions encountered in the workplace.

(5) Tags may create a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

(6) Tags must be securely attached to energy isolating devices so that they cannot be accidentally detached during use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32023** ~~((What requirements apply to))~~ **Employee retraining** ~~((?))~~. (1) Authorized and affected employees must be retrained whenever there is a change in job assignments, machines, equipment, or processes that present a new hazard, or when there is a change in the energy control procedures.

(2) Additional retraining must also be provided whenever an inspection reveals, or whenever ~~((you))~~ the employer believes, that the employee's knowledge or use of the energy control procedures is inadequate.

(3) Retraining must reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32025** ~~((What))~~ **Retention of training records** ~~((must an employer keep?))~~. ~~((You))~~ The employer must keep records that certify that employee training has been completed and is up to date. The records must contain each employee's name and dates of training.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32027** ~~((Who may))~~ **Qualifications to perform lockout or tagout** ~~((?))~~. Lockout or tagout must be performed only by authorized employees performing the service or maintenance.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32029** ~~((Who must be notified))~~ **Notification of lockout and tagout** ~~((?))~~. Affected employees must be notified of the application and removal of lockout or



tagout devices. Notification must be given before controls are applied and after they are removed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32031 ((What)) Order of events ((must)) for lockout or tagout procedures ((follow?)).** The established lockout or tagout procedures must cover the following elements in the following sequence:

Machinery or equipment shutdown before lockout or tagout:

(1) Before an authorized or affected employee turns off a machine or equipment, the authorized employee must have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.

(2) The machine or equipment must be turned off or shut down using the procedures established for the machine or equipment. The shutdown must be done in the prescribed order to avoid increased hazards to employees.

(3) All necessary energy isolating devices must be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Application of the lockout or tagout device:

(4) Lockout or tagout devices must be affixed to each energy isolating device by authorized employees.

(5) Lockout devices, where used, must be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.

(6) Tagout devices, where used, must be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

(a) Where tagout devices are used with energy isolating devices designed with the capability of being locked, the tag attachment must be fastened at the same point at which the lock would have been attached.

(b) Where a tag cannot be affixed directly to the energy isolating device, the tag must be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.

Eliminating the hazards of stored energy:

(7) After applying lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy must be relieved, disconnected, restrained, and otherwise rendered safe.

(8) If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

Before beginning service or maintenance:

(9) Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized employee must verify that the machine or equipment has been isolated and deenergized.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32033 ((What)) Order of events ((must)) to be followed to remove lockout or tagout**

**devices(?)).** (1) Before removing lockout or tagout devices, the authorized employee must complete the following procedures:

(a) Inspect the work area to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact.

(b) Check the work area to ensure that all employees have been safely positioned or removed.

(2) After lockout or tagout devices have been removed and before a machine or equipment is started, affected employees must be notified that the lockout or tagout device(s) have been removed.

(3) Each lockout or tagout device must be removed from each energy isolating device by the authorized employee who applied the device.

**Exception:** When the authorized employee who applied the lockout or tagout device is not available to remove it, that device may be removed under ((your)) the employer's direction, if specific procedures and training for such removal have been developed, documented, and incorporated into the energy control program.

((You)) The employer must ensure that the specific procedure provides equivalent safety to the removal of the device by the authorized employee who applied it. The specific procedure must include at least the following elements:

(a) Verification by the employer that the authorized employee who applied the device is not at the facility;

(b) Making all reasonable efforts to inform the authorized employee that the lockout or tagout device has been removed; and

(c) Ensuring that the authorized employee has this knowledge before resuming work at that facility.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32035 ((What requirements apply to)) Testing and positioning machines and equipment(?)).** When lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine or equipment, the following sequence of actions must be followed:

(1) Clear the machine or equipment of tools and materials according to WAC 296-307-32033 (1)(a).

(2) Remove employees from the machine or equipment area according to WAC 296-307-32033 (1)(b).

(3) Remove the lockout or tagout devices as specified in WAC 296-307-32033(3).

(4) Energize and proceed with testing or positioning.

(5) Deenergize all systems and reapply energy control measures in accordance with WAC 296-307-32031 to continue the servicing and/or maintenance.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32037 ((What requirements apply to)) Outside servicing contractors(?)).** (1) Whenever outside servicing contractors are to be engaged in activities covered by this standard, ((you)) the employer and the outside

employer must inform each other of ~~((you))~~ the employer's respective lockout or tagout procedures.

(2) The outside employer must ensure that employees understand and comply with the restrictions and prohibitions of ~~((you))~~ the employer's energy control program.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-32039 (~~What requirements apply to~~) Group lockout or tagout**~~((?))~~. (1) When servicing and/or maintenance is performed by a crew or other group, they must use a procedure that provides a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.

(2) Group lockout or tagout devices must be used according to the procedures required by WAC 296-307-32013 including, but not limited to, the following:

(a) An authorized employee has primary responsibility for a set number of employees working under the protection of a group lockout or tagout device (such as an operations lock); and

(b) A method for the authorized employee to determine if individual group members are exposed to release of stored energy hazards; and

(c) When more than one crew or group is involved, assignment of overall lockout or tagout control responsibility to an authorized employee designated to coordinate individual group members and ensure continuity of protection; and

(d) Each authorized employee must affix a personal lockout or tagout device to the group lockout device when beginning work, and must remove those devices when the work is complete.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-32041 (~~What requirements apply to~~) Lockout/tagout during shift changes**~~((?))~~. During shift or personnel changes, ~~((you))~~ the employer must ensure that employees follow specific procedures to ensure the continuity of lockout or tagout protection. The procedures must include orderly transfer of lockout or tagout protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or start up of the machine or equipment, or release of stored energy.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33001 (~~What~~) Definitions that apply to this section**~~((?))~~. ~~((<sup>1</sup>))~~ **Accident prevention sign**~~((<sup>1</sup>))~~ ~~((<sup>1</sup> "sign" means))~~ (sign). A surface with text or pictographs, meant to warn or instruct employees who may be exposed to hazards. Safety posters and education bulletins are not included in this definition.

~~((<sup>1</sup>))~~ **Accident prevention tag**~~((<sup>1</sup> "tag" means))~~ (tag). A card that identifies a hazardous condition, generally related to unsafe equipment.

~~((<sup>1</sup>))~~ **Major message**~~((<sup>1</sup> means))~~. The sign's or tag's text that is more specific than the signal word and that identifies

the specific hazardous condition or safety instruction. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph.

~~((<sup>1</sup>))~~ **Pictograph**~~((<sup>1</sup> means))~~. A pictorial representation that identifies a specific hazardous condition or safety instruction.

~~((<sup>1</sup>))~~ **Signal word**~~((<sup>1</sup> means))~~. The sign's or tag's text that contains the word, usually "danger" or "caution" that is intended to capture the employee's immediate attention.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33003 (~~What does~~) Use of red**~~((<sup>1</sup> identify))~~ in safety color coding~~((?))~~. Use red to identify:

(1) Fire protection equipment;

(2) Safety cans or other portable containers of flammable liquids;

(3) Danger signs and tags;

(4) Emergency stop bars on hazardous machines; and

(5) Stop buttons or electrical switches used to stop machinery in an emergency~~((;))~~.

Red lights must be provided at barricades and at temporary obstructions, as specified in ANSI Safety Code for Building Construction, A10.2-1944.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33005 (~~What does~~) Use of yellow**~~((<sup>1</sup> identify))~~ in safety color coding~~((?))~~. Use yellow to identify:

(1) Caution signs and tags; and

(2) Physical hazards.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33007 (~~When should signs and tags~~) Use of "danger" versus "caution"**~~((?))~~ on signs and tags.

(1) Danger signs and tags.

(a) Use danger signs and tags when an immediate hazard presents a threat of death or serious injury to employees.

(b) Instruct all employees that danger signs and tags indicate immediate danger and that special precautions are necessary.

(2) Caution signs and tags.

(a) Use caution signs and tags to warn against potential hazards or to caution against unsafe practices.

(b) Instruct all employees that caution signs and tags indicate a possible hazard against which proper precaution should be taken.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33009 (~~What are the~~) Design and color specifications for accident prevention signs**~~((?))~~. (1) All signs must have rounded or blunt corners and be free from sharp edges. The ends or heads of bolts or other fasten-

ing devices must be located so that they do not constitute a hazard.

(2) Danger, caution, directional, informational, exit, and safety instruction signs must comply with the specification of safety colors of the ANSI Z53.1-1971.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-33011** (~~What are the~~) **Proper uses of accident prevention tags**(~~(?)~~). (1) Use tags as a temporary means of warning employees of a hazardous condition, especially defective equipment. Tags are not a complete warning method, but should be used until the hazard can be eliminated.

For example: (~~You~~) The employer may use a "do not start" tag on power equipment for a short time until the switch in the system can be locked out; (~~you~~) the employer may use a "defective equipment" tag on a damaged ladder while arrangements are made for the ladder to be taken out of service and repaired.

(2) Use of accident prevention tags.

(a) Use tags as a warning to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations that are out of the ordinary, unexpected or not readily apparent.

(b) Use tags until the identified hazard is eliminated or the hazardous operation is completed. Tags are not necessary if signs, guarding, or other protection is used.

(c) Place "do not start" tags in a conspicuous location and, if possible, so that they block the starting mechanism that would cause hazardous conditions if the equipment was energized.

(3) General accident prevention tag specifications.

(a) Tags must contain a signal word and a major message. The signal word must be either "danger" or "caution."

(b) The signal word must be readable at least five feet from the hazard.

(c) The signal word and the major message must be understandable to all employees who may be exposed to the identified hazard.

(d) Inform all employees of the meaning of the tags used throughout the workplace and what special precautions are necessary.

(e) Attach tags as closely as is safely possible to the hazard. Attach the tags so as to prevent loss or unintentional removal.

(f) The tag and attachment method must be constructed of material that is not likely to deteriorate.

(4) (~~You~~) The employer may use warning tags to represent a hazard level between "caution" and "danger," instead of the required "caution" tag, if they have a signal word of "warning" and an appropriate major message.

(5) Use "out of order" tags only to indicate that a piece of equipment, machinery, etc., is out of order and that it might present a hazard if used.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-34003** (~~What does this section cover?~~) **Scope**. (1) WAC 296-307-340 applies to the placement, use, maintenance, and testing of portable fire extinguishers provided for employee use. WAC 296-307-34012 does not apply to extinguishers provided for employee use on the outside of workplace buildings or structures. If (~~you do~~) the employer does not intend for employees to use extinguishers, and (~~your~~) the employer's emergency action plan and fire prevention plan meet the requirements of WAC 296-307-35018, then only the requirements of WAC 296-307-34015 and 296-307-34018 apply.

(2) All standpipe and hose systems, automatic sprinkler systems, fixed extinguishing systems, dry-chemical fixed extinguishing systems, water-spray and foam, and fire detection systems, must be installed according to state and local ordinances, codes, and regulations governing such installations.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-34006** (~~Who is exempt~~) **Exemption from the requirements of this section**(~~(?)~~). (1) (~~You are~~) The employer is exempt from all requirements of this section, if:

(a) (~~You have~~) The employer has implemented a written fire safety policy that requires all employees to evacuate immediately when the fire alarm sounds; and

(b) (~~You have~~) The employer has an emergency action plan and a fire prevention plan meeting the requirements of WAC 296-307-35015 and 296-307-35018; and

(c) Extinguishers are not available for employee use in the workplace.

**Note:** If (~~you are~~) the employer is covered by one of the following sections requiring (~~you~~) the employer to provide a portable fire extinguisher, then (~~you~~) the employer may not apply this exemption:

(~~■~~) 1. WAC 296-307-07013(12)—Transporting employees;

(~~■~~) 2. WAC 296-307-34009(8)—Storage of flammables; or

(~~■~~) 3. WAC 296-307-49503(2)—Welding.

(2) (~~You are~~) The employer is exempt from the distribution requirements in WAC 296-307-34012, if:

(a) (~~You have~~) The employer has an emergency action plan meeting the requirements of WAC 296-307-35015 that authorizes only certain employees to use the available portable fire extinguishers; and

(b) The plan requires all other employees to evacuate immediately when the fire alarm sounds.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34009** (~~What general requirements apply to~~) **Portable fire extinguishers**(~~(?)~~). (1) (~~You~~) The employer must provide portable fire extinguishers that are readily accessible to employees without subjecting the employees to possible injury.

(2) ~~((You))~~ The employer must only use approved portable fire extinguishers.

(3) Portable fire extinguishers using carbon tetrachloride or chlorobromomethane extinguishing agents are prohibited.

(4) Water type fire extinguishers with a soldered or riveted shell that use self-generating soda acid or self-generating foam or gas cartridges are prohibited.

(5) ~~((You))~~ The employer must ensure that all portable fire extinguishers are fully charged, operable, and kept in their designated places at all times except during use.

(6) ~~((You))~~ The employer must ensure that all portable fire extinguishers are tested, constructed, and used according to the National Fire Protection Association's pamphlet No. 10A-1970.

**Note:** The supplier of the extinguisher or local fire official can furnish this information.

(7) ~~((You))~~ The employer must post "no smoking" signs in areas where fire or explosion hazards exist. ~~((You))~~ The employer must prohibit smoking within fifty feet of all refueling operations. Take precautions to prevent open flames, sparks, or electric arcs in refueling areas.

(8) ~~((You))~~ The employer must keep a portable fire extinguisher with a rating of at least 12-B units outside the door of any room used to store flammables or combustibles. This extinguisher must not be more than ten feet from the door.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34012 (~~((How should))~~ Selection and distribution of portable fire extinguishers (~~(be selected and distributed?))~~)**. (1) ~~((You))~~ The employer must select and distribute portable fire extinguishers based on the classes of anticipated workplace fires and on the size and degree of hazard that would affect their use.

(2) Distribution of portable fire extinguishers.

(a) For Class A fires: ~~((You))~~ The employer must distribute portable fire extinguishers so that no employee must travel more than 75 feet (22.9 m) to a fire extinguisher.

**Exception:** ~~((You))~~ The employer may use uniformly spaced stand-pipe systems or hose stations connected to a sprinkler system for emergency use by employees instead of Class A portable fire extinguishers, if:

- ~~((\*)~~) 1. The system meets all regulatory requirements governing total coverage of the area to be protected; and
- ~~((\*)~~) 2. Employees are trained at least annually in their use.

(b) For Class B fires: ~~((You))~~ The employer must distribute portable fire extinguishers so that no employee must travel more than 50 feet (15.2 m) to a fire extinguisher.

(c) For Class C fires: ~~((You))~~ The employer must distribute portable fire extinguishers on the basis of the appropriate pattern for the existing Class A or Class B hazards.

(d) For Class D fires: ~~((You))~~ The employer must distribute portable fire extinguishers or other containers of Class D extinguishing agent so no employee must travel more than 75 feet (22.9 m) from the combustible metal working area to any extinguishing agent. Portable fire extinguishers for Class D hazards are required in those combustible metal working

areas where combustible metal powders, flakes, shavings, or similarly sized products are generated at least once every two weeks.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34015 (~~((What are the requirements for))~~ Inspection, maintenance and testing of portable fire extinguishers(~~(?)~~)**. (1) ~~((You are))~~ The employer is responsible for the inspection, maintenance, and testing of all portable fire extinguishers in the workplace.

(2) ~~((You))~~ The employer must visually inspect portable extinguishers or hose at least once a month.

(3) ~~((You))~~ The employer must ensure that portable fire extinguishers receive an annual maintenance check. ~~((You))~~ The employer must keep records of the maintenance dates for one year after the previous entry or the life of the shell, whichever comes first. ~~((You))~~ The employer must provide us with a copy of the record if we ask for it.

(4) ~~((You))~~ The employer must ensure that stored-pressure dry chemical extinguishers that require a twelve-year hydrostatic test are emptied and undergo applicable maintenance procedures every six years.

**Exception:** Dry chemical extinguishers with nonrefillable disposable containers are exempt from this requirement.

The six years begins when recharging or hydrostatic testing is performed.

(5) ~~((You))~~ The employer must ensure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34018 (~~((What requirements apply to))~~ Hydrostatic testing(~~(?)~~)**. (1) ~~((You))~~ The employer must ensure that a trained person performs hydrostatic testing with suitable testing equipment and facilities.

(2) ~~((You))~~ The employer must ensure that portable extinguishers are hydrostatically tested at the intervals listed in the table below.

Type of Extinguishers	Test interval (years)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (stainless steel shell)	5
Aqueous film forming form (AFFF)	5
Loaded stream	5
Dry chemical with stainless steel	5
Carbon dioxide	5

Type of Extinguishers	Test interval (years)
Dry chemical, stored pressure, with mild steel, brazed brass or aluminum shells	12
Dry chemical, cartridge or cylinder operated, with mild steel shells	12
Halon 1211	12
Halon 1301	12
Dry powder, cartridge or cylinder operated, with mild steel shell	12

**Exception:** Extinguishers must not be hydrostatically tested if the following conditions exist:

- (a) When the unit has been repaired by soldering, welding, brazing, or use of patching compounds;
- (b) When the cylinder or shell threads are damaged;
- (c) When there is corrosion that has caused pitting, including corrosion under removable name plate assemblies;
- (d) When the extinguisher has been burned in a fire; or
- (e) When a calcium chloride extinguishing agent has been used in a stainless steel shell.

(3) In addition to an external visual examination, ~~((you))~~ the employer must ensure that the cylinders and shells are examined internally before the hydrostatic testing.

(4) ~~((You))~~ The employer must ensure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury.

(5) ~~((You))~~ The employer must ensure that hydrostatic tests are performed on extinguisher hose assemblies that are equipped with a shut-off nozzle at the discharge end of the hose. The test interval must be the same as specified for the extinguisher on which the hose is installed.

(6) Carbon dioxide hose assemblies with a shut-off nozzle must be hydrostatically tested at 1,250 psi (8,620 kPa).

(7) Dry chemical and dry powder hose assemblies with a shut-off nozzle must be hydrostatically tested at 300 psi (2,070 kPa).

(8) Hose assemblies passing a hydrostatic test do not require any type of recording or stamping.

(9) ~~((You))~~ The employer must ensure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) ~~((You))~~ The employer must ensure that carbon dioxide extinguishers and nitrogen or carbon dioxide cylinders used with wheeled extinguishers are tested every five years at 5/3 of the service pressure as stamped into the cylinder. Nitrogen cylinders that comply with 29 C.F.R. 173.34(e)(15) may be hydrostatically tested every ten years.

(11) ~~((You))~~ The employer must ensure that all stored pressure and Halon 1211 types of extinguishers are hydrostatically tested at the factory test pressure not to exceed two times the service pressure.

(12) ~~((You))~~ The employer must ensure that self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).

(13) Air or gas pressure used for hydrostatic testing is prohibited.

(14) ~~((You))~~ The employer must remove from the workplace all extinguisher shells, cylinders, or cartridges that fail a hydrostatic pressure test, or that are not fit for testing.

(15)(a) Water-jacket equipment must be used for testing compressed gas type cylinders. The equipment must have an expansion indicator that operates with an accuracy within one percent of the total expansion or 0.1 cc (.1 mL) of liquid.

(b) The following equipment must be used to test non-compressed gas type cylinders:

(i) A hydrostatic test pump, hand or power operated, capable of producing not less than one hundred fifty percent of the test pressure, which must include appropriate check valves and fittings;

(ii) A flexible connection for attachment to fittings to test through the extinguisher nozzle, test bonnet, or hose outlet, as is applicable; and

(iii) A protective cage or barrier for personal protection of the tester, designed to provide visual observation of the extinguisher under test.

(16) ~~((You))~~ The employer must maintain records of the hydrostatic testing. ~~((You#))~~ Their records must include:

~~((#))~~ (a) The date of test;

~~((#))~~ (b) The test pressure used;

~~((#))~~ (c) The serial number, or other identifier of the fire extinguisher that was tested; and

~~((#))~~ (d) The person or agency performing the test.

~~((You))~~ The employer must keep the records until the next testing, or until the extinguisher is taken out of service, whichever comes first. ~~((You))~~ The employer must provide us with copies of the records if we ask for them.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34021** ~~((What are the))~~ Training requirements for portable fire extinguishers(?), (1) If ~~((you))~~ the employer provides portable fire extinguishers for employee use, then ~~((you))~~ the employer must also provide training to familiarize employees with the general principles of fire extinguisher use and the hazards involved in fighting fires when they first appear.

~~((You))~~ The employer must provide the training when the employee is first hired and at least annually thereafter.

(2) For employees who have been designated to use fire-fighting equipment as part of an emergency action plan, ~~((you))~~ the employer must provide training in the use of the appropriate equipment.

~~((You))~~ The employer must provide the training upon initial assignment to the designated group of employees and at least annually thereafter.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-34503** ~~((What does this section cover?))~~ Scope. (1) WAC 296-307-345 applies to all emergency employee alarms required by a specific WAC chapter. This section does not apply to discharge or supervisory alarms required on various fixed extinguishing systems or to

supervisory alarms on fire suppression, alarm or detection systems unless they are intended to be employee alarm systems.

(2) The maintenance, testing, and inspection requirements of this section apply to all local fire alarm signaling systems used for alerting employees regardless of the other functions of the system.

(3) All predischarge employee alarms required by this chapter must meet the requirements of WAC 296-307-34506 and 296-307-34512.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34506** (~~What general requirements apply to~~) **Employee alarm systems**(~~(?)~~). (1) (~~You~~) The employer's employee alarm system must provide warning for necessary emergency action called for in the emergency action plan, or safe escape of employees from the workplace.

(2) (~~You~~) The employer must ensure that all employees can see or hear (~~your~~) their employee alarm above normal noise or light levels in the workplace. (~~You~~) The employer may use tactile devices to alert employees who can not see or hear the alarm.

(3) (~~You~~) The employer must ensure that (~~your~~) their employee alarm is recognizable as an evacuation signal or signal to perform actions designated under the emergency action plan.

(4) (~~You~~) The employer must explain to each employee how to report emergencies. For example: They may use manual pull box alarms, public address systems, radio or telephones. (~~You~~) The employer must post emergency telephone numbers near telephones, or employee notice boards when telephones serve as a means of reporting emergencies. When (~~your~~) the employer's communication system also serves as the employee alarm system, (~~your~~) the employer must ensure that all emergency messages have priority over all nonemergency messages.

(5) (~~You~~) The employer must establish procedures for sounding emergency alarms in the workplace. If (~~you have~~) the employer has ten or fewer employees in a workplace, direct voice communication is an acceptable procedure for sounding the alarm if all employees can hear it. In this case, (~~you do~~) the employer does not need a back-up system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34509** (~~What are the~~) **Installation and restoration requirements for employee alarm systems**(~~(?)~~). (1) (~~You~~) The employer must ensure that all systems installed to comply with this standard are approved. Steam whistles, air horns, strobe lights or similar lighting devices, or tactile devices meeting the requirements of this section must also be approved.

(2) After each test or alarm, (~~you~~) the employer must ensure that all employee alarm systems are restored to normal operating condition as soon as possible. (~~You~~) The employer must ensure that (~~you have~~) spare alarm components are available in sufficient quantities and locations for prompt restoration of the system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34512** (~~How must~~) **Employee alarm system**(~~s be maintained and tested?~~) **maintenance and testing**. (1) (~~You~~) The employer must ensure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

(2) (~~You~~) The employer must ensure that a test of the reliability and adequacy of nonsupervised employee alarm systems is made every two months. (~~You~~) The employer must use a different actuation device in each test of a multi-actuation device system so that no individual device is used for two consecutive tests.

(3) (~~You~~) The employer must maintain or replace power supplies as often as necessary to ensure fully operational condition. (~~You~~) The employer must provide back-up alarms, such as employee runners or telephones, when systems are out of service.

(4) (~~You~~) The employer must ensure that supervised employee alarm circuitry is supervised and that it will provide positive notification to assigned personnel whenever a deficiency exists in the system. (~~You~~) The employer must ensure that all supervised employee alarm systems are tested at least annually for reliability and adequacy.

(5) (~~You~~) The employer must ensure that employee alarms are serviced, maintained, and tested by someone trained in the operation and functions necessary for reliable and safe operation of the system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-34515** (~~Where must~~) **Location(s) of manually operated devices** (~~(be located?)~~). (~~You~~) The employer must ensure that manually operated actuation devices used with employee alarms are easy to find and accessible.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-35003** (~~What does this section cover?~~) **Scope**. WAC 296-307-350 requires (~~you~~) the employer to provide exit routes for employees to leave the workplace safely during emergencies. This section does not apply to mobile workplaces, such as vehicles or vessels.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-35006** (~~What~~) **Definitions apply to this section**(~~(?)~~). (~~Exit~~) Exit (~~means~~). The portion of an exit route that is generally separated from other areas to provide a protected way of travel out of the workplace.

(~~Exit route~~) Exit route (~~means~~). A continuous and unobstructed path of exit travel from any point within a workplace to safety outside. An exit route generally consists of three parts: Access to an exit; the area which provides a way of travel out of the workplace; and the way from the exit to the

outside. An exit route includes all vertical and horizontal areas.

**AMENDATORY SECTION** (Amending WSR 11-04-080, filed 2/1/11, effective 4/1/11)

**WAC 296-307-35009** (~~What are the~~) **Design requirements for exit routes**(~~(?)~~), (~~(You)~~) The employer must ensure that each workplace meets each of the following requirements:

- (1) Each exit is a permanent part of the workplace.
- (2) Two exit routes, remote from one another, are available to provide alternate means for employees to safely leave the workplace during an emergency.
  - (a) A single exit route is permitted where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace indicate that a single exit will allow all employees to exit safely during an emergency. Other means of escape, such as fire exits or accessible windows, should be available where fewer than two exit routes are provided.
  - (b) More than two exit routes are available to allow employees to safely leave the workplace during an emergency where the number of employees, the size of the building, its occupancy, or the arrangement of the workplace reasonably suggest that reliance on two exit routes could endanger employees.
  - (3) An exit has only those openings necessary to permit access to, or exit from, occupied areas of the workplace. An opening into an exit is protected by a self-closing fire door that remains closed. Each fire door, its frame, and hardware are listed or approved by a nationally recognized testing laboratory.
  - (4) Construction materials used to separate an exit have a 1-hour fire resistance rating if the exit connects three or fewer stories. Construction materials used to separate an exit have a 2-hour fire resistance rating if the exit connects 4 or more stories.
  - (5) Free and unobstructed access to each exit route is provided to ensure safe exit during an emergency.
    - (a) The exit route is free of material or equipment.
    - (b) Employees are not required to travel through a room that can be locked, such as a bathroom, or toward a dead end to reach an exit.
    - (c) Stairs or a ramp are used if the exit route is not substantially level.
    - (6) An exit leads directly outside or to a street, walkway, refuge area, or to an open space with access to the outside.
      - (a) The street, walkway, refuge area, or open space to which an exit leads is large enough to accommodate all building occupants likely to use that exit.
      - (b) A refuge area is:
        - (i) A space along an exit route protected from the effects of fire either by separation from other spaces within the building or by its location; or
        - (ii) A floor with at least two spaces separated by smoke-resistant partitions, in a building where each floor is protected by an automatic sprinkler system. An automatic sprinkler system complies with NFPA No. 13, Automatic Sprinkler Systems.

(c) Exit stairs that continue beyond the floor of exit discharge are interrupted by doors, partitions, or other effective means.

(7) Where a doorway or corner of a building is located near a railroad or trolley track so that an employee is liable to walk upon the track in front of an approaching engine or cars, a standard safeguard must be installed with a warning sign.

(8) An exit door can be readily opened from the inside without keys, tools, or special knowledge. A device, such as a panic bar, that locks only from the outside is permitted. An exit door is free of any device or alarm that, if it fails, can restrict emergency use of an exit.

**Note:** An exit door may be locked or blocked from the inside in a mental, penal, or correctional institution, if supervisory personnel are continually on duty and a plan exists to remove occupants during an emergency.

(9) The opening device on all doors of walk-in refrigerated or freezer rooms must be the type, when locked from the outside with a lock, can be opened from inside.

(10) A side-hinged exit door is used to connect any room to an exit route. A door that connects any room to an exit route swings out if the room may be occupied by more than 50 persons or highly flammable or explosive materials may be used inside.

(11) Each exit route supports the maximum-permitted occupant load for each floor served by the exit route. The capacity of an exit does not decrease with the direction of exit travel.

(12) Minimum height and width requirements:

(a) Make sure the exit route has a minimum ceiling height of 7 feet 6 inches and that no projection from the ceiling is less than 6 feet 8 inches from the floor.

(b) Objects that stick out into the exit route, such as fans hanging from the ceilings or cabinets on walls, must not reduce the minimum height of the exit route to less than 6 feet 8 inches from the floor.

(c) The width of an exit route is at least 28 inches wide at all points between handrails. An exit route is wider than 28 inches if necessary to accommodate the expected occupant load.

(d) Objects that project into the exit route do not reduce the minimum height and width of an exit route.

(13) An outdoor exit route is permitted if it meets the requirements for an indoor exit route and the following additional requirements.

(a) The exit has guardrails to protect exposed sides.

(b) The exit route is covered if accumulation of snow or ice is likely and is not removed regularly.

(c) The exit route is reasonably straight with smooth, solid, substantially level floors.

(d) The exit route has no dead ends longer than 20 feet.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-35012** (~~What are the~~) **Operation and maintenance requirements for exit routes**(~~(?)~~), (~~(You)~~) The employer must ensure that each workplace meets the following requirements:

(1) The workplace exit route is maintained to minimize danger to employees during an emergency.

(a) The workplace exit route is free of explosive or highly flammable furnishings or decorations.

(b) Accumulations of flammable or combustible waste materials are controlled.

(c) An exit route does not require employees to travel toward materials that burn very quickly, emit poisonous fumes, or are explosive, unless those materials are effectively shielded from the exit route.

(2) Each exit route is adequately lit.

(3) Each exit is clearly visible and is marked by a distinctive sign reading "exit."

(a) An exit door is free of signs or decorations that obscure its visibility.

(b) Signs are posted along the exit route indicating the direction of travel to the nearest exit.

(c) The line-of-sight to an exit sign is uninterrupted.

(d) Any doorway or passage that might be mistaken for an exit is marked "not an exit" or with an indication of its actual use.

(e) An exit sign is illuminated to a surface value of at least 5 foot candles by a reliable light source and shows a designated color. Self-luminous or electroluminescent signs have a minimum luminance surface value of .06 footlam-berts.

(4) Fire retardant paints or other coatings used in the workplace are maintained.

(5) Each safeguard to protect employees during an emergency is maintained in proper working order.

(6) Employees do not occupy a workplace under construction until an exit route that meets these requirements is available for the portion of the workplace to be occupied.

(a) Employees do not occupy a workplace during repair or alteration unless either all exits and existing fire protection are maintained or alternate fire protection is provided that ensures an equivalent level of safety.

(b) Flammable or explosive materials used during construction or repair do not expose employees to hazards not otherwise present in the workplace or impede emergency escape from the workplace.

(7) An operable employee alarm system with a distinctive signal to warn employees of fire or other emergencies is installed and maintained. No employee alarm system is required if employees can see or smell a fire or other hazard so that it would provide adequate warning to them. The employee alarm system complies with the requirements of WAC 296-307-345.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-35015** (~~What are the requirements for an~~) **Emergency action plan**(~~(?)~~). (1) (~~You~~) The employer must develop an emergency action plan for each part of the workplace as required by WAC 296-307-030 (3)(d).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of 10 or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) An emergency action plan must include:

(a) Procedures for emergency evacuation, including exit route assignments;

(b) Procedures to account for all employees after evacuation;

(c) Procedures for reporting a fire or other emergency;

(d) Procedures to follow for emergency operation or shut down of critical equipment before evacuation;

(e) Procedures to follow for rescue and medical duties;

(f) Procedures for operating and maintaining an emergency alarm system; and

(g) Names or job titles of employees to be contacted to get more information about what to do in an emergency.

(3) (~~You~~) The employer must designate employees to assist in the safe emergency evacuation of other employees.

(~~You~~) The employer must ensure that the designated employees receive training in emergency evacuation procedures.

(4) (~~You~~) The employer must review the emergency action plan with each employee covered by the plan:

(a) When the plan is developed or the employee is assigned initially to the job;

(b) When the employee's responsibilities under the plan change; and

(c) When the plan is changed.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-35018** (~~What are the requirements for a~~) **Fire prevention plan**(~~(?)~~). (1) (~~You~~) The employer must develop a fire prevention plan for each part of the workplace if required by WAC 296-307-34006(1).

(a) The plan must be in writing, kept in the workplace, and made available to employees on request.

(b) An employer of ten or fewer employees may communicate the plan orally to employees rather than develop a written plan.

(2) A fire prevention plan must include:

(a) A list of all major fire hazards, including proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each major hazard;

(b) Procedures to control accumulations of flammable and combustible waste materials;

(c) Procedures for regular maintenance of safeguards installed on heat producing equipment to prevent accidental ignition of combustible materials;

(d) Names or job titles of employees responsible for maintaining equipment to prevent or control sources of ignition or fires;

(e) Names or job titles of employees responsible for control of fuel source hazards.

(3) (~~You~~) The employer must:

(a) Inform employees of the fire hazards to which they are exposed; and



(b) Review with each employee those parts of the fire prevention plan necessary for self-protection upon initial assignment to a job.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-36005 (~~What does this part cover?~~)**

**Scope.** (1) Chapter 296-307 WAC Part T covers methods to protect against electrical hazards in agricultural workplaces.

(2) Chapter 296-307 WAC Part T does not cover:

(\*) (a) Installations in watercraft, or automotive vehicles; or

(\*) (b) Electric welding. (See chapter 296-307 WAC Part V.)

(3) Unless otherwise provided in this chapter all electrical work, installation, and wire capacities must be according to the National Electrical Code, NFPA 70-1973; ANSI C1-1971, and all other applicable standards administered by the department of labor and industries.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36010 (~~What~~) Definitions that apply to this part(2).** The following definitions apply to this part:

(~~the~~) **Acceptable**(~~"means"~~). A n installation or equipment that is acceptable to the department and meets the requirements of this section. An installation or equipment is acceptable if:

(1) It is accepted, certified, listed, labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(2) For installations or equipment that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, it is inspected or tested by another federal agency, or by state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code, and complies with the provisions of the National Electrical Code as applied in this section; or

(3) For custom-made equipment or related installations that are designed, fabricated for, and intended for use by a particular customer, it is determined to be safe for its intended use by its manufacturer on the basis of test data that (~~you~~) the employer keeps and make available for our inspection.

(~~the~~) **Accepted**(~~"means"~~). A n installation that has been inspected and certified by a nationally recognized testing laboratory to meet specified plans or procedures of applicable codes.

(~~the~~) **Bonding jumper**(~~"means"~~). A reliable conductor that provides the correct electrical conductivity between metal parts that are required to be electrically connected.

(~~the~~) **Branch circuits**(~~"means"~~). The part of a wiring system extending beyond the final overcurrent device protecting the circuit. A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.

(~~the~~) **Certified**(~~"means"~~). Equipment that:

(\*) (a) Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards, or to be safe for use in a specified manner; or

(\*) (b) Is a kind whose production is periodically inspected by a nationally recognized testing laboratory; and

(\*) (c) Bears a label, tag, or other record of certification.

(~~the~~) **Exposed**(~~"means"~~). A live part that can be accidentally touched or approached nearer than a safe distance. This term applies to parts that are not suitably guarded, isolated, or insulated.

(~~the~~) **Fixed equipment**(~~"means"~~). Equipment fastened or connected by permanent wiring methods.

(~~the~~) **Ground**(~~"means"~~). A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and earth, or to some conducting body that serves in place of the earth.

(~~the~~) **Grounded**(~~"means"~~). Conected to earth or to some conducting body that serves in place of the earth.

(~~the~~) **Isolated**(~~"means"~~). Equipment that is not readily accessible except through special means of access.

(~~the~~) **Labeled**(~~"means"~~). Equipment that has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that:

(\*) (a) Makes periodic inspections of the production of such equipment; and

(\*) (b) Whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

(~~the~~) **Qualified person**(~~"means"~~). A person who is familiar with the construction and operation of the equipment and the hazards involved.

**Note 1:** Whether an employee is considered a "qualified person" depends on various circumstances in the workplace. It is possible and likely for an individual to be considered "qualified" with regard to certain equipment in the workplace, but "unqualified" as to other equipment.

**Note 2:** An employee undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training and who is under the direct supervision of a qualified person is considered a qualified person for the performance of those duties.

(~~the~~) **Shock hazard**(~~""~~). Exists at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500 ohm load is more than 5 milliamperes.

(~~the~~) **Weatherproof**(~~"means"~~). Constructed or protected so that exposure to the weather does not interfere with successful operation. Rainproof, raintight, or watertight equipment may be considered weatherproof where weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36203 (~~What~~) The following electrical equipment must be approved(2).** The conductors and equipment required or permitted by this section must be approved.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36206 ((How must)) Determining electrical equipment safety ((be determined?))**, (1) Electrical equipment must be free from hazards to employees. Safety of equipment must be determined using the following considerations:

(a) Suitability for installation and use according to the requirements of this part. Suitability of equipment for a specific purpose may be shown by listing or labeling for that purpose.

(b) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection provided.

(c) Electrical insulation.

(d) Heating effects under conditions of use.

(e) Arcing effects.

(f) Classification by type, size, voltage, current capacity, specific use.

(g) Other factors that contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(2) Listed or labeled equipment must be used or installed according to any instructions included in the listing or labeling.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36209 ((What requirements apply to)) Guarding live parts((?))**, (1) Unless otherwise indicated, live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact by an approved cabinet or other form of approved enclosure, or by any of the following:

(a) Location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(b) Suitable permanent substantial partitions or screens arranged so that only qualified persons have access to the area within reach of the live parts. Any openings in such partitions or screens must be small enough and located so that employees are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.

(c) Location on a suitable balcony, gallery, or platform elevated and accessible only to qualified persons.

(d) Elevation of eight feet or more above the floor or other working surface.

(2) In locations where electric equipment would be exposed to physical damage, enclosures or guards must be arranged and be strong enough to prevent damage.

(3) Entrances to rooms and other guarded locations containing exposed live parts must be marked with conspicuous warning signs forbidding unqualified persons to enter.

(4) Electrical repairs must be made only by qualified persons ((that you authorize)) authorized by the employer.

(5) Fuse handling equipment, insulated for the circuit voltage, must be used to remove or install fuses when the fuse terminals are energized.

(6) Employees must be prohibited from working closely enough to an electric power circuit to contact it unless the employee is protected against electric shock.

**Note:** The circuit must be protected by deenergizing the circuit and grounding it, by guarding it, by effective insulation, or other means.

(7) In work areas where the exact location of underground electric power lines is unknown, employees using jack-hammers, bars or other hand tools that may contact a line must have insulated protective gloves.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36212 ((What)) Workspace that must be provided((?) by the employer)**, (1) When parts are exposed, the minimum clearance for the workspace must be at least six feet six inches high, or at least a radius of three feet wide.

(2) There must be enough clearance to permit at least a 90° opening of all doors or hinged panels.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36215 ((What general requirements apply to)) Splices((?))**, Conductors must be spliced or joined with splicing devices suitable for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices must first be spliced or joined so they are mechanically and electrically secure without solder and then soldered. (Rosin-core solder should be used instead of acid core solder when joining electrical conductors.) All splices and joints and the free ends of conductors must be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36218 ((What)) Protection ((must be)) provided against combustible materials((?))**, Parts of electric equipment that in ordinary operation produce arcs, sparks, flames, or molten metal must be enclosed or separated and isolated from all combustible material.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36221 ((How must)) Marking electrical equipment ((be marked?))**, All electrical equipment in use must have the manufacturer's name, trademark, or other descriptive marking of the organization responsible for the product on the equipment. Other markings must be provided giving voltage, current, wattage, or other ratings as necessary. The marking must be durable enough to withstand the environment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36224 ((How must)) Marking disconnecting means ((be marked?))**, Each disconnecting means required by this part for motors and appliances must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, must be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings must be durable enough to withstand the environment involved.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36227 ((What)) Access and working space ((must be provided)) for electrical equipment of 600 volts, nominal, or less((?))**, Sufficient access and working space must be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(1) Unless otherwise indicated, the dimension of the working space in the direction of access to live parts operating at 600 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive must be at least that indicated in the table below. Also, workspace must be at least 30 inches wide in front of the electric equipment. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered grounded. Working space is not required behind assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from other directions.

Working Clearances

Nominal voltage to ground	Minimum clear distance for condition (ft)		
	(a)	(b)	(c)
0-150	13	13	3
151-600	13	3-1/2	4

- Conditions:
- (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.
  - (b) Exposed live parts on one side and grounded parts on the other side.
  - (c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(2) Working space required by this part must not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, must be suitably guarded.

(3) At least one entrance of sufficient area must be provided to give access to the working space about electric equipment.

(4) Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment must be at least 3 feet.

(5) All working spaces around service equipment, switchboards, panelboards, and motor control centers installed indoors must be adequately lit.

(6) The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers must be 6 feet 3 inches.

**((=))Motor control center((= means))**, An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-36230 ((What)) Access and working space ((must be provided)) for electrical equipment over 600 volts, nominal((?))**, (1) Conductors and equipment used on circuits exceeding 600 volts, nominal, must meet all requirements of WAC 296-307-36221 and the additional requirements of this section. This section does not apply to equipment on the supply side of the service conductors.

(2) Electrical installations in a vault, room, closet or area surrounded by a wall, screen, or fence, with access controlled by lock and key or other approved means, are considered accessible to qualified persons only. A wall, screen, or fence less than 8 feet high is not considered to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot fence. The entrances to all buildings, rooms, or enclosures containing exposed live parts or exposed conductors operating at over 600 volts, nominal, must be kept locked or under the observation of a qualified person at all times.

(a) Electrical installations with exposed live parts must be accessible to qualified persons only.

(b) Electrical installations that are open to unqualified persons must be made with metal-enclosed equipment or enclosed in a vault or in an area, with access controlled by a lock. If metal-enclosed equipment is installed so that the bottom of the enclosure is less than 8 feet above the floor, the door or cover must be kept locked. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment must be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards must be provided to prevent damage. Ventilating or similar openings in metal-enclosed equipment must be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(3) **((You)) The employer** must provide and maintain enough space around electric equipment to permit ready and safe operation and maintenance of equipment. Where energized parts are exposed, the minimum clear workspace must be at least 6 feet 6 inches high (measured vertically from the floor or platform), or less than 3 feet wide (measured parallel to the equipment). The depth must meet the requirements of

Table T. The workspace must be adequate to permit at least a 90-degree opening of doors or hinged panels.

(a) The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment must be at least that specified in Table T unless otherwise indicated. Distances must be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from another direction. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 inches horizontally (~~shall~~) must be provided.

Table T  
Minimum Depth of Clear Working Space in Front of Electric Equipment

Nominal voltage to ground	Conditions (ft)		
	(a)	(b)	(c)
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75kV1	6	8	10
Above 75kV1	8	10	12

**Note:** Minimum depth of clear working space in front of electric equipment with a nominal voltage to ground above 25,000 volts may be the same as for 25,000 volts under conditions (a), (b) and (c) for installations built prior to April 16, 1981.

**Conditions:**

- (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at 300 volts or less are not considered live parts.
- (b) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered grounded surfaces.
- (c) Exposed live parts on both sides of the workspace (not guarded as in (a)) with the operator between.

(b) All working spaces around electric equipment must be adequately lit. The lighting outlets (~~shall~~) must be arranged so that anyone changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control must be located so that no one is likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(c) Unguarded live parts above working space must be elevated to at least the height specified below:

Elevation of Unguarded Energized Parts Above Working Space

Nominal voltage between phases	Minimum elevation
601 to 7,500	8 feet 6 inches
7,501 to 35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV

**Note:** Minimum elevation may be 8 feet for installations built prior to April 16, 1981, if the nominal voltage between phases is in the range of 601-6600 volts.

(4) Entrance and access to workspace must meet the following requirements:

(a) At least one entrance that is at least 24 inches wide and 6 feet 6 inches high must be provided to give access to the working space around electric equipment. On switchboard and control panels over 48 inches wide, there must be one entrance at each end of the board where practical. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to the entrance, they must be suitably guarded.

(b) Permanent ladders or stairways must be provided to give safe access to the working space around electric equipment installed on platforms, balconies, mezzanine floors, or in attic or roof rooms or spaces.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36403 ((How must)) Installation and maintenance of flexible cords and cables ((be installed and maintained?)).** (1) Extension cords used with portable electric tools and appliances must be three wire and must be fitted with an approved grounding attachment plug and receptacle providing ground continuity.

**Exception:** This does not apply to cords used with portable tools and equipment provided by an approved system of double insulation or its equivalent.

(2) Worn or frayed electric cables are prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36406 ((How must)) Installation and maintenance of attachment plugs and receptacles ((be installed and maintained?)).** (1) Attachment plugs used in work areas must be constructed so that they will endure rough use and have a suitable cord grip to prevent strain on the terminal screws.

(2) Attachment plugs must be approved grounding plugs.

(3) Receptacles for attachment plugs must have approved concealed contacts with a contact for extending ground continuity. Receptacles must be designed and constructed to ensure that the plug can be pulled out without leaving any live parts exposed to accidental contact.

(4) Polarized attachment plugs, receptacles, and cord connectors must be wired to maintain continuity.

(5) Polarized attachment plugs, receptacles, and cord connectors for plugs and polarized plugs must have the terminal intended for connection to the grounded (white) conductor identified by a metal coating that is mostly white. If the terminal is not visible, its entrance hole must be marked with the word "white," or the color white.

(6) The terminal for the connection of the equipment grounding conductor must be:

(a) A green colored, not easily removed terminal screw with hexagonal head; or

(b) A green colored, hexagonal, not easily removed terminal nut; or

(c) A green colored pressure wire connector.

If the terminal for the grounding conductor is not visible, the conductor entrance hole must be marked with the word "green" or the color green.

**Note:** Two-wire attachment plugs, unless of the polarity type, need not have their terminals marked for identification.

(7) Where different voltages, or types of current (A.C. or D.C.) are to be supplied by portable cords, receptacles must be designed so that attachment plugs used on the circuits are not interchangeable.

(8) Attachment plugs or other connectors supplying equipment at more than 300 volts must be skirted or otherwise designed so that arcs are confined.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36409 ((~~What must~~) Safety measures employees ((~~do~~) must take when equipment causes electrical shock((?)).** Employees must report all shocks received from electrical equipment, no matter how slight, immediately to ((you)) the employer. The equipment causing the shock must be checked and any necessary corrective action taken immediately.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36412 ((~~What~~) Grounding and bonding requirements that apply to equipment installation and maintenance((?)).** (1) The path to ground must have enough carrying capacity to conduct safely the currents likely to be imposed on it; and have low enough impedance to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit.

(2) Driven rod electrodes must, where practical, have a resistance to ground of a maximum of 25 ohms. Where the resistance is over 25 ohms, two electrodes connected in parallel ((~~shall~~)) must be used.

(3) Grounding circuits must be checked to ensure that the circuit between the ground and the grounded power conductor has a resistance that is low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(4) Conductors used for bonding and grounding equipment must be large enough to carry the anticipated current.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36415 ((~~What requirements apply to~~) Disconnecting means((?)).** (1) Disconnecting means must be located or shielded so that employees will not be injured. Using open knife switches is prohibited.

(2) Boxes for disconnecting means must be securely and rigidly fastened to the surface upon which they are mounted, and fitted with covers.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36418 ((~~What requirements apply to~~) Identification and load rating of electrical equipment((?)).** (1) Name plates, rating data, and marks of identification on electrical equipment and electrically operated machines must not be removed, defaced or obliterated.

(2) In existing installations, no changes in circuit protection must be made to increase the load beyond the load rating of the circuit wiring, as specified in the National Electrical Code, NFPA 70-1973; ANSI C1-1972, Article 310.

(3) Tampering with, bridging, or using oversize fuses is prohibited. If fuses blow repeatedly, employees must immediately report the trouble to ((you)) the employer or to an authorized electrician.

(4) Attempting to start electric motors that kick out repeatedly is prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36421 ((~~How must equipment be installed~~) Installing equipment in wet locations((?)).** (1) Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations must be installed to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures must be weather-proof.

(2) Switches, circuit breakers, and switchboards installed in wet locations must be enclosed in weatherproof enclosures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36603 ((~~How must~~) Use and identification of grounded and grounding conductors ((~~be used and identified~~)).** (1) A conductor used as a grounded conductor must be identified separately from all other conductors. A conductor used as an equipment grounding conductor must be identified separately from all other conductors.

(2) A grounded conductor must not be attached to any terminal or lead to reverse the designated polarity.

(3) Using a grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug for anything other than grounding is prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36606** (~~What~~) **Ampere rating** (~~must~~) **for outlet devices** (~~have~~). Outlet devices must have an ampere rating at least equal to the load served.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36609** (~~What requirements apply to~~) **Conductors**(~~?~~). This section applies to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors.

(1) Conductors supported on poles must provide a horizontal climbing space of at least the following:

(a) For power conductors below communication conductors, 30 inches.

(b) For power conductors alone or above communication conductors:

((\*) (i) 300 volts or less, 24 inches;

((\*) (ii) More than 300 volts, 30 inches.

(c) For communication conductors below power conductors with power conductors of:

((\*) (i) 300 volts or less, 24 inches;

((\*) (ii) More than 300 volts, 30 inches.

(2) Open conductors must provide at least the following minimum clearances:

(a) 10 feet, above finished grade, sidewalks, or from any platform or projection from which they might be reached;

(b) 12 feet, over areas subject to vehicular traffic other than truck traffic;

(c) 15 feet, over areas that are subject to truck traffic; except

(d) 18 feet, over public streets, alleys, roads, and drive-ways.

(3) Conductors must have a clearance of at least 3 feet from windows, doors, porches, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet away.

(4) Conductors must have a clearance of at least 8 feet from the highest point of roofs they pass over.

**Exceptions:**

(a) Where the voltage between conductors is 300 volts or less and the roof has a slope of at least 4 inches in 12, the clearance from the roofs must be at least 3 feet; or

(b) Where the voltage between conductors is 300 volts or less, the conductors do not pass over more than 4 feet of the overhang portion of the roof, and they are terminated at a through-the-roof raceway or approved support, the clearance from the roofs must be at least 18 inches.

(5) Lamps for outdoor lighting must be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36612** (~~What~~) **Design and protection requirements that apply to service-entrances**(~~?~~). (1) Disconnecting means for service-entrances must meet the following requirements:

(a) Means must be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means must plainly indicate whether it is in the open or closed position and must be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(b) Each service disconnecting means must disconnect all ungrounded conductors at the same time.

(2) The following additional requirements apply to services over 600 volts, nominal.

(a) Service-entrance conductors installed as open wires must be guarded to make them accessible only to qualified persons.

(b) Signs warning of high voltage must be posted where other than qualified employees might come in contact with live parts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36615** (~~What~~) **Overcurrent protection** (~~must be provided~~). (1) The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(a) Conductors and equipment must be protected from overcurrent according to their ability to safely conduct current.

(b) Except for motor running overload protection, overcurrent devices must not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened at the same time.

(c) Except for service fuses, all cartridge fuses that are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground must have disconnecting means. This disconnecting means must be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(d) Overcurrent devices must be readily accessible to each employee or authorized building management personnel. These overcurrent devices must be located where they will be protected against physical damage and away from easily ignitable material.

(e) Fuses and circuit breakers must be located or shielded so that employees will not be burned or otherwise injured by their operation.

(f) Circuit breakers must meet the following requirements:

(i) Circuit breakers must clearly indicate whether they are in the open (off) or closed (on) position.

(ii) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle must be the closed (on) position.

(iii) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers must be approved for the purpose and marked "SWD."

(2) Feeders and branch circuits over 600 volts, nominal, must have short-circuit protection.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36618 ((What)) Grounding for premises wiring systems ((must be grounded?)).** The following systems that supply premises wiring must be grounded:

(1) All 3-wire DC systems must have their neutral conductor grounded.

(2) Two-wire DC systems operating at 50-300 volts between conductors must be grounded.

**Exception((s)):** This requirement does not apply if:

((a)) 1. They supply only industrial equipment in limited areas and are equipped with a ground detector; or

((b)) 2. They are rectifier-derived from an AC system that meets the requirements of subsections (3), (4), and (5) of this section; or

((c)) 3. They are fire-protective signaling circuits with a maximum current of 0.030 amperes.

(3) AC circuits of less than 50 volts must be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(4) AC systems of 50-1000 volts must be grounded under any of the following conditions:

(a) If the system can be grounded so that the maximum voltage to ground on the ungrounded conductors is a maximum of 150 volts;

(b) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(c) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(d) If a service conductor is uninsulated.

(5) Exceptions: AC systems of 50-1000 volts are not required to be grounded under any of the following conditions:

(a) If the system is used exclusively to supply industrial electric furnaces for melting, refining, tempering, and the like.

(b) If the system is separately derived and is used exclusively for rectifiers supplying only adjustable speed industrial drives.

(c) If the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, if all of the following conditions are met:

(i) The system is used exclusively for control circuits;

(ii) The conditions of maintenance and supervision ensure that only qualified persons will service the installation;

(iii) Continuity of control power is required; and

(iv) Ground detectors are installed on the control system.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36621 ((Must the conductor be grounded for)) Grounding the conductor in AC premises wiring((?)).** For AC premises wiring systems the identified conductor must be grounded.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36624 ((What)) General requirements that apply to grounding conductors((?)).** (1) For a grounded system, a grounding electrode conductor must be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor must be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(2) For an ungrounded service-supplied system, the equipment grounding conductor must be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor must be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(3) On extensions of existing branch circuits that do not have an equipment grounding conductor, grounding-type receptacles may be grounded to a grounded cold water pipe near the equipment.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36627 ((Must the)) Continuous path to ground ((be continuous?)).** The path to ground from circuits, equipment, and enclosures must be permanent and continuous.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36630 ((What)) Grounding supports, enclosures, and equipment ((must be grounded?)).** (1) Metal cable trays, metal raceways, and metal enclosures for conductors must be grounded.

**Exceptions:**

((a)) 1. Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; or

((b)) 2. Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

((i)) a. Runs are less than 25 feet;

((ii)) b. Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

((iii)) c. Enclosures are guarded against employee contact.

(2) Metal enclosures for service equipment must be grounded.

(3) Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and metal outlet or junction boxes that are part of the circuit for these appliances must be grounded.

(4) Exposed noncurrent-carrying metal parts of fixed equipment that may become energized must be grounded under any of the following conditions:

(a) If within 8 feet vertically or 5 feet horizontally of ground or grounded metal objects and subject to employee contact;

(b) If located in a wet or damp location and not isolated;

(c) If in electrical contact with metal;

(d) If in a hazardous (classified) location;

(e) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method;

(f) If equipment operates with any terminal at over 150 volts to the ground; however, the following need not be grounded:

(i) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(ii) Metal frames of electrically heated appliances that are permanently and effectively insulated from ground; and

(iii) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles that are over 8 feet above ground or grade level.

(5) Under any of the conditions below, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment that may become energized must be grounded.

(a) When equipment is in hazardous (classified) locations.

(b) When equipment is operated at over 150 volts to ground.

**Exception:** Guarded motors and metal frames of electrically heated appliances need not be grounded if the appliance frames are permanently and effectively insulated from ground.

(c) When equipment is one of the following:

(\*) (i) Refrigerators, freezers, and air conditioners;

(\*) (ii) Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment;

(\*) (iii) Hand-held motor-operated tools;

(\*) (iv) The following motor-operated appliances: Hedge clippers, lawn mowers, snow blowers, and wet scrubbers;

(\*) (v) Cord-connected and plug-connected appliances used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

(\*) (vi) Tools likely to be used in wet and conductive locations; and

(\*) (vii) Portable hand lamps.

Tools likely to be used in wet and conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of a maximum of 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its

equivalent, need not be grounded. The equipment must be distinctively marked to indicate that the tool or appliance uses an approved system of double insulation.

(6) The metal parts of the following nonelectrical equipment must be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and other metal enclosures around equipment of over 750 volts between conductors.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36633 ((How must) Grounding fixed equipment ((be grounded?)).** (1) Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this section, must be grounded by an equipment grounding conductor that is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(2) Electric equipment is considered grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded as described above.

For installations made before May 30, 1982, electric equipment is also considered grounded if it is secured to, and in metallic contact with, the grounded structural metal frame of a building. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered grounded.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-36636 ((How must) Grounding high voltage systems ((be grounded?)).** Grounded high voltage (1000 volts or more) systems and circuits must meet all requirements of WAC 296-307-366 and the additional requirements of this section.

(1) Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, must meet the following requirements:

(a) Portable and mobile high voltage equipment must be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral must be derived.

(b) Exposed noncurrent-carrying metal parts of portable and mobile equipment must be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(c) Ground-fault detection and relaying must be provided to automatically deenergize any high voltage system component that has developed a ground fault. The continuity of the equipment grounding conductor must be continuously monitored to deenergize automatically the high voltage feeder to the portable equipment on loss of continuity of the equipment grounding conductor.



(d) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected must be isolated from and separated in the ground by at least 20 feet from any other system or equipment grounding electrode. There must be no direct connection between the grounding electrodes, such as buried pipe, fence, etc.

(2) All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures (~~shall~~) **must** be grounded. However, equipment that is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus over 8 feet above ground or grade level need not be grounded.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-36803 (~~Does this section apply to~~) Factory-assembled equipment(~~(?)~~).** WAC 296-307-368 does not apply to conductors that are an integral part of factory-assembled equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36806 (~~What wiring methods must be used for~~) Temporary wiring(~~(?)~~).** Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. All requirements for permanent wiring apply to temporary wiring installations, except as indicated in this section.

(1) Temporary electrical power and lighting installations 600 volts, nominal, or less must only be used:

(a) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

(b) For experimental or development work; and

(c) For a maximum of 90 days for Christmas lighting and similar purposes.

(2) Temporary wiring over 600 volts, nominal, must only be used during periods of tests, experiments, or emergencies.

(3) General requirements for temporary wiring.

(a) Working spaces, walkways, and similar locations must be kept clear of power cords.

(b) All temporary wiring must be grounded. (See NFPA 70 Art. 250.)

(c) All wiring equipment must be maintained as vapor-tight, dust-tight, or fiber-tight as their approval requires. There must be no loose or missing screws, gaskets, threaded connections, or other conditions that impair the required tightness.

(d) Take precautions to make necessary open wiring accessible only to authorized personnel.

(e) Feeders must originate in an approved distribution center. The conductors must be run as multiconductor cord or cable assemblies, or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet apart.

(f) Branch circuits must originate in an approved power outlet or panelboard. Conductors must be multiconductor cord or cable assemblies or open conductors. If run as open

conductors they must be fastened at ceiling height every 10 feet. A branch-circuit conductor must not be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment must have a separate equipment grounding conductor if run as open conductors.

(g) Receptacles must be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit must have a separate equipment grounding conductor and all receptacles must be electrically connected to the grounding conductor.

(h) A bare conductor or an earth return must not be used to wire any temporary circuit.

(i) Suitable disconnecting switches or plug connectors must be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(j) Lamps for general illumination must be protected from accidental contact or breakage. Lamps must be elevated at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

(k) Flexible cords and cables must be protected from accidental damage. Sharp corners and projections must be avoided. Where passing through doorways or other pinch points, flexible cords and cables must be protected to avoid damage.

(4) General requirements for temporary lighting.

(a) Temporary lights must have guards to prevent accidental contact with the bulb.

**Note:** Guards are not required when the entire bulb is below the rim and completely surrounded and protected by the reflector.

(b) Temporary lights must have heavy duty electric cords with connections and insulation maintained in safe condition.

(c) Temporary lights must not be suspended by their electric cords unless cords and lights are designed for suspension.

(d) Brass shell, paper-lined lamp holders are prohibited.

(e) Portable extension lamps used where flammable vapors or gases, combustible dusts, or easily ignitable fibers or flyings are present, must be specifically approved as complete assemblies for the type of hazard.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36809 (~~When may~~) Cable trays (~~be used~~?).** (1) Only the following may be installed in cable tray systems:

(a) Mineral-insulated metal-sheathed cable (Type MI);

(b) Armored cable (Type AC);

(c) Metal-clad cable (Type MC);

(d) Power-limited tray cable (Type PLTC);

(e) Nonmetallic-sheathed cable (Type NM or NMC);

(f) Shielded nonmetallic-sheathed cable (Type SNM);

(g) Multiconductor service-entrance cable (Type SE or USE);

(h) Multiconductor underground feeder and branch-circuit cable (Type UF);

(i) Power and control tray cable (Type TC);

(j) Other factory-assembled, multiconductor control, signal, or power cables that are specifically approved for installation in cable trays; or

(k) Any approved conduit or raceway with its contained conductors.

(2) In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified persons will service the installed cable tray system, the following cables may also be installed in ladder, ventilated trough, or 4 inch ventilated channel-type cable trays:

Single conductor cables that are 250 MCM or larger and are Types RHH, RHW, MV, USE, or THW, and other 250 MCM or larger single conductor cables if specifically approved for installation in cable trays. Where exposed to direct rays of the sun, cables must be sunlight-resistant.

(3) Cable trays in hazardous (classified) locations must contain only the cable types permitted in such locations.

**Exception:** Cable tray systems must not be used in hoistways or where subjected to severe physical damage.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36812 (~~What requirements apply to~~) Open wiring on insulators(?)** (1) Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

(2) Conductors must be rigidly supported on noncombustible, nonabsorbent insulating materials and must not contact any other objects.

(3) In dry locations with no exposure to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing must be in continuous lengths a maximum of 15 feet and secured to the surface by straps at maximum intervals of 4 feet 6 inches.

(4) Open conductors must be separated from contact with walls, floors, and wood cross members, or partitions through which they pass by tubes or bushings of noncombustible, nonabsorbent insulating material. If the bushing is shorter than the hole, a waterproof sleeve of nonconductive material must be inserted in the hole and an insulating bushing slipped into the sleeve at each end to keep the conductors completely out of contact with the sleeve. Each conductor must be carried through a separate tube or sleeve.

(5) Conductors within 7 feet of the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they must be protected.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36815 (~~What~~) Wiring requirements that apply to cabinets, boxes, and fittings(?)** (1) Conductors entering boxes, cabinets, or fittings must be protected from abrasion, and openings through which conductors enter must be closed. Unused openings in cabinets, boxes, and fittings must also be closed.

(2) All pull boxes, junction boxes, and fittings must have covers approved for the purpose. All metal covers must be grounded. In completed installations each outlet box must have a cover, faceplate, or fixture canopy. A cover of an out-

let box with holes through which a flexible cord pendant passes must have bushings designed for the purpose or have a smooth, well-rounded surface for the cord to run on.

(3) All pull and junction boxes for systems over 600 volts, nominal, must meet the following requirements:

(a) Boxes must provide a complete enclosure for the contained conductors or cables.

(b) Boxes must be closed by suitable covers securely fastened in place. Underground box covers that weigh over 100 pounds meet this requirement. Covers for boxes must be permanently marked "HIGH VOLTAGE." The marking must be on the outside of the box cover and must be readily visible and legible.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36818 (~~What requirements apply to~~) Switches(?)** (1) Single-throw knife switches must be connected so that the blades are dead when the switch is in the open position. Single-throw knife switches must be placed so that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position must have a locking device that keeps the blades open when set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device must be provided to ensure that the blades remain open when so set.

(2) Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces must have faceplates of nonconducting, noncombustible material.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36821 (~~Where must~~) Location of switchboards and panelboards (~~be located~~?)** Switchboards that have any exposed live parts must be located in permanently dry locations and accessible only to qualified persons. Panelboards must be mounted in cabinets, cutout boxes, or enclosures approved for the purpose and must be dead front. However, panelboards other than the dead front externally operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches must be dead when open.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36824 (~~When must~~) Insulating conductors (~~be insulated~~?)** All conductors used for general wiring must be insulated unless otherwise permitted in this section. The conductor insulation must be approved for the voltage, operating temperature, and location of use. Insulated conductors must be distinguishable by appropriate color or other means as grounded conductors, ungrounded conductors, or equipment grounding conductors.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36827** (~~(When may)~~) **Use of flexible cords and cables** (~~(be used?)~~). (1) Flexible cords and cables must be approved and suitable for conditions of use and location. Flexible cords and cables must be used only for:

- (a) Pendants;
- (b) Wiring of fixtures;
- (c) Connection of portable lamps or appliances;
- (d) Elevator cables;
- (e) Wiring of cranes and hoists;
- (f) Connection of stationary equipment to facilitate frequent interchange;
- (g) Prevention of the transmission of noise or vibration;
- (h) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair; or
- (i) Data processing cables approved as a part of the data processing system.

(2) If used as permitted above, the flexible cord must have an attachment plug and (~~(shall)~~) must be energized from an approved receptacle outlet.

(3) Unless permitted in subsection (1) of this section, flexible cords and cables must not be used:

- (a) As a substitute for the fixed wiring of a structure;
- (b) Where run through holes in walls, ceilings, or floors;
- (c) Where run through doorways, windows, or similar openings;
- (d) Where attached to building surfaces; or
- (e) Where concealed behind building walls, ceilings, or floors.

(4) Flexible cords used in show windows and showcases must be Type S, SO, SJ, SJO, ST, STO, SJT, SJTO, or AFS except for the wiring of chain-supported lighting fixtures and supply cords for portable lamps and other merchandise being displayed or exhibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36830** (~~(How must)~~) **Identification, splicing and termination of flexible cords and cables** (~~(be identified, spliced, and terminated?)~~). (1) A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor must be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO must be durably marked on the surface with the type designation, size, and number of conductors.

(2) Flexible cords must be used only in continuous lengths without splice or tap. Vulcanized splices or equivalent means such as systems using shrinkable materials may be used to repair flexible cords. Hard service flexible cords No. 12 or larger may be repaired by splice if the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(3) Flexible cords must be connected to devices and fittings so that strain relief is provided to prevent pull from being directly transmitted to joints or terminal screws.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36833** (~~(What requirements apply to)~~) **Multiconductor portable cable** (~~(?)~~). Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, must consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2,000 volts must be shielded to confine the voltage stresses to the insulation. Grounding conductors must be provided. Connectors for these cables must be locking with provisions to prevent their opening or closing while energized. Strain relief must be provided at connections and terminations. Portable cables must not be operated with splices unless the splices are permanent molded, vulcanized, or other approved type. Termination enclosures must be suitably marked with a high voltage hazard warning, and terminations must be accessible only to authorized and qualified personnel.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36836** (~~(When may)~~) **Use of fixture wires** (~~(be used?)~~). (1) A fixture wire must be approved for the voltage, temperature, and location of use. A fixture wire used as a grounded conductor must be identified.

(2) Fixture wires may be used:

(a) For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(b) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(3) Fixture wires must not be used as branch-circuit conductors except as permitted for Class 1 power limited circuits.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36839** (~~(What requirements apply to)~~) **Wiring for lighting fixtures, lampholders, lamps, and receptacles** (~~(?)~~). (1) Fixtures, lampholders, lamps, rosettes, and receptacles must have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet above the floor may have exposed parts.

(2) Handlamps of the portable type supplied through flexible cords must have a handle of molded composition or other material approved for the purpose, and a substantial guard must be attached to the lampholder or the handle.

(3) Lampholders of the screw-shell type must be installed for use as lampholders only. Lampholders installed in wet or damp locations must be weatherproof.

(4) Fixtures installed in wet or damp locations must be approved for the purpose and must be constructed or installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36842 (~~What requirements apply to~~)**  
**Wiring for receptacles, cord connectors, and attachment plugs (caps)((?)**. (1) Receptacles, cord connectors, and attachment plugs must be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating.

(2) A receptacle installed in a wet or damp location must be suitable for the location.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36845 (~~What requirements apply to~~)**  
**Wiring for appliances((?)**. (1) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, must have no live parts normally exposed to employee contact.

(2) Each appliance must have a disconnecting means.

(3) Each appliance must be marked with its rating in volts and amperes or volts and watts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36848 (~~What requirements apply to~~)**  
**Wiring for motors, motor circuits, and controllers((?)**. (1) If specified that one piece of equipment must be "in sight from" another piece of equipment, one (~~shall~~) must be visible and not more than 50 feet from the other.

(2) Disconnecting means must meet the following requirements:

(a) A disconnecting means must be located in sight from the controller location. However, a single disconnecting means may be located adjacent to a group of coordinated controllers mounted adjacent to each other or a multimotor continuous process machine. The controller disconnecting means for motor branch circuits over 600 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(b) The disconnecting means must disconnect the motor and the controller from all ungrounded supply conductors and must be designed so that no pole can be operated independently.

(c) If a motor and the driven machinery are not in sight from the controller location, the installation must meet one of the following conditions:

(i) The controller disconnecting means must be able to be locked in the open position.

(ii) A manually operable switch that will disconnect the motor from its source of supply must be placed in sight from the motor location.

(d) The disconnecting means must plainly indicate whether it is in the open (off) or closed (on) position.

(e) The disconnecting means must be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(f) An individual disconnecting means must be provided for each motor, but a single disconnecting means may be used for a group of motors under any of the following conditions:

(i) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist; or

(ii) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(iii) If a group of motors is in a single room in sight from the location of the disconnecting means.

(3) Motors, motor-control apparatus, and motor branch-circuit conductors must be protected against overheating from motor overloads or failure to start, and against short-circuits or ground faults. Overload protection is not required if it will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(4) Live parts of all voltages must be protected according to the following:

(a) Stationary motors with commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground may have those parts unguarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals must be guarded against accidental contact by any of the following:

(i) By installation in a room or enclosure that is accessible only to qualified persons;

(ii) By installation on a suitable balcony, gallery, or platform, elevated and arranged to exclude unqualified persons; or

(iii) By elevation 8 feet or more above the floor.

(b) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, suitable insulating mats or platforms must be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36851 (~~What requirements apply to~~)**  
**Wiring for transformers((?)**. (1) This section applies to the installation of all transformers.

**Exceptions:** ((+)) 1. Current transformers;  
 ((+)) 2. Dry-type transformers installed as a component part of other apparatus;  
 ((+)) 3. Transformers that are an integral part of a high frequency or electrostatic-coating apparatus;

~~((4))~~ 4. Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits; and

~~((5))~~ 5. Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.

(2) The operating voltage of exposed live parts of transformer installations must be indicated by warning signs or visible markings on the equipment or structure.

(3) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV must be in a vault.

(4) If they present a fire hazard to employees, oil-insulated transformers installed indoors must be in a vault.

(5) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings must be safeguarded from fires that may originate in oil-insulated transformers attached or adjacent to a building or combustible material.

(6) Transformer vaults must be constructed to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches must be arranged so that a vault door can be readily opened from the inside.

(7) Any pipe or duct system foreign to the vault installation must not enter or pass through a transformer vault.

(8) Materials must not be stored in transformer vaults.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36854 (~~What requirements apply to~~) Wiring for capacitors(?)**, (1) All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, must have an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

(2) Capacitors rated over 600 volts, nominal, must meet the following additional requirements:

(a) Isolating or disconnecting switches (with no interrupting rating) must be interlocked with the load interrupting device or must have prominently displayed caution signs to prevent switching load current.

(b) For series capacitors, the proper switching must be ensured by any of the following:

(i) Mechanically sequenced isolating and bypass switches;

(ii) Interlocks; or

(iii) Switching procedure prominently displayed at the switching location.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36857 (~~How must storage~~) Ventilation for stored batteries (~~be ventilated?~~)**, ~~((You))~~ The employer must ensure that there is sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-36860 (~~What other~~) Miscellaneous requirements that apply to wiring methods(?)**, (1) Metal raceways, cable armor, and other metal enclosures for conductors must be metallically joined into a continuous electric conductor and must be connected to all boxes, fittings, and cabinets to provide effective electrical continuity.

(2) All wiring systems are prohibited from being installed in ducts used to transport dust, loose stock or flammable vapors. All wiring system are prohibited from being installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37003 (~~What requirements apply to~~) Cranes, hoists, and runways(?)**, The installation of electric equipment and wiring used with cranes, monorail hoists, hoists, and all runways must meet the following requirements:

(1) Disconnecting means must meet the following requirements:

(a) A readily accessible disconnecting means is provided between the runway contact conductors and the power supply.

(b) Another disconnecting means, capable of being locked in the open position, is provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(i) If this additional disconnection means is not readily accessible from the crane or monorail hoist operating station, means is provided at the operating station, to open the power circuit to all motors of the crane or monorail hoist.

(ii) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(A) The unit is floor controlled;

(B) The unit is within view of the power supply disconnecting means; and

(C) No fixed work platform has been provided for servicing the unit.

(2) A limit switch or other device (~~shall~~) must be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(3) The dimension of the working space in the direction of access to live parts that may require examination, adjustment, servicing, or maintenance while alive must be a minimum of 2 feet 6 inches. Where controls are enclosed in cabinets, the door must either open at least 90 degrees or be removable.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37006 (~~What requirements apply to~~) Elevators, dumbwaiters, escalators, and moving walks(?)**, (1) Elevators, dumbwaiters, escalators, and mov-

ing walks must have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(2) If interconnections between control panels are necessary for operation of the system on a multicar installation that remains energized from a source other than the disconnecting means, a warning sign must be mounted on or adjacent to the disconnecting means. The sign must be clearly legible and ~~((shall))~~ must read "Warning—Parts of the control panel are not deenergized by this switch."

(3) If control panels are not located in the same space as the drive machine, they must be located in cabinets with doors or panels capable of being locked closed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37009** ~~((What requirements apply to the))~~ Disconnecting means for electric welders~~((?))~~. (1) A disconnecting means must be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder that is not equipped with a disconnect mounted as an integral part of the welder.

(2) A switch or circuit breaker must be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means must not be less than the supply conductor ampacity.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37012** ~~((What requirements apply to))~~ Electrically driven or controlled irrigation machines~~((?))~~. (1) If an electrically driven or controlled irrigation machine has a stationary point, a driven ground rod must be connected to the machine at the stationary point for lightning protection.

(2) The main disconnecting means for a center pivot irrigation machine must be located at the point of connection of electrical power to the machine and must be readily accessible and capable of being locked in the open position. A disconnecting means must be provided for each motor and controller.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37203** ~~((What does this section cover?))~~ Scope. WAC 296-307-372 covers the requirements for electric equipment and wiring in locations that are classified based on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers that may be present and the likelihood that a flammable combustible concentration or quantity is present. Each room, section, or area must be considered individually to determine its classification.

All requirements in this part apply to hazardous locations, unless otherwise indicated.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37206** ~~((What))~~ Classifications that apply to this section~~((?))~~. These hazardous locations are classified as follows:

(1) ~~((Class I locations))~~ Class I locations. ~~((are these))~~ Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. They include the following:

(a) **Class I, Division 1 locations** ~~((are these))~~ Locations where:

(i) Hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) Hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) Breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

This classification usually includes locations where:

~~((A))~~ (A) Volatile flammable liquids or liquefied flammable gases are transferred from one container to another;

~~((B))~~ (B) Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used;

~~((C))~~ (C) Locations containing open tanks or vats of volatile flammable liquids;

~~((D))~~ (D) Drying rooms or compartments for the evaporation of flammable solvents;

~~((E))~~ (E) Locations containing fat and oil extraction equipment using volatile flammable solvents;

~~((F))~~ (F) Gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape;

~~((G))~~ (G) Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids;

~~((H))~~ (H) The interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and

~~((I))~~ (I) All other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) **Class I, Division 2 locations** ~~((are these))~~ Locations where:

(i) Volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases are normally confined within closed containers or systems from which they can escape only in an accidental rupture or breakdown of containers or systems, or in case of abnormal operation of equipment; or

(ii) Hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operation of the ventilating equipment; or

(iii) They are adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

This classification usually includes locations where:

(\*) ~~(A)~~ Volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors to consider in determining the classification.

(\*) ~~(B)~~ Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers are not normally considered hazardous unless also subject to other hazardous conditions.

(\*) ~~(C)~~ Electrical conduits and their enclosures separated from process fluids by a single seal or barrier are Division 2 locations if the outside of the conduit and enclosures is a nonhazardous location.

(2) ~~(1)~~ **Class II locations** (~~"are those~~), Locations that are hazardous because of the presence of combustible dust. They include the following:

(a) **Class II, Division 1 locations** (~~"are those~~), Locations where:

(i) Combustible dust is or may be suspended in the air under normal operating conditions, in quantities sufficient to produce explosives or ignitable mixtures; or

(ii) Mechanical failure or abnormal operation of machinery or equipment might produce explosive or ignitable, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) Combustible dusts of an electrically conductive nature may be present.

This classification may include areas of grain handling and processing plants, starch plants, sugar-pulverizing plants, malting plants, hay-grinding plants, coal pulverizing plants, areas where metal dusts and powders are produced or processed, and other similar locations that contain dust producing machinery and equipment (except where the equipment is dust-tight or vented to the outside). These areas would have combustible dust in the air, under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures.

Combustible dusts that are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and wood flour, oil meal from beans and seed, dried hay, and other organic materials that may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) **Class II, Division 2 location** (~~"are those~~), Locations where:

(i) Combustible dust is not normally suspended in the air in quantities sufficient to produce explosive or ignitable mixtures; and dust accumulations are normally insufficient to

interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and resulting dust accumulations may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location into which an explosive or ignitable concentration of dust may be suspended under abnormal operating conditions.

(3) ~~(2)~~ **Class III locations** (~~"are those~~), Locations that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be suspended in the air in quantities sufficient to produce ignitable mixtures. They include the following:

(a) **Class III, Division 1 locations** (~~"are those~~), Locations where easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Such locations usually include combustible fiber manufacturing and processing plants; cotton gins and cottonseed mills; flax-processing plants; and industries involving similar hazardous processes or conditions.

Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, and other materials of similar nature.

(b) **Class III, Division 2 locations** (~~"are those~~), Locations where easily ignitable fibers are stored or handled, except in process of manufacture.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37209** (~~What~~) **Equipment, wiring methods, and installations** (~~"may be used~~) **in hazardous locations** (~~"?~~). Equipment, wiring methods, and installations of equipment in hazardous locations must be intrinsically safe, or approved for the hazardous location, or safe for the hazardous location. Requirements for each of these options are as follows:

(1) Equipment and associated wiring approved as intrinsically safe are permitted in any hazardous location for which it is approved.

(2) Requirements to be approved for the hazardous location:

(a) Equipment must be approved for the class of location and for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

(b) Equipment must be marked to show the class, group, and operating temperature or temperature range, based on operation in a 40 degrees C (104 degrees Fahrenheit) ambient, for which it is approved. The temperature marking must be a maximum of the ignition temperature of the specific gas

or vapor to be encountered. The following provisions apply to specific equipment:

(i) Nonheat-producing equipment, such as junction boxes, conduit, and fittings, and heat-producing equipment with a maximum temperature of 100 degrees C (212 degrees ((F)) Fahrenheit) need not have a marked operating temperature or temperature range.

(ii) Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.

(iii) Fixed general-purpose equipment in Class I locations (other than lighting fixtures) that is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(iv) Fixed dust-tight equipment (other than lighting fixtures) that is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(3) Equipment that is safe for the location (~~(shall)~~ must) be of a type and design that provides protection from the hazards arising from combustible and flammable vapors, liquids, gases, dusts, or fibers.

**Note:** Equipment that meets the requirements of The National Electrical Code, NFPA 70, shall be considered in compliance with the requirements of WAC 296-307-372.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37212 ((How must) Installing conduit ((be installed)) in hazardous locations((?)).** All conduits must be threaded and wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper must be used.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37215 ((Which) Equipment ((may) to be used in Division 1 and 2 locations((?)).** Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the equipment does not constitute a source of ignition under normal operating conditions.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37218 ((What requirements apply to) Motors and generators used in hazardous locations((?)).** In Class I, Division 1 locations, motors, generators and other rotating electric machinery must be:

(1) Approved for Class I, Division 1 locations (explosion-proof); or

(2) Of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, arranged to prevent energizing of the machine until ventilation has been established and the enclosure has been purged with at least 10 volumes of air, and also arranged

to automatically deenergize the equipment when the air supply fails; or

(3) Of the totally enclosed inert-gas-filled type supplied with a suitable reliable source of inert gas for pressuring the enclosure, with devices provided to ensure a positive pressure in the enclosure and arranged to automatically deenergize the equipment when the gas supply fails; or

(4) Of a type designed to be submerged in a liquid that is flammable only when vaporized and mixed with air, or in a gas or vapor at a pressure greater than atmospheric and which is flammable only when mixed with air; and the machine is arranged to prevent energizing it until it has been purged with the liquid or gas to exclude air, and also arranged to automatically deenergize the equipment when the supply of liquid, or gas or vapor fails or the pressure is reduced to atmospheric.

Totally enclosed type (2) and (3) motors must have no external surface with a Celsius operating temperature greater than 80% of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices must be provided to detect an increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment must be approved for the location in which it is installed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37403 ((What requirements apply to) Systems over 600 volts, nominal((?)).** (1) Wiring methods for fixed installations over 600 volts, nominal, must meet the following requirements:

(a) Above-ground conductors must be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable suitable for the use and purpose. Open runs of nonmetallic-sheathed cable or of bare conductors or bus-bars must be installed in locations accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, must be grounded. Open runs of insulated wires and cables with a bare lead sheath or a braided outer covering must be supported to prevent physical damage to the braid or sheath.

(b) Conductors emerging from the ground must be enclosed in approved raceways.

(2) Interrupting and isolating devices must meet the following requirements:

(a) Circuit breaker installations located indoors must consist of metal-enclosed units or fire-resistant cell-mounted units. Circuit breakers must be open mounted only in locations that are accessible only to qualified persons. A means of indicating the open and closed position of circuit breakers must be provided.

(b) Fused cutouts installed in buildings or transformer vaults must be approved for the purpose. They must be readily accessible for fuse replacement.

(c) A means must be provided to completely isolate equipment for inspection and repairs. Isolating means that are not designed to interrupt the load current of the circuit must be either interlocked with an approved circuit interrupter or



provided with a sign warning against opening them under load.

(3) Mobile and portable equipment must meet the following requirements:

(a) A metallic enclosure must be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure must include provisions for a solid connection for the ground wire terminal to effectively ground the machine frame. The method of cable termination used must prevent any strain or pull on the cable from stressing the electrical connections. The enclosure must be lockable so only authorized qualified persons may open it and must be marked with a sign warning of the presence of energized parts.

(b) All energized switching and control parts must be enclosed in grounded metal cabinets or enclosures. Circuit breakers and protective equipment must have the operating means projecting through the metal cabinet or enclosure so these units can be reset without opening locked doors. Enclosures and metal cabinets must be locked so that only authorized qualified persons have access and must be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving machines (shovels, draglines, etc.) must be guarded.

(4) Tunnel installations of high-voltage power distribution and utilization equipment that is portable or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators must meet the following requirements:

(a) Conductors in tunnels must be installed in one or more of the following:

- (i) Metal conduit or other metal raceway;
- (ii) Type MC cable; or
- (iii) Other approved multiconductor cable.

Conductors must also be located or guarded to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor must be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(b) Bare terminals of transformers, switches, motor controllers, and other equipment must be enclosed to prevent accidental contact with energized parts. Enclosures used in tunnels must be drip-proof, weatherproof, or submersible as required by environmental conditions.

(c) A disconnecting means that simultaneously opens all ungrounded conductors must be installed at each transformer or motor location.

(d) All nonenergized metal parts of electric equipment and metal raceways and cable sheaths must be effectively grounded and bonded to all metal pipes and rails at the portal and at maximum intervals of 1000 feet throughout the tunnel.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37406 (~~What requirements apply to~~) Emergency power systems(?)**. This section applies to circuits, systems, and equipment intended to supply power for illumination and special loads, in the event of failure of the normal supply.

(1) Emergency circuit wiring must be kept entirely independent of all other wiring and equipment and must not enter the same raceway, cable, box, or cabinet as other wiring.

**Exception:** This does not apply where common circuit elements suitable for the purpose are required, or for transferring power from the normal to the emergency source.

(2) Where emergency lighting is necessary, the system must be arranged so that the failure of any individual lighting element, such as a burned out light bulb, cannot leave any space in total darkness.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37409 (~~How are~~) Classification of Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits(~~classified?~~)**. (1) Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified according to their voltage and power limitations as follows.

(a) Class 1 circuits.

(i) A Class 1 power-limited circuit is supplied from a source with a maximum rated output of 30 volts and 1000 volt-amperes.

(ii) A Class 1 remote control circuit or a Class 1 signaling circuit has a maximum voltage of 600 volts; however, the power output of the source need not be limited.

(b) Class 2 and Class 3 circuits.

(i) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(ii) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(iii) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(c) The maximum circuit voltages in (a) and (b) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact is unlikely.

(2) A Class 2 or Class 3 power supply unit must be durably and visibly marked to indicate the class of supply and its electrical rating.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37412 (~~What requirements apply to~~) Fire protective signaling systems(?)**. (1) Fire protective signaling circuits must be classified either as nonpower limited or power limited.

(2) The power sources for use with fire protective signaling circuits must be either power limited or nonlimited as follows:

(a) The power supply of nonpower-limited fire protective signaling circuits must have a maximum output voltage of 600 volts.

(b) The power for power-limited fire protective signaling circuits must be either inherently limited, in which no over-current protection is required, or limited by a combination of power source and overcurrent protection.

(3) Nonpower-limited fire protective signaling circuits and Class 1 circuits may occupy the same enclosure, cable, or raceway if all conductors are insulated for maximum voltage of any conductor within the enclosure, cable or raceway. Power supply and fire protective signaling circuit conductors are permitted in the same enclosure, cable, or raceway only if connected to the same equipment.

(4) Where open conductors are installed, power-limited fire protective signaling circuits must be separated at least 2 inches from conductors of any light, power, Class 1, and non-power-limited fire protective signaling circuits unless using a special and equally protective method of conductor separation. Cables and conductors of two or more power-limited fire protective signaling circuits or Class 3 circuits are permitted in the same cable, enclosure, or raceway. Conductors of one or more Class 2 circuits are permitted within the same cable, enclosure, or raceway with conductors of power-limited fire protective signaling circuits if the insulation of Class 2 circuit conductors in the cable, enclosure, or raceway is at least that needed for the power-limited fire protective signaling circuits.

(5) Fire protective signaling circuits must be identified at terminal and junction locations in a manner that will prevent unintentional interference with the signaling circuit during testing and servicing. Power-limited fire protective signaling circuits must be visibly and durably marked at terminations.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37603** (~~What does this section cover?~~) **Scope.** WAC 296-307-376 applies to work performed on exposed live parts (involving either direct contact or contact by means of tools or materials) or near enough to them for employees to be exposed to any hazard they present.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37606** (~~Who may work~~) **Qualified person working on energized parts**(?). Only qualified persons may work on electric circuit parts of equipment that have not been deenergized under the procedures of WAC 296-307-37807. Qualified persons must be capable of working safely on energized circuits and must be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37609** (~~What requirements apply to~~) **Working near low voltage lines**(?). When employees are

working near energized electrical service conductors operating at 750 volts or less, employees must work in a manner to prevent contact with the energized conductors.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37612** (~~What requirements apply to~~) **Qualified persons working near overhead lines**(?). When a qualified person is working near overhead lines, whether in an elevated position or on the ground, the person must not approach, or take any conductive object without an approved insulating handle, closer to exposed energized parts than shown in WAC 296-307-150 unless:

(1) The person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed); or

(2) The energized part is insulated both from all other conductive objects at a different potential and from the person; or

(3) The person is insulated from all conductive objects at a potential different from that of the energized part.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37615** (~~What requirements apply to~~) **Vehicles and mechanical equipment near overhead lines**(?). (1) Any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead lines must be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over the voltage. The clearance may be reduced only if:

(a) The vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance must be increased 0.4 inch for every 1kV over that voltage.

(b) Insulating barriers are installed to prevent contact with the lines, and if the barriers are rated for the voltage of the line being guarded and are not a part of or an attachment to the vehicle or its raised structure, the clearance may be reduced to a distance within the designed working dimensions of the insulating barrier.

(2) If the equipment is an aerial lift insulated for the voltage involved, and if the work is performed by a qualified person, the clearance (between the uninsulated portion of the aerial lift and the power line) may be reduced to the distance given in WAC 296-307-150.

(3) Employees standing on the ground must not contact the vehicle or mechanical equipment or any of its attachments, unless:

(a) The employee is using protective equipment rated for the voltage; or

(b) The equipment is located so that no uninsulated part of its structure (that portion of the structure that provides a conductive path to employees on the ground) can come closer to the line than permitted in this section.

(4) If any vehicle or mechanical equipment that may have parts of its structure elevated near energized overhead

lines is intentionally grounded, employees working on the ground near the point of grounding must not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, must be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37618 ((What)) Lighting ((must be provided)) for employees working near exposed energized parts((?)).** (1) Employees must not enter spaces containing exposed energized parts, unless lighting is provided that enables the employees to perform the work safely.

(2) Where lack of lighting or an obstruction prevents an employee from seeing the work to be performed, employees must not perform tasks near exposed energized parts. Employees ((shall)) must not reach blindly into areas that may contain energized parts.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37621 ((What requirements apply to)) Working near exposed energized parts in confined spaces((?)).** (1) For working in a confined or enclosed space (such as a manhole or vault) that contains exposed energized parts, the employer ((shall)) must provide, and the employee must use, protective shields, protective barriers, or insulating materials that are necessary to avoid contact with these parts. Doors, hinged panels, and the like must be secured to prevent swinging into an employee and causing the employee to contact exposed energized parts.

(2) Conductive materials and equipment that are in contact with any part of an employee's body ((shall)) must be handled in a manner that will prevent them from contacting exposed energized conductors or circuit parts. If an employee handles long conductive objects (such as ducts and pipes) in areas with exposed live parts, ((you)) the employer must institute work practices (such as the use of insulation, guarding, and material handling techniques) that will minimize the hazard.

(3) Portable ladders must have nonconductive siderails if they are used where the employee or the ladder could contact exposed energized parts.

(4) Conductive articles of jewelry and clothing ((shall)) must not be worn if they might contact exposed energized parts.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37624 ((What)) Housekeeping requirements that apply to working near exposed energized parts((?)).** (1) Where live parts present an electrical contact hazard, employees must not perform housekeeping duties near enough to the parts that there is a possibility of

contact, unless adequate safeguards (such as insulating equipment or barriers) are provided.

(2) Electrically conductive cleaning materials (including conductive solids such as steel wool, metalized cloth, and silicon carbide, as well as conductive liquid solutions) must not be used in proximity to energized parts unless procedures are followed that will prevent electrical contact.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37627 ((Who)) Qualified persons that may defeat an electrical safety interlock((?)).** Only a qualified person following the requirements of this section may defeat an electrical safety interlock, and then only temporarily while he or she is working on the equipment. The interlock system must be returned to its operable condition when this work is completed.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37801 ((What does this section cover?)) Scope.** (1) WAC 296-307-376 and 296-307-378 cover electrical safety-related work practices for both qualified persons (those who have training in avoiding the electrical hazards of working on or near exposed energized parts) and unqualified persons (those with little or no such training) working on, near, or with the following installations:

(a) Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, parking, and other lots, and industrial substations;

(b) Installations of conductors that connect to the supply of electricity;

(c) Installations of other outside conductors on the premises; and

(d) Installations of optical fiber cable where such installations are made along with electric conductors.

(2) WAC 296-307-367 and 296-307-378 cover work performed by unqualified persons on, near, or with the installations listed in subsection (3) of this section.

(3) WAC 296-307-376 and 296-307-378 do not apply to work performed by qualified persons on or directly associated with the following installations:

(a) Installations for the generation, control, transformation, transmission, and distribution of electric energy (including communication and metering) located in buildings used for such purposes or located outdoors.

Work on or directly associated with generation, transmission, or distribution installations includes:

(i) Work performed directly on installations, such as repairing distribution lines or repairing a feed-water pump for the boiler in a generating plant.

(ii) Work directly associated with installations, such as line-clearance tree trimming and replacing utility poles.

(iii) Work on electric utilization circuits in a generating plant where:

(\*) (A) The circuits are combined with installations of power generation equipment or circuits; and

((\*) (B) The generation equipment or circuits present greater electrical hazards than those posed by the utilization equipment or circuits (such as exposure to higher voltages or lack of overcurrent protection).

(b) Installations in watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(c) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations of railways used exclusively for signaling and communication purposes.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37803** (~~(How must employees be trained)~~) **Training employees on safety practices**((?)). (1) The training requirements in this section apply to employees who face a risk of electrical shock that is not reduced to a safe level by the electrical installation requirements of WAC 296-307-362 through 296-307-374.

(2) Training contents must include the following:

(a) Employees must be trained in and familiar with the safety-related work practices required by WAC 296-307-376 through 296-307-378 that apply to their job assignments.

(b) Employees who are covered by this section but who are not qualified persons must also be trained in and familiar with any electrically related safety practices that are not covered by this standard, but that are necessary for their safety.

(c) Qualified persons must, at a minimum, be trained in and familiar with the following:

(i) The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment;

(ii) The skills and techniques necessary to determine the nominal voltage of exposed live parts; and

(iii) The clearance distance specified in WAC 296-307-376 and the corresponding voltages to which the qualified person will be exposed.

**Note 1:** For the purposes of WAC 296-307-376 and 296-307-378, an employee must have the training required for a qualified person in order to be considered a qualified person.

**Note 2:** Qualified persons whose work on energized equipment involves either direct contact or contact by means of tools or materials must also have the training needed to meet WAC 296-307-376.

(3) ((You)) **The employer** must provide either classroom or on-the-job training. The degree of training provided must be determined by the risk to the employee.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37805** (~~(How must)~~) **Identification and use of safety-related work practices** (~~(be chosen and used?)~~). Safety-related work practices must be used to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts, when work is performed near or on equipment or circuits that are or may be energized. The specific safety-related work practices must be consistent with the nature and extent of the associated electrical hazards.

(1) When an employee may be exposed to live parts, they must be deenergized before the employee works on or near them, unless deenergizing introduces other hazards or is infeasible due to equipment design or operational limitations. Live parts that operate at less than 50 volts to ground need not be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

**Note 1:** Examples of other hazards include deactivation of emergency alarm systems, shutdown of hazardous location ventilation equipment, or removal of illumination for an area.

**Note 2:** An example of work that may be performed on or near energized circuit parts because of unfeasibility due to equipment design or operational limitations is testing of electric circuits that can only be performed with the circuit energized.

(2) If the exposed live parts are not deenergized (for reasons of increased or additional hazards or unfeasibility), other safety-related work practices must be used to protect employees who may be exposed to the electrical hazards involved. Such work practices must protect employees against contact with energized circuit parts directly with any part of their body or indirectly through some other conductive object. The work practices must be suitable for the voltage level of the exposed electric conductors or circuit parts.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37807** (~~(What work practices must be followed for)~~) **Work on exposed deenergized parts**((?)).

(1) This section applies to work on exposed deenergized parts or near enough to them to expose the employee to any electrical hazard they present. Conductors and parts of electric equipment that have been deenergized but have not been locked out or tagged must be treated as energized parts, and WAC 296-307-376 applies to work on or near them.

(2) While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been deenergized, the circuits energizing the parts must be locked out or tagged or both according to the requirements of this section. The requirements must be followed in the order in which they are presented.

((=)) **Fixed equipment** ((= means)). Equipment that is fastened or connected by permanent wiring methods.

**Note:** Lockout and tagging procedures that comply with WAC 296-307-320 will also be deemed to comply with WAC 296-307-37807 through 296-307-37817 if:

((\*) 1. The procedures address the electrical safety hazards covered by this part; and

((\*) 2. The procedures include the requirements of WAC 296-307-37813(4) and 296-307-37815(2).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37809** (~~(Must)~~) **An employer must have a written copy of lockout-tagout procedures**((?)). The employer must maintain a written copy of the procedures outlined in WAC 296-307-37807 through 296-307-37817 and must make it available for inspection by us or by employ-

ees. The written procedures may be in the form of a copy of WAC 296-307-37807 through 296-307-37817.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37811** (~~What work practices must be followed for~~) **Deenergizing equipment**(~~(?)~~). (1) Safe procedures for deenergizing circuits and equipment must be determined before circuits or equipment are deenergized.

(2) The circuits and equipment to be worked on must be disconnected from all electric energy sources. Control circuit devices, such as push buttons, selector switches, and interlocks, must not be used as the sole means for deenergizing circuits or equipment. Interlocks for electric equipment must not be used as a substitute for lockout and tagging procedures.

(3) Stored electric energy which might endanger employees must be released. Capacitors must be discharged and high capacitance elements must be short-circuited and grounded, if the stored electric energy might endanger employees.

**Note:** Capacitors or associated equipment handled in meeting this requirement must be treated as energized.

(4) Stored nonelectrical energy in devices that could reenergize electric circuit parts must be blocked or relieved to the extent that the circuit parts could not be accidentally energized by the device.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37813** (~~How must~~) **Application of locks and tags** (~~(be applied?)~~). (1) A lock and a tag must be placed on each disconnecting means used to deenergize circuits and equipment on which work is to be performed, except as provided in subsections (3) and (5) of this section. The lock must be attached to prevent anyone from operating the disconnecting means unless they resort to undue force or the use of tools.

(2) Each tag must have a statement prohibiting unauthorized operation of the disconnecting means and removal of the tag.

(3) If a lock cannot be applied, or if tagging procedures will provide a level of safety equivalent to that obtained by the use of a lock, a tag may be used without a lock.

(4) A tag used without a lock must be supplemented by at least one additional safety measure that provides a level of safety equivalent to that obtained by the use of a lock. Examples of additional safety measures include the removal of an isolating circuit element, blocking of a controlling switch, or opening of an extra disconnecting device.

(5) A lock may be placed without a tag only under the following conditions:

(a) Only one circuit or piece of equipment is deenergized; and

(b) The lockout period does not extend beyond the work shifts; and

(c) Employees exposed to the hazards associated with reenergizing the circuit or equipment are familiar with this procedure.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37815** (~~What work practices must be followed to verify~~) **Verifying deenergization**(~~(?)~~). The requirements of this section must be met before any circuits or equipment can be considered and worked as deenergized.

(1) A qualified person must operate the equipment operating controls or otherwise verify that the equipment cannot be restarted.

(2) A qualified person must use test equipment to test the circuit elements and electrical parts of equipment to which employees will be exposed and (~~shall~~) **must** verify that the circuit elements and equipment parts are deenergized. The test must also determine if any energized conditions exist as a result of inadvertently induced voltage or unrelated voltage backfeed even though specific parts of the circuit have been deenergized and presumed to be safe. If the circuit to be tested is over 600 volts, nominal, the test equipment must be checked for proper operation immediately before and immediately after this test.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37817** (~~What work practices must be followed when~~) **Reenergizing equipment**(~~(?)~~). These requirements must be met, in the order given, before circuits or equipment are reenergized, even temporarily.

(1) A qualified person must conduct tests and visual inspections as necessary to verify that all tools, electrical jumpers, shorts, grounds, and other devices have been removed, so that the circuits and equipment can be safely energized.

(2) Employees exposed to the hazards associated with reenergizing the circuit or equipment must be warned to stay clear of circuits and equipment.

(3) Each lock and tag must be removed by the employee who applied it or under his or her direct supervision. However, if this employee is absent from the workplace, then the lock or tag must be removed by a qualified person designated to perform this task if:

(a) The employer ensures that the employee who applied the lock or tag is not available at the workplace; and

(b) The employer ensures that the employee is aware that the lock or tag has been removed before resuming work at that workplace.

(4) There (~~shall~~) **must** be a visual determination that all employees are clear of the circuits and equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37819** (~~What safety-related work practices relate to~~) **Portable electric equipment**(~~(?)~~). This section applies to using cord-connected and plug-connected equipment, including flexible cord sets (extension cords).

(1) Portable equipment must be handled in a manner that will not cause damage. Flexible electric cords connected to equipment must not be used for raising or lowering the equipment. Flexible cords must not be fastened with staples or otherwise hung in a way that could damage the outer jacket or insulation.

(2) Visual inspection requirements:

(a) Portable cord-connected and plug-connected equipment and flexible cord sets must be visually inspected before use on any shift for external defects (such as loose parts, deformed and missing pins, or damage to outer jackets or insulation) and for evidence of possible internal damage (such as pinched or crushed outer jacket). Cord-connected and plug-connected equipment and flexible cord sets that remain connected once they are in place and are not exposed to damage need not be visually inspected until they are relocated.

(b) If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged items must be removed from service, and ~~((no))~~ employee shall not be allowed to use it until repairs and tests necessary to render the equipment safe have been made.

(c) When an attachment plug is to be connected to a receptacle (including any on a cord set), the relationship of the plug and receptacle contacts must first be checked to ensure they are of proper mating configurations.

(3) Requirements for grounding-type equipment:

(a) A flexible cord used with grounding-type equipment must contain an equipment grounding conductor.

(b) Attachment plugs and receptacles must not be connected or altered in a manner that would prevent proper continuity of the equipment grounding conductor at the point where plugs are attached to receptacles. These devices must not be altered to allow the grounding pole of a plug to be inserted into slots intended for connection to the current-carrying conductors.

(c) Adapters that interrupt the continuity of the equipment grounding connection are prohibited.

(4) Portable electric equipment and flexible cords used in highly conductive work locations, or in locations where employees are likely to contact water or conductive liquids, must be approved for those locations.

(5) Connecting attachment plugs.

(a) Employees' hands must not be wet when plugging and unplugging flexible cords and cord-connected and plug-connected equipment, if energized equipment is involved.

(b) Energized plug and receptacle connections must be handled only with insulating protective equipment if the condition of the connection could provide a conducting path to the employee's hand. For example: If a cord connector is wet from being immersed in water.

(c) Locking-type connectors must be properly secured after connection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37821** (~~What safety-related work practices relate to~~) **Electric power and lighting circuits((?))**. (1) Load rated switches, circuit breakers, or other

devices specifically designed as disconnecting means must be used for the opening, reversing, or closing of circuits under load conditions. Any cable connectors other than the load-break type, fuses, terminal lugs, and cable splice connections are prohibited for such purposes, except in an emergency.

(2) After a circuit is deenergized by a circuit protective device, the circuit must not be manually reenergized until it has been determined that the equipment and circuit can be safely energized. This repetitive manual reclosing of circuit breakers or reenergizing circuits through replaced fuses is prohibited.

**Note:** When it can be determined from the design of the circuit and the overcurrent devices involved that the automatic operation of a device was caused by an overload rather than a fault connection, no examination of the circuit or connected equipment is needed before the circuit is reenergized.

(3) Overcurrent protection of circuits and conductors must not be modified, even on a temporary basis, beyond that allowed by this part for the installation safety requirements for overcurrent protection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-37823** (~~What safety-related work practices relate to~~) **Test instruments and equipment((?))**.

(1) Only qualified persons may perform testing work on electric circuits or equipment.

(2) Test instruments and equipment and all associated test leads, cables, power cords, probes, and connectors must be visually inspected for external defects and damage before the equipment is used. If there is a defect or evidence of damage that might expose an employee to injury, the defective or damaged item must be removed from service, and no employee may use it until necessary repairs and tests to render the equipment safe have been made.

(3) Test instruments and equipment and their accessories must be rated for the circuits and equipment to which they will be connected and must be designed for the environment in which they will be used.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-37825** (~~What safety-related work practices relate to~~) **Flammable materials((?))**.

Where flammable materials are present only occasionally, electric equipment capable of igniting them must not be used, unless measures are taken to prevent hazardous conditions from developing.

Such materials include, but are not limited to: Flammable gases, vapors, or liquids; combustible dust; and ignitable fibers or flyings.

**Note:** Electrical installation requirements for locations where flammable materials are present on a regular basis are contained in WAC 296-307-372.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-38003 ((How-must)) Use of protective equipment ((be-used?)).** (1) Employees working in the areas where there are potential electrical hazards must have and use electrical protective equipment that is appropriate for the specific parts of the body to be protected and for the work to be performed.

(2) If the insulating capability of protective equipment may be subject to damage during use, the insulating material must be protected.

For example: An outer covering of leather is sometimes used to protect rubber insulating material.

(3) Employees must wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with exposed energized parts.

(4) Employees must wear protective equipment for the eyes or face wherever there is danger of injury to the eyes or face from electrical arcs or flashes or from flying objects resulting from electrical explosion.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-38006 ((What requirements apply to)) General protective equipment and tools((?)).** (1) When working near exposed energized conductors or circuit parts, each employee must use insulated tools or handling equipment if the tools or handling equipment might make contact with such conductors or parts. If the insulating capability of insulated tools or handling equipment is subject to damage, the insulating material must be protected.

(2) Ropes and handlines used near exposed energized parts must be nonconductive.

(3) Protective shields, protective barriers, or insulating materials must be used to protect each employee from shock, burns, or other electrically related injuries while that employee is working near exposed energized parts that might be accidentally contacted or where dangerous electric heating or arcing might occur. When normally enclosed live parts are exposed for maintenance or repair, they must be guarded to protect unqualified persons from contact with the live parts.

(4) Altering techniques must be used to warn and protect employees from hazards that could cause injury due to electric shock, burns, or failure of electric equipment parts.

(5) Safety signs, safety symbols, or accident prevention tags must be used where necessary to warn employees about electrical hazards that may endanger them, as required by WAC 296-307-330.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-38009 ((What)) Manufacturing and marking requirements that apply to electrical protective devices((?)).** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following manufacture and marking requirements:

(1) Blankets, gloves, and sleeves must be produced by a seamless process.

(2) Each item must be clearly marked as follows:

(a) All classified equipment must be marked with its class number.

(b) Nonozone-resistant equipment other than matting must be marked Type I.

(c) Ozone-resistant equipment other than matting must be marked Type II.

(d) Other relevant markings, such as the manufacturer's identification and the size of the equipment, may also be provided.

(3) Markings must be nonconducting and ((shall)) must be applied so they do not impair the insulating qualities of the equipment.

(4) Markings on gloves must be on the cuff.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-38012 ((What)) Electrical requirements that apply to electrical protective devices((?)).** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following electrical requirements:

(1) Equipment must be capable of withstanding the a-c proof-test voltage specified in Table 1 or the d-c proof-test voltage specified in Table 2.

(a) The proof-test must reliably indicate that the equipment can withstand the voltage involved.

(b) The test voltage must be applied continuously for three minutes for equipment other than matting and must be applied continuously for one minute for matting.

(c) Gloves must also be capable of withstanding the a-c proof-test voltage specified in Table 1 after a sixteen-hour water soak.

(2) When the a-c proof-test is used on gloves, the 60 hertz proof-test current must not exceed the values specified in Table 1 at any time during the test period.

(a) If the a-c proof-test is made at a frequency other than 60 hertz, the permissible proof-test current must be computed from the direct ratio of the frequencies.

(b) For the test, gloves (right side out) must be filled with tap water and immersed in water to a depth that is in accordance with Table 3. Water must be added to or removed from the glove, as necessary, so that the water level is the same inside and outside the glove.

(c) After the sixteen-hour water soak, the 60 hertz proof-test current may exceed the values given in Table 1 by not more than 2 milliamperes.

(3) Equipment that has been subjected to a minimum breakdown voltage test must not be used for electrical protection.

(4) Material used for Type II insulating equipment must be capable of withstanding an ozone test, with no visible effects. The ozone test must reliably indicate that the material will resist ozone exposure in actual use. Any visible signs of ozone deterioration of the material, such as checking, cracking, breaks, or pitting, is evidence of failure to meet the requirements for ozone-resistant material.

**Note:** Rubber insulating equipment meeting the following national consensus standards is considered to be in compliance with WAC 296-307-38009, 296-307-38012, and 296-307-38015:

- (\*) 1. American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.
- (\*) 2. ASTM D 178-93, Specification for Rubber Insulating Matting.
- (\*) 3. ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- (\*) 4. ASTM D 1049-93, Specification for Rubber Insulating Covers.
- (\*) 5. ASTM D 1050-90, Specification for Rubber Insulating Line Hose.
- (\*) 6. ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

These standards contain specifications for conducting the tests required in this section.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-38015 ((What) Workmanship and finish requirements that apply to electrical protective devices(?)).** Insulating blankets, matting, covers, line hose, gloves, and sleeves made of rubber must meet the following workmanship and finish requirements:

(1) Equipment must be free of harmful physical irregularities that can be detected by the tests or inspections required in WAC 296-307-38012.

(2) Surface irregularities that may be present on all rubber goods because of imperfections on forms or molds or because of inherent difficulties in the manufacturing process and that may appear as indentations, protuberances, or imbedded foreign material are acceptable if:

(a) The indentation or protuberance blends into a smooth slope when the material is stretched.

(b) Foreign material remains in place when the insulating material is folded and stretches with the insulating material surrounding it.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-38018 ((How must) Use and maintenance of electrical protective devices ((be maintained and used?)).** (1) Electrical protective equipment must be maintained in a safe, reliable condition.

(2) The following specific requirements apply to insulating blankets, covers, line hose, gloves, and sleeves made of rubber:

(a) Maximum use voltages must meet the requirements in Table 4.

(b) Insulating equipment must be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves must be given an air test, along with the inspection.

(c) Insulating equipment with any of the following defects must not be used:

(i) A hole, tear, puncture, or cut;

(ii) Ozone cutting or ozone checking (the cutting action produced by ozone on rubber under mechanical stress into a series of interlacing cracks);

(iii) An embedded foreign object;

(iv) Any of the following texture changes: Swelling, softening, hardening, or becoming sticky or inelastic;

(v) Any other defect that damages the insulating properties.

(d) Insulating equipment found to have other defects that might affect its insulating properties must be removed from service and returned for testing under (h) of this subsection.

(e) Insulating equipment must be cleaned as needed to remove foreign substances.

(f) Insulating equipment must be stored in such a location and in such a manner as to protect it from light, temperature extremes, excessive humidity, ozone, and other injurious substances and conditions.

(g) Protector gloves must be worn over insulating gloves.

(h) Electrical protective equipment must be subjected to periodic electrical tests. Test voltages and the maximum intervals between tests must be according to Table 4 and Table 5.

(i) The test method used must reliably indicate whether the insulating equipment can withstand the voltages involved.

**Note:** Standard electrical test methods considered as meeting this requirement are given in the following national consensus standards:

(\*) 1. American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.

(\*) 2. ASTM D 1048-93, Specification for Rubber Insulating Blankets.

(\*) 3. ASTM D 1049-93, Specification for Rubber Insulating Covers.

(\*) 4. ASTM D 1050-90, Specification for Rubber Insulating Line Hose.

(\*) 5. ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

(\*) 6. ASTM F 478-92, Specification for In-Service Care of Insulating Line Hose and Covers.

(\*) 7. ASTM F 479-88a, Specification for In-Service Care of Insulating Blankets.

(\*) 8. ASTM F 496-93b, Specification for In-Service Care of Insulating Gloves and Sleeves.

(j) Insulating equipment that fails inspections or electrical tests must not be used by employees, except as follows:

(i) Rubber insulating line hose could be used in shorter lengths with the defective portion cut off.

(ii) Rubber insulating blankets could be repaired using a compatible patch that results in physical and electrical properties equal to those of the blanket.

(iii) Rubber insulating blankets could be salvaged by severing the defective area from the undamaged portion of the blanket. The resulting undamaged area must not be smaller than twenty-two inches by twenty-two inches (560 mm by 560 mm) for Class 1, 2, 3, and 4 blankets.

(k) Repaired insulating equipment must be retested before it may be used by employees.



(l) ~~(You)~~ **The employer** must certify that equipment has been tested in accordance with the requirements of (h), (i), and (k) of this subsection. The certification must identify the equipment that passed the test and the date it was tested.

**Note:** This requirement may be met by marking the equipment and entering the results of the tests and the dates of testing onto logs.

<b>Table 1</b> <b>A-C Proof-Test Requirements</b> <b>Maximum proof-test current, mA (gloves only)</b>					
Class of equipment	Proof-test voltage rms V	267 mm (10.5 in.) glove	356 mm (14 in.) glove	406 mm (16 in.) glove	457 mm (18 in.) glove
0	5,000	8	12	14	16
1	10,000		14	16	18
2	20,000		16	18	20
3	30,000		18	20	22
4	40,000			22	24

<b>Table 2</b> <b>D-C Proof-Test Requirements</b>	
Class of Equipment	Proof-test voltage
0	20,000
1	40,000
2	50,000
3	60,000
4	70,000

*Note:* The d-c voltages listed in this table are not appropriate for proof testing rubber insulating line hose or covers. For this equipment, d-c proof-tests ~~(shall)~~ must use a voltage high enough to indicate that the equipment can be safely used at the voltages listed in Table 3. See ASTM D 1050-90 and ASTM D 1049-88 for further information on proof tests for rubber insulating line hose and covers.

<b>Table 3</b> <b>Glove Tests-Water Level<sup>1,2</sup></b>				
Class of glove	A-C proof-test		D-C proof-test	
	mm.	in.	mm.	in.
0	38	1.5	38	1.5
1	38	1.5	51	2.0
2	64	2.5	76	3.0
3	89	3.5	102	4.0
4	127	5.0	153	6.0

<sup>1</sup>The water level is given as the clearance from the cuff of the glove to the water line, with a tolerance of 13 mm. (0.5 in.).

<sup>2</sup>If atmospheric conditions make the specified clearances impractical, the clearances may be increased by a maximum of 25 mm. (1 in.)

<b>Table 4</b> <b>Rubber Insulating Equipment</b> <b>Voltage Requirements</b>			
Class of equipment	Maximum use voltage <sup>1</sup> a-c-rms	Retest voltage <sup>2</sup> a-c-rms	Retest voltage <sup>2</sup> d-c-rms
0	1,000	5,000	20,000
1	7,500	10,000	40,000
2	17,000	20,000	50,000

**Table 4  
Rubber Insulating Equipment  
Voltage Requirements**

Class of equipment	Maximum use voltage <sup>1</sup> a-c-rms	Retest voltage <sup>2</sup> a-c-rms	Retest voltage <sup>2</sup> d-c-rms
3	26,500	30,000	60,000
4	36,000	40,000	70,000

*Note:* Rubber gloves (~~shall~~) **must** only be used on voltages of 5000 volts phase to phase or less.

<sup>1</sup>The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design/voltage of the energized system that may be safely worked. The nominal voltage design is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design/voltage:

(a) If there is no multiphase exposure in a system area and if the voltage exposure is limited to the phase-to-ground potential, or

(b) If the electrical equipment and devices are insulated or isolated or both so that the multiphase exposure on a grounded wye circuit is removed.

<sup>2</sup>The proof-test voltage (~~shall~~) **must** be applied continuously for at least one minute, but no more than three minutes.

**Table 5  
Rubber Insulating Equipment Test Intervals**

Type of equipment	When to test
Rubber insulating line hose	Upon indication that insulating value is suspect
Rubber insulating covers	Upon indication that insulating value is suspect
Rubber insulating blankets	Before first issue and every 12 months thereafter
Rubber insulating gloves	Before first issue and every 6 months thereafter
Rubber insulating sleeves	Before first issue and every 12 months thereafter

(3) Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operations, suitable insulating floors, mats or platforms must be provided on which the operator must stand while handling the switches.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40001** (~~What does this section cover?~~) **Scope.** WAC 296-307-400 covers the transportation and application of anhydrous ammonia.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40003** (~~What~~) **Definitions that apply to this section(?)**. ~~(Certified)~~ **Certified** (~~means~~) **The** equipment has been tested by a nationally recognized testing laboratory and meets nationally recognized standards or is safe for a specific use; or is a kind whose production is periodically inspected by a nationally recognized testing laboratory, and bears identification of certification.

~~(DOT)~~ **DOT** (~~means~~) **The** Federal Department of Transportation.

~~(DOT)~~ **DOT container** (~~means~~) **A** container constructed according to the requirements of 49 C.F.R. chapter I.

~~(DOT)~~ **DOT cylinder** (~~means~~) **A** cylinder that meets the requirements of 49 C.F.R. chapter I.

~~(Labeled)~~ **Labeled** (~~means~~) **The** equipment has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that makes periodic inspections of the production of such equipment, and the label indicates compliance with nationally recognized standards or tests.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40005** (~~What general requirements apply to the~~) **Storage and handling of anhydrous ammonia(?)**. (1) All employees must use at least gloves and goggles and may supplement with a face shield while working on or with charged anhydrous ammonia equipment.

(2) ~~(You)~~ **The employer** must ensure that equipment is inspected before each day's work. Conditions that would contribute to leaks (~~shall~~) **must** be corrected.

(3) Hose end-valves must be closed when not in use to prevent accidental discharge in case the main valve is opened.

(4) Relief and vapor valves must discharge away from the operator's working position.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40007** (~~What requirements apply to~~) **Systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia(?)**. All anhy-

drous ammonia containers with a capacity of 3,000 gallons or less and equipment mounted on farm wagons (implements of husbandry) that is used to transport ammonia must meet the requirements of this section.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) Containers must meet the following mounting requirements:

(a) The farm wagon or container has a stop so the container does not dislodge from its mounting when a farm wagon stops suddenly.

(b) The container is anchored to the farm wagon at one or more places on each side of the container.

(c) The weight of containers mounted on four-wheel farm wagons, is distributed evenly over both axles.

(d) When the cradle and the container are not welded together, material between them eliminates metal-to-metal friction.

(2) Container accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) All containers with more than 250-gallon capacity have a pressure gauge with a dial graduated from 0-400 psi.

(c) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(d) All containers with more than 250-gallon capacity are equipped for spray loading or with an approved vapor return valve.

(e) All vapor and liquid connections have approved excess flow valves or quick-closing internal valves that are only open for operating.

**Exception:** Safety-relief valves and connections that are specifically exempted by WAC 296-307-40019(5) are exempt from this requirement.

(f) Fittings are protected from physical damage by a rigid guard. The guard is designed to withstand force from any direction, equal to twice the weight of the container and lading, at a safety factor of four. If the guard is fully enclosed, the safety-relief valves are properly vented through the guard.

(g) If a liquid withdrawal line is installed in the bottom of a container, the connections and hose are at least as high as the lowest horizontal edge of the farm wagon axle.

(h) Both ends of the hose are secure while in transit.

(3) Each side and the rear end of the container must be marked in letters at least four inches high, with the words "ANHYDROUS AMMONIA" or, "CAUTION—AMMONIA," or marked according to DOT regulations.

(4) Farm wagons (implements of husbandry) must meet all state regulations and the following requirements:

(a) All farm wagons must be securely attached to the vehicle drawing them by drawbars with safety chains.

(b) A farm wagon must be constructed so that it will follow the path of the towing vehicle and will prevent the towed

wagon from whipping or swerving dangerously from side to side.

(c) All farm wagons must have five gallons or more of readily available clean water.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40009 (~~What requirements apply to~~) Systems mounted on farm wagons (implements of husbandry) for the application of ammonia(?)**. This section applies to systems mounted on farm equipment that are used for the field application of ammonia.

WAC 296-307-40011 through 296-307-40037 also apply unless otherwise noted.

(1) All containers must be securely mounted.

(2) Container valves and accessories must meet the following requirements:

(a) Each container has a fixed maximum liquid-level gauge.

(b) The filling connection is fitted with one of the following:

(i) A combination back-pressure check valve and excess-flow valve; or

(ii) One double or two single back-pressure check valves; or

(iii) A positive shut-off valve that has either an internal back-pressure check valve or an internal excess flow valve.

(c) An excess-flow valve is not required in the vapor connection if the controlling orifice is a maximum of 7/16 inch in diameter and the valve is a hand-operated shut-off valve. To assist in filling applicator tanks, ~~((you))~~ the employer may bleed vapors to the open air, if this requirement is met.

(d) Metering devices may be connected directly to the tank withdrawal valve. ~~((You))~~ The employer may use a union type connection between the tank valve and metering device. ~~((You))~~ The employer may use remote mounting of metering devices if the hose meets the requirements of Appendix B. When the applicator tank is trailed and the metering device is remotely mounted, such as on the tractor tool bar, ~~((you))~~ the employer must use an automatic break-away type, self-closing coupling.

(e) No excess-flow valve is required in the liquid withdrawal line if the controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 7/16 inch in diameter.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40011 (~~What requirements must~~) Approved anhydrous ammonia equipment (~~(meet?)~~)**. All equipment must be approved by one of the following methods:

(1) The equipment was installed before February 8, 1973, and was approved and tested, and installed according to either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage

and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(2) The equipment is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(3)(a) The equipment is a type that no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe; and

(b) The equipment is inspected or tested by an authority responsible for enforcing occupational safety provisions of a law, code, or regulation pertaining to the storage, handling, transport, and use of anhydrous ammonia; and

(c) The equipment is found in compliance with either the requirements of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(4) For a custom-designed and custom-built unit:

(a) ~~((You))~~ The employer cannot find a nationally recognized testing laboratory or authority responsible for the enforcement of a law, code or regulation pertaining to the storage, transportation and use of anhydrous ammonia that is willing to accept, certify, list, label or determine to be safe ~~((your))~~ the employer's custom equipment; and

(b) ~~((You have))~~ The employer has on file a document attesting to its safe condition following appropriate tests. The document must be signed by a registered professional engineer or qualified person. The document must describe the test bases, test data and results, and also the qualifications of the certifying person.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-40013** ~~((What requirements apply to the))~~ Construction, original test, and requalification of nonrefrigerated containers ~~((?))~~. The code is the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler Construction Code), 1952, 1956, 1959, 1962, 1965, 1968 and 1971 editions, the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code) 1951 edition, and amendments or later editions, as adopted.

(1) Containers used with systems covered in WAC 296-307-40005 and 296-307-40007 must be constructed and tested according to the code.

**Exception:** Construction under Table UW-12 at a basic joint efficiency of under 80% is prohibited. Containers built according to code are exempt from paragraphs UG-125 to UG-128, inclusive, and paragraphs UG-132 and UG-133 of the code.

**Note:** This subsection allows the continued use or reinstallation of containers constructed and maintained according to the 1949, 1950, 1952, 1956, 1959, 1962, 1965 and 1968 editions of the Unfired Pressure Vessel Code of the ASME or any revisions thereof in effect at the time of fabrication.

(2) Containers more than 36 inches in diameter or 250 gallons water capacity must be constructed to meet one or more of the following requirements:

(a) Containers must be stress relieved after fabrication according to the code; or

(b) Cold-formed heads, when used, must be stress relieved; or

(c) Hot-formed heads must be used.

(3) Welding to the shell, head, or any other part of the container subject to internal pressure must be according to the code. Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the container manufacturer.

Containers used with systems covered in subsection (4) of this section must be constructed and tested in accordance with the DOT specifications.

(4) Containers must comply with department of transportation specifications and must be maintained, filed, packaged, marked, labeled and shipped to comply with current DOT regulations and American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954 R1970. See Appendix C for availability.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-40015** ~~((How must))~~ Marking nonrefrigerated containers and systems (other than DOT containers) ~~((be marked?))~~. (1) System nameplates, when required, must be permanently attached to the system so they are readily accessible for inspection.

(2) Each container or system covered in WAC 296-307-40005 and 296-307-40007 must be marked as follows:

(a) With indication that the container or system meets the requirements of the code under which the container is constructed.

(b) With indication on the container and system nameplate when the system is designed for underground installation.

(c) With the name and address of the supplier of the container or the trade name of the container and with the date of fabrication.

(d) With the water capacity of the container in pounds at 60°F or gallons, United States standard.

(e) With the design pressure in pounds per square inch gauge.

(f) With the wall thickness of the shell and heads.

(g) With indication of the maximum fill level for liquid anhydrous ammonia between 20°F and 100°F. Markings must be in increments of not more than 20°F.

**Exception:** Containers with fixed maximum level indicators, such as fixed length dip tubes, or containers that are filled by weight are exempt from this requirement.

(h) With the outside surface area in square feet.

(i) With minimum temperature in Fahrenheit for which the container is designed.

(j) The marking must be on the container itself or on a permanently attached nameplate.

(3) All main operating valves on permanently installed containers with a capacity of over 3,000 water gallons must be identified to show whether the valve is in liquid or vapor service. The valve must be identified as follows:

(a) The word LIQUID (or LIQUID VALVE), VAPOR (or VAPOR VALVE), as appropriate, must be placed on or within twelve inches of the valve by means of a stencil tag or decal.

(b) Liquid valves must be painted orange and vapor valves must be painted yellow. The legend ORANGE-LIQUID, YELLOW-VAPOR must be displayed in one or more conspicuous places at each permanent storage location. The legend must have letters at least two inches high and must be placed against a contrasting background.

(4) "Marking refrigerated containers." Each refrigerated container must be marked with a name plate on the outer covering in an accessible place as specified in the following:

(\*) (a) With the notation, "Anhydrous Ammonia";

(\*) (b) With the name and address of the builder and the date of fabrication;

(\*) (c) With the water capacity of the container in gallons, U.S. Standard;

(\*) (d) With the design pressure;

(\*) (e) With the minimum temperature in degrees Fahrenheit for which the container was designed;

(\*) (f) The maximum allowable water level to which the container may be filled for test purposes;

(\*) (g) With the density of the product in pounds per cubic foot for which the container was designed;

(\*) (h) With the maximum level to which the container may be filled with liquid anhydrous ammonia.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40017 ((Where may)) Locations for anhydrous ammonia containers ((be located?)).** (1) When selecting the location for a storage container, ((you)) the employer must take into account the physiological effects of ammonia and adjacent fire hazards. Containers located indoors must be in areas especially approved for container storage.

(2) Containers must be located at least fifty feet from a dug well or other sources of potable water supply, unless the container is a part of a water treatment installation.

(3) Permanent storage containers must be located outside densely populated areas.

(4) Containers must be located according to the following:

Minimum distances (feet) from container to:

Nominal capacity of container	Line of adjoining property that may be built upon, highways & main line of railroad	Place of public assembly	Institution occupancy
Over 500 to 2,000	25	150	250

Minimum distances (feet) from container to:

Nominal capacity of container	Line of adjoining property that may be built upon, highways & main line of railroad	Place of public assembly	Institution occupancy
Over 2,000 to 30,000	50	300	500
Over 30,000 to 100,000	50	450	750
Over 100,000	50	600	1,000

(5) Storage areas must be kept free of readily ignitable materials such as waste, weeds and long dry grass.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40019 ((What requirements apply to)) Container accessories((?)).** (1) All accessories must be designed for at least the maximum working pressure of the part of the system on which they are installed. All accessories must be fabricated from materials suitable for anhydrous ammonia service.

(2) All connections to containers must have shut-off valves located as close to the container as practical.

**Exception:** Safety-relief devices, gauging devices, or those fitted with a No. 54 drill size orifice are exempt from this requirement.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid-level gauging devices that require bleeding to the atmosphere and that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from the container or through fittings attached directly on container to which pressure gauge connections are made may be installed without excess flow valves if the openings are a maximum of No. 54 drill size.

(6) Required excess flow and back pressure check valves must be located inside the container or outside as close as practical to where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Shut-off valves provided with an excess flow valve must be designed for proper installation in a container connection so that the excess flow valve will close if the shut-off valve breaks.

(9) All excess flow valves must be plainly and permanently marked with the name or trademark of the manufacturer, the catalog number, and the rated capacity.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40021** (~~What requirements apply to~~) **Piping, tubing, and fittings**(~~?~~). (1) All piping, tubing and fittings must be made of material suitable for anhydrous ammonia service.

(2) All piping, tubing and fittings must be designed for a pressure of at least the maximum pressure to which they may be subjected in service.

(3) All piping must be well supported and allow for expansion and contraction. All refrigeration system piping must conform to the Refrigeration Piping Code (ANSI B31.5 1966 addenda B31.1a-1968), a section of the American Standard Code for Pressure Piping, as it applies to ammonia.

(4) Piping used on nonrefrigerated systems must meet the requirements of ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe. Pipe must be at least Schedule 40 when joints are welded, or welded and flanged. Pipe must be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing is prohibited.

(5) All metal flexible connections for permanent installations must have a minimum working pressure of 250 psig (safety factor of 4). For temporary installations, ~~((you))~~ the employer may use hose that meets the requirements of WAC 296-307-40023.

(6) Cast iron fittings are prohibited. ~~((You))~~ The employer must use fittings made especially for ammonia service of malleable or nodular iron that meet the requirements of Specification ASTM A47 or ASTM A395.

(7) All piping, tubing, and fittings must allow for expansion, contraction, jarring, vibration, and settling.

(8) ~~((You))~~ The employer must make adequate provision to protect all exposed piping from physical damage from moving machinery, the presence of automobiles or trucks, or other strain on the piping.

(9) Joint compounds must be resistant to ammonia.

(10) After assembly, all piping and tubing must be tested and proved to be free from leaks at pressure that is at least equal to the normal operating pressure of the system.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40023** (~~What~~) **Specifications** (~~must~~) **for hoses** (~~meet?~~). (1) Hose used in ammonia service and subject to container pressure must meet the requirements of the joint Rubber Manufacturers Association and the Fertilizer Institute "Hose Specifications for Anhydrous Ammonia."

(2) Hose subject to container pressure must be designed for a minimum working pressure of 350 psig and a minimum burst pressure of 1750 psig. Hose assemblies must be able to withstand a test pressure of 500 psig.

(3) Hose and hose connections on the low pressure side of flow control or pressure reducing valves on devices dis-

charging to atmospheric pressure must be designed for the maximum low side working pressure. All connections must be designed, constructed, and installed to prevent leaks when connected.

(4) Where liquid transfer hose is not drained after transfer operations, the hose must have an approved shut-off valve at the discharge end. ~~((You))~~ The employer must provide a method to prevent excessive hydrostatic pressure in the hose. (See WAC 296-307-40025.)

(5) On all hose 1/2-inch outside diameter and larger, used for the transfer of anhydrous ammonia liquid or vapor, ~~((you))~~ the employer must ensure that the following information is etched, cast, or impressed at five-foot intervals:

- (\*) (a) Anhydrous ammonia;
- (\*) (b) xxx psig (maximum working pressure);
- (\*) (c) Manufacturer's name or trademark;
- (\*) (d) Year of manufacture.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40025** (~~What requirements apply to~~) **Safety-relief devices**(~~?~~). (1) Every container used in systems covered by WAC 296-307-400 must have one or more spring-loaded safety-relief valves or the equivalent.

(2) The discharge from safety-relief valves must be vented away from the container, upward, and unobstructed to the atmosphere. All safety-relief valve discharge openings must have suitable raincaps that allow free discharge of the vapor and prevent water from entering. ~~((You))~~ The employer must provide a method to drain condensate. The rate of discharge must be as follows:

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
20	258	185	1,600	900	5,850
25	310	190	1,640	950	6,120
30	360	195	1,670	1,000	6,380
35	408	200	1,710	1,050	6,640
40	455	210	1,780	1,100	6,900
45	501	220	1,850	1,150	7,160
50	547	230	1,920	1,200	7,410
55	591	240	1,980	1,250	7,660
60	635	250	2,050	1,300	7,910
65	678	260	2,120	1,350	8,160
70	720	270	2,180	1,400	8,410
75	762	280	2,250	1,450	8,650
80	804	290	2,320	1,500	8,900
85	845	300	2,380	1,550	9,140
90	885	310	2,450	1,600	9,380
95	925	320	2,510	1,650	9,620
100	965	330	2,570	1,700	9,860
105	1,010	340	2,640	1,750	10,090
110	1,050	350	2,700	1,800	10,330
115	1,090	360	2,760	1,850	10,560

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
120	1,120	370	2,830	1,900	10,800
125	1,160	380	2,890	1,950	11,030
130	1,200	390	2,950	2,000	11,260
135	1,240	400	3,010	2,050	11,490
140	1,280	450	3,320	2,100	11,720
145	1,310	500	3,620	2,150	11,950
150	1,350	550	3,910	2,200	12,180
155	1,390	600	4,200	2,250	12,400
160	1,420	650	4,480	2,300	12,630
165	1,460	700	4,760	2,350	12,850
170	1,500	750	5,040	2,400	13,080
175	1,530	800	5,300	2,450	13,300
180	1,570	850	5,590	2,500	13,520

Surface area = total outside surface area of container in square feet. When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

((\*) (a) Hemispherical heads: Area = (Length in feet) X (outside diameter in feet) X 3.1416.

((\*) (b) Other than hemispherical heads: Area = (Length in feet) + (0.3 outside diameter in feet) X (outside diameter in feet) X 3.1416.

((\*) (c) Spherical container: Area = (outside diameter in feet)<sup>2</sup> X 3.1416.

((\*) (d) Flow rate: CFM air = cubic feet per minute of air required at standard conditions, 60F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,500 sq. ft., the formula is: Flow rate CFM air = 22.11 A<sup>0.82</sup> where A = outside surface area of the container in square feet.

(3) Container safety-relief valves must be set for start to discharge as follows, according to the design pressure of the container.

Containers	Minimum	Maximum*
ASME U-68, U-69	110%	125%
ASME U-200, U-201	95%	100%
ASME 1952, 1956, 1959, 1962, 1965, 1968 or 1971	95%	100%
API-ASME	95%	100%
U.S. Coast Guard	As required by USCG regulations	
DOT	As required by DOT regulations	

\*Note: Plus a relief valve manufacturer's tolerance of ten percent.

(4) Safety-relief devices used in systems covered by WAC 296-307-400 must be constructed to discharge at a rate equal to or greater than the rates required in subsection (2) of this section before the pressure exceeds 120% (not including

the tolerance referred to in subsection (3) of this section) of the maximum permitted start-to-discharge pressure setting of the device.

(5) Safety-relief valves must be arranged to minimize tampering. If the pressure setting adjustment is external, the relief valves must have a sealable adjustment.

(6) Shut-off valves installed between the safety-relief valves and the containers or systems described in WAC 296-307-400 are prohibited.

**Exception:** A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the relief valves.

**Exception example 1:** A three-way valve installed under two safety-relief valves, each of which has the required rate of discharge and is installed to allow either of the safety-relief valves to be closed off, but does not allow both safety valves to be closed off at the same time.

**Exception example 2:** Two separate relief valves are installed with individual shut-off valves. The two shut-off valve stems must be mechanically interconnected to allow the full required flow of one safety-relief valve at all times.

**Exception example 3:** A safety-relief valve manifold that allows one valve of two, three, four or more to be closed off and the remaining valve or valves will provide not less than the rate of discharge shown on the manifold name-plate.

(7) Safety-relief valves must have direct communication with the vapor space of the container.

(8) Each safety-relief valve used with systems described in WAC 296-307-400 must be plainly and permanently marked as follows:

(a) With the letters "AA" or the symbol NH3.

(b) The pressure in pounds per square inch gauge (psig) at which the valve is set to start to discharge.

(c) The rate of discharge of the valve in cubic feet per minute of air at 60°F and atmospheric pressure (14.7 psia).

(d) The manufacturers name and catalog number.

For example: A safety-relief valve marked AA-250-4200 (air) mean the valve is suitable for use on an anhydrous ammonia container; that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,200 cubic feet per minute of air.

(9) No connection to the safety-relief valve may restrict the flow capacity on either the upstream or downstream side.

(10) The manufacturer or supplier of a safety-relief valve manifold must publish complete data showing the flow rating through the combined assembly of the manifold with safety-relief valves installed. The manifold flow rating must be determined by testing the manifold with all but one valve discharging. The flow rate must be determined by the restricted opening or openings or those having the lowest flow. The valve must be marked as required in subsection (7) of this section.

(11) A hydrostatic relief valve must be installed between each pair of valves in the liquid ammonia piping or hose where liquid may be trapped to release into the atmosphere at a safe location.

(12) Discharge from safety-relief devices must not terminate in or beneath any building.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-40027 (~~What~~) Emergency precautions (~~are required~~) when handling anhydrous ammonia(~~?~~)**, (1) (~~You~~) The employer must train employees required to handle ammonia in the safe operating practices and the proper action to take in an emergency. Employees must be instructed to use the equipment listed in subsection (3) of this section in an emergency.

(2) If ammonia system leaks, the employees trained for and designated to act in emergencies must:

(a) See that anyone not required to deal with an emergency is evacuated from the contaminated area.

(b) Have two suitable gas masks in readily accessible locations. Full face masks with ammonia canisters as certified by NIOSH under 42 C.F.R. Part 84, are suitable for emergency action for most leaks, particularly those that occur outdoors. For protection in concentrated ammonia atmospheres, self-contained breathing apparatus is required.

(c) Wear gauntlet type plastic or rubber gloves and wear plastic or rubber suits in heavily contaminated atmospheres.

(d) Shut off the appropriate valves.

(3) All storage systems must have on hand at least the following equipment for emergency and rescue purposes:

(a) \*One full face gas mask with anhydrous ammonia refill canisters.

(b) \*\*One pair of protective gloves.

(c) \*\*One pair of protective boots.

(d) \*\*One protective slicker and/or protective pants and jacket.

(e) Easily accessible shower and/or at least 50 gallons of clean water in an open top container.

(f) Tight-fitting vented goggles or one full face shield.

\*If ammonia vapors are detected when the mask is applied, leave the area immediately. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use or as recommended by the canister manufacturer. Unopened canisters may be guaranteed for as long as three years and all should be dated when received. In addition, an independently supplied air mask of the type used by fire departments may be used for emergencies.

\*\*Gloves, boots, slickers, jackets, and pants must be made of rubber or other material impervious to ammonia.

(4) Where several persons are usually present, additional safety equipment may be necessary.

(5) Each tank motor vehicle transporting anhydrous ammonia, except farm applicator vehicles, must carry a container of at least five gallons of water and must have a full face gas mask, a pair of tight-fitting goggles or one full face shield. The driver must be instructed in their use and the proper action to take to provide for the driver's safety.

(6) If a leak occurs in transportation equipment and it is impractical to stop the leak, the driver should move the vehicle to an isolated location.

(7) If liquid ammonia contacts the skin or eyes, the affected area should be promptly and thoroughly flushed with water. Do not use neutralizing solutions or ointments on

affected areas. A physician must treat all cases of eye exposure to liquid ammonia.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40029 (~~What requirements apply to~~) Filling densities(~~?~~)**, Filling density means the percent ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One pound of water equals 27.737 cubic inches at 60°F. To determine the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air must be 8.32828 pounds.

(1) The filling densities for nonrefrigerated containers must not exceed the following:

	Aboveground	Underground
(i) Uninsulated	56%	58%
(ii) Insulated	57%	

(iii) DOT containers (~~shall~~) must be filled according to DOT regulations.

This corresponds to 82% by volume at -28°F, 85% by volume at 5°F, 87.5% by volume at 30°F, and 90.6% by volume at 60°F.

(2) When containers are filled according to liquid level by any gauging method other than a fixed length dip tube gauge, each container (~~should~~) must have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a 60°F basis.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40031 (~~What requirements apply to the~~) Transfer of liquids(~~?~~)**, (1) Anhydrous ammonia must always be at a temperature suitable for the material of construction and design of the receiving containers. Ordinary steels are not suitable for refrigerated ammonia. See Appendix R of API Standard 620 "Recommended Rules for Design and Construction of Large Welded Low-Pressure Storage Tanks" for materials for low temperature service.

(2) At least one attendant must supervise the transfer of liquids from the time the connections are first made until they are finally disconnected.

(3) Flammable gases or gases that will react with ammonia (such as air) must not be used to unload tank cars or transport trucks.

(4) Containers must be charged or used only on authorization of the owner.

(5) Containers must be gauged and charged only in the open atmosphere or in buildings approved for that purpose.

(6) Pumps used for transferring ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Pumps must be designed for at least 250 psig working pressure.



(b) Positive displacement pumps must have installed, off the discharge port, a constant differential relief valve discharging into the suction port of the pump through a line large enough to carry the full capacity of the pump at relief valve setting. The setting and installation must be according to the pump manufacturer's recommendations.

(c) On the discharge side of the pump, before the relief valve line, there must be a pressure gauge graduated from 0 to 400 psig installed.

(d) Plant piping must contain shut-off valves located as close as practical to pump connections.

(7) Compressors used for transferring or refrigerating ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Compressors, except those used for refrigeration, must be designed for at least 250 psig working pressure. Crank cases of compressors not designed to withstand system pressure must be protected with a suitable safety-relief valve.

(b) Plant piping must have shut-off valves located as close as practical to compressor connections.

(c) A safety-relief valve large enough to discharge the full capacity of the compressor must be connected to the discharge before any shut-off valve.

(d) Compressors must have pressure gauges at suction and discharge graduated to at least one and one-half times the maximum pressure that can develop.

(e) Adequate means, such as drainable liquid trap, must be provided on the compressor suction to minimize the entry of liquid into the compressor.

(f) Where necessary to prevent contamination, an oil separator must be provided on the discharge side of the compressor.

(8) Loading and unloading systems must be protected by suitable devices to prevent emptying of the storage container or the container being loaded or unloaded if the hose is cut. Backflow check valves or properly sized excess flow valves must be installed where necessary to provide this protection. In the event that valves are not practical, remotely operated shut-off valves may be installed.

(9) Meters used to measure liquid anhydrous ammonia must be recommended and labeled for ammonia service by the manufacturer.

(a) Liquid meters must be designed for a minimum working pressure of 250 psig.

(b) The metering system must incorporate devices that will prevent the inadvertent measurement of vapor.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40033 (~~What requirements apply to~~) Tank car unloading points and operations(?)**, (1) Provisions for unloading tank cars must meet DOT requirements.

(2) Unloading operations must be performed by reliable employees who are properly instructed and responsible for careful compliance with all procedures.

(3) Caution signs must be placed on the track or car to give necessary warning to anyone approaching car from the open end of the siding. The signs must be left up until after car is unloaded and disconnected from discharge connec-

tions. Signs must be of metal or other suitable material, at least 12 by 15 inches, and bear the words "STOP—Tank car connected" or "STOP—Men at work." The word "STOP" must be in letters at least four inches high and the other words in letters at least two inches high. The letters must be white on a blue background.

(4) The track of a tank car siding must be substantially level.

(5) Brakes must be set and wheels blocked on all cars being unloaded.

(6) Tank cars of anhydrous ammonia must be unloaded only at approved locations meeting the requirements of WAC 296-307-40025(4) and 296-307-40031(8).

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40035 (~~What requirements apply to the~~) Liquid-level gauging device(?)**, (1) Each container except those filled by weight must have an approved liquid-level gauging device.

(2) All gauging devices must be arranged so that the maximum liquid level to which the container is filled is easily determined.

(3) Gauging devices that require bleeding of the product to the atmosphere such as the rotary tube, fixed tube, and slip tube devices, must be designed so that the maximum opening of the bleed valve is a maximum of No. 54 drill size unless provided with an excess flow valve.

(4) Gauging devices must have a design pressure equal to or greater than the design pressure of the container on which they are installed.

(5) Fixed liquid-level gauges must be designed so that the maximum volume of the container filled by liquid is a maximum of 85% of its water capacity. The coupling into which the fixed liquid-level gauge is threaded must be placed at the 85% level of the container. If located elsewhere, the dip tube of this gauge must be installed so that it cannot be readily removed.

**Note:** This does not apply to refrigerated storage.

(6) Columnar gauge glasses must be restricted to stationary storage installation. They must have shut-off valves having metallic hand wheels, excess flow valves, and extra heavy glass adequately protected by a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-40037 (~~How should~~) Maintenance of aboveground uninsulated containers (~~be maintained~~)**, Aboveground uninsulated containers should have a reflective surface maintained in good condition. We recommend white for painted surfaces, but other light reflecting colors are acceptable.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-40039 (~~What requirements apply to~~) Electrical equipment and wiring(?)** (1) Electrical equipment and wiring for use in ammonia installations must be general purpose or weather resistant as appropriate.

(2) Where concentrations of ammonia in the air in excess of 16% by volume are likely to be encountered, electrical equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for Class I, Group D locations.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41001 (~~What does this part cover?~~) Scope**. Chapter 296-307 WAC Part U2 covers the storage and handling of liquefied petroleum gases.

The requirements of WAC 296-307-410 apply to all LP-gas installations covered by this part.

For additional requirements related to:	See WAC:
Cylinder systems	296-307-415
Systems using non-DOT containers	296-307-420
LP-gas as a motor fuel	296-307-425
Storage of containers awaiting use or resale	296-307-430
LP-gas installations on commercial vehicles	296-307-435
LP-gas service stations	296-307-440

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41003 (~~Which~~) LP-gas installations (are) not covered by this part**(?) (1) This part does not apply to:

- LP-gas refrigerated storage systems;
- LP-gas used with oxygen;
- LP-gas used in utility gas plants (covered by the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants, NFPA No. 59-1968);
- Low-pressure (less than 1/2 pound per square inch or 14 inches water column) LP-gas piping systems, and the installation and operation of residential and commercial appliances supplied through such systems. The National Fire Protection Association Standard for the Installation of Gas Appliances and Gas Piping, NFPA 54-1969 apply to these systems.

(2) LP-gas installations, equipment, and appliances that met the requirements of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases NFPA No. 58-1972, 1973 at the time of manufacture or installation may be used if they do not create a hazard to employees.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41005 (~~What~~) Definitions that apply to this part**(?) (1) Adequate ventilation(?) (for fire

prevention during normal operation(~~means~~)). The concentration of the gas in a gas-air mixture does not exceed 25% of the lower flammable limit.

(2) Containers(?) All vessels, such as tanks, cylinders, or drums, used to transport or store LP-gases.

(3) DOT(?) The federal Department of Transportation.

(4) DOT container(?) A container that meets DOT regulations.

(5) DOT cylinder(?) A cylinder that meets DOT regulations.

(6) DOT regulations/requirements/specifications(?) The DOT regulations of 49 C.F.R. Part 178.

(7) Liquefied petroleum gases(~~and~~) and LP-gas(?) Any material that is composed mostly of any of the following: Hydrocarbons, or mixtures of them; propane; propylene; butanes (normal butane or iso-butane); and butylenes.

(8) PSIA(?) Pounds per square inch absolute.

(9) PSIG(?) Pounds per square inch gauge.

(10) Systems(?) An assembly of the container or containers, major devices such as vaporizers, safety-relief valves, excess flow valves, regulators, and piping connecting such parts.

(11) Vaporizer-burner(?) An integral vaporizer-burner unit, dependent upon the heat generated by the burner to vaporize the liquid used for dehydrators or dryers.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41007 (~~When must~~) Odorizing LP-gas (be odorized)**(?) (1) The employer must ensure that all LP-gas is odorized by an approved agent to indicate by distinct odor, the presence of gas down to concentration in air of a maximum of 1/5 the lower limit of flammability.

**Exception:** Odorization is not required if it will create a hazard in further processing, or if it serves no useful purpose as a warning agent.

**Note:** The odorization requirement may be met by using 1.0 pounds of ethyl mercaptan, 1.0 pounds of thiophene, or 1.4 pounds of amyl mercaptan per ten thousand gallons of LP-gas. (2) The employer may use any odorant and quantity that meets the requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41009 (~~Must~~) Approval of LP-gas containers and equipment (be approved)**(?) (1) Each system of DOT containers must have approved container valves, connectors, manifold valve assemblies, and regulators.

(2) Each non-DOT system using containers of 2,000 gallons or less water capacity, must have a container assembly, one or more regulators, and other necessary parts. The entire system, or the container assembly with the regulators, must be individually listed by a nationally recognized testing laboratory.

(3) Container assembly(?) The container and fittings for all openings, including shut-off valves, excess flow

valves, liquid-level gauging devices, safety-relief devices, and protective housing.

(3) In systems using containers of over 2,000 gallons water capacity, each regulator, container, valve, excess flow valve, gauging device, and relief valve, must be listed by a nationally recognized testing laboratory.

(4) All DOT containers must be constructed, tested, and stamped according to the DOT specifications effective at the date of their manufacture.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41011 (~~What~~) Construction and test requirements (~~must~~) for containers (~~meet~~).** (1) Containers must be designed, constructed, and tested according to the *Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code*, 1968 edition, unless otherwise specified.

(2) Containers constructed according to the 1949 and earlier editions of the ASME Code are exempt from U-2 through U-10 and U-19 of the code. Containers constructed according to U-70 in the 1949 and earlier editions do not meet the requirements of this section.

(3) Containers designed, constructed, and tested prior to July 1, 1961, according to the *Code for Unfired Pressure Vessels for Petroleum Liquids and Gases*, 1951 edition with 1954 Addenda, of the American Petroleum Institute and the American Society of Mechanical Engineers are considered in compliance. Containers constructed according to API-ASME Code do not have to comply with section I or with the appendix to section I. W-601 through W-606 in the 1943 and earlier editions do not apply.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41013 (~~How must~~) Welding containers (~~be welded~~).** (1) (~~You~~) The employer must ensure that all welding to the shell, head, or any other part of the container subject to internal pressure, meets the requirements of the code under which the tank was fabricated. (~~You~~) The employer may weld on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(2) When (~~you~~) the employer must repair or modify DOT containers by welding, (~~you~~) the employer must return the container to a qualified manufacturer, making containers of the same type, to make the repair or modification according to DOT regulations.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41015 (~~How must~~) Marking containers (~~be marked~~).** (1) (~~You~~) The employer must ensure that containers are marked according to DOT regulations or with the following:

(a) Indication that the container meets the requirements of the code under which it is constructed, and all marks required by that code.

(b) Indication whether the container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking must indicate the proper hood for each type of installation.

(c) The name and address of the supplier of the container, or with the trade name of the container.

(d) The water capacity of the container in pounds or gallons, United States standard.

(e) The pressure in psig, for which the container is designed.

(f) The wording "This container must not contain a product with a vapor pressure greater than \_ psig at 100°F."

(g) The tare weight, for containers with a water capacity of three hundred pounds or less.

(h) Indication of the maximum fill level for liquid at temperatures between 20°F and 130°F. Markings must be in maximum increments of 20°F. This marking may be located on the liquid level gauging device.

**Exception:** Containers provided with fixed maximum level indicators or that are filled by weighing are exempt from this requirement.

(i) The outside surface area in square feet.

(2) The markings must be on a metal nameplate attached to the container so that it is visible after the container is installed.

(3) When LP-gas and one or more other gases are stored or used in the same area, the containers must be marked to identify their content. Marking must be according to American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers to Identify the Material Contained."

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41017 (~~Where must~~) Container(~~s be located~~) locations. (~~You~~) The employer must ensure that containers are located according to the following:**

(1) Containers and first stage regulating equipment are located outdoors.

Containers may be located indoors under any of the following conditions:

(a) In buildings used exclusively for container charging, vaporization pressure reduction, gas mixing, gas manufacturing, or distribution;

(b) When portable use is necessary and meets the requirements of WAC 296-307-41509;

(c) LP-gas fueled stationary or portable engines that meet the requirements of WAC 296-307-42521 or 296-307-42523;

(d) LP-gas fueled industrial trucks that meet the requirements of WAC 296-307-42525;

(e) LP-gas fueled vehicles garaged according to WAC 296-307-42527; or

(f) Containers awaiting use or resale when stored according to WAC 296-307-430.

(2) Each individual container is located away from the nearest important building, group of buildings, or line of adjoining property that may be built on, according to Table U-1.

**TABLE U-1**  
**Minimum Distances**

Water capacity per container	Containers		Between above-ground containers
	Under-ground	Above-ground	
Less than 125 gals <sup>a</sup>	10 feet	None	None
125-250 gals	10 feet	10 feet	None
251-500 gals	10 feet	10 feet	3 feet
501-2,000 gals	25 feet <sup>b</sup>	25 feet <sup>b</sup>	3 feet
2,001-30,000 gals	50 feet	50 feet	5 feet
30,001-70,000 gals	50 feet	75 feet	1/4 of sum of diameters of adjacent containers
70,001-90,000 gals	50 feet	100 feet	1/4 of sum of diameters of adjacent containers

(a) If the total water capacity of a multicontainer installation at a consumer site is 501 gallons or more, the minimum distance must comply with this table, applying the aggregate capacity instead of the capacity per container. For multiple installations, installations must be at least twenty-five feet apart. Do not apply the MINIMUM DISTANCES BETWEEN ABOVEGROUND CONTAINERS to such installations.

(b) Distance requirements may be reduced to 10 feet for a single container of 1200 gallons water capacity or less, if the container is at least 25 feet from any other LP-gas container of more than 125 gallons water capacity.

(c) In buildings devoted exclusively to gas manufacturing and distributing operations, the distances may be reduced if no containers of more than 500 gallons water capacity are located closer than ten feet to gas manufacturing and distributing buildings.

(3) Containers installed for use must not be stacked one above the other.

(4) In industrial installations involving containers of 180,000 gallons total water capacity or more, where serious exposures from the container to adjacent properties are common, firewalls or other means of protection designed and constructed according to good engineering practices are required.

(5) Readily ignitable material such as weeds and long dry grass is removed within ten feet of any container.

(6) The minimum separation between LP-gas containers and flammable liquid tanks is twenty feet; the minimum separation between a container and the centerline of the dike is ten feet.

**Exception:** This does not apply when LP-gas containers of 125 gallons or less capacity are installed adjacent to Class III flammable liquid tanks of 275 gallons or less capacity.

(7) The accumulation of flammable liquids under adjacent LP-gas containers is prevented by a means such as diking, diversion curbs, or grading.

(8) When dikes are used with flammable liquid tanks, no LP-gas containers are located within the diked area.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41019 ((What requirements apply to)) Valves and accessories((?))**, (1) Valves, fittings, and accessories connected directly to the container including primary shut-off valves, must have a rated working pressure of at least 250 psig and must be of material and design suitable for LP-gas service. The use of cast iron for container valves, fittings, and accessories is prohibited. Container valves may be made of malleable or nodular iron.

(2) Connections to containers must have shut-off valves located as close to the container as practical.

**Exception:** This does not apply to safety-relief connections, liquid level gauging devices, and plugged openings.

(3) All required excess flow valves must close automatically at the rated flows of vapor or liquid specified by the manufacturer. The connections, lines, valves, and fittings must have a greater capacity than the rated flow of the excess flow valve.

(4) Liquid level gauging devices that are constructed so that outward flow is a maximum of that passed by a No. 54 drill size opening may be installed without excess flow valves.

(5) Openings from container or through fittings attached directly on container to which pressure gauge connection is made, need not have shut-off or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(6) Required excess flow and back pressure check valves must be located inside the container or outside where the line enters the container. When located outside, the installation must be made to prevent any stress beyond the excess flow or back pressure check valve from causing a break between the container and the valve.

**Exception:** This does not apply to systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity).

(7) Excess flow valves must be designed with a bypass that is a maximum of No. 60 drill size opening to allow equalization of pressures.

(8) Containers of more than 30 gallons water capacity and less than 2,000 gallons water capacity, filled on a volumetric basis, and manufactured after December 1, 1963, must be equipped for filling into the vapor space.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41021 ((What requirements apply to) Piping, tubing, and fittings(?))** (1) Pipe must be wrought iron or steel (black or galvanized), brass, copper, or aluminum alloy. Aluminum alloy pipe must be at least Schedule 40 according to the specifications for Aluminum Alloy Pipe, ANSI H38.7-1969 (ASTM, B241-1969), and must be suitably marked at each end of each length indicating compliance with ANSI specifications. Alloy 5456 is prohibited.

**Exception:** This does not apply to piping for LP-gas used as a motor fuel or to piping on commercial vehicles.

(2) Aluminum alloy pipe must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by such liquids as water (except rain water), detergents, sewage, or leaking from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(3) Aluminum pipe must be three-fourths inch nominal and shall not be used for pressures exceeding 20 psig. Aluminum alloy pipe must not be installed within six inches of the ground.

(a) Vapor piping with operating pressures not exceeding 125 psig must be suitable for a working pressure of at least 125 psig. Pipe must be at least Schedule 40 ASTM A-53-69, Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal.

(b) Vapor piping with operating pressures over 125 psig and all liquid piping must be suitable for a working pressure of at least 250 psig. Pipe must be at least Schedule 80 if joints are threaded or threaded and back welded. At least Schedule 40 (ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal) must be used if joints are welded, or welded and flanged.

(4) Tubing must be seamless copper, brass, steel, or aluminum alloy. Copper tubing must be of Type K or L or equivalent as covered in the Specification for Seamless Copper Water Tube, ANSI H23.1-1970 (ASTM B88-1969). Aluminum alloy tubing must be of Type A or B or equivalent as covered in Specification ASTM B210-1968 and must be suitably marked every 18 inches indicating compliance with ASTM specifications. The minimum nominal wall thickness of copper tubing and aluminum alloy tubing must be as specified in Table U-2 and Table U-3.

TABLE U-2

WALL THICKNESS OF COPPER TUBING<sup>1</sup>

Note: The standard tube size is one-eighth-inch smaller than its nominal outside diameter.

Standard size (inches)	Nominal O.D. (inches)	Nominal wall thickness (inches)	
		Type K	Type L
1/4	0.375	0.035	0.030
3/8	0.500	0.049	0.035
1/2	0.625	0.049	0.040
5/8	0.750	0.049	0.042
3/4	0.875	0.065	0.045
1	1.125	0.065	0.050
1 1/4	1.375	0.065	0.055
1 1/2	1.625	0.072	0.060
2	2.125	0.083	0.070

<sup>1</sup>Based on data in Specification for Seamless Copper Water Tubing, ANSI H23.1-1970 (ASTM B-88-69).

TABLE U-3

WALL THICKNESS OF ALUMINUM ALLOY TUBING<sup>1</sup>

Outside diameter (inches)	Nominal wall thickness (inches)	
	Type A	Type B
3/8	0.035	0.049
1/2	0.035	0.049
5/8	0.042	0.049
3/4	0.049	0.058

<sup>1</sup>Based on data in Standard Specification for Aluminum-Alloy Drawn Seamless Coiled Tubes for Special Purpose Applications, ASTM B210-68.

(5) Aluminum alloy tubing must be protected against external corrosion whenever:

(a) It is in contact with dissimilar metals other than galvanized steel; or

(b) Its location is subject to repeated wetting by liquids such as water (except rainwater), detergents, sewage, or leakage from other piping; or

(c) It passes through flooring, plaster, masonry, or insulation.

Galvanized sheet steel or pipe, galvanized inside and out, are considered suitable protection.

(6) The maximum outside diameter for aluminum alloy tubing must be three-fourths inch and must not be used for pressures exceeding 20 psig. Aluminum alloy tubing installed within six inches of the ground is prohibited.

(7) In systems where the gas in liquid form enters the building without pressure reduction, only heavy walled seamless brass or copper tubing with an internal diameter a maximum of 3/32 inch, and a wall thickness of at least 3/64 inch ~~((shall))~~ must be used.

**Exception:** This requirement does not apply to research and experimental laboratories, buildings or separate fire divisions of buildings used exclusively for housing internal combustion engines, and to commercial gas plants or bulk stations where containers are charged, nor to industrial vaporizer buildings, nor to buildings, structures, or equipment under construction or undergoing major renovation.

(8) Pipe joints must be screwed, flanged, welded, soldered, or brazed with a material having a melting point over 1,000°F. Joints on seamless copper, brass, steel, or aluminum alloy gas tubing (~~(shall)~~ must be made by approved gas tubing fittings, or soldered or brazed with a material having a melting point over 1,000°F.

(9) For operating pressures of 125 psig or less, fittings must be designed for a pressure of at least 125 psig. For operating pressures above 125 psig, fittings must be designed for a minimum of 250 psig.

(10) Threaded cast iron pipe fittings are prohibited. Aluminum alloy fittings must be used with aluminum alloy pipe and tubing. Insulated fittings must be used where aluminum alloy pipe or tubing connects with a dissimilar metal. (~~(You)~~) The employer may use malleable, nodular, or higher strength gray iron for fittings.

**Note:** Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings.

(11) All materials such as valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas under the service conditions to which they are subjected.

(12) All piping, tubing, or hose must be tested after assembly and proved free from leaks at least normal operating pressures. After installation, piping and tubing of all domestic and commercial systems must be tested and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. Test made by flame is prohibited.

(13) (~~(You)~~) The employer must ensure that piping allows for expansion, contraction, jarring, and vibration, and settling. (~~(You)~~) The employer may use flexible connections.

(14) Piping outside buildings may be buried, aboveground, or both, but must be well supported and protected against physical damage. Where soil conditions warrant, all piping must be protected against corrosion. Where condensation may occur, the piping must be pitched back to the container, or (~~(you)~~) the employer must provide a means for reevaporation of the condensate.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41023 ((What)) Specifications ((must)) for hoses ((meet?)).** (1) Hose (~~(shall)~~ must be fabricated of materials that are resistant to the action of LP-gas in the liquid and vapor phases. If wire braid is used for reinforcing the hose, it must be of corrosion-resistant material such as stainless steel.

(2) Hose subject to container pressure must be marked "LP-gas" or "LPG" at not greater than ten-foot intervals.

(3) Hose subject to container pressure must be designed for a bursting pressure of not less than 1,250 psig.

(4) Hose subject to container pressure must be listed by a nationally recognized testing laboratory.

(5) Hose connections subject to container pressure must be able to withstand, without leaking, a test pressure of not less than 500 psig.

(6) Hose and hose connections on the low-pressure side of the regulator or reducing valve must be designed for a bursting pressure of not less than 125 psig or five times the set pressure of the relief devices protecting that portion of the system, whichever is higher.

(7) Hose may be used on the low-pressure side of regulators to connect to other than domestic and commercial gas appliances under the following conditions:

(a) The appliances connected with hose are portable and need a flexible connection.

(b) For use inside buildings, the hose is of minimum practical length, but is a maximum of six feet. Hose must not extend from one room to another, nor pass through any walls, partitions, ceilings, or floors. Such hose must not be concealed from view or used in a concealed location.

**Exception:** For use outside of buildings, the hose may exceed this length but must be kept as short as practical.

(c) The hose must be approved and must not be used where it may be exposed to temperatures above 125°F. The hose must be securely connected to the appliance. Rubber slip ends are prohibited.

(d) The shut-off valve for an appliance connected by hose must be in the metal pipe or tubing and not at the appliance end of the hose. When shut-off valves are installed close to each other, precautions must be taken to prevent operation of the wrong valve.

(e) Hose used for connecting to wall outlets must be protected from physical damage.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41025 ((What requirements apply to)) Safety devices((?)).** (1) Every container except those constructed according to DOT specifications and every vaporizer (except motor fuel vaporizers and vaporizers described in WAC 296-307-41029(3) and 296-307-42007 (6)(a) whether heated by artificial means or not, must have one or more safety-relief valves of spring-loaded or equivalent type. These valves must be arranged to afford free vent to the outer air with discharge not less than five feet horizontally away from any opening into the building that is below such discharge. The rate of discharge must be according to the requirements of subsection (2) or (4) of this section.

(2) Minimum required rate of discharge in cubic feet per minute of air at one hundred twenty percent of the maximum permitted start to discharge pressure for safety-relief valves to be used on containers other than those constructed according to DOT specification must be as follows:

Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air	Surface area sq. ft.	Flow rate CFM air
20 or less	626	170	3,620	550	9,470
25	751	175	3,700	600	10,170
30	872	180	3,790	650	10,860
35	990	185	3,880	700	11,550
40	1,100	190	3,960	750	12,220
45	1,220	195	4,050	850	13,540
50	1,330	200	4,130	900	14,190
55	1,430	210	4,300	950	14,830
60	1,540	220	4,470	1,000	15,470
65	1,640	230	4,630	1,050	16,100
70	1,750	240	4,800	1,100	16,720
75	1,850	250	4,960	1,150	17,350
80	1,950	260	5,130	1,200	17,960
85	2,050	270	5,290	1,250	18,570
90	2,150	280	5,450	1,300	19,180
95	2,240	290	5,610	1,350	19,780
100	2,340	300	5,760	1,400	20,380
105	2,440	310	5,920	1,450	20,980
110	2,530	320	6,080	1,500	21,570
115	2,630	330	6,230	1,550	22,160
120	2,720	340	6,390	1,600	22,740
125	2,810	350	6,540	1,650	23,320
130	2,900	360	6,690	1,700	23,900
135	2,990	370	6,840	1,750	24,470
140	3,080	380	7,000	1,800	25,050
145	3,170	390	7,150	1,850	25,620
150	3,260	400	7,300	1,900	26,180
155	3,350	450	8,040	1,950	26,750
160	3,440	500	8,760	2,000	27,310
165	3,530				

Surface area = total outside surface area of container in square feet.

(3) When the surface area is not stamped on the name plate or when the marking is not legible, calculate the area with one of the following formulas:

((\*) (a) Hemispherical heads: Area = (equals) (overall length) X (outside diameter) X 3.1416.

((\*) (b) Other than hemispherical heads: Area = (equals) (overall length) + 0.3 (outside diameter) X (outside diameter) X 3.1416.

**Note:** This formula is not exact, but will give results within the limits of practical accuracy for the sole purpose of sizing relief valves.

((\*) (c) Spherical container: Area = (equals) (outside diameter)<sup>2</sup> X 3.1416.

((\*) (d) Flow rate: CFM air = (equals) required flow capacity in cubic feet per minute of air at standard conditions, 60°F and atmospheric pressure (14.7 psia).

For containers with total outside surface area greater than 2,000 sq. ft., the formula is: Flow rate CFM air = (equals) 53.632 A0.82 where A = (equals) outside surface area of the container in square feet.

Valves not marked "air" have flow rate marking in cubic feet per minute of LP-gas. These can be converted to ratings in cubic feet per minute of air by multiplying the LP-gas ratings by factors listed below. Air flow ratings can be converted to ratings in cubic feet per minute of LP-gas by dividing the air ratings by the factors listed below.

**AIR CONVERSION FACTORS**

Container type	100	125	150	175	200
Air conversion factor	1.162	1.142	1.113	1.078	1.010

(4) The minimum required rate of discharge for safety-relief valves for LP-gas vaporizers (steam heated, water heated, and direct fired) must be determined as follows:

(a) Obtain the total surface area by adding the surface area of vaporizer shell in square feet directly in contact with LP-gas and the heat exchanged surface area in square feet directly in contact with LP-gas.

(b) Obtain the minimum required rate of discharge in cubic feet of air per minute, at 60°F and 14.7 psia from subsection (2) of this section, for this total surface area.

(5) Container and vaporizer safety-relief valves must be set to start to discharge, with relation to the design pressure of the container, according to the following:

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-68, U-69—1949 and earlier editions	110	*125
ASME Code; Par. U-200, U-201—1949 edition	88	*100
ASME Code—1950, 1952, 1956, 1959, 1962, 1965 and 1968 (Division I) editions	88	*100
API—ASME Code—all editions	88	*100
DOT	As prescribed in 49 C.F.R. Chapter I	

\*Manufacturers of safety-relief valves are allowed a plus tolerance not exceeding 10% of the set pressure marked on the valve.

(6) Safety-relief devices used with systems employing non-DOT containers must be constructed to discharge at not less than the rates shown in subsection (2) of this section, before the pressure is in excess of 120% of the maximum (not including the 10% referred to in subsection (5) of this sec-

tion) permitted start-to-discharge pressure setting of the device.

(7) In high temperature areas, ~~((you))~~ the employer must use a lower vapor pressure product or a higher designed pressure vessel to prevent the safety valves from opening. The tanks may be protected by cooling devices such as spraying, shading, or other means.

(8) Safety-relief valves must be arranged to minimize tampering. For external pressure setting or adjustment, the relief valves must have an approved sealable adjustment.

(9) Shut-off valves are prohibited between safety-relief devices and the container, equipment, or piping.

**Exception:** A shut-off valve may be used where the arrangement of the valve allows the required capacity flow through the safety-relief device.

(10) Safety-relief valves must have direct communication with the vapor space of the container.

(11) Each safety-relief valve must be plainly and permanently marked with the following:

(a) Container type of the pressure vessel on which the valve is designed to be installed;

(b) The pressure in psig at which the valve is set to discharge;

(c) The actual rate of discharge of the valve in cubic feet per minute of air at 60°F and 14.7 psia; and

(d) The manufacturer's name and catalog number.

For example: T200-250-4050 AIR: Indicates that the valve is suitable for use on a Type 200 container, that it is set to start to discharge at 250 psig; and that its rate of discharge is 4,050 cubic feet per minute of air.

(12) Safety-relief valve assemblies and their connections must be large enough to provide the required rate of flow for the container on which they are installed.

(13) A hydrostatic relief valve must be installed between each pair of shut-off valves on LP-gas liquid piping. The start-to-discharge pressure setting of such relief valves must be a maximum of 500 psig. The minimum setting on relief valves installed in piping connected to non-DOT containers ~~((shall))~~ must be 140% of the container relief valve setting. For piping connected to DOT containers, the minimum must be 400 psig. The relief valve should not be installed in the pump discharge piping if the same protection can be provided by installing the relief valve in the suction piping. The start-to-discharge pressure setting of such a relief valve, if installed on the discharge side of a pump, must exceed the maximum pressure permitted by the recirculation device in the system.

(14) The discharge from any safety-relief device must not terminate in or beneath any building.

**Exception:** This requirement does not apply to relief devices covered by WAC 296-307-41017(1), 296-307-41507(1), or 296-307-41509.

(15) Container safety-relief devices and regulator relief vents must be located at least five feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41027 ((How must) Construction and installation of indirect fired vaporizers ((be constructed and installed?)).** Indirect fired vaporizers utilizing steam, water, or other heating medium must be constructed and installed according to the following:

(1) Vaporizers must be constructed according to the requirements of WAC 296-307-41011 and must be permanently marked as follows:

(a) With the code marking signifying the specifications to which the vaporizer is constructed;

(b) With the allowable working pressure and temperature for which the vaporizer is designed;

(c) With the sum of the outside surface area and the inside heat exchange surface area expressed in square feet; and

(d) With the name or symbol of the manufacturer.

(2) Vaporizers with an inside diameter of six inches or less exempted by the ASME Unfired Pressure Vessel Code, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968, must have a design pressure of at least 250 psig and need not be permanently marked.

(3) Heating or cooling coils installed inside a storage container are prohibited.

(4) Vaporizers may be installed in buildings, rooms, sheds, or lean-tos used exclusively for gas manufacturing or distribution, or in other light, noncombustible structures that are well ventilated near the floor line and roof.

**Exception:** When vaporizing and/or mixing equipment is in a structure not used exclusively for gas manufacturing or distribution, the structure or room must be separated from the remainder of the building. The separation must be a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipe or conduit passing through it. Such structure or room must have adequate ventilation and must have a roof or at least one exterior wall of lightweight construction.

(5) All DOT vaporizers must have, at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025.

(6) The heating medium lines into and out of the vaporizer must have a mechanism to prevent the flow of gas into the heat systems in the event of tube rupture in the vaporizer. Vaporizers must have an automatic means to prevent liquid from passing through the vaporizers to the gas discharge piping.

(7) The device that supplies heat to produce steam, hot water, or other heat may be installed in a building, compartment, room, or lean-to ventilated near the floorline and roof to the outside. The device must be separated from all compartments or rooms containing LP-gas vaporizers, pumps, and central gas mixing devices by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it.

**Exception:** This requirement does not apply to the domestic water heaters that may supply heat for a vaporizer in a domestic system.



(8) Gas-fired heating systems supplying heat exclusively for vaporization must have automatic safety devices to shut off the flow of gas to main burners, if the pilot light should fail.

(9) Vaporizers may be an integral part of a fuel storage container directly connected to the liquid section or gas section or both.

(10) Fusible plugs are prohibited on vaporizers.

(11) Vaporizer houses must not have unprotected drains to sewers or sump pits.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41029 ((How must)) Construction and installation of atmospheric vaporizers ((be constructed and installed?)).** Atmospheric vaporizers using heat from the ground or surrounding air must be installed as follows:

(1) Buried underground; or

(2) Located inside the building near where the pipe enters the building, if the capacity of the unit does not exceed one quart;

(3) Vaporizers of less than one quart capacity heated by the ground or surrounding air, may be installed without safety-relief valves if tests show that the assembly is safe.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41031 ((How must)) Construction and installation of direct gas-fired vaporizers ((be constructed and installed?)).** Direct gas-fired vaporizers must be constructed, marked, and installed as follows:

(1) According to the requirements of the *American Society of Mechanical Engineers Boiler and Pressure Vessel Code*, 1968, that apply to the maximum working conditions for which the vaporizer is designed.

(2) With the name of the manufacturer; rated Btu input to the burner; the area of the heat exchange surface in square feet; the outside surface of the vaporizer in square feet; and the maximum vaporizing capacity in gallons per hour.

(3) Vaporizers may be connected to the liquid section or the gas section of the storage container, or both. The container must have a manually operated valve in each connection that completely shuts off when desired, all flow of gas or liquid from container to vaporizer.

(4) Vaporizers with a maximum capacity of 35 gallons per hour must be located at least 5 feet from container shut-off valves. Vaporizers more than 35 gallon capacity but a maximum of 100 gallons per hour must be located at least 10 feet from the container shut-off valves. Vaporizers having a capacity greater than 100 gallons per hour must be located at least 15 feet from container shut-off valves.

(5) Vaporizers may be installed in buildings, rooms, housings, sheds, or lean-tos used exclusively for vaporizing or mixing of LP-gas. Vaporizing housing structures must be noncombustible, and well ventilated near the floorline and the highest point of the roof. When vaporizer and/or mixing equipment is located in a structure or room attached to or within a building, such structure or room must be separated from the remainder of the building by a wall designed to

withstand a static pressure of at least 100 pounds per square foot. This wall must have no openings or pipes or conduit passing through it. The structure or room must have adequate ventilation, and a roof or at least one exterior wall of light-weight construction.

(6) Vaporizers must have at or near the discharge, a safety-relief valve providing an effective rate of discharge according to WAC 296-307-41025. The relief valve must be located where it is not subjected to temperatures over 140°F.

(7) Vaporizers must have suitable automatic means to prevent liquid passing from the vaporizer to the gas discharge piping of the vaporizer.

(8) Vaporizers must have means for manually turning off the gas to the main burner and pilot.

(9) Vaporizers must have automatic safety devices to shut off the flow of gas to main burners if the pilot light should fail. When the flow through the pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(10) Pressure regulating and pressure reducing equipment located within 10 feet of a direct fired vaporizer must be separated from the open flame by an airtight noncombustible partition.

(11) Except as provided in subsection (5) of this section, the following minimum distances must be maintained between direct fired vaporizers and the nearest important building, group of buildings, or line of adjoining property that may be built on:

(a) Ten feet for vaporizers with a vaporizing capacity of 15 gallons per hour or less;

(b) Twenty-five feet for vaporizers with a vaporizing capacity of 16-100 gallons per hour;

(c) Fifty feet for vaporizers with a vaporizing capacity over 100 gallons per hour.

(12) Direct fired vaporizers must not raise the product pressure above the design pressure of the vaporizer equipment or above the pressure shown in the second column of Table U-8.

(13) Fusible plugs are prohibited on vaporizers.

(14) Vaporizers must not have unprotected drains to sewers or sump pits.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41033 ((How must)) Construction and installation of direct gas-fired tank heaters ((be constructed and installed?)).** Direct gas-fired tank heaters must be constructed and installed as follows:

(1) Direct gas-fired tank heaters, and tanks to which they are applied, must only be installed aboveground.

(2) Tank heaters must be permanently marked with the name of the manufacturer, the rated Btu input to the burner, and the maximum vaporizing capacity in gallons per hour.

**Note:** Tank heaters may be an integral part of a fuel storage container directly connected to the container liquid section, or vapor section, or both.

(3) Tank heaters must have a means for manually turning off the gas to the main burner and pilot.

(4) Tank heaters must have an automatic safety device to shut off the flow of gas to main burners, if the pilot light should fail. When flow through pilot exceeds 2,000 Btu per hour, the pilot also must have an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(5) Pressure regulating and pressure reducing equipment if located within ten feet of a direct fired tank heater must be separated from the open flame by a substantially airtight non-combustible partition.

(6) The following minimum distances must be maintained between a storage tank heated by a direct fired tank heater and the nearest important building, group of buildings, or line of adjoining property that may be built on:

- (a) Ten feet for storage containers of less than 500 gallons water capacity;
- (b) Twenty-five feet for storage containers of 500-1,200 gallons water capacity;
- (c) Fifty feet for storage containers of over 1,200 gallons water capacity.

(7) No direct fired tank heater may raise the product pressure within the storage container over 75% of the pressure in the second column of Table U-8.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41035 ((How must) Construction and installation of dehydrators ((be constructed and installed?)).** The vaporizer section of vaporizer-burners used for dehydrators or dryers must be located outdoors; they must be constructed and installed as follows:

- (1) Vaporizer-burners must have a minimum design pressure of 250 psig with a factor safety of five.
- (2) Manually operated positive shut-off valves must be located at the containers to shut off all flow to the vaporizer-burners.
- (3) Minimum distances between storage containers and vaporizer-burners must be as follows:

Water capacity per container (gallons)	Minimum distances (feet)
Less than 501	10
501 to 2,000	25
Over 2,000	50

(4) The vaporizer section of vaporizer-burners must be protected by a hydrostatic relief valve. The relief valve must be located where it is not subjected to temperatures over 140°F. The start-to-discharge pressure setting must protect the components involved, and be at least 250 psig. The discharge must be directed upward and away from component parts of the equipment and away from operating personnel.

(5) Vaporizer-burners must have means for manually turning off the gas to the main burner and pilot.

(6) Vaporizer-burners must have automatic safety devices to shut off the flow of gas to the main burner and pilot in the event the pilot is extinguished.

(7) Pressure regulating and control equipment must be located or protected so that the temperatures surrounding this equipment shall not exceed 140°F.

**Exception:** Equipment components may be used at higher temperatures if designed to withstand such temperatures.

(8) Pressure regulating and control equipment when located downstream of the vaporizer must be designed to withstand the maximum discharge temperature of the vapor.

(9) Fusible plugs are prohibited on the vaporizer section of vaporizer-burners.

(10) Vaporizer coils or jackets must be made of ferrous metal or high temperature alloys.

(11) Equipment utilizing vaporizer-burners must have automatic shutoff devices upstream and downstream of the vaporizer section connected so as to operate in the event of excessive temperature, flame failure, and, if applicable, insufficient airflow.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41037 ((What are the) Maximum filling densities((?)).** (1) ((=)) **Filling density** ((= means)). The percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60°F. All containers ((shall)) must be filled according to the filling densities shown in Table U-4.

TABLE U-4  
MAXIMUM PERMITTED FILLING DENSITY

Specific Gravity at 60°F (15.6°C)	Aboveground containers		Underground containers, all capacities
	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	0 to 1,200 U.S. gals. (1,000 imp. gal. 4,500 liters) total water cap	
	Percent	Percent	
.496-.503	41	44	45
.504-.510	42	45	46
.511-.519	43	46	47
.520-.527	44	47	48
.528-.536	45	48	49
.537-.544	46	49	50
.545-.552	47	50	51
.553-.560	48	51	52
.561-.568	49	52	53
.569-.576	50	53	54
.577-.584	51	54	55
.585-.592	52	55	56
.593-.600	53	56	57

(2) Any container including mobile cargo tanks and portable tank containers regardless of size or construction, shipped under DOT jurisdiction or constructed according to DOT specifications must be charged according to DOT requirements.

(3) Exception: Portable containers not subject to DOT jurisdiction must be filled either by weight, or by volume using a fixed length dip tube gauging device.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41039** (~~What requirements apply to~~) **LP-gas in buildings(?)**. (1) Vapor may be piped into buildings at pressures over 20 psig only if the buildings or separate areas thereof:

(a) Are constructed according to this section;  
 (b) Are used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard;

(c) Are buildings, structures, or equipment under construction or undergoing major renovation.

(2) Liquid may be permitted in buildings as follows:

(a) In buildings, or separate areas of buildings, used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard; and when such buildings, or separate areas are constructed according to this section.

(b) In buildings, structures, or equipment under construction or undergoing major renovation if the temporary piping meets the following conditions:

(i) Liquid piping inside the building meets the requirements of WAC 296-307-41021 and is a maximum of three-fourths iron pipe size. Copper tubing with an outside diameter of 3/4 inch or less may be used if it meets the requirements of Type K of Specifications for Seamless Water Tube, ANSI H23.1-1970 (ASTM B88-1969). (See Table U-2.) All such piping must be protected against construction hazards. Liquid piping inside buildings must be kept to a minimum. Such piping must be securely fastened to walls or other surfaces to provide adequate protection from breakage and located to subject the liquid line to the lowest ambient temperatures.

(ii) A shut-off valve must be installed in each intermediate branch line where it takes off the main line and must be readily accessible. A shut-off valve must also be placed at the appliance end of the intermediate branch line. Such shut-off valve must be upstream of any flexible connector used with the appliance.

(iii) Suitable excess flow valves must be installed in the container outlet line supplying liquid LP-gas to the building. A suitable excess flow valve must be installed immediately downstream of each shut-off valve. Excess flow valves must be installed where piping size is reduced and must be sized appropriately.

(iv) Hydrostatic relief valves must be installed according to WAC 296-307-41025(13).

(v) Using hose to carry liquid between the container and the building or at any point in the liquid line, except at the appliance connector, is prohibited.

(vi) Where flexible connectors are necessary for appliance installation, such connectors must be as short as practical and must meet the requirements of WAC 296-307-41021(4) or 296-307-41023.

(vii) Release of fuel when any section of piping or appliances is disconnected must be minimized by either of the following methods:

(A) Using an approved automatic quick-closing coupling (closing in both directions when coupled in the fuel line); or

(B) Closing the valve nearest to the appliance and allowing the appliance to operate until the fuel in the line is consumed.

(viii) See WAC 296-307-41509 for the conditions under which portable containers may be brought indoors.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41041** (~~What requirements apply to~~) **Transferring of liquids(?)**. When transferring liquids, (~~you~~) the employer must ensure that:

(1) At least one attendant remains close to the transfer connection from the time the connections are first made until they are finally disconnected, during the transfer of the product.

(2) Containers must be filled or used only upon authorization of the owner.

(3) Containers manufactured according to DOT specifications authorized by DOT as a "single trip" or "nonrefillable container" must not be refilled or reused in LP-gas service.

(4) Gas or liquid must not be vented to the atmosphere to assist in transferring contents of one container to another, except as provided in WAC 296-307-42509(4). A listed pump may use LP-gas in the vapor phase as a source of energy. The gas may be vented to the atmosphere at a rate not to exceed that from a No. 31 drill size opening, if venting and liquid transfer are located at least fifty feet from the nearest important building.

(5) Filling fuel containers for industrial trucks or motor vehicles from industrial bulk storage containers must be performed at least ten feet from the nearest important masonry-walled building or at least twenty-five feet from the nearest important building or other construction and always at least twenty-five feet from any building opening.

(6) Filling portable containers, containers mounted on skids, fuel containers on farm tractors, or similar applications, from storage containers used in domestic or commercial service, must be performed at least fifty feet from the nearest important building.

(7) The filling connection and the vent from the liquid level gauges in containers, filled at point of installation, must be at least ten feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(8) Fuel supply containers must be gauged and charged only in the open air or in buildings especially provided for that purpose.

(9) Marketers and users must exercise precaution to ensure that only those gases for which the system is designed,

examined, and listed, are employed in its operation, particularly with regard to pressures.

(10) Pumps or compressors must be designed for use with LP-gas. When compressors are used they must normally take suction from the vapor space of the container being filled and discharge to the vapor space of the container being emptied.

(11) Pumping systems, when equipped with a positive displacement pump, must include a recirculating device that limits the differential pressure on the pump under normal operating conditions to the maximum differential pressure rating of the pump. The discharge of the pumping system must be protected so that pressure is a maximum of 350 psig. If a recirculation system discharges into the supply tank and contains a manual shut-off valve, an adequate secondary safety recirculation system must be incorporated that has no means of rendering it inoperative. Manual shut-off valves in recirculation systems must be kept open except during an emergency or when repairs are being made to the system.

(12) When necessary, unloading piping or hoses must have suitable bleeder valves for relieving pressure before disconnection.

(13) Agricultural air moving equipment, including crop dryers, ~~((shall))~~ must be shut down when supply containers are filling unless the air intakes and sources of ignition on the equipment are located fifty feet or more from the container.

(14) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and tractors, must be shut down during refueling.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41043 (~~(Must)~~) Training for workers (~~(be trained?)~~).** Workers performing installation, removal, operation, and maintenance work must be properly trained in that function.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41045 (~~(What)~~) Fire protection (~~(must be provided)~~) for LP-gas installations(~~(?)~~).** (1) Open flames or other sources of ignition are prohibited in vaporizer rooms (except those housing direct-fired vaporizers), pump-houses, container charging rooms or other similar locations. Direct-fired vaporizers are prohibited in pumphouses or container charging rooms.

**Note:** LP-gas storage containers do not require lightning protection. Since LP-gas is contained in a closed system of piping and equipment, the system need not be electrically conductive or electrically bonded for protection against static electricity. (See NFPA No. 77-1972-1973, Recommended Practice for Static Electricity.)

(2) Open flames (except as provided in subsection (1) of this section), cutting or welding, portable electric tools, and extension lights capable of igniting LP-gas, are prohibited within classified areas specified in Table U-5 unless the LP-gas facilities have been freed of all liquid and vapor, or spe-

cial precautions observed under carefully controlled conditions.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41047 (~~(What)~~) Electrical requirements that apply to LP-gas installations(~~(?)~~).** (1) Electrical equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for ordinary locations.

(2) Fixed electrical equipment and wiring installed within classified areas must comply with Table U-5 and must be installed according to chapter 296-307 WAC Part T.

**Exception:** This provision does not apply to fixed electrical equipment at residential or commercial installations of LP-gas systems, LP-gas used as a motor fuel, or to LP-gas system installations on commercial vehicles.

TABLE U-5

Part	Location	Extent of classified area <sup>1</sup>	Equipment ( <del>(shall))</del> <u>must be suitable for Class I, Group D<sup>2</sup></u>
A	Storage containers other than DOT cylinders	Within 15 feet in all directions from connections, except connections otherwise covered in this table	Division 2
B	Tank vehicle and tank car loading and unloading <sup>3</sup>	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)	Division 2
C	Gauge vent openings other than those on DOT cylinders	Within 5 feet in all directions from point of discharge	Division 1
		Beyond 5 feet but within 15 feet in all directions from point of discharge	Division 2
D	Relief valve discharge other than those on DOT cylinders	Within direct path of discharge	Division 1 <i>Note:</i> Fixed electrical equipment should not be installed
		Within 5 feet in all directions from point of discharge	Division 1

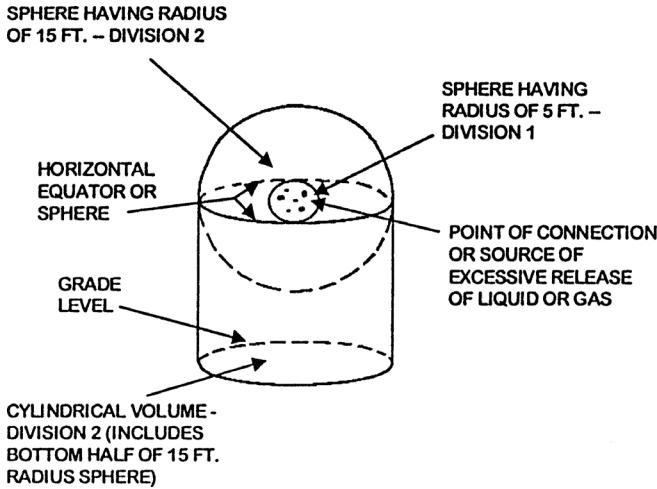
Part	Location	Extent of classified area <sup>1</sup>	Equipment <del>((shalt))</del> <u>must</u> be suitable for Class I, Group D <sup>2</sup>
		Beyond 5 feet but within 15 feet in all directions from point of discharge except within the direct path of discharge	Division 2
E	Pumps, compressors, gas-air mixers and vaporizers other than direct fired		
	Indoors without ventilation	Entire room and any adjacent room not separated by a gastight partition	Division 1
		Within 15 feet of the exterior side of any exterior wall or roof that is not vaportight or within 15 feet of any exterior opening	Division 2
	Indoors with adequate ventilation <sup>4</sup>	Entire room and any adjacent room not separated by a gastight partition	Division 2
	Outdoors in open air at or above grade	Within 15 feet in all directions from this equipment and within the cylindrical volume between the horizontal equator of the sphere and grade (See Figure H-1)	Division 2
F	Service station dispensing units		
		Entire space within dispenser enclosure, and 18 inches horizontally from enclosure exterior up to an elevation 4 ft. above dispenser base. Entire pit or open space beneath dispenser	Division 1
		Up to 18 inches above grade within 20 ft. horizontally from any edge of enclosure	Division 2
		<i>Note:</i> For pits within this area, see Part F of this table	
G	Pits or trenches containing or located beneath LP-gas valves, pumps, compressors, regulators, and similar equipment		
	Without mechanical ventilation	Entire pit or trench	Division 1
		Entire room and any adjacent room not separated by a gastight partition	Division 2

Part	Location	Extent of classified area <sup>1</sup>	Equipment <del>((shalt))</del> <u>must</u> be suitable for Class I, Group D <sup>2</sup>
		Within 15 feet in all directions from pit or trench when located outdoors	Division 2
	With adequate mechanical ventilation	Entire pit or trench	Division 2
		Entire room and any adjacent room not separated by a gastight partition	Division 2
		Within 15 feet in all directions from pit or trench when located outdoors	Division 2
H	Special buildings or rooms for storage of portable containers	Entire room	Division 2
I	Pipelines and connections containing operational bleeds, drips, vents or drains		
		Within 5 ft. in all directions from point of discharge	Division 1
		Beyond 5 ft. from point of discharge, same as Part E of this table	
J	Container filling		
	Indoors without ventilation	Entire room	Division 1
	Indoors with adequate ventilation <sup>4</sup>	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet and entire room	Division 2
	Outdoors in open air	Within 5 feet in all directions from connections regularly made or disconnected for product transfer	Division 1
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Fig. H-1.)	Division 2

<sup>1</sup> The classified area must not extend beyond an unpierced wall, roof, or solid vaportight partition.

<sup>2</sup> See chapter 296-46 WAC, and chapter 296-306A WAC Part T.

- 3 When classifying the extent of a hazardous area, consider the possible variations in the spotting of tank cars and tank vehicles at the unloading points and the effect these variations of actual spotting point may have on the point of connection.
- 4 Ventilation, either natural or mechanical, is considered adequate when the concentration of the gas in a gas-air mixture does not exceed twenty-five percent of the lower flammable limit under normal operating conditions.



**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41049** (~~What requirements apply to~~)

**Liquid-level gauging devices(?)**. (1) Each container manufactured after December 31, 1965, and filled on a volumetric basis must have a fixed liquid-level gauge to indicate the maximum permitted filling level according to subsection (5) of this section. Each container manufactured after December 31, 1969, must have permanently attached to the container adjacent to the fixed level gauge a marking showing the percentage full that will be shown by that gauge. When used with a variable liquid-level gauge, the fixed liquid-level gauge will act as a check on the variable gauge. Gauges must be used in charging containers as required in WAC 296-307-41034.

(2) All variable gauging devices must be arranged so that the maximum liquid level for butane, for a 50/50 mixture of butane and propane, and for propane, to which the container may be charged, is easily determined. Liquid levels from empty to full must be marked on the system nameplate or gauging device. Dials of magnetic or rotary gauges must show whether they are for cylindrical or spherical containers and whether for aboveground or underground service. The dials of gauges for aboveground containers of over 1,200 gallons water capacity must be so marked.

(3) Gauging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, must be designed so that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(4) Gauging devices must have a design working pressure of at least 250 psig.

(5) Length of tube or position of fixed liquid-level gauge must be designed to indicate the maximum level to which the

container may be filled for the product contained. This level must be based on the volume of the product at 40°F at its maximum permitted filling density for aboveground containers and at 50°F for underground containers. The employer must calculate the filling point for which the fixed liquid level gauge must be designed according to this section.

**Note:** It is impossible to set out in a table the length of a fixed dip tube for various tank capacities because of the various tank diameters and lengths, and because the tank may be installed either vertically or horizontally. If the employer can determine the length of the fixed tube by using a strapping table from the container manufacturer.

The fixed tube should be long enough so that when its lower end touches the surface of the liquid in the container, the contents of the container will be the maximum permitted volume as determined by the following formula:

$$\frac{\text{Water capacity of container}^1 \text{ (gals.)} \times \text{filling density}^2}{\text{Specific gravity of LP-gas}^1 \times \text{volume correction factor}^3 \times 100} = \text{Maximum volume of LP-gas}$$

1 Measure at 60°F.

2 From WAC 296-307-41037(1).

3 For aboveground containers the liquid temperature is assumed to be 40°F and for underground containers the liquid temperature is assumed to be 50°F. To correct the liquid volumes at these temperatures to 60°F, use the following factors:

(a) To determine maximum volume of LP-gas for which a fixed length of dip tube must be set:

**TABLE U-6**  
**VOLUME CORRECTION FACTORS**

Specific gravity	Aboveground	Underground
0.500	1.033	1.017
.510	1.031	1.016
.520	1.029	1.015
.530	1.028	1.014
.540	1.026	1.013
.550	1.025	1.013
.560	1.024	1.012
.570	1.023	1.011
.580	1.021	1.011
.590	1.020	1.010

(b) To calculate the maximum volume of LP-gas that can be placed in a container when determining the length of the dip tube expressed as a percentage of total water content of the container, use the formula in (c) of this subsection.

(c) Determine the maximum weight of LP-gas that may be placed in a container for determining the length of a fixed dip tube by multiplying the maximum volume of LP-gas from Table U-6 by the pounds of LP-gas in a gallon at 40°F for aboveground and at 50°F for underground containers. Typical pounds per gallon are specified below:

Example: Assume a one hundred gallon total water capacity tank for aboveground storage of propane having a specific gravity of 0.510 of 60°F.

$$\frac{100 \text{ (gals.)} \times 42 \text{ (filling density)}}{0.510 \times 1.031 \text{ (correction factor from Table U-6)} \times 100} = \frac{4200}{52.6}$$

79.8 gallons propane, the maximum amount permitted to be placed in a 100-gallon total water capacity above ground container equipped with a fixed dip tube.

Maximum volume of LP-gas (from formula in (a) of this subsection) x 100

$$\frac{\text{Total water content of container in gallons}}{\text{Maximum percent of LP-gas}} =$$

	Aboveground, pounds per gallon	Underground, pounds per gallon
Propane	4.37	4.31
N Butane	4.97	4.92

(6) Fixed liquid-level gauges used on non-DOT containers must be stamped on the exterior of the gauge with the letters DT followed by the vertical distance (expressed in inches and carried out to one decimal place) from the top of container to the end of the dip tube or to the centerline of the gauge when located at the maximum permitted filling level. For portable containers that may be filled in the horizontal and/or vertical position the letters DT must be followed by V with the vertical distance from the top of the container to the end of the dip tube for vertical filling, and with H followed by the proper distance for horizontal filling. For DOT containers the stamping must be placed both on the exterior of the gauge and on the container. On aboveground or cargo containers where the gauges are positioned at specific levels, the marking may be specified in percent of total tank contents and the marking must be stamped on the container.

(7) Columnar gauge glasses must be restricted to charging plants where the fuel is withdrawn in the liquid phase only. They must have valves with metallic handwheels, excess flow valves, and extra-heavy glass adequately protected with a metal housing applied by the gauge manufacturer. They must be shielded against the direct rays of the sun. Columnar gauge glasses are prohibited on tank trucks, motor fuel tanks, and containers used in domestic, commercial, and industrial installations.

(8) Float gauging devices or equivalent that do not require flow for their operation and that have connections extending outside the container do not have to have excess flow valves if the piping and fittings are adequately designed to withstand the container pressure and are properly protected against physical damage and breakage.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41051 ((What)) Requirements that apply to appliances(?)**. (1) New commercial and industrial gas consuming appliances must be approved.

**Exception:** Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas and is in good condition may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(2) Unattended heaters used inside buildings for the purpose of animal or poultry production or care must have an approved automatic device designed to shut off the flow of gas to the main burners, and pilot if used, in case the flame goes out.

(3) All commercial, industrial, and agricultural appliances or equipment must be installed according to the requirements of these standards and according to the following:

(a) Domestic and commercial appliances, NFPA 54-1969, Standard for the Installation of Gas Appliances and Gas Piping.

(b) Industrial appliances, NFPA 54A-1969, Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises.

(c) Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970.

(d) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96-1970.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41501 ((What does this section cover?)) Scope.** WAC 296-307-415 applies to systems using DOT containers. Cylinder systems must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41503 ((What is a "cylinder system"?) Cylinder system. ((A-"))Cylinder system(("))**. Includes the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41505 ((How must)) Marking containers ((be marked for)) used in cylinder systems(?)**. (1) Containers must be marked according to DOT regulations. Additional markings that do not conflict with DOT regulations may be used.

(2) Each container must be marked with its water capacity in pounds or other identified unit of weight.

(3) Exception: If ~~((you are))~~ the employer is the only one who fills and maintains the container and if the water capacity of the container is identified by a code, subsection (2) of this section does not apply.

(4) Each container must be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41507 ((What)) Additional requirements that apply to cylinder systems installed outdoors((?)).** (1) Containers must not be buried below ground. However, systems may be installed in a compartment or recess below grade level, such as a niche in a slope or terrace wall that is used for no other purpose, if the container and regulating equipment are not in contact with the ground, and the compartment or recess is drained and ventilated horizontally to the outside air from its lowest level, with the outlet at least three feet away from any building opening below the level of the outlet.

(2) Except as provided in WAC 296-307-41025(14), the discharge from safety-relief devices must be located at least three feet away from any building opening that is below the level of discharge and must not terminate beneath any building unless the space is well ventilated to the outside and is not enclosed on more than two sides.

(3) Containers must be set on firm foundation or otherwise firmly secured; the possible effect of settling on the outlet piping must be guarded against by a flexible connection or special fitting.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41509 ((What)) Additional requirements that apply to cylinder system installed indoors((?)).** (1) When portable containers are necessary and it is not practical to use them outdoors, containers and equipment may be used indoors only if they meet the requirements of this section.

(a) ~~(("))~~ **Containers in use** ~~(("means))~~. Connected for use.

(b) Systems using containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must have excess flow valves. Such excess flow valves must be either integral with the container valves or in the connections to the container valve outlets. In either case, an excess flow valve must be installed so that any strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves must take into account the type of valve protection provided.

(c) Regulators must be either directly connected to the container valves or to manifolds connected to the container valves. The regulator must be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets must be designed for at least 250 psig service pressure.

(d) Valves on containers having a water capacity greater than fifty pounds (nominal twenty pounds LP-gas capacity) must be protected while in use.

(e) Aluminum pipe or tubing is prohibited.

(f) Hose must be designed for a working pressure of at least 250 psig. Hose and hose connections ~~((shall))~~ must be listed by a nationally recognized testing laboratory.

(i) Hose must be as short as practical.

(ii) Hose must be long enough to allow required spacing without kinking, straining, or allowing hose to be close enough to a burner to be damaged by heat.

(g) Portable heaters, including salamanders, must have an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in case the flame goes out. Heaters with inputs above 50,000 Btu manufactured on or after May 17, 1967, and heaters with inputs above 100,000 Btu manufactured before May 17, 1967, must have either:

(i) A pilot that must be lighted and proved before the main burner can be turned on; or

(ii) An electric ignition system;

(iii) Container valves, connectors, regulators, manifolds, piping, and tubing must not be used as structural supports for heaters.

**Exception:** These requirements do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 Btu input when used with containers with a maximum water capacity of 2-1/2 pounds.

(h) Containers, regulating equipment, manifolds, piping, tubing, and hose must be located to minimize exposure to abnormally high temperatures (such as may result from exposure to convection or radiation from heating equipment or installation in confined spaces), physical damage, or tampering.

(i) Heat producing equipment must be located and used to minimize the possibility of igniting combustibles.

(j) Containers with water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) connected for use, must stand on a firm and substantially level surface and, when necessary, must be secured in an upright position.

(k) Containers, including the valve protective devices, must be installed to minimize the probability of impingement of discharge of safety-relief devices upon containers.

(2) Containers with a maximum water capacity of 2-1/2 pounds (nominal one pound LP-gas capacity) may be used indoors as part of approved self-contained hand torch assemblies or similar appliances.

(3) When buildings frequented by the public are open to the public, containers may be used for repair or minor renovation as follows:

(a) The maximum water capacity of individual containers must be 50 pounds (nominal twenty pounds LP-gas capacity).

(b) The number of LP-gas containers must not exceed the number of employees assigned to use LP-gas.

(c) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(4) When buildings frequented by the public are closed to the public, containers may be used in buildings or structures for repairs or minor renovation as follows:



(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) For temporary heating such as curing concrete, drying plaster and similar applications, heaters (other than integral heater-container units) must be located at least six feet from any LP-gas container. ~~((You))~~ The employer may use heaters specifically designed for attachment to the container or to a supporting standard, if they are designed and installed to prevent direct or radiant heat application from the heater onto the container. Blower and radiant type heater must not be directed toward any LP-gas container within 20 feet.

(c) If two or more heater-container units are located in an unpartitioned area on the same floor, the container or containers of each unit must be separated from the container or containers of any other unit by at least 20 feet.

(d) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers manifolded together for connection to a heater or heaters ~~((shall))~~ must not be greater than 735 pounds (nominal three hundred pounds LP-gas capacity). Such manifolds must be separated by at least 20 feet.

(e) On floors on which heaters are not connected for use, containers may be manifolded together for connection to a heater or heaters on another floor, if:

(i) The total water capacity of containers connected to any one manifold is a maximum of 2,450 pounds (nominal one thousand pounds LP-gas capacity) and;

(ii) Where more than one manifold having a total water capacity greater than 735 pounds (nominal three hundred pounds LP-gas capacity) are located in the same unpartitioned area, they ~~((shall))~~ must be separated by at least 50 feet.

(f) Containers with a water capacity greater than 2-1/2 pounds (nominal one pound LP-gas capacity) must be attended at all times.

(5) Containers may be used in industrial occupancies for processing, research, or experimental purposes as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity).

(b) Containers connected to a manifold must have a total water capacity of a maximum of 735 pounds (nominal three hundred pounds LP-gas capacity) and only one manifold may be located in the same room unless separated at least 20 feet from a similar unit.

(c) LP-gas in containers for research and experimental use must use the smallest practical quantity.

(6) Containers used in industrial occupancies with essentially noncombustible contents where portable equipment for space heating is essential and where a permanent heating installation is not practical, must meet the requirements of subsection (5) of this section.

(7) Containers may be used in buildings for temporary emergency heating purposes, if necessary to prevent damage to the buildings or contents, when the permanent heating system is temporarily out of service, as follows:

(a) Containers and heaters must meet the requirements of subsection (5) of this section.

(b) The temporary heating equipment must be attended at all times.

(8) Containers may be used temporarily in buildings for training purposes related in installation and use of LP-gas systems, as follows:

(a) The maximum water capacity of individual containers must be 245 pounds (nominal one hundred pounds LP-gas capacity), but the maximum quantity of LP-gas that may be placed in each container is 20 pounds.

(b) If more than one container is located in the same room, the containers must be separated by at least 20 feet.

(c) Containers must be removed from the building when the training class has terminated.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41511 (~~What requirements apply to~~) Valves and accessories(?)**, (1) Valves in the assembly of multiple container systems must be arranged so that containers can be replaced without shutting off the flow of gas in the system.

**Note:** An automatic changeover device is not required.

(2) Regulators and low-pressure relief devices must be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls or otherwise rigidly secured and must be installed or protected so that weather will not affect their operation.

(3) Valves and connections to the containers must be protected while in transit, in storage, and while being moved into final use, as follows:

(a) By setting into the recess of the container to prevent the possibility of being struck if the container is dropped on a flat surface; or

(b) By ventilated cap or collar, fastened to the container capable of withstanding a blow from any direction equivalent to that of a 30-pound weight dropped four feet. Construction must ensure that a blow will not be transmitted to the valve or other connection.

(4) When containers are not connected to the system, the outlet valves must be kept tightly closed or plugged, even on empty containers.

(5) Containers having a water capacity in excess of 50 pounds (approximately 21 pounds LP-gas capacity), recharged at the installation, must have excess flow or back-flow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-41513 (~~What requirements apply to~~) Safety devices for cylinder systems(?)**, (1) Containers must have safety devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

TABLE U-7

Regulator delivery pressure	Relief valve start-to-discharge pressure setting (percent of regulator delivery pressure)	
	Minimum	Maximum
1 psig or less	200	300
Above 1 psig but not over 3 psig	140	200
Above 3 psig	125	200

(3) When a regulator or pressure relief valve is used indoors for other than purposes specified in WAC 296-307-41017(1), the relief valve and the space above the regulator and relief valve diaphragms (~~(shall)~~) must be vented to the outside air with the discharge outlet located at least three feet horizontally away from any building opening that is below such discharge.

**Exception:** This requirement does not apply to individual appliance regulators when protection is otherwise provided, nor to WAC 296-307-41509 and 296-307-41025(14). In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-41515 (~~What~~) Other requirements that apply to cylinder systems(?)**, (1) Containers must not be reinstalled unless they are requalified according to DOT regulations.

(2) A product must not be placed in a container marked with a service pressure less than four-fifths of the maximum vapor pressure of product at 130°F.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42001 (~~What does this section cover?~~) Scope.** WAC 296-307-420 applies to systems using storage containers not constructed according to DOT specifications. Non-DOT containers must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42003 (~~How must~~) Design and classification of non-DOT containers (~~be designed and classified?~~)**, Storage containers must be designed and classified according to Table U-8.

TABLE U-8

Minimum design pressures of container lb. per sp. in. gauge
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Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>3</sup>
80 <sup>1</sup>	80 <sup>1</sup>	80 <sup>1</sup>	100 <sup>1</sup>
100	100	100	125
125	125	125	156
150	150	150	187
175	175	175	219
200 <sup>2</sup>	215	200	250

- 1 New type 80 storage containers have not been authorized since Dec. 31, 1947.
- 2 Container type may be increased by increments of 25. The minimum design pressure of containers (~~(shall)~~) must be 100% of the container type designations when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers (~~(shall)~~) must be 125% of the container type designation when constructed under:
  1. The 1949 ASME Code (Par. U-200 and U-201);
  2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
  3. All editions of the API-ASME Code.
- 3 Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42005 (~~What requirements apply to~~) Valves and accessories, filler pipes, and discharge pipes for non-DOT containers(?)**, (1) The filling pipe inlet terminal must not be located inside a building. For containers with a water capacity of 125 gallons or more, such terminals must be located at least 10 feet from any building, and preferably at least 5 feet from any driveway, and must have a protective housing.

- (2) The filling connection must be fitted with one of the following:
  - (a) Combination back-pressure check valve and excess flow valve.
  - (b) One double or two single back-pressure check valves.
  - (c) A positive shut-off valve in conjunction with either:
    - (i) An internal back pressure valve; or
    - (ii) An internal excess flow valve.
- (3) All openings in a container must have approved automatic excess flow valves unless otherwise exempt.
- (4) An excess flow valve is not required in the withdrawal service line if the following requirements are met:
  - (a) The total water capacity is a maximum of 2,000 U.S. gallons.
  - (b) The discharge from the service outlet is controlled by a manually operated shut-off valve that is:
    - (i) Threaded directly into the service outlet of the container; or

(ii) Is an integral part of a substantial fitting threaded into or on the service outlet of the container; or

(iii) Threaded directly into a substantial fitting threaded into or on the service outlet of the container.

(c) The shut-off valve is equipped with an attached hand-wheel or the equivalent.

(d) The controlling orifice between the contents of the container and the outlet of the shut-off valve is a maximum of 5/16 inch in diameter for vapor withdrawal systems and 1/8 inch in diameter for liquid withdrawal systems.

(e) An approved pressure-reducing regulator is directly attached to the outlet of the shut-off valve and is rigidly supported, or an approved pressure-reducing regulator is attached to the outlet of the shut-off valve by means of a suitable flexible connection, if the regulator is adequately supported and properly protected on or at the tank.

(5) All inlet and outlet connections except safety-relief valves, liquid-level gauging devices and pressure gauges on containers of 2,000 gallons water capacity, or more, and on any container used to supply fuel directly to an internal combustion engine, must be labeled to designate whether they communicate with vapor or liquid space. Labels may be on valves.

(6) Instead of an excess flow valve, openings may be fitted with a quick-closing internal valve that must remain closed when not in operation. The internal mechanism for such valves may have a secondary control that must have a fusible plug (not over 220°F melting point) that will cause the internal valve to close automatically in case of fire.

(7) A maximum of two plugged openings may be used on a container of 2,000 gallons or less water capacity.

(8) Containers of 125 gallons water capacity or more manufactured after July 1, 1961, must have an approved device for liquid evacuation, the size of which must be 3/4 inch national pipe thread minimum. A plugged opening does not satisfy this requirement.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42007 (~~What~~) Additional requirements that apply to safety devices for non-DOT containers(2).** (1) All safety devices must comply with the following:

(a) All container safety-relief devices must be located on the containers.

(b) In industrial and gas manufacturing plants, discharge pipe from safety-relief valves on pipe lines within a building must discharge upward and be piped to a point outside a building.

(c) Safety-relief device discharge terminals must be located to provide protection against physical damage and must be fitted with loose raincaps. Return bends and restrictive pipefittings are prohibited.

(d) If desired, discharge lines from two or more safety-relief devices located on the same unit, or similar lines from two or more different units, may be run into a common discharge header, if the cross-sectional area of the header is at least equal to the sum of the cross-sectional area of the indi-

vidual discharge lines, and the setting of safety-relief valves are the same.

(e) Each storage container of over 2,000 gallons water capacity must have a suitable pressure gauge.

(f) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(g) When a regulator or pressure relief valve is installed indoors, the relief valve and the space above the regulator and relief valve diaphragms must be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any opening into the building that is below such discharge.

**Exception:** This requirement does not apply to individual appliance regulators already protected. In buildings devoted exclusively to gas distribution, the space above the diaphragm need not be vented to the outside.

(2) Safety devices for aboveground containers must be provided as follows:

(a) Containers of 1,200 gallons water capacity or less that may contain liquid fuel when installed aboveground must have the rate of discharge required by WAC 296-307-41025(2) provided by a spring-loaded relief valve or valves. In addition to the required spring-loaded relief valve, a suitable fuse plug may be used if the total discharge area of the fuse plug for each container does not exceed 0.25 square inch.

(b) The fusible metal of the fuse plugs must have a yield temperature of 208°F minimum and 220°F maximum. Relief valves and fuse plugs must have direct communication with the vapor space of the container.

(c) On a container having a water capacity between 125 and 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps (~~shall~~) must be used. Suitable provision must be made for draining condensate that may accumulate in the relief valve or its discharge pipe.

(d) On containers of 125 gallons water capacity or less, the discharge from safety-relief devices must be located at least 5 feet horizontally away from any opening into the building below the level of such discharge.

(e) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented away from the container upwards to a point at least 7 feet above the container, and unobstructed to the open air so that it prevents any impingement of escaping gas upon the container; loose-fitting rain caps (~~shall~~) must be used. Suitable provision must be made so that any liquid or condensate that may accumulate inside of the safety-relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, the container, adjacent containers, piping, or equipment must be protected against impingement of flame resulting from ignition of product escaping from the drain.

(3) On all containers that are installed underground and that contain no liquid fuel until buried and covered, the rate of discharge of the spring-loaded relief valve installed thereon may be reduced to a minimum of 30% of the rate of discharge

specified in WAC 296-307-41025(2). Containers so protected must remain covered after installation until the liquid fuel has been removed. Containers that may contain liquid fuel before being installed underground and before being completely covered with earth are aboveground containers when determining the rate of discharge requirement of the relief valves.

(4) On underground containers of over 2,000 gallons water capacity, the discharge from safety-relief devices must be piped directly upward to a point at least 7 feet above the ground.

(5) Where the manhole or housing may become flooded, the discharge from regulator vent lines must be above the highest probable water level. All manholes or housings must have ventilated louvers or equivalent, and the area of openings must be equal to or exceed the combined discharge areas of the safety-relief valves and other vent lines that discharge their content into the manhole housing.

(6) Safety devices for vaporizers must be provided as follows:

(a) Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not have safety-relief valves if adequate tests demonstrate that the assembly is safe without safety-relief valves.

(b) Fusible plugs are prohibited on vaporizers.

(c) In industrial and gas manufacturing plants, safety-relief valves on vaporizers within a building must be piped to a point outside the building and be discharged upward.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42009 ((When may)) Reinstallation of non-DOT containers ((be reinstalled?)).** Containers may be reinstalled if they are free from harmful external corrosion or other damage. Where containers are reinstalled underground, the corrosion resistant coating must be put in good condition. Where containers are reinstalled aboveground, the safety devices and gauging devices must meet all requirements for aboveground containers.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42011 ((What is the)) Maximum capacity ((allowed)) for non-DOT containers((?)).** A non-DOT storage container must have a maximum 90,000 gallons water capacity.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42013 ((How must)) Installing non-DOT containers ((be installed?)).** (1) Containers installed aboveground must have substantial masonry or noncombustible structural supports on firm masonry foundation, unless otherwise indicated.

(2) Aboveground containers must be supported as follows:

(a) Horizontal containers must be mounted on saddles that permit expansion and contraction. Structural metal sup-

ports may be used when they are protected against fire. Suitable means of preventing corrosion must be provided on that portion of the container in contact with the foundations or saddles.

(b) Containers of 2,000 gallons water capacity or less may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell to the concrete pad, footing, or the ground is a maximum of 24 inches.

(3) Any container may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container to the ground is a maximum of 5 feet, if the container is in an isolated location.

(4) Partially buried containers must meet the following requirements:

(a) The portion of the container below the surface and for a vertical distance not less than 3 inches above the surface of the ground is protected to resist corrosion, and the container is protected against settling and corrosion as required for fully buried containers.

(b) Partially buried containers must meet the same spacing requirements as underground tanks.

(c) Relief valve capacity must be the same as for aboveground containers.

(d) Container is protected against vehicular damage by location or other means.

(e) Partially buried containers must meet the same requirements for filling densities as for aboveground containers.

(5) Containers buried underground must be placed so that the top of the container is at least 6 inches below grade. Underground containers subject to abrasive action or physical damage must be:

(a) Placed not less than 2 feet below grade; or

(b) Otherwise protected against such physical damage.

It is not necessary to cover the portion of the container to which manhole and other connections are affixed. When necessary to prevent floating, containers must be securely anchored or weighted.

(6) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, take care to prevent damage to the coating. Any damage to the coating must be repaired before backfilling.

Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(7) Containers with foundations attached (portable or semiportable containers with suitable steel runners or skids popularly known as "skid tanks") must meet the requirements of WAC 296-307-410 and the following:

(a) If they are to be used at a given general location for a temporary period of 6 months at most, they may be without fire-resisting foundations or saddles but must have adequate ferrous metal supports.

(b) They must not be located with the outside bottom of the container shell more than 5 feet above the surface of the ground unless fire-resisting supports are provided.

(c) The bottom of the skids must be between 2 and 12 inches below the outside bottom of the container shell.

(d) Flanges, nozzles, valves, fittings, and the like, having communication with the interior of the container, must be protected against physical damage.

(e) When not permanently located on fire-resisting foundations, piping connections must be flexible enough to minimize breakage or leakage of connections if the container settles, moves, or is otherwise displaced.

(f) Skids, or lugs for attachment of skids, must be secured to the container according to the rules under which the container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments when filled to the maximum permissible loaded weight.

(8) Field welding where necessary must be made only on saddle plates or brackets that were applied by the manufacturer of the tank.

(9) For aboveground containers, secure anchorage or adequate pier height must be provided against possible container flotation wherever high floodwater might occur.

(10) When permanently installed containers are interconnected, ~~((you))~~ the employer must allow for expansion, contraction, vibration, and settling of containers, and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Nonmetallic hose is prohibited for permanently interconnecting containers.

(11) Container assemblies listed for interchangeable installation aboveground or underground must meet the requirements for aboveground installations for safety-relief capacity and filling density. For installation aboveground all other requirements for aboveground installations apply. For installation underground all other requirements for underground installations apply.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42015 ((How must)) Protecting non-DOT containers ((be protected?))**, (1) Valves, regulating, gauging, and other container accessory equipment must be protected against tampering and physical damage. Such accessories must also be protected during the transit of containers intended for installation underground.

(2) On underground or combination aboveground-underground containers, the service valve handwheel, the terminal for connecting the hose, and the opening through which there can be a flow from safety-relief valves must be at least 4 inches above the container and this opening must be located in the dome or housing. Underground systems must be installed so that all openings, including the regulator vent, are located above the normal maximum water table.

(3) All connections to the underground containers must be located within a substantial dome, housing, or manhole, with access protected by a substantial cover.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42017 ((What requirements apply to)) Non-DOT containers in industrial plants((?))**, General provisions applicable to systems in industrial plants (of 2,000 gallons water capacity and more) and to bulk filling plants.

(1) When standard watch service is provided, it must be extended to the LP-gas installation and personnel ~~((shall))~~ must be properly trained.

(2) If loading and unloading are normally done during the night, adequate lights must be provided to illuminate storage containers, control valves, and other equipment.

(3) Suitable roadways or means of access for extinguishing equipment such as wheeled extinguishers or fire department apparatus must be provided.

(4) To minimize trespassing or tampering, the area that includes container accessories, pumping equipment, loading and unloading facilities, and cylinder-filling facilities must be enclosed with at least a 6-foot-high industrial fence unless otherwise adequately protected. There must be at least two means of emergency access.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42019 ((What requirements apply to)) Container-charging plants((?))**, (1) The container-charging room must be located at least:

(a) Ten feet from bulk storage containers.

(b) Twenty-five feet from line of adjoining property that may be built on.

(2) Tank truck filling station outlets must be located at least:

(a) Twenty-five feet from line of adjoining property that may be built on.

(b) Ten feet from pumps and compressors if housed in one or more separate buildings.

(3) The pumps or compressors may be located in the container-charging room or building, in a separate building, or outside of buildings. When housed in separate building, such building (a small noncombustible weather cover is not to be construed as a building) must be located at least:

(a) Ten feet from bulk storage tanks.

(b) Twenty-five feet from line of adjoining property that may be built on.

(c) Twenty-five feet from sources of ignition.

(4) When a part of the container-charging building is to be used for a boiler room or where open flames or similar sources of ignition exist or are employed, the space to be occupied must be separated from container charging room by a partition wall or walls of fire-resistant construction continuous from floor to roof or ceiling. Such separation walls must be without openings and must be joined to the floor, other walls, and ceiling or roof to provide a permanent gas-tight joint.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42021 (~~What~~) Fire protection (~~must be provided~~) for non-DOT containers(~~?~~).** (1) Each bulk plant must have at least one approved portable fire extinguisher with a minimum rating of 12-B, C.

(2) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, (~~you~~) the employer must provide an adequate supply of water at the container site for fire protection in the container area, unless other adequate means for fire control are provided. Water hydrants must be readily accessible and spaced to provide water protection for all containers. Enough firehose must be provided to facilitate easy movement of the hose in the container area. (~~You~~) The employer should equip the outlet of each hose line with a combination fog nozzle. A shelter must be provided to protect the hose and its conveyor from the weather.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42023 (~~What~~) Other requirements that apply to non-DOT containers(~~?~~).** (1) Aboveground containers must be kept properly painted.

(2) Vaporizers for internal combustion engines must meet the requirements of WAC 296-307-42515.

(3) Gas regulating and mixing equipment for internal combustion engines must meet the requirements of WAC 296-307-42517.

(4) Where vaporized gas on the low-pressure side of the system may condense to a liquid at normal operating temperatures and pressures, means must be provided to re-vaporize condensate.

(5) (~~You~~) The employer must protect LP-gas systems against damage from vehicular traffic.

(6) Avoid the use of pits when possible, except pits fitted with automatic flammable vapor detecting devices. No drains or blowoff lines must be directed into or in proximity to sewer systems used for other purposes.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42501 (~~What does this section cover?~~) Scope.** (1) WAC 296-307-425 applies to internal combustion engines, fuel containers, and pertinent equipment for the use of LP-gases as a motor fuel on easily movable, readily portable units including self-propelled vehicles. This section does not apply to containers for transportation of LP-gases nor to marine fuel use.

(2) All uses of LP-gas as a motor fuel must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42503 (~~What general requirements apply to~~) Using LP-gas used as a motor fuel(~~?~~).** (1) Fuel

may be used from the cargo tank of a truck while in transit, but not from cargo tanks on trailers or semitrailers. Fuel may be used from the cargo tanks to operate stationary engines if the wheels are securely blocked.

(2) Passenger-carrying vehicles must not be fueled while passengers are on board.

(3) Industrial trucks (including lift trucks) equipped with permanently mounted fuel containers must be charged outdoors. Charging equipment must meet the requirements of WAC 296-307-440.

(4) LP-gas fueled industrial trucks must comply with the Standard for Type Designations, Areas of Use, Maintenance and Operation of Powered Industrial Trucks, NFPA 505-1969.

(5) Engines on vehicles must be shut down while fueling if the fueling operation involves venting to the atmosphere.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42505 (~~How must~~) Design and classification of fuel containers (~~be designed and classified?~~).** (1) Containers must meet the following requirements:

**Minimum design pressure of container lb. per sp. in. gauge**

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge at 100°F (37.8°C.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); editions 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>2</sup>
200 <sup>1</sup>	215	200	250

<sup>1</sup> Container type may be increased by increments of 25. The minimum design pressure of containers (~~shall~~) must be 100% of the container type designation when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers (~~shall~~) must be 125% of the container type designation when constructed under:

1. The 1949 ASME Code (Par. U-200 and U-201);
2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code; and
3. All editions of the API-ASME Code.

<sup>2</sup> Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

**Exception:** Fuel containers for use in industrial trucks (including lift trucks) (~~shall~~) must be either DOT containers authorized for LP-gas service having a minimum service pressure of 240 psig or minimum Container Type 250. Under 1950 and later ASME Codes, this means a 312.5-psig design pressure container.

(2) DOT containers used as fuel containers must meet all requirements of this section.

(3) All container inlets and outlets except safety-relief valves and gauging devices must be labeled to designate

whether they communicate with vapor or liquid space. (Labels may be on valves.)

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42507 ((How-must)) Installing fuel containers ((be-installed?))** (1) Containers must be located to minimize the possibility of damage to the container. Containers located in the rear of trucks and buses, when protected by substantial bumpers meet this requirement. Fuel containers on passenger-carrying vehicles must be installed as far from the engine as is practical, and the passenger space and any space containing radio equipment must be sealed from the container space to prevent direct seepage of gas to these spaces. The container compartment must be vented to the outside. In case the fuel container is mounted near the engine or the exhaust system, the container must be shielded against direct heat radiation.

(2) Containers must be installed with as much clearance as practical and at least the minimum road clearance of the vehicle under maximum spring deflection. This minimum clearance must be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(3) Permanent and removable fuel containers must be securely mounted to prevent jarring loose, slipping, or rotating, and the fastenings must be designed and constructed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with fuel using a safety factor of at least four based on the ultimate strength of the material to be used. Field welding, when necessary, must be made only on saddle plates, lugs or brackets, attached to the container by the manufacturer.

(4) Fuel containers on buses must be permanently installed.

(5) Containers from which only vapor is to be withdrawn must be installed and equipped with suitable connections to minimize the accidental withdrawal of liquid.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42509 ((What-requirements-apply-to)) Valves and accessories((?))** (1) Container valves and accessories must have a rated working pressure of at least 250 psig, and must be suitable for LP-gas service.

(2) The filling connection must be fitted with an approved double back-pressure check valve, or a positive shutoff in conjunction with an internal back-pressure check valve. On a removable container the filler valve may be a hand operated shut-off valve with an internal excess flow valve. Main shut-off valves on the container on liquid and vapor must be readily accessible.

(3) Filling connections equipped with approved automatic back-pressure check valves, and safety-relief valves, all connections to the containers having openings for the flow of gas in excess of a No. 54 drill size must have approved automatic excess flow valves to prevent discharge of content in case connections are broken.

(4) Liquid-level gauging devices must meet the following requirements:

(a) Variable liquid-level gauges that require the venting of fuel to the atmosphere are prohibited on fuel containers of industrial trucks (including lift trucks).

(b) On portable containers that may be filled in the vertical and/or horizontal position, the fixed liquid-level gauge must indicate maximum permitted filling level for both vertical and horizontal filling with the container oriented to place the safety-relief valve in communication with the vapor space.

(c) For containers used solely in farm tractor service and charged at a point at least 50 feet from any important building, the fixed liquid-level gauging device may be constructed so that the outward flow of container content exceeds that passed by a No. 54 drill size opening, but must never exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. Fittings equipped with restricted drill size opening and the container on which they are used must be marked to indicate the size of the opening.

(d) All valves and connections on containers must be adequately protected to prevent damage due to accidental contact with stationary objects or from loose objects thrown up from the road. All valves must be safeguarded against damage due to collision, overturning or other accident. Farm tractors where parts of the vehicle provide protection to valves and fittings meet this requirement. However, on removable type containers the protection for the fittings must be permanently attached to the container.

(e) ((You)) The employer should normally exchange removable fuel outdoors. When removable fuel containers are used, means ((shall)) must be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. ((You)) The employer must use one of the following methods:

(i) Using an approved automatic quick-closing coupling (a type closing in both directions when uncoupled) in the fuel line; or

(ii) Closing the valve at the fuel container and allowing the engine to run until the fuel in the line is consumed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42511 ((What-requirements-apply-to)) Piping, tubing, and fittings((?))** (1) Pipe from fuel container to first-stage regulator must be at least schedule 80 wrought iron or steel (black or galvanized), brass or copper;

or seamless copper, brass, or steel tubing. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel pipe or tubing must be adequately protected against exterior corrosion. Copper tubing must be types K or L or equivalent with a minimum wall thickness of 0.032 inch. Approved flexible connections may be used between container and regulator or between regulator and gas-air mixer. Using aluminum pipe or tubing is prohibited. For removable containers, an approved flexible connection must be used between the container and the fuel line.

(2) All piping must be installed, braced, and supported to minimize vibration strains or wear.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42513 ((~~What requirements apply to~~) ~~Safety devices~~(?))** (1) Spring-loaded internal safety-relief valves must be used on all motor fuel containers.

(2) The discharge outlet from safety-relief valves must be located on the outside of enclosed spaces and as far as practical from possible sources of ignition, and vented upward within 45 degrees of the vertical to prevent impingement of escaping gas upon containers, or parts of vehicles, or on vehicles in adjacent lines of traffic. A rain cap or other protector must be used to keep water and dirt from collecting in the valve.

(3) When a discharge line from the container safety-relief valve is used, the line ((~~shall~~) must) be metallic, other than aluminum, and must be sized, located, and maintained so as not to restrict the required flow of gas from the safety-relief valve. The discharge line must be able to withstand the pressure resulting from the discharge of vapor when the safety-relief valve is in the full open position. Flexible metal hose or tubing must be used when necessary.

(4) Portable containers equipped for volumetric filling may be filled in either the vertical or horizontal position only when oriented to place the safety-relief valve in communication with the vapor space.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42515 ((~~What requirements apply to vaporizers~~?) ~~Vaporizers~~)** (1) Vaporizers, their parts, and other devices that may be subjected to container pressure must have a design pressure of at least 250 psig.

(2) Each vaporizer must have a valve or suitable plug that will permit substantially complete draining of the vaporizer. It must be located at or near the lowest portion of the section occupied by the water or other heating medium.

(3) Vaporizers must be securely fastened to minimize the possibility of loosening.

(4) Each vaporizer must be permanently marked at a visible point as follows:

(a) With the design pressure of the fuel-containing portion in psig.

(b) With the water capacity of the fuel-containing portion of the vaporizer in pounds.

(5) Devices to supply heat directly to a fuel container must have an automatic device to cut off the supply of heat before the pressure inside the fuel container reaches 80% of the start-to-discharge pressure setting of the safety-relief device on the fuel container.

(6) Engine exhaust gases may be used as a direct source of heat supply for the vaporization of fuel if the materials of construction of those parts of the vaporizer in contact with exhaust gases are resistant to the corrosive action of exhaust gases and the vaporizer system is designed to prevent excessive pressures.

(7) Fusible plugs are prohibited on vaporizers.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42517 ((~~What requirements apply to~~) ~~Gas regulating and mixing equipment~~(?))** (1) Approved automatic pressure reducing equipment must be installed securely between the fuel supply container and gas-air mixer to reduce the pressure of the fuel delivered to the gas-air mixer.

(2) An approved automatic shut-off valve must be provided in the fuel system at some point ahead of the inlet of the gas-air mixer, designed to prevent flow of fuel to the mixer when the ignition is off and the engine is not running. For industrial trucks and engines operating in buildings other than those used exclusively to house engines, the automatic shut-off valve must be designed to operate if the engine stops. Atmospheric regulators (zero governors) are adequate as an automatic shut-off valve only in cases of outdoor operation such as farm tractors, construction equipment, irrigation pump engines, and other outdoor stationary engine installations.

(3) The source of air for combustion must be completely isolated from the passenger compartment, ventilating system, or air-conditioning system.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42519 ((~~What is the~~) ~~Maximum container capacity~~ (~~allowed~~?)** A single fuel container used on passenger carrying vehicles must have a maximum of 200 gallons water capacity. A single fuel container on other vehicles normally operating on the highway must have a maximum of 300 gallons water capacity except as provided in WAC 296-307-42503(1).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42521 ((~~What requirements apply to~~) ~~Stationary engines used indoors~~(?))** Stationary engines and gas turbines installed in buildings, including portable engines used instead of or to supplement stationary engines, must comply with the Standard for the Institution and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970, and the appropriate requirements of WAC 296-307-410 through 296-307-420.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-42523 ((~~What requirements apply to~~) ~~Portable engines used indoors~~(?))** (1) Portable engines may be used in buildings only for emergency use, and according to WAC 296-307-42521.

(2) Exhaust gases must be discharged outside the building or to an area where they will not constitute a hazard.

(3) Provision must be made to supply sufficient air for combustion and cooling.

(4) An approved automatic shut-off valve must be provided in the fuel system ahead of the engine, designed to pre-



vent flow of fuel to the engine when the ignition is off or if the engine should stop.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42525 (~~What requirements apply to~~) Industrial trucks used indoors((?)).** (1) LP-gas-fueled industrial trucks may be used in buildings and structures.

(2) No more than two LP-gas containers must be used on an industrial truck for motor fuel purposes.

(3) LP-gas-fueled industrial trucks may be used in buildings frequented by the public, when occupied by the public. The total water capacity of containers on each industrial truck must be a maximum of 105 pounds (nominal 45 pounds LP-gas).

(4) Trucks must be attended at all times in areas occupied by the public.

(5) Industrial trucks must not be parked and left unattended in areas of possible excessive heat or sources of ignition.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-42527 (~~How must~~) LP-gas-fueled vehicles to be garaged((?)).** (1) LP-gas-fueled vehicles may be stored or serviced inside garages if there are no leaks in the fuel system and the fuel tanks are not filled beyond the maximum filling capacity allowed.

(2) LP-gas-fueled vehicles being repaired in garages must have the container shut-off valve closed except when fuel is required for engine operation.

(3) Such vehicles must not be parked near sources of heat, open flames, or similar sources of ignition or near open pits unless such pits are adequately ventilated.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43001 (~~What does this section cover?~~) Scope.** WAC 296-307-430 applies to the storage of portable containers a maximum of 1,000 pounds water capacity, filled or partially filled, at user location but not connected for use, or in storage for resale by dealers or resellers. This section does not apply to containers stored at charging plants or at plants devoted primarily to the storage and distribution of LP-gas or other petroleum products.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43003 (~~What general requirements apply to~~) Storage of containers((?)).** (1) Containers in storage must be located to minimize exposure to excessive temperature rise, physical damage, or tampering.

(2) Containers stored inside must be located away from exits, stairways, or in areas normally used or intended for the safe exit of people.

(3) Container valves must be protected while in storage as follows:

(a) By setting into recess of container to prevent the possibility of their being struck if the container is dropped upon a flat surface; or

(b) By ventilated cap or collar, fastened to container capable of withstanding blow from any direction equivalent to that of a thirty-pound weight dropped four feet. Construction must be such that a blow will not be transmitted to a valve or other connection.

(4) The outlet valves of containers in storage must be closed.

(5) Empty containers that have been in LP-gas service should preferably be stored in the open. When stored inside, they must be considered full containers for the purpose of determining the maximum quantity of LP-gas permitted by this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43005 (~~How must~~) Containers ((be)) stored within buildings frequented by the public((?)).** DOT containers with a maximum individual water capacity of 2-1/2 pounds, used with completely self-contained hand torches and similar applications, may be stored or displayed in a building frequented by the public. The display of such containers must be limited to a total of 24 units of each brand and size. The total quantity on display and in storage must not exceed 200 pounds LP-gas.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43007 (~~How must~~) Containers ((be)) stored in buildings not frequented by the public((?)).** (1) The quantity of LP-gas stored must be a maximum of 300 pounds (approximately 2,550 cubic feet in vapor form), except when stored within special buildings or rooms.

(2) Containers carried as a part of service equipment on highway mobile vehicles are not considered in the total storage capacity if the vehicles are stored in private garages, and are limited to one container per vehicle with a maximum LP-gas capacity of 100 pounds. All container valves must be closed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43009 (~~How must~~) Containers ((be)) stored within special buildings or rooms((?)).** (1) The quantity of LP-gas stored in special buildings or rooms must be a maximum of 10,000 pounds.

(2) The walls, floors, and ceilings of container storage rooms that are within or adjacent to other parts of the building must be constructed of material having at least a two-hour fire resistance rating.

(3) At least 10% of the exterior walls or roof must be of explosion relieving construction.

(4) Each opening from storage rooms to other parts of the building must be protected by a listed one and one-half hour "(B)" fire door.

(5) Such rooms must have no open flames for heating or lighting.

(6) Such rooms must be adequately ventilated both top and bottom to the outside only. The openings from such vents must be at least five feet away from any other opening into any building.

(7) The floors of such rooms must not be below ground level. Any space below the floor must be of solid fill or properly ventilated to the open air.

(8) Such storage rooms must not be located adjoining the line of property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43011 ((How must) Containers ((be) stored outdoors((?)).** (1) Storage outside of buildings, for containers awaiting use or resale, must be located according to the table below with respect to:

- (a) The nearest important building or group of buildings;
- (b) The line of adjoining property that may be built on;
- (c) Busy thoroughfares;
- (d) The line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.

Quantity of LP-Gas Stored	Distance
500 pounds or less	0
501 to 2,500 pounds	0*
2,501 to 6,000 pounds	10 feet
6,001 to 10,000 pounds	20 feet
Over 10,000 pounds	25 feet

\* Containers must be at least ten feet from any building on adjoining property, any sidewalk, or any of the exposures described in (c) or (d) of this subsection.

(2) Containers must be in a suitable enclosure or otherwise protected against tampering.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43013 ((What) Fire protection ((must be) provided for stored containers((?)).** Storage locations other than supply depots separated and located apart from dealer, reseller, or user establishments must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43501 ((What does this section cover?)) Scope.** (1) WAC 296-307-435 applies to:

- (a) LP-gas system installations on vehicles (self-propelled, trailers, or semitrailers) used for commercial or construction purposes;

(b) All exchangeable container systems with container capacities greater than 105 pounds water capacity (approximately 45 pounds LP-gas capacity); and

(c) Systems using containers permanently mounted on vehicles.

(2) All LP-gas installations on commercial vehicles must meet all requirements of WAC 296-307-410 (unless otherwise indicated) and the additional requirements of this section. When such a vehicle is permanently parked, and LP-gas is supplied from a system not mounted on and secured to the unit, WAC 296-307-415 and 296-307-420 also apply.

(3) This section does not apply to LP-gas motor fuel systems covered by WAC 296-307-425.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43503 ((How must containers be constructed?)) Container construction.** Containers must be constructed according to WAC 296-307-41011, and marked according to the applicable requirements of WAC 296-307-41015, and must also meet the following:

(1) Containers designed for use as portable cylinders must be constructed according to DOT specifications.

(2) All other containers whether designed for permanent mounting, or for portable or semiportable use (such as skid tanks), must be constructed as provided for by WAC 296-307-41009(4) and 296-307-41011(1).

(3) Nonrecessed container fittings and accessories must be protected against damage by either:

- (a) Their location;
- (b) The vehicle frame or bumper; or
- (c) Protective housing. The housing must meet the requirements under which the tanks are fabricated with respect to design and construction and must be designed to withstand static loading in any direction equal to twice the weight of the tank and attachments when filled with the loading at a safety factor of at least four, based on the ultimate strength of the material used. The housing must have a weather cover if necessary to ensure proper operation of valves and safety devices.

(4) Manually operated shut-off valves or self-closing internal valves must be closed except during transfer operations.

(5) Permanently installed containers must meet the following requirements:

(a) Tank motor vehicles with frames not made integral with the tank, as by welding, must have turnbuckles or similar positive devices for drawing the tank down tight on the frame. In addition, suitable stops or anchors must be attached to the frame and/or the tank to prevent relative motion between them from starting, stopping, and turning. The stops and anchors must be installed to be accessible for inspection and maintenance.

(b) Any tank motor vehicle designed and constructed so that the cargo tank constitutes the stress member used instead of a frame must be supported by external cradles enclosing at least 120 degrees of the shell circumference. The design calculations must include beam stress, shear stress, torsion stress, bending moment, and acceleration stress for the cargo

tank as a whole using a factor of safety of four, based on the ultimate tensile strength of the material. Maximum concentrated stresses that might be created at pads and cradles due to shear, bending, and torsion (~~(shell)~~) must also be calculated according to Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded vehicles must be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue (~~(shell)~~) must be taken into consideration. Cargo tanks mounted on frames may be supported by upright supports attached to pads if these factors are taken into account.

(c) Where any tank support is attached to any part of a tank head, the stresses imposed upon the head must be provided for as required above.

(d) Tank supports, stops, anchors, and bumpers must not be welded directly to the tank but must be attached by means of pads of the same material as the tank. The pad thickness must be at least 1/4 inch, or the thickness of the shell material if less, and no greater than the shell material. Each pad must extend at least four times its thickness, in each direction, beyond the weld attaching the support, bumper, stop, or anchor. Each pad must be preformed to an inside radius no greater than the outside radius of the tank at the place of attachment. Each pad corner must be rounded to a radius at least one-fourth the width of the pad, and no greater than one-half the width of the pad. Weepholes and tell-tale holes, if used, must be drilled or punched before the pads are attached to the tank. Each pad must be attached to the tank by continuous fillet welding using filler material having properties that meet the recommendations of the maker of the shell and head material.

(6) Portable or semiportable containers must meet the applicable requirements of WAC 296-307-42507(3). Containers designed for permanent installation as part of systems under WAC 296-307-420 are prohibited.

(a) Filling connections must have an approved automatic back pressure check valve, excess flow check valve, or quick closing internal valve to prevent excessive escape of gas in case the filling connection is broken.

**Exception:** Where the filling and discharge connect on a common opening in the container shell, and the opening is fitted with a quick-closing internal valve, the automatic valve is not required.

Every inlet and outlet connection must have a manually or automatically operated shut-off valve. Liquid discharge openings, except those for engine fuel lines, on tanks built after September 1, 1965, must be fitted with a remotely controlled internal shut-off valve. Valves must meet the following requirements:

(i) The seat of the valve must be inside the tank, or in the opening nozzle or flange, or in a companion flange bolted to the nozzle or flange.

(ii) All parts of the valve inside the tank, nozzle, or companion flange must be made of material that protects against corrosion or other deterioration in the presence of the lading.

(iii) The parts must be arranged so that damage to parts exterior to the tank will not prevent effective seating of the valve.

(iv) The valve may be operated mechanically, by hydraulically, or by air, or gas pressure.

(v) The valve must have remote means of automatic closure, both mechanical and thermal, in at least two places for tanks over 3,500 gallons water capacity. These remote control stations must be located at each end of the tank and diagonally opposite. The thermal control mechanism must have a fusible element with a melting point between 220°F and 208°F. At least one remote control station must be provided for tanks of 3,500 gallons water capacity or less, and such actuating means may be mechanical.

(b) All other connections to containers, except those used for gauging devices, thermometer wells, safety-relief devices, and plugged openings, must have suitable automatic excess flow valves, or may instead be fitted with quick-closing internal valves.

The control mechanism for the internal valve must have a secondary control, remote from the fill or discharge connections (for use in the event of accidents or fire during delivery operations), and such control mechanism must have a fusible element with a melting point not over 220°F or less than 208°F.

(c) Excess flow valves must close automatically at the rated flow of vapor or liquid as specified by the valve manufacturers. The flow rating of the piping beyond the excess flow valve must be greater than that of the excess flow valve and such rating must include valves, fittings, and hose.

**Exception:** When branching or necessary restrictions are incorporated in a piping system so that flow ratings are less than that of the excess flow valve and the tank, then additional excess flow valves must be installed in the piping where such flow rate is reduced.

(d) Container inlets and outlets, except those used for safety-relief valves, liquid-level gauging devices, and pressure gauges, must be labeled to designate whether they communicate with vapor or liquid space when the container is filled to maximum permitted filling density. Labels may be on the valves.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43505 (~~(What is the)~~) Maximum capacity allowed for LP-gas installations on commercial vehicles(?).** A single fuel container used on passenger carrying vehicles must not exceed 200 gallons water capacity.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43507 (~~(Where must systems be located?)~~) Location of systems.** (1) Containers must not be installed, transported, or stored (even temporarily) inside any vehicle covered by these standards except as provided by the DOT regulations.

(2) Containers, control valves, and regulating equipment comprising a complete system must be suitably protected against damage and weather. Systems may be installed in a recess vaportight to the inside of the vehicle and accessible from and vented to the outside.

(3) Systems installed outside of mobile units must be located so that discharge from safety-relief devices must be at

least 3 feet horizontally away from any opening into the unit below the level of such discharge. When the system is located in a recess vaportight to the inside, vent openings in the recess must be at least 3 feet horizontally away from any opening into the mobile unit below the level of these vents.

(4) There must be no fuel connection between tractor and trailer or other vehicle units.

(5) The container or container carrier must be secured in place by fastenings designed and constructed with a minimum safety factor of four to withstand loading in any direction equal to twice the weight of the container when filled to normal capacity with LP-gas.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43509** (~~What requirements apply to~~) **Valves and accessories**(~~?~~). Container valves and accessories must be provided, protected and mounted as follows:

(1) Systems using DOT cylinders according to WAC 296-307-41511.

(2) All other systems according to WAC 296-307-42005 (2) through (8).

(3) Portable, semiportable and permanently mounted containers (~~shall~~) **must** be mounted and protected as provided under WAC 296-307-43503 (2), (5), and (6).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43511** (~~What requirements apply to~~) **Safety devices**(~~?~~). (1) DOT containers must have safety-relief devices as required by DOT regulations.

(2) A final stage regulator of an LP-gas system (excluding any appliance regulator) must have, on the low-pressure side, a relief valve that is set to start to discharge within the limits specified in Table U-7.

(3) The relief valve and space above the regulator and relief valve diaphragms must be vented to the outside air and terminate at a position to minimize the possibility of vapors accumulating at sources of ignition.

(4) Whenever equipment such as a cargo heater or cooler on commercial vehicles is designed to be in operation while in transit, suitable means to stop the flow such as an excess flow valve or other device, must be installed. This device will be actuated to stop the flow in the event of the break in the fuel supply line. All excess flow valves must comply with WAC 296-307-41019(3).

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43513** (~~What types of~~) **Systems** (~~may be~~) **used on commercial vehicles**(~~?~~). Commercial vehicles must use either vapor withdrawal or liquid withdrawal systems.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-43515** (~~What requirements apply to~~) **Enclosures and mounting**(~~?~~). (1) Housing or enclosures must be designed to provide proper ventilation.

(2) Hoods, domes, or removable portions of cabinets must have means to keep them firmly in place during transit.

(3) The assembly must hold the containers firmly in position and prevent their movement during transit according to WAC 296-307-42507(3).

(4) Containers must be mounted on a substantial support or base secured firmly to the vehicle chassis. Neither the container nor its support must extend below the frame.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43517** (~~What requirements apply to~~) **Piping, tubing, and fittings**(~~?~~). (1) Regulators must be connected directly to the container valve outlet or mounted securely by means of support bracket and connected to the container valve or valves with a listed high pressure flexible connector.

(2) Provision must be made between the regulator outlet and the gas service lines by either a flexible connector or a tubing loop to provide for expansion, contraction, jarring, and vibration.

(3) Aluminum alloy piping is prohibited. Steel tubing must have a minimum wall thickness of 0.049 inch. Steel piping or tubing must be adequately protected against exterior corrosion.

(4) Approved gas tubing fittings must be used for tubing connections.

(5) The fuel line must be firmly fastened in a protected location and where under the vehicle and outside and below any insulation or false bottom, fastenings must prevent abrasion or damage to the gas line due to vibration. Where the fuel line passes through structural members or floors, a rubber grommet or equivalent must be installed to prevent chafing.

(6) The fuel line must be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance that it serves. When a branch line is required, the tee connection must be in the main fuel line and located under the floor and outside the vehicle.

(7) All parts of the system assembly must be designed and secured to preclude such parts working loose during transit.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43519** (~~What requirements apply to~~) **Appliances**(~~?~~). (1) LP-gas appliances must be approved for use on commercial vehicles.

(2) In vehicles not intended for human occupancy, where the gas-fired heating appliance is used to protect the cargo, such heater may be unvented, but provision must be made to dispose of the products of combustion to the outside.

(3) In vehicles intended for human occupancy, all gas-fired heating appliances, including water heaters, must be designed or installed to provide for complete separation of the combustion system from the atmosphere of the living space. Such appliances must be installed with the combustion air inlet assembly furnished as a component of the appliance, and with either:

- (a) The flue gas outlet assembly furnished as a component of the appliance; or
- (b) A listed roof jack if the appliance is listed for such use.

The combustion air inlet assembly, flue gas outlet assembly, and roof jack must extend to the outside atmosphere.

(4) Provision must be made to ensure an adequate supply of outside air for combustion.

(5) All gas-fired heating appliances and water heaters must have an approved automatic device designed to shut off the flow of gas to the main burner and to the pilot in the event the pilot flame is extinguished.

(6) Gas-fired appliances installed in the cargo space must be readily accessible.

(7) Appliances must be constructed or protected to minimize the possible damage or impaired operation resulting from cargo shifting or handling.

(8) Appliances inside the vehicle must be located so that a fire at an appliance will not block the exit route.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43521 ((What)) General precautions the employer must ((be followed)) follow for LP-gas system installations on commercial vehicles((?)).** (1) DOT containers must be marked, maintained, and requalified for use according to DOT regulations.

(2) Containers that have not been requalified according to DOT regulations must be removed from service. Requalified containers must be stamped with the date of requalification. When DOT cylinders are requalified by retesting, the retest must be made according to DOT regulations.

(3) Containers must not be charged with fuel unless they bear the proper markings of the code under which they were constructed, and with their water capacity. In the case of cylinders or portable containers filled by weight, the container must be marked with its tareweight.

(4) DOT containers that have been involved in a fire must not be recharged until they have been requalified for service according to DOT regulations.

(5) API-ASME containers or ASME containers that have been involved in a fire must not be recharged until they have been retested according to the requirements for their original hydrostatic test and found to be suitable for continued service.

**((<sup>2</sup>))API-ASME (ASME) container((<sup>1</sup> means))**, A container constructed according to the Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1968 edition.

(6) Containers must not be charged without the consent of the owner.

(7) A permanent caution plate must be provided on the appliance or adjacent to the container outside of any enclosure. It must include the word "caution" and the following or similar instructions.

(a) Be sure all appliance valves are closed before opening container valve.

(b) Connections at appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(c) A match or flame must not be used to check for leaks.

(d) Container valves must be closed except when the equipment is in use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43523 ((How must)) Containers to be charged((?)).** Containers must be charged according to DOT specifications.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-43525 ((What)) Fire protection ((must be provided)) for mobile cook units((?)).** Mobile cook units must have at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-44001 ((What does this section cover?)) Scope.** WAC 296-307-440 applies to storage containers, dispensing devices, and pertinent equipment in service stations where LP-gas is stored and dispensed into fuel tanks of motor vehicles. LP-gas service stations must meet all requirements of WAC 296-307-410 and the requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44003 ((How must)) Design and classification of storage containers ((be designed and classified?)).** Storage containers must be designed and classified according to the following table:

Container type	For gases with vapor press. Not to exceed lb. per sp. in. gauge 100°F (37.8°C.)	Minimum design pressure of container lb. per sp. in. gauge	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par.U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code <sup>2</sup>
200 <sup>1</sup>	215	200	250

- 1 Container type may be increased by increments of 25. The minimum design pressure of containers ~~((shall))~~ must be 100% of the container type designation when constructed under 1949 or earlier editions of ASME Code (Par. U-68 and U-69). The minimum design pressure of containers ~~((shall))~~ must be 125% of the container type designation when constructed under: 1. The 1949 ASME Code (Par. U-200 and U-201), 2. 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and 3. All editions of the API-ASME Code.
- 2 Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44005 ~~((What requirements apply to))~~ Valves and accessories(?)** (1) A filling connection on the container must be fitted with one of the following:

- (a) A combination back-pressure check and excess flow valve.
- (b) One double or two single back-pressure valves.
- (c) A positive shut-off valve, in conjunction with either:
- (i) An internal back-pressure valve; or
- (ii) An internal excess flow valve.

Instead of an excess flow valve, filling connections may be fitted with a quick-closing internal valve that only opens during operating periods. The mechanism for such valves may have a secondary control that will close automatically in case of fire. The melting point for a fusible plug must be a maximum of 220°F.

- (2) A filling pipe inlet terminal off the container must have a positive shut-off valve and either:
- (a) A back pressure check valve; or
- (b) An excess flow check valve.
- (3) All openings in the container must have approved excess flow check valves.

**Exceptions:**

(a) Filling connections;

(b) Safety-relief connections;

(c) Liquid-level gauging devices; and

(d) Pressure gauge connections.

(4) All container inlets and outlets must be labeled to designate whether they connect with vapor or liquid (labels may be on valves).

**Exceptions:**

(a) Safety-relief valves;

(b) Liquid-level gauging devices; and

(c) Pressure gauges.

(5) Each storage container must have a suitable pressure gauge.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-44007 ~~((What requirements apply to))~~ Safety devices(?)** (1) All safety-relief devices must be installed as follows:

- (a) On the container and directly connected with the vapor space.
- (b) Safety-relief valves and discharge piping ~~((shall))~~ must be protected against physical damage. The outlet must

have loose-fitting rain caps. There ~~((shall))~~ must be no return bends or restrictions in the discharge piping.

(c) The discharge from two or more safety-relief valves with the same pressure settings may be run into a common discharge header. The cross-sectional area of such header must be at least equal to the sum of the individual discharges.

(d) Discharge from a safety-relief device that terminates in or beneath any building is prohibited.

(2) Aboveground containers must have safety-relief valves as follows:

(a) The rate of discharge, which may be provided by one or more valves, must be at least that specified in WAC 296-307-41025(2).

(b) The discharge from safety-relief valves must be vented upward to the open air to prevent impingement of escaping gas upon the container. ~~((You))~~ The employer must use loose-fitting rain caps. On a container having a water capacity greater than 2,000 gallons, the discharge from the safety-relief valves must be vented upward away from the container to a point at least seven feet above the container. Provisions must be made so that any liquid or condensate accumulation inside the relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, ~~((you))~~ the employer must protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of the product escaping from the drain.

(3) Underground containers must have safety-relief valves as follows:

(a) The discharge from safety-relief valves must be piped upward to a point at least ten feet above the ground. The discharge lines or pipes must be adequately supported and protected against physical damage.

(b) In areas where the manhole or housing may flood, the discharge from regulator vent lines should be above the highest probable water level.

(c) If no liquid is put into a container until after it is buried and covered, the rate of discharge of the relief valves may be reduced to at least thirty percent of the rate shown in WAC 296-307-41025(2). If liquid fuel is present during installation of containers, the rate of discharge must be the same as for aboveground containers. Only empty containers may be uncovered.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44009 ~~((What is the))~~ Maximum capacity allowed for containers(?)** Individual storage containers must be a maximum of 30,000 gallons water capacity.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44011 ~~((How must))~~ Installation of storage containers ~~((be installed?))~~** (1) Each storage container used exclusively in service station operation must comply with the following table. This table outlines the minimum distances from a container to a building, group of buildings, or adjoining property lines that may be built on.

**Minimum distances**

<b>Water capacity per container (gallons)</b>	<b>Aboveground and underground (feet)</b>	<b>Between aboveground containers (feet)</b>
Up to 2,000	25	3
Over 2,000	50	5

*Note:* The above distances may be reduced to at least 10 feet for service station buildings of other than wood frame construction.

(a) Readily ignitable material including weeds and long dry grass, must be removed within 10 feet of containers.

(b) The minimum separation between LP-gas containers and flammable liquid tanks must be 20 feet and the minimum separation between a container and the centerline of the dike must be 10 feet.

(c) LP-gas containers located near flammable liquid containers must be protected against the flow or accumulation of flammable liquids by diking, diversion curbs, or grading.

(d) LP-gas containers located within diked areas for flammable liquid containers are prohibited.

(e) Field welding is permitted only on saddle plates or brackets that were applied by the container manufacturer.

(f) When permanently installed containers are interconnected, ~~((you))~~ the employer must allow for expansion, contraction, vibration, and settling of containers and interconnecting piping. Where flexible connections are used, they must be approved and designed for a bursting pressure of at least five times the vapor pressure of the product at 100°F. Using nonmetallic hose is prohibited for interconnecting containers.

(g) Where high water table or flood conditions may be encountered, ~~((you))~~ the employer must protect against container flotation.

(2) Aboveground containers must be installed according to this section.

(a) Containers may be installed horizontally or vertically.

(b) Containers must be protected by crash rails or guards to prevent physical damage unless they are protected by location. Servicing vehicles within 10 feet of containers is prohibited.

(c) Container foundations must be of substantial masonry or other noncombustible material. Containers must be mounted on saddles that permit expansion and contraction, and must provide against excess stresses. Corrosion protection must be provided for tank-mounting areas. Structural metal container supports must be protected against fire.

**Exception:** This protection is not required on prefabricated storage and pump assemblies, mounted on a common base, with container bottom a maximum of 24 inches above ground with water capacity of 2,000 gallons or less, if the piping connected to the storage and pump assembly is flexible enough to minimize breakage or leakage in case container supports fail.

(3) Underground containers must be installed according to this section.

(a) Containers must be given a protective coating before being placed underground. This coating must be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. During installation, take care to minimize abrasion or other damage to the coating. Repair coating damage before back-filling.

(b) Containers must be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(c) A minimum of 2 feet of earth cover must be provided. Where ground conditions make impractical, equivalent protection against physical damage must be provided. The portion of the container to which manhole and other connections are attached may be left uncovered. If there is vehicle traffic at the site, containers must be protected by a concrete slab or other cover to prevent the weight of a loaded vehicle imposing a load on the container shell.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44013 (~~What~~) Protecting equipment (must be protected) against tampering(?)**. Valves, regulators, gauges, and other container fittings must be protected against tampering and physical damage.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44015 (~~What requirements apply to the~~) Transport truck unloading point(?)**. (1) During unloading, the transport truck must not be parked on public thoroughfares and must be at least 5 feet from storage containers. The truck must be positioned so that shut-off valves are accessible.

(2) The filling pipe inlet terminal must not be located within a building nor within 10 feet of any building or driveway. It must be protected against physical damage.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44017 (~~What requirements apply to~~) Piping, valves, and fittings(?)**. (1) Piping may be underground, aboveground, or a combination of both. It must be well supported and protected against physical damage and corrosion.

(2) Piping laid beneath driveways must be installed to prevent physical damage by vehicles.

(3) Piping must be wrought iron or steel (black or galvanized), brass or copper pipe; or seamless copper, brass, or steel tubing and must be suitable for a minimum pressure of 250 psig. Pipe joints may be screwed, flanged, brazed, or welded. The use of aluminum alloy piping or tubing is prohibited.

(4) All shut-off valves (liquid or gas) must be suitable for LP-gas service and designed for at least the maximum pressure to which they may be subjected. Valves that may be subjected to container pressure must have a rated working pressure of at least 250 psig.

(5) All materials used for valve seats, packing, gaskets, diaphragms, etc., must be resistant to the action of LP-gas.

(6) Fittings must be steel, malleable iron, or brass having a minimum working pressure of 250 psig. Cast iron pipe fittings, such as ells, tees and unions must not be used.

(7) All piping must be tested after assembly and proved free from leaks at least at the normal operating pressures.

(8) ~~((You))~~ The employer must allow for expansion, contraction, jarring, and vibration, and for settling. ~~((You))~~ The employer may use flexible connections.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44019 ~~((What requirements apply to))~~ Pumps and accessory equipment ~~((?))~~.** All pumps and accessory equipment must be suitable for LP-gas service, and designed for at least the maximum pressure to which they may be subjected. Accessories must have a minimum rated working pressure of 250 psig. Positive displacement pumps must have suitable pressure actuated bypass valves permitting flow from pump discharge to storage container or pump suction.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44021 ~~((What requirements apply to))~~ LP-gas dispensing devices ~~((?))~~.** (1) Meters, vapor separators, valves, and fittings in the dispenser must be suitable for LP-gas service and must be designed for a minimum working pressure of 250 psig.

(2) Provisions must be made for venting LP-gas from a dispensing device to a safe location.

(3) Pumps used to transfer LP-gas must allow control of the flow and to prevent leakage or accidental discharge. Means must be provided outside the dispensing device to readily shut off the power in the event of fire or accident.

(4) A manual shut-off valve and an excess flow check valve must be installed downstream of the pump and ahead of the dispenser inlet.

(a) Dispensing hose must be resistant to the action of LP-gas in the liquid phase and designed for a minimum bursting pressure of 1,250 psig.

(b) An excess flow check valve or automatic shut-off valve must be installed at the terminus of the liquid line at the point of attachment of the dispensing hose.

(5) LP-gas dispensing devices must be located at least 10 feet from aboveground storage containers greater than 2,000 gallons water capacity. The dispensing devices must be at least 20 feet from any building (not including canopies), basement, cellar, pit, or line of adjoining property that may be built on and at least 10 feet from sidewalks, streets, or thoroughfares. No drains or blowoff lines must be directed into or in proximity to the sewer systems used for other purposes.

(a) LP-gas dispensing devices must be installed on a concrete foundation or as part of a complete storage and dispensing assembly mounted on a common base, and must be adequately protected from physical damage.

(b) LP-gas dispensing devices must not be installed within a building.

**Exception:** Dispensing devices may be located under a weather shelter or canopy if the area is not enclosed on more than two sides. If the enclosing sides are adjacent, the area ~~((shall))~~ must be properly ventilated.

(6) Dispensing LP-gas into the fuel container of a vehicle ~~((shall))~~ must be performed by a competent attendant who ~~((shall))~~ must remain at the LP-gas dispenser during the entire transfer operation.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44023 ~~((Is smoking allowed))~~ Smoking is prohibited at LP-gas service stations ~~((?))~~.** Smoking is prohibited on the driveway of service stations in the dispensing areas or transport truck unloading areas. Conspicuous signs prohibiting smoking must be posted within sight of the customer being served. Letters on such signs must be at least 4 inches high. The motors of all vehicles being fueled must be shut off during the fueling operations.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-44025 ~~((What))~~ Fire protection ~~((must be provided))~~ at LP-gas service stations ~~((?))~~.** Each service station must have at least one approved portable fire extinguisher with at least an 8-B, C, rating.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-445 Scope.**

**IMPORTANT:**

~~((A))~~ Dip tank ~~((is))~~, A container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

**Exemption:** Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

~~((\*)~~ (1) A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:

~~((-))~~ (a) Clean an object;

~~((-))~~ (b) Coat an object;

~~((-))~~ (c) Alter the surface of an object;

**OR**

~~((-))~~ (d) Change the character of an object.

~~((\*)~~ (2) Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

~~((-))~~ (a) Paint dipping;

~~((-))~~ (b) Anodizing;

~~((-))~~ (c) Pickling;

~~((-))~~ (d) Quenching;

~~((-))~~ (e) Tanning;

~~((-))~~ (f) Degreasing;

~~((-))~~ (g) Stripping;

~~((-))~~ (h) Cleaning;



((-)) (i) Dyeing.

**Reference:** ((You have)) The employer has to do a hazard assessment to identify hazards or potential hazards in ((you#)) the workplace and determine if PPE is necessary to protect ((you#)) employees. See personal protective equipment (PPE), WAC 296-307-100 through 296-307-10025.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-450 General requirements.**

**Summary.**

~~((You#))~~ **Employer responsibility:**

Safeguard employees working with dip tanks.

~~((You must:~~

~~**CONSTRUCTION**~~

~~Construct safe dip tanks~~

~~WAC 296-307-45005~~

~~**VENTILATION**~~

~~Provide proper ventilation for the vapor area~~

~~WAC 296-307-45010~~

~~Take additional precautions if you recirculate ventilation system exhaust air into the workplace~~

~~WAC 296-307-45015~~

~~Take additional precautions when using an exhaust hood~~

~~WAC 296-307-45020~~

~~**INSPECTION**~~

~~Periodically inspect your dip tanks and associated equipment and correct any deficiencies~~

~~WAC 296-307-45025~~

~~**FIRST AID**~~

~~Make sure employees working near dip tanks know appropriate first-aid procedures~~

~~WAC 296-307-45030~~

~~**CLEANING**~~

~~Prepare dip tanks before cleaning~~

~~WAC 296-307-45035~~

~~**WELDING**~~

~~Protect employees during welding, burning or other work using open flames~~

~~WAC 296-307-45045~~

~~**LIQUIDS HARMFUL TO SKIN**~~

~~Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin~~

~~WAC 296-307-45050.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<b>CONSTRUCTION</b>	
Construct safe dip tanks.	<u>WAC 296-307-45005</u>
<b>VENTILATION</b>	
Provide proper ventilation for the vapor area.	<u>WAC 296-307-45010</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
The employer must take additional precautions if the ventilation system recirculates exhaust air into the workplace.	<u>WAC 296-307-45015</u>
The employer must take additional precautions when using an exhaust hood.	<u>WAC 296-307-45020</u>
<b>INSPECTION</b>	
Periodically inspect dip tanks and associated equipment and correct any deficiencies.	<u>WAC 296-307-45025</u>
<b>FIRST AID</b>	
Make sure employees working near dip tanks know appropriate first-aid procedures.	<u>WAC 296-307-45030</u>
<b>CLEANING</b>	
Prepare dip tanks before cleaning.	<u>WAC 296-307-45035</u>
<b>WELDING</b>	
Protect employees during welding, burning or other work using open flames.	<u>WAC 296-307-45045</u>
<b>LIQUIDS HARMFUL TO SKIN</b>	
Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin.	<u>WAC 296-307-45050</u>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45005 Construct safe dip tanks.**

~~((You must:~~

~~•)) The employer must make sure dip tanks, including any drain boards, are strong enough to support the expected load.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-45010 Provide proper ventilation for the vapor area.**

~~((You must:~~

~~•)) (1) The employer must make sure mechanical ventilation meets the requirements of one or more of the following standards:~~

~~((-)) (a) NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids;~~

((-)) (b) ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995);

((-)) (c) ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If ~~((you empty))~~ the employer complies with a later version of a consensus standard, ~~((you))~~ the employer will be considered to have complied with any previous version of the same consensus standard.

~~((You must:~~

~~\*)~~ (2) The employer must limit the vapor area to the smallest practical space by using mechanical ventilation;

~~((\*)~~ (3) The employer must keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL);

~~((\*)~~ (4) The employer must make sure mechanical ventilation draws the flow of air into a hood or exhaust duct;

~~((\*)~~ (5) The employer must have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:

((-) (a) Fire;

((-) (b) Explosion;

**OR**

((-) (c) Potentially hazardous chemical reaction.

**Reference:** ~~((You))~~ The employer needs to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Respiratory hazards, chapter 296-307 WAC, Part Y-6.

**Note:** ~~((You))~~ The employer may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods ~~((you choose))~~ selected by the employer has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45015 (~~(Fake)~~) Additional precautions if ~~((you recirculate))~~ recirculating ventilation system exhaust air into the workplace.**

~~((You must:~~

~~\*)~~ (1) The employer must only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees;

~~((\*)~~ (2) The employer must make sure any exhaust system that recirculates air into the workplace:

((-) (a) Passes the air through a device that removes contaminants;

((-) (b) Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL;

((-) (c) Monitors the concentration of vapor from flammable or combustible liquids with approved equipment.

**Notes:** ~~((\*)~~ 1 The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workplace.

~~((\*)~~ 2. Most substances will pose a health hazard at a concentration far below twenty-five percent of its LFL.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45020 Take additional precautions when using an exhaust hood.**

~~((You must:~~

~~\*)~~ The employer must make sure each room with an exhaust hood has a source of outside air that:

((-) (1) Enters the room in a way that will not interfere with the function of the hood;

((-) (2) Replaces at least ninety percent of the air taken in through the hood.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45025 Periodically inspect ~~((your))~~ dip tanks and associated equipment and correct any deficiencies.**

~~((You must:~~

~~\*)~~ (1) The employer must inspect or test ~~((your))~~ the dip tanks and associated equipment periodically, including:

((-) (a) Covers;

((-) (b) Overflow pipes;

((-) (c) Bottom drains and valves;

((-) (d) Electrical wiring, equipment, and grounding connections;

((-) (e) Ventilating systems;

((-) (f) Fire extinguishing equipment.

~~((\*)~~ (2) The employer must inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:

((-) (a) At least quarterly during operation;

((-) (b) Prior to operation after a prolonged shutdown.

~~((\*)~~ (3) The employer must promptly fix any deficiencies found.

**Notes:** ~~((\*)~~ 1. To assist ~~((you))~~ the employer in tracking ~~((your))~~ inspections and actions taken from those inspections, ~~((you))~~ the employer may want to keep a written record.

~~((\*)~~ 2. It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45030 Make sure employees working near dip tanks know appropriate first-aid procedures.**

~~((You must:~~

~~\*)~~ The employer must make sure ~~((your))~~ employees know the appropriate first-aid procedures for the hazards of ~~((your))~~ dipping and coating operations.

**Notes:** ~~((\*)~~ 1. First-aid procedures are contained in the material safety data sheet (MSDS) for the chemicals used in the dip tank.

~~((\*)~~ 2. First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered "readily available" as required by WAC 296-307-03920.

**Reference:** There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC 296-307-039, and employer chemical hazard communication, WAC 296-307-550.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-45035 Prepare dip tanks before cleaning.**

~~((You must:))~~

(1) The employer must drain the contents of the tank and open any cleanout doors.

(2) The employer must ventilate the tank to clear any accumulated hazardous vapors.

**Reference:** There may be requirements that apply before an employee enters a dip tank. See Confined spaces, WAC 296-307-642 and safety procedures, WAC 296-307-320.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-45045 Protect employees during welding, burning, or other work using open flames.**

~~((You must:))~~

~~(\*)~~ The employer must make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:

~~((-))~~ (1) Welding;

~~((-))~~ (2) Burning;

**OR**

~~((-))~~ (3) Open flames.

**Reference:** There are additional requirements for this type of work. See Welding, cutting and brazing, WAC 296-307-475, and Respirators, chapter 296-307 WAC, Part Y-5.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.**

~~((You must:))~~

(1) The employer must make sure washing facilities, including hot water, are available for every ten employees that work with dip tank liquids.

(2) The employer must satisfy medical requirements:

~~((\*))~~ (a) Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person;

~~((\*))~~ (b) Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work;

~~((\*))~~ (c) Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

**Notes:** ~~((\*))~~ 1. Periodic means on a yearly basis unless otherwise indicated.

~~((\*))~~ 2. Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.

~~((You must:))~~

(3) The employer must provide lockers or other storage space to prevent contamination of street clothes.

**Reference:** ~~((You have))~~ The employer has to do a hazard assessment to identify hazards or potential hazards in ~~((your))~~ the workplace and determine if PPE is necessary to protect ~~((your))~~ employees. See Personal protective equipment (PPE), WAC 296-307-100.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-455 Additional requirements for dip tanks using flammable or combustible liquids.**

**Summary.**

**IMPORTANT:**

This section applies to:

~~((\*))~~ 1. Flammable and combustible liquids (flashpoint below 200°F);

~~((\*))~~ 2. Liquids that have a flashpoint of 200°F (93.3°C) or higher if ~~((you))~~:

~~((-))~~ a. Heat the liquid;

~~((-))~~ b. Dip a heated object in the tank.

~~((Your))~~ **Employer responsibility:**

Safeguard employees working with dip tanks containing flammable or combustible liquids.

~~((You must:))~~

~~**CONSTRUCTION**~~

~~Include additional safeguards when constructing dip tanks~~

~~WAC 296-307-45505~~

~~Provide overflow pipes~~

~~WAC 296-307-45510~~

~~Provide bottom drains~~

~~WAC 296-307-45515~~

~~**FIRE PROTECTION**~~

~~Provide fire protection in the vapor area~~

~~WAC 296-307-45520~~

~~Provide additional fire protection for large dip tanks~~

~~WAC 296-307-45525~~

~~**ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION**~~

~~Prevent static electricity sparks or arcs when adding liquids to a dip tank~~

~~WAC 296-307-45535~~

~~Control ignition sources~~

~~WAC 296-307-45540~~

~~Provide safe wiring and electrical equipment where the liquid can drip or splash~~

~~WAC 296-307-45545~~

~~**HOUSEKEEPING**~~

~~Keep the area around dip tanks clear of combustible material and properly dispose of waste~~

~~WAC 296-307-45550~~

~~**HEATING LIQUID**~~

~~Make sure heating the liquid in your dip tanks does not cause a fire~~

~~WAC 296-307-45555~~

~~**HEAT DRYING**~~

~~Make sure a heating system used for drying objects does not cause a fire~~

~~WAC 296-307-45560~~

**CONVEYORS**

Make sure the conveyor system for dip tanks is safe

~~WAC 296-307-45565))~~

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<b><u>CONSTRUCTION</u></b>	
<u>Additional safeguards when constructing dip tanks.</u>	<u>WAC 296-307-45505</u>
<u>Provide overflow pipes.</u>	<u>WAC 296-307-45510</u>
<u>Provide bottom drains.</u>	<u>WAC 296-307-45515</u>
<b><u>FIRE PROTECTION</u></b>	
<u>Fire protection in the vapor area.</u>	<u>WAC 296-307-45520</u>
<u>Additional fire protection for large dip tanks.</u>	<u>WAC 296-307-45525</u>
<b><u>ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION</u></b>	
<u>Prevention of static electricity sparks or arcs when adding liquids to a dip tank.</u>	<u>WAC 296-307-45535</u>
<u>Control ignition sources.</u>	<u>WAC 296-307-45540</u>
<u>Provide safe wiring and electrical equipment where the liquid can drip or splash.</u>	<u>WAC 296-307-45545</u>
<b><u>HOUSEKEEPING</u></b>	
<u>Keep the area around dip tanks clear of combustible material and properly dispose of waste.</u>	<u>WAC 296-307-45550</u>
<b><u>HEATING LIQUID</u></b>	
<u>Make sure heating the liquid in dip tanks does not cause a fire.</u>	<u>WAC 296-307-45555</u>
<b><u>HEAT DRYING</u></b>	
<u>Make sure a heating system used for drying objects does not cause a fire.</u>	<u>WAC 296-307-45560</u>
<b><u>CONVEYORS</u></b>	
<u>Make sure the conveyor system for dip tanks is safe.</u>	<u>WAC 296-307-45565</u>

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45505 ((Include)) Additional safeguards when constructing dip tanks.**

~~((You must:))~~

(1) The employer must make sure the dip tank, drain boards (if provided), and supports are made of noncombustible material.

(2) The employer must make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45510 Provide overflow pipes.**

~~((You must:))~~

~~(\*)~~ (1) The employer must provide an overflow pipe on dip tanks that:

~~(-)~~ (a) Hold more than one hundred fifty gallons of liquid;

**OR**

~~(-)~~ (b) Have more than ten square feet of liquid surface area.

~~(\*)~~ (2) The employer must make sure the overflow pipe is:

~~(-)~~ (a) Properly trapped;

~~(-)~~ (b) Able to prevent the dip tank from overflowing;

~~(-)~~ (c) Three inches or more (7.6 cm) in diameter;

~~(-)~~ (d) Discharged to a safe location.

**Note:** Discharged to a safe location could be a:

~~(\*)~~ 1. Safe location outside the building;

**OR**

~~(\*)~~ 2. Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

~~((You must:))~~

~~(\*)~~ (3) The employer must make sure the bottom of the overflow pipe is at least six inches (15.2 cm) below the top of the tank.

**Note:** The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

**AMENDATORY SECTION** (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45515 Provide bottom drains.**

**Exemption:** A bottom drain is not required if:

~~(-)~~ 1. The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping;

**OR**

~~(-)~~ 2. The dip tank has an automatic closing cover that meets the requirements of WAC 296-307-45530.

~~((You must:))~~

~~(\*)~~ (1) The employer must provide a bottom drain on all dip tanks that hold more than five hundred gallons of liquid.

~~(\*)~~ (2) The employer must make sure the bottom drain:

~~(-)~~ (a) Is properly trapped;

~~(-)~~ (b) Will empty the dip tank during a fire;

~~(-)~~ (c) Has pipes large enough to empty the tank within five minutes;

~~(-)~~ (d) Uses automatic pumps if gravity draining is not practical;

((-) (e) Is capable of both manual and automatic operation;

((-) (f) Discharges to a safe location.

**Note:** Discharges to a safe location could be a:  
 ((\*) 1. Safe location outside the building;  
**OR**  
 ((\*) 2. Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

~~((You must:))~~  
 (\*) (3) The employer must make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45520 ((Provide)) Fire protection in the vapor area.**

~~((You must:))~~  
 \*) The employer must provide a manual fire extinguisher near the tank that is suitable for putting out flammable and combustible liquid fires.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45525 ((Provide)) Additional fire protection for large dip tanks.**

~~((You must:))~~  
 \*) (1) The employer must provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:

- ((-) (a) Holds one hundred fifty gallons or more of liquid;
- OR**
- ((-) (b) Has four square feet or more of liquid surface area.

((\*) (2) The employer must make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

**Exemption:** An automatic fire extinguishing system or an automatic dip tank cover is **not** required for a hardening or tempering tank that:  
 ((\*) 1. Holds less than five hundred gallons;  
**OR**  
 ((\*) 2. Has less than twenty-five square feet of liquid surface area.

**Table 1: Automatic Fire Protection System Requirements**

<b>If ((you)) the employer provides:</b>	<b>((Then-you)) The employer must:</b>
An automatic fire extinguishing system	<ul style="list-style-type: none"> <li>• Use extinguishing materials suitable for a fire fueled by the liquid in the tank</li> <li>• Make sure the system protects the:                             <ul style="list-style-type: none"> <li>- Tanks</li> <li>- Drain boards</li> </ul> </li> </ul>

<b>If ((you)) the employer provides:</b>	<b>((Then-you)) The employer must:</b>
	- Stock over drain boards.
A dip tank cover	<ul style="list-style-type: none"> <li>• Make sure the cover is:                             <ul style="list-style-type: none"> <li>- Closed by approved automatic devices in the event of fire</li> <li>- Able to be manually activated</li> <li>- Kept closed when the tank is not being used</li> <li>- Made of noncombustible material or metal-clad material with locked metal joints.</li> </ul> </li> </ul>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45535 ((Prevent)) Prevention of static electricity sparks or arcs when adding liquids to a dip tank.**

~~((You must:))~~  
 \*) The employer must make sure any portable container used to add liquid to the tank is:  
 ((-) (1) Electrically bonded to the dip tank;  
 ((-) (2) Positively grounded.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45540 Control ignition sources.**

~~((You must:))~~  
 (1) The employer must make sure the vapor areas and adjacent areas do not have any:  
 ((\*) (a) Open flames;  
 ((\*) (b) Spark producing devices;  
 ((\*) (c) Heated surfaces hot enough to ignite vapors.  
 (2) The employer must use explosion-proof wiring and equipment in the vapor area.

**Reference:** Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-307-37209.

~~((You must:))~~  
 (3) The employer must prohibit smoking in any vapor area: ((\*) Post an easily seen "NO SMOKING" sign near each dip tank.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45545 Provide safe electrical wiring and equipment where the liquid can drip or splash.**

~~((You must:))~~  
 \*) The employer must make sure all electrical wiring and equipment in the vapor area is approved for areas that have:  
 ((-) (1) Deposits of easily ignited residue;  
 ((-) (2) Explosive vapor.

**Exemption:** This does not apply to wiring that is:  
 ((-)) 1. In rigid conduit, threaded boxes or fittings;  
 ((-)) 2. Has no taps, splices, or terminal connections.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45550 Keep the area around dip tanks clear of combustible material and properly dispose of waste.**

~~((You must:))~~

(1) The employer must make sure the area surrounding dip tanks is:

- ((-)) (a) Completely free of combustible debris;
- ((-)) (b) As free of combustible stock as possible.

(2) The employer must provide approved metal waste cans that are:

- ((-)) (a) Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations;
- ((-)) (b) Emptied and the contents properly disposed of at the end of each shift.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45555 Make sure heating the liquid in ~~((your))~~ dip tanks does not cause a fire.**

~~((You must:))~~

•) The employer must keep the temperature of the liquid in the dip tank:

- ((-)) (1) Below the liquid's boiling point;
- ((-)) (2) At least 100°F below the liquid's autoignition temperature.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45560 Make sure a heating system used for drying objects does not cause a fire.**

~~((You must:))~~

•) The employer must make sure the heating system used in a drying operation that could cause ignition:

- ((-)) (1) Has adequate mechanical ventilation that operates before and during the drying operation;
- ((-)) (2) Shuts down automatically if a ventilating fan fails to maintain adequate ventilation;
- ((-)) (3) Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

**Note:** Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If ~~((you comply))~~ the employer complies with a later version of a consensus standard, ~~((you))~~ the employer will be considered to have complied with any previous version of the same consensus standard.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-45565 Make sure conveyor systems are safe.**

~~((You must:))~~

•) The employer must make sure the conveyor system shuts down automatically if:

- ((-)) (1) The ventilation system fails to maintain adequate ventilation;
- OR
- ((-)) (2) There is a fire.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-460 Additional requirements for dip tanks used for specific processes.**

~~((Summary:))~~

~~Your))~~ Employer responsibility:

Safeguard employees working with dip tanks used for specific processes.

~~((You must:))~~

~~HARDENING OR TEMPERING~~

~~Meet specific requirements if you use a hardening or tempering tank~~

~~WAC 296-307-46005~~

~~VAPOR DEGREASING~~

~~Provide additional safeguards for vapor degreasing tanks~~

~~WAC 296-307-46025~~

~~SPRAY CLEANING OR DEGREASING~~

~~Control liquid spray over an open surface cleaning or degreasing tank~~

~~WAC 296-307-46030.)~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<del>HARDENING OR TEMPERING</del>	
<u>Meet specific requirements if using a hardening or tempering tank.</u>	<u>WAC 296-307-46005</u>
<del>VAPOR DEGREASING</del>	
<u>Additional safeguards for vapor degreasing tanks.</u>	<u>WAC 296-307-46025</u>
<del>SPRAY CLEANING OR DEGREASING</del>	
<u>Control liquid spray over an open surface cleaning or degreasing tank.</u>	<u>WAC 296-307-46030</u>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-46005 Meet specific requirements if ~~((you use))~~ using a hardening or tempering tank.**

~~((You must:))~~

(1) The employer must provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable or combustible liquids and:

- ((-)) (a) Holds five hundred gallons (1893 L) or more of liquid;
- OR

((-)) (b) Has twenty-five square feet (2.37 m<sup>2</sup>) or more of liquid surface area.

(2) The employer must prevent fires.

((\*) (a) Make sure hardening and tempering tanks are:

((-) (i) Not located on or near combustible flooring;

((-) (ii) Located as far away as practical from furnaces;

((-) (iii) Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.

((\*) (b) Treat vent ducts as flues and keep them away from combustible material, particularly roofs.

(3) The employer must make sure air under pressure is not used to:

((\*) (a) Fill the tank;

OR

((\*) (b) Agitate the liquid in the tank.

(4) The employer must equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).

(5) The employer must make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.

(6) Have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

**Note:** The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-307-45515 are satisfied.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-46025 ((Provide)) Additional safeguards for vapor degreasing tanks.**

((You must:))

(1) The employer must make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:

((\*) (a) Thirty-six inches (91 cm) below the top of the tank if the width of the tank is seventy-two inches or more;

OR

((\*) (b) One-half the tank width below the top of the tank if the tank is less than seventy-two inches wide.

(2) The employer must make sure, if ((you use)) gas is used as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.

(3) The employer must make sure the exhaust flue:

((\*) (a) Is made of corrosion-resistant material;

((\*) (b) Extends to the outside;

((\*) (c) Has a draft diverter if mechanical exhaust is used.

(4) The employer must take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.

(5) The employer must keep the temperature of the heating element low enough to keep a solvent or mixture from:

((\*) (a) Decomposing;

OR

((\*) (b) Generating excessive vapor.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-46030 Control liquid spray over an open surface cleaning or degreasing tank.**

((You must:))

((\*) The employer must control the spray to the greatest extent feasible by:

((-) (1) Enclosing the spraying operation as completely as possible;

((-) (2) Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

**Note:** Mechanical baffles may be used to help prevent the discharge of spray.

**Reference:** Spray painting operations are covered in Spray-finishing operations, WAC 296-62-11019.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

**WAC 296-307-465 Definitions.**

**ACGIH((+))** American Conference of Governmental Industrial Hygienists.

**Adjacent area((+))** Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

**ANSI((+))** American National Standards Institute.

**Approved((+))** Approved or listed by a nationally recognized testing laboratory. Refer to Federal Regulation 29 C.F.R. 1910.7, for definition of nationally recognized testing laboratory.

**Autoignition temperature((+))** The minimum temperature required to cause self-sustained combustion without any other source of heat.

**Combustible liquid((+))** A liquid having a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least ninety-nine percent of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

**Detearing((+))** A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

**Dip tank((+))** A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

**Flammable liquid((+))** Any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C) or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture.

**Flashpoint((+))** The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the measurement methods described in the definition of flashpoint in WAC 296-307-55060.

**Lower flammable limit((+))** The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

**NFPA((+))**, National Fire Protection Association.

**Vapor area((+))**, Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

**You((+Means))**, The employer.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-47501 ((What)) Definitions that apply to this part((?))**, ((("))**Welder((and))** and **welding operator((mean))**, Any operator of electric or gas welding and cutting equipment.

All other welding terms are defined according to American Welding Society, Terms and Definitions, A3.0-1969.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48001 ((What general requirements apply to)) **Oxygen fuel gas systems((?))****, (1) Explosive mixtures of fuel gases and air or oxygen must be guarded against. No accessory that allows air or oxygen to mix with flammable gases prior to use must be allowed unless approved for that purpose.

**Exception:** Air or oxygen may mix with flammable gases at the burner or in a standard torch.

(2) Acetylene must never be generated, piped (except in approved cylinder manifolds) or used at a pressure in excess of 15 psi gauge pressure or 30 psi absolute pressure. (The 30 psi absolute pressure limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations or tunnel construction.) Using liquid acetylene is prohibited.

**Exception:** This requirement does not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to DOT requirements, or to acetylene for chemical use.

(3) Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds must be used. Replacement tips may be used on approved torches, if the replacement tips are made to the same specifications as the original, or when replacements are used with convertor/adaptors that meet the same specifications.

(4) Before leaving any employee in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems, ((you)) **the employer** must ensure that the employee has received proper instruction and is competent to do the work. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems must be readily available.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48003 ((What requirements apply to)) **Portable cylinders((?))****, All portable cylinders used for storing and shipping compressed gases must be constructed and maintained according to DOT regulations.

(1) Compressed gas cylinders must be legibly marked with either the chemical or the trade name of the gas. The marking must be a permanent stencil, stamp, or label. Whenever practical, the marking must be located on the shoulder of the cylinder.

(2) Compressed gas cylinders must have connections that meet the requirements of the American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B 57.1-1965.

(3) All cylinders with a water weight capacity greater than thirty pounds must have means of connecting a valve protection cap or with a collar or recess to protect the valve.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48005 ((What general requirements apply to)) **Storing compressed gas cylinders((?))****, (1) Cylinders must be kept away from radiators and other sources of heat.

(2) Indoors, cylinders must be stored in a well-protected, well-ventilated, dry area, at least twenty feet from highly combustible materials such as oil or excelsior. Cylinders should be stored in assigned places away from elevators, stairs, or gangways. Assigned storage spaces must be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering. All cylinder enclosures must be ventilated.

(3) Empty cylinders must have their valves closed.

(4) Valve protection caps on cylinders designed to accept a cap, must always be in place and hand-tight, except when cylinders are in use or connected for use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48007 ((How must)) **Storing fuel-gas cylinders ((be stored?))****, Cylinders stored indoors, except those in use or attached ready for use, must be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of LP-gas.

(1) Cylinders in excess of 2,000 cubic feet total gas capacity or 300 pounds of LP-gas, must be stored in a separate room or compartment that meets the requirements of 252 (a)(8) and (9) C.F.R., or cylinders must be kept outside or in a special building. Special buildings, rooms or compartments must be free from open flame for heating or lighting and must be well ventilated. They may also be used for storage of a maximum of 600 pounds of calcium carbide, when contained in metal containers complying with 252 (a)(7)(a) and (b) C.F.R. Signs should be conspicuously posted in such rooms reading, "Danger—No smoking, matches or open lights," or other equivalent wording.

(2) Acetylene cylinders must be stored valve end up.



AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48009 ((How must)) Storing oxygen cylinders ((be stored?))** (1) Oxygen cylinders must not be stored near highly combustible material, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.

(2) Oxygen cylinders stored in outside generator houses must be separated from the generator or carbide storage rooms by a noncombustible partition having a fire-resistance rating of at least one hour. This partition must be without openings and must be gastight.

(3) Oxygen cylinders in storage must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum of 20 feet or by a noncombustible barrier at least five feet high having a fire-resistance rating of at least one-half hour. (Cylinders "in-use," secured to a hand truck or structural member, with regulators, hoses, and torch temporarily removed for security purposes overnight or weekends, are not considered "in-storage.")

(4) Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), including unconnected reserves on hand at the site, it must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48011 ((What general operating procedures apply to)) Working with cylinders and containers((?))** (1) The numbers and markings stamped into cylinders must not be tampered with.

(2) Cylinders, cylinder valves, couplings, regulators, hose, and apparatus must be kept free from oily or greasy substances. Oxygen cylinders or apparatus must not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

(3) Cylinders must be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields must be provided.

(4) No person, other than the gas supplier, may attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by the owner, may refill a cylinder.

(5) Cylinders must not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., must be avoided.

(6) Fuel-gas cylinders must be placed with valve end up whenever they are in use. Liquefied gases must be stored and shipped with the valve end up.

(7) A suitable cylinder truck, chain, or other steadying device must be used to prevent cylinders from being knocked over while in use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48013 ((What requirements apply to)) Safety devices on cylinders((?))** (1) Valve-protection caps must not be used for lifting cylinders from one vertical position to another. Bars must not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; we recommend using warm (not boiling) water. Valve-protection caps are designed to protect cylinder valves from damage.

(2) Cylinders without fixed hand wheels must have keys, handles, or nonadjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

(3) No one may tamper with safety devices in cylinders or valves.

(4) Nothing may be placed on top of an acetylene cylinder when in use that may damage the safety device or interfere with the quick closing of the valve.

(5) Where a special wrench is required it must be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench must always be available for immediate use.

(6) Cylinders with leaking fuse plugs or other leaking safety devices should be plainly marked with a warning not to approach them with a lighted cigarette or other source of ignition. ((You)) The employer should notify the supplier promptly and follow the supplier's instructions as to their return.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48015 ((How must)) Transporting cylinders ((be transported?))** (1) When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform must be used. Slings or electric magnets are prohibited for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, must always be in place.

(2) Unless cylinders are secured on a special truck, regulators must be removed and valve-protection caps, when provided for, must be put in place before cylinders are moved.

(3) When cylinders are transported by powered vehicle they must be secured in a vertical position.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48017 ((How must)) Handling cylinders ((be handled?))** (1) Cylinders must not be dropped or struck or permitted to strike each other violently.

(2) Cylinders must be handled carefully. Cylinders must not be subjected to rough handling, knocks, or falls that are

liable to damage the cylinder, valve or safety devices and cause leakage.

(3) Cylinders must never be used as rollers or supports, whether full or empty.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48019** (~~What requirements apply to~~) **Cylinder valves**(~~(?)~~). (1) Cylinder valves must be closed before moving cylinders.

(2) Cylinder valves must be closed when work is finished.

(3) Valves of empty cylinders must be closed.

(4) A hammer or wrench must not be used to open cylinder valves. If valves cannot be opened by hand, the supplier must be notified.

(5) Cylinder valves must not be tampered with nor should any attempt be made to repair them. If ~~((you have))~~ the employer has trouble with a cylinder, ~~((you))~~ the employer should send a report to the supplier indicating the character of the trouble and the cylinder's serial number. ~~((You))~~ The employer must follow the supplier's instructions on what to do with the cylinder.

(6) Complete removal of the stem from a diaphragm-type cylinder valve must be avoided.

(7) If cylinders are found to have leaky valves or fittings that cannot be stopped by closing of the valve, the cylinders must be taken outdoors away from sources of ignition and slowly emptied.

(8) The cylinder valve must always be opened slowly.

(9) An acetylene cylinder valve must not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48021** (~~What requirements apply to~~) **Cylinder regulators**(~~(?)~~). (1) Unless connected to a manifold, oxygen from a cylinder must first have an oxygen regulator attached to the cylinder valve.

(2) Before connecting a regulator to a cylinder valve, the valve must be opened slightly and closed immediately. The valve must be opened while standing to one side of the outlet; never in front of it. Fuel-gas cylinder valves must not be cracked near other welding work or near sparks, flame, or other possible sources of ignition.

(3) Before a regulator is removed from a cylinder valve, the cylinder valve must be closed and the gas released from the regulator.

(4) Fuel-gas must not be used from cylinders through torches or other devices equipped with shut-off valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48023** (~~What requirements apply to~~) **Fuel-gas manifolds**(~~(?)~~). (1) Manifolds must be approved

either separately for each component part or as an assembled unit.

(2) Fuel-gas cylinders connected to one manifold inside a building must be limited to a maximum total capacity of 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(3) Exception: Fuel-gas cylinders connected to one manifold having an aggregate capacity exceeding 300 pounds of LP-gas or 3,000 cubic feet of other fuel-gas must be located outdoors, or in a separate building or room constructed according to 252 (a)(8) and (9) C.F.R.

(4) Separate manifold buildings or rooms may also be used for the storage of drums of calcium carbide and cylinders containing fuel gases as provided in WAC 296-307-48007. Such buildings or rooms must have no open flames for heating or lighting and must be well ventilated.

(5) High-pressure fuel-gas manifolds must have approved pressure regulating devices.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48025** (~~What requirements apply to~~) **High-pressure oxygen manifolds**(~~(?)~~). This section applies to cylinders with a DOT service pressure above 200 psig.

(1) Manifolds must be approved either separately for each component or as an assembled unit.

(2) Oxygen manifolds must not be located in an acetylene generator room. Oxygen manifolds must be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(3) Oxygen cylinders connected to one manifold must be limited to a total gas capacity of 6,000 cubic feet. More than one such manifold with connected cylinders may be located in the same room if the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.

(4) Exception: An oxygen manifold, to which cylinders having an aggregate capacity of more than 6,000 cubic feet of oxygen are connected, should be located outdoors or in a separate noncombustible building. Such a manifold, if located inside a building having other occupancy, must be located in a separate room of noncombustible construction having a fire-resistance rating of at least one-half hour or in an area with no combustible material within 20 feet of the manifold.

(5) An oxygen manifold or oxygen bulk supply system that has storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 psia and 70°F), including unconnected reserves on hand at the site, must meet the requirements of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(6) High-pressure oxygen manifolds must have approved pressure-regulating devices.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48027 (~~What requirements apply to~~) Low-pressure oxygen manifolds(?)** This section applies to cylinders with a maximum DOT service pressure of 200 psig.

(1) Manifolds must be of substantial construction suitable for use with oxygen at a pressure of 250 psig. They must have a minimum bursting pressure of 1,000 psig and must be protected by a safety-relief device that will relieve at a maximum pressure of 500 psig.

**Note:** DOT-4L200 cylinders have safety devices that relieve at a maximum pressure of 250 psig (or 235 psig if vacuum insulation is used).

(2) Hose and hose connections subject to cylinder pressure must meet the requirements of WAC 296-307-48049. Hose must have a minimum bursting pressure of 1,000 psig.

(3) The assembled manifold including leads must be tested and proven gas-tight at a pressure of 300 psig. The fluid used for testing oxygen manifolds must be oil-free and not combustible.

(4) The location of manifolds must meet the requirements of WAC 296-307-48025.

(5) The following sign must be conspicuously posted at each manifold:

Low-Pressure Manifold  
Do Not Connect High-Pressure Cylinders  
Maximum Pressure—250 PSIG

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48029 (~~What requirements apply to~~) Manifolding portable outlet headers(?)** (1) Portable outlet headers must not be used indoors except for temporary service where the conditions preclude a direct supply from outlets located on the service piping system.

(2) Each outlet on the service piping from which oxygen or fuel-gas is withdrawn to supply a portable outlet header must have a readily accessible shut-off valve.

(3) Hose and hose connections used for connecting the portable outlet header to the service piping must meet the requirements of WAC 296-307-48051.

(4) Master shut-off valves for both oxygen and fuel-gas must be provided at the entry end of the portable outlet header.

(5) Portable outlet headers for fuel-gas service must have an approved hydraulic back-pressure valve installed at the inlet and preceding the service outlets, unless an approved pressure-reducing regulator, an approved backflow check valve, or an approved hydraulic back-pressure valve is installed at each outlet. Outlets provided on headers for oxygen service may be fitted for use with pressure-reducing regulators or for direct hose connection.

(6) Each service outlet on portable outlet headers must have a valve assembly that includes a detachable outlet seal cap, chained or otherwise attached to the body of the valve.

(7) Materials and fabrication procedures for portable outlet headers must comply with WAC 296-307-48033, 296-307-48035, and 296-307-48041.

(8) Portable outlet headers must have frames that will support the equipment securely in the correct operating position and protect them from damage during handling and operation.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48031 (~~What~~) Operating procedures (~~apply to~~) for cylinder manifolds(?)** (1) Cylinder manifolds must be installed under the supervision of someone familiar with the proper practices of construction and use.

(2) All component parts used in the methods of manifolding described in WAC 296-307-48023 must have the materials, design and construction approved either separately or as an assembled unit.

(3) All manifolds and parts used in methods of manifolding must be used only for the gas or gases for which they are approved.

(4) When acetylene cylinders are coupled, approved flash arresters must be installed between each cylinder and the coupler block. For outdoor use only, and when the number of cylinders coupled does not exceed three, one flash arrester installed between the coupler block and regulator is acceptable.

(5) Each fuel-gas cylinder lead should have a backflow check valve.

(6) The maximum aggregate capacity of fuel-gas cylinders connected to a portable manifold inside a building must be 3,000 cubic feet of gas.

(7) Acetylene and liquefied fuel-gas cylinders must be manifolded vertically.

(8) The pressure in the gas cylinders connected to and discharged simultaneously through a common manifold must be approximately equal.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48033 (~~How must~~) Design of service piping systems (~~be designed~~)** (1) Piping and fittings must comply with Section 2, Industrial Gas and Air Piping Systems, of the American National Standard Code for Pressure Piping, ANSI B 31.1-1967, if they do not conflict with subsections (2) and (3) of this section.

(2) Pipe must be at least Schedule 40 and fittings must be at least standard weight in sizes up to and including 6-inch nominal.

(3) Copper tubing must be Types K or L according to the Standard Specification for Seamless Copper Water Tube, ASTM B88-66a.

(4) Piping must be steel, wrought iron, brass or copper pipe, or seamless copper, brass or stainless steel tubing, except as provided in subsections (5) through (9) of this section.

(5) Oxygen piping and fittings at pressures in excess of 700 psig, must be stainless steel or copper alloys.

(6) Hose connections and hose complying with WAC 296-307-48051 may be used to connect the outlet of a manifold pressure regulator to piping if the working pressure of the piping is 250 psig or less and the length of the hose is a maximum of 5 feet. Hose must have a minimum bursting pressure of 1,000 psig.

(7) When oxygen is supplied to a service piping system from a low-pressure oxygen manifold without an intervening pressure regulating device, the piping system must have a minimum design pressure of 250 psig. A pressure regulating device must be used at each station outlet when the connected equipment is for use at pressures less than 250 psig.

(8) Piping for acetylene or acetylenic compounds must be steel or wrought iron.

(9) Unalloyed copper must only be used for acetylene or acetylenic compounds in listed equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48035 ((~~What requirements apply to~~) ~~Piping joints~~))** (1) Joints in steel or wrought iron piping must be welded, threaded or flanged. Fittings, such as ells, tees, couplings, and unions, must be rolled, forged or cast steel, malleable iron or nodular iron. Gray or white cast iron fittings are prohibited.

(2) Joints in brass or copper pipe must be welded, brazed, threaded, or flanged. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

(3) Joints in seamless copper, brass, or stainless steel tubing must be approved gas tubing fittings or the joints must be brazed. Socket type joints must be brazed with silver-brazing alloy or similar high melting point (not less than 800°F) filler metal.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48037 ((~~How must~~) ~~Installation of service piping systems~~))** (1) Distribution lines must be installed and maintained in a safe operating condition.

(2) Piping may be above or below ground. All piping must be run as directly as practical, protected against physical damage, with an allowance for expansion and contraction, jarring and vibration. Pipe laid underground in earth must be below the frost line and protected against corrosion. After assembly, piping must be thoroughly blown out with air or nitrogen to remove foreign materials. For oxygen piping, only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used.

(3) Only piping that has been welded or brazed must be installed in tunnels, trenches or ducts. Shut-off valves must be located outside such conduits. Oxygen piping may be placed in the same tunnel, trench or duct with fuel-gas pipe-lines, if there is good natural or forced ventilation.

(4) Low points in piping carrying moist gas must be drained into drip pots constructed to permit pumping or

draining out the condensate at necessary intervals. Drain valves must be installed for this purpose having outlets normally closed with screw caps or plugs. Open end valves or petcocks are prohibited, except that in drips located outdoors, underground, and not readily accessible, valves may be used at such points if they have means to secure them in the closed position. Pipes leading to the surface of the ground must be cased or jacketed where necessary to prevent loosening or breaking.

(5) Gas cocks or valves must be provided for all buildings at points where they will be readily accessible for shutting off the gas supply to these buildings in any emergency. Underground valve boxes or manholes should be avoided wherever possible. There must be a shut-off valve in the discharge line from the generator, gas holder, manifold or other source of supply.

(6) Shut-off valves must not be installed in safety-relief lines in such a manner that the safety-relief device can be rendered ineffective.

(7) Fittings and lengths of pipe must be examined internally before assembly and, if necessary, freed from scale or dirt. Oxygen piping and fittings must be washed out with a suitable solution that will effectively remove grease and dirt but will not react with oxygen.

**Note:** Hot water solutions of caustic soda or trisodium phosphate are effective for this purpose.

(8) Piping must be thoroughly blown out after assembly to remove foreign materials. For oxygen piping, oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used. For other piping, air or inert gas may be used.

(9) When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition are prohibited near uncapped openings.

(10) No welding or cutting must be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide must be used to purge oxygen lines.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48039 ((~~How must~~) ~~Painting and marking service piping systems~~))** (1) Underground pipe and tubing and outdoor ferrous pipe and tubing must be covered or painted with a suitable material for protection against corrosion.

(2) Aboveground piping systems must be marked according to the American National Standard Scheme for the Identification of Piping Systems, ANSI A 13.1-1956.

(3) Station outlets must be marked to indicate the name of the gas.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48041 ((~~How must~~) ~~Testing service piping systems~~))** (1) Piping systems must be tested and proved gastight at 1-1/2 times the maximum operating pressure, and must be thoroughly purged of air before

being placed in service. The material used for testing oxygen lines must be oil free and noncombustible. Flames must not be used to detect leaks.

(2) When flammable gas lines or other parts of equipment are being purged of air or gas, sources of ignition are prohibited near uncapped openings.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48043 ((How must equipment be installed?)) Equipment installation.** Equipment shall be installed and used only in the service for which it is approved and as recommended by the manufacturer.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48045 ((How must service)) Protecting piping systems ((be protected?)).** Service piping systems must be protected by pressure relief devices set to function at not more than the design pressure of the systems and discharging upwards to a safe location.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48047 ((What requirements apply to)) Piping protective equipment((?)).** (1) The fuel-gas and oxygen piping systems, including portable outlet headers must incorporate the protective equipment shown in Figures V-1, V-2, and V-3.

When only a portion of a fuel-gas system is to be used with oxygen, only that portion must meet this requirement.

(2) Approved protective equipment (designated PF in Figs. V-1, V-2, and V-3) must be installed in fuel-gas piping to prevent:

- (a) Backflow of oxygen into the fuel-gas supply system;
- (b) Passage of a flash back into the fuel-gas supply system; and

(c) Excessive back pressure of oxygen in the fuel-gas supply system. The three functions of the protective equipment may be combined in one device or may be provided by separate devices.

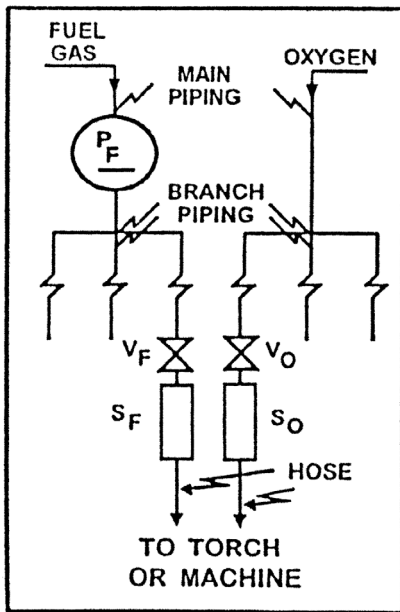


Fig. 1

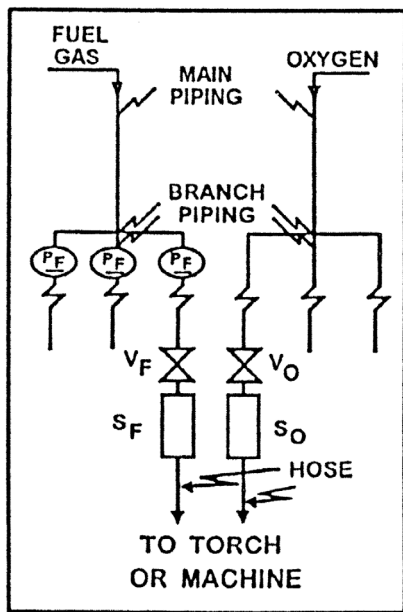


Fig. 2

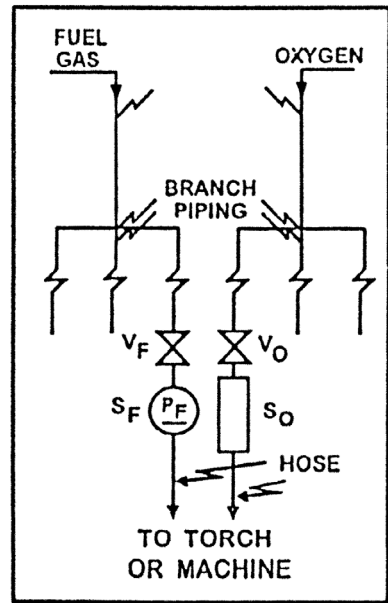


Fig. 3

PF = Protective equipment in fuel-gas piping  
 VF = Fuel-gas station outlet valve  
 VO = Oxygen station outlet valve  
 SF = Backflow prevention device(s) at fuel-gas station outlet  
 SO = Backflow prevention device(s) at oxygen station outlet

(3) The protective equipment must be located in the main supply line, as in Figure 1 or at the head of each branch line, as in Figure 2 or at each location where fuel-gas is withdrawn, as in Figure 3. Where branch lines are of 2-inch pipe size or larger or of substantial length, protective equipment (designated as PF) ~~((shall))~~ must be located as shown in either 2 or 3.

(4) Backflow protection must be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system (see SF, Figs. 1 and 2).

(5) Flash-back protection must be provided by an approved device that will prevent flame from passing into the fuel-gas system.

(6) Back-pressure protection must be provided by an approved pressure-relief device set at a pressure not greater than the pressure rating of the backflow or the flashback protection device, whichever is lower. The pressure-relief device must be located on the downstream side of the backflow and

flashback protection devices. The vent from the pressure-relief device must be at least as large as the relief device inlet and must be installed without low points that may collect moisture. If low points are unavoidable, drip pots with drains closed with screw plugs or caps (~~shall~~) must be installed at the low points. The vent terminus must not endanger personnel or property through gas discharge; must be located away from ignition sources; and must terminate in a hood or bend.

(7) If pipeline protective equipment incorporates a liquid, the liquid level must be maintained, and a suitable anti-freeze may be used to prevent freezing.

(8) Fuel-gas for use with equipment not requiring oxygen must be withdrawn upstream of the piping protective devices.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48049 (~~What requirements apply to~~) Station outlet protective equipment(?)** (1) A check valve pressure regulator, hydraulic seal, or combination of these devices must be provided at each station outlet, including those on portable headers, to prevent backflow, as shown in Figures 1, 2, and 3 and designated as SF and SO.

(2) When approved pipeline protective equipment (designated PF) is located at the station outlet as in Figure 3, no additional check valve, pressure regulator, or hydraulic seal is required.

(3) Each station outlet must have a shut-off valve (designated VF and VO) installed on the upstream side of other station outlet equipment.

(4) If the station outlet is equipped with a detachable regulator, the outlet must terminate in a union connection that meets the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(5) If the station outlet is connected directly to a hose, the outlet must terminate in a union connection that meets the requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(6) Station outlets may terminate in pipe threads to which permanent connections are to be made, such as to a machine.

(7) Station outlets must have a detachable outlet seal cap secured in place. This cap must be used to seal the outlet except when a hose, a regulator, or piping is attached.

(8) Where station outlets are equipped with approved backflow and flashback protective devices, as many as four torches may be supplied from one station outlet through rigid piping, if each outlet from such piping, is equipped with a shut-off valve and if the fuel-gas capacity of any one torch does not exceed 15 cubic feet per hour. This rule does not apply to machines.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48051 (~~What requirements apply to~~) Hose and hose connections(?)** (1) Hose for oxy-fuel gas service must meet the requirements of the Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association.

(2) The generally recognized colors are red for acetylene and other fuel-gas hose, green for oxygen hose, and black for inert-gas and air hose.

(3) When parallel lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, a maximum of 4 inches out of 12 inches must be covered by tape.

(4) Hose connections must meet the requirements of the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(5) Hose connections must be clamped or otherwise securely fastened so they will withstand, without leakage, twice the pressure to which they are normally subjected in service, but never less than a pressure of 300 psi. Oil-free air or an oil-free inert gas must be used for the test.

(6) Hose showing leaks, burns, worn places, or other defects rendering it unfit for service must be repaired or replaced.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48053 (~~What requirements apply to~~) Pressure-reducing regulators(?)** (1) Pressure-reducing regulators must be used only for the gas and pressures for which they are intended. The regulator inlet connections must meet the requirements of the Regulator Connection Standards, 1958, Compressed Gas Association.

(2) When regulators or parts of regulators, including gauges, need repair, the work must be performed by skilled mechanics who have been properly instructed.

(3) Gauges on oxygen regulators must be marked "USE NO OIL."

(4) Union nuts and connections on regulators must be inspected before use to detect faulty seats that may cause leakage of gas when the regulators are attached to the cylinder valves. Damaged nuts or connections must be destroyed.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48501 (~~What general requirements apply to~~) Resistance welding equipment(?)** (1) All equipment must be installed by a qualified electrician according to the requirements of chapter 296-307 WAC Part T. There must be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

(2) Ignitron tubes used in resistance welding equipment must have a thermal protection switch.

(3) Employees designated to operate resistance welding equipment must have been properly instructed and judged competent to operate such equipment.

(4) Controls of all automatic or air and hydraulic clamps must be arranged or guarded to prevent the operator from accidentally activating them.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48503 (~~What requirements apply to~~) Portable welding machines(?)**, (1) All portable welding guns must have suitable counter-balanced devices for supporting the guns, including cables, unless the design of the gun or fixture makes counterbalancing impractical or unnecessary.

(2) All portable welding guns, transformers, and related equipment that is suspended from overhead structures, eye beams, or trolleys must have safety chains or cables. Safety chains or cables (~~shall~~) must be able to support the total shock load in the event of failure of any component of the supporting system.

(3) When trolleys are used to support portable welding equipment, they must have suitable forged steel clevis for the attachment of safety chains. Each clevis must be able to support the total shock load of the suspended equipment in the event of trolley failure.

(4) All initiating switches, including retraction and dual schedule switches, located on the portable welding gun must have suitable guards able to prevent accidental initiation through contact with fixturing, operator's clothing, etc. Initiating switch voltage must be a maximum of 24 volts.

(5) The movable holder, where it enters the gun frame, must have enough clearance to prevent the shearing an operator's fingers if placed on the operating movable holder.

(6) The secondary and case of all portable welding transformers must be grounded. Secondary grounding may be by center tapped secondary or by a center tapped grounding reactor connected across the secondary.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-48505 (~~What requirements apply to~~) Flash welding equipment(?)**, (1) Flash welding machines must have a hood to control flying flash. In cases of high production, where materials may contain a film of oil and where toxic elements and metal fumes are given off, ventilation must be provided according to WAC 296-307-50009 through 296-307-50029.

(2) For the protection of the operators of nearby equipment, fire-resistant curtains or suitable shields must be set up around the machine and in such a manner that the operator's movements are not hampered.

(3) If the welding process cannot be isolated, anyone who may be exposed to the hazard of arc flash must be properly protected.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48507 (~~Who must perform a~~) Job hazard analysis(?)**, A qualified person must perform a job hazard analysis on the operations to be performed on each welding machine to determine the safeguards and personal protective equipment that (~~shall~~) must be used for each job.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-48509 (~~What~~) Maintenance (~~requirements apply to~~) of resistance welding equipment(?)**, Qualified maintenance personnel must periodically inspect the equipment and maintain records of the inspections. The operator must be instructed to report any equipment defects to the supervisor and the use of the equipment must be discontinued until safety repairs have been completed.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-49001 (~~What~~) Environmental conditions (~~must~~) required to be taken into account when selecting arc welding equipment(?)**,

**Note:** (~~You~~) The employer may ensure that (~~your~~) equipment is designed for safety by choosing equipment that complies with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2-1956, Underwriters' Laboratories.

(1) Standard machines for arc welding service must be designed and constructed to carry their rated load with rated temperature rises where the temperature of the cooling air is a maximum of 40°C (104°F) and where the altitude is a maximum of 3,300 feet, and must be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

(2) When exposed to the following or other conditions, machines must be designed to safely meet the requirements of the service(:

- (a);
- (a) Unusually corrosive fumes;
- (b) Steam or excessive humidity;
- (c) Excessive oil vapor;
- (d) Flammable gases;
- (e) Abnormal vibration or shock;
- (f) Excessive dust;
- (g) Weather;
- (h) Unusual seacoast or shipboard conditions.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-49003 (~~What~~) Voltages (~~must~~) when using arc welding equipment (~~use~~)**, Open circuit (no load) voltages of arc welding and cutting machines should be as low as possible consistent with satisfactory welding or cutting being done. Following are the maximum limits:

- (1) For alternating-current machines:
  - (a) Manual arc welding and cutting—80 volts.
  - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (2) For direct-current machines:
  - (a) Manual arc welding and cutting—100 volts.
  - (b) Automatic (machine or mechanized) arc welding and cutting—100 volts.

(3) When special welding and cutting processes require values of open circuit voltages higher than the above, means must be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.

**Note:** For a.c. welding under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing no load voltage is recommended to reduce the shock hazard.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49005 ((How must)) Designing arc welding equipment ((be designed?))**, (1) A controller integrally mounted in an electric motor driven welder must be able to carry the rated motor current, must be able to make and interrupt stalled rotor current of the motor, and may serve as the running overcurrent device if provided with the number of over-current units as specified by chapter 296-307 WAC Part T. Starters with magnetic undervoltage release should be used with machines installed more than one to a circuit to prevent circuit overload caused by simultaneously starting several motors upon return of voltage.

(2) On all types of arc welding machines, control apparatus must be enclosed except for the operating wheels, levers, or handles.

**Note:** Control handles and wheels should be large enough to be easily grasped by a gloved hand.

(3) Input power terminals, tap change devices, and live metal parts connected to input circuits must be completely enclosed and accessible only by tools.

(4) Terminals for welding leads should be protected from accidental electrical contact by employees or by metal objects i.e., vehicles, crane hooks, etc. ~~((You))~~ The employer may provide protection with:

- ((★)) (a) Dead-front receptacles for plug connections;
- ((★)) (b) Recessed openings with nonremovable hinged covers;
- ((★)) (c) Heavy insulating sleeving or taping; or
- ((★)) (d) Other equivalent electrical and mechanical protection.

If a welding lead terminal that is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal must be marked to indicate that it is grounded.

(5) No connections for portable control devices (such as push buttons to be carried by the operator) must be connected to an a.c. circuit of higher than 120 volts. Exposed metal parts of portable control devices operating on circuits above 50 volts must be grounded by a grounding conductor in the control cable.

(6) Auto transformers or a.c. reactors must not be used to draw welding current directly from any a.c. power source having a voltage exceeding 80 volts.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49007 ((How must)) Installing arc welding equipment ((be installed?))**, Arc welding equipment, including the power supply, must be installed according to the requirements of chapter 296-307 WAC Part T.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49009 ((How must)) Grounding arc welding equipment ((be grounded?))**, (1) The frame or case of the welding machine (except engine-driven machines) must be grounded according to the requirements of chapter 296-307 WAC Part T.

(2) Conduits containing electrical conductors must not be used for completing a work-lead circuit. Pipelines must not be used as a permanent part of a work-lead circuit, but may be used during construction, extension or repair if current is not carried through threaded joints, flanged bolted joints, or caulked joints and special precautions are used to avoid sparking at connection of the work-lead cable.

(3) Using chains, wire ropes, cranes, hoists, and elevators to carry welding current is prohibited.

(4) Where a structure, conveyor, or fixture is regularly used as a welding current return circuit, joints must be bonded or provided with adequate current collecting devices and appropriate periodic inspection should be conducted to ensure that no electrocution, shock, or fire hazard exists.

(5) All ground connections must be checked to determine that they are mechanically strong and electrically adequate for the required current.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49011 ((What requirements apply to)) Supply connections and conductors((?))**, (1) A disconnecting switch or controller must be provided at or near each welding machine without a switch or controller mounted as an integral part of the machine. The switch must meet the requirements of chapter 296-307 WAC Part T. Overcurrent protection must be provided as specified in chapter 296-307 WAC Part T. A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by chapter 296-307 WAC Part T must be provided for each outlet intended for connection to a portable welding machine.

(2) For individual welding machines, the rated current-carrying capacity of the supply conductors must be at least that of the rated primary current of the welding machines.

(3) For groups of welding machines, the rated current-carrying capacity of conductors may be less than the sum of the rated primary currents of the welding machines supplied. The conductor rating must be determined according to the machine loading based on the use to be made of each welding machine and the allowance permissible in the event that all the welding machines supplied by the conductors will not be in use at the same time.

(4) In operations involving several welders on one structure, d.c. welding process requirements may require the use



of both polarities; or supply circuit limitations for a.c. welding may require distribution of machines among the phases of the supply circuit. In such cases, no load voltages between electrode holders will be two times normal in d.c. or 1, 1.4, 1.73, or 2 times normal on a.c. machines. Similar voltage differences will exist if both a.c. and d.c. welding are done on the same structure.

(a) All d.c. machines must be connected with the same polarity.

(b) All a.c. machines must be connected to the same phase of the supply circuit and with the same instantaneous polarity.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49013 ((How-must)) Operating arc welding equipment ((be-operated?))**. (1) Employees assigned to operate or maintain arc welding equipment must be acquainted with the requirements of WAC 296-307-490, 296-307-495, and 296-307-500; if doing gas-shielded arc welding, also Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

(2) Before starting operations, all connections to the machine must be checked to make certain they are properly made. The work lead must be firmly attached to the work; magnetic work clamps ((~~shall~~)) must be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable must be spread out before use to avoid serious overheating and damage to insulation.

(3) ((You)) The employer must ensure that the welding machine frame grounding is checked with special attention given to safety ground connections of portable machines.

(4) Cylinders must be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits. Any practice such as the tapping of an electrode against a cylinder to strike an arc is prohibited.

(5) There must be no leaks of cooling water, shielding gas or engine fuel.

(6) ((You)) The employer must ensure that the machine has proper switching equipment for shutting down.

(7) Printed rules and instructions covering operation of equipment supplied by the manufacturers must be strictly followed.

(8) Electrode holders when not in use must be placed so that they cannot make electrical contact with persons, conducting objects, fuel or compressed gas tanks.

(9) Cables with splices within 10 feet of the holder are prohibited. The welder should not coil or loop welding electrode cable around parts of the body.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-49015 ((How-must)) Maintaining arc welding equipment ((be-maintained?))**. (1) The operator should report any equipment defect or safety hazard to the supervisor and discontinue using the equipment until its safety is ensured. Repairs must be made only by qualified persons.

(2) Machines that have become wet must be thoroughly dried and tested before being used.

(3) Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors must be replaced. Lengths of work and electrode cables must be joined by connecting means specifically intended for the purpose. The connecting means must have insulation adequate for the service conditions.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49501 ((What)) Basic fire prevention precautions ((must-be-taken?))**. For more information on these basic precautions and the special precautions of WAC 296-307-49503, including fire protection and prevention responsibilities of welders, cutters, their supervisors (including outside contractors), and management, see the Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B, 1962.

The basic precautions for fire prevention in welding or cutting work are:

(1) If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity must be taken to a safe place.

(2) If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards must be used to confine the heat, sparks, and slag, and to protect the fire hazards.

(3) If the requirements of this section cannot be met, then welding and cutting are prohibited.

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-49503 ((What)) Special fire prevention precautions ((must-be-taken?))**. When the nature of the work to be performed falls within the scope of WAC 296-307-49501(2), certain additional precautions may be necessary:

(1) Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions must be taken so that no readily combustible materials on the floor below will be exposed to sparks that drop through. The same precautions must be observed with regard to cracks or holes in walls, open doorways, and open or broken windows.

(2) Suitable fire extinguishing equipment must be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose, or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

(3) The following requirements apply to fire watch:

(a) Fire watchers are required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

(i) Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

(ii) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

(iii) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(iv) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

(b) Fire watchers must have fire extinguishing equipment readily available and be trained in its use. They must be familiar with facilities for sounding an alarm in the event of a fire. They must watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch must be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

(4) Before cutting or welding is permitted, the area must be inspected by the individual responsible for authorizing cutting and welding operations. The responsible individual must designate precautions to be followed in granting authorization to proceed, preferably in the form of a written permit.

(5) Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor must be swept clean for a radius of 35 feet. Combustible floors must be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, employees operating arc welding or cutting equipment must be protected from possible shock.

(6) Cutting and welding are prohibited in the following situations:

(a) In areas not authorized by management.

(b) In sprinklered buildings while such protection is impaired.

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or where explosive atmospheres may develop inside uncleaned or improperly prepared tanks or equipment that have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

(d) In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulphur, baled paper, or cotton.

(7) Where practical, all combustibles must be relocated at least 35 feet from the worksite. Where relocation is impractical, combustibles must be protected with flame-proofed covers or otherwise shielded with metal or asbestos guards or curtains. Edges of covers at the floor should be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.

(8) Ducts and conveyor systems that might carry sparks to distant combustibles must be suitably protected or shut down.

(9) Where cutting or welding is done near walls, partitions, ceiling, or roof of combustible construction, fire-resistant shields or guards must be provided to prevent ignition.

(10) If welding is to be done on a metal wall, partition, ceiling, or roof, precautions must be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles

are not relocated, a fire watch on the opposite side from the work must be provided.

(11) Welding must not be attempted on a metal partition, wall, ceiling, or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

(12) Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs must not be undertaken if the work is close enough to cause ignition by conduction.

(13) ~~((You are))~~ The employer is responsible for the safe use of cutting and welding equipment on ~~((your))~~ the property and:

(a) Based on fire potentials of plant facilities, ~~((you))~~ the employer must establish areas and procedures for cutting and welding;

(b) ~~((You))~~ The employer must designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes;

(c) ~~((You))~~ The employer must insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process; and

(d) ~~((You))~~ The employer must advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

(14) The supervisor must:

(a) Ensure that cutting and welding equipment is handled and used safely.

(b) Determine the combustible materials and hazardous areas present or likely to be present in the work location.

(c) Protect combustibles from ignition by the following:

(i) Have the work moved to a location free from dangerous combustibles;

(ii) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition; and

(iii) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(d) Secure authorization for the cutting or welding operations from the designated management representative.

(e) Determine that the cutter or welder secures their approval that conditions are safe before going ahead;

(f) Determine that fire protection and extinguishing equipment are properly located at the site; and

(g) Ensure fire watches are available at the site when required.

(15) Cutting or welding is permitted only in areas that are or have been made fire safe. Within the confines of an operating plant or building, cutting and welding should preferably be done in a specific area designed for such work, such as a maintenance shop or a detached outside location. Such areas should be of noncombustible or fire-resistive construction, essentially free of combustible and flammable contents, and suitably segregated from adjacent areas. When work cannot be moved practically, as in most construction work, the area must be made safe by removing combustibles or protecting combustibles from ignition sources.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-49505 ((What)) Precautions ((must)) to be taken when welding or cutting containers((?)).** (1) No welding, cutting, or other hot work may be performed on used drums, barrels, tanks or other containers until they have been cleaned thoroughly enough to be certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel must be disconnected or blanked.

(2) All hollow spaces, cavities, or containers must be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-49507 ((What)) Precautions ((must)) to be taken when welding in confined spaces((?)).** (1) When arc welding work is stopped for a substantial time, such as during lunch or overnight, all electrodes must be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.

(2) In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves must be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practical, the torch and hose must also be removed from the confined space.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-50001 ((How must)) Eye protection ((be selected?)).** (1) Helmets or hand shields must be used during all arc welding or arc cutting operations, excluding submerged arc welding. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending on the amount of exposure to adjacent welding operations. Helpers or attendants must have proper eye protection.

(2) Goggles or other suitable eye protection must be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing, or for inspection.

(3) All operators and attendants of resistance welding or resistance brazing equipment must use transparent face shields or goggles, depending on the job, to protect their faces or eyes as required.

(4) Suitable goggles must be provided where needed for brazing operations not above.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-50003 ((What)) Specifications ((must)) for eye protection ((meet?)).** (1) Helmets and hand shields must be made of a material that is an insulator for heat and electricity. Helmets, shields and goggles must be not readily flammable and must be able to be sterilized.

(2) Helmets and hand shields must be arranged to protect the face, neck and ears from direct radiant energy from the arc.

(3) Helmets must have filter plates and cover plates designed for easy removal.

(4) All parts must be constructed of a material that will not readily corrode or discolor the skin.

(5) Goggles must be ventilated to prevent fogging of the lenses as much as practical.

(6) Cover lenses or plates should be provided to protect each helmet, hand shield, or goggle filter lens or plate.

(7) All glass for lenses must be tempered, substantially free from scratches, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows must be smooth and parallel.

(8) Lenses must be marked with the source and shade.

(9) Following is a guide to select proper shade numbers. Individual needs may vary.

Welding Operation	Shade No.
Shielded metal-arc welding—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous)—1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12
Shielded metal-arc welding:	
3/16-, 7/32-, 1/4-inch electrodes	12
5/16-, 3/8-inch electrodes	14
Atomic hydrogen welding	10-14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, 6 inches and over	5 or 6
Gas welding (light) up to 1/8 inch	4 or 5
Gas welding (medium) 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy) 1/2 inch and over	6 or 8

**Note:** In gas welding or oxygen cutting where the torch produces a high yellow light it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

(10) All filter lenses and plates must meet the test for transmission of radiant energy prescribed in ANSI Z 87.1-

1968—American National Standard Practice for Occupational and Educational Eye and Face Protection.

(11) Where the work permits, an arc welder should be enclosed in an individual booth painted with a finish of low-reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or must be enclosed with noncombustible screens similarly painted. Booths and screens must permit circulation of air at floor level. Employees or other persons adjacent to the welding areas must be protected from the rays by noncombustible or flameproof screens or shields or must be required to wear appropriate goggles.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50005 (~~What~~) Protective clothing (~~must~~) for welders (~~wear~~?)** (1) Employees exposed to the hazards created by welding, cutting, or brazing operations must be protected by personal protective equipment according to the requirements of chapter 296-307 WAC Part H. Appropriate protective clothing required for any welding operation will vary with the size, nature and location of the work to be performed.

(2) The following suggestions may be helpful when choosing protective clothing:

(a) Except when engaged in light work, all welders should wear flameproof gauntlet gloves.

(b) Flameproof aprons made of leather, asbestos, or other suitable material may help to protect against radiated heat and sparks.

(c) Woolen clothing is better than cotton because it is less easily ignited and helps to protect the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce its combustibility. All outer clothing such as jumpers or overalls should be reasonably free from oil or grease.

(d) Sparks may lodge in rolled-up sleeves, pockets, or cuffs. Therefore sleeves and collars should be buttoned, and clothing should have no front pockets. Trousers or overalls should be uncuffed.

(e) For heavy work, fire-resistant leggings, high boots, or other equivalent means should be used.

(f) In production work a sheet metal screen in front of the employee's legs can provide further protection against sparks and molten metal in cutting operations.

(g) Capes or shoulder covers made of leather or other suitable materials should be worn during overhead welding or cutting operations. Leather skull caps may be worn under helmets to prevent head burns.

(h) For welding and cutting overhead or in extremely confined spaces, ear protection is sometimes desirable.

(i) Where there is exposure to sharp or heavy falling objects, or a hazard of bumping in confined spaces, hard hats or head protectors must be used.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-50007 (~~What~~) Other requirements that apply to employee protection(??)** (1) (~~Yes~~) The

employer must ensure that a welder or helper working on platforms, scaffolds, or runways is protected against falling by using railings, safety belts, life lines, or other equally effective safeguards.

(2) Welders must place welding cable and other equipment so that it is clear of passageways, ladders, and stairways.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50009 (~~What~~) Employee protection (~~must be provided~~) for work in confined spaces(??)** (~~is~~) Confined space(~~means~~) A relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

(1) Confined spaces must be ventilated. For ventilation requirements see WAC 296-307-50011 through 296-307-50029.

(2) When welding or cutting in a confined space, the gas cylinders and welding machines must be left outside. Before operations are started, heavy portable equipment mounted on wheels must be securely blocked to prevent accidental movement.

(3) Where a welder must enter a confined space through a manhole or other small opening, means must be provided for quickly removing the welder in case of emergency. When safety belts and lifelines are used, they must be attached so that the welder's body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure must be stationed outside to observe the welder at all times and be able to put rescue operations into effect.

(4) After welding operations are completed, the welder must mark the hot metal or provide some other means of warning other employees.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50011 (~~What~~) General requirements that apply to welding ventilation(??)** (1) The following three factors in arc and gas welding must be considered when determining the amount of contamination to which welders may be exposed:

(a) Dimensions of space in which welding is to be done (especially ceiling height);

(b) Number of welders; and

(c) The possibility of hazardous fumes, gases, or dust according to the metals involved.

(2) Other factors involved may require ventilation or respiratory protective devices as needed to meet the requirements of this section. Such factors include:

(a) Atmospheric conditions;

(b) Heat generated; and

(c) Presence of volatile solvents.

(3) When welding must be performed in a space entirely screened on all sides, the screens must be arranged so that no serious restriction of ventilation exists. The screens should be mounted so that they are about 2 feet above the floor unless the work is performed at so low a level that the screen must

be extended nearer to the floor to protect nearby employees from the glare of welding.

(4) Local exhaust or general ventilating systems must be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable in chapter 296-62 WAC.

**Note:** A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. These include but are not limited to the materials itemized in WAC 296-307-50019 through 296-307-50029.

(5) ~~((You))~~ The employer must determine which potentially hazardous materials are associated with welding and cutting and inform employees through signs, labels or other appropriate means.

(a) Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z 49.1-1967, Safety in Welding and Cutting, published by the American Welding Society.

(b) Brazing (welding) filler metals containing cadmium in significant amounts must carry the following notice on tags, boxes, or other containers:

WARNING

CONTAINS CADMIUM—POISONOUS FUMES MAY BE FORMED ON HEATING

- Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z 49.1-1967.

- If chest pain, cough, or fever develops after use call physician immediately.

- Keep children away when using.

(c) Brazing and gas welding fluxes containing fluorine compounds must have a cautionary wording to indicate that they contain fluorine compounds. The American Welding Society recommends the following for brazing and gas welding fluxes:

CAUTION

CONTAINS FLUORIDES

This flux when heated gives off fumes that may irritate eyes, nose and throat.

- Avoid fumes. Use only in well-ventilated spaces.
- Avoid contact of flux with eyes or skin.
- Do not take internally.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50013 ((What)) Ventilation must be provided for general welding and cutting((?))** (1) Mechanical ventilation must be provided when welding or cutting is done on metals not covered in WAC 296-307-50019 through 296-307-50029 in the following locations:

(a) In a space of less than 10,000 cubic feet per welder.

(b) In a room with a ceiling height of less than 16 feet.

(c) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross-ventilation.

(2) Ventilation must be at the minimum rate of 2,000 cubic feet per minute per welder.

**Exception:** This requirement does not apply where local exhaust hoods and booths that meet the requirements of WAC 296-307-50015, or airline respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations where the restrictions in subsection (1) of this section are not present.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-50015 ((What requirements apply to)) Local exhaust hoods and booths((?))** Mechanical local exhaust ventilation may be provided by either of the following:

(1) Freely movable hoods intended to be placed by the welder as near as practical to the work being welded and provided with a rate of airflow sufficient to maintain a velocity in the direction of the hood of 100 linear feet per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch wide flanged suction opening are shown in the following table:

Welding zone	Minimum air flow cubic feet/minutes	Duct diameter inches
4 to 6 inches from arc or torch	150	3
6 to 8 inches from arc or torch	275	3-1/2
8 to 10 inches from arc or torch	425	4-1/2
10 to 12 inches from arc or torch	600	5-1/2

1 When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.

2 Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

(2) A fixed enclosure with a top and at least two sides that surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet per minute.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-50017 ((What)) Ventilation must be provided in confined spaces((?))** (1) All welding and cutting operations carried on in confined spaces must be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies to welders, helpers, and other employees in the immediate vicinity. All replacement air must be clean and respirable.

(2) In circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for this purpose must be used.

(3) In areas immediately hazardous to life, hose masks with blowers or self-contained breathing equipment must be used. The breathing equipment must be approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH).

(4) Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with blowers or self-contained breathing equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), an employee must be stationed on the outside of such confined spaces to ensure the safety of those working within.

(5) Oxygen must not be used for ventilation.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50019** (~~What requirements apply to~~) **Welding fluorine compounds(?)**. In confined spaces, welding or cutting involving fluxes, coverings, or other materials that contain fluorine compounds must be done according to WAC 296-307-50017.

**(<sup>(1)</sup>)Fluorine compound**(~~"means"~~), A compound that contains fluorine as an element in chemical combination, not as a free gas.

**Note:** The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend on the circumstances. However, such protection is desirable for fixed-location production welding and for all production welding on stainless steels. Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50021** (~~What requirements apply to~~) **Welding zinc(?)**. (1) In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing materials must be done according to WAC 296-307-50017.

(2) Indoors, welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials must be done according to WAC 296-307-50015.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50023** (~~What requirements apply to~~) **Welding lead(?)**. (1) In confined spaces, welding involving lead-base metals (erroneously called lead-burning) must be done according to WAC 296-307-50017.

(2) Indoors, welding involving lead-base metals must be done according to WAC 296-307-50015.

(3) In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes. In all cases, employees in the immediate vicinity of the cutting operation must be protected as necessary by local exhaust ventilation or airline respirators.

**Note:** See chapter 296-62 WAC for additional requirements on lead.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-50025** (~~What requirements apply to~~) **Welding beryllium(?)**. Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals must be done using local exhaust ventilation and airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by WAC 296-307-62625. In all cases, employees in the immediate vicinity of the welding or cutting operations must be protected as necessary by local exhaust ventilation or airline respirators.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-50027** (~~What requirements apply to~~) **Welding cadmium(?)**. (1) Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals must be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors, such operations must be done using respiratory protective equipment such as fume respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

(2) Welding (brazing) involving cadmium-bearing filler metals must be done using ventilation as prescribed in WAC 296-307-50015 or 296-307-50017 if the work is to be done in a confined space.

**Note:** See chapter 296-62 WAC for additional requirements on cadmium.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-50029** (~~What requirements apply to~~) **Welding mercury(?)**. Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials, including paint, must be done using local exhaust ventilation or airline respirators unless atmospheric

tests under the most adverse conditions have established that employee exposure is within the acceptable concentrations defined by WAC 296-307-62625. Outdoors, such operations must be done using respiratory protective equipment approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH) for such purposes.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52001** (~~(What does this section cover?)~~) **Scope.** WAC 296-307-520 applies to all powered industrial trucks used in agricultural operations.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52003** (~~(What is a " ")~~) **Powered industrial truck**(~~(" ")~~), (~~(" ")~~) **Powered industrial truck**(~~(" or ")~~) **or truck**(~~(" means")~~). A fork truck, industrial tractor, platform lift truck, motorized hand truck, or other specialized industrial trucks, powered by electric motors or internal combustion engines. The definition does not include compressed gas-operated industrial trucks, tractor-mounted forklifts, or vehicles intended primarily for earth moving or over-the-road hauling.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52005** (~~(What)~~) **Manufacturer's requirements that apply to powered industrial trucks**(~~(" ")~~). (1) All powered industrial trucks in use by an employer must meet the applicable requirements of design, construction and stability as defined by the American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks, except for vehicles intended primarily for earth moving or over-the-road hauling. All new powered industrial trucks acquired and used by an employer on or after March 1, 2000, must meet the applicable requirements of design, construction and stability as defined in ASME B56.1-1993. The employer must ensure that all powered industrial trucks are inspected, maintained and operated in accordance with this section and the manufacturer's recommendations and specifications.

(2) Approved trucks must have a label indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1-1969.

(3) Modifications or additions must only be performed with the manufacturer's prior written approval. When modifications or additions are made, capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

(4) If the truck is equipped with front-end attachments other than factory installed attachments, it must be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with the load centered from side to side.

(5) The user must ensure that all nameplates and markings are in place and legible.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52007** (~~(What are the)~~) **Classifications of powered industrial trucks**(~~(" ")~~). Powered industrial trucks are identified according to the following classifications:

(1) (~~("D" refers to)~~) **D Classification.** Trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

(2) (~~("DS" refers to)~~) **DS Classification.** Diesel powered trucks that, in addition to meeting all the requirements for the type D trucks, with additional safeguards to the exhaust, fuel, and electrical systems.

(3) (~~("DY" refers to)~~) **DY Classification.** Diesel powered trucks that have all the safeguards of the DS trucks; in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

(4) (~~("E" refers to)~~) **E Classification.** Electrically powered trucks with minimum acceptable safeguards against inherent fire hazards.

(5) (~~("ES" refers to)~~) **ES Classification.** Electrically powered trucks that, in addition to all of the requirements for the E trucks, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

(6) (~~("EE" refers to)~~) **EE Classification.** Electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

(7) (~~("EX" refers to)~~) **EX Classification.** Electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment are so designed, constructed, and assembled to be used in atmospheres containing flammable vapors or dusts.

(8) (~~("G" refers to)~~) **G Classification.** Gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(9) (~~("GS" refers to)~~) **GS Classification.** Gasoline powered trucks with additional safeguards to the exhaust, fuel, and electrical systems.

(10) (~~("LP" refers to)~~) **LP Classification.** Liquefied petroleum gas-powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(11) (~~("LPS" refers to)~~) **LPS Classification.** LP-gas powered trucks that in addition to meeting the requirements for LP trucks, are provided with additional safeguards to the exhaust, fuel, and electrical systems.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52009** (~~(What)~~) **The employer must** (~~(a user)~~) **consider the following before choosing a powered industrial truck**(~~(" ")~~). Before choosing the industrial truck to use, the user must determine whether the atmosphere or location is hazardous or nonhazardous. The type of industrial truck must be chosen according to the requirements of WAC 296-307-52011.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52011 ((What)) Requirements ((determine)) for determining which trucks to use in specific hazardous environments((?)).** Following are the mini-

num truck types required in specific hazardous environments. ((Y00)) The employer may choose to use industrial trucks having greater safeguards. Tables W-1 and W-2 give specific vehicle usage information by Group and Class.

TABLE W-1  
SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS IN VARIOUS LOCATIONS

CLASSES (Description of classes)	GROUPS (Examples of locations or atmosphere in classes and groups)				DIVISIONS (Nature of hazardous conditions)	
UNCLASSIFIED	No group designations in Unclassified				No divisions in Unclassified	
Locations not possessing atmospheres as described in other columns.	Piers and wharves inside and outside general storage, general industrial or commercial properties					
CLASS I LOCATIONS	A	B	C	D	1	2
Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.	Acetylene	Hydrogen	Ethyl ether	Gasoline Naphtha Alcohols Acetone Lacquer solvent Benzene	Conditions exists continuously, intermittently, or periodically under normal operating conditions.	Condition may occur due to accidentally, for example, due to a puncture of a storage drum.
CLASS II LOCATIONS	E	F	G		1	2
Locations which are hazardous because of the presence of combustible dust.	Metal dust	Carbon black Coal dust Coke dust	Grain dust Flour dust Starch dust Organic dust		Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.	Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.
CLASS III LOCATIONS	Class III has no groups				1	2
Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.	Baled waste, cocoa fiber, cotton, excelsior, hemp, istle, jute, kapok, oakum, sisal, Spanish moss, synthetic fibers, tow.				Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).

TABLE W-2  
AUTHORIZED USES OF TRUCKS BY TYPES IN GROUPS OF CLASSES AND DIVISIONS

	UNCLASSIFIED	CLASS I								CLASS II						CLASS III	
		DIV I				DIV II				DIV I			DIV II			DIV I	DIV II
Groups in classes	None	A	B	C	D	A	B	C	D	E	F	G	E	F	G	None	None
Type of truck authorized:																	
<i>Diesel:</i>																	
Type D .....	D**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type DS .....	.....	...	...	...	...	...	...	...	DS...	...	...	...	...	...	DS...	...	DS
Type DY .....	.....	...	...	...	...	...	...	...	DY...	...	...	...	...	...	DY...	DY...	DY
<i>Electric:</i>																	
Type E .....	E**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	E
Type ES .....	.....	...	...	...	...	...	...	...	ES...	...	...	...	...	...	ES...	...	ES
Type EE .....	.....	...	...	...	...	...	...	...	EE...	...	...	...	...	...	EE...	EE...	EE
Type EX .....	.....	...	...	...	EX...	...	...	...	EX...	...	EX...	EX...	...	...	EX...	EX...	EX
<i>Gasoline:</i>																	
Type G .....	G**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type GS .....	.....	...	...	...	...	...	...	...	GS...	...	...	...	...	...	GS...	...	GS



LP-Gas:																			
Type LP .....	LP**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type LPS .....	...	...	...	...	...	...	...	...	...	LPS...	...	...	...	...	...	LPS...	...	...	LPS

\*\* Trucks conforming to these types may also be used.

(1) Powered industrial trucks are prohibited in atmospheres with a hazardous concentration of:

- (\*) (a) Acetaldehyde(7);
- (\*) (b) Acetylene(7);
- (\*) (c) Butadiene(7);
- (\*) (d) Cyclopropane(7);
- (\*) (e) Diethyl ether(7);
- (\*) (f) Ethylene(7);
- (\*) (g) Ethylene oxide(7);
- (\*) (h) Hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas)(7);
- (\*) (i) Isoprene(7);
- (\*) (j) Propylene oxide(7); or
- (\*) (k) Unsymmetrical dimethyl hydrazine (UDMH).

((+)) (i) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing hazardous concentrations of metal dust, including:

- (\*) (A) Aluminum, magnesium, and their commercial alloys;
- (\*) (B) Other dusts of similarly hazardous characteristics; or
- (\*) (C) In atmospheres containing:
  - ((=)) (I) Carbon black(7);
  - ((=)) (II) Coal(7); or
  - ((=)) (III) Coke dust.
- ((+)) (ii) In atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks must have enclosures specifically approved for such locations.

(2) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing:

- (\*) (a) Acetone(7);
- (\*) (b) Acrylonitrile(7);
- (\*) (c) Alcohol(7);
- (\*) (d) Ammonia(7);
- (\*) (e) Benzene(7);
- (\*) (f) Benzol(7);
- (\*) (g) Butane(7);
- (\*) (h) Ethylene dichloride(7);
- (\*) (i) Gasoline(7);
- (\*) (j) Hexane(7);
- (\*) (k) Lacquer solvent vapors(7);
- (\*) (l) Naphtha(7);
- (\*) (m) Natural gas(7);
- (\*) (n) Propane(7);
- (\*) (o) Propylene(7);
- (\*) (p) Styrene(7);
- (\*) (q) Vinyl acetate(7);
- (\*) (r) Vinyl chloride(7); or
- (\*) (s) Xylenes;

in quantities sufficient to produce explosive or ignitable mixtures.

(3) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in locations where volatile flammable liquids or flammable gases are han-

dled, processed or used, if the hazardous liquids, vapors or gases are normally confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown, or in case of abnormal equipment operation.

Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may also be used in locations in which hazardous concentrations of gases or vapors are normally prevented by mechanical ventilation but that might become hazardous through failure or abnormal operation of the ventilating equipment.

(4) Only approved DS, ES, GS, or LPS trucks, or other trucks approved by the manufacturer, may be used in locations used for the storage of hazardous liquids in sealed containers or liquefied or compressed gases in containers. This classification includes locations where volatile flammable liquids or flammable gases or vapors are used but are hazardous only in case of an accident or an unusual operation condition.

The quantity of hazardous material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the business's history of explosions or fires are all factors that should be considered in determining which truck has sufficient safeguards for the location.

(a) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres in which combustible dust is or may be suspended in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.

(b) The EX classification, or other trucks approved by the manufacturer as having equal or greater safeguards, usually includes the working areas of:

- (\*) (i) Grain handling and storage plants(7);
- (\*) (ii) Rooms containing grinders or pulverizers(7);
- (\*) (iii) Cleaners(7);
- (\*) (iv) Graders(7);
- (\*) (v) Scalpers(7);
- (\*) (vi) Open conveyors or spouts(7);
- (\*) (vii) Open bins or hoppers(7);
- (\*) (viii) Mixers or blenders(7);
- (\*) (ix) Automatic or hopper scales(7);
- (\*) (x) Packing machinery(7);
- (\*) (xi) Elevator heads and boots(7);
- (\*) (xii) Stock distributors(7);
- (\*) (xiii) Dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in:
  - ((=)) (A) Grain processing plants(7);
  - ((=)) (B) Starch plants(7);
  - ((=)) (C) Sugar pulverizing plants(7);
  - ((=)) (D) Malting plants(7);
  - ((=)) (E) Hay grinding plants, and other similar locations; and(7)
  - ((=)) (F) Areas where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(5) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres in which deposits or accumulations of combustible dust may be ignited by arcs or sparks from the truck, if combustible dust will not normally be suspended or thrown into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures.

(6) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may be used in locations with easily ignitable fibers or flyings if the fibers or flyings are not likely to be suspended in quantities sufficient to produce ignitable mixtures.

(7) Only approved DS, DY, ES, EE, EX, GS, or LPS trucks, or other trucks approved by the manufacturer, may be used in locations, including outside storage, where easily ignitable fibers are stored or handled, but are not processed or manufactured. E trucks that have been previously used in these locations may continue to be used.

(8) If storage warehouses and outside storage locations are hazardous, the specified approved truck, or other truck approved by the manufacturer, must be used. If not classified as hazardous, any approved D, E, G, or LP truck, or other truck approved by the manufacturer, may be used, or trucks meeting the requirements for these types may be used.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52013** (~~(In what environments may)~~) Using converted trucks (~~(be used?)~~). When powered industrial trucks that were originally approved to use gasoline are converted to use LP-gas according to WAC 296-307-52047 (12), they may be used in locations where G, GS or LP, and LPS trucks are specified.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52015** (~~(What requirements apply to)~~) Overhead safety guards (~~(?)~~). (1) High-lift rider trucks must be fitted with an overhead guard manufactured according to WAC 296-307-52005(1), unless operating conditions do not permit.

(2) An overhead guard must be used as protection against falling objects.

**Note:** An overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, and other objects involved in the job, but not to withstand the impact of a falling capacity load.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-52017** (~~(What requirements apply to)~~) Load backrests (~~(?)~~). (1) A load backrest extension must be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(2) If the type of load presents a hazard, the user must equip fork trucks with a vertical load backrest extension manufactured according to WAC 296-307-52005(1).

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52019** (~~(What)~~) Requirements that apply to fuel handling and storage (~~(?)~~). (1) (~~(You)~~) The employer must ensure that liquid fuels such as gasoline and diesel fuel are stored and handled according to NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1996).

(2) (~~(You)~~) The employer must ensure that LP-gas fuel is stored and handled according to NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1998).

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52021** (~~(What requirements apply to)~~) Lighting for operating areas (~~(?)~~). (1) Adequate lighting should be provided in operating areas. (See ANSI Practice for Industrial Lighting, ANSI/IES RP-7 1990.)

(2) Where general lighting is inadequate, directional lighting must be provided on the truck.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52023** (~~(What level of)~~) Carbon monoxide gas (~~(is allowed?)~~) levels. Concentration levels of carbon monoxide gas created by truck operations must not exceed the levels specified in WAC 296-62-075, Part L (general occupational health standards).

**Note:** Questions concerning degree of concentration and methods of sampling should be referred to a qualified industrial hygienist.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52025** (~~(What requirements apply to)~~) Dockboards (bridge plates) (~~(?)~~). (1) Portable and powered dockboards must be strong enough to support the load carried on them.

(2) Portable dockboards must be secured in position, either by anchors or anti-slipping devices.

(3) Powered dockboards must meet the design and construction requirements of Commercial Standard CS202-56 (1956) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce.

(4) Dockboard or bridge plates must be driven over carefully and slowly and their rated capacity never exceeded.

(5) Portable dockboards must have handholds for safe handling.

(6) Railroad cars must be kept stationary while dockboards or bridge plates are in position.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52027** (~~(What rules apply to)~~) Loading trucks, trailers, and railroad cars with powered industrial trucks (~~(?)~~). (1) Wheel stops or other positive protection must be provided to prevent railroad cars from moving during loading or unloading.

(2) Fixed jacks may be necessary to support a semi-trailer and prevent up-ending during loading or unloading if the trailer is not coupled to a tractor.

(3) Many truck-trailers are equipped with a rear-end protection device to prevent cars from wedging underneath during a collision. These protection devices must be used with equipment that secures the truck-trailer to the loading dock. Wheel chocks are not required under the following conditions:

(a) Trucks or trailers are secured to the loading dock with a mechanical system that prevents movement away from the dock during loading, unloading, and boarding.

(b) All of the mechanical equipment is installed, maintained, and used as recommended by the manufacturer.

(c) Any damaged mechanical equipment is removed from service immediately and is not used to secure trucks and trailers.

(4) The flooring of trucks, trailers, and railroad cars must be checked for breaks and weakness before use.

**AMENDATORY SECTION** (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52029 (~~What are the~~) Operator training requirements for powered industrial trucks(?)**,  
(1) **Safe operation.**

(a) The employer must ensure that each powered industrial truck operator is trained in the safe operation of a powered industrial truck, and is competent to operate a powered industrial truck safely.

(b) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer must ensure that each operator has successfully completed the training required by this section.

(2) **Training program implementation.**

(a) Trainees may operate a powered industrial truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and where such operation does not endanger the trainee or other employees.

**Note:** The employer, or any other qualified person of the employer's choosing, may give required training and evaluation.

(b) Training must consist of formal instruction and/or practical training, conveyed in a manner that the trainee understands.

**Note:** Formal instruction may include lecture, discussion, interactive computer learning, video tape and/or written material. Practical training may include demonstrations performed by the trainer and practical exercises performed by the trainee.

(3) **Training program content.** Powered industrial truck operators must receive initial training in the topics that follow, except in topics that the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

(a) Truck-related topics:

((\*) (i) Operating instructions, warnings and precautions for the types of truck the operator will be authorized to operate;

((\*) (ii) Differences between the truck and the automobile;

((\*) (iii) Truck controls and instrumentation: Where they are located, what they do, and how they work;

((\*) (iv) Engine or motor operation;

((\*) (v) Steering and maneuvering;

((\*) (vi) Visibility (including restrictions due to loading);

((\*) (vii) Fork and attachment adaption, operation, and use limitations;

((\*) (viii) Vehicle capacity;

((\*) (ix) Vehicle stability;

((\*) (x) Any vehicle inspection and maintenance that the operator will be required to perform;

((\*) (xi) Refueling and/or charging and recharging of batteries;

((\*) (xii) Operating limitations;

((\*) (xiii) Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

(b) Workplace-related topics:

((\*) (i) Surface conditions where the vehicle will be operated;

((\*) (ii) Composition of loads to be carried and load stability;

((\*) (iii) Load manipulation, stacking, and unstacking;

((\*) (iv) Pedestrian traffic in areas where the vehicle will be operated;

((\*) (v) Narrow aisles and other restricted places where the vehicle will be operated;

((\*) (vi) Hazardous (classified) locations where the vehicle will be operated;

((\*) (vii) Ramps and other sloped surfaces that could affect the vehicle's stability;

((\*) (viii) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;

((\*) (ix) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

(4) **Retraining.**

(a) Retraining in relevant topics must be provided to the operator when:

((\*) (i) The operator has been observed to operate the vehicle in an unsafe manner;

((\*) (ii) The operator has been involved in an accident or near-miss incident;

((\*) (iii) The operator has received an evaluation that reveals that the operator is not operating the truck safely;

((\*) (iv) The operator is assigned to drive a different type of truck; or

((\*) (v) The condition in the workplace changes in a manner that could affect safe operation of the truck.

(b) Retraining must be provided to an operator if three years has elapsed since he or she last received training.

(5) **Avoidance of duplicative training.** If an operator has previously received training in a topic specified in subsection (3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator can provide proof of such training within three years, and the employer can verify operator competency.

(6) **Recordkeeping.** Employers must keep records showing that each operator has been trained or received retraining as required by this section. These records must include the name of the operator, the date of the training or retraining, and the name of the person(s) giving the training or retraining.

(7) **Implementation dates.** The employer must ensure that operators of powered industrial trucks are trained, as appropriate, by the effective date of this section. Employees hired on or after the effective date of this section must be trained and found competent prior to being assigned to operate a powered industrial truck.

(8) **Nonmandatory guidance.** To assist employers in implementing operator training requirements, a nonmandatory appendix has been added as WAC 296-307-52030. This appendix does not add to, alter, or reduce the requirements of this section.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52030 ((Is there any)) Additional (nonmandatory) information that may assist ((me)) with powered industrial truck operator training((?)).** (1) **Definitions.** The following definitions may help to explain the principle of stability:

(( )) **Center of gravity**(( means)). The point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

(( )) **Counterweight**(( means)). The weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

(( )) **Fulcrum**(( means)). The truck's axis of rotation when it tips over.

(( )) **Grade**(( means)). The slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (the slope is expressed as a percent).

(( )) **Lateral stability**(( means)). A truck's resistance to overturning sideways.

(( )) **Line of action**(( means)). An imaginary vertical line through an object's center of gravity.

(( )) **Load center**(( means)). The horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

(( )) **Longitudinal stability**(( means)). The truck's resistance to overturning forward or rearward.

(( )) **Moment**(( means)). The product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

(( )) **Track**(( means)). The distance between the wheels on the same axle of the truck.

(( )) **Wheelbase**(( means)). The distance between the centerline of the vehicle's front and rear wheels.

(2) **General.**

(a) Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: The vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

(b) The "stability triangle," used in most stability discussions, demonstrates stability simply (see Figures 1 and 2).

(3) **Basic principles.**

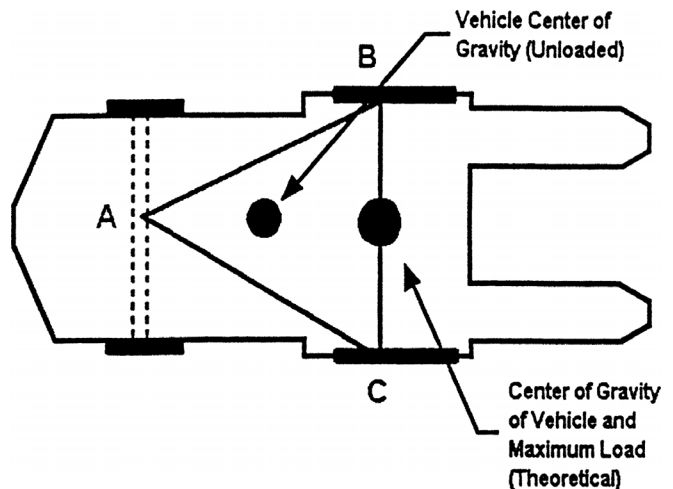
(a) Whether an object is stable depends on the object's "moment" (see definitions, this section) at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a seesaw or teeter-totter works: That is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater moment at one end of the device, the device will try to move downward at the end with the greater moment.

(b) The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the load's moment. In other words, if the mathematic product of the load-moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

(4) **The stability triangle.**

(a) Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle.

Figure 1



- Notes:**
1. When the vehicle is loaded, the combined center of gravity shifts toward line B-C. Theoretically, the maximum load will result in the center of gravity at the line B-C. In actual practice, the combined center of gravity should never be at line B-C.
  2. The addition of additional counterweight will cause the truck center of gravity to shift toward point A and result in a truck that is less stable laterally.

(b) When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/load combination falls outside the stability triangle, the vehicle is unstable and may tip over.

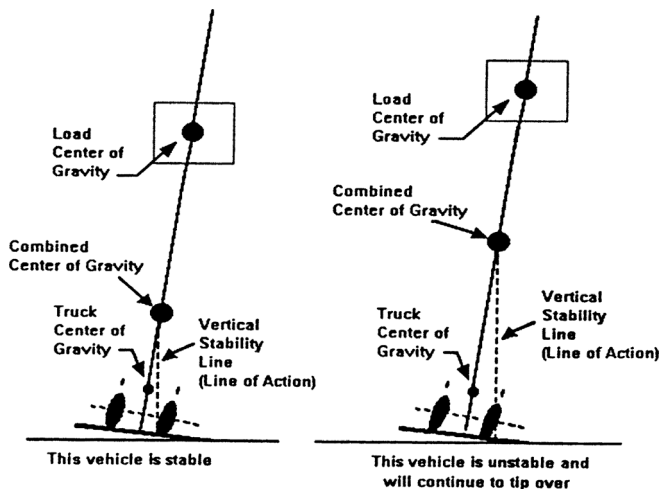


Figure 2

#### (5) Longitudinal stability.

(a) The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load-moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle-moment, the truck will tip forward.

(b) To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

(c) Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load-moment using the load-center distance always provides a lower load-moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. For example, if an operator is operating a 3,000-pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times 24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).

#### (6) Lateral stability.

(a) The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle. When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line of action falls outside the stability triangle, the truck is not stable and may tip over. Refer to Figure 3.

(b) Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

#### (7) Dynamic stability.

(a) Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

(b) When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52031** (~~What requirements apply to~~) **Operating powered industrial trucks((?)**. (1) No operator may drive a truck up to anyone standing in front of a fixed object.

(2) No one may stand or pass under the elevated portion of any truck, whether loaded or empty.

(3) Employers must not allow people to ride on powered industrial trucks unless a safe place to ride is provided.

(4) Employers must prohibit employees from placing any body parts between the uprights of the mast or outside the running lines of the truck.

(5) When an operator leaves a powered industrial truck unattended:

- (a) The load must be fully lowered;
- (b) The controls must be neutralized;
- (c) The power must be shut off; and
- (d) The brakes must be set.
- (e) If the truck is parked on an incline, the wheels must be blocked.

A powered industrial truck is "unattended" when the operator is 25 feet or more away from the vehicle, which remains in view, or whenever the operator leaves the vehicle and it is not in view.

(6) When a truck operator is dismounted, within 25 feet of the truck, and still in view, the load must be fully lowered, the controls must be neutralized, and the brakes must be set to prevent movement.

(7) The operator must maintain a safe distance from the edge of ramps or platforms while operating on any elevated dock, or platform or freight car.

(8) There must be enough headroom for trucks to operate under overhead installations, lights, pipes, sprinkler systems, or other overhead projections.

(9) An active operator protection restraint device (such as a seatbelt or lap-bar) or system must be used, when provided.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52033** (~~When may~~) **Use of trucks** (~~to be used~~) **to open or close freight car doors**(<sup>(?)</sup>). Trucks may only be used for opening or closing freight car doors with an approved device that meets the following requirements:

(1) The door opening or closing device requires that the force applied by the device to the door is parallel to the door travel.

(2) The truck operator is trained in the use of the door opening or closing device and keeps the operation in full view while opening and closing.

(3) The area is clear of people while the door is moved with a device.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52035** (~~What requirements apply to~~) **Lifting employees on the forks of trucks**(<sup>(?)</sup>). Employees may be lifted on the lifting carriage or forks of a powered industrial truck under the following conditions:

(1) The truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks.

(2) A safety platform is firmly secured to the lifting carriage and/or forks.

(3) Employees on the platform have a mechanism to shut off power to the truck.

(4) Employees on the platform are protected from falling objects according to the operating conditions.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52037** (~~What requirements apply to~~) **Using platforms for hoisting employees**(<sup>(?)</sup>). A platform built specifically for hoisting people may be used to lift employees when:

(1) The platform is securely attached to the forks and has standard guardrails and toeboards installed on all sides.

(2) The hydraulic system is designed so that the lift mechanism will not drop faster than 135 feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms are identified as meeting this requirement.

(3) A safety strap is installed or the control lever is locked to prevent the boom from tilting.

(4) An operator attends the lift equipment while employees are on the platform.

(5) The operator is in the normal operating position while raising or lowering the platform.

(6) The vehicle remains stationary while employees are on the platform.

**Exception:** Inching or maneuvering at very slow speed is permissible.

(7) The area between employees on the platform and the mast is adequately guarded to prevent contact with chains or other shear points.

**AMENDATORY SECTION** (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52039** (~~What requirements apply to~~) **Traveling in a powered industrial truck**(<sup>(?)</sup>). (1) The operator must maintain a safe distance of approximately three truck lengths from the truck ahead. The truck must be kept under control at all times.

(2) The operator must yield the right of way to ambulances, fire trucks, or other vehicles in emergency situations.

(3) Passing other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations is prohibited.

(4) Railroad tracks must be crossed diagonally wherever possible. The operator must not park closer than 8 feet from the center of railroad tracks.

(5) The operator must look in the direction of, and keep a clear view of, the path of travel.

(6) Stunt driving and horseplay are prohibited.

(7) The operator must approach elevators slowly, and then enter squarely after the elevator car is properly leveled. Once on the elevator, the operator must neutralize controls, shut off power, and set the brakes.

(8) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(9) The operator must avoid running over loose objects on the roadway surface.

(10) Access to fire aisles, stairways, and fire equipment must be kept clear.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52041 ((What requirements apply to))**  
**Traveling speeds of powered industrial trucks((?)).** (1) The operator must observe all traffic regulations, including authorized plant speed limits.

(2) The operator must slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load obstructs a forward view, the driver must travel with the load trailing.

**Exception:** If traveling with the load trailing creates new hazards, it is not required.

- (3) The operator must ascend and descend grades slowly.
- (a) At grades over 10 percent, loaded trucks must be driven with the load upgrade.
- (b) Unloaded trucks should be operated on all grades with the load carrier downgrade.
- (c) On all grades the load and load carrier must be tilted back if applicable, and raised only as far as necessary to clear the road surface.
- (4) Under all travel conditions, the truck must be operated at a speed that will permit it to be stopped safely.
- (5) The driver must slow down for wet and slippery floors.
- (6) While negotiating turns, the operator must slow to a safe speed and turn the wheel in a smooth, sweeping motion.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52043 ((What requirements apply to))**  
**Loading powered industrial trucks((?)).** (1) All loads must be stable or safely arranged. Exercise caution when handling off-center loads that cannot be centered.

- (2) All loads must be within the rated capacity of the truck.
- (3) Take care securing, manipulating, positioning, and transporting loads when attachments are used. Trucks with attachments must be operated as partially loaded trucks when not handling a load.
- (4) Place the load carrier under the load as far as possible. Tilt the mast backward to stabilize the load.
- (5) Use extreme care when tilting the load forward or backward, particularly when high tiering. Avoid tilting the load forward with the load carrier elevated except to pick up a load, or when the load is in a deposit position over a rack or stack. When stacking or tiering, use only enough backward tilt to stabilize the load.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-52045 ((What requirements apply to))**  
**Servicing powered industrial trucks((?)).** (1) Powered industrial trucks that need repairs, are defective, or in any

way unsafe must be taken out of service until restored to safe operating condition.

(2) Stop the engine before filling fuel tanks. Avoid spilling fuel.

(3) When oil or fuel spills, wash the spill away carefully or evaporate the spill completely and replace the fuel tank cap before restarting engine.

(4) No truck may be operated with a leak in the fuel system.

(5) Open flames are prohibited for checking electrolyte level in storage batteries or gasoline level in fuel tanks.

**AMENDATORY SECTION** (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

**WAC 296-307-52047 ((What requirements apply to))**  
**Maintaining powered industrial trucks((?)).** (1) Powered industrial trucks must be removed from service when not in safe operating condition. All repairs must be made by an authorized employee.

(2) No repairs may be made in Class I, II, and III locations.

(3) When repairs to fuel and ignition systems of industrial trucks involve fire hazards, the repairs must be conducted only in designated locations.

(4) Trucks in need of repairs to the electrical system must have the battery disconnected prior to repair.

(5) Industrial truck parts must be replaced only by parts of equivalent safety.

(6) Industrial trucks must not be altered so that the relative positions of parts are different from when they were manufactured. Industrial trucks must not have parts added or eliminated, except as provided in WAC 296-307-52005. Fork trucks must not have additional counterweighting added unless approved by the truck manufacturer.

(7) Industrial trucks must be examined at least daily before being placed in service. Industrial trucks must not be placed in service if the examination shows any unsafe condition.

Where industrial trucks are used on a round-the-clock basis, they ((shall)) must be examined after each shift. Defects must be immediately reported and corrected.

(8) Water mufflers must be filled daily or as frequently as necessary to prevent the water supply from dropping below 75 percent. Vehicles must not be operated if muffler screens or other parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system must immediately be removed from service until the emission of such sparks and flames has been eliminated.

(9) When the temperature of any part of any truck exceeds its normal operating temperature, the vehicle must be removed from service until the cause for overheating has been eliminated.

(10) Industrial trucks must be kept clean and free of excess accumulations of combustible materials, oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100°F) solvents must not be used. High flash point (at or above 100°F) solvents may be used. Take precautions regarding toxicity, ventilation, and fire hazard according to the agent or solvent used.

(11) Industrial trucks originally approved to use gasoline fuel may be converted to use LP-gas fuel if the converted truck has the features specified for LP or LPS designated trucks. The converted equipment must be approved. ~~((You))~~ The employer may find a description of the conversion system and the recommended method of installation in the "listed by report" of a nationally recognized testing laboratory.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-53001** ~~((What does this section cover?))~~ Scope. WAC 296-307-530 applies to the servicing of multipiece and single-piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to servicing rim wheels used on automobiles, or on pickup trucks and vans with automobile tires or truck tires designated "LT."

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53003** ~~((What))~~ Definitions that apply to rim wheel servicing(?). ~~(( ))~~ Barrier ("means"). A fence, wall, or structure placed between a single-piece rim wheel and an employee during tire inflation, to contain the rim wheel components in the event of the sudden release of the contained air of the single-piece rim wheel.

~~(( ))~~ Charts ("means"). The United States Department of Labor, Occupational Safety and Health Administration (OSHA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," the National Highway Traffic Safety Administration (NHTSA) publications entitled "Demounting and Mounting Procedures for Truck/Bus Tires" and "Multi-Piece Rim Matching Chart," or any other poster that contains at least the same instructions, safety precautions and other information contained in the charts that is applicable to the types of wheels being serviced.

~~(( ))~~ Demounting. The opposite of mounting.

~~(( ))~~ Installing a rim wheel ("means"). The transfer and attachment of an assembled rim wheel onto a vehicle axle hub. ~~(( "Removing" means the opposite of installing.~~

~~(( ))~~ Mounting a tire ("means"). The assembly or putting together of the wheel and tire components to form a rim wheel, including inflation. ~~(( "Demounting" means the opposite of mounting.~~

~~(( ))~~ Multipiece rim wheel ("means"). The assembly of a multipiece wheel with the tire tube and other components.

~~(( ))~~ Multipiece wheel ("means"). A vehicle wheel consisting of two or more parts, one of which is a side or locking ring designed to hold the tire on the wheel by interlocking components, when the tire is inflated.

~~(( ))~~ Removing. The opposite of installing.

~~(( ))~~ Restraining device ("means"). A cage, rack, assembly of bars, or other components that will constrain all rim wheel components during an explosive separation of a multipiece rim wheel, or during the sudden release of the contained air of a single-piece rim wheel.

~~(( ))~~ Rim manual ("means"). A publication containing instructions from the manufacturer or other qualified organization for correct mounting, demounting, maintenance, and safety precautions peculiar to the type of wheel being serviced.

~~(( ))~~ Rim wheel ("means"). An assembly of tire, tube and liner (where appropriate), and wheel components.

~~(( ))~~ Service ("") or ~~(( ))~~ servicing ("means"). The mounting and demounting of rim wheels, and related activities such as inflating, deflating, installing, removing, and handling.

~~(( ))~~ Service area ("means"). That part of an employer's premises used for the servicing of rim wheels, or any other place where an employee services rim wheels.

~~(( ))~~ Single-piece rim wheel ("means"). The assembly of single-piece rim wheel with the tire and other components.

~~(( ))~~ Single-piece wheel ("means"). A vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

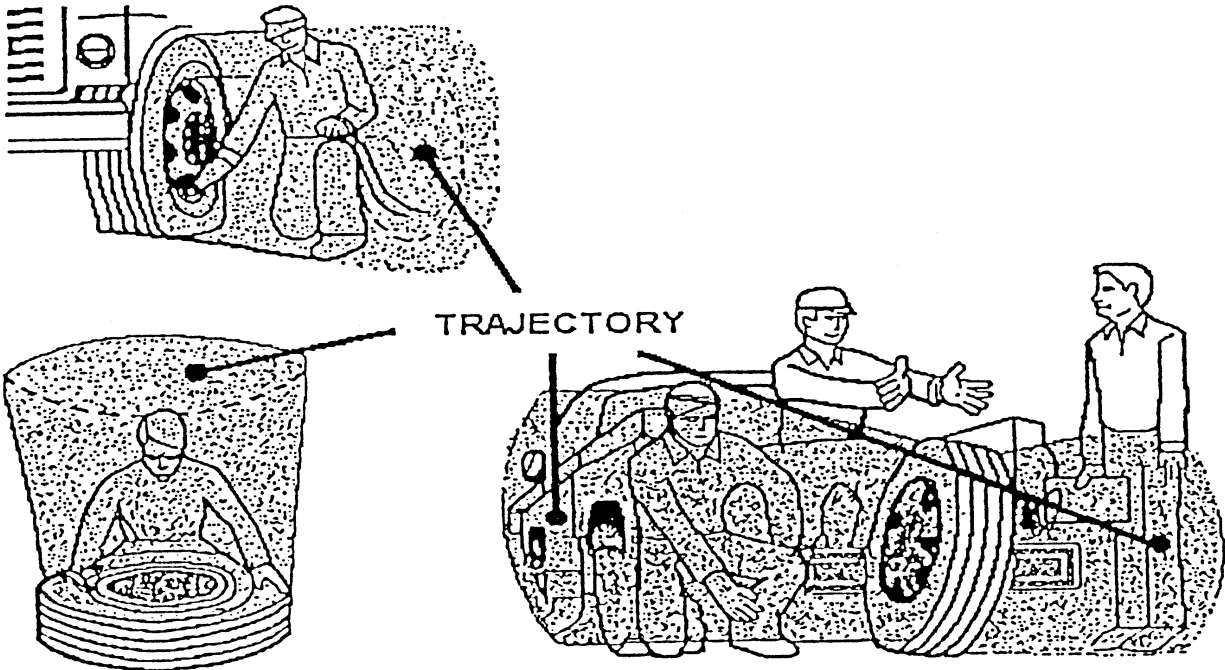
~~(( ))~~ Trajectory ("means"):

(\*) (a) Any potential path that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air; or

(\*) (b) An area at which an air blast from a single-piece rim wheel may be released.

The trajectory may deviate from paths that are perpendicular to the assembled position of the rim wheel. (See Figure for examples of trajectories.)





**(2) Wheel** means the part of a rim wheel that provides the method of attachment of the assembly to the axle of a vehicle and also provides the means to contain the inflated portion of the assembly (i.e., the tire and/or tube).

**AMENDATORY SECTION** (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

**WAC 296-307-53005 (What) Employer provided training (must an employer provide) for employees who service rim wheels.** (1) ~~(You)~~ The employer must implement a training program that covers at least the following:

- (a) The hazards involved in servicing rim wheels;
  - (b) The safe operating procedures for the types of wheel serviced, described in WAC 296-307-53013 and 296-307-53015; and
  - (c) The applicable data contained in the charts (rim manuals) and the contents of this standard.
- (2) ~~(You)~~ The employer must ensure that each employee demonstrates and maintains the ability to service rim wheels safely, including the following:
- (a) Demounting tires (including deflation);
  - (b) Inspecting and identifying the rim wheel components;
  - (c) Mounting tires (including inflation with a restraining device or other safeguard required by this section);
  - (d) Using the restraining device and other equipment required by this section;
  - (e) Handling rim wheels;
  - (f) Inflating the tire when a single-piece rim wheel is mounted on a vehicle;
  - (g) Understanding the necessity of standing outside the trajectory both during inflation of the tire and during inspection of the rim wheel following inflation; and

(h) Installing and removing rim wheels.

(3) If ~~(you believe)~~ the employer believes that any employee is unable to read and understand the charts or rim manual, ~~(you)~~ the employer must instruct the employee in the contents of the charts and rim manual in a manner that the employee can understand.

(4) ~~(You)~~ The employer must evaluate each employee's ability to perform these tasks safely, and provide additional training as necessary to ensure that each employee maintains proficiency.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53007 (What requirements apply to) Restraining devices.** (1) ~~(You)~~ The employer must furnish a restraining device for inflating tires on multipiece wheels.

(2) ~~(You)~~ The employer must provide a restraining device for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining devices must:

(a) Withstand the force of a rim wheel separation occurring at 150% of the maximum tire pressure for the rim wheel being serviced.

(b) Prevent the rim wheel components from being thrown out of the device.

(c) The restraining device is visually inspected before each day's use and after any rim wheel separation or sudden release of contained air. Any damaged restraining device is immediately removed from service.

(d) If the restraining device is removed from service, it is not returned to service until repaired and reinspected. If the restraining device requires structural repair, it is not returned to service until certified by either the manufacturer or a regis-

tered professional engineer to meet the strength requirements of (a) of this subsection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53009 (~~What other~~) Equipment (~~must~~) an employer must provide for rim wheel servicing(?)**, (1) (~~You~~) The employer must furnish an air line assembly and ensure that employees use it for inflating tire.

(2) The air line assembly must contain the following components:

- (a) A clip-on chuck;
- (b) An in-line valve with a pressure gauge or a presettable regulator; and
- (c) Enough hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(3) Current charts or rim manuals for the types of wheels being serviced (~~shall~~) must be available in the service area.

(4) (~~You~~) The employer must furnish the tools recommended in the rim manual for the type of wheel being serviced and ensure that they are the only tools used to service rim wheels.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53011 (~~What requirements apply to~~) Wheel component assembly(?)**, (1) (~~You~~) The employer must ensure that multipiece wheel components are not interchanged except as provided in the charts or rim manual.

(2) Multipiece wheel components and single-piece wheels must be inspected prior to assembly. Any wheel or wheel component that is bent out of shape, pitted from corrosion, broken, or cracked (~~shall~~) must not be used. Mark damaged wheels or components "unserviceable" and remove from the service area. Replace damaged or leaky valves.

(3) Rim flanges, rim gutters, rings, bead seating surfaces and the bead areas of tires must be free of any dirt, surface rust, scale or loose or flaked rubber build-up prior to mounting and inflation.

(4) The size (bead diameter and tire/wheel widths) and type of both the tire and the wheel must be checked for compatibility before assembly.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53013 (~~What are the~~) Safe operating procedures for servicing multipiece rim wheels(?)**, (~~You~~) The employer must establish safe operating procedures for servicing multipiece rim wheels, and ensure that employees are instructed in and follow the procedures. (~~Your~~) The employer's procedures must include at least the following:

- (1) Before demounting, remove the valve core to completely deflate the tire.
- (2) Remove the valve core to completely deflate the tire before removing a rim wheel from the axle whenever:

(a) The tire has been driven on underinflated at eighty percent or less of its recommended pressure; or

(b) There is obvious or suspected damage to the tire or wheel components.

(3) Apply rubber lubricant to bead and rim mating surfaces during wheel assembly and tire inflation, unless the tire or wheel manufacturer recommends against it.

(4) A tire on a vehicle underinflated at more than eighty percent of the recommended pressure may be inflated while the rim wheel is on the vehicle, only if remote control inflation equipment is used and no employees remain in the trajectory during inflation.

(5) Tires may be inflated outside a restraining device only to pressure sufficient to force the tire bead onto the rim ledge and to create an airtight seal with the tire and bead.

(6) Whenever a rim wheel is in a restraining device, the employee must not rest any part of the body or equipment on the restraining device.

(7) After tire inflation, inspect the tire and wheel components while still within the restraining device. Ensure that they are properly seated and locked. If further adjustment to the tire or wheel components is necessary, deflate the tire by removing the valve core before making adjustments.

(8) Never correct the seating of side and lock rings by hammering, striking, or forcing the components while the tire is pressurized.

(9) Cracked, broken, bent, or otherwise damaged rim components (~~shall~~) must not be reworked, welded, brazed, or otherwise heated.

(10) When handling multipiece rim wheels, employees must stay out of the trajectory unless the performance of the servicing makes the employee's presence in the trajectory necessary.

(11) Do not apply heat to a multipiece wheel or wheel component.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53015 (~~What are the~~) Safe operating procedures for servicing single-piece rim wheels(?)**, (~~You~~) The employer must establish safe operating procedures for servicing single-piece rim wheels, and ensure that employees are instructed in and follow the procedures. (~~Your~~) The employer's procedures must include at least the following:

(1) Before demounting, remove the valve core to completely deflate the tire.

(2) Mount and demount tires only from the narrow ledge side of the wheel. Take care to avoid damaging the tire beads while mounting. Only mount tires on compatible wheels of matching bead diameter and width.

(3) Apply nonflammable rubber lubricant to bead and wheel mating surfaces before rim wheel assembly, unless the tire or wheel manufacturer recommends against it.

(4) When using a tire changing machine, inflate tires only to the minimum pressure necessary to force the tire bead onto the rim ledge while on the tire changing machine.

(5) When using a bead expander, remove the bead expander before the valve core is installed and as soon as the

rim wheel becomes airtight (the tire bead slips onto the bead seat).

(6) Always inflate tires within a restraining device, positioned behind a barrier, or bolted on the vehicle with the lug nuts fully tightened.

(7) Inflate tires only when the trajectory area is clear of flat, solid objects.

(8) Employees stay out of the trajectory when inflating a tire.

(9) Tires must not be inflated to more than the inflation pressure stamped in the sidewall unless a higher pressure is recommended by the manufacturer.

(10) Tires must not be inflated above the maximum pressure recommended by the manufacturer to seat the tire bead firmly against the rim flange.

(11) Heat must not be applied to a single-piece wheel.

(12) Cracked, broken, bent, or otherwise damaged wheels must not be reworked, welded, brazed, or otherwise heated.

**AMENDATORY SECTION** (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**WAC 296-307-53017 ((How can an employer order) Ordering the OSHA charts(?))** OSHA charts are available through OSHA area offices. ((You)) The employer may find the address and telephone number of the nearest OSHA office in the local telephone directory under U.S. Government, U.S. Department of Labor, Occupational Safety and Health Administration. Single copies are available without charge.

If ((you want)) the employer wants multiple copies of these charts, ((you)) the employer may order them from the Publications Office, U.S. Department of Labor, Room N3101, Washington, D.C. 20210. Telephone: (((202)-523-9667)) 202-523-9667.

**AMENDATORY SECTION** (Amending WSR 01-17-033, filed 8/8/01, effective 9/1/01)

**WAC 296-307-570 Lighting rule. ((Your)) Employer responsibility:** To provide ((an)) and maintain adequate lighting in ((your)) the workplace.

**AMENDATORY SECTION** (Amending WSR 01-17-033, filed 8/8/01, effective 9/1/01)

**WAC 296-307-57005 Provide and maintain adequate lighting.**

**Note:** This section establishes minimal levels of lighting for safety purposes only. Guidelines pertaining to optimal levels of lighting and illumination may be found in Practice for Industrial Lighting, ANSI/IES RP7-1979.

((You must:

•)) (1) The employer must provide and maintain adequate lighting for all work activities in ((your)) the workplace. See the following table.

Lighting Table		
Activity	Minimum Acceptable average lighting level in an area: (Foot-candles)	Any one single measurement used to determine the average lighting level* cannot be less than: (Foot-candles)
Indoor task	10	5
Outdoor task	5	2.5
Nontask activities for both indoor and outdoor	3	1.5

((Lighting levels must be measured at thirty inches above the floor/working)) surface or at the task.

\*

((You must:

•)) (2) The employer must have adequate light for employees to see nearby objects that might be potential hazards or to see to operate emergency controls or other equipment, if general lighting is not available.

**Notes:** ((•)) 1. Lighting levels can be measured with a light meter.  
((•)) 2. Conversion information: 1 foot candle = 1 lumen incident per square foot = 10.76 lux.

**AMENDATORY SECTION** (Amending WSR 06-22-023, filed 10/24/06, effective 12/1/06)

**WAC 296-307-590 Environmental tobacco smoke in the office—Summary.**

**((Your)) Employer responsibility:**

To eliminate exposure to environmental tobacco smoke in ((your)) the office work environment,

((You must:))

The employer must prohibit tobacco smoke in ((your)) the office work environment.

*WAC 296-307-59005*

**Note:** This rule does not preempt any federal, state, municipal, or other local authority's regulation of indoor smoking that is more protective than this section.

**Definitions:** **Office work environment ((is))** An indoor or enclosed occupied space where clerical work, administration, or business is carried out.

In addition, it includes:

((•)) a. Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.

((•)) b. Office areas of manufacturing and production facilities, not including process areas.

((•)) c. Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

**Smoking.** A person is smoking if they are:

((•)) a. Lighting up;

((•)) b. Inhaling;

((•)) c. Exhaling;

~~((\*)~~ d. Carrying a pipe, cigar or cigarette of any kind that is burning.

**Link:** For work environments outside the office, contact ~~((your))~~ the local health department using the link <http://www.secondhandsmokesyou.com> or by calling them directly.

AMENDATORY SECTION (Amending WSR 06-22-023, filed 10/24/06, effective 12/1/06)

**WAC 296-307-59005 Prohibit tobacco smoke in ~~((your))~~ the office work environment.**

**Exemption:** The minimum criteria specified in this rule do not apply to outdoor structures provided for smokers such as gazebos or lean-tos that maintain the twenty-five-foot distance from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

~~((You must:))~~

(1) The employer must prohibit smoking in ~~((your))~~ the office work environment.

(2) The employer must use administrative controls to prevent tobacco smoke from entering ~~((your))~~ the office from outside the building.

~~((\*)~~ (3) The employer must make sure that outside smoking areas used by ~~((your))~~ their employees are at least twenty-five feet from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-594 Scope.** This part applies to all use of respirators at work.

**IMPORTANT:**

Before ~~((you))~~ the employer decides to use respirators, ~~((you are))~~ the employer is required to evaluate respiratory hazards and implement control methods as outlined in WAC 296-307-624 through 296-307-628, Respiratory hazards.

The term "respiratory hazards" will be used throughout this part to refer to oxygen deficient conditions and harmful airborne hazards.

**Definition:**

**Respirators ~~((are))~~.** A type of personal protective equipment designed to protect the wearer from respiratory hazards.

~~((You))~~ The employer can use Table 1 for general guidance on which sections apply ~~((to you))~~.

**Table 1**  
**Sections That Apply to ~~((your))~~ the Employer's Workplace**

If employees...	Then the sections marked with an "X" apply...					
	596	598	600	602-618	620	622
Request and are <b>permitted</b> to voluntarily use filtering-facepiece respirators, and are not exposed to a respiratory hazard		X				X
Request and are <b>permitted</b> to voluntarily use respirators that are NOT filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are <b>required</b> to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an <b>escape respirator</b> in an emergency	X		X	X	X	X

**Reference:** See WAC 296-307-100, Personal protective equipment (PPE) to find requirements for other types of personal protective equipment (PPE), such as eye, hand, and head protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-596 Respirator program administrator.**

~~((Your))~~ **Employer responsibility:**

To make sure a capable individual is in charge of respirator program development and management.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-59605 Designate a program administrator.**

**Exemption:** ~~((You do))~~ The employer does not need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

**Definition:**

**Voluntary use ~~((is))~~.** Respirator use that is requested by the employee AND permitted by the employer when NO respiratory hazard exists.

~~((You must:))~~

~~((\*)~~) The employer must designate a program administrator who has overall responsibility for ~~((your))~~ the employer's program and has sufficient training or experience to:

~~((-))~~ (1) Oversee program development and coordinate implementation.

~~((-))~~ (2) Conduct required evaluations of program effectiveness outlined in WAC 296-307-60005.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-598 Voluntary respirator use requirements.**

~~((You))~~ **Employer responsibility:**

To make sure voluntary use of respirators by employees does not create job safety or health hazards.

~~((You must:~~

~~Make sure voluntary use of respirators is safe  
WAC 296-307-59805~~

~~Keep voluntary use respirator program records  
WAC 296-307-59810.))~~

<b>The employer must meet the requirements...</b>	<b>in this section:</b>
Make sure voluntary use of respirators is safe.	WAC 296-307-59805
Keep voluntary use respirator program records.	WAC 296-307-59810

**IMPORTANT:**

(\*) 1. Respirator use is NOT voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.

(\*) 2. To evaluate respiratory hazards in ~~((you))~~ the employer's workplace, see WAC 296-307-624(~~(, Respiratory hazards))~~ Scope.

(\*) 3. Some requirements in this section do not apply if only filtering-facepiece respirators are used voluntarily. Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing "nuisance" organic vapors. These can be used for voluntary use, but are not NIOSH certified for protection against hazardous concentrations of organic vapor.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-59805 Make sure voluntary use of respirators is safe.**

**Definition:**

**Voluntary use** ~~((is))~~ Respirator use that is requested by the employee AND permitted by the employer when NO respirator hazard exists.

**IMPORTANT:**

If ~~((you))~~ the employer chooses to require respirator use, use is NOT voluntary and the required use sections of this part apply.

~~((You must:))~~

(1) The employer must make sure voluntary respirator use does NOT:

(\*) (a) Interfere with an employee's ability to work safely, such as restricting necessary vision or radio communication;

**OR**

(\*) (b) Create health hazards.

**Notes:** Examples of health hazards include:

(\*) 1. Skin irritation, dermatitis, or other health effects caused by using a dirty respirator;

(\*) 2. Illness created by sharing contaminated respirators;

(\*) 3. Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

~~((You must:))~~

(2) The employer must provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

**Note:** If ~~((you have provided))~~ employees ~~((with))~~ are provided the advisory information required in the previous section, WAC 296-307-598, ~~((you do))~~ the employer does not need to provide the additional information in Table 2 to those employees.

~~((You must:))~~

(3) The employer must develop and maintain a written program that includes the following:

(\*) (a) Medical evaluation provisions as specified in WAC 296-307-604.

(\*) (b) Procedures to properly clean and disinfect respirators, according to WAC 296-307-62015, if they are reused.

(\*) (c) How to properly store respirators, according to WAC 296-307-61010, so that using them does not create hazards.

(\*) (d) Procedures to make sure there is a safe air supply, according to WAC 296-307-616, when using air-line respirators and SCBAs.

(\*) (e) Training according to WAC 296-307-608 when necessary to ensure respirator use does NOT create a hazard.

**Notes:** (\*) 1. Pay for medical evaluations, training, travel related costs, and wages. ~~((You do))~~ The employer does NOT need to pay for respirators employees use only voluntarily.

(\*) 2. If ~~((you have))~~ the employer has both voluntary and required respirator users, ~~((you))~~ the employer may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

**Exemption:** If employees use only filtering-facepiece respirators and do so only voluntarily, ~~((you do))~~ the employer does not need to develop and maintain a written program.

Use Table 2 to provide information to employees who voluntarily use any type of respirator.

**Table 2**

<b>Advisory Information for Employees Who Voluntarily Use Respirators</b>
<ul style="list-style-type: none"> <li>Respirators protect against airborne hazards when properly selected and used. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide <del>((you))</del> <u>employees</u> an additional level of comfort and protection.</li> <li>If <del>((you))</del> <u>the employee</u> chooses to voluntarily use a respirator (whether it is provided by <del>((you or your))</del> <u>the employee</u> or by <u>the employer</u>) be aware that <b>respirators can create hazards for</b> <del>((you))</del> <u>the user</u>. <del>((You))</del> <u>Employees</u> can avoid these hazards if <del>((you))</del> <u>they</u> know how to use <del>((you))</del> <u>the</u> respirator properly AND how to keep it clean. Take these steps: <ul style="list-style-type: none"> <li>Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.</li> </ul> </li> </ul>

<b>Advisory Information for Employees Who Voluntarily Use Respirators</b>
<p>- Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator is not certified by NIOSH, <del>((you))</del> <u>employees</u> have no guarantee that it meets minimum design and performance standards for workplace use.</p> <ul style="list-style-type: none"> <li>■ A NIOSH approval label will appear on or in the respirator packaging. It will tell <del>((you))</del> <u>the employee and employer</u> what protection the respirator provides.</li> </ul> <p>- <u>The employee should keep track of</u> <del>((your))</del> respirator so <del>((you do))</del> <u>the employee does</u> not mistakenly use someone else's.</p> <p>- <b>DO NOT</b> wear <del>((your))</del> <u>the</u> respirator into:</p> <ul style="list-style-type: none"> <li>■ Atmospheres containing hazards that <del>((your))</del> <u>the</u> respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect <del>((you))</del> against solvent vapor, smoke or oxygen deficiency.</li> <li>■ Situations where respirator use is required.</li> </ul>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-59810 Keep voluntary use program records.**

**Exemption:** If employees use only filtering-facepiece respirators voluntarily, ~~((you do))~~ the employer does not need to follow these recordkeeping requirements.

- ~~((You must:))~~  
 (\*) (1) The employer must keep copies of:  
~~((You))~~ (a) The current written respirator program;  
 (-) (b) Written recommendations from the LHCP;  
 (\*) (2) The employer must allow records required by this section to be examined and copied by affected employees and their representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-600 Written respirator program and recordkeeping.**

~~((You))~~ **Employer responsibility:**

To develop, implement, and maintain a written program that provides clear instruction for safe and reliable respirator use.

- ~~((You must:))~~  
~~Develop and maintain a written program~~  
~~WAC 296-307-60005~~  
~~Keep respirator program records~~  
~~WAC 296-307-60010.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Develop and maintain a written program.</u>	<u>WAC 296-307-60005</u>
<u>Keep respirator program records.</u>	<u>WAC 296-307-60010</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60005 Develop and maintain a written program.**

**Exemption:** This section does **NOT** apply to respirator use that is voluntary. See WAC 296-307-59805 for voluntary use program requirements.

- ~~((You must:))~~  
 (1) The employer must develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

**Note:** Pay for respirators, medical evaluations, fit testing, training, maintenance, travel costs, and wages.

- ~~((You must:))~~  
 (2) The employer must keep ~~((your))~~ its program current and effective by evaluating it and making corrections. Do ALL of the following:

(\*) (a) Make sure procedures and program specifications are followed and appropriate.

(\*) (b) Make sure selected respirators continue to be effective in protecting employees. For example(~~(:~~ -), if changes in work area conditions, level of employee exposure, or employee physical stress have occurred, ~~((you need))~~ the employer needs to reevaluate ~~((your))~~ respirator selection.

(\*) (c) Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.

(\*) (d) Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:

- (-) (i) Respirator fit during use;
- (-) (ii) Any effects of respirator use on work performance;
- (-) (iii) Respirators being appropriate for the hazards encountered;
- (-) (iv) Proper use under current worksite conditions;
- (-) (v) Proper maintenance.

When developing ~~((your))~~ a written program include applicable elements listed in Table 3.

Table 3

Required Elements for Required-Use Respirator Programs
<ul style="list-style-type: none"> <li>• Selection: <ul style="list-style-type: none"> <li>- Procedures for respirator selection</li> <li>- A list specifying the appropriate respirator for each respiratory hazard in <del>((you))</del> <u>the</u> workplace</li> <li>- Procedures for issuing the proper type of respirator, if appropriate</li> </ul> </li> </ul>
• Medical evaluation provisions
• Fit-test provisions and procedures, if tight-fitting respirators are selected
<ul style="list-style-type: none"> <li>• Training provisions that address: <ul style="list-style-type: none"> <li>- Respiratory hazards encountered during: <ul style="list-style-type: none"> <li>■ Routine activities</li> <li>■ Infrequent activities, for example, bimonthly cleaning of equipment</li> <li>■ Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations</li> </ul> </li> <li>- Proper use of respirators, for example, how to put on or remove respirators, and use limitations.</li> </ul> </li> </ul> <p><b>Note:</b> <del>((You do))</del> <u>The employer does</u> NOT need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-307-550, employer chemical hazard communication.</p>
<ul style="list-style-type: none"> <li>• Respirator use procedures for: <ul style="list-style-type: none"> <li>- Routine activities</li> <li>- Infrequent activities</li> <li>- Reasonably foreseeable emergencies</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Maintenance: <ul style="list-style-type: none"> <li>- Procedures and schedules for respirator maintenance covering: <ul style="list-style-type: none"> <li>■ Cleaning and disinfecting</li> <li>■ Storage</li> <li>■ Inspection and repair</li> <li>■ When to discard respirators</li> </ul> </li> <li>- A cartridge or canister change schedule <b>IF</b> air-purifying respirators are selected for use against gas or vapor contaminants <b>AND</b> an end-of-service-life-indicator (ESLI) is not available. In addition, provide: <ul style="list-style-type: none"> <li>■ The data and other information <del>((you))</del> <u>the employer</u> relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors)</li> </ul> </li> </ul> </li> </ul>
• Procedures to ensure a safe air quantity and quality <b>IF</b> atmosphere-supplying respirators (air-line or SCBA) are selected
• Procedures for evaluating program effectiveness on a regular basis

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60010 Keep respirator program records.**

~~((You must:~~

•) (1) The employer must keep the following records:

~~((You))~~ (a) Current respirator program;

(-) (b) Each employee's current fit test record, if fit testing is conducted. Fit test records must include:

(■) (i) Employee name;

(■) (ii) Test date;

(■) (iii) Type of fit-test performed;

(■) (iv) Description (type, manufacturer, model, style, and size) of the respirator tested;

(■) (v) Results of fit tests, for example, for quantitative fit tests include the overall fit factor **AND** a print out, or other recording of the test.

(-) (c) Training records that include employee's names and the dates trained;

(-) (d) Written recommendations from the LHCP.

(\*) (2) The employer must allow records required by this section to be examined and copied by affected employees and their representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-602 Respirator selection.**

~~((You))~~ Employer responsibility:

To select and provide respirators that are appropriate for the hazard, user, and worksite conditions.

**Exemption:** This section does NOT apply to voluntary respirator use. See WAC 296-307-598 of this part for voluntary use program requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60205 Select and provide appropriate respirators.**

**IMPORTANT:**

See WAC 296-307-624(~~(Respiratory hazards)~~) Scope, for:

(\*) 1. Hazard evaluation requirements. Evaluation results are necessary for respirator selection.

(\*) 2. A list of substance-specific rules that may also apply (~~(to you)~~). Those listed rules have additional respirator selection requirements.

~~(You must)~~

\*) The employer must select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

**Respirator Selection Process**

**Step 1:** If (~~(you)~~) the only respirator use is for escape, skip to **Step 8** to select appropriate respirators.

**Step 2:** If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for **nonemergency** activities recognized to present a health risk to workers AND skip to **Step 8**.

(\*) (a) If respirator use will occur during **emergencies**, skip to **Step 8** and document the analysis used to select the appropriate respirator.

(\*) (b) Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit (~~(http://www.cdc.gov)~~) <https://www.cdc.gov>.

**Step 3:** If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label AND skip to **Step 9**.

**Step 4:** Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by WAC 296-307-624, Respiratory hazards.

**Step 5:** Determine if the respiratory hazard is classified as IDLH; if it is NOT IDLH skip to **Step 7**.

(\*) The respiratory hazard **IS** classified as IDLH if:

(-) (a) The atmosphere is oxygen deficient or oxygen enriched;

**OR**

~~(You)~~ (b) The employer CANNOT measure or estimate (~~(you)~~) expected exposure concentration;

**OR**

~~(You)~~ (c) The measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH *Pocket Guide to Chemical Hazards*.

**Notes:** (\*) 1. WISHA uses the IDLH values in the 1990 edition of the NIOSH *Pocket Guide to Hazardous Chemicals* to determine the existence of IDLH conditions. (~~(You)~~) The employer may use more recent editions of this guide. Visit [www.cdc.gov/niosh](http://www.cdc.gov/niosh) for more information.

(\*) 2. If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to **Step 7**.

**Step 6:** Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to **Step 8**:

(\*) (a) Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes;

**OR**

(\*) (b) Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply.

**Exception:** If the respiratory hazard is oxygen deficiency AND (~~(you)~~) the employer can show oxygen concentrations can be controlled within the ranges listed in Table 4 under ALL foreseeable conditions, (~~(you are)~~) the employer is allowed to select ANY type of SCBA or air-line respirator.

**Table 4  
Concentration Ranges for Oxygen Deficiency**

Altitude (as ft. above sea level)	Oxygen Concentration Range (as percent oxygen)
Below 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5
Above 8,000 feet the exception does not apply.	

**Step 7:** Identify respirator types with assigned protection factors (APFs) from Table 5 that are appropriate to protect employees from the expected exposure concentration.

**Step 8:** Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

**Step 9:** Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

(\*) If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 11**.

Examples:

(\*) (a) High humidity or temperature extremes in the workplace.

(\*) (b) Necessary voice communication.

(\*) (c) High traffic areas and moving machinery.

(\*) (d) Time or distance for escape.

**Step 10:** Follow Table 6 requirements to select an air-purifying respirator.

(\*) If Table 6 requirements cannot be met, (~~(you)~~) the employer must select an air-line respirator or an SCBA.

**Step 11:** Make sure respirators (~~(you)~~) the employer selects are certified by the National Institute for Occupational Safety and Health (NIOSH).



((\*) To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label.

**Note:** While selecting respirators, ((y00)) the employer will need to select a sufficient number of types, models or sizes to provide for fit testing. ((Y00)) The employer can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

Use Table 5 to identify the assigned protection factor for different types of respirators.

**Table 5**

**Assigned Protection Factors (APF) for Respirator Types**

If the respirator is a(n) . . .	Then the APF is . . .
Air-purifying respirator with a:	
• Half-facepiece . . . . .	10
• Full-facepiece . . . . .	100
<b>Note:</b> Half-facepiece includes 1/4 masks, filtering facepieces, and elastomeric facepieces.	
Powered air-purifying respirator (PAPR) with a:	
• Loose-fitting facepiece . . . . .	25
• Half-facepiece . . . . .	50
• Full-facepiece, equipped with HEPA filters, chemical cartridges or canisters . . . . .	1000
• Hood or helmet, equipped with HEPA filters, chemical cartridges or canisters . . . . .	1000
Air-line respirator with a:	
• Half-facepiece and designed to operate in demand mode . . . . .	10
• Loose-fitting facepiece and designed to operate in continuous flow mode . . . . .	25
• Half-facepiece and designed to operate in continuous-flow, or pressure-demand mode . . . . .	50
• Full-facepiece and designed to operate in demand mode . . . . .	100
• Full-facepiece and designed to operate in continuous-flow OR pressure-demand mode . . . . .	1000
• Helmet or hood and designed to operate in continuous-flow mode . . . . .	1000
Self-contained breathing apparatus (SCBA) with a tight fitting:	
• Half-facepiece and designed to operate in demand mode . . . . .	10

If the respirator is a(n) . . .	Then the APF is . . .
• Full-facepiece and designed to operate in demand mode . . . . .	100
• Full-facepiece and designed to operate in pressure-demand mode . . . . .	10,000
Combination respirators:	
• Find the APF for each type of respirator in the combination.	The lowest value
• Use the lower APF to represent the combination.	

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

**Table 6**

**Requirements for Selecting Any Air-purifying Respirator**

If the contaminant is a . . .	Then . . .
• Gas OR vapor	<ul style="list-style-type: none"> <li>• Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• If a canister or cartridge with an ESLI is NOT available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Select an atmosphere-supplying respirator</li> </ul>
• Particle, such as a dust, spray, mist, fog, fume, or aerosol	<ul style="list-style-type: none"> <li>• Select respirators with filters certified to be at least 95% efficient by NIOSH</li> <li>- For example, N95s, R99s, P100s, or High Efficiency Particulate Air filters (HEPA)</li> </ul> <p><b>OR</b></p>

If the contaminant is a . . .	Then . . .
	<p>• <del>((You))</del> <u>The employer</u> may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," OR "pesticides."                      ((You)) <u>The employer</u> can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least two micrometers.</p> <p><b>Note:</b> These respirators are no longer sold for occupational use.</p>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-604 Medical evaluations.**

~~((You))~~ **Employer responsibility:**

To make sure a respirator used under ~~((you))~~ the employer's specific worksite conditions is not a health risk to employees.

- Exemption:** This section does **NOT** apply to employees who **only** use:
- ((\*) 1. Filtering-facepiece respirators voluntarily. See WAC 296-307-598 of this part for voluntary use requirements;
  - OR**
  - ((\*) 2. Escape-only respirators that are mouthpiece, loose-fitting, or hooded respirators.

**IMPORTANT:**

((\*) Using a respirator can create physical risks for an employee each time it is worn. The extent of these risks depends on these factors:

- ((-) 1. Type of respirator;
- ((-) 2. Environmental conditions at the worksite;
- ((-) 3. Physical demands of the work;
- ((-) 4. Use of other protective clothing;
- ((-) 5. Employee's health status.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60405 Provide medical evaluations.**

**IMPORTANT:**

If ~~((you have))~~ the employer has provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

~~((You must:~~

\*) The employer must follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

**Medical Evaluation Process**

**Step 1:** Identify employees who need medical evaluations AND determine the frequency of evaluations from Table 7. Include employees who:

- ((\*) (a) Are required to use respirators;
- OR**
- ((\*) (b) Voluntarily use respirators that are **not** filtering-facepiece respirators.

**Note:** ~~((You))~~ The employer may use a previous employer's medical evaluation for an employee if ~~((you))~~ the employer can:

- ((\*) 1. Show the employee's previous work and use conditions were substantially similar to ~~((yours))~~ the employer's;

**AND**

- ((\*) 2. Obtain a copy of the licensed health care professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

**Step 2:** Identify a licensed health care professional (LHCP) to perform ~~((you))~~ the medical evaluations.

**Note:** If ~~((you))~~ the employer selects a different LHCP, ~~((you))~~ they do not need to have new medical evaluations done.

**Step 3:** Make sure ~~((you))~~ the LHCP has the following information **before** the evaluation is completed:

- ((\*) (a) Information describing the respirators employees may use, including the weight and type.
- ((\*) (b) How the respirators will be used, including:
- ((-) (i) How often the respirator will be used, for example, daily, or once a month;
- ((-) (ii) The duration of respirator use, for example, a minimum of one hour, or up to twelve hours;
- ((-) (iii) The employee's expected physical work effort;
- ((-) (iv) Additional personal protective clothing and equipment to be worn;
- ((-) (v) Temperature and humidity extremes expected during use.
- ((\*) (c) A copy of ~~((you))~~ the employer's written respiratory protection program **and** this part.

**Notes:** ~~((You))~~ 1. The employer may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions.

((\*) 2. The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

**Step 4:** Administer the medical questionnaire in WAC 296-307-61605 to employees, OR provide them a medical exam that obtains the same information.

**Note:** ~~((You))~~ The employer may use online questionnaires if the questions are the same and requirements of this section are met.

((\*) (a) Administer the examination or questionnaire at no cost to employees:

- ((-) (i) During the employee's normal working hours;
- OR**
- ((-) (ii) At a time and place convenient to the employee.
- ((\*) (b) Maintain employee confidentiality during examination or questionnaire administration:

- ((-) (i) Do **not** view employee's answers on the questionnaire;
- ((-) (ii) Do **not** act in a manner that may be considered a breach of confidentiality.

**Note:** Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

((\*) (c) Make sure employees understand the content of the questionnaire.

((\*) (d) Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

**Step 5:** Provide follow-up evaluation for employees when:

((\*) (a) The LHCP needs more information to make a final recommendation;

**OR**

((\*) (b) An employee gives any positive response to questions 1-8 in Part 2 OR to questions 1-6 in Part 3 of the WISHA medical evaluation questionnaire in WAC 296-307-61605.

**Note:** Follow-up may include:

((\*) 1. Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses;

((\*) 2. Medical exams;

((\*) 3. Medical tests or other diagnostic procedures.

**Step 6:** Obtain a written recommendation from the LHCP that contains only the following medical information:

((\*) (a) Whether or not the employee is medically able to use the respirator;

((\*) (b) Any limitations of respirator use for the employee;

((\*) (c) What future medical evaluations, if any, are needed;

((\*) (d) A statement that the employee has been provided a copy of the written recommendation.

**Step 7:** Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee should not wear a negative-pressure air-purifying respirator AND is able to wear a PAPR.

**Reference:** See WAC 296-307-602 for requirements regarding selection of air-purifying respirators.

**Notes:** ((\*) ~~You~~) 1. The employer may discontinue medical evaluations for an employee when the employee no longer uses a respirator.

((\*) 2. If ((you have)) the employer has staff conducting ((you) ~~its~~) its medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

Use Table 7 to determine medical evaluation frequency.

**Table 7**  
**Evaluation Frequency**

Type of Evaluation:	When required:
Initial medical evaluations	• Before respirators are fit-tested or used in the workplace.
Subsequent medical evaluations	• If any of these occur: <ul style="list-style-type: none"> <li>- ((You) <del>The employer's</del>) <u>The employer's</u> licensed health care professional (LHCP) recommends them; for example, periodic evaluations at specified intervals.</li> <li>- A respirator program administrator or supervisor informs ((you) <del>the employer</del>) <u>the employer</u> that an employee needs reevaluation.</li> <li>- Medical signs or symptoms (such as breathing difficulties) are:                             <ul style="list-style-type: none"> <li>■ Observed during fit-testing or program evaluation</li> <li><b>OR</b></li> <li>■ Reported by the employee</li> </ul> </li> <li>- Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress.</li> </ul>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-606 Fit testing.**

**((You) ~~Employer~~ responsibility:**

To make sure negative and positive-pressure tight-fitting respirators can provide an adequate fit and acceptable level of comfort for employees.

**Exemption:** This section does NOT apply to any respirators that are:

((\*) 1. Voluntarily used. See WAC 296-307-598 for voluntary use requirements.

((\*) 2. Mouthpiece respirators.

**IMPORTANT:**

((\*) 1. Fit testing is an activity where the seal of a respirator is tested to determine if it is adequate.

((\*) 2. This section covers general **requirements** for fit testing. Fit-testing **procedures** are covered in WAC 296-307-62010 of this part.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60605 Conduct fit testing.**

**((You must:**

**\*) (1) The employer must provide, at no cost to the employee, fit tests for ALL tight fitting respirators on the following schedule:**

((-)) (a) Before employees are assigned duties that may require the use of respirators;

((-)) (b) At least every twelve months after initial testing;

((-)) (c) Whenever any of the following occurs:

((■)) (i) A different respirator facepiece is chosen such as a different type, model, style, or size;

((■-You)) (ii) The employer becomes aware of a physical change in an employee that could affect respirator fit. For example, ((you)) the employer may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes;

((■)) (iii) An employee notifies ((you)) the employer, or ((you)) the employer's LHCP, that the respirator fit is unacceptable. During the retest, ((you)) the employer must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

**Note:** ((You)) The employer may accept a fit test completed by a previous employer **IF:**

((-You)) 1. The employer obtain written documentation of the fit test;

**AND**

((\*) 2. The results of the fit test are not more than twelve months old;

**AND**

((\*) 3. The employee will use the same respirator (the same type, model, style, and size);

**AND**

((\*) 4. The fit test was conducted in a way that meets the requirements of WAC 296-307-606 and 296-307-62010.

~~((You must:~~

\*) (2) The employer must select an appropriate fit-testing procedure from WAC 296-307-62010 of this part **AND:**

((-)) (a) Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:

((■)) (i) Full facepiece air-purifying respirators;

((■)) (ii) SCBAs operated in demand (negative pressure) mode;

((■)) (iii) Air-line respirators operated in demand mode.

((-)) (b) Make sure PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode.

((\*) (3) The employer must make sure the person conducting fit testing is able to do ALL of the following:

((-)) (a) Prepare test solutions if required;

((-)) (b) Make sure equipment works properly;

((-)) (c) Perform tests properly;

((-)) (d) Recognize invalid tests;

((-)) (e) Calculate fit factors properly if required.

**Notes:** ((\*) 1. No specific training program or certification is required for those who conduct fit tests.

((-You)) 2. The employer should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.

((-You)) 3. The employer can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit [www.ansi.org](http://www.ansi.org) or [www.aiha.org](http://www.aiha.org).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-608 Training.**

~~((You))~~ **Employer responsibility:**

To make sure employees who are required to use respirators understand and can demonstrate proper respirator use and maintenance.

**IMPORTANT:**

This section applies to employees who voluntarily use respirators only when training is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-60805 Provide effective training.**

~~((You must:~~

\*) (1) The employer must train employees, based on their duties, if they do any of the following:

((-)) (a) Use respirators;

((-)) (b) Supervise respirator users;

((-)) (c) Issue, repair, or adjust respirators;

((\*) (2) The employer must present effective training in a way that employees understand.

**Notes:** ((\*) 1. Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.

((-You)) 2. The employer may want to have instructors available when using video or automated training methods to:

((-)) a. Encourage and provide responses to questions for the benefit of employees;

((-)) b. Evaluate employees' understanding of the material;

((-)) c. Provide other instructional interaction to employees.

~~((You must:~~

\*) (3) The employer must make sure a qualified instructor provides training.

((\*) (4) The employer must provide training, at no cost to the employee, at these times:

((-)) (a) Initially, before worksite respirator use begins;

((-)) (b) Periodically, within twelve months of the previous training;

((-)) (c) Additionally, when the following occur:

((■)) (i) The employee has not retained knowledge or skills;

**OR**

((■)) (ii) Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

**Notes:** ((-You)) 1. The employer may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:

((-You)) a. The employer can demonstrate the employee received training within the past twelve months;

**AND**

((-)) b. The employee can demonstrate the knowledge and skills to use required respirators effectively.

~~((\*) 2. If (you) the employer accepts an employee's previous training to satisfy the initial training requirement, ((you are) the employer is still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within twelve months of the employee's previous training.~~

~~((You must:~~

~~\*) (5) The employer must make sure employees can demonstrate the following knowledge and skills as required by their duties:~~

~~((-) (a) Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms;~~

~~((-) (b) The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators cannot be used in oxygen-deficient conditions;~~

~~((-) (c) How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability;~~

~~((-) (d) How to properly inspect, put on, seal check, use, and remove the respirator;~~

~~((-) (e) How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else;~~

~~((-) (f) How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored;~~

~~((-) (g) Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness;~~

~~((-) (h) The employer's general obligations under this part. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-610 Maintenance.**

~~((You must:~~ **Employer responsibility:**

To make sure respirators are maintained so they will function properly and not create health hazards such as skin irritation.

~~((You must:~~

~~Maintain respirators in a clean and reliable condition~~

~~WAC 296-307-61005~~

~~Store respirators properly~~

~~WAC 296-307-61010~~

~~Inspect and repair respirators~~

~~WAC 296-307-61015))~~

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Maintain respirators in a clean and reliable condition.</u>	<u>WAC 296-307-61005</u>
<u>Store respirators properly.</u>	<u>WAC 296-307-61010</u>
<u>Inspect and repair respirators.</u>	<u>WAC 296-307-61015</u>

**IMPORTANT:**

This section applies to employees who voluntarily use respirators only when maintenance is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61005 Maintain respirators in a clean and reliable condition.**

~~((You must:~~

~~\*) (1) The employer must make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order. Do at least the following:~~

~~((-) Clean and disinfect respirators as often as specified in Table 8 of this section.~~

**Notes:**

~~((\*) 1. Use required cleaning and disinfecting procedures in WAC 296-307-62015, or the manufacturer's procedures that:~~

~~((-) a. Result in a clean and sanitary respirator;~~

~~((-) b. Do not damage the respirator;~~

~~((-) c. Do not harm the user;~~

~~((\*) 2. Automated cleaning and disinfecting are permitted;~~

~~((\*) 3. Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.~~

~~((You must:~~

~~\*) (2) The employer must make sure respirators are assembled properly after cleaning or disinfecting.~~

Use Table 8 to determine how often to clean and disinfect respirators.

**Table 8**

**Required Frequencies for Cleaning and Disinfecting Respirators**

<b>If, the respirator will be . . .</b>	<b>Then, clean and disinfect the respirator . . .</b>
<ul style="list-style-type: none"> <li>Used exclusively by one employee</li> </ul>	<ul style="list-style-type: none"> <li>As often as needed to:                             <ul style="list-style-type: none"> <li>Keep it clean and functional</li> <li>AND</li> <li>To prevent health hazards such as skin irritation</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Shared for nonemergency use</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>Used for fit-testing or training</li> </ul>	<ul style="list-style-type: none"> <li><b>Before</b> it is worn by another employee</li> </ul>
<ul style="list-style-type: none"> <li>Shared for emergency use</li> </ul>	<ul style="list-style-type: none"> <li><b>After</b> each use so the respirator is immediately ready for use at all times</li> </ul>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61010 Store respirators properly.**

~~((You must:))~~

\*) (1) The employer must store respirators to protect them from ALL of the following:

- ((-) (a) Deformation of the facepiece or exhalation valve;
- ((-) (b) Sunlight or extreme temperatures or other conditions;
- ((-) (c) Contamination such as dust or damaging chemicals;
- ((-) (d) Excessive moisture.

**Note:** Use coffee cans, sealable plastic bags, or other suitable means of protection.

~~((You must:))~~

\*) (2) The employer must follow these additional requirements for emergency respirators:

- ((-) (a) Keep respirators accessible to the work area;
- ((-) (b) Store respirators in compartments or with covers clearly marked as containing emergency respirators;
- ((-) (c) Follow additional storage instructions from the respirator manufacturer;
- ((-) (d) Store an adequate number of emergency respirators in each area where they may be needed.

**Note:** Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61015 Inspect and repair respirators.**

~~((You must:))~~

\*) (1) The employer must conduct respirator inspections as often as specified in Table 9.

(\*) (2) The employer must make sure respirator inspections cover **all** of the following:

- ((-) (a) Respirator function;
- ((-) (b) Tightness of connections;
- ((-) (c) The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters;
- ((-) (d) Pliability and deterioration of elastomeric parts;
- ((-) (e) Maintenance of air or oxygen cylinders;
- ((-) (f) Making sure SCBA air cylinders are at ninety percent of the manufacturer's recommended pressure level;
- ((-) (g) Proper functioning of SCBA regulators when air-flow is activated;
- ((-) (h) Proper functioning of SCBA low-pressure warning devices when activated.

(\*) (3) The employer must certify inspections for emergency respirators by documenting the following:

- ((-) (a) Inspection date;
- ((-) (b) Serial number of each respirator or other identifying information;
- ((-) (c) Inspector's name or signature;
- ((-) (d) Inspection findings;
- ((-) (e) Required action, if problems are found.

**Note:** ((\*) When documenting inspections ((you)) the employer may either:

((-) 1. Provide the information on a tag or label and attach it to the respirator compartment;

**OR**

((-) 2. Include the information in an inspection report stored in paper or electronic files accessible to employees.

~~((You must:))~~

\*) (4) The employer must repair or replace any respirator that is not functioning properly **before** the employee returns to a situation where respirators are required.

((-) (a) If respirators fail inspection or are not functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance, **ALL** of the following apply:

((\*) (i) **Do NOT** permit such respirators to be used until properly repaired or adjusted;

((\*) (ii) Use only NIOSH-certified parts;

((\*) (iii) Make sure repairs and adjustments are made by appropriately trained individuals.

((-) (b) Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.

((\*) (c) Follow the manufacturer's recommendations and specifications for the type and extent of repairs.

Use Table 9 to determine how often to inspect respirators.

**Table 9**

**Required Frequencies for Respirator Inspections**

If the respirator is . . .	Then inspect . . .
A SCBA in any use	<ul style="list-style-type: none"> <li>• Before <b>each</b> use</li> <li>AND</li> <li>• During cleaning</li> <li>OR</li> <li>• Monthly if <b>NOT</b> used</li> </ul>
Used for nonemergencies, including day-to-day or infrequent use	<ul style="list-style-type: none"> <li>• Inspect before each use</li> <li>AND</li> <li>• During cleaning</li> </ul>
Used only for emergencies	<ul style="list-style-type: none"> <li>• Check for proper function before <b>and</b> after <b>each</b> use</li> <li>AND</li> <li>• Inspect at least monthly as instructed by the manufacturer</li> </ul>
Used for escape-only purposes	<ul style="list-style-type: none"> <li>• Before carrying into a work place for use</li> </ul>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-612 Safe use and removal of respirators.**

~~((You))~~ Employer responsibility:

To make sure respirator use and removal is safe.

**Exemption:** These sections do NOT apply to employees who voluntarily use any type of respirator. See WAC 296-307-598 for voluntary use requirements.

~~((You must: Prevent sealing problems with tight-fitting respirators WAC 296-307-61205 Make sure employees leave the use area before removing respirators WAC 296-307-61210.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Prevent sealing problems with tight-fitting respirators.</u>	<u>WAC 296-307-61205</u>
<u>Make sure employees leave the use area before removing respirators.</u>	<u>WAC 296-307-61210</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61205 Prevent sealing problems with tight-fitting respirators.**

~~((You must:~~

~~\*) (1) The employer must make sure employees use the procedure in WAC 296-307-62020 to perform a user seal check each time they put on their tight-fitting respirator.~~

~~((\*) (2) The employer must make sure ((you)) employees do NOT ((permit)) use a respirator ((use)) if employees have a characteristic that interferes with the respirator face-piece seal or valve function. For example, stubble, moustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.~~

~~((\*) (3) The employer must make sure corrective glasses or personal protective equipment (PPE) do NOT interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, faceshields, clothing, and hard hats.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61210 Make sure employees leave the use area before removing respirators.**

~~((You must:~~

~~\*) The employer must make sure employees leave the use area for any of these reasons:~~

~~((-) (1) To replace air-purifying filters, cartridges, or canisters;~~

~~((-) (2) When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the face-piece seal;~~

~~((-) (3) When they detect changes in breathing resistance;~~

~~((-) (4) To readjust their respirators;~~

~~((-) (5) To wash their faces and respirators as necessary to prevent skin or eye irritation;~~

~~((-) (6) If they become ill;~~

~~((-) (7) If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-614 Standby requirements for immediately dangerous to life or health (IDLH) conditions.**

~~((You)) Employer responsibility:~~

To provide adequate assistance to employees using respirators in conditions immediately dangerous to life or health (IDLH).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61405 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.**

**IMPORTANT:**

WISHA currently uses the IDLH values in the 1990 NIOSH *Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. ~~((You))~~ The employer may use more recent editions of this guide. Visit (~~www.ede.gov/niosh~~) <https://www.cdc.gov/niosh> for more information.

~~((You must:~~

~~\*) (1) The employer must provide at least two standby employees outside the IDLH area.~~

**Note:** ~~((You))~~ The employer need only one standby employee if the IDLH condition is well characterized, will remain stable AND ~~((you))~~ the employer can show one employee can adequately do ALL of the following:

~~((\*) 1. Monitor employees in the IDLH area;~~

~~((\*) 2. Implement communication;~~

~~((\*) 3. Initiate rescue duties.~~

~~((\*) (2) The employer must train and equip standby employees to provide effective emergency rescue. Equip them with:~~

~~((-) (a) A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee;~~

~~((-) (b) Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue;~~

~~((\*) (3) The employer must make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area;~~

~~((\*) (4) The employer must make sure that in the event of an emergency:~~

~~((-) (a) Standby employees notify ((you)) the employer or ((you)) the employer's designee before they enter the IDLH area to provide emergency rescue;~~

~~((-You)) (b) The employer provides necessary assistance when notified.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-616 Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.**

~~((You must))~~ **Employer responsibility:**

To provide employees who use SCBAs or air-line respirators with an acceptable air supply.

~~((You must:~~

~~Make sure breathing air and oxygen meet established specifications~~

~~WAC 296-307-61605~~

~~Prevent conditions that could create a hazardous breathing air supply~~

~~WAC 296-307-61610~~

~~Make sure compressors do not create a hazardous breathing air supply~~

~~WAC 296-307-61615.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Make sure breathing air and oxygen meet established specifications.</u>	<u>WAC 296-307-61605</u>
<u>Prevent conditions that could create a hazardous breathing air supply.</u>	<u>WAC 296-307-61610</u>
<u>Make sure compressors do not create a hazardous breathing air supply.</u>	<u>WAC 296-307-61615</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61605 Make sure breathing air and oxygen meet established specifications.**

~~((You must:~~

~~\*) (1) The employer must make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen according to the following:~~

~~((-) Compressed breathing air must meet the following specifications for Grade D air:~~

~~((■)) (a) Oxygen (volume/volume) within 19.5-23.5%;~~

~~((■)) (b) Hydrocarbon (condensed): NO MORE than five milligrams per cubic meter of air;~~

~~((■)) (c) Carbon monoxide (CO): NO MORE than ten parts per million (ppm);~~

~~((■)) (d) Carbon dioxide (CO<sub>2</sub>): NO MORE than 1,000 ppm;~~

~~((■)) (e) No noticeable odor.~~

**Reference:** See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

~~((You must:~~

~~\*) (2) The employer must make sure the moisture content of the air supplied meets the following:~~

~~((-) (a) Air supplied to respirators from cylinders must NOT exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.~~

~~((-) (b) Compressor supplied air must NOT exceed a dew point of 10°F (or 5.56°C) BELOW the use temperature at 1 atmospheric pressure.~~

~~((\*) (3) The employer must make sure cylinders obtained from a supplier of breathing air must have a certificate of analysis that verifies each cylinder's contents meet Grade D and dew point standards.~~

~~((\*) (4) The employer must make sure compressed and liquid oxygen ((must)) meet the United States Pharmacopoeia requirements for medical or breathing oxygen.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61610 Prevent conditions that could create a hazardous breathing air supply.**

~~((You must:~~

~~\*) (1) The employer must use SCBA and air-line respirators safely:~~

~~((-) Do NOT supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.~~

**Note:** Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

~~((You must:~~

~~\*) (2) The employer must use breathing air couplings on air-line respirators that are NOT compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.~~

~~((-Do)) (3) The employer must NOT allow asphyxiating substances to enter breathing air lines; for example, do not flush nitrogen through worksite air lines also used for breathing air.~~

~~((\*) (4) The employer must use equipment specifically designed for oxygen service or distribution IF oxygen concentrations greater than 23.5% are used.~~

**Note:** Respiratory equipment NOT designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

~~((You must:~~

~~\*) (5) The employer must make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 C.F.R. Parts 173 and 178.~~

**Notes:** ((\*) 1. Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations.

((\*) 2. To find any Code of Federal Regulations (C.F.R.) visit: [www.access.gpo.gov](http://www.access.gpo.gov).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61615 Make sure compressors do not create a hazardous breathing air supply.**

**IMPORTANT:**



((\*) 1. Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.

((\*) 2. Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

~~((You must:))~~

(1) The employer must locate or modify compressor intakes so they will not pick up contaminated air OR exhaust gases such as carbon monoxide from:

((\*) (a) Fuel-powered vehicles;

OR

((\*) (b) The internal combustion motor of the compressor;

OR

((\*) (c) Other contaminant sources in the area, for example, a ventilation system discharge.

**Notes:** ~~((You))~~ 1. The employer may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.

((\*) 2. Be aware that exhaust gases may not adequately disperse when the compressor is operated in:

((-) a. An enclosed space such as a small room, a corner, or near a wall;

OR

((-) b. In turbulent wind conditions.

~~((You must:))~~

(2) The employer must equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:

((\*) (a) Periodically change or clean them according to the manufacturer or supplier's instructions;

((\*) (b) Keep a tag at the compressor with the following information:

((-) (i) When the sorbent and filters were last replaced or cleaned;

((-) (ii) The date of the most recent changes or cleaning;

((-) (iii) The signature of the person authorized by the employer to perform changes or cleaning.

**Note:** To be sure ~~((you are))~~ the employer is providing the recommended operating pressure for respirators, ~~((you))~~ the employer may need to install a delivery pressure gauge at the point where the manifold respirator hose is attached.

~~((You must:))~~

(3) The employer must make sure the carbon monoxide (CO) level in breathing air from compressors does NOT exceed ten parts per million (ppm).

**Note:** If ~~((you do))~~ the employer does not have a reliable CO-free area available for locating ~~((you))~~ compressor intake, consider these examples of methods to prevent CO contamination of the air supply:

((\*) 1. Use of continuous and effective carbon monoxide alarms and filters;

((\*) 2. Conduct frequent monitoring of air quality;

((\*) 3. Use a CO converter (converts CO to carbon dioxide).

~~((You must:))~~

~~((You))~~ (4) The employer must maintain CO levels in oil lubricated compressors by using at least one of the following:

((-) (a) An effective CO alarm;

((-) (b) An effective high temperature alarm AND testing the air supply often enough to see if CO levels exceed ten ppm.

**Notes:** ((\*) 1. How often to test depends on a number of considerations, for example:

((-) a. Compressor age;

((-) b. Maintenance history of the compressor;

((-) c. Stability of CO readings.

((\*) 2. If the CO or high temperature alarm cannot be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used.

((\*) 3. Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating.

((\*) 4. Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs.

((-) Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system.

~~((You need))~~ 5. The employer needs to instruct employees to move to a safe area when the alarm sounds AND to stop using respirators.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-618 Labeling of air-purifying respirator filters, cartridges, and canisters.**

~~((You))~~ Employer responsibility:

To make sure employees, their supervisors, and program administrators can easily check for the correct air-purifying filters, cartridges, and canisters on respirators.

**Exemption:** This section does NOT apply to filtering-facepiece respirators when used voluntarily. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-61805 Keep labels readable on respirator filters, cartridges, and canisters during use.**

~~((You must:))~~

~~((You))~~ The employer must make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-620 Required procedures for respiratory protection program.**

~~((You))~~ Employer responsibility:

To use the procedures and questionnaire provided in this section when implementing ~~((you))~~ a respiratory protection program.

~~((You must:))~~

Use this medical questionnaire for medical evaluations

~~WAC 296-307-62005~~

~~Follow these fit-testing procedures for tight-fitting respirators~~

~~WAC 296-307-62010~~

~~Follow procedures established for cleaning and disinfecting respirators~~

~~WAC 296-307-62015~~

~~Follow procedures established for seal checking respirators~~

~~WAC 296-307-62020~~

<b>The employer must meet the requirements...</b>	<b>in this section:</b>
Use this medical questionnaire for medical evaluations.	<u>WAC 296-307-62005</u>
Follow these fit-testing procedures for tight-fitting respirators.	<u>WAC 296-307-62010</u>
Follow procedures established for cleaning and disinfecting respirators.	<u>WAC 296-307-62015</u>
Follow procedures established for seal checking respirators.	<u>WAC 296-307-62020</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62005 Use this medical questionnaire for medical evaluations.**

~~((You must:))~~

~~\*) The employer must use the medical questionnaire in Table 10 when conducting medical evaluations.~~

~~Note: ((+You)) 1. The employer may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.~~

~~((+You)) 2. The employer may use online questionnaires if the questions are the same and the requirements in WAC 296-307-604 of this part are met.~~

~~((+You)) 3. The employer may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.~~

~~((\*) 4. The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.~~

**Table 10**

<b>WISHA Medical Evaluation Questionnaire</b>
<b>Employer instructions:</b>
<ul style="list-style-type: none"> <li><del>((You)) The employer may use online questionnaires if the requirements in WAC 296-307-60405 are met.</del></li> <li><del>((You)) The employer must tell ((you)) the employee how to deliver or send the completed questionnaire to the health care provider ((you have)) the employer selected.</del></li> <li><del>((You)) The employer must NOT review employees' questionnaires.</del></li> </ul>
<b>Health care provider's instructions:</b>
<ul style="list-style-type: none"> <li><del>Review the information in this questionnaire and any additional information provided ((to you)) by the employer.</del></li> <li><del>((You)) The health care provider may add questions to this questionnaire at ((you)) the discretion of the health care provider; HOWEVER, questions in Parts 1-3 may not be deleted or substantially altered.</del></li> <li><del>Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: Phone consultations to evaluate positive responses, medical tests, and diagnostic procedures.</del></li> <li><del>When ((you)) the health care provider's evaluation is complete, send a copy of ((you)) the written recommendation to the employer AND employee.</del></li> </ul>
<b>Employee information and instructions:</b>
<ul style="list-style-type: none"> <li><del>((You)) The employee's employer must allow ((you)) the employee to answer this questionnaire during normal working hours, or at a time and place that's convenient to ((you)) the employee.</del></li> <li><del>((You)) The employee's employer or supervisor must not look at or review ((you)) the employee's answers at any time.</del></li> </ul>

**Part 1 - Employee Background Information**

**ALL employees must complete this part**

**Please print**

1. Today's date: \_\_\_\_\_
2. Your name: \_\_\_\_\_
3. Your age (to nearest year): \_\_\_\_
4. Sex (circle one): Male / Female
5. Your height: \_\_\_ ft. \_\_\_ in.
6. Your weight: \_\_\_\_ lbs.

7. Your job title: \_\_\_\_\_

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include Area Code): \_\_\_\_\_

9. The best time to call you at this number: \_\_\_\_\_

10. Has your employer told you how to contact the health care professional who will review this questionnaire? Yes / No

11. Check the type of respirator(s) you will be using:

a. \_\_\_ N, R, or P filtering-facepiece respirator (for example, a dust mask, OR an N95 filtering-facepiece respirator).

b. Check all that apply.

Half mask  Full facepiece mask  Helmet hood  Escape

Nonpowered cartridge or canister  Powered air-purifying cartridge respirator (PAPR)

Supplied-air or Air-line

Self-contained breathing apparatus (SCBA):  Demand or  Pressure demand

Other: \_\_\_\_\_

12. Have you previously worn a respirator? Yes / No

If "yes," describe what type(s): \_\_\_\_\_

**Part 2 - General Health Information**  
**ALL employees must complete this part**  
**Please circle "Yes" or "No"**

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month? Yes / No

2. Have you *ever had* any of the following conditions?

a. Seizures (fits): Yes / No

b. Diabetes (sugar disease): Yes / No

c. Allergic reactions that interfere with your breathing: Yes / No

d. Claustrophobia (fear of closed-in places): Yes / No

e. Trouble smelling odors: Yes / No

3. Have you *ever had* any of the following pulmonary or lung problems?

a. Asbestosis: Yes / No

b. Asthma: Yes / No

c. Chronic bronchitis: Yes / No

d. Emphysema: Yes / No

e. Pneumonia: Yes / No

f. Tuberculosis: Yes / No

g. Silicosis: Yes / No

h. Pneumothorax (collapsed lung): Yes / No

i. Lung cancer: Yes / No

j. Broken ribs: Yes / No

k. Any chest injuries or surgeries: Yes / No

l. Any other lung problem that you have been told about: Yes / No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?

a. Shortness of breath: Yes / No

b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes / No

c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes / No

d. Have to stop for breath when walking at your own pace on level ground: Yes / No

e. Shortness of breath when washing or dressing yourself:	Yes	/	No
f. Shortness of breath that interferes with your job:	Yes	/	No
g. Coughing that produces phlegm (thick sputum):	Yes	/	No
h. Coughing that wakes you early in the morning:	Yes	/	No
i. Coughing that occurs mostly when you are lying down:	Yes	/	No
j. Coughing up blood in the last month:	Yes	/	No
k. Wheezing:	Yes	/	No
l. Wheezing that interferes with your job:	Yes	/	No
m. Chest pain when you breathe deeply:	Yes	/	No
n. Any other symptoms that you think may be related to lung problems:	Yes	/	No
5. Have you <i>ever had</i> any of the following cardiovascular or heart problems?	Yes	/	No
a. Heart attack:	Yes	/	No
b. Stroke:	Yes	/	No
c. Angina:	Yes	/	No
d. Heart failure:	Yes	/	No
e. Swelling in your legs or feet (not caused by walking):	Yes	/	No
f. Heart arrhythmia (heart beating irregularly):	Yes	/	No
g. High blood pressure:	Yes	/	No
h. Any other heart problem that you have been told about:	Yes	/	No
6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms?			
a. Frequent pain or tightness in your chest:	Yes	/	No
b. Pain or tightness in your chest during physical activity:	Yes	/	No
c. Pain or tightness in your chest that interferes with your job:	Yes	/	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e. Heartburn or indigestion that's not related to eating:	Yes	/	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No
7. Do you <i>currently</i> take medication for any of the following problems?	Yes	/	No
a. Breathing or lung problems:	Yes	/	No
b. Heart trouble:	Yes	/	No
c. Blood pressure:	Yes	/	No
d. Seizures (fits):	Yes	/	No
8. If you have used a respirator, have you <i>ever had</i> any of the following problems? (If you have never used a respirator, check the following space and go to question 9): ____			
a. Eye irritation:	Yes	/	No
b. Skin allergies or rashes:	Yes	/	No
c. Anxiety:	Yes	/	No
d. General weakness or fatigue:	Yes	/	No
e. Any other problem that interferes with your use of a respirator?	Yes	/	No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers?	Yes	/	No

**Part 3 - Additional Questions for Users of Full-Facepiece Respirators or SCBAs**

**Please circle "Yes" or "No"**

1. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)?	Yes	/	No
2. Do you <i>currently</i> have any of these vision problems?			

a. Need to wear contact lenses:	Yes	/	No
b. Need to wear glasses:	Yes	/	No
c. Color blindness:	Yes	/	No
d. Any other eye or vision problem:	Yes	/	No
3. Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	Yes	/	No
4. Do you <i>currently</i> have any of these hearing problems?			
a. Difficulty hearing:	Yes	/	No
b. Need to wear a hearing aid:	Yes	/	No
c. Any other hearing or ear problem:	Yes	/	No
5. Have you <i>ever had</i> a back injury?	Yes	/	No
6. Do you <i>currently</i> have any of the following musculoskeletal problems?			
a. Weakness in any of your arms, hands, legs, or feet:	Yes	/	No
b. Back pain:	Yes	/	No
c. Difficulty fully moving your arms and legs:	Yes	/	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	/	No
e. Difficulty fully moving your head up or down:	Yes	/	No
f. Difficulty fully moving your head side to side:	Yes	/	No
g. Difficulty bending at your knees:	Yes	/	No
h. Difficulty squatting to the ground:	Yes	/	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	/	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	/	No

**Part 4 - Discretionary Questions**

**Complete questions in this part ONLY IF your employer's health care provider says they are necessary**

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	Yes	/	No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions:	Yes	/	No
2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as gases, fumes, or dust), OR have you come into skin contact with hazardous chemicals?	Yes	/	No
If "yes," name the chemicals, if you know them: _____			
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:			
a. Asbestos?	Yes	/	No
b. Silica (for example, in sandblasting)?	Yes	/	No
c. Tungsten/cobalt (for example, grinding or welding this material)?	Yes	/	No
d. Beryllium?	Yes	/	No
e. Aluminum?	Yes	/	No
f. Coal (for example, mining)?	Yes	/	No
g. Iron?	Yes	/	No
h. Tin?	Yes	/	No
i. Dusty environments?	Yes	/	No
j. Any other hazardous exposures?	Yes	/	No
If "yes," describe these exposures: _____			
4. List any second jobs or side businesses you have: _____			
5. List your previous occupations: _____			
6. List your current and previous hobbies: _____			

7. Have you been in the military services?	Yes	/	No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?	Yes	/	No
8. Have you ever worked on a HAZMAT team?	Yes	/	No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?	Yes	/	No
If "yes," name the medications if you know them: _____			
10. Will you be using any of the following items with your respirator(s)?			
a. HEPA filters:	Yes	/	No
b. Canisters (for example, gas masks):	Yes	/	No
c. Cartridges:	Yes	/	No
11. How often are you expected to use the respirator(s)?			
a. Escape-only (no rescue):	Yes	/	No
b. Emergency rescue only:	Yes	/	No
c. Less than 5 hours <i>per week</i> :	Yes	/	No
d. Less than 2 hours <i>per day</i> :	Yes	/	No
e. 2 to 4 hours per day:	Yes	/	No
f. Over 4 hours per day:			
12. During the period you are using the respirator(s), is your work effort:			
a. <i>Light</i> (less than 200 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.			
b. <i>Moderate</i> (200 to 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.			
c. <i>Heavy</i> (above 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).			
13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator?	Yes	/	No
If "yes," describe this protective clothing and/or equipment: _____			
14. Will you be working under hot conditions (temperature exceeding 77°F):	Yes	/	No
15. Will you be working under humid conditions:	Yes	/	No
16. Describe the work you will be doing while using your respirator(s): _____			
17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases): _____			
18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):			

Name of the first toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 Name of the second toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 Name of the third toxic substance: \_\_\_\_\_  
 Estimated maximum exposure level per shift: \_\_\_\_\_  
 Duration of exposure per shift: \_\_\_\_\_  
 The name of any other toxic substances that you will be exposed to while using your respirator: \_\_\_\_\_  
 19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security). \_\_\_\_\_

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62010 Follow these fit-testing procedures for tight-fitting respirators.**

**IMPORTANT:**

((\*) 1. This section contains procedural requirements that apply during actual fit testing.

((\*) 2. See WAC 296-307-606 of this part for fit-testing requirements that apply to ~~((you))~~ the employer's overall program.

**Exemption(s):** This section does **NOT** apply to employees who:

((\*) 1. Voluntarily use respirators;

**OR**

((\*) 2. Are required to use mouthpiece respirators.

~~((You must:~~

**\*) The employer must conduct fit testing according to all of the following:**

((-) (1) Follow the procedure in Table 11 to choose a respirator for fit testing:

((■) (a) Prior to conducting fit tests;

**AND**

((■) (b) Any time ~~((you))~~ an employee must select a different respirator such as when a previously selected respirator fails a test.

((-) (2) Select and follow at least one of the following fit test procedures:

((■) (a) Qualitative fit-test procedures:

((♦) (i) Isoamyl acetate vapor (IAA, banana oil) in Table 12;

((♦) (ii) Saccharine aerosol in Table 13;

((♦) (iii) Bitrex™ aerosol in Table 14;

((♦) (iv) Irritant smoke in Table 15;

((■) (b) Quantitative fit-test procedures:

((♦) (i) Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16;

((♦) (ii) Controlled negative pressure (CNP) such as the FitTester 3000™, in Table 17;

((♦) (iii) Generated aerosol in Table 18;

((-) (3) Make sure employees perform the appropriate fit-test exercises listed in Table 19.

((-) (4) Clean and maintain equipment according to the manufacturer's instructions.

((-) (5) Make sure during fit testing employees wear any safety equipment that could:

((■) (a) Interfere with respirator fit;

**AND**

((■) (b) Be worn in the workplace. For example, chemical splash goggles.

((-) (6) Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If ~~((you))~~ the employer finds such conditions, do **NOT** conduct fit testing for that individual.

**Note:** Examples of conditions that may interfere with the respirator seal or valve functions include:

((\*) 1. Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function;

((\*) 2. Temple bars of corrective eyewear or headgear that extend through the face seal area.

**Table 11**

<b>Procedure for Choosing a Respirator for Fit Testing</b>	
<b>1. Inform</b> the employee:	<ul style="list-style-type: none"> <li>• To choose the most comfortable respirator that provides an adequate fit</li> <li>• That each respirator sample represents a different size and, if more than one model is supplied, a different shape</li> <li>• That if fitted and used properly, the respirator chosen will provide adequate protection</li> </ul>
<b>2. Provide</b> a mirror and show the employee how to:	<ul style="list-style-type: none"> <li>• Put on the respirator</li> <li>• Position the respirator on the face</li> <li>• Set strap tension.</li> </ul>
<b>Note:</b>	This instruction does <b>NOT</b> take the place of the employee's formal training since it is only a review.

<b>Procedure for Choosing a Respirator for Fit Testing</b>
<p>3. <b>Review</b> with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.</p> <ul style="list-style-type: none"> <li>• Tell the employee the respirator should be comfortable while talking or wearing eye protection.</li> </ul> <p>4. <b>Have the employee</b> hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:</p> <ul style="list-style-type: none"> <li>• Reject any facepiece that clearly does not feel comfortable or fit adequately</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Choose which facepiece is most acceptable and which is less acceptable, if any.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that's acceptable and fits correctly</li> <li>• To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.</li> </ul> <p>5. <b>Have the employee wear</b> the most acceptable respirator for <b>AT LEAST 5 minutes</b> to evaluate comfort and fit. Do <b>ALL</b> of the following during this time:</p> <ul style="list-style-type: none"> <li>• Ask the employee to observe and comment about the comfort and fit:                     <ul style="list-style-type: none"> <li>- Around the nose, cheeks, and other areas on the face</li> <li>- When talking or wearing eye protection</li> </ul> </li> <li>• Have the employee put on the respirator and adjust the straps until they show proficiency</li> <li>• Evaluate the respirator's general fit by checking:                     <ul style="list-style-type: none"> <li>- Proper chin placement</li> <li>- Properly tightened straps (do <b>NOT</b> over tighten)</li> <li>- Acceptable fit across the nose bridge</li> <li>- Respirator size; it must span the distance from nose to chin</li> <li>- To see if the respirator stays in position</li> </ul> </li> <li>• Have the employee complete a successful seal check as specified in WAC 296-307-62020 of this chapter                     <ul style="list-style-type: none"> <li>- Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths <b>WHILE SLOWLY:</b> <ul style="list-style-type: none"> <li>■ Moving their head from side-to-side</li> </ul> </li> <li><b>AND</b></li> <li>■ Up and down.</li> </ul> </li> </ul> <p>6. <b>If the employee finds the respirator unacceptable</b>, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.</p> <p>7. <b>Before starting the fit test</b>, you must:</p>

<b>Procedure for Choosing a Respirator for Fit Testing</b>
<ul style="list-style-type: none"> <li>• Describe the fit test including screening procedures, employee responsibilities, and test exercises</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• Make sure the employee wears the respirator <b>AT LEAST</b> five minutes.</li> </ul>

**Table 12**

<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor                     <ul style="list-style-type: none"> <li>- Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:                             <ul style="list-style-type: none"> <li>■ Prepare <b>ALL</b> solutions in a location separate from screening and test areas</li> <li>■ Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air</li> </ul> </li> <li>- Always use odor-free water, for example, distilled or spring water that's 25°C (77°F).</li> </ul> </li> <li>• Isoamyl acetate is also known as isopentyl acetate.</li> </ul>
<b>Screening Preparations</b>
<p><b>Important:</b></p> <p>Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.</p> <ol style="list-style-type: none"> <li>1. Choose an appropriate location to conduct screening.                     <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> </li> <li>2. Prepare a stock solution <b>AT LEAST</b> weekly as follows:                     <ul style="list-style-type: none"> <li>• Add one milliliter (ml) of pure IAA to 800 ml of odor-free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> <li>• Clean the dropper or pipette.</li> </ul> </li> <li>3. Prepare the odor test solution daily as follows:                     <ul style="list-style-type: none"> <li>• Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper</li> <li>• Seal the jar with the lid and shake it for 30 seconds</li> <li>• Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium</li> <li>• Label this jar so you know the contents but the employee cannot know its contents, for example, "1."</li> </ul> </li> </ol>



Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p><b>Note:</b> To maintain the integrity of the test, use labels that peel off easily AND periodically switch the labels.</p> <p>4. Prepare a "test blank" solution as follows:</p> <ul style="list-style-type: none"> <li>• Add 500 ml of odor-free water to a one liter glass jar with a metal lid</li> <li>• Seal the jar</li> <li>• Label the jar so you know the contents but the employee cannot know its contents.</li> </ul> <p>5. Type or neatly print the following instructions on a card and place it on the table in front of the two test jars:</p> <p><i>"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one ALSO contains a small amount of banana oil.</i></p> <p><i>Make sure the lid is secure then pick up a jar and shake it for two seconds. Open the jar and sniff at the opening. Repeat this for the second jar.</i></p> <p><i>Tell the individual conducting the fit test which jar contains banana oil."</i></p>
Test Preparations
<p>6. Choose an appropriate location to conduct fit testing.</p> <ul style="list-style-type: none"> <li>• Conduct screening and tests in separate well-ventilated rooms.</li> </ul> <p>7. Assemble the fit test enclosure in the room.</p> <ul style="list-style-type: none"> <li>• Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other light-weight rigid material OR construct a similar enclosure using plastic sheeting</li> <li>• Hang the frame with the plastic covering so the top of the enclosure is about six inches above the employee's head</li> <li>• Attach a small hook inside top center of the enclosure</li> <li>• Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it.</li> </ul> <p>8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.</p> <p>9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material AND 0.75 ml of pure IAA. Do NOT apply IAA yet.</p> <p><b>Note:</b> As an alternative to using the paper towel, you may use an IAA test swab OR ampoule if it has been demonstrated to generate an equivalent test concentration.</p>
Screening

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p>10. Have the employee, while NOT wearing a respirator, follow the instructions on the card provided.</p> <ul style="list-style-type: none"> <li>• If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11)</li> <li>• If the employee is NOT able to correctly identify the jar containing IAA, you must STOP and use a different fit test protocol.</li> </ul>
Test
<p>11. BEFORE entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.</p> <p>12. Wet the paper towel with 0.75 ml of pure IAA AND fold it in half.</p> <p>13. Pass the paper towel to the employee inside the enclosure AND instruct the employee to hang it on the hook at the top of the enclosure.</p> <p>14. Wait two minutes for the IAA vapor to fill the enclosure.</p> <ul style="list-style-type: none"> <li>• While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test</li> <li>• You may also demonstrate the test exercises.</li> </ul> <p>15. Have the employee perform the appropriate fit-test exercises in Table 19.</p> <ul style="list-style-type: none"> <li>• If the employee does NOT detect IAA while performing test exercises, the fit test has been PASSED. Proceed as follows: <ul style="list-style-type: none"> <li>- BEFORE leaving the enclosure, have the employee break the respirator seal and inhale. If they detect IAA, the test is valid</li> <li>- When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests</li> <li>- The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination</li> </ul> </li> <li>• If the employee detects IAA during any test exercise, the fit test has FAILED. STOP and have the employee do the following: <ul style="list-style-type: none"> <li>- Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity</li> <li>- Select another respirator</li> <li>- Repeat screening and testing</li> </ul> </li> </ul>

<b>Isoamyl Acetate (Banana Oil) Vapor Test Procedure</b>
<ul style="list-style-type: none"> <li>■ At this stage, if the employee fails the screening part of this procedure, the employee can repeat it <b>AFTER</b> waiting at least five minutes for odor sensitivity to return.</li> </ul>

**Table 13**

<b>Saccharin Aerosol Test Procedure</b>
<b>Screening Preparations</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• Taste threshold screening determines whether the employee being tested can detect the taste of saccharin             <ul style="list-style-type: none"> <li>- The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening</li> <li>- Nebulizers must be thoroughly rinsed in water and shaken dry:                 <ul style="list-style-type: none"> <li>■ Each morning and afternoon</li> </ul> </li> </ul> </li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>■ At least every four hours.</li> </ul> <ul style="list-style-type: none"> <li>• You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure (hood) that meets the following specifications:</p> <ul style="list-style-type: none"> <li>• Twelve inches in diameter by fourteen inches tall</li> <li>• A clear front portion</li> <li>• Enough space inside to allow free movement of the head when a respirator is worn</li> <li>• A 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>• This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent.</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>• Dissolve 83.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>• <b>IF</b> you have already prepared the fit-test solution, you can make the screening solution by adding 1 ml of this solution to 100 ml of distilled water.</li> </ul>

<b>Saccharin Aerosol Test Procedure</b>
<p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit-test solution as follows:</p> <ul style="list-style-type: none"> <li>• Add 83.0 grams of sodium saccharin to 100 ml of warm water.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>• Mark this nebulizer to distinguish it from the one used for screening</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
<b>Screening</b>
<p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly open mouth with tongue extended during screening <b>AND</b> testing</li> <li>• Immediately report when a sweet taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer saccharin as follows:</p> <ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul> <p>11. Ask the employee if a sweet taste is detected.</p> <ul style="list-style-type: none"> <li>• <b>IF YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you:             <ul style="list-style-type: none"> <li>- Ask the employee to remember the taste for reference during the fit test</li> <li>- Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed</li> </ul> </li> <li>• <b>IF NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a sweet taste is reported.</p> <ul style="list-style-type: none"> <li>• If a sweet taste is still <b>NOT</b> detected, repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a sweet taste is reported.</li> </ul> <p>13. If <b>NO</b> sweet taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>

<b>Saccharin Aerosol Test Procedure</b>
<b>Test</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>Periodically check nebulizers to make sure they do not clog during use. A test is <b>NOT</b> valid if the nebulizer is clogged at the end of the test.</li> </ul> <p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).</p> <p>15. Instruct the employee to immediately report if a sweet taste is detected.</p> <p>16. Insert the nebulizer into the front hole of the test enclosure <b>AND</b> administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>The employee must report if a sweet taste is detected:                             <ul style="list-style-type: none"> <li>If <b>NO</b> saccharin is tasted, the test has been <b>PASSED</b> <ul style="list-style-type: none"> <li>If saccharin is tasted the test has <b>FAILED</b>, have the employee select another respirator</li> </ul> </li> <li><b>AND</b> <ul style="list-style-type: none"> <li>Repeat screening and testing.</li> </ul> </li> </ul> </li> </ul>

**Table 14**

<b>Bitrex™ Aerosol Test Procedure</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>This is a qualitative fit-test (QLFT) procedure</li> <li>Bitrex™ (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children shouldn't drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers</li> <li>The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the fit test.</li> </ul>
<b>Screening Preparations</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex™</li> <li>Nebulizers must be thoroughly rinsed in water and shaken dry:                             <ul style="list-style-type: none"> <li>Each morning and afternoon</li> </ul> </li> </ul> <p style="text-align: center;"><b>OR</b></p>

<b>Bitrex™ Aerosol Test Procedure</b>
<ul style="list-style-type: none"> <li>At least every four hours.</li> <li>You may use commercially prepared solutions if they meet the requirements in this procedure.</li> </ul> <p>1. Obtain a test enclosure that meets the following specifications:</p> <ul style="list-style-type: none"> <li>Twelve inches in diameter by fourteen inches tall</li> <li>A clear front portion</li> <li>Enough space inside the front to allow free movement of the head when a respirator is worn</li> <li>3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications</li> <li>This enclosure can also be used for testing.</li> </ul> <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers <b>OR</b> equivalent:</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> <li>Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water</li> <li>Dissolve 13.5 milligrams of Bitrex™ in the salt solution.</li> </ul> <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> <li>Mark this nebulizer to distinguish it from the one to be used for fit testing.</li> </ul>
<b>Test Preparations</b>
<p>5. Prepare the fit test solution.</p> <ul style="list-style-type: none"> <li>Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water</li> <li>Add 337.5 milligrams of Bitrex™ to the warmed salt solution.</li> </ul> <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> <li>Mark this nebulizer to distinguish it from the one used for screening.</li> </ul> <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
<b>Screening</b>
<p><b>Important:</b></p> <p>The employee must <b>NOT</b> eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes <b>BEFORE</b> the screening and test</p> <p>8. Have the employee, while <b>NOT</b> wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p>

<b>Bitrex™ Aerosol Test Procedure</b>
<ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening AND testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>10. Insert the nebulizer into the front hole of the test enclosure AND administer Bitrex™ as follows:</p> <ul style="list-style-type: none"> <li>• Direct the nozzle away from the employee's nose and mouth</li> <li>• Complete 10 squeezes in rapid succession</li> <li>• Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.</li> </ul> <p>11. Ask the employee whether a bitter taste is detected.</p> <ul style="list-style-type: none"> <li>• If <b>YES</b>, screening is completed. Proceed to conduct testing, Step 14, <b>AFTER</b> you:             <ul style="list-style-type: none"> <li>- Ask the employee to remember the taste for reference during the fit test</li> <li>- Note the employee's taste threshold as "10," regardless of the number of squeezes actually completed</li> </ul> </li> <li>• If <b>NO</b>, screening must continue. Proceed to Step 12.</li> </ul> <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; <b>EXCEPT</b> this time note the employee's taste threshold as "20" <b>IF</b> a bitter taste is reported.</p> <ul style="list-style-type: none"> <li>• If a bitter taste is still <b>NOT</b> detected repeat with 10 more squeezes and follow Step 11 one last time; <b>EXCEPT</b> this time note "30" for the taste threshold <b>IF</b> a bitter taste is reported.</li> </ul> <p>13. If <b>NO</b> bitter taste is reported after 30 squeezes, you must <b>STOP</b> and choose a different fit-test protocol for the employee.</p>
<b>Test</b>
<p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.</p> <p>15. Instruct the employee to:</p> <ul style="list-style-type: none"> <li>• Breathe through a slightly opened mouth with tongue extended during screening AND testing</li> <li>• Immediately report when a bitter taste is detected.</li> </ul> <p>16. Insert the nebulizer into the front hole of the test enclosure AND administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> <li>• Replenish the aerosol in the hood <b>EVERY</b> 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15</li> <li>• The employee must report if a bitter taste is detected:             <ul style="list-style-type: none"> <li>- If <b>NO</b> Bitrex™ is tasted, the test has been <b>PASSED</b></li> </ul> </li> </ul>

<b>Bitrex™ Aerosol Test Procedure</b>
<p>- If Bitrex™ is tasted the test has <b>FAILED</b>. Have the employee:</p> <ul style="list-style-type: none"> <li>■ Select another respirator</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>■ Repeat all screening and testing steps.</li> </ul>

**Table 15**

<b>Irritant Smoke (Stannic Chloride) Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• <b>DO NOT USE A TEST ENCLOSURE OR HOOD FOR THIS FIT TEST!</b></li> <li>• This is a qualitative fit-test (QLFT) procedure</li> <li>• During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages</li> <li>• Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke</li> <li>• Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.</li> </ul>
<b>Screening AND Test Preparations</b>
<p><b>Important:</b></p> <p>Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke <b>AND</b> whether any gross facepiece leakage is detected.</p> <ol style="list-style-type: none"> <li>1. Obtain only stannic chloride (ventilation) smoke tubes, <b>AND</b> an aspirator squeeze bulb <b>OR</b> use a low-flow air pump set to deliver 200 milliliters of air flow per minute.</li> <li>2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high-efficiency particulate air (HEPA) filters.</li> </ol>
<b>Screening</b>
<p><b>Important!</b></p> <p>When performing sensitivity screening checks use only the <b>MINIMUM</b> amount of smoke necessary to elicit a response from the employee.</p> <ol style="list-style-type: none"> <li>3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages <b>AND</b> instruct the employee to keep eyes closed while exposed.</li> </ol>

<b>Irritant Smoke (Stannic Chloride) Test Procedure</b>
<p>4. Break both ends of the ventilation smoke tube AND fit a short piece of plastic tubing, for example, two-to-six inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.</p> <p>5. While the employee is <b>NOT</b> wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties.</p> <ul style="list-style-type: none"> <li>• Carefully direct a small amount of irritant smoke toward the employee.</li> </ul>
<b>Test</b>
<p>Test 6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.</p> <p>7. Remind the employee to keep eyes closed during testing.</p> <p>8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:</p> <ul style="list-style-type: none"> <li>• Begin at least 12 inches from the facepiece AND move the smoke around the whole perimeter of the mask</li> <li>• Gradually make two more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator</li> <li>• <b>STOP</b> at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening.</li> </ul> <p>9. Have the employee perform appropriate fit-test exercises in Table 19 <b>IF</b> the employee has <b>NOT</b> had an involuntary response such as evidence of coughing, flinching, or other response, <b>OR</b> detected smoke in the facepiece.</p> <ul style="list-style-type: none"> <li>• Continue to direct smoke from a distance of 6 inches around the facepiece perimeter                     <ul style="list-style-type: none"> <li>- If smoke is detected at any time the test has <b>FAILED</b>. A different respirator must be chosen and tested, starting with sensitivity screening</li> <li>- If <b>NO</b> smoke is detected proceed to Step 10.</li> </ul> </li> </ul> <p>10. Have the employee remove the respirator AND perform another sensitivity screening check as follows:</p> <ul style="list-style-type: none"> <li>• Continue to use the smoke tube used for fit testing</li> <li>• Carefully direct a <b>SMALL</b> amount of irritant smoke toward the employee                     <ul style="list-style-type: none"> <li>- The test has been <b>PASSED IF</b> the employee responds to the smoke</li> <li>- The fit test is <b>VOIDED IF</b> the employee does <b>NOT</b> respond to the smoke.</li> </ul> </li> </ul>

Table 16

<b>Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative (QNFT) fit-test procedure</li> <li>• This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises</li> <li>• Particles in the ambient air are used as the test aerosol.</li> </ul>
<b>Test Preparations</b>
<p>1. Obtain a test instrument such as a Portacount™.</p> <p>2. Have probed respirators available for each respirator model and size the employer uses, <b>OR</b> have a sampling adapter available if the employee's actual or chosen respirator will be tested.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, <b>AND</b> can only be used for fit-testing purposes</li> <li>• Contact TSI Inc., <b>OR</b> the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters.</li> </ul> <p>3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass <b>OR</b> fail criterion is programmed to the following <b>MINIMUM</b> performance levels:</p> <ul style="list-style-type: none"> <li>• For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level</li> <li>• For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level</li> </ul> <p>4. Have high-efficiency particulate air (HEPA) filters, <b>OR</b> other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.</p> <ul style="list-style-type: none"> <li>• If you'll use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.</li> </ul>
<b>Test</b>
<p>5. Properly attach the sampling line to the facepiece probe or sampling adapter.</p>

<b>Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure</b>
<p>6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator five minutes <b>BEFORE</b> the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:</p> <ul style="list-style-type: none"> <li>• Proper chin placement</li> <li>• Properly tightened straps (do <b>NOT</b> over tighten)</li> <li>• Acceptable fit across the nose bridge</li> <li>• Respirator size. It must span the distance from nose to chin</li> <li>• To see if the respirator stays in position.</li> </ul> <p><b>Note:</b> Wearing the respirator for five minutes permits the employee to make certain the respirator is comfortable <b>AND</b> allows for purging of ambient particles trapped inside the facepiece.</p> <p>7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If <b>NO</b> leakage is detected, proceed to Step 8. If leakage is detected:</p> <ul style="list-style-type: none"> <li>• Determine the cause</li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>• If leakage is due to a poorly fitting facepiece, have the employee:             <ul style="list-style-type: none"> <li>- Choose another respirator size or model</li> </ul> </li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>- Start again at Step 6.</li> </ul> <p>8. Start the fit test cycle.</p> <ul style="list-style-type: none"> <li>• Follow the manufacturer's instructions for operating the test instrument</li> <li>• Have the employee perform the appropriate fit-test exercises in Table 19             <ul style="list-style-type: none"> <li>- The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed                 <ul style="list-style-type: none"> <li>■ The test has been <b>PASSED</b> if the overall fit factor is at least 100 for a half facepiece, <b>OR</b> 500 for a full facepiece</li> <li>■ The test has <b>FAILED</b> if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.</li> </ul> </li> </ul> </li> </ul> <p><b>Note:</b> If the test has failed, have the employee select another respirator model or size following Table 11 <b>AND</b> repeat this procedure.</p>

Table 17

<b>Controlled Negative Pressure (CNP) Test Procedure</b>
<p><b>Important!</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative fit-test (QNFT) procedure</li> <li>• This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure <b>AFTER</b> various premeasurement activities</li> <li>• Measurements occur while employees remain still <b>AND</b> hold their breath for 10 seconds</li> <li>• No test aerosols are used. Respirator cartridges aren't needed for this test.</li> </ul>
<b>Test Preparations</b>
<p>1. Make sure the individual conducting the fit test is thoroughly trained to perform this test.</p> <p>2. Obtain a CNP test instrument such as a FitTester 3000™. Make sure:</p> <ul style="list-style-type: none"> <li>• Defaults are set at:             <ul style="list-style-type: none"> <li>- -15mm (-0.58 inches) of water test pressure</li> </ul> </li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>- A modeled inspiratory flow rate of 53.8 liters per minute</li> </ul> <ul style="list-style-type: none"> <li>• It has an effective audio warning device that signals when employees fail to hold their breath.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• You are not required to obtain test recording and printing equipment such as computers <b>OR</b> printers. Hand recording results is acceptable</li> <li>• To see default settings, check the instrument's "REDON protocol."</li> </ul> <p>3. Obtain facepiece adapters appropriate for each test respirator.</p> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Adapters are either a one-piece (for SCBA facepieces), <b>OR</b> two-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure</li> <li>• To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, <b>OR</b> the respirator manufacturer.</li> </ul>
<b>Test</b>
<p><b>Important!</b></p> <p>After the test, you must ask the employee about the comfort of the respirator <b>AND</b> if the respirator has become unacceptable, another size or model must be chosen and tested.</p>

<b>Controlled Negative Pressure (CNP) Test Procedure</b>
<p>4. Explain the test procedure to the employee.</p> <p>5. Train the employee on how to hold a breath for at least 20 seconds.</p> <p>6. Prepare the respirator for the fit test as follows:</p> <ul style="list-style-type: none"> <li>• Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it</li> <li>• Replace cartridges, if present, with the manifold and breathing valve adapter                             <ul style="list-style-type: none"> <li>- For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve adapter</li> </ul> </li> <li>• Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions.</li> </ul> <p>7. Have the employee put on, adjust, and seal check the respirator.</p> <p>8. Turn on the instrument <b>AND</b> have the employee stand and perform the fit-test exercises in Table 19.</p> <p>9. Interpret the test results:</p> <ul style="list-style-type: none"> <li>• The test is <b>PASSED IF</b> the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece</li> <li>• The test has <b>FAILED IF</b> the fit factor is less than 100 for a half facepiece; 500 for a full facepiece                             <ul style="list-style-type: none"> <li>- If the test has <b>FAILED</b> you must have the employee select another respirator model or size following the steps in Table 11 <b>AND</b> repeat this procedure, starting at Step 6.</li> </ul> </li> </ul>

**Table 18**

<b>Generated Aerosol Test Procedure</b>
<p><b>Important:</b></p> <ul style="list-style-type: none"> <li>• This is a quantitative (QNFT) fit-test procedure</li> <li>• In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises</li> <li>• Special equipment is needed to generate, disperse, detect, and measure test aerosols.</li> </ul>
<b>Test Preparations</b>
<p>1. Test aerosol.</p> <ul style="list-style-type: none"> <li>• Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride.</li> </ul> <p>2. Instrumentation.</p> <ul style="list-style-type: none"> <li>• Do <b>ALL</b> the following:                             <ul style="list-style-type: none"> <li>- Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates</li> <li>- Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation</li> <li>- Select a sampling instrument that allows for a computer record or strip chart record to be created                                     <ul style="list-style-type: none"> <li>■ The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000.</li> </ul> </li> </ul> </li> </ul> <p><b>Note:</b> Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.</p>

### Generated Aerosol Test Procedure

- Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.

#### 3. Test enclosure.

- Do **ALL** the following:
  - Make sure the enclosure is equipped and constructed to effectively:
    - Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **ALL** employees freedom of movement during testing **WITHOUT** disturbing the test concentration or measurement instrument
    - Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air
    - Allow the individual conducting the fit test to view the employee during the test
  - Make sure the tubing used to collect samples from the enclosure **AND** respirator is the same material, diameter, **AND** length. This makes the effect of aerosol loss caused by deposition in each sample line equal
  - If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.

#### 4. Prepare test respirators.

- Do **ALL** the following:
  - Inspect test respirators regularly for missing parts **AND** damage
  - Keep test respirators in proper working order
  - Make sure in-mask sampling probes are:
    - Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth
  - AND**
  - The probe extends inside the facepiece at least 1/4 inch
  - Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **NOT**:
    - Block air flow into the sampling line
    - Leak
    - Interfere with the respirator's fit or performance
- Have high efficiency particulate air (HEPA) filters **OR** P100 series filter available
  - Replace filters when increased breathing resistance is detected **OR** when the test agent has altered the filter material's integrity.

### Test

#### **Important!**

- Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration
- If a single peak penetration exceeds 5% for half facepieces **OR** 1% for full facepieces:
  - **STOP** the test

**AND**

- Have the employee select another respirator for testing.

#### 5. Have the employee attach filters, put on, adjust, and seal check the respirator.

- Be sure to crimp the sampling line to avoid pressure leaks during the seal check

**AND**

- Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **NOT** over tighten.

#### 6. **OPTIONAL Step.** To save time conduct a screening test to quickly identify poorly fitting respirators.

- Note:** You may use a qualitative screening test **OR** an ambient aerosol condensation nuclei counter instrument in the count mode.



### Generated Aerosol Test Procedure

7. Make sure test aerosol concentration is reasonably stable.
  - If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **AFTER** the employee enters the enclosure.
8. Have the employee enter the test enclosure and connect the respirator to the sample lines.
9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
  - Make sure the peak penetration does **NOT** exceed 5% for half facepieces, **OR** 1% for full facepieces.
10. Have employee perform the appropriate fit-test exercises in Table 19.
  - Do **NOT** adjust the respirator once exercises begin.
11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
  - **PASSED IF** the minimum fit factor of 100 for half facepieces **OR** 500 for full facepieces is obtained
  - OR**
  - IF a passing fit factor is **NOT** obtained, the test has **FAILED** and you must have the employee select and test another respirator.

### Calculations

#### **Important!**

- Do **NOT** count the grimace exercise measurements during these calculations
  - Take into account the limitations of instrument detection when determining fit factors.
12. Calculate individual fit factors for **EACH** exercise by applying the following:  
 Exercise fit factor (ffE) = 
$$\frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$$
    - To determine the average test enclosure concentration use one of the following methods:
      - Arithmetic average of the concentration before and after each **test** (an average of two values per entire test)
      - Arithmetic average of concentration before and after each **exercise** (an average of two values per exercise)
      - True average measured continuously during the respirator sample
    - Determine the test aerosol concentration inside the respirator in one of the following ways:
      - Average peak penetration values. Determine aerosol penetration for each exercise by:
        - Using integrators or computers that calculate the actual test agent penetration
        - OR**
        - Average the peak heights shown on the strip chart recording, graph, or by computer integration
      - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value
      - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.
  13. Using individual exercise fit factors (ffE) calculate the **overall fit factor** by doing **ALL** of the following:
    - Convert each exercise fit factor to a penetration value
    - Determine the average penetration value
    - Convert the average penetration value back to a fit factor
    - OR**
    - Use this equation to calculate the **overall fit factor**:

<b>Generated Aerosol Test Procedure</b>	
Overall fit factor =	$\frac{n}{1/ffE1 + 1/ffE2 + 1/ffE3 \dots + 1/ffEn}$

**Table 19**

<b>Fit-Test Exercises</b>			
<b>Important:</b>			
<ul style="list-style-type: none"> <li>• This list applies when you use any fit test</li> <li>• Employees tested must perform ALL exercises marked with an "X" as described for the fit-test procedure used                             <ul style="list-style-type: none"> <li>- Once exercises begin, any adjustments made void the test AND you must begin again</li> <li>- After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing</li> </ul> </li> <li>• When the controlled negative pressure procedure is used, <b>STOP and repeat</b> the test if the employee adjusts the respirator OR takes a breath and fails to hold it for 10 seconds</li> <li>• Controlled negative pressure tests conducted according to the method published in 29 C.F.R. 1910.134, Appendix A are an acceptable alternative to the method outlined below.</li> </ul>			
<b>Description of Required Fit-Test Exercises</b>	<b>Fit-Test Procedures</b>		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
<ul style="list-style-type: none"> <li>• Normal breathing                             <ul style="list-style-type: none"> <li>- Breathe normally, while standing for one minute</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Deep breathing                             <ul style="list-style-type: none"> <li>- Breathe slowly and deeply while standing for one minute</li> <li>- Take caution to avoid hyperventilating</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Head side to side                             <ul style="list-style-type: none"> <li>- Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale</li> <li>- Be careful to NOT bump the respirator</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Head up and down                             <ul style="list-style-type: none"> <li>- Slowly move head up and down while standing for one minute, inhaling in the up position</li> <li>- Be careful to NOT bump the respirator</li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Talking                             <ul style="list-style-type: none"> <li>- Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose ONE of the following:                                     <ul style="list-style-type: none"> <li>■ Read from a prepared text such as the Rainbow Passage<sup>1</sup></li> <li>■ Count backward from 100</li> <li>■ Recite a memorized poem or song.</li> </ul> </li> </ul> </li> </ul>	X	X	
<ul style="list-style-type: none"> <li>• Grimace                             <ul style="list-style-type: none"> <li>- Smile or frown for fifteen seconds.</li> </ul> </li> </ul>		X	
<ul style="list-style-type: none"> <li>• Bending over</li> </ul>			

Fit-Test Exercises			
- Bend over to touch toes while standing. Repeat at a comfortable pace for one minute <b>OR</b> - Jog in place for one minute if the test enclosure, such as a hood, does not permit bending over	X	X	
• Normal breathing - Breathe normally while standing for one minute	X	X	
• Face forward - <b>Premeasurement activity:</b> Stand and breath normally, without talking - <b>Measurement position:</b> Face forward while holding breath for 10 seconds			X
• Bending over - <b>Premeasurement activity:</b> While standing, bend over to touch toes - <b>Measurement position:</b> Hold the bending position with face parallel to the floor while holding breath for 10 seconds			X
• Head shaking - <b>Premeasurement activity:</b> Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRRR" loudly - <b>Measurement position:</b> Face forward, while holding breath for 10 seconds			X
• Redon-1 - <b>Premeasurement activity:</b> Remove the respirator completely and put it back on - <b>Measurement position:</b> Face forward while holding breath for 10 seconds			X
• Redon-2 - Repeat the premeasurement activity and measurement position described in Redon-1			X

<sup>1</sup> The Rainbow Passage:

"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62015 Follow procedures established for cleaning and disinfecting respirators.**

~~((You must:~~

**•)) The employer must follow the procedure in Table 20 for cleaning and disinfecting respirators.**

**Table 20  
Respirator Cleaning Procedure**

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. • Discard or repair any defective parts.
2.	Wash components in warm (43°C (110°F) maximum) water with a mild detergent or with a cleaner recommended by the manufacturer

Step	Task
	<ul style="list-style-type: none"> <li>• A stiff bristle (not wire) brush may be used to help remove the dirt</li> <li>• If the detergent or cleaner does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:                             <ul style="list-style-type: none"> <li>- A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F)</li> <li>- A solution of iodine (50 parts per million iodine). Make this in two steps:                                     <ul style="list-style-type: none"> <li>■ First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately</li> <li>■ Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution</li> </ul> </li> <li>- Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.</li> </ul> </li> </ul>
3.	Rinse components thoroughly in clean, warm (43°C (110°F) maximum), preferably, running water. <b>Note:</b> The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. <ul style="list-style-type: none"> <li>• Replace filters, cartridges, and canisters, if necessary (for testing).</li> </ul>
7.	Test the respirator to make sure all components work properly.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62020 Follow procedures established for seal checking respirators.**

**IMPORTANT:**

((\*) 1. User seal checks are **NOT** a substitute for fit tests. See WAC 296-307-62010 for fit test procedures.

((~~Y000~~) 2. The employer may use a seal check procedure recommended by the respirator manufacturer **INSTEAD** of the procedure outlined in Table 21 if ((y000)) the employer can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.

((~~You must~~

•)) The employer must make sure employees perform a user seal check as outlined in Table 21, **EACH TIME** the respirator is worn, to make sure the seal is adequate.

**Table 21**

User Seal Check Procedure
<p><b>Important information for employees:</b></p> <ul style="list-style-type: none"> <li>• You need to conduct a seal check <b>each time</b> you put your respirator on <b>BEFORE</b> you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems</li> </ul>

User Seal Check Procedure
<ul style="list-style-type: none"> <li>• The procedure below has two parts; a positive pressure check and a negative pressure check. <b>You must complete both parts each time.</b> It should only take a few seconds to perform, once you learn it</li> <li>- If you cannot pass both parts, your respirator is <b>NOT</b> functioning properly, see your supervisor for further instruction.</li> </ul>
<p><b>Positive pressure check:</b></p> <ol style="list-style-type: none"> <li>1. Remove exhalation valve cover, if removable.</li> <li>2. Cover the exhalation valve completely with the palm of your hand <b>WHILE</b> exhaling gently to inflate the facepiece slightly.</li> <li>3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and <b>NO</b> outward leakage).                             <ul style="list-style-type: none"> <li>• If you detect <b>NO</b> leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check</li> <li>• If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.</li> </ul> </li> </ol>
<p><b>Negative pressure check:</b></p>

### User Seal Check Procedure

4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands **WHILE** inhaling gently to collapse the facepiece slightly.
  - If you cannot use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use:
    - Filter seal(s) (if available)

**OR**

  - Thin rubber gloves.
5. Once the facepiece is collapsed, hold your breath for 10 seconds **WHILE** keeping the inhalation openings covered.
6. The facepiece should remain slightly collapsed (indicating negative pressure and **NO** inward leakage).
  - If you detect **NO** evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator
  - If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat **BOTH** the positive and negative fit checks.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

#### **WAC 296-307-622 Definitions.**

**Air-purifying respirator (APR)**<sub>2</sub> A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **OR** having a filtering facepiece, for example, a dust mask.

The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

**Air-line respirator**<sub>2</sub> An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:

- ((★)) (a) A cylinder or a tank;
- ((★)) (b) A compressor;
- ((★)) (c) An uncontaminated environment.

**Air supplied respirator (see air-line respirator)**<sub>2</sub>

**Assigned protection factor (APF)**<sub>2</sub> Indicates the expected level of workplace respiratory protection **WHEN** the respirator is:

- ((★)) (a) Functioning properly;

**AND**

- ((★)) (b) Fitted to the user;

**AND**

- ((★)) (c) Worn by trained individuals;

**AND**

((★)) (d) Used with the limitations specified on the NIOSH approval label.

**Atmosphere-supplying respirator**<sub>2</sub> A respirator that supplies the user with breathing air from sources, such as:

- ((★)) (a) A cylinder or a tank;
- ((★)) (b) A compressor;
- ((★)) (c) An uncontaminated environment.

**Breathing air**<sub>2</sub> Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-307-616.

**Canister or cartridge (air-purifying)**<sub>2</sub> Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

**Cartridge respirator (see also air-purifying respirator)**<sub>2</sub> An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

**Demand respirator**<sub>2</sub> An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

**Dust mask**<sub>2</sub> A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

**Emergency respirator**<sub>2</sub> Respirators suitable for rescue, escape, or other activities during emergency situations.

**Emergency situation**<sub>2</sub> Any occurrence that could **OR** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

**End-of-service-life indicator (ESLI)**<sub>2</sub> A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

**Escape-only respirator**<sub>2</sub> A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

**Exposed, or exposure**<sub>2</sub> The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Filter**<sub>2</sub> Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **OR** other aerosols from the air.

**Filtering-facepiece respirator**<sub>2</sub> A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **MAINLY** composed of filter material. These respirators do not use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

**Fit factor**<sub>2</sub> A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

**Fit test (see also qualitative fit test and quantitative fit test)**<sub>2</sub> Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

**Full-facepiece respirator**<sub>2</sub> A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

**Gas mask**<sub>2</sub> An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

**Half-facepiece respirator.** A tight-fitting respirator that only covers the wearer's nose and mouth.

**Helmet.** The rigid part of a respirator that covers the wearer's head AND also provides head protection against impact or penetration.

**High-efficiency particulate air filter (HEPA).** A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

**Note:** Filters designated, under 42 C.F.R. Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

**Hood.** The part of a respirator that completely covers the wearer's head and neck AND may also cover some or all of the shoulders and torso.

**Immediately dangerous to life or health (IDLH).** An atmospheric condition that would:

(\*) (a) Cause an immediate threat to life;

OR

(\*) (b) Cause permanent or delayed adverse health effects;

OR

(\*) (c) Interfere with an employee's ability to escape.

**Licensed health care professional (LHCP).** An individual whose legally permitted scope of medical practice allows him or her to provide **SOME OR ALL** of the health care services required for respirator users' medical evaluations.

**Loose-fitting facepiece.** A respiratory inlet covering that is designed to form a partial seal with the face.

**Negative-pressure respirator.** Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

**NIOSH.** The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

**Oxygen deficient.** An atmosphere with an oxygen content below 19.5% by volume.

**Permissible exposure limit (PEL).** Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA chapters.

**Positive-pressure respirator.** A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

**Powered air-purifying respirators (PAPRs).** An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **NOT** classified as positive pressure respirators and must not be used as such.

**Pressure-demand respirator.** A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

**Qualitative fit test (QLFT).** A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

**Quantitative fit test (QNFT).** A test that determines the adequacy of respirator fit for an individual. The test relies on

specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

**Respiratory hazard.** Harmful airborne hazards and oxygen deficiency that are addressed in WAC 296-307-624, Identifying and controlling airborne hazards and oxygen deficiency.

**Required use** (~~Respirator use:~~

\*) (**Respirator use**).

(a) That is necessary to protect employees from respiratory hazards;

OR

(\*) (b) That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits;

(\*) (c) The employer for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits, OR the employer is required to follow a medical recommendation.

**Respirator.** A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

**Respiratory inlet covering.** The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

**Seal check.** Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

**Self-contained breathing apparatus (SCBA).** An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

**Service-life.** The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent cartridge is effective for removing a harmful substance from the air.

**Sorbent.** Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

**Supplied-air respirator (see air-line respirator).**

**Tight-fitting facepiece.** A respiratory inlet covering forming a complete seal with the face OR neck. Mouthpiece respirators aren't tight-fitting facepieces.

**Voluntary use.** Respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

**AMENDATORY SECTION** (Amending WSR 06-08-087, filed 4/4/06, effective 9/1/06)

**WAC 296-307-624 Scope.**

(1) This part applies **only** if (~~your~~) employees:

(\*) (a) Are exposed to a respiratory hazard;

OR

(\*) (b) Could be exposed to one of the specific hazards listed below.

(2) This part applies to any workplace with potential or actual employee exposure to respiratory hazards. It requires

~~((you))~~ the employer to protect employees from respiratory hazards by applying this protection strategy:

~~((\*)~~ (a) Evaluate employee exposures to determine if controls are needed;

~~((\*)~~ (b) Use feasible controls. For example, enclose or confine the operation, use ventilation systems, or substitute with less toxic material;

~~((\*)~~ (c) Use respirators if controls are not feasible or if they cannot completely remove the hazard.

**Definition(~~(\*)~~).**

**Exposed or exposure(~~(\*)~~).** The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Note:** Examples of substances that may be respiratory hazards when airborne include:

- ~~((\*)~~ 1. Chemicals listed in Table 3.
  - ~~((\*)~~ 2. Any substance;
  - ~~(-)~~ a. Listed in the latest edition of the NIOSH Registry of Toxic Effects of Chemical Substances;
  - ~~(-)~~ b. For which positive evidence of an acute or chronic health hazard exists through tests conducted by, or known to, the employer;
  - ~~(-)~~ c. That may pose a hazard to human health as stated on a material safety data sheet kept by, or known to, the employer.
  - ~~((\*)~~ 3. Atmospheres considered oxygen deficient.
  - ~~((\*)~~ 4. Biological agents such as harmful bacteria, viruses or fungi.
  - ~~(-)~~ Examples include airborne TB aerosols and anthrax.
  - ~~((\*)~~ 5. Pesticides with a label requirement for respirator use.
  - ~~((\*)~~ 6. Chemicals used as crowd control agents such as pepper spray.
  - ~~((\*)~~ 7. Chemicals present at clandestine drug labs.
- These substances can be airborne as dusts, fibers, fogs, fumes, mists, gases, smoke, sprays, vapors, or aerosols.

**References:** ~~((\*)~~ 1. Substances in Table 3 that are marked with an X in the "skin" column may require personal protective equipment (PPE). See WAC 296-307-100, Personal protective equipment, for additional information and requirements.

~~((\*)~~ 2. If any of the following hazards are present in ~~((you))~~ the workplace, ~~((you))~~ the employer will need both this part and any of the following specific rules that apply:

**Hazard**

- a. Acrylonitrile;
- b. Arsenic (inorganic);
- c. Asbestos;
- d. Benzene;
- e. Butadiene;
- f. Cadmium;
- g. Carcinogens;
- h. Coke ovens;
- i. Cotton dust;

**Hazard**

- j. 1,2-Dibromo-3-chloropropane;
- k. Ethylene oxide;
- l. Formaldehyde;
- m. Lead;
- n. Methylene chloride;
- o. Methylenedianiline;
- p. Thiram;
- q. Vinyl chloride.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-626 Evaluate and control employee exposures.**

~~((Summary:~~

~~**You))** **Employer responsibility:**~~

To protect ~~((you))~~ employees from exposure to respiratory hazards in the workplace by identifying and controlling the hazards.

~~((You must:~~

~~Identify and evaluate employee exposures~~

~~WAC 296-307-62605~~

~~Control employee exposures~~

~~WAC 296-307-62610~~

~~Use respirators~~

~~WAC 296-307-62615~~

~~Notify employees~~

~~WAC 296-307-62620~~

~~Permissible exposure limits of air contaminants~~

~~WAC 296-307-62625.))~~

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Identify and evaluate employee exposures.</u>	<u>WAC 296-307-62605</u>
<u>Control employee exposures.</u>	<u>WAC 296-307-62610</u>
<u>Use respirators.</u>	<u>WAC 296-307-62615</u>
<u>Notify employees.</u>	<u>WAC 296-307-62620</u>
<u>Permissible exposure limits of air contaminants.</u>	<u>WAC 296-307-62625</u>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62605 Identify and evaluate respiratory hazards.**

~~((You must:~~

~~**\*)** (1) The employer must make sure employees are protected from potentially hazardous exposure while ~~((you perform you))~~ the employer performs an evaluation.~~

~~**\*)** (2) The employer must perform ~~((you))~~ the evaluation without considering the protection provided to employees by a respirator.~~

((\*) (3) The employer must determine the form of the hazard, such as dust, mist, gas, oxygen deficiency, or biological agent.

((\*) (4) The employer must make sure ((you)) to consider:

((-) (a) Potential emergency and rescue situations that may occur, such as equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error;

((-) (b) Workplace conditions such as work processes, types of material, control methods, work practices and environmental conditions.

((\*) (5) The employer must determine or reasonably estimate whether any employee is or could be exposed to any of the following:

((-) (a) Any airborne substance above a permissible exposure limit (PEL) listed in Table 3;

((-) (b) A substance at or above the action level (AL) specified in the rule for that substance;

((-) (c) Any other respiratory hazard.

((\*) (6) The employer must use any of the following to determine employee exposure:

((-) (a) Information that would allow an estimate of the level of employee exposure, such as MSDSs or pesticide labels, observations, measurements or calculations;

((-) (b) Data demonstrating that a particular product, material or activity cannot result in employee exposure at or above the AL or PEL;

((-) (c) Personal air samples that represent an employee's usual or worst case exposure for the entire shift.

**Notes:** ((\*) 1. Rules for specific substances may contain additional requirements for determining employee exposure.

((\*) 2. Use methods of sampling and analysis that have been validated by the laboratory performing the analysis.

((\*) 3. Samples from a representative group of employees may be used for other employees performing the same work activities when the duration and level of exposure are similar.

~~((You must:~~

\*) (7) The employer must consider the atmosphere to be immediately dangerous to life or health (IDLH) when ((you)) the employer cannot determine or reasonably estimate employee exposure;

((\*) (8) The employer must make sure employee exposure, to 2 or more substances with additive health effects, is evaluated using this formula:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

The symbol	Is the . . .
E	Equivalent exposure for the mixture. <b>When the value of E is greater than 1, a respiratory hazard is present.</b>
C	Concentration of a particular substance.
L	TWA, STEL, or ceiling for that substance from Table 3.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62610 Control employee exposures.**

~~((You must:~~

\*) The employer must use feasible controls to protect employees from exposure to respiratory hazards by:

((-) (1) Reducing employee exposure to a level that removes the respiratory hazard, such as to a level below the permissible exposure limit (PEL) in Table 3;

**OR**

((-) (2) Reducing the exposure to the lowest achievable level, when the respiratory hazard cannot be removed.

**Note:** The following table gives ((you)) examples of control methods.

**Table 1**  
**Examples of Possible Controls**

<b>Control:</b>	<b>For example:</b>
Using a different chemical (substitution)	<ul style="list-style-type: none"> <li>Choose a chemical with a lower evaporation rate or vapor pressure.</li> <li>Choose a chemical without hazardous ingredients.</li> </ul>
Changing a process to lessen emissions	<ul style="list-style-type: none"> <li>Use hand rolling or paint dipping instead of paint spraying.</li> <li>Bolt items instead of welding them.</li> </ul>
Separating employees from emissions areas and sources	<ul style="list-style-type: none"> <li>Use control rooms.</li> <li>Build an enclosure around process machinery or other emissions sources.</li> <li>Automate a process.</li> </ul>
Removing emissions at or near the source (local exhaust ventilation)	<ul style="list-style-type: none"> <li>Install exhaust hoods or slots to capture emissions.</li> <li>Use an exhausted enclosure (like a blasting cabinet or laboratory hood).</li> </ul>
Diluting and removing emissions in the work area (general exhaust ventilation)	<ul style="list-style-type: none"> <li>Allow natural air movement to create an adequate airflow through an area.</li> <li>Use mechanical fans.</li> </ul>
Modify work practices	<ul style="list-style-type: none"> <li>Change the position of the worker relative to the work so fumes, vapors, or smoke do not go into their face.</li> </ul>
Rotate employees - Some specific rules prohibit the use of this control method	<ul style="list-style-type: none"> <li>Move employees to another job that is without exposure, on a schedule to keep their total exposure below the permissible exposure limit.</li> </ul>



**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62615 Use respirators.**

~~((You must:~~

•)) **The employer must** require employees to use respiratory protection when respiratory hazards have not been removed using feasible controls. For example, use respirators at any of the following times:

((-) (1) While controls are being evaluated or put in place;

((-) (2) When the respiratory hazard is not completely removed;

((-) (3) When controls are **not** feasible.

**Reference:** See WAC 296-307-594, Respirators, for respirator program requirements.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-62620 Notify employees.**

~~((You must:~~

•)) **The employer must** notify employees who are or may be exposed to respiratory hazards, as specified in Table 2.

**Note:** ((\*) The notification may be provided either individually, to a group, or by posting of results in an appropriate location that's accessible to affected employees.

**Table 2  
Notification Requirements**

Notify employees of:	As follows:
Any exposure result above a permissible exposure limit (PEL)	Within five business days, after the employee's exposure result is known to the employer
The corrective action being taken to reduce employee exposure to or below the PEL  AND The schedule for completion of the corrective action and any reasons why exposures cannot be lowered to below the PEL	Within fifteen business days, after the employee's exposure result is known to the employer
An exposure to these substances:  • Acrylonitrile • Arsenic (inorganic) • Asbestos • Benzene • Butadiene • Cadmium • Coke oven emissions	In writing, as specified in the rule specific to the substance

Notify employees of:	As follows:
<ul style="list-style-type: none"> <li>• Cotton dust</li> <li>• 1,2-Dibromo-3-chloropropane</li> <li>• Ethylene oxide</li> <li>• Formaldehyde</li> <li>• Lead</li> <li>• Methylene chloride</li> <li>• Methylenedianiline</li> <li>• Vinyl chloride</li> </ul>	

**AMENDATORY SECTION** (Amending WSR 18-17-156, filed 8/21/18, effective 12/12/18)

**WAC 296-307-62625 Permissible exposure limits of air contaminants.**

**IMPORTANT:**

The following information applies to Table 3, Permissible Exposure Limits for Air Contaminants.

((\*) 1. Exposure needs to be determined from personal air samples taken in the breathing zone or from monitoring representative of the employee's breathing zone.

((\*) 2. Ppm refers to parts of vapor or gas per million parts of air by volume, at 25 degrees C and 760 mm Hg pressure.

((\*) 3. Mg/m<sup>3</sup> refers to milligrams of substance per cubic meter of air.

((\*) 4. For a metal that is measured as the metal itself, only the CAS number for the metal is given. The CAS numbers for individual compounds of the metal are not provided. For more information about CAS registry numbers see the website: (~~http://www.cas.org~~) <https://www.cas.org>.

((\*) 5. Time weighted averages (TWA<sub>8</sub>) represent the maximum allowed average exposure for any 8-hour time period. For work periods longer than 8 hours the TWA<sub>8</sub> needs to be determined using the 8 continuous hours with the highest average concentration.

((\*) 6. Short-term exposure limits (STEL) represent maximum allowed average exposure for any fifteen-minute period, unless another time period is noted in Table 3.

((\*) 7. The ceiling represents the maximum allowed exposure for the shortest time period that can feasibly be measured.

((\*) 8. An "X" in the "skin" column indicates the substance can be absorbed through the skin, either by airborne or direct contact.

((\*) 9. Requirements for the use of gloves, coveralls, goggles, and other personal protective equipment can be found in WAC 296-307-100.

((\*) 10. The respirable fraction of particulate is measured by sampling with a size-selector having the following characteristics:

Mean aerodynamic diameter in micrometers	Percent passing the selector
1	97

Mean aerodynamic diameter in micrometers	Percent passing the selector
2	91
3	74
4	50
5	30
6	17
7	9
8	5
10	1

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Abate (Temephos)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acetaldehyde	75-07-0	100 ppm	150 ppm	—	—
Acetic acid	64-19-7	10 ppm	20 ppm	—	—
Acetic anhydride	108-24-7	—	—	5 ppm	—
Acetone	67-64-1	750 ppm	1,000 ppm	—	—
Acetonitrile	75-05-8	40 ppm	60 ppm	—	—
2-Acetylaminofluorene	53-96-3	—	—	—	—
Acetylene	74-86-2	Simple asphyxiant	—	—	—
Acetylene dichloride (1,2-Dichloroethylene)	540-59-0	200 ppm	250 ppm	—	—
Acetylene tetrabromide	79-27-6	1 ppm	3 ppm	—	—
Acetylsalicylic acid (Aspirin)	50-78-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Acrolein	107-02-8	0.1 ppm	0.3 ppm	—	—
Acrylamide	79-06-1	0.03 mg/m <sup>3</sup>	0.09 mg/m <sup>3</sup>	—	X
Acrylic acid	79-10-7	10 ppm	20 ppm	—	X
Acrylonitrile (Vinyl cyanide)	107-13-1	2 ppm	10 ppm	—	—
Aldrin	309-00-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Allyl alcohol	107-18-6	2 ppm	4 ppm	—	X
Allyl chloride	107-05-1	1 ppm	2 ppm	—	—
Allyl glycidyl ether (AGE)	106-92-3	5 ppm	10 ppm	—	—
Allyl propyl disulfide	2179-59-1	2 ppm	3 ppm	—	—
alpha-Alumina (Aluminum oxide)	1344-28-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Aluminum (as Al)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyro powders	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Welding fumes	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Soluble salts	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Alkyls (NOC)	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Aluminum oxide (Alundum, Corundum)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
4-Aminodiphenyl	92-67-1	—	—	—	—
2-Aminoethanol (Ethanolamine)	141-43-5	3 ppm	6 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
2-Aminopyridine	504-29-0	0.5 ppm	1.5 ppm	—	—
Amitrole	61-82-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Ammonia	7664-41-7	25 ppm	35 ppm	—	—
Ammonium chloride, fume	12125-02-9	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ammonium sulfamate (Ammate)	7773-06-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5.0 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
n-Amyl acetate	628-63-7	100 ppm	150 ppm	—	—
sec-Amyl acetate	626-38-0	125 ppm	156 ppm	—	—
Aniline and homologues	62-53-3	2 ppm	4 ppm	—	X
Anisidine (o, p-isomers)	29191-52-4	0.1 ppm	0.3 ppm	—	X
Antimony and compounds (as Sb)	7440-36-0	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
ANTU (alpha Naphthyl thiourea)	86-88-4	0.3 mg/m <sup>3</sup>	0.9 mg/m <sup>3</sup>	—	—
Argon	7440-37-1	Simple asphyxiant	—	—	—
Arsenic, organic compounds (as As)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsenic, inorganic compounds (as As) (when use is covered by WAC 296-62-07347)	7440-38-2	0.01 mg/m <sup>3</sup>	—	—	—
Arsenic, inorganic compounds (as As) (when use is not covered by WAC 296-62-07347)	7440-38-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Arsine	7784-42-1	0.05 ppm	0.15 ppm	—	—
Asbestos	—	—	—	—	—
Asphalt (Petroleum fumes)	8052-42-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Atrazine	1912-24-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Azinphos methyl (Guthion)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Azodrin (Monocrotophos)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Barium, soluble compounds (as Ba)	7440-39-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Barium sulfate	7727-43-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Baygon (Propoxur)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Benomyl	17804-35-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzene	71-43-2	1 ppm	5 ppm	—	—
Benzydine	92-87-5	—	—	—	—
p-Benzoquinone (Quinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
Benzo(a) pyrene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Benzoyl peroxide	94-36-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Benzyl chloride	100-44-7	1 ppm	3 ppm	—	—
Beryllium and beryllium compounds (as Be) (see chapter 296-850 WAC)	7440-41-7	0.0002 mg/m <sup>3</sup>	0.002 mg/m <sup>3</sup>	—	—
Biphenyl (Diphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Bismuth telluride, undoped	1304-82-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Bismuth telluride, Se-doped	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Borates, tetra, sodium salts	—	—	—	—	—
Anhydrous	1330-43-4	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Decahydrate	1303-96-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentahydrate	12179-04-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Boron oxide	1303-86-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Boron tribromide	10294-33-4	—	—	1 ppm	—
Boron trifluoride	6737-07-2	—	—	1 ppm	—
Bromacil	314-40-9	1 ppm	3 ppm	—	—
Bromine	7726-95-6	0.1 ppm	0.3 ppm	—	—
Bromine pentafluoride	7789-30-2	0.1 ppm	0.3 ppm	—	—
Bromochloromethane (Chlorobromomethane)	74-97-5	200 ppm	250 ppm	—	—
Bromoform	15-25-2	0.5 ppm	1.5 ppm	—	X
Butadiene (1,3-butadiene)	106-99-0	1 ppm	5 ppm	—	—
Butane	106-97-8	800 ppm	1,000 ppm	—	—
Butanethiol (Butyl mercaptan)	109-79-5	0.5 ppm	1.5 ppm	—	—
2-Butanone (Methyl ethyl ketone)	78-93-3	200 ppm	300 ppm	—	—
2-Butoxy ethanol (Butyl cellosolve)	111-76-2	25 ppm	38 ppm	—	X
n-Butyl acetate	123-86-4	150 ppm	200 ppm	—	—
sec-Butyl acetate	105-46-4	200 ppm	250 ppm	—	—
tert-Butyl acetate	540-88-5	200 ppm	250 ppm	—	—
Butyl acrylate	141-32-2	10 ppm	20 ppm	—	—
n-Butyl alcohol	71-36-3	—	—	50 ppm	X
sec-Butyl alcohol	78-92-2	100 ppm	150 ppm	—	—
tert-Butyl alcohol	75-65-0	100 ppm	150 ppm	—	—
Butylamine	109-73-9	—	—	5 ppm	X
Butyl cellosolve (2-Butoxy ethanol)	111-76-2	25 ppm	38 ppm	—	—
tert-Butyl chromate (as CrOs)	1189-85-1	—	—	0.1 mg/m <sup>3</sup>	X
n-Butyl glycidyl ether (BGE)	2426-08-6	25 ppm	38 ppm	—	—
n-Butyl lactate	138-22-7	5 ppm	10 ppm	—	—
Butyl mercaptan	109-79-5	0.5 ppm	1.5 ppm	—	—
o-sec-Butylphenol	89-72-5	5 ppm	10 ppm	—	X
p-tert-Butyl-toluene	98-51-1	10 ppm	20 ppm	—	—
Cadmium oxide fume (as Cd)	1306-19-0	0.005 mg/m <sup>3</sup>	—	—	—
Cadmium dust and salts (as Cd)	7440-43-9	0.005 mg/m <sup>3</sup>	—	—	—
Calcium arsenate	—	0.01 mg/m <sup>3</sup>	—	—	—
Calcium carbonate	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium cyanamide	156-62-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Calcium hydroxide	1305-62-0	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium oxide	1305-78-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Calcium silicate	1344-95-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Calcium sulfate	7778-18-9	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Camphor (synthetic)	76-22-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Caprolactam	105-60-2	—	—	—	—
Dust	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Vapor	—	5 ppm	10 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Captafol (Difolatan)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Captan	133-06-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Carbaryl (Sevin)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Carbofuran (Furadon)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Carbon black	1333-86-4	3.5 mg/m <sup>3</sup>	7 mg/m <sup>3</sup>	—	—
Carbon dioxide	124-38-9	5,000 ppm	30,000 ppm	—	—
Carbon disulfide	75-15-0	4 ppm	12 ppm	—	X
Carbon monoxide	630-08-0	35 ppm	200 ppm (5 min.)	1,500 ppm	—
Carbon tetrabromide	558-13-4	0.1 ppm	0.3 ppm	—	—
Carbon tetrachloride (Tetrachloromethane)	56-23-5	2 ppm	4 ppm	—	X
Carbonyl chloride (Phosgene)	7803-51-2	0.1 ppm	0.3 ppm	—	—
Carbonyl fluoride	353-50-4	2 ppm	5 ppm	—	—
Catechol (Pyrocatechol)	120-80-9	5 ppm	10 ppm	—	X
Cellosolve acetate (2-Ethoxyethylacetate)	111-15-9	5 ppm	10 ppm	—	X
Cellulose (paper fiber)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cesium hydroxide	21351-79-1	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Chlordane	57-74-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Chlorinated camphene (Toxaphen)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X
Chlorinated diphenyl oxide	55720-99-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chlorine	7782-50-5	0.5 ppm	—	1 ppm	—
Chlorine dioxide	10049-04-4	0.1 ppm	0.3 ppm	—	—
Chlorine trifluoride	7790-91-2	—	—	0.1 ppm	—
Chloroacetaldehyde	107-20-0	—	—	1 ppm	—
a-Chloroacetophenone (Phenacyl chloride)	532-21-4	0.05 ppm	0.15 ppm	—	—
Chloroacetyl chloride	79-04-9	0.05 ppm	0.15 ppm	—	—
Chlorobenzene (Monochlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
o-Chlorobenzylidene malononitrile (OCBM)	2698-41-1	—	—	0.05 ppm	X
Chlorobromomethane	74-97-5	200 ppm	250 ppm	—	—
2-Chloro-1, 3-butadiene (beta-Chloroprene)	126-99-8	10 ppm	20 ppm	—	X
Chlorodifluoromethane	75-45-6	1,000 ppm	1,250 ppm	—	—
Chlorodiphenyl (42% Chlorine) (PCB) (Polychlorobiphenyls)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Chlorodiphenyl (54% Chlorine) (Polychlorobiphenyls (PCB))	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1-Chloro-2, 3-epoxypropane (Epichlorhydrin)	106-89-8	2 ppm	4 ppm	—	X
2-Chloroethanol (Ethylene chlorohydrin)	107-07-3	—	—	1 ppm	X
Chloroethylene (vinyl chloride)	75-01-4	1 ppm	5 ppm	—	—
Chloroform (Trichloromethane)	67-66-3	2 ppm	4 ppm	—	—
1-Chloro-1-nitropropane	600-25-9	2 ppm	4 ppm	—	—
bis-Chloromethyl ether	542-88-1	—	—	—	—
Chloromethyl methyl ether (Methyl chloromethyl ether)	107-30-2	—	—	—	—
Chloropentafluoroethane	76-15-3	1,000 ppm	1,250 ppm	—	—
Chloropicrin (Nitrotrichloromethane)	76-06-2	0.1 ppm	0.3 ppm	—	—
beta-Chloroprene (2-Chloro-1, 3-butadiene)	126-99-8	10 ppm	20 ppm	—	X
o-Chlorostyrene	2039-87-4	50 ppm	75 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
o-Chlorotoluene	95-49-8	50 ppm	75 ppm	—	—
2-Chloro-6-trichloromethyl pyridine (Nitrapyrin)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Chlorpyrifos	2921-88-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Chromic acid and chromates (as CrO <sub>3</sub> )	Varies with compound	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Chromium, soluble, chromic and chromous salts (as Cr)	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromium (VI) compounds (as Cr)	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Chromium metal and insoluble salts	7440-47-3	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Chromyl chloride	14977-61-8	0.025 ppm	0.075 ppm	—	—
Chrysene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Clopidol	2971-90-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Coal dust (less than 5% SiO <sub>2</sub> )	—	—	—	—	—
Respirable fraction	—	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Coal dust (greater than or equal to 5% SiO <sub>2</sub> )	—	—	—	—	—
Respirable fraction	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coal tar pitch volatiles (benzene soluble fraction) (Particulate polycyclic aromatic hydrocarbons)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Cobalt, metal fume & dust (as Co)	7440-48-4	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Cobalt carbonyl (as Co)	10210-68-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Cobalt hydrocarbonyl (as Co)	16842-03-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Coke oven emissions	—	0.15 mg/m <sup>3</sup>	—	—	—
Copper (as Cu)	7440-50-8	—	—	—	—
Fume	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Dusts and mists	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Cotton dust (raw) (waste sorting, blending, clean- ing, willowing and garetting)	—	1 mg/m <sup>3</sup>	—	—	—
Corundum (Aluminum oxide)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Crag herbicide (Sesone, Sodium-2, 4-dichloro-phenoxyethyl sulfate)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cresol (all isomers)	1319-77-3	5 ppm	10 ppm	—	X
Crotonaldehyde	123-73-9; 4170-30-3	2 ppm	4 ppm	—	—
Crufomate	299-86-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Cumene	98-82-8	50 ppm	75 ppm	—	X
Cyanamide	420-04-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Cyanide (as CN)	Varies with compound	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
Cyanogen	460-19-5	10 ppm	20 ppm	—	—
Cyanogen chloride	506-77-4	—	—	0.3 ppm	—
Cyclohexane	110-82-7	300 ppm	375 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Cyclohexanol	108-93-0	50 ppm	75 ppm	—	X
Cyclohexanone	108-94-1	25 ppm	38 ppm	—	X
Cyclohexene	110-83-8	300 ppm	375 ppm	—	—
Cyclohexylamine	108-91-8	10 ppm	20 ppm	—	—
Cyclonite (RDX)	121-82-4	1.5 mg/m <sup>3</sup>	3.0 mg/m <sup>3</sup>	—	X
Cyclopentadiene	542-92-7	75 ppm	113 ppm	—	—
Cyclopentane	287-92-3	600 ppm	750 ppm	—	—
Cyhexatin (Tricyclohexyltin hydroxide)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
2,4-D (Dichlorophenoxy-acetic acid)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
DBCP (1,2-Dibromo-3-chloropropane)	96-12-8	0.001 ppm	—	0.005 ppm	—
DDT (Dichlorodiphenyltri-chloroethane)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
DDVP, (Dichlorvos)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dasanit (Fensulfothion)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Decaborane	17702-41-9	0.05 ppm	0.15 ppm	—	X
Demeton	8065-48-3	0.01 ppm	0.03 ppm	—	X
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50 ppm	75 ppm	—	—
1, 2-Diaminoethane (Ethylenediamine)	107-15-3	10 ppm	20 ppm	—	—
Diazinon	333-41-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diazomethane	334-88-3	0.2 ppm	0.6 ppm	—	—
Diborane	19287-45-7	0.1 ppm	0.3 ppm	—	—
Dibrom (see Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
1, 2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.001 ppm	—	0.005 ppm	—
2-N-Dibutylamino ethanol	102-81-8	2 ppm	4 ppm	—	X
Dibutyl phosphate	107-66-4	1 ppm	2 ppm	—	—
Dibutyl phthalate	84-74-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dichloroacetylene	7572-29-4	—	—	0.1 ppm	—
o-Dichlorobenzene	95-50-1	—	—	50 ppm	—
p-Dichlorobenzene	106-46-7	75 ppm	110 ppm	—	—
3, 3'-Dichlorobenzidine	91-94-1	—	—	—	—
Dichlorodiphenyltri-chloroethane (DDT)	50-29-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dichlorodifluoromethane	75-71-8	1,000 ppm	1,250 ppm	—	—
1, 3-Dichloro-5, 5-dimethyl hydantoin	118-52-5	0.2 mg/m <sup>3</sup>	0.4 mg/m <sup>3</sup>	—	—
1, 1-Dichloroethane (Ethylidene chloride)	75-34-3	100 ppm	150 ppm	—	—
1, 2-Dichloroethane (Ethylene dichloride)	107-06-2	1 ppm	2 ppm	—	—
1, 1-Dichloroethylene (Vinylidene chloride)	75-35-4	1 ppm	3 ppm	—	—
1, 2-Dichloroethylene (Acetylene dichloride)	540-59-0	200 ppm	250 ppm	—	—
Dichloroethyl ether	111-44-4	5 ppm	10 ppm	—	X
Dichlorofluoromethane	75-43-4	10 ppm	20 ppm	—	—
Dichloromethane (Methylene chloride)	75-09-2	25 ppm	125 ppm	—	—
1, 1-Dichloro-1-nitroethane	594-72-9	2 ppm	10 ppm	—	—
Dichlorophenoxyacetic acid (2, 4-D)	94-75-7	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
1, 2-Dichloropropane (Propylene dichloride)	78-87-5	75 ppm	110 ppm	—	—
Dichloropropene	542-75-6	1 ppm	3 ppm	—	X
2, 2-Dichloropropionic acid	75-99-0	1 ppm	3 ppm	—	—
Dichlorotetrafluoroethane	76-14-2	1,000 ppm	1,250 ppm	—	—
Dichlorvos (DDVP)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dicrotophos	141-66-2	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Dicyclopentadiene	77-73-6	5 ppm	10 ppm	—	—
Dicyclopentadienyl iron	102-54-5	—	—	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dieldrin	60-57-1	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	X
Diethanolamine	111-42-2	3 ppm	6 ppm	—	—
Diethylamine	109-89-7	10 ppm	25 ppm	—	—
2-Diethylaminoethanol	100-37-8	10 ppm	20 ppm	—	X
Diethylene triamine	111-40-0	1 ppm	3 ppm	—	X
Diethyl ether (Ethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Diethyl ketone	96-22-0	200 ppm	250 ppm	—	—
Diethyl phthalate	84-66-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Difluorodibromomethane	75-61-6	100 ppm	150 ppm	—	—
Difolatan (Captafol)	2425-06-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Diglycidyl ether (DGE)	2238-07-5	0.1 ppm	0.3 ppm	—	—
Dihydroxybenzene (Hydroquinone)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Diisobutyl ketone (2, 6-Dimethylheptanone)	108-83-8	25 ppm	38 ppm	—	—
Diisopropylamine	108-18-9	5 ppm	10 ppm	—	X
Dimethoxymethane (Methylal)	109-87-5	1,000 ppm	1,250 ppm	—	—
Dimethyl acetamide	127-19-5	10 ppm	20 ppm	—	X
Dimethylamine	124-40-3	10 ppm	20 ppm	—	—
4-Dimethylaminoazo benzene	60-11-7	—	—	—	—
Dimethylaminobenzene (Xylidene)	1300-73-8	2 ppm	4 ppm	—	X
Dimethylaniline (N, N-Dimethylaniline)	121-69-7	5 ppm	10 ppm	—	X
Dimethylbenzene (Xylene)	1300-73-8	100 ppm	150 ppm	—	—
Dimethyl-1, 2-dibromo-2, 2-dichloroethyl phosphate (Naled)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Dimethylformamide	68-12-2	10 ppm	20 ppm	—	X
2, 6-Dimethylheptanone (Diisobutyl ketone)	108-83-8	25 ppm	38 ppm	—	—
1, 1-Dimethylhydrazine	57-14-7	0.5 ppm	1.5 ppm	—	X
Dimethyl phthalate	131-11-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dimethyl sulfate	77-78-1	0.1 ppm	0.3 ppm	—	X
Dinitolmide (3, 5-Dinitro-o-toluamide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrobenzene (all isomers - alpha, meta and para)	528-29-0; 99-65-0; 100-25-4	0.15 ppm	0.45 ppm	—	X
Dinitro-o-cresol	534-52-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
3, 5-Dinitro-o-toluamide (Dinitolmide)	148-01-6	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Dinitrotoluene	25321-14-6	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Dioxane (Diethylene dioxide)	123-91-1	25 ppm	38 ppm	—	X
Dioxathion	78-34-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Diphenyl (Biphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Diphenylamine	122-39-4	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diphenylmethane diisocyanate (Methylene bisphenyl isocyanate (MDI))	101-68-8	—	—	0.02 ppm	—
Dipropylene glycol methyl ether	34590-94-8	100 ppm	150 ppm	—	X
Dipropyl ketone	123-19-3	50 ppm	75 ppm	—	—
Diquat	85-00-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Di-sec, Octyl phthalate (Di-2-ethylhexylphthalate)	117-81-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Disulfam	97-77-8	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—



Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Disulfoton	298-04-4	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 6-Di-tert-butyl-p-cresol	128-37-0	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Diuron	330-54-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Divinyl benzene	1321-74-0	10 ppm	20 ppm	—	—
Emery	12415-34-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Endosulfan (Thiodan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Endrin	72-20-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Epichlorhydrin (1-Chloro-2,3-epoxypropane)	106-89-8	2 ppm	4 ppm	—	X
EPN	2104-64-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
1, 2-Epoxypropane (Propylene oxide)	75-56-9	20 ppm	30 ppm	—	—
2, 3-Epoxy-1-propanol (Glycidol)	556-52-5	25 ppm	38 ppm	—	—
Ethane	—	Simple asphyxiant	—	—	—
Ethanethiol (Ethyl mercaptan)	75-08-1	0.5 ppm	1.5 ppm	—	—
Ethanol (Ethyl alcohol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethanolamine (2-Aminoethanol)	141-43-5	3 ppm	6 ppm	—	—
Ethion	563-12-2	0.4 mg/m <sup>3</sup>	1.2 mg/m <sup>3</sup>	—	X
2-Ethoxyethanol (Glycol monoethyl ether)	110-80-5	5 ppm	10 ppm	—	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	5 ppm	10 ppm	—	X
Ethyl acetate	141-78-6	400 ppm	500 ppm	—	—
Ethyl acrylate	140-88-5	5 ppm	25 ppm	—	X
Ethyl alcohol (ethanol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethylamine	75-04-07	10 ppm	20 ppm	—	—
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl benzene	100-41-4	100 ppm	125 ppm	—	—
Ethyl bromide	74-96-4	200 ppm	250 ppm	—	—
Ethyl butyl ketone (3-Heptanone)	106-35-4	50 ppm	75 ppm	—	—
Ethyl chloride	75-00-3	1,000 ppm	1,250 ppm	—	—
Ethylene	74-85-1	Simple asphyxiant	—	—	—
Ethylene chlorohydrin (2-Chloroethanol)	107-07-3	—	—	1 ppm	X
Ethylenediamine (1,2-Diaminoethane)	107-15-3	10 ppm	20 ppm	—	X
Ethylene dibromide	106-93-4	0.1 ppm	0.5 ppm	—	—
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylene glycol	107-21-1	—	—	50 ppm	—
Ethylene glycol dinitrate	628-96-6	—	0.1 mg/m <sup>3</sup>	—	X
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate)	—	5 ppm	10 ppm	—	X
Ethyleneimine	151-56-4	—	—	—	X
Ethylene oxide	75-21-8	1 ppm	5 ppm	—	—
Ethyl ether (Diethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Ethyl formate	109-94-4	100 ppm	125 ppm	—	—
Ethylidene chloride (1, 1-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylidene norbornene	16219-75-3	—	—	5.0 ppm	—
Ethyl mercaptan (Ethanethiol)	75-08-1	0.5 ppm	1.5 ppm	—	—
n-Ethylmorpholine	100-74-3	5 ppm	10 ppm	—	X
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl silicate	78-10-4	10 ppm	20 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Fenamiphos	22224-92-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Fensulfothion (Dasanit)	115-90-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Fenthion	55-38-9	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Ferbam	—	—	—	—	—
Total particulate	14484-64-1	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Ferrovandium dust	12604-58-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Fluorides (as F)	Varies with compound	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Fluorine	7782-41-4	0.1 ppm	0.3 ppm	—	—
Fluorotrichloromethane (see Trichlorofluoro methane)	75-69-4	—	—	1,000 ppm	—
Fonofos	944-22-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Formaldehyde	50-00-0	0.75 ppm	2 ppm	—	—
Formamide	75-12-7	20 ppm	30 ppm	—	—
Formic acid	64-18-6	5 ppm	10 ppm	—	—
Furadon (carbofuran)	1563-66-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Furfural	98-01-1	2 ppm	4 ppm	—	X
Furfuryl alcohol	98-00-0	10 ppm	15 ppm	—	X
Gasoline	8006-61-9	300 ppm	500 ppm	—	—
Germanium tetrahydride	7782-65-2	0.2 ppm	0.6 ppm	—	—
Glass, fibrous or dust	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Gluteraldehyde	111-30-8	—	—	0.2 ppm	—
Glycerin mist	56-81-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Glycidol (2, 3-Epoxy-1-propanol)	556-52-5	25 ppm	38 ppm	—	—
Glycol monoethyl ether (2-Ethoxyethanol)	110-80-5	5 ppm	10 ppm	—	X
Grain dust (oat, wheat, barley)	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Graphite, natural	7782-42-5	—	—	—	—
Respirable particulate	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Graphite, synthetic	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Guthion (Azinphosmethyl)	86-50-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Gypsum	13397-24-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Hafnium	7440-58-6	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Helium	—	Simple asphyxiant	—	—	—
Heptachlor	76-44-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Heptane (n-heptane)	142-82-5	400 ppm	500 ppm	—	—
2-Heptanone (Methyl n-amyl ketone)	110-43-0	50 ppm	75 ppm	—	—
3-Heptanone (Ethyl butyl ketone)	106-35-4	50 ppm	75 ppm	—	—
Hexachlorobutadiene	87-68-3	0.02 ppm	0.06 ppm	—	X
Hexachlorocyclopentadiene	77-47-4	0.01 ppm	0.03 ppm	—	—
Hexachloroethane	67-72-1	1 ppm	3 ppm	—	X
Hexachloronaphthalene	1335-87-1	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Hexafluoroacetone	684-16-2	0.1 ppm	0.3 ppm	—	X
Hexane	—	—	—	—	—
n-hexane	110-54-3	50 ppm	75 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
other isomers	Varies with compound	500 ppm	1,000 ppm	—	—
2-Hexanone (Methyl-n-butyl ketone)	591-78-6	5 ppm	10 ppm	—	—
Hexone (Methyl isobutyl ketone)	108-10-1	50 ppm	75 ppm	—	—
sec-Hexyl acetate	108-84-9	50 ppm	75 ppm	—	—
Hexylene glycol	107-41-5	—	—	25 ppm	—
Hydrazine	302-01-2	0.1 ppm	0.3 ppm	—	X
Hydrogen	—	Simple asphyxiant	—	—	—
Hydrogenated terphenyls	61788-32-7	0.5 ppm	1.5 ppm	—	—
Hydrogen bromide	10035-10-6	—	—	3.0 ppm	—
Hydrogen chloride	7647-01-0	—	—	5.0 ppm	—
Hydrogen cyanide	74-90-8	—	4.7 ppm	—	X
Hydrogen fluoride	7664-39-3	—	—	3 ppm	—
Hydrogen peroxide	7722-84-1	1 ppm	3 ppm	—	—
Hydrogen selenide (as Se)	7783-07-5	0.05 ppm	0.15 ppm	—	—
Hydrogen sulfide	7783-06-4	10 ppm	15 ppm	—	—
Hydroquinone (Dihydroxybenzene)	123-31-9	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	123-42-2	50 ppm	75 ppm	—	—
2-Hydroxypropyl acrylate	99-61-1	0.5 ppm	1.5 ppm	—	X
Indene	95-13-6	10 ppm	20 ppm	—	—
Indium and compounds (as In)	7440-74-6	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Iodine	7553-56-2	—	—	0.1 ppm	—
Iodoform	75-47-8	0.6 ppm	1.8 ppm	—	—
Iron oxide dust and fume (as Fe)	1309-37-1	—	—	—	—
Total particulate	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Iron pentacarbonyl (as Fe)	13463-40-6	0.1 ppm	0.2 ppm	—	—
Iron salts, soluble (as Fe)	Varies with compound	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Isoamyl acetate	123-92-2	100 ppm	150 ppm	—	—
Isoamyl alcohol (primary and secondary)	123-51-3	100 ppm	125 ppm	—	—
Isobutyl acetate	110-19-0	150 ppm	188 ppm	—	—
Isobutyl alcohol	78-83-1	50 ppm	75 ppm	—	—
Isooctyl alcohol	26952-21-6	50 ppm	75 ppm	—	X
Isophorone	78-59-1	4 ppm	—	5 ppm	—
Isophorone diisocyanate	4098-71-9	0.005 ppm	0.02 ppm	—	X
Isopropoxyethanol	109-59-1	25 ppm	38 ppm	—	—
Isopropyl acetate	108-21-4	250 ppm	310 ppm	—	—
Isopropyl alcohol	67-63-0	400 ppm	500 ppm	—	—
Isopropylamine	75-31-0	5 ppm	10 ppm	—	—
N-Isopropylaniline	768-52-5	2 ppm	4 ppm	—	X
Isopropyl ether	108-20-3	250 ppm	313 ppm	—	—
Isopropyl glycidyl ether (IGE)	4016-14-2	50 ppm	75 ppm	—	—
Kaolin	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Ketene	463-51-4	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
Lannate (Methomyl)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Lead, inorganic (as Pb)	7439-92-1	0.05 mg/m <sup>3</sup>	—	—	—
Lead arsenate (as Pb)	3687-31-8	0.05 mg/m <sup>3</sup>	—	—	—
Lead chromate (as Pb)	7758-97-6	0.05 mg/m <sup>3</sup>	—	—	—
Limestone	1317-65-3	—	—	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Lindane	58-89-9	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Lithium hydride	7580-67-8	0.025 mg/m <sup>3</sup>	0.075 mg/m <sup>3</sup>	—	—
L.P.G. (liquified petroleum gas)	68476-85-7	1,000 ppm	1,250 ppm	—	—
Magnesite	546-93-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Magnesium oxide fume	1309-48-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Malathion	121-75-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	X
Maleic anhydride	108-31-6	0.25 ppm	0.75 ppm	—	—
Manganese and compounds (as Mn)	7439-96-5	—	—	5 mg/m <sup>3</sup>	—
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Manganese tetroxide and fume (as Mn)	7439-96-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Marble	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
MBOCA (4, 4'-Methylene bis (2-chloro-aniline))	101-14-4	—	—	—	X
MDA (4, 4-Methylene dianiline)	101-77-9	0.01 ppm	0.1 ppm	—	X
MDI (Methylene bisphenyl isocyanate) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
MEK (Methyl ethyl ketone) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
MEKP (Methyl ethyl ketone peroxide)	1338-23-4	—	—	0.2 ppm	—
Mercury (as Hg)	7439-97-6	—	—	—	—
Aryl and inorganic	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Organo-alkyl compounds	—	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	X
Vapor	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Mesityl oxide	141-79-7	15 ppm	25 ppm	—	—
Methacrylic acid	79-41-4	20 ppm	30 ppm	—	X
Methane	—	Simple asphyxiant	—	—	—
Methanethiol (Methyl mercaptan)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methanol (Methyl alcohol)	67-56-1	200 ppm	250 ppm	—	X
Methomyl (lannate)	16752-77-5	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—
Methoxychlor	72-43-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
2-Methoxyethanol (Methyl cellosolve)	109-86-4	5 ppm	10 ppm	—	X
2-Methoxyethyl acetate (Methyl cellosolve ace- tate)	110-49-6	5 ppm	10 ppm	—	X
4-Methoxyphenol	150-76-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Methyl acetate	79-20-9	200 ppm	250 ppm	—	—
Methyl acetylene (propyne)	74-99-7	1,000 ppm	1,250 ppm	—	—
Methyl acetylene-propadiene mixture (MAPP)	—	1,000 ppm	1,250 ppm	—	—
Methyl acrylate	96-33-3	10 ppm	20 ppm	—	X
Methylacrylonitrile	126-98-7	1 ppm	3 ppm	—	X

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Methylal (Dimethoxy-methane)	109-87-5	1,000 ppm	1,250 ppm	—	—
Methyl alcohol (methanol)	67-56-1	200 ppm	250 ppm	—	X
Methylamine	74-89-5	10 ppm	20 ppm	—	—
Methyl amyl alcohol (Methyl isobutyl carbinol)	108-11-2	25 ppm	40 ppm	—	X
Methyl n-amyl ketone (2-Heptanone)	110-43-0	50 ppm	75 ppm	—	—
N-Methyl aniline (Monomethyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Methyl bromide	74-83-9	5 ppm	10 ppm	—	X
Methyl-n-butyl ketone (2-Hexanone)	591-78-6	5 ppm	10 ppm	—	—
Methyl cellosolve (2-Methoxyethanol)	109-86-4	5 ppm	10 ppm	—	X
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	5 ppm	10 ppm	—	X
Methyl chloride	74-87-3	50 ppm	100 ppm	—	—
Methyl chloroform (1, 1, 1-trichlorethane)	71-55-6	350 ppm	450 ppm	—	—
Methyl chloromethyl ether (chloromethyl methyl ether)	107-30-2	—	—	—	—
Methyl 2-cyanoacrylate	137-05-3	2 ppm	4 ppm	—	—
Methylcyclohexane	108-87-2	400 ppm	500 ppm	—	—
Methylcyclohexanol	25639-42-3	50 ppm	75 ppm	—	—
Methylcyclohexanone	583-60-8	50 ppm	75 ppm	—	X
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl demeton	8022-00-2	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Methylene bisphenyl isocyanate (MDI) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
4, 4'-Methylene bis (2-chloro-aniline) (MBOCA)	101-14-4	—	—	—	X
Methylene bis (4-cyclohexylisocyanate)	5124-30-1	—	—	0.01 ppm	—
Methylene chloride (Dichloromethane)	75-09-2	25 ppm	125 ppm	—	—
4, 4-Methylene dianiline (MDA)	101-77-9	0.01 ppm	0.1 ppm	—	X
Methyl ethyl ketone (MEK) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	—	—	0.2 ppm	—
Methyl formate	107-31-3	100 ppm	150 ppm	—	—
5-Methyl-3-heptanone (Ethyl amyl ketone)	541-85-5	25 ppm	38 ppm	—	—
Methyl hydrazine (Monomethyl hydrazine)	60-34-4	—	—	0.2 ppm	X
Methyl iodide	74-88-4	2 ppm	4 ppm	—	X
Methyl isoamyl ketone	110-12-3	50 ppm	75 ppm	—	—
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	25 ppm	40 ppm	—	X
Methyl isobutyl ketone (Hexone)	108-10-1	50 ppm	75 ppm	—	—
Methyl isocyanate	624-83-9	0.02 ppm	0.06 ppm	—	X
Methyl isopropyl ketone	563-80-4	200 ppm	250 ppm	—	—
Methyl mercaptan (Methanethiol)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methyl methacrylate	80-62-6	100 ppm	150 ppm	—	—
Methyl parathion	298-00-0	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Methyl propyl ketone (2-Pentanone)	107-87-9	200 ppm	250 ppm	—	—
Methyl silicate	684-84-5	1 ppm	3 ppm	—	—
alpha-Methyl styrene	98-83-9	50 ppm	100 ppm	—	—
Mevinphos (Phosdrin)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Metribuzin	21087-64-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Mica (Silicates) Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Molybdenum (as Mo)	7439-98-7	—	—	—	—
Soluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Insoluble compounds	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Monochlorobenzene (Chlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
Monocrotophos (Azodrin)	6923-22-4	0.25 mg/m <sup>3</sup>	0.75 mg/m <sup>3</sup>	—	—
Monomethyl aniline (N-Methyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Monomethyl hydrazine	—	—	—	0.2 ppm	—
Morpholine	110-91-8	20 ppm	30 ppm	—	X
Naled (Dibrom)	300-76-5	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Naphtha	8030-30-6	100 ppm	150 ppm	—	X
Naphthalene	91-20-3	10 ppm	15 ppm	—	—
alpha-Naphthylamine	134-32-7	—	—	—	—
beta-Naphthylamine	91-59-8	—	—	—	—
Neon	7440-01-9	Simple asphyxiant	—	—	—
Nickel carbonyl (as Ni)	13463-39-3	0.001 ppm	0.003 ppm	—	—
Nickel (as Ni)	7440-02-0	—	—	—	—
Metal and insoluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble compounds	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Nicotine	54-11-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Nitrapyrin (2-Chloro-6 trichloromethyl pyridine)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Nitric acid	7697-37-2	2 ppm	4 ppm	—	—
Nitric oxide	10102-43-9	25 ppm	38 ppm	—	—
p-Nitroaniline	100-01-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	X
Nitrobenzene	98-95-3	1 ppm	3 ppm	—	X
4-Nitrobiphenyl	92-93-3	—	—	—	—
p-Nitrochlorobenzene	100-00-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
4-Nitrodiphenyl	—	—	—	—	—
Nitroethane	79-24-3	100 ppm	150 ppm	—	—
Nitrogen	7727-37-9	Simple asphyxiant	—	—	—
Nitrogen dioxide	10102-44-0	—	1 ppm	—	—
Nitrogen oxide (Nitrous oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nitrogen trifluoride	7783-54-2	10 ppm	20 ppm	—	—
Nitroglycerin	55-63-0	—	0.1 mg/m <sup>3</sup>	—	X
Nitromethane	75-52-5	100 ppm	150 ppm	—	—
1-Nitropropane	108-03-2	25 ppm	38 ppm	—	—
2-Nitropropane	79-46-9	10 ppm	20 ppm	—	—
N-Nitrosodimethylamine	62-75-9	—	—	—	—
Nitrotoluene	—	—	—	—	—
o-isomer	88-72-2	2 ppm	4 ppm	—	X
m-isomer	98-08-2	2 ppm	4 ppm	—	X
p-isomer	99-99-0	2 ppm	4 ppm	—	X
Nitrotrichloromethane (Chloropicrin)	76-06-2	0.1 ppm	0.3 ppm	—	—
Nitrous oxide (Nitrogen oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nonane	111-84-2	200 ppm	250 ppm	—	—
Octachloronaphthalene	2234-13-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Octane	111-65-9	300 ppm	375 ppm	—	—
Oil mist mineral (particulate)	8012-95-1	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Osmium tetroxide (as Os)	20816-12-0	0.0002 ppm	0.0006 ppm	—	—
Oxalic acid	144-62-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Oxygen difluoride	7783-41-7	—	—	0.05 ppm	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Ozone	10028-15-6	0.1 ppm	0.3 ppm	—	—
Paper fiber (Cellulose)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Paraffin wax fume	8002-74-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Paraquat	—	—	—	—	—
Respirable fraction	4685-14-7 1910-42-5 2074-50-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Parathion	56-38-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Particulate polycyclic aromatic hydrocarbons (benzene soluble fraction) (coal tar pitch volatiles)	65996-93-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Particulates not otherwise regulated	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentaborane	19624-22-7	0.005 ppm	0.015 ppm	—	—
Pentachloronaphthalene	1321-64-8	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentachlorophenol	87-86-5	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Pentaerythritol	115-77-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pentane	109-66-0	600 ppm	750 ppm	—	—
2-Pentanone (methyl propyl ketone)	107-87-9	200 ppm	250 ppm	—	—
Perchloroethylene (tetrachloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Perchloromethyl mercaptan	594-42-3	0.1 ppm	0.3 ppm	—	—
Perchloryl fluoride	7616-94-6	3 ppm	6 ppm	—	—
Perlite	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Petroleum distillates (Naptha, rubber solvent)	—	100 ppm	150 ppm	—	—
Phenacyl chloride (a-Chloroacetophenone)	532-21-4	0.05 ppm	0.15 ppm	—	—
Phenol	108-95-2	5 ppm	10 ppm	—	X
Phenothiazine	92-84-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
p-Phenylene diamine	106-50-3	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Phenyl ether (vapor)	101-84-8	1 ppm	3 ppm	—	—
Phenyl ether-diphenyl mixture (vapor)	—	1 ppm	3 ppm	—	—
Phenylethylene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Phenyl glycidyl ether (PGE)	122-60-1	1 ppm	3 ppm	—	—
Phenylhydrazine	100-63-0	5 ppm	10 ppm	—	X
Phenyl mercaptan	108-98-5	0.5 ppm	1.5 ppm	—	—
Phenylphosphine	638-21-1	—	—	0.05 ppm	—
Phorate	298-02-2	0.05 mg/m <sup>3</sup>	0.2 mg/m <sup>3</sup>	—	X
Phosdrin (Mevinphos)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Phosgene (carbonyl chloride)	75-44-5	0.1 ppm	0.3 ppm	—	—
Phosphine	7803-51-2	0.3 ppm	1 ppm	—	—
Phosphoric acid	7664-38-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus (yellow)	7723-14-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Phosphorous oxychloride	10025-87-3	0.1 ppm	0.3 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Phosphorus pentachloride	10026-13-8	0.1 ppm	0.3 ppm	—	—
Phosphorus pentasulfide	1314-80-3	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Phosphorus trichloride	12-2-19	0.2 ppm	0.5 ppm	—	—
Phthalic anhydride	85-44-9	1 ppm	3 ppm	—	—
m-Phthalodinitrile	626-17-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picloram	1918-02-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Picric acid (2, 4, 6-Trinitrophenol)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Pindone (2-Pivalyl-1, 3-indandione, Pival)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Piperazine dihydrochloride	142-64-3	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pival (Pindone)	83-26-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Plaster of Paris	26499-65-0	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Platinum (as Pt)	7440-06-4	—	—	—	—
Metal	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Soluble salts	—	0.002 mg/m <sup>3</sup>	0.006 mg/m <sup>3</sup>	—	—
Polychlorobiphenyls (Chlorodiphenyls)	—	—	—	—	—
42% Chlorine (PCB)	53469-21-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
54% Chlorine (PCB)	11097-69-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Portland cement	65997-15-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Potassium hydroxide	1310-58-3	—	—	2 mg/m <sup>3</sup>	—
Propane	74-98-6	1,000 ppm	1,250 ppm	—	—
Propargyl alcohol	107-19-7	1 ppm	3 ppm	—	X
beta-Propiolactone	57-57-8	—	—	—	—
Propionic acid	79-09-4	10 ppm	20 ppm	—	—
Propoxur (Baygon)	114-26-1	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	—
n-Propyl acetate	109-60-4	200 ppm	250 ppm	—	—
n-Propyl alcohol	71-23-8	200 ppm	250 ppm	—	X
n-Propyl nitrate	627-13-4	25 ppm	40 ppm	—	—
Propylene	—	Simple asphyxiant	—	—	—
Propylene dichloride (1, 2-Dichloropropane)	78-87-5	75 ppm	110 ppm	—	—
Propylene glycol dinitrate	6423-43-4	0.05 ppm	0.15 ppm	—	X
Propylene glycol monomethyl ether	107-98-2	100 ppm	150 ppm	—	—
Propylene imine	75-55-8	2 ppm	4 ppm	—	X
Propylene oxide (1,2-Epoxypropane)	75-56-9	20 ppm	30 ppm	—	—
Propyne (Methyl acetylene)	74-99-7	1,000 ppm	1,250 ppm	—	—
Pyrethrum	8003-34-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Pyridine	110-86-1	5 ppm	10 ppm	—	—
Pyrocatechol (Catechol)	120-80-9	5 ppm	10 ppm	—	X
Quinone (p-Benzoquinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
RDX (Cyclonite)	—	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Resorcinol	108-46-3	10 ppm	20 ppm	—	—
Rhodium (as Rh)	7440-16-6	—	—	—	—



Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Insoluble compounds, metal fumes and dusts	—	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Soluble compounds, salts	—	0.001 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	—	—
Ronnel	299-84-3	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Rosin core solder, pyrolysis products (as formaldehyde)	8050-09-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Rotenone	83-79-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rouge	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Rubber solvent (naphtha)	8030-30-6	100 ppm	150 ppm	—	—
Selenium compounds (as Se)	7782-49-2	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
Selenium hexafluoride (as Se)	7783-79-1	0.05 ppm	0.15 ppm	—	—
Sesone (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sevin (Carbaryl)	63-25-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silane (see Silicon tetrahydride)	7803-62-5	5 ppm	10 ppm	—	—
Silica, amorphous, precipitated and gel	112926-00-8	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Silica, crystalline cristobalite	—	—	—	—	—
Respirable fraction	14464-46-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, crystalline quartz	—	—	—	—	—
Respirable fraction	14808-60-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, crystalline tripoli (as quartz)	—	—	—	—	—
Respirable fraction	1317-95-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silica, crystalline tridymite	—	—	—	—	—
Respirable fraction	15468-32-3	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, fused	—	—	—	—	—
Respirable fraction	60676-86-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Silicates (less than 1% crystalline silica )	—	—	—	—	—
Mica	—	—	—	—	—
Respirable fraction	12001-26-2	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tremolite	—	—	—	—	—
Silicon	7440-21-3	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon carbide	409-21-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Silicon tetrahydride (Silane)	7803-62-5	5 ppm	10 ppm	—	—
Silver, metal dust and soluble compounds (as Ag)	7440-22-4	0.01 mg/m <sup>3</sup>	0.03 mg/m <sup>3</sup>	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m <sup>3</sup>	12 mg/m <sup>3</sup>	—	—
Respirable fraction	—	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Sodium azide (as HN <sub>3</sub> or NaN <sub>3</sub> )	26628-22-8	—	—	0.1 ppm	X
Sodium bisulfite	7631-90-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium-2, 4-dichloro-phenoxyethyl sulfate (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sodium fluoroacetate	62-74-8	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	X
Sodium hydroxide	1310-73-2	—	—	2 mg/m <sup>3</sup>	—
Sodium metabisulfite	7681-57-4	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Starch	9005-25-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Stibine	7803-52-3	0.1 ppm	0.3 ppm	—	—
Stoddard solvent	8052-41-3	100 ppm	150 ppm	—	—
Strychnine	57-24-9	0.15 mg/m <sup>3</sup>	0.45 mg/m <sup>3</sup>	—	—
Styrene (Phenylethylene, Vinyl benzene)	100-42-5	50 ppm	100 ppm	—	—
Subtilisins	9014-01-1	—	0.00006 mg/m <sup>3</sup> (60 min.)	—	—
Sucrose	57-50-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Sulfotep (TEDP)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Sulfur dioxide	7446-09-5	2 ppm	5 ppm	—	—
Sulfur hexafluoride	2551-62-4	1,000 ppm	1,250 ppm	—	—
Sulfuric acid	7664-93-9	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Sulfur monochloride	10025-67-9	—	—	1 ppm	—
Sulfur pentafluoride	5714-22-1	—	—	0.01 ppm	—
Sulfur tetrafluoride	7783-60-0	—	—	0.1 ppm	—
Sulfuryl fluoride	2699-79-8	5 ppm	10 ppm	—	—
Sulprofos	35400-43-2	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Systox (Demeton)	8065-48-3	0.01 ppm	0.03 ppm	—	X
2, 4, 5-T	93-76-5	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tantalum	—	—	—	—	—
Metal and oxide dusts	7440-25-7	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TDI (Toluene-2, 4-diisocyanate)	584-84-9	0.005 ppm	0.02 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
TEDP (Sulfotep)	3689-24-5	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	X
Tellurium and compounds (as Te)	13494-80-9	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Tellurium hexafluoride (as Te)	7783-80-4	0.02 ppm	0.06 ppm	—	—
Temephos (Abate)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
TEPP	107-49-3	0.004 ppm	0.012 ppm	—	X
Terphenyls	26140-60-3	—	—	0.5 ppm	—
1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane	76-11-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane	76-12-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloroethane	79-34-5	1 ppm	3 ppm	—	X
Tetrachloroethylene (Perchloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Tetrachloromethane (Carbon tetrachloride)	56-23-5	2 ppm	4 ppm	—	X
Tetrachloronaphthalene	1335-88-2	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	X
Tetraethyl lead (as Pb)	78-00-2	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetrahydrofuran	109-99-9	200 ppm	250 ppm	—	—
Tetramethyl lead (as Pb)	75-74-1	0.075 mg/m <sup>3</sup>	0.225 mg/m <sup>3</sup>	—	X
Tetramethyl succinonitrile	3333-52-6	0.5 ppm	1.5 ppm	—	X
Tetranitromethane	509-14-8	1 ppm	3 ppm	—	—
Tetrasodium pyrophosphate	7722-88-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tetryl (2, 4, 6-trinitrophenyl-methylnitramine)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
Thallium (soluble compounds) (as Tl)	7440-28-0	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
4, 4-Thiobis					
(6-tert-butyl-m-cresol)	96-69-5	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Thiodan (Endosulfan)	115-29-7	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Thioglycolic acid	68-11-1	1 ppm	3 ppm	—	X
Thionyl chloride	7719-09-7	—	—	1 ppm	—
Thiram	137-26-8	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Tin (as Sn)	—	—	—	—	—
Inorganic compounds	7440-31-5	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Tin (as Sn)	—	—	—	—	—
Organic compounds	7440-31-5	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Tin oxide (as Sn)	21651-19-4	2 mg/m <sup>3</sup>	4 mg/m <sup>3</sup>	—	—
Titanium dioxide	13463-67-7	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
TNT (2, 4, 6-Trinitrotoluene)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Toluene	108-88-3	100 ppm	150 ppm	—	—
Toluene-2, 4-diisocyanate (TDI)	584-84-9	0.005 ppm	0.02 ppm	—	—
m-Toluidine	108-44-1	2 ppm	4 ppm	—	X
o-Toluidine	95-53-4	2 ppm	4 ppm	—	X
p-Toluidine	106-49-0	2.0 ppm	4 ppm	—	X
Toxaphene (Chlorinated camphene)	8001-35-2	0.5 mg/m <sup>3</sup>	1 mg/m <sup>3</sup>	—	X
Tremolite	—	—	—	—	—
Tributyl phosphate	126-73-8	0.2 ppm	0.6 ppm	—	—
Trichloroacetic acid	76-03-9	1 ppm	3 ppm	—	—
1, 2, 4-Trichlorobenzene	120-82-1	—	—	5 ppm	—
1, 1, 1-Trichloroethane (Methyl chloroform)	71-55-6	350 ppm	450 ppm	—	—
1, 1, 2-Trichloroethane	79-00-5	10 ppm	20 ppm	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Trichloroethylene	79-01-6	50 ppm	200 ppm	—	—
Trichlorofluoromethane (Fluorotrichloromethane)	75-69-4	—	—	1,000 ppm	—
Trichloromethane (Chloroform)	67-66-3	2 ppm	4 ppm	—	—
Trichloronaphthalene	1321-65-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	X
1, 2, 3-Trichloropropane	96-18-4	10 ppm	20 ppm	—	X
1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	76-13-1	1,000 ppm	1,250 ppm	—	—
Tricyclohexyltin hydroxide (Cyhexatin)	13121-70-5	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triethylamine	121-44-8	10 ppm	15 ppm	—	—
Trifluorobromomethane	75-63-8	1,000 ppm	1,250 ppm	—	—
Trimellitic anhydride	552-30-7	0.005 ppm	0.015 ppm	—	—
Trimethylamine	75-50-3	10 ppm	15 ppm	—	—
Trimethyl benzene	25551-13-7	25 ppm	38 ppm	—	—
Trimethyl phosphite	121-45-9	2 ppm	4 ppm	—	—
2, 4, 6-Trinitrophenol (Picric acid)	88-89-1	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrophenyl-methylnitramine (Tetryl)	479-45-8	1.5 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	X
2, 4, 6-Trinitrotoluene (TNT)	118-96-7	0.5 mg/m <sup>3</sup>	1.5 mg/m <sup>3</sup>	—	X
Triorthocresyl phosphate	78-30-8	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	X
Triphenyl amine	603-34-9	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Triphenyl phosphate	115-86-6	3 mg/m <sup>3</sup>	6 mg/m <sup>3</sup>	—	—
Tungsten (as W)	7440-33-7	—	—	—	—
Soluble compounds	—	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Turpentine	8006-64-2	100 ppm	150 ppm	—	—
Uranium (as U)	7440-61-1	—	—	—	—
Soluble compounds	—	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Insoluble compounds	—	0.2 mg/m <sup>3</sup>	0.6 mg/m <sup>3</sup>	—	—
n-Valeraldehyde	110-62-3	50 ppm	75 ppm	—	—
Vanadium (as V2O5)	—	—	—	—	—
Respirable fraction	1314-62-1	0.05 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	—	—
Vegetable oil mist	—	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Vinyl acetate	108-05-1	10 ppm	20 ppm	—	—
Vinyl benzene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Vinyl bromide	593-60-2	5 ppm	10 ppm	—	—
Vinyl chloride (Chloroethylene)	75-01-4	1 ppm	5 ppm	—	—
Vinyl cyanide (Acrylonitrile)	107-13-1	2 ppm	10 ppm	—	—
Vinyl cyclohexene dioxide	106-87-6	10 ppm	20 ppm	—	X
Vinyl toluene	25013-15-4	50 ppm	75 ppm	—	—
Vinylidene chloride (1, 1-Dichloroethylene)	75-35-4	1 ppm	3 ppm	—	—
VM & P Naphtha	8032-32-4	300 ppm	400 ppm	—	—
Warfarin	81-81-2	0.1 mg/m <sup>3</sup>	0.3 mg/m <sup>3</sup>	—	—
Welding fumes (total particulate)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Wood dust	—	—	—	—	—
Nonallergenic; (All woods except allergenic)	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Allergenic (e.g. cedar, mahogany and teak)	—	2.5 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	—	—

Substance	CAS	TWA <sub>8</sub>	STEL	Ceiling	Skin
Xylenes (ortho, meta, and para isomers) (Dimethylbenzene)	1330-20-7	100 ppm	150 ppm	—	—
m-Xylene alpha, alpha-diamine	1477-55-0	—	—	0.1 mg/m <sup>3</sup>	X
Xylidine (Dimethylaminobenzene)	1300-73-8	2 ppm	4 ppm	—	X
Yttrium	7440-65-5	1 mg/m <sup>3</sup>	3 mg/m <sup>3</sup>	—	—
Zinc chloride fume	7646-85-7	1 mg/m <sup>3</sup>	2 mg/m <sup>3</sup>	—	—
Zinc chromate (as CrO <sub>3</sub> )	Varies with compound	0.05 mg/m <sup>3</sup>	—	0.1 mg/m <sup>3</sup>	—
Zinc oxide	1314-13-2	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc oxide fume	1314-13-2	5 mg/g <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zinc stearate	557-05-1	—	—	—	—
Total particulate	—	10 mg/m <sup>3</sup>	20 mg/m <sup>3</sup>	—	—
Respirable fraction	—	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—
Zirconium compounds (as Zr)	7440-67-2	5 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	—	—

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-628 Definitions.**

**Ceiling ((-)).** An exposure limit, measured over the shortest time period feasible, that must not be exceeded during any part of the employee's workday.

**Dust ((-)).** Solid particles suspended in air. Dusts are generated by handling, drilling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc.

**Exposed or exposure ((-)).** The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

**Fume ((-)).** Solid particles suspended in air, generated by condensation from the gaseous state, generally after volatilization from molten metals, etc.

**Gas ((-)).** A normally formless fluid which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

**Mist ((-)).** Liquid droplets suspended in air, generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, spraying or atomizing.

**Oxygen deficient ((-)).** An atmosphere with an oxygen content below 19.5% by volume.

**Permissible exposure limits (PEL) ((-)).** Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA rules.

**Short-term exposure limit (STEL) ((-)).** An exposure limit averaged over a short time period (usually measured for 15 minutes) that must not be exceeded during any part of an employee's workday.

**Time weighted average (TWA<sub>8</sub>) ((-)).** An exposure limit averaged over 8 hours that must not be exceeded during an employee's workday.

**Toxic substance ((-)).** Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

((\*) (a) Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS);

((\*) (b) Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.

The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

**Vapor ((-)).** The gaseous form of a substance that is normally in the solid or liquid state.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-630 Scope.** The purpose of this part is to:

((\*) (1) Prevent employee hearing loss by minimizing employee noise exposures;

AND

((\*) (2) Make sure employees exposed to noise are protected.

These goals are accomplished by:

((\*) (a) Measuring and computing the employee noise exposure from all equipment and machinery in the workplace, as well as any other noise sources in the work area;

((\*) (b) Protecting employees from noise exposure by using feasible noise controls;

((\*) (c) Making sure employees use hearing protection, if ((you)) the employer cannot feasibly control the noise;

((\*) (d) Training employees about hearing loss prevention;

((\*) (e) Evaluating ((your)) the employer's hearing loss prevention efforts by tracking employee hearing or periodically reviewing controls and protection;

~~((\*) (f))~~ Making appropriate corrections to ~~((you#))~~ the employer's program.

**Reference:** Table 1 will help ~~((you#))~~ the employer determine the hearing loss prevention requirements for ~~((you#))~~ the workplace. For the specific requirements associated with Noise Evaluation Criteria, see WAC 296-307-63410 of this part.

**Table 1  
Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA <sub>g</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	- Hearing protection - Training - Audiometric testing
90 dBA TWA <sub>g</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	- Noise controls <b>AND</b> - Hearing protection - Training - Audiometric testing
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Hearing protection - Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-632 Summary.**

~~((You#))~~ **Employer responsibility:**

To prevent employee hearing loss by minimizing, and providing protection from, noise exposures.

~~((You must:~~

~~Conduct employee noise exposure monitoring~~

~~WAC 296-307-63205~~

~~Control employee noise exposures that equal or exceed 90 dBA TWA<sub>g</sub>~~

~~WAC 296-307-63210~~

~~Make sure employees use hearing protection when their noise exposure equals or exceed 85 dBA TWA<sub>g</sub>~~

~~WAC 296-307-63215~~

~~Make sure exposed employees receive training about noise and hearing protection~~

~~WAC 296-307-63220~~

~~Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA~~

~~WAC 296-307-63225~~

~~Arrange for oversight of audiometric testing~~

~~WAC 296-307-63230~~

~~Identify and correct deficiencies in your hearing loss prevention program~~

~~WAC 296-307-63235~~

~~Document your hearing loss prevention activities~~

~~WAC 296-307-63240.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Conduct employee noise exposure monitoring.</u>	<u>WAC 296-307-63205</u>
<u>Control employee noise exposures that equal or exceed 90 dBA TWA<sub>g</sub>.</u>	<u>WAC 296-307-63210</u>
<u>Make sure employees use hearing protection when their noise exposure equals or exceed 85 dBA TWA<sub>g</sub>.</u>	<u>WAC 296-307-63215</u>
<u>Make sure exposed employees receive training about noise and hearing protection.</u>	<u>WAC 296-307-63220</u>
<u>Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA.</u>	<u>WAC 296-307-63225</u>
<u>Arrange for oversight of audiometric testing.</u>	<u>WAC 296-307-63230</u>
<u>Identification and correction of deficiencies in a hearing loss prevention program.</u>	<u>WAC 296-307-63235</u>
<u>Documenting hearing loss prevention activities.</u>	<u>WAC 296-307-63240</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63205 Conduct employee noise exposure monitoring.**

~~((You must:~~

~~\*) (1) The employer must conduct employee noise exposure monitoring to determine the employee's actual exposure when reasonable information indicates that any employee's exposure may equal or exceed 85 dBA TWA<sub>g</sub>.~~

**Notes:** ~~((\*)~~ 1. Representative monitoring may be used where several employees perform the same tasks in substantially similar conditions.

((\*) 2. Examples of information or situations that can indicate exposures which equal or exceed 85 dBA TWA<sub>8</sub>, include:

- ((-) a. Noise in the workplace that interferes with people speaking, even at close range;
- ((-) b. Information from the manufacturer of equipment (~~you use~~) the employer uses in the workplace that indicates high noise levels for machines in use;
- ((-) c. Reports from employees of ringing in their ears or temporary hearing loss;
- ((-) d. Warning signals or alarms that are difficult to hear;
- ((-) e. Work near abrasive blasting or jack hammering operations;
- ((-) f. Use of tools and equipment such as the following:
  - ((■) i. Heavy equipment or machinery;
  - ((■) ii. Fuel-powered hand tools;
  - ((■) iii. Compressed air-driven tools or equipment in frequent use;
  - ((■) iv. Power saws, grinders or chippers;
  - ((■) v. Powder-actuated tools.

~~((You must:~~

\*) (2) The employer must follow applicable guidance in WAC 296-307-634 when conducting noise exposure monitoring.

((\*) (3) The employer must make sure (~~your~~) the sampling for noise exposure monitoring identifies:

((-) (a) All employees whose exposure equals or exceeds the following:

- ((■) (i) 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period);
- ((■) (ii) 115 dBA (slow response sound level meter, identifying short-term noise exposures);
- ((■) (iii) 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).

((-) (b) Exposure levels for selection of hearing protection.

((\*) (4) The employer must provide exposed employees and their representatives with an opportunity to observe any measurements of employee noise exposure that are conducted.

((\*) (5) The employer must notify each employee whose exposure equals or exceeds 85 dBA TWA<sub>8</sub> of the monitoring results within five working days of when (~~you~~) the employer receives the results.

((\*) (6) The employer must conduct additional noise monitoring whenever a change in production, process, equipment or controls, may reasonably be expected to result in:

((-) (a) Additional employees whose exposure equals or exceeds 85 dBA TWA<sub>8</sub>;

((-) (b) Employees exposed to higher level of noise requiring more effective hearing protection.

**Note:** Conditions that may be expected to increase exposure include:

- ((\*) 1. Adding machinery to the work area;
- ((\*) 2. Increasing production rates;
- ((\*) 3. Removal or deterioration of noise control devices;
- ((\*) 4. Increased use of noisy equipment;
- ((\*) 5. Change in work schedule;
- ((\*) 6. Change of job duties.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63210 Control employee noise exposures that equal or exceed 90 dBA TWA<sub>8</sub>.**

**IMPORTANT:**

Hearing protection provides a barrier to noise and protects employees but is not considered a control of the noise hazard. Separate requirements apply to hearing protection and are found in WAC 296-307-63215.

~~((You must:~~

\*) The employer must reduce employee noise exposure, using feasible controls, wherever exposure equals or exceeds 90 dBA TWA<sub>8</sub>.

**Notes:**

- ((\*) 1. Once noise exposures are brought below 90 dBA TWA<sub>8</sub>, no further reduction is required. However, further reduction of noise may reduce the need for other hearing loss prevention requirements.
- ((\*) 2. Controls that eliminate noise at the source or establish a permanent barrier to noise are typically more reliable. For example:
  - ((-) a. Replacing noisy equipment with quiet equipment;
  - ((-) b. Using silencers and mufflers;
  - ((-) c. Installing enclosures;
  - ((-) d. Damping noisy equipment and parts.
- ((\*) 3. Other controls and work practices may also be useful for reducing noise exposures. Examples include:
  - ((-) a. Employee rotation;
  - ((-) b. Limiting use of noisy equipment;
  - ((-) c. Rescheduling work.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63215 Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>.**

~~((You must:~~

\*) (1) the employer must make sure employees wear hearing protectors that will provide sufficient protection when exposure equals or exceeds:

- ((-) (a) 85 dBA TWA<sub>8</sub> (noise dosimetry, providing an average exposure over an eight-hour time period);
- ((-) (b) 115 dBA (slow response sound level meter, identifying short-term noise exposures);
- ((-) (c) 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).

((\*) (2) The employer must provide employees with an appropriate selection of hearing protectors:

((-) (a) The selection must include at least two distinct types (such as molded earplugs, foam earplugs, custom-molded earplugs, earcaps, or earmuffs) for each exposed employee and must be sufficient to cover:

- ((■) (i) Different levels of hearing protection needed in order to reduce all employee exposures to a level below 85 dBA TWA<sub>8</sub>;
- ((■) (ii) Different sizes;
- ((■) (iii) Different working conditions.
- ((-) (b) Consider requests of the employees regarding:
  - ((■) (i) Physical comfort;

- (■) (ii) Environmental conditions;
- (■) (iii) Medical needs;
- (■) (iv) Communication requirements.

**Note:** Hearing protector selection should include earplugs, earcaps and earmuffs.

**~~(You must:~~**

\*) (3) The employer must provide hearing protection at no cost to employees;

(\*) (4) The employer must supervise employees to make sure that hearing protection is used correctly;

(\*) (5) The employer must make sure hearing protectors are:

- (-) (a) Properly chosen for fit;
- (-) (b) Replaced as necessary.

(\*) (6) The employer must make sure all hearing protection is sufficient to reduce the employee's equivalent eight-hour noise exposure to 85 dBA or less. When using the A-weighted exposure measurements, reported as "dBA TWA<sub>8</sub>," the reduction in noise exposure by hearing protectors is given by Table 2(†).

**Table 2**

**Effective Protection of Hearing Protectors**

Type of hearing protection	Effective protection
Single hearing protection (earplugs, earcaps or earmuffs)	7 dB less than the manufacturer assigned noise reduction rating (NRR); for example, earplugs with an NRR of 20 dB are considered to reduce employee exposures of 95 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>
Dual hearing protection (earplug and earmuff worn together)	2 dB less than the higher NRR of the two protectors; for example, earplugs with an NRR of 20 dB and earmuffs with an NRR of 12 dB are considered to reduce employee exposures of 100 dBA TWA <sub>8</sub> to 82 dBA TWA <sub>8</sub>

(\*) (7) In addition to protection based on daily noise dose, the employer must make sure hearing protection has an NRR of at least 20 dB when exposures involve noise that equals or exceeds 115 dBA (slow response sound level meter) or 140 dBC (fast response sound level meter).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**Note:** (~~You~~) The employer may also evaluate hearing protection by using the other methods given in the NIOSH *Compendium of Hearing Protection* (DHHS (NIOSH)) Publication No. 95-105 or online at <http://www.cdc.gov/niosh/topics/noise/hpcomp.html>. These methods require additional monitoring and are more complex, but provide a more thorough evaluation of protection. This may be useful in cases where communication is critical or for evaluating hearing protection for employees with hearing impairment.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63220 Make sure exposed employees receive training about noise and hearing protection.**

**~~(You must:~~**

\*) (1) The employer must train all employees whose noise exposure equals or exceeds 85 dBA TWA<sub>8</sub>.

(\*) (2) The employer must provide training when an employee is first assigned to a position involving noise exposure that equals or exceeds 85 dBA TWA<sub>8</sub> and at least annually after that.

(\*) (3) The employer must update information provided in the training program to be consistent with changes in controls, hearing protectors and work processes.

(\*) (4) The employer must make sure (~~your~~) noise and hearing protection training includes:

- (-) (a) The effects of noise on hearing (including both occupational and nonoccupational exposures);
- (-) (b) Noise controls used in (~~your~~) workplace;
- (-) (c) The purpose of hearing protectors: The advantages, disadvantages, and attenuation of various types;
- (-) (d) Instructions about selecting, fitting, using, and caring for hearing protection;
- (-) (e) The purpose and procedures for program evaluation including audiometric testing and hearing protection auditing when (~~you~~) the employer chooses to rely upon auditing (see WAC 296-307-638);
- (-) (f) The employees' right to access records kept by the employer.

(\*) (5) The employer must maintain a written program describing initial and refresher training.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63225 Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.**

**~~(You must:~~**

\*) The employer must make sure warning signs are posted at the entrances or boundaries of all well-defined work areas where employees may be exposed to noise that equals or exceeds 115 dBA (measured using a sound level meter with slow response).

(-) Warning signs must clearly indicate that the area is a high noise area and that hearing protectors are required.

**WAC 296-307-63230 Arrange for oversight of audiometric testing.**



~~((You must:~~

\*) (1) The employer must make sure audiometric testing as described by WAC 296-307-636 is supervised and reviewed by one of the following licensed or certified individuals:

- ~~((-) (a) An audiologist;~~
- ~~((-) (b) An otolaryngologist;~~
- ~~((-) (c) Another qualified physician.~~

~~((\*) (2) The employer must make sure audiograms are conducted by one of the above individuals or by a technician certified by the Council of Accreditation in Occupational Hearing Conservation (CAOHC) and responsible to a qualified reviewer.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63235 ~~((Identify and correct))~~ Identification and correction of deficiencies in ~~((your))~~ a hearing loss prevention program.**

~~((You must:~~

\*) (1) The employer must use audiometric testing to identify hearing loss, which may indicate program deficiencies;

~~((\*) (2) The employer must take appropriate actions when deficiencies are found with ~~((your))~~ the employer's program.~~

~~((-) A deficiency may be indicated when:~~

~~((\*) (a) Any employee experiences measurable hearing loss indicated by a standard threshold shift;~~

**OR**

~~((\*) (b) Any employee isn't wearing appropriate hearing protection during an audit when auditing is used in place of baseline audiograms for short term employees (see WAC 296-307-638, Option to audiometric testing).~~

**Note:** A standard threshold shift or audit deficiency does not necessarily indicate that a significant hearing loss has occurred. These criteria are intended to help identify where there may be flaws in ~~((your))~~ the employer's hearing loss prevention program that can be fixed before permanent hearing loss occurs. There are additional statistical tools and tests that may be used to improve the effectiveness of ~~((your))~~ the employer's program. Staff conducting audiometric testing and auditing may be able to suggest additional ways to improve ~~((your))~~ the employer's hearing loss prevention program and tailor it to ~~((your))~~ the worksite.

~~((You must:~~

\*) (3) The employer must evaluate the following, at a minimum, when responding to a standard threshold shift:

- ~~((-) (a) Employee noise exposure measurements;~~
- ~~((-) (b) Noise controls in the work area;~~
- ~~((-) (c) The selection of hearing protection available and refit employees as necessary;~~
- ~~((-) (d) Employee training on noise and the use of hearing protection and conduct additional training as necessary.~~

**Reference:**

~~((You))~~ The employer may use the option of auditing hearing protection (see WAC 296-307-638) for employees hired or transferred to jobs with noise exposure for less than one year. ~~((You))~~ The employer may also use audiograms provided by a third-party hearing loss prevention program in some circumstances. Details of these program options are found in WAC 296-307-638, Options to audiometric testing.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63240 ~~((Document your))~~ Documenting hearing loss prevention activities.**

~~((You must:~~

\*) The employer must create and retain records documenting noise exposures. Include, at a minimum:

~~((-) (1) Exposure measurements required by this part for at least two years and for as long as ~~((you rely))~~ the employer relies upon them to determine employee exposure;~~

~~((-) (2) Audiometric test records for the duration of employment for the affected employees;~~

~~((-) (3) Hearing protection audits, if ~~((you))~~ the employer chooses to rely upon them, for the duration of employment of the affected employees.~~

**Notes:**

~~((You need)) 1. The employer needs to keep as complete a record as possible. Records developed under previous rules or in other jurisdictions need to be kept, even when they do not fulfill the full requirements of this part. Similarly, records found to have errors in collection or processing need to be kept if they provide an indication of employee exposure or medical condition not found in other records.~~

~~((You)) 2. The employer may want to consider ~~((your))~~ other business needs, such as worker's compensation claims management, before discarding these records.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-634 Summary.**

~~((Your)) Employer responsibility:~~

~~Conduct noise monitoring or measurement to evaluate employee exposures in ~~((your))~~ the workplace.~~

~~((You must:~~

~~Make sure that noise measuring equipment meets recognized standards~~

~~WAC 296-307-63405~~

~~Measure employee noise exposure~~

~~WAC 296-307-63410~~

~~Use these equations when estimating full-day noise exposure from sound level measurements~~

~~WAC 296-307-63415.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Make sure that noise-measuring equipment meets recognized standards.</u>	<u>WAC 296-307-63405</u>
<u>Measure employee noise exposure.</u>	<u>WAC 296-307-63410</u>

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Use these equations when estimating full-day noise exposure from sound level measurements.</u>	<u>WAC 296-307-63415</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63405 Make sure that noise-measuring equipment meets recognized standards.**

~~((You must:~~

•)) (1) The employer must make sure that noise dosimetry equipment meets these specifications:

((-) (a) Dosimeters must be equipment class 2AS-90/80-5 of the American National Rule Specification for Personal Noise Dosimeters, ANSI S1.25-1991, such dosimeters are normally marked "Type 2."

- Note:** Make sure any dosimeter (~~(you use))~~ used is Type 2 equipment that:
- ((\*) 1. Uses slow integration and A-weighting of sound levels.
  - ((\*) 2. Has the **critterion level** set to 90 dB, so the dosimeter will report a constant 8-hour exposure at 90 dBA as a 100% dose.
  - ((\*) 3. Has the **threshold level** set at 80 dB, so the dosimeter will register all noise above 80 dB.
  - ((\*) 4. Uses a 5 dB **exchange rate** for averaging of noise levels over the sample period.

~~((You must:~~

•)) (2) The employer must make sure that sound level meters meet these specifications:

((-) (a) American National Standard Specification for Sound Level Meters, S1.4-1984, Type 2 requirements for sound level meters, such sound level meters are normally marked "Type 2."

((■) (b) For continuous noise measurements, the meter must be capable of measuring A-weighted sound levels with slow response.

((■) (c) For impulse or impact noise measurements, the meter must be capable of indicating maximum C-weighted sound level measurements with fast response.

((\*) (3) The employer must calibrate dosimeters and sound level meters used to monitor employee noise exposure:

((-) (a) Before and after each day's use;

AND

((-) (b) Following the instrument manufacturer's calibration instructions.

- Notes:**
- ((-You)) 1. The employer may conduct dosimetry using an exchange rate less than 5 dB and compare the results directly to the noise evaluation criteria in Table 1.
  - ((\*) 2. For measuring impulse and impact noise (~~(you))~~ the employer may also use a sound level meter set to measure maximum impulse C-weighted sound levels or peak C-weighted sound levels.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63410 Measure employee noise exposure.**

**IMPORTANT:**

A noise dosimeter is the basis for determining total daily noise exposure for employees. However, where (~~(you have))~~ there is constant noise levels, (~~(you))~~ the employer may estimate employee noise exposure using measurements from a sound level meter. Calculation of the employee noise exposure must be consistent with WAC 296-307-63415.

~~((You must:~~

•)) (1) The employer must include all:

((-) (a) Workplace noise from equipment and machinery in use;

((-) (b) Other noise from sources necessary to perform the work;

((-) (c) Noise outside the control of the exposed employees.

((\*) (2) The employer must use a noise dosimeter when necessary to measure employee noise dose.

((\*) (3) The employer must use a sound level meter to evaluate continuous and impulse noise levels.

((\*) (4) The employer must identify all employees whose exposures equal or exceed the Noise Evaluation Criteria as follows:

**Noise Evaluation Criteria**

<b>Criteria</b>	<b>Description</b>	<b>Requirements</b>
85 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	- Hearing protection - Training - Audiometric testing
90 dBA TWA <sub>8</sub>	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	Noise controls (in addition to the requirements for 85 dBA TWA <sub>8</sub> )
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Hearing protection - Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63415 Use these equations when estimating full-day noise exposure from sound level measurements.**

~~((You must:~~

**•)) The employer must** compute employee's full-day noise exposure by using the appropriate equations from Table 3 "Noise Dose Computation" **when** using a sound level meter to estimate noise dose.

**Table 3  
Noise Dose Computation**

<b>Description</b>	<b>Equation</b>
Compute the noise dose based on several time periods of constant noise during the shift	The total noise dose over the work day, as a percentage, is given by the following equation where C <sub>n</sub> indicates the total time of exposure at a specific noise level, and T <sub>n</sub> indicates the reference duration for that level. $D = 100 * ((C_1/T_1) + (C_2/T_2) + (C_3/T_3) + \dots + (C_n/T_n))$
The reference duration is equal to the time of exposure to continuous noise at a specific sound level that will result in a one hundred percent dose	The reference duration, T, for sound level, L, is given in hours by the equation: $T = 8 / (2^{((L - 90)/5)})$
Given a noise dose as a percentage, compute the equivalent eight-hour time weighted average noise level	The equivalent eight-hour time weighted average, TWA <sub>8</sub> , is computed from the dose, D, by the equation: $TWA_8 = 16.61 * \text{Log}_{10}(D/100) + 90$

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-636 Summary.**

~~((You\*)) **Employer responsibility:**~~

To conduct audiometric testing of employees exposed to noise to make sure that their hearing protection is effective.

~~((You must:~~

~~Provide audiometric testing at no cost to employees~~

~~WAC 296-307-63605~~

~~Establish a baseline audiogram for each exposed employee~~

~~WAC 296-307-63610~~

~~Conduct annual audiograms~~

~~WAC 296-307-63615~~

~~Review audiograms that indicate a standard threshold shift~~

~~WAC 296-307-63620~~

~~Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing~~

~~WAC 296-307-63625~~

~~Make sure a record is kept of audiometric tests~~

~~WAC 296-307-63630~~

~~Make sure audiometric testing equipment meets these requirements~~

~~WAC 296-307-63635.))~~

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Provide audiometric testing at no cost to employees.</u>	<u>WAC 296-307-63605</u>
<u>Establish a baseline audiogram for each exposed employee.</u>	<u>WAC 296-307-63610</u>
<u>Conduct annual audiograms.</u>	<u>WAC 296-307-63615</u>
<u>Review audiograms that indicate a standard threshold shift.</u>	<u>WAC 296-307-63620</u>
<u>Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.</u>	<u>WAC 296-307-63625</u>
<u>Make sure a record is kept of audiometric tests.</u>	<u>WAC 296-307-63630</u>
<u>Make sure audiometric testing equipment meets these requirements.</u>	<u>WAC 296-307-63635</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63605 Provide audiometric testing at no cost to employees.**

~~((You must:~~

**•)) The employer must** provide audiograms, including any required travel or necessary additional examinations or testing, at no cost to exposed employees.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63610 Establish a baseline audiogram for each exposed employee.**

~~((You must:~~

**•)) (1) The employer must** conduct a baseline audiogram when an employee is first assigned to work involving noise exposures that equal or exceed 85 dBA TWA<sub>8</sub>.

~~((-)) (a) Make sure this audiogram is completed no more than one hundred eighty days after the employee is first assigned;~~

**OR**

((-) (b) Make sure employee is covered by a hearing protection audit program (as described by WAC 296-307-638 and available as an alternative only for employees hired for less than one year).

**Note:** Employers who utilize mobile test units are allowed up to one year to obtain a valid baseline audiogram for each exposed employee. The employees must still be given training and hearing protection as required by this part.

~~((You must:~~

\*) (2) The employer must make sure employees are not exposed to workplace noise at least fourteen hours before testing to establish a baseline audiogram.

((-) Hearing protectors may be used to accomplish this.

((\*) (3) The employer must notify employees of the need to avoid high levels of nonoccupational noise exposure (such as loud music, headphones, guns, power tools, motorcycles, etc.) during the fourteen-hour period immediately preceding the baseline audiometric examination.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63615 Conduct annual audiograms.**

~~((You must:~~

\*) (1) The employer must conduct annual audiograms for employees as long as they continue to be exposed to noise that equals or exceeds 85 dBA TWA<sub>8</sub>.

**Note:** Annual audiometric testing may be conducted at any time during the work shift. By conducting the annual audiogram during the work shift with the employee exposed to typical noise for their job, the test may record a temporary threshold shift. This makes the test more sensitive to potential hearing loss and may help you improve employee protection before a permanent threshold shift occurs. A suspected temporary shift is one reason an employer may choose to retest employee hearing.

~~((You must:~~

\*) (2) The employer must make sure each employee is informed of the results of his or her audiometric test.

((-) Include whether or not there has been a hearing level decrease or improvement since their previous test.

((\*) (3) The employer must make sure each employee's annual audiogram is compared to his or her baseline audiogram by an audiologist, otolaryngologist, another qualified physician, or the technician conducting the test to determine if a standard threshold shift has occurred.

((-) If the annual audiogram indicates that an employee has suffered a standard threshold shift, ~~((you))~~ the employer may obtain a retest within thirty days and consider the results of the retest as the annual audiogram.

((\*) (4) The employer must make sure that an audiologist, otolaryngologist, or other qualified physician sees any annual audiogram that indicates a standard threshold shift.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63620 Review audiograms that indicate a standard threshold shift.**

~~((You must:~~

\*) (1) The employer must make sure the health care professional supervising audiograms has:

((-) (a) A copy of this part;

((-) (b) The baseline audiogram and most recent audiogram of the employee to be evaluated;

((-) (c) Background noise level records for the testing room;

((-) (d) Calibration records for the audiometer.

((\*) (2) The employer must obtain an opinion from the health care professional supervising audiograms as to whether the audiograms indicate possible occupational hearing loss and any recommendations for changes in hearing protection.

((\*) (3) The employer must pay for any clinical audiological evaluation or otological examination required by the reviewer, if:

((-) (a) Additional review is necessary to evaluate the cause of hearing loss;

**OR**

((-) (b) If there is indication of a medical condition of the ear caused or aggravated by the wearing of hearing protectors.

((\*) (4) The employer must inform the employee in writing of the existence of a standard threshold shift within twenty-one calendar days of the determination.

((\*) (5) The employer must make arrangements for the reviewer to communicate to the employee any suspected medical conditions that are found unrelated to ~~((your))~~ the workplace. This information is confidential and must be handled appropriately.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63625 Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.**

~~((You must:~~

\*) The employer must keep the baseline audiogram without revision, unless a qualified reviewer determines:

((-) (1) The standard threshold shift revealed by the audiogram is persistent;

**OR**

((-) (2) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63630 Make sure a record is kept of audiometric tests.**

~~((You must:~~

\*) The employer must retain a legible copy of all employee audiograms conducted under this part.

((-) Make sure the record includes:

((■)) (1) Name and job classification of the employee;

((■)) (2) Date of the audiogram;

((■)) (3) The examiner's name;

~~(\*)~~ (4) Date of the last acoustic or exhaustive calibration of the audiometer;

~~(\*)~~ (5) Employee's most recent noise exposure assessment;

~~(\*)~~ (6) The background sound pressure levels in audiometric test rooms.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63635 Make sure audiometric testing equipment meets these requirements.**

~~(You must:~~

~~(\*)~~ (1) The employer must use pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz.

~~(-)~~ (a) Tests at each frequency must be taken separately for each ear.

~~(-)~~ (b) Supra-aural headphones must be used.

~~(\*)~~ (2) The employer must conduct audiometric tests with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used according to, American National Standard Specification for Audiometers, S3.6-1996.

~~(\*)~~ (3) The employer must check the functional operation of the audiometer each day before use by doing all of the following:

~~(-)~~ (a) Make sure the audiometer's output is free from distorted or unwanted sound;

~~(-)~~ (b) Test either a person with known, stable hearing thresholds or a bio-acoustic simulator;

~~(-)~~ (c) Perform acoustic calibration for deviations of 10 dB or greater.

~~(\*)~~ (4) Audiometer calibration must be checked acoustically at least annually to verify continued conformance with ANSI S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check.

~~(\*)~~ (5) The employer must perform an exhaustive calibration (~~must be performed~~) at least every two years according to the American National Standard Specification for Audiometers, S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from the calibration.

~~(\*)~~ (6) The employer must provide audiometric test rooms that meet the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms using the following table of Maximum Ambient Sound Pressure Levels(~~:~~).

**Table 4**

**Maximum Ambient Sound Pressure Levels**

Frequency (Hz)	500	1000	2000	4000	8000
Sound Pressure Level (dB)	40	40	47	57	62

**Note:** The American Industrial Hygiene Association and National Hearing Conservation Association recommend conducting audiograms using the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms with adjustments at only 500 Hz and below.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-638 Summary.**

~~(Your)~~ **Employer responsibility:**

This section provides options to baseline audiometric testing for employees assigned to duties with noise exposures for **less than one year**. These program options may also be used to provide added assessment of longer-term employees in addition to audiometric testing.

The requirements of this section apply only if ~~(you)~~ the employer decides to use auditing or a third-party hearing loss prevention program and do not conduct baseline audiometric testing for those employees.

~~(Hearing Protection Audits~~

~~You must:~~

~~Conduct hearing protection audits at least quarterly~~

~~WAC 296-307-63805~~

~~Make sure staff conducting audits are properly trained~~

~~WAC 296-307-63810~~

~~Assess the hearing protection used by each employee during audits~~

~~WAC 296-307-63815~~

~~Document your hearing protection audits~~

~~WAC 296-307-63820~~

~~Third-Party Audiometric Testing~~

~~You must:~~

~~Make sure third-party hearing loss prevention programs meet the following requirements~~

~~WAC 296-307-63825))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<b><u>Hearing Protection Audits</u></b>	
<u>Conduct hearing protection audits at least quarterly.</u>	<u>WAC 296-307-63805</u>
<u>Make sure staff conducting audits are properly trained.</u>	<u>WAC 296-307-63810</u>
<u>Assess the hearing protection used by each employee during audits.</u>	<u>WAC 296-307-63815</u>
<u>Document your hearing protection audits.</u>	<u>WAC 296-307-63820</u>
<b><u>Third-Party Audiometric Testing</u></b>	
<u>Make sure third-party hearing loss prevention programs meet the following requirements.</u>	<u>WAC 296-307-63825</u>

**IMPORTANT:**

**Hearing protection audits** are a tool for use in evaluating ~~((you))~~ the employer's hearing loss prevention program in cases where audiometric testing does not provide a useful measure. For example, if most of ~~((you))~~ the employees are hired on a temporary basis for a few months at a time, audiometric testing may not identify the small changes in hearing acuity that could occur. Auditing provides an alternative to audiometric testing in these cases.

Auditing is not required unless ~~((you))~~ the employer uses it in place of baseline audiometric testing for employees hired for a period of **less than one year** and is permitted as a substitute for audiometric testing only for these employees.

**Third-party hearing loss prevention programs** are full hearing loss prevention programs and are distinct from audiometric testing provided by third parties as part of ~~((your own))~~ the employer's hearing loss prevention program. These programs may be organized by labor groups, trade associations, labor-management cooperatives, or other organizations to:

~~((★))~~ (1) Cover a specific group of employees;

OR

~~((★))~~ (2) Combine efforts for several employers with common employees.

Although ~~((you))~~ the employer remains responsible for the program, third-party programs can have at least two benefits over the employer running ~~((your))~~ its own program:

~~((★))~~ (a) The audiometric testing is portable between the participating employers so new testing will not be needed when an employee changes employers.

~~((★))~~ (b) Employees who only work for short periods for any one employer can be monitored under the group program over a longer period of time increasing the effectiveness of the audiometric testing in preventing hearing loss for these employees.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63805 Conduct hearing protection audits at least quarterly.**

~~((You must:~~

~~((★))~~ (1) The employer must conduct audits at least quarterly to provide a representative assessment of ~~((your))~~ the workplace.

~~((-))~~ (a) The assessment is representative if it:

~~((■))~~ (i) Covers all processes and work activities in ~~((your))~~ the employer's business at full production levels;

AND

~~((■))~~ (ii) Covers all employees present on the audit day.

~~((-))~~ (b) If ~~((your))~~ the business is mobile or involves variable processes, auditing may need to be repeated more often than quarterly;

~~((-))~~ (c) Auditing does not need to be repeated more than monthly as long as a reasonable effort is made to cover:

~~((■))~~ (i) The activities with greatest exposure;

AND

~~((■))~~ (ii) As many employees as possible.

~~((★))~~ (2) The employer must assess exposures and hearing protection for the full shift for each employee covered at the time of the audit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63810 Make sure staff conducting audits are properly trained.**

~~((You must:~~

~~((★))~~ (1) The employer must make sure staff conducting hearing protection audits:

~~((-))~~ (1) Can demonstrate competence in:

~~((■))~~ (a) Evaluating hearing protection attenuation;

~~((■))~~ (b) Evaluating hearing protector choices;

~~((■))~~ (c) Assessing the correct use of hearing protectors.

~~((-))~~ (2) Are certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or have training in the following areas:

~~((■))~~ (a) Noise and hearing loss prevention;

~~((■))~~ (b) Washington state noise regulations;

~~((■))~~ (c) Hearing protectors;

~~((■))~~ (d) Fitting of hearing protectors;

~~((■))~~ (e) Basic noise measurement;

~~((■))~~ (f) Hearing loss prevention recordkeeping.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63815 Assess the hearing protection used by each employee during audits.**

~~((You must:~~

~~((★))~~ (1) The employer must confirm that:

~~((-))~~ (1) Current site conditions during audits are consistent with conditions existing during noise monitoring;

~~((-))~~ (2) The hearing protection used by the employee is sufficient and appropriate for the conditions;

~~((-))~~ (3) The hearing protection is worn properly;

~~((-))~~ (4) The employees are satisfied with the performance and comfort of the hearing protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63820 Document ~~((your))~~ hearing protection audits.**

~~((You must:~~

~~((★))~~ (1) The employer must keep a record of audit results for each employee assessed for the length of their employment and for the length of time ~~((your))~~ the employer will rely upon the audit results.

~~((★))~~ (2) The employer must include the following information in the record:

~~((-))~~ (a) The make and model of the hearing protectors;

~~((-))~~ (b) The size of the protectors;

~~((-))~~ (c) Average noise exposure of the employee;

~~((-))~~ (d) Any problems found with use of the hearing protection;

~~((-))~~ (e) Any comments or complaints from the employee regarding the hearing protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-63825 Make sure third-party hearing loss prevention programs meet the following requirements.**

**IMPORTANT:**

Third-party hearing loss prevention programs are intended:

((\*) 1. For short-term employees hired or assigned to duties having noise exposures **for less than one year**;

**AND**

((\*) 2. For seasonal employees.

However, other employees may be included as long as ((you)) the employer meets all requirements for hearing loss follow-ups and recordkeeping.

~~((You must:~~

\*) (1) The employer must make sure that the third-party program is:

((-) (a) Equivalent to an employer program as required by this part;

**AND**

((-) (b) Uses audiometric testing to evaluate hearing loss.

((\*) (2) The employer must make sure a licensed or certified audiologist, otolaryngologist, or other qualified physician administers the third-party program.

((\*) (3) The employer must make sure the third-party program has written procedures for:

((-) (a) Communicating with participating employers of program requirements;

((-) (b) Follow-up procedures for detected hearing loss;

((-) (c) Annual review of participating employer programs.

((\*) (4) The employer must make sure the following program elements are corrected by ((you)) the employer or the third-party program when deficiencies are found:

((-) (a) Noise exposures;

((-) (b) Hearing protection;

((-) (c) Employee training;

((-) (d) Noise controls.

((\*) (5) The employer must obtain a review of ((you)) the hearing loss prevention program at least once per year, conducted by the third-party program administrator or their representative, in order to:

((-) (a) Identify any tasks needing a revised selection of hearing protection;

**AND**

((-) (b) Provide an overall assessment of the employers' hearing loss prevention activities.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-640 Noise definitions.**

**A-weighted ((-)).** An adjustment to sound level measurements that reflects the sensitivity of the human ear. Used for evaluating continuous or average noise levels.

**Audiogram ((-)).** A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

**Audiologist ((-)).** A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association, or the American Academy of Audiology, and is licensed by the state board of examiners.

**Baseline audiogram ((-)).** The audiogram against which future audiograms are compared. The baseline audiogram is collected when an employee is first assigned to work with noise exposure. The baseline audiogram may be revised if persistent standard threshold shift (STS) of improvement is found.

**Continuous noise ((-)).** Noise with peaks spaced no more than one second apart. Continuous noise is measured using sound level meters and noise dosimeters with the slow response setting.

**Criterion sound level ((-)).** A sound level of ninety decibels. An eight-hour exposure to constant 90 dBA noise is a one hundred percent noise dose exposure.

**C-weighted ((-)).** An adjustment to sound level measurements that evenly represents frequencies within the range of human hearing. Used for evaluating impact or impulse noise.

**Decibel (dB) ((-)).** Unit of measurement of sound level. A-weighting, adjusting for the sensitivity of the human ear, is indicated as "dBA." C-weighting, an even reading across the frequencies of human hearing, is indicated as "dBC."

**Fast response ((-)).** A setting for a sound level meter that will allow the meter to respond to noise events of less than one second. Used for evaluating impulse and impact noise levels.

**Hertz (Hz) ((-)).** Unit of measurement of frequency, numerically equal to cycles per second.

**Impulsive or impact noise ((-)).** Noise levels which involve maxima at intervals greater than one second. Impulse and impact noise are measured using the fast response setting on a sound level meter.

**Noise dose ((-)).** The total noise exposure received by an employee during their shift. It can be expressed as a percentage indicating the ratio of exposure received to the noise exposure received in an eight-hour exposure to constant noise at 90 dBA. It may also be expressed as the sound level that would produce the equivalent exposure during an eight-hour period (TWA<sub>8</sub>).

**Noise dosimeter ((-)).** An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

**Occupational hearing loss ((-)).** A reduction in the ability of an individual to hear either caused or contributed to by exposure in the work environment.

**Otolaryngologist ((-)).** A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

**Permanent threshold shift ((-)).** A hearing level change that has become persistent and is not expected to improve.

**Qualified reviewer ((-)).** An audiologist, otolaryngologist, or other qualified physician who has experience and training in evaluating occupational audiograms.

**Slow response ((-)).** A setting for sound level meters and dosimeters in which the meter does not register events of less than about one second. Used for evaluating continuous and average noise levels.

**Sound level ((-)).** The intensity of noise as indicated by a sound level meter.

**Sound level meter ((-)).** An instrument that measures sound levels.

**Standard threshold shift (STS) ((-)).** A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

**Temporary threshold shift ((-)).** A hearing level change that improves. A temporary threshold shift may occur with exposure to noise and hearing will return to normal within a few days. Temporary threshold shifts can be indicators of exposures that lead to permanent hearing loss.

**TWA<sub>8</sub> - Equivalent eight-hour time-weighted average sound level ((-)).** That sound level, which if constant over an eight-hour period, would result in the same noise dose measured in an environment where the noise level varies.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-642 Scope.** This part applies to all confined spaces and provides requirements to protect employees from the hazards of entering and working in confined spaces. This part applies in any of the following circumstances:

~~((You have))~~ (1) The employer has confined spaces in ~~((your))~~ the workplace.

~~((You are))~~ (2) Employees will enter another employer's confined spaces.

~~((You are))~~ (3) A contractor will enter ~~((your))~~ the employer's confined spaces.

~~((You are))~~ (4) The employer provides confined space rescue services.

~~((You are))~~ The employer can use Table 1 to help ~~((you))~~ decide which requirements to follow for confined spaces.

**Table 1  
Requirements for Confined Spaces**

For confined spaces that are	The requirements in the following sections apply					
	644	646	648	650	652	654
Permit-required confined spaces	X	X	X	X	X	X
Entered by a contractor	X	X	X	X	X	X
Nonpermit confined spaces	X					X
Never entered	X					
<b>If <del>((you))</del> <u>the employer</u> only:</b>						
<u>Uses</u> alternate entry procedures	X	X	X		X	
<del>((Have))</del> <u>Has</u> a contractor enter <del>((your))</del> <u>the</u> space	X					
<del>((Are))</del> <u>Is</u> a rescue service provider		X	X	X		

**Definition:**

~~((A))~~ Confined space ~~((is))~~, A space that is ALL of the following:

~~((A))~~ (a) Large enough and arranged so an employee could fully enter the space and work.

~~((A))~~ (b) Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.

~~((A))~~ (c) Not primarily designed for human occupancy.

**Notes:** ~~((1))~~ 1. Requirements in other chapters may apply to ~~((your))~~ the employer's work. ~~((You))~~ The employer will find some safety and health requirements are addressed on a broad level in this part, while being addressed for a specific application in another rule. When this happens, both requirements apply and should not conflict. When a conflict does occur, ~~((you))~~ the employer needs to follow the more specific requirement.

~~((2))~~ 2. If ~~((you are))~~ the employer is uncertain which requirements to follow, contact ~~((your))~~ the local labor and industries (L&I) office.

~~((Your))~~ Employer responsibility:

To identify ~~((your))~~ permit-required confined spaces and control employee entry.

~~((You must:))~~

~~Identify permit-required confined spaces.~~

~~WAC 296-307-64402~~

~~Inform employees and control entry to permit-required confined spaces.~~

~~WAC 296-307-64404~~

~~Follow these requirements when you contract with another employer to enter your confined space.~~

~~WAC 296-307-64406))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Identify permit-required confined spaces.</u>	<u>WAC 296-307-64402</u>
<u>Inform employees and control entry to permit-required confined spaces.</u>	<u>WAC 296-307-64404</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-644 Summary. Identifying and controlling permit-required confined spaces.**



<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>The employer must follow these requirements when contracting with another employer to enter its confined space.</u>	<u>WAC 296-307-64406</u>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64402 Identify permit-required confined spaces.**

**IMPORTANT:**

If ~~((you#))~~ the employer's workplace contains only non-permit confined spaces and ~~((you#))~~ employees do not enter another employer's confined space, ~~((you#))~~ the employer may follow only the requirements in:

~~((-))~~ 1. WAC 296-307-644, Identifying and controlling permit-required confined spaces; and

~~((-))~~ 2. WAC 296-307-654, Nonpermit confined spaces requirements.

~~((You must#~~

~~(\*)~~) (1) The employer must identify all permit-required confined spaces in your workplace.

~~((\*)~~) (2) The employer must assume any confined space is a permit-required confined space, unless ~~((you#))~~ the employer determines the space to be a nonpermit confined space.

~~((-If you))~~ (a) If the employer or employees enter the space to determine the hazards, follow the requirements in WAC 296-307-650, Permit entry procedures.

~~((-If you))~~ (b) If the employer evaluates the confined space and there are no potential or actual hazards, ~~((you#))~~ the employer can consider it to be a nonpermit confined space.

~~((\*)~~) (3) The employer must document ~~((you#))~~ its determination that the space is nonpermit, as required by WAC 296-307-654.

**Definitions:**

~~((\*)~~) Permit-required confined space or permit space ~~((is))~~, A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

~~((-))~~ (a) Contains or has a potential to contain a hazardous atmosphere.

~~((-))~~ (b) Contains a material with the potential for engulfing someone who enters the space.

~~((-))~~ (c) Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross-section.

~~((-))~~ (d) Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

~~((-))~~ (e) Contains any other recognized safety or health hazard that could either:

~~((\*)~~) (i) Impair the ability to self rescue;

**OR**

~~((\*)~~) (ii) Result in a situation that presents an immediate danger to life or health.

~~((\*)~~) Nonpermit confined space ~~((is))~~, A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64404 Inform employees and control entry to permit-required confined spaces.**

~~((You must#~~

(1) The employer must provide information about confined spaces as follows:

~~((\*)~~) (a) Make available to affected employees and their authorized representatives all information and documents required by this part.

~~((\*)~~) (b) Inform affected employees about the existence, location, and danger of any permit-required confined spaces in ~~((you#))~~ the workplace by:

~~((-))~~ (i) Posting danger signs; or

~~((-))~~ (ii) Using any other equally effective means to inform employees.

**Note:** A sign reading "Danger-Permit Required Confined Space, DO NOT ENTER" or using pictures or other similar wording employees can understand would satisfy the requirement for a sign.

~~((You must#~~

(2) The employer must take effective measures to prevent unauthorized employees from entering permit-required confined spaces.

**Note:** Examples of measures to prevent employee entry include padlocks, bolted covers, special tools to remove covers, and providing employee training.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64406 The employer must follow these requirements when ~~((you contract))~~ contracting with another employer to enter ~~((you#))~~ its confined space.**

**IMPORTANT:**

The contractor is responsible for following all confined space requirements in this part and in other rules that apply.

~~((You must#~~

~~(\*)~~) The employer must do all of the following if ~~((you#))~~ the employer arranges to have another employer (contractor) perform work that involves entry into ~~((you#))~~ its permit-required confined space:

~~((-))~~ (1) Inform the contractor:

~~((#))~~ (a) That the workplace contains permit-required confined spaces and entry is allowed only if the applicable requirements of this part are met.

~~((#))~~ (b) Of the identified hazards and ~~((you#))~~ experience with each permit-required confined space.

~~((#))~~ (c) Of any employer required precautions or procedures ~~((you require))~~ for the protection of employees in or near spaces where the contractor will be working.

~~((-))~~ (2) Coordinate entry operations with the contractor, when either employees or employers from the different com-

panies will be working in or near permit-required confined spaces.

((-)) (3) Discuss entry operations with the contractor when they are complete. Include the following in ((you)) the discussion:

- ((■)) (a) The program followed during confined space entry; and
- ((■)) (b) Any hazards confronted or created.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-646 Summary.**

~~((You))~~ **Employer responsibility:**

To develop ((you)) the employer's permit-required confined space program and practices.

**IMPORTANT:**

This section applies if employees will enter a permit-required confined space.

~~((You must:~~

~~Develop a written permit-required confined space program.~~

~~WAC 296-307-64602~~

~~Meet these additional requirements if your employees enter another employer's confined space.~~

~~WAC 296-307-64604))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Develop a written permit-required confined space program.</u>	<u>WAC 296-307-64602</u>
<u>Meet these additional requirements if employees enter another employer's confined space.</u>	<u>WAC 296-307-64604</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64602 Develop a written permit-required confined space program.**

**IMPORTANT:**

((\*) Identify and evaluate the hazards of permit-required confined spaces and the work performed, to assist ((you)) the employer in developing ((you)) its entry program.

~~((You must:~~

\*) (1) The employer must develop a written program, before employees enter, that describes the means, procedures, and practices ((you)) the employer uses for the safe entry of permit-required confined spaces as required by this part. Include the following when applicable to ((you)) the employer's confined space entry program:

- ((-) (a) Documentation of permit entry procedures.
- ((-) (b) Documentation used for alternate entry procedures.
- ((-) (c) How to reclassify permit-required confined spaces to nonpermit spaces.

((-) (d) Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit-required space.

((-) (e) Identification of designated employee duties.

((-) (f) Training employees on their designated roles.

((-) (g) How to identify and evaluate hazards.

((-) (h) Use and maintenance of equipment.

((-) (i) How to prevent unauthorized entry.

((-) (j) How to coordinate entry with another employer.

((-) (k) How to rescue entrants.

**Note:** For alternate entry, ((you)) the employer's written program only needs to meet the requirements of WAC 296-307-648, Employee training, and WAC 296-307-652, Alternate entry procedures, of this part.

~~((You must:~~

\*) (2) The employer must consult with affected employees and their authorized representatives when developing and implementing all aspects of ((you)) the employer's permit-required confined space program.

((\*) (3) The employer must make the written program available to employees and their authorized representatives.

((\*) (4) The employer must update ((you)) its written program as necessary.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64604 Meet these additional requirements if ((you)) employees enter another employer's confined space.**

~~((You must:~~

\*) (1) The employer must obtain any available information about permit-required confined space hazards and entry operations from the host employer.

((\*) (2) The employer must coordinate entry operations with any other employers whose employees will be working in or near the permit-required confined space.

((\*) (3) The employer must inform the host employer, either through a debriefing or during entry operations, about:

((-) (a) The entry program ((you)) that will ((follow)) be followed; and

((-) (b) Any hazards ((you)) confronted or created in the space during entry operations.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-648 Summary.**

~~((You))~~ **Employer responsibility:**

To make sure employees are trained to perform their designated roles safely.

~~((You must:~~

~~Provide employee training.~~

~~WAC 296-307-64802~~

~~Certify employee proficiency.~~

~~WAC 296-307-64804))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Provide employee training.</u>	<u>WAC 296-307-64802</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Certify employee proficiency.</u>	<u>WAC 296-307-64804</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64802 Provide employee training.**

~~((You must:~~

•)) (1) The employer must provide training to each employee involved in permit-required confined space activities, so they acquire the understanding, knowledge and skills necessary to safely perform assigned duties.

(-)(a) Establish employee proficiency in their confined space duties.

(-)(b) Introduce new or revised procedures as necessary.

- Note: (•) Employers can determine employee proficiency by:
- (-)(-) 1. Observing employee performance during training exercises that simulate actual confined space conditions(-);
  - (-)(-) 2. A comprehensive written examination; or
  - (-)(-) 3. Any other method that is effective for the employer.

~~((You must:~~

•)) (2) The employer must provide training at the following times:

(-)(a) Before an employee is first assigned to duties covered by this part.

(-)(b) Before there is a change in an employee's assigned duties.

(-)(c) When there is a permit-required confined space hazard for which the employee has not already been trained.

~~((If you have))~~ (d) If the employer has reason to believe that there are either:

(•) (i) Deviations from ~~((your))~~ the employer's procedures for permit-required confined space entry; or

(•) (ii) Employee knowledge or use of ~~((your))~~ the employer's procedures is inadequate.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-64804 Certify employee proficiency.**

~~((You must:~~

•)) (1) The employer must certify employee proficiency in their assigned duties.

(•) (2) The employer must make sure the certification:

(-)(a) Contains each employee's name, the trainer's written or electronic signature or initials, and the dates of training.

(-)(b) Is available for inspection by employees and their authorized representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-650 Summary.**

~~((Your))~~ Employer responsibility:

To establish procedures for the safe permit-required entry of confined spaces.

~~((Implement procedures for entry permits.~~

~~WAC 296-307-65002~~

~~Use an entry permit that contains all required information.~~

~~WAC 296-307-65004~~

~~Keep and review your entry permits.~~

~~WAC 296-307-65006~~

~~Prevent unauthorized entry.~~

~~WAC 296-307-65008~~

~~Provide, maintain, and use proper equipment.~~

~~WAC 296-307-65010~~

~~Evaluate and control hazards for safe entry.~~

~~WAC 296-307-65012~~

~~Make sure you have adequate rescue and emergency services available.~~

~~WAC 296-307-65014~~

~~Use nonentry rescue systems or methods whenever possible.~~

~~WAC 296-307-65016~~

~~Make sure entry supervisors perform their responsibilities and duties.~~

~~WAC 296-307-65018~~

~~Provide an attendant outside the permit-required confined space.~~

~~WAC 296-307-65020~~

~~Make sure entrants know the hazardous conditions and their duties.~~

~~WAC 296-307-65022~~

~~Implement procedures for ending entry.~~

~~WAC 296-307-65024))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Implement procedures for entry permits.</u>	<u>WAC 296-307-65002</u>
<u>Use an entry permit that contains all required information.</u>	<u>WAC 296-307-65004</u>
<u>Keep and review entry permits.</u>	<u>WAC 296-307-65006</u>
<u>Prevent unauthorized entry.</u>	<u>WAC 296-307-65008</u>
<u>Provide, maintain, and use proper equipment.</u>	<u>WAC 296-307-65010</u>
<u>Evaluate and control hazards for safe entry.</u>	<u>WAC 296-307-65012</u>
<u>Make sure adequate rescue and emergency services are available.</u>	<u>WAC 296-307-65014</u>
<u>Use nonentry rescue systems or methods whenever possible.</u>	<u>WAC 296-307-65016</u>
<u>Make sure entry supervisors perform their responsibilities and duties.</u>	<u>WAC 296-307-65018</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Provide an attendant outside the permit-required confined space.</u>	<u>WAC 296-307-65020</u>
<u>Make sure entrants know the hazardous conditions and their duties.</u>	<u>WAC 296-307-65022</u>
<u>Implement procedures for ending entry.</u>	<u>WAC 296-307-65024</u>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65002 Implement procedures for entry permits.**

~~((You must:))~~

•) (1) The employer must identify and evaluate, before employees enter, potential hazards from:

- ((-)) (a) The permit-required confined space; and
- ((-)) (b) The work to be performed.

((\*) (2) The employer must complete an entry permit before entry is authorized, documenting that ~~((you have))~~ the employer has completed the means, procedures and practices necessary for safe entry and work.

((\*) (3) The employer must make sure that entrants or their representatives have an opportunity to observe any monitoring or testing, or any actions to eliminate or control hazards, performed to complete the permit.

((\*) (4) The employer must identify the entry supervisor.

((-) Make sure the entry supervisor signs the entry permit, authorizing entry, before the space is entered.

((\*) (5) The employer must make the completed permit available to entrants or their authorized representatives at the time of entry.

((-) Do this by either posting the completed permit at the entry location, or by any other equally effective means.

((\*) (6) The employer must make sure the duration of the permit does not exceed the time required to complete the assigned task or job identified on the permit.

((\*) (7) The employer must note any problems encountered during an entry operation on the permit. Use the information to make appropriate revisions to ~~((your))~~ the employer's program, entry operations, means, systems, procedures and practices.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65004 Use an entry permit that contains all required information.**

~~((You must:))~~

•) (1) The employer must make sure ~~((your))~~ its entry permit identifies all of the following that apply to ~~((your))~~ its entry operation:

- ((-) (a) The space to be entered.
- ((-) (b) Purpose of the entry.
- ((-) (c) Date and the authorized duration of the entry permit.

- ((-) (d) Hazards of the space to be entered.
- ((-) (e) Acceptable entry conditions.
- ((-) (f) Results of initial and periodic tests performed to evaluate and identify the hazards and conditions of the space, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

((-) (g) Appropriate measures used before entry to isolate the space, and eliminate or control hazards.

((\*) Examples of appropriate measures include the lock-out or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit-required confined spaces.

((-) (2) Names of entrants and current attendants.

((\*) (3) Other means include the use of rosters or tracking systems as long as the attendant can determine quickly and accurately, for the duration of the permit, which entrants are inside the space.

((-) (a) The current entry supervisor.

((-) (b) A space for the signature or initials of the original supervisor authorizing entry.

((-) (c) Communication procedures for entrants and attendants to maintain contact during the entry.

((-) (d) Equipment provided for safe entry, such as:

((■)) (i) Personal protective equipment (PPE).

((■)) (ii) Testing equipment.

((■)) (iii) Communications equipment.

((■)) (iv) Alarm systems.

((■)) (v) Rescue equipment.

((-) (e) Rescue and emergency services available, and how to contact them. Include equipment to use, and names and contact information.

((-) (f) Other information needed for safety in the particular confined space.

((-) (g) Additional permits issued for work in the space, such as for hot work.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65006 Keep and review ~~((your))~~ entry permits.**

~~((You must:))~~

•) (1) The employer must keep entry permits for at least one year.

((\*) (2) The employer must keep entry permits or other atmospheric monitoring records that show the actual atmosphere an employee entered or worked in, as employee exposure records.

((\*) (3) The employer must review ~~((your))~~ its permit-required confined space entry program as follows:

((-) Conduct a review when ~~((you have any))~~ there is reason to believe ~~((your))~~ its entry program may not protect employees, and revise ~~((your))~~ the program before allowing subsequent entries.

**Note:** Examples of circumstances requiring the review of your program include the following:

((\*) 1. There is unauthorized entry of a permit space.

((\*) 2. A permit space hazard not covered by the permit is found.

((\*) 3. A condition prohibited by the permit occurs.

- ((\*) 4. An injury or near-miss occurs during entry.
- ((\*) 5. There is a change in the use or configuration of a permit space.
- ((\*) 6. An employee complains about the effectiveness of the program.

~~((You must:~~

\*) (4) The employer must review canceled entry permits within one year following each entry to evaluate:

~~((Your)) (a) The employer's~~ permit-required confined space program.

((-) (b) The protection provided to employees entering permit-required confined spaces.

((\*) (5) The employer must update ~~((your)) its~~ written permit-required confined space entry program as necessary.

**Note:** Employers may perform a single annual review covering all entries performed during a twelve-month period. If no entry is performed during a twelve-month period, no review is necessary.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65008 Prevent unauthorized entry.**

~~((You must:~~

\*) The employer must implement measures necessary to prevent unauthorized entry into permit-required confined spaces, when conducting authorized entry.

- Notes:**
- ((\*) 1. When removing entrance covers to open the confined space, protect entrants and those outside the confined space from hazards.
  - ((\*) 2. Examples of measures to prevent unauthorized entry are signs, barricades, warning tape, and an attendant.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65010 Provide, maintain, and use proper equipment.**

~~((You must:~~

\*) (1) The employer must provide the equipment in Table 2, when needed and at no cost to employees.

((\*) (2) The employer must make sure that employees use provided equipment properly.

((\*) (3) The employer must maintain the provided equipment.

**Table 2**

**Equipment Provided to Employees at No Cost**

Type of equipment	For
Testing and monitoring equipment	Evaluating permit-required confined space conditions
Ventilating equipment	Obtaining and maintaining acceptable entry conditions
Communication equipment	Effective communication between the attendant and the entrants and to initiate rescue when required

Type of equipment	For
Personal protective equipment (PPE)	Protecting employees from hazards of the space or the work performed
Lighting equipment	Employees to see well enough to work safely and to exit the space quickly in an emergency
Barriers or shields, such as pedestrian, vehicle or other barriers	Protecting employees from hazards outside of the space
Ladders	Safe entry and exit by entrants
Rescue and emergency equipment, except for equipment provided by the rescue service provider	Safe and effective rescue
Any other equipment	Safe entry into and rescue from permit-required confined spaces

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65012 Evaluate and control hazards for safe entry.**

((\*) (1) Evaluate and control hazards for safe entry into permit-required confined spaces by doing all the following:

((-) (a) Test for atmospheric hazards, in this order:

((\*) (i) Oxygen.

((\*) (ii) Combustible gases and vapors.

((\*) (iii) Toxic gases and vapors.

((-) (b) Provide each entrant or their authorized representative an opportunity to observe any of the following:

((\*) (i) Preentry testing.

((\*) (ii) Subsequent testing.

((\*) (iii) Monitoring of permit-required spaces.

((-) (c) Reevaluate the permit-required space in the presence of any entrant, or their authorized representative, who requests this to be done because they have reason to believe that the evaluation of that space may not have been adequate.

((-) (d) Upon request, immediately provide each entrant or their authorized representative, with the results of any testing required by this rule.

((-) (e) Continuously monitor conditions in areas where entrants are working, when isolation of the space is not feasible.

((\*) (i) Examples would be a large space or space that is part of a continuous system, such as a sewer.

((\*) (ii) Evaluate space conditions during entry as follows:

**Table 3**  
**Evaluating Space Conditions**

<del>((You))</del> <b>The employer must:</b>	<b>In order to</b>
Test conditions before entry	Determine that acceptable entry conditions exist before entry is authorized by the entry supervisor
Test or evaluate space conditions during entry	Determine that acceptable entry conditions are being maintained during entry operations
Evaluate entry operations	Make sure entrants of more than one employer working at the same time in or around a permit-required confined space, do not endanger each other

**IMPORTANT:**

This section applies to both:

- ~~((★))~~ 1. Employers whose employees use permit entry procedures; and
- ~~((★))~~ 2. Employers who provide rescue services.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65014 Make sure ~~((you have))~~ adequate rescue and emergency services are available.**

~~((You must:))~~

(1) The employer must make sure ~~((you))~~ they have adequate rescue and emergency services available during ~~((your))~~ their permit-required confined space entry operations.

~~((★))~~ (a) Evaluate and select rescue teams or services who can:

~~((-))~~ (i) Respond to a rescue call in a timely manner. Timeliness is based on the identified hazards. Rescuers must have the capability to reach potential victims within an appropriate time frame based on the identified permit space hazards.

~~((-))~~ (ii) Proficiently rescue employees from a permit-required confined space in ~~((your))~~ the workplace. Rescuers must have the appropriate equipment for the type of rescue.

~~((★))~~ (b) Make sure that at least one member of the rescue team or service holds a current certification in first aid and cardiopulmonary resuscitation (CPR).

~~((★))~~ (c) Inform each rescue team or service about the hazards they may confront when called to perform rescue.

~~((★))~~ (d) Provide the rescue team or service with access to all permit spaces from which rescue may be necessary.

~~((-))~~ This will allow them to develop appropriate rescue plans and to practice rescue operations.

**Note:** What will be considered timely will vary according to the specific hazards involved in each entry. For example, WAC 296-307-594, Respirators, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) for work areas considered to contain an IDLH atmosphere.

~~((You must:))~~

(2) The employer must provide employees, assigned to provide permit-required confined space rescue and emergency services, with:

~~((★))~~ (a) Personal protective equipment (PPE) needed for safe entry.

~~((★))~~ (b) Other equipment required to conduct rescues safely.

~~((★))~~ (c) Training so they are:

~~((-))~~ (i) Proficient in the use of the PPE and other equipment.

~~((-))~~ (ii) Proficient as an entrant of permit-required confined spaces.

~~((-))~~ (iii) Able to safely perform assigned rescue and emergency duties.

~~((-))~~ (iv) Knowledgeable in basic first aid and cardiopulmonary resuscitation (CPR).

~~((★))~~ (d) Practice sessions for permit-required confined space rescues **at least** once every twelve months where dummies, manikins, or actual persons are removed from either:

~~((-))~~ (i) The actual permit spaces; or

~~((-))~~ (ii) Representative permit spaces that simulate the opening size, configuration, and accessibility, of permit spaces where rescue will be performed.

(3) The employer must establish procedures for:

~~((★))~~ (a) Contacting rescue and emergency services.

~~((★))~~ (b) Rescuing entrants from permit-required confined spaces.

~~((★))~~ (c) Providing necessary emergency services to rescued entrants.

~~((★))~~ (d) Preventing unauthorized persons from attempting a rescue.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65016 Use nonentry rescue systems or methods whenever possible.**

~~((You must:))~~

~~((★))~~ (1) The employer must use nonentry retrieval systems or methods to rescue entrants in a permit-required confined space unless this:

~~((-))~~ (a) Would increase the overall risk of injury to entrants; or

~~((-))~~ (b) Would not contribute to the rescue of the entrant.

~~((★))~~ (2) The employer must make sure each entrant uses a chest or full-body harness, with a retrieval line attached to the harness at one of the following locations:

~~((-))~~ (a) At the center of the employee's back, near shoulder level.

~~((-))~~ (b) Above the employee's head.

~~((-))~~ (c) At another point which presents a profile small enough for the successful removal of the employee.

~~((★))~~ (3) The employer must attach the retrieval line to a mechanical device or fixed point outside the space, so rescue can begin as soon as necessary.

~~((★))~~ (4) The employer must make sure a mechanical device is available to retrieve entrants from vertical spaces more than five feet (1.52 m) deep.

**Note:** When ~~((you))~~ the employer can demonstrate that the use of a chest or full-body harness is not feasible or creates a greater hazard, then ~~((you))~~ the employer may use wristlets or another method shown to be the safest and most effective alternative.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65018 Make sure entry supervisors perform their responsibilities and duties.**

~~((You must:~~

\*) The employer must make sure that an entry supervisor:

((-) (1) Authorizes the entry into a permit-required confined space by signing the entry permit.

((-) (2) Oversees entry operations.

((-) (3) Knows about the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.

((-) (4) Verifies and checks **all** of the following:

((■) (a) The appropriate entries have been made on the permit.

((■) (b) All tests specified by the permit have been conducted.

((■) (c) All procedures and equipment specified by the permit are in place before approving the permit and allowing entry to the space.

((-) (5) Terminates the entry and cancels the permit when:

((■) (a) The assigned task or job has been completed.

((■) (b) A condition in the space that is not covered by the entry permit is discovered.

((-) (6) Verifies that rescue services are available and that there is a way to contact them.

((-) (7) Removes unauthorized individuals who enter or attempt to enter the permit-required confined space during entry operations.

((-) (8) Determines that entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained:

((■) (a) Whenever responsibility for a permit-required space entry operation is transferred; and

((■) (b) At regular intervals dictated by the hazards and operations performed within the space.

**Notes:** ((\*) 1. Make sure entry supervisors have the required knowledge and proficiency to perform the job duties and responsibilities required by this part.

((\*) 2. The entry supervisor may also perform other duties under this part, such as attendant or entrant, if they are trained and proficient in those duties.

((\*) 3. The responsibility of the entry supervisor may be passed from one supervisor to another during an entry operation.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65020 Provide an attendant outside the permit-required confined space.**

**IMPORTANT:**

((\*) 1. The number of attendants assigned should be tailored to the requirements of the space and the work performed.

~~((You))~~ 2. The employer needs to assess if it is appropriate or possible to have multiple permit spaces monitored by a single attendant, or have an attendant stationed at a location outside each space. Video cameras and radios are examples of tools that may assist an attendant monitoring more than one space.

((\*) 3. Attendants may be stationed at any location outside the permit-required confined space if the duties described in this section can be effectively performed for each space that is monitored.

~~((You must:~~

\*) (1) The employer must provide at least one attendant outside the permit-required confined space during entry operations.

((\*) (2) The employer must make sure each permit-required confined space attendant:

((-) (a) Understands the hazards that may be faced during entry, including the mode, signs or symptoms, and results of exposure to the hazards.

((-) (b) Is aware of the behavioral effects of exposure to the hazard.

((-) (c) Continuously maintains an accurate count of entrants in the space.

((-) (d) Maintains an accurate record of who is in the permit-required confined space.

((-) (e) Communicates with entrants as necessary to monitor their status or alert them of the need to evacuate the space.

((-) (f) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space.

((-) (g) Orders entrants to evacuate the space immediately if **any** of the following conditions occur:

((■) (i) A prohibited condition.

((■) (ii) The behavioral effects of hazardous exposure on an entrant.

((■) (iii) A situation outside the space that could endanger entrants.

((■) (iv) The attendant cannot effectively and safely perform all the duties required in this part.

((-) (h) Takes the following actions when unauthorized persons approach or enter a space:

((■) (i) Warns unauthorized persons to stay away from the space.

((■) (ii) Tells the unauthorized persons to exit immediately if they have entered the space.

((■) (iii) Informs entrants and the entry supervisor if unauthorized persons have entered the space.

((-) (i) Performs nonentry rescues as specified ~~((by you))~~ in the employer's rescue procedure.

((-) (j) Has the means to respond to an emergency affecting one or more of the permit spaces being monitored without preventing performance of the attendant's duties to the other spaces being monitored.

((-) (k) Carries out no duties that might interfere with their primary duty to monitor and protect the entrants.

((-)) (l) Calls for rescue and other emergency services as soon as entrants may need assistance to escape from the space.

((-)) (m) Monitors entry operations until relieved by another attendant or all entrants are out of the space.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65022 Make sure entrants know the hazardous conditions and their duties.**

~~((You must:~~

•) The employer must make sure that all entrants:

((-)) (1) Know the hazards they may face during entry, including the mode, signs or symptoms, and results of exposure to the hazards.

((-)) (2) Use equipment properly.

((-)) (3) Communicate with the attendant as necessary so the attendant can:

((■)) (a) Monitor entrant status.

((■)) (b) Alert entrants of the need to evacuate.

((-)) (4) Alert the attendant whenever either of these situations exist:

((■)) (a) A warning sign or symptom of exposure to a dangerous situation such as, behavioral changes, euphoria, giddiness potentially from lack of oxygen or exposure to solvents.

((■)) (b) A prohibited condition.

((-)) (5) Exit from the permit-required confined space as quickly as possible when one of the following occurs:

((■)) (a) The attendant or entry supervisor gives an order to evacuate.

((■)) (b) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

((■)) (c) The entrant detects a prohibited condition.

((■)) (d) An evacuation alarm is activated.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65024 Implement procedures for ending entry.**

~~((You must:~~

•~~Make sure you~~) The employer must terminate ~~((the))~~ entry when entry operations are completed, including securing an entrance cover and canceling the permit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-652 Alternate entry procedures.**

**Summary:**

~~((Your))~~ **Employer responsibility:**

To choose alternate entry procedures for spaces where the only hazard is a hazardous atmosphere.

~~((IMPORTANT:~~

~~In addition to this section, you also need to meet the requirements in the following sections of this part:~~

~~–WAC 296 307 644, Identifying and controlling permit required confined spaces.~~

((-)) Eliminate any unsafe conditions before removing an

~~–WAC 296-307-646, Permit required confined space program.~~

~~–WAC 296-307-648, Employee training.~~

~~**You must:**~~

~~Make sure the following conditions are met if using alternate entry procedures.~~

~~**WAC 296-307-65202**~~

~~Follow these alternate entry procedures for permit required confined spaces.~~

~~**WAC 296-307-65204))**~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Identifying and controlling permit-required confined spaces.</u>	<u>WAC 296-307-644</u>
<u>Permit-required confined spaces program.</u>	<u>WAC 296-307-646</u>
<u>Employee training.</u>	<u>WAC 296-307-648</u>
<u>Make sure the following conditions are met if using alternate entry procedures.</u>	<u>WAC 296-307-65202</u>
<u>Follow these alternate entry procedures for permit-required confined spaces.</u>	<u>WAC 296-307-65204</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65202 Make sure the following conditions are met if using alternate entry procedures.**

~~((You must:~~

•) (1) The employer must make sure, when using alternate entry procedures, instead of permit entry procedures, that ~~((you have))~~ it has monitoring and inspection data that supports the following:

((-)) (a) That the only hazard of the permit-required confined space is an actual or potentially hazardous atmosphere.

((-)) (b) That continuous forced air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.

((•)) (2) The employer must make sure an entry to obtain monitoring and inspection data or to eliminate hazards is performed according to WAC 296-307-500, Permit entry procedures.

((•)) (3) The employer must make sure all documentation produced is available to each affected employee and their authorized representative.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65204 Follow these alternate entry procedures for permit-required confined spaces.**

~~((You must:~~

•) (1) The employer must use the following alternate entry procedures:

entrance cover.



~~((■))~~ (a) When entrance covers are removed, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.

~~((■))~~ (b) Certify that preentry measures have been taken (such as safe removal of the cover and having protection needed to gather preentry data), with the date, location of the space, and signature of the person certifying.

~~((★))~~ (2) The employer must make the preentry certification available before entry to each entrant.

~~((-))~~ (a) Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:

- ~~((■))~~ (i) Oxygen content.
- ~~((■))~~ (ii) Flammable gases and vapors.
- ~~((■))~~ (iii) Potential toxic air contaminants.

~~((-))~~ (b) Provide entrants, or their authorized representatives, with an opportunity to observe the preentry and periodic testing.

~~((-))~~ (c) Make sure the atmosphere within the space is not hazardous when entrants are present.

~~((-))~~ (d) Use continuous forced air ventilation, as follows:

~~((■))~~ (i) Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.

~~((■))~~ (ii) Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.

~~((★))~~ (3) The employer must provide the air supply from a clean source and make sure it does not increase hazards in the space.

~~((-))~~ (a) Test the atmosphere within the space as needed to make sure hazards do not accumulate.

~~((-))~~ (b) If a hazardous atmosphere is detected during entry, do all of the following:

~~((■))~~ (i) Evacuate employees from the space immediately.

~~((■))~~ (ii) Evaluate the space to determine how the hazardous atmosphere developed.

~~((■))~~ (iii) Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.

~~((■))~~ (iv) Verify the space is safe for entry before continuing the entry operation.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-654 Nonpermit confined spaces requirements.**

**Summary:**

**IMPORTANT:**

A confined space may be classified as a nonpermit confined space for as long as the hazards remain eliminated. Once a hazard is present, ~~((you))~~ the employer must follow all requirements of this part that apply.

~~((You\*))~~ **Employer responsibility:**

To make sure any space ~~((you classify))~~ classified as nonpermit does not have the potential to contain serious health or safety hazards.

~~((You must:~~

~~Follow these requirements when classifying a confined space as a nonpermit confined space.~~

~~**WAC 296-307-65402**~~

~~Reevaluate nonpermit confined spaces if hazards develop.~~

~~**WAC 296-307-65404))**~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Follow these requirements when classifying a confined space as a nonpermit confined space.</u>	<u>WAC 296-307-65402</u>
<u>Reevaluate nonpermit confined spaces if hazards develop.</u>	<u>WAC 296-307-65404</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65402 Follow these requirements when classifying a confined space as a nonpermit confined space.**

~~((You must:~~

~~★))~~ (1) The employer must make sure the confined space meets these conditions to be classified as nonpermit confined spaces:

~~((-))~~ (a) The confined space does not contain an actual or potential hazardous atmosphere.

~~((-))~~ (b) The confined space does not contain hazards capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

~~((If you))~~ (c) If the employer must enter to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated.

**Notes:**

- ~~((★))~~ 1. Controlling atmospheric hazards through forced air ventilation does not eliminate the hazards.
- ~~((You))~~ 2. The employer should evaluate the use of lockout-tagout, as covered in WAC 296-307-320, to determine if using it fully eliminates the hazard.
- ~~((You are))~~ 3. The employer is allowed to use alternate entry procedures covered in WAC 296-307-652, if ~~((you))~~ the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

~~((You must:~~

~~★))~~ (2) The employer must document how ~~((you))~~ the employer determined the confined space contained no permit-required confined space hazards. Certify this documentation with the following:

~~((-))~~ (a) Date.

~~((-))~~ (b) Location of the space.

~~((-))~~ (c) Signature of the person making the determination.

**(\*) (3) The employer must** make the certification available to each entrant, or their authorized representative.

**Note:** This certification must be completed every time a permit-required confined space is reclassified as a nonpermit space.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-65404 Reevaluate nonpermit confined spaces if hazards develop.**

~~(You must:~~

**\*) (1) The employer must** reclassify a nonpermit confined space to a permit-required confined space, if necessary, when changes in the use or configuration of the space increase the hazards to entrants.

**(\*) (2) The employer must** make sure all employees exit the space if hazards develop. ~~(You)~~ **The employer must** then reevaluate the space and determine whether it must be reclassified as a permit-required confined space.

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-656 Definitions.**

**Acceptable entry conditions(\*)**. The conditions that must exist in a permit-required confined space to allow safe entry and work.

**Attendant(\*)**. An individual stationed outside one or more permit-required confined spaces to monitor the entrants.

**Blanking or blinding(\*)**. The absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore. It is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

**Confined space(\*)**. A space that is **all** of the following:

**(\*) (a)** Large enough and arranged so an employee could fully enter the space and work.

**(\*) (b)** Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.

**(\*) (c)** Not primarily designed for human occupancy.

**Double block and bleed(\*)**. The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

**Emergency(\*)**. Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit-required confined space that could endanger authorized entrants.

**Engulfment(\*)**. The surrounding capture of a person by a liquid or finely divided (flowable) solid substance that can be inhaled to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

**Enter (entry)(\*)**. The action by which a person passes through an opening into a permit-required confined space and includes work activities in that space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Note:** If the opening is large enough for the worker to fully enter the space, a permit is required even for partial body entry. Permits are not required for partial body entry where the opening is not large enough for full entry, although other rules such as lock-out-tagout, WAC 296-307-320 or respiratory hazards, WAC 296-307-624 may apply.

**Entrant(\*)**. An employee who is authorized by the employer to enter a permit-required confined space.

**Entry permit (permit)(\*)**. The written or printed document that is provided by ~~(you)~~ **the employer** to allow and control entry into a permit-required confined space and that contains the information required in WAC 296-307-650, Permit entry procedures.

**Entry supervisor(\*)**. The person (such as the employer, crew leader, or crew chief) responsible for:

**(\*) (a)** Determining if acceptable entry conditions are present at a permit-required confined space where entry is planned;

**(\*) (b)** Authorizing entry and overseeing entry operations; and

**(\*) (c)** Terminating entry as required.

**Hazardous atmosphere(\*)**. An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit-required confined space), injury, or acute illness caused by one or more of the following:

**(\*) (a)** Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL).

**(\*) (b)** Airborne combustible dust at a concentration that meets or exceeds its LFL.

**Note:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of five feet (1.52 m) or less.

**(\*) (c)** Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

**(\*) (d)** Atmospheric concentration of any substance which may exceed a permissible exposure limit. For additional information about atmospheric concentration, see chapter 296-62 WAC, Parts F, G, and I, General occupational health standards and WAC 296-307-624, Respiratory hazards.

**Note:** An airborne concentration of a substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this definition.

**(\*) (e)** Any other atmospheric condition that is immediately dangerous to life or health.

**Note:** ~~(You)~~ **The employer** can find guidance on establishing acceptable atmospheric conditions for air contaminants, which have no WISHA-determined doses or permissible exposure limits using other sources of information, such as:

**(\*) 1.** Material safety data sheets required by WAC 296-307-550, Employer chemical hazard communication.

**(\*) 2.** Published information.

**(\*) 3.** Internal documents.

**Hot work permit(\*)**. A written authorization to perform operations, for example, riveting, welding, cutting, burning, and heating, that can provide a source of ignition.

**Immediately dangerous to life or health (IDLH)((+)),**

Any of the following conditions:

((\*) (a) An immediate or delayed threat to life.

((\*) (b) Anything that would cause irreversible adverse health effects.

((\*) (c) Anything that would interfere with an individual's ability to escape unaided from a permit-required confined space.

**Note:** Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse twelve to seventy-two hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health (IDLH).

**Inerting((+)).** The displacement of the atmosphere in a permit-required confined space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

**Note:** This procedure produces an IDLH oxygen-deficient atmosphere.

**Isolation((+)).** The process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as:

(a) Blanking or blinding;

(b) Misaligning or removing sections of lines, pipes, or ducts;

(c) A double block and bleed system;

(d) Lockout or tagout of all sources of energy; or

(e) Blocking or disconnecting all mechanical linkages.

**Line breaking((+)).** The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

**Nonpermit confined space((+)).** A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

**Oxygen deficient atmosphere((+)).** An atmosphere containing less than 19.5 percent oxygen by volume.

**Oxygen enriched atmosphere((+)).** An atmosphere containing more than 23.5 percent oxygen by volume.

**Permit-required confined space or permit space((+)).** A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

((\*) (a) Contains or has a potential to contain a hazardous atmosphere.

((\*) (b) Contains a material with the potential for engulfing someone who enters.

((\*) (c) Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross section.

((\*) (d) Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

((\*) (e) Contains any other recognized serious safety or health hazard that could either:

((-) (i) Impair the ability to self-rescue; or

((-) (ii) Result in a situation that presents an immediate danger to life or health.

**Permit-required confined space program((+)).** An overall program for:

((\*) (a) Controlling and appropriately protecting employees from permit-required confined space hazards; and

((\*) (b) Regulating employee entry into permit-required confined spaces.

**Prohibited condition((+)).** Any condition in a permit-required confined space that is not allowed by the permit during the authorized entry period.

**Rescue service((+)).** The personnel designated to rescue employees from permit-required confined spaces.

**Retrieval system((+)).** The equipment used for nonentry rescue of persons from permit-required confined spaces, such as a retrieval line, full-body harness or wristlets, and a lifting device or anchor.

**Testing((+)).** The process of identifying and evaluating the hazards that entrants may be exposed to in a permit-required confined space. Testing includes specifying the tests that are to be performed in the permit-required confined space.

**Note:** Testing allows employers to devise and implement adequate controls to protect entrants during entry, and to determine if acceptable entry conditions are present.

**AMENDATORY SECTION** (Amending WSR 06-02-060, filed 1/3/06, effective 4/1/06)

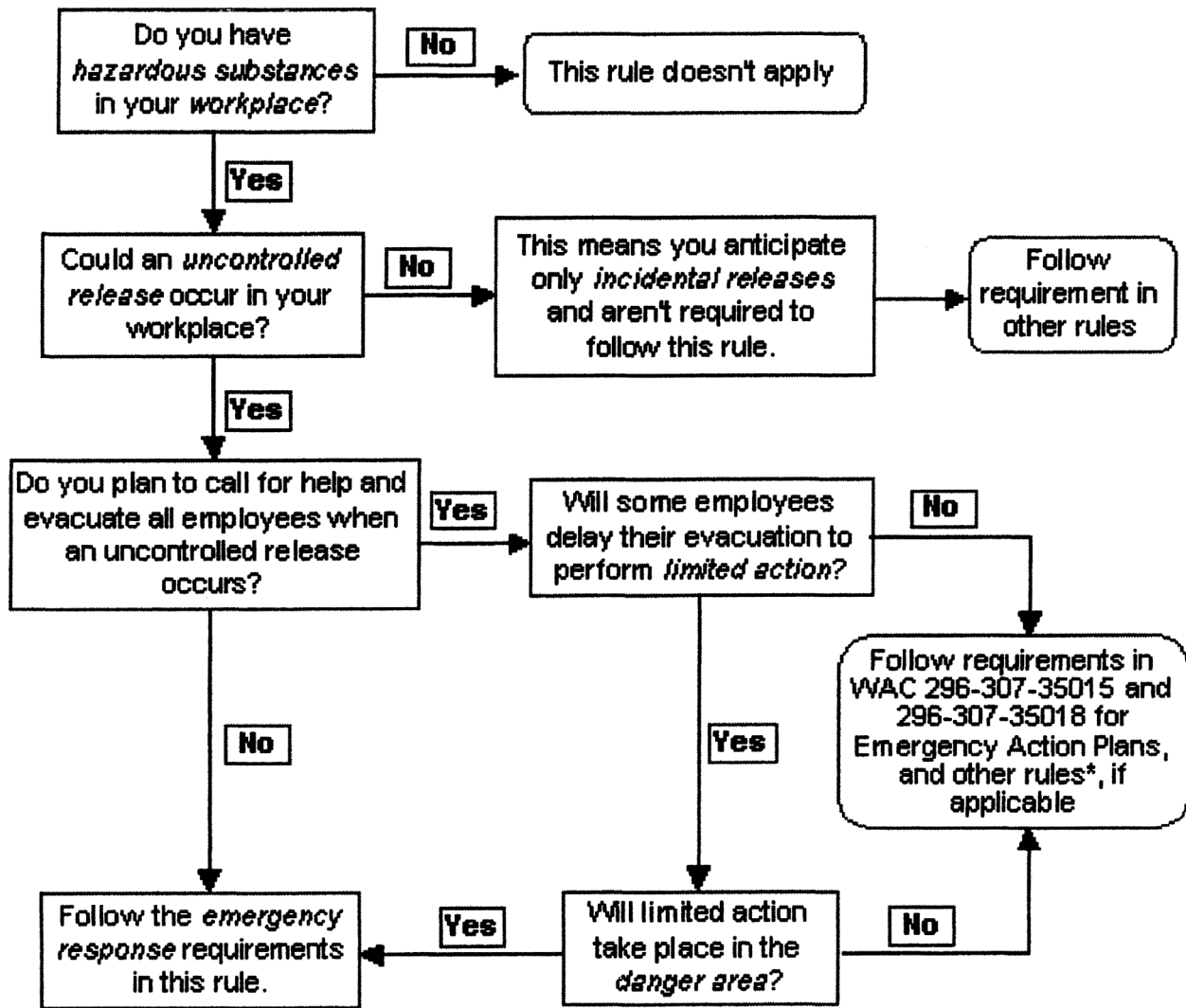
**WAC 296-307-704 Scope. ((What is the purpose of WAC 296-307-704,)) Emergency response to hazardous substance releases((?)).**

To state the minimum requirements that help ((you)) the employer protect the safety and health of ((you)) its employees during a response to hazardous substance releases in ((you)) the employer's workplace or any other location.

**((Do the)) Requirements of this rule that apply to ((you)) the employer's workplace((?)).**

This section applies if ((you)) the employer's employees are, or could become, involved in responding to uncontrolled releases of hazardous substances in ((you)) the workplace or any other location. Use the scope flow chart, and definitions that follow, to determine if this section applies to ((you)) the employer's workplace(s). Defined words are *italicized* in the flow chart.

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\*The flow chart references other rules applicable to (your) the workplace depending on conditions and hazards.

Examples include:

((\*) (1) Chapter 296-828 WAC, Hazardous chemicals in laboratories;

((\*) (2) WAC 296-307-594, Respiratory protection.

**Definitions ((applicable)) that apply to the flow chart (see WAC 296-307-70480 for additional definitions used in this section):**

**Danger area.** Areas where conditions pose a serious danger to employees, such as areas where:

((\*) (a) Immediately dangerous to life or health (IDLH) conditions could exist;

OR

((\*) (b) High levels of exposure to toxic substances could exist;

OR

((\*) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Emergency response.** A response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

**Hazardous substance.** Any biological, radiological, or chemical substance that can have adverse effects on humans. (See WAC 296-307-70480 for a more specific definition.)

**Immediately dangerous to life or health (IDLH).** Any atmospheric condition that would:

((\*) (a) Cause an immediate threat to life;

((\*) (b) Cause permanent or delayed adverse health effects;

((\*) (c) Interfere with an employee's ability to escape.

**Incidental release.** A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and

provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

**Limited action.** Action necessary to:

(\*) (a) Secure an operation during emergency responses;

OR

(\*) (b) Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

**Release.** A spill, leak, or other type of hazardous substance discharge.

**Uncontrolled release.** A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

(a) Examples of conditions that could create a significant safety and health risk:

(\*) (i) Large-quantity releases;

(\*) (ii) Small-releases that could be highly toxic;

(\*) (iii) Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

(b) Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

**Workplace.**

(\*) (a) A fixed facility;

OR

(\*) (b) A temporary location (such as a traffic corridor);

OR

(\*) (c) Locations where employees respond to emergencies.

**Summary:**

~~(You)~~ **Employer responsibility:**

To anticipate, plan for, and manage emergency response operations so employees are protected from hazardous substances and conditions.

**Note:** Other chapters may apply to ~~(you)~~ the employer's workplace, such as:

(\*) Chapter 296-62 WAC, General occupational health standards.

~~(You)~~ The employer will find some safety and health requirements (for example, personal protective equipment) are addressed on a general level in the core rules, while being addressed for a specific application in this section. When this happens, both requirements apply and should not conflict.

If ~~(you are)~~ the employer is uncertain which requirements to follow, ~~(you)~~ the employer must comply with the more protective requirement. Contact ~~(your)~~ the local L&I office if ~~(you need)~~ assistance is needed in making this determination.

~~(You must:~~

~~WAC 296-307-70410 Planning~~

~~WAC 296-307-70415 Training~~

~~WAC 296-307-70420 Medical surveillance~~

~~WAC 296-307-70425 Keep records~~

~~WAC 296-307-70430 Incident requirements~~

~~WAC 296-307-70435 Implement and maintain an incident command system (ICS) (incident command system)~~

~~WAC 296-307-70440 Prepare skilled support personnel~~

~~WAC 296-307-70445 Make sure the incident commander oversees activities during the response~~

~~WAC 296-307-70450 Use the buddy system in danger areas~~

~~WAC 296-307-70455 Provide rescue and medical assistance~~

~~WAC 296-307-70460 Personal protective equipment~~

~~WAC 296-307-70465 Control hazards created by personal protective equipment (PPE)~~

~~WAC 296-307-70470 Use personal protective equipment (PPE) properly~~

~~WAC 296-307-70475 Postemergency response~~

~~WAC 296-307-70480 Definitions.))~~

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Planning.</u>	<u>WAC 296-307-70410</u>
<u>Training.</u>	<u>WAC 296-307-70415</u>
<u>Medical surveillance.</u>	<u>WAC 296-307-70420</u>
<u>Keep records.</u>	<u>WAC 296-307-70425</u>
<u>Incident requirements.</u>	<u>WAC 296-307-70430</u>
<u>Implement and maintain an incident command system (ICS) (incident command system).</u>	<u>WAC 296-307-70435</u>
<u>Prepare skilled support personnel.</u>	<u>WAC 296-307-70440</u>
<u>Make sure the incident commander oversees activities during the response.</u>	<u>WAC 296-307-70445</u>
<u>Use the buddy system in danger areas.</u>	<u>WAC 296-307-70450</u>
<u>Provide rescue and medical assistance.</u>	<u>WAC 296-307-70455</u>
<u>Personal protective equipment.</u>	<u>WAC 296-307-70460</u>
<u>Control hazards created by personal protective equipment (PPE).</u>	<u>WAC 296-307-70465</u>

<b><u>The employer must meet the requirements...</u></b>	<b><u>in this section:</u></b>
<u>Use personal protective equipment (PPE) properly.</u>	<u>WAC 296-307-70470</u>
<u>Postemergency response.</u>	<u>WAC 296-307-70475</u>
<u>Definitions.</u>	<u>WAC 296-307-70480</u>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70410 Planning.** Develop an emergency response plan.

**Notes:** ((\*)~~(Y0u)~~) 1. The employer may already have an emergency response plan, such as required by chapter 296-843 WAC, Hazardous waste operations or by state and locally coordinated response efforts (Section 303 of Superfund Amendments and Reauthorization Act (SARA), Title III). ((Y0u)) The employer may use those plans to comply with this section, if they include the items listed below.  
 ((\*) 2. Before a written emergency response plan can be developed, ((y0u)) the employer will need to anticipate the types of uncontrolled releases that employees could encounter in ((y0u)) the workplace(s).

**((You must:))**

(1) The employer must make sure ((y0u)) its plan is written and adequately addresses, as a minimum, all of the following:

((\*) (a) Preemergency planning and coordination with additional responders (including personnel from other employers such as: Fire departments, law enforcement agencies, emergency medical services, and state or federal agencies).

((\*) (b) Personnel roles, (see Table 1) and lines of authority and communications for all affected parties including responders.

((\*) (c) Employee training (see WAC 296-307-70415, train ((y0u)) employees), for more detail:

**Notes:** ((\*) 1. Responders' level of training depends on the duties and roles the employer assigns.  
 ((\*) 2. Training for the employees' role should address the competencies specified in Tables 3 through 6.  
 ((\*) 3. Training on specific substances may be appropriate depending on the number and characteristics of hazardous substances expected to be encountered. For example, if employees may only respond to one substance, ((y0u)) the employer could provide training (covering the knowledge and skills specified in Tables 3 through 6) relevant to that single substance. If employees might respond to a range of hazardous substances, training may be required to cover categories of hazardous substances.

**((You must:))**

\*) (d) Videos and automated training methods (for example: Interactive computer based programs) may be used in training; however, instructors must be readily available to:

((-) (i) Encourage and provide responses to questions for the benefit of the group;

((-) (ii) Evaluate employees' understanding of the material;

((-) (iii) Provide instructional interaction to the group.

- ((\*) (e) Emergency recognition;
- ((\*) (f) Immediate emergency procedures including:
- ((-) (i) Methods of alerting employees (see WAC 296-307-345, Employee alarm systems) and outside responders;
- ((-) (ii) Procedures for limited action (emergency prevention).

**Note:** *Limited action* includes shutting down processes, closing emergency valves and other critical actions to secure the operation, or prevent the incident from increasing in severity.

<b>Limited Action and Employee Roles</b>	
<b>If . . .</b>	<b>Then employees involved would be:</b>
Limited action could be conducted in the danger area	Considered emergency responders
Limited action will not be conducted in IDLH conditions	Considered evacuees, not emergency responders

((\*) (g) Details of who will evacuate immediately and who will remain behind for limited action;

((\*) (h) Evacuation routes and procedures;

((\*) (i) How to establish safe distances and places of refuge (for example, during emergency response the incident commander (IC) decides to make changes based on new developments, i.e., changes in the wind direction).

**((You must:))**

\*) (j) Methods of securing and controlling access to the site;

((\*) (k) Emergency medical treatment and first aid;

((\*) (l) A complete personal protective equipment (PPE) program that addresses:

((-) (i) Selection of PPE including selection criteria to be used and the identification, specified use and limitations of the PPE selected;

((-) (ii) Training on proper use of PPE (including maintenance);

((-) (iii) Hazards created by wearing PPE including heat stress during temperature extremes, and/or other appropriate medical considerations;

((-) (iv) Criteria used for determining the proper fit of PPE;

((-) (v) Procedures covering proper use of PPE including procedures for inspection, putting it on (donning) and removing it (doffing);

((-) (vi) Maintenance of PPE including procedures for decontamination, disposal and storage;

((-) (vii) Methods used to evaluate the effectiveness of your PPE program((-));

**Notes:** ((\*) 1. If a manufacturer's printed information or WISHA rule adequately addresses procedural requirements (such as donning or doffing for PPE), it is not necessary to rewrite this into your program; simply attach the printed information.

((\*)~~(Y0u)~~) 2. The employer may use written procedures provided by the equipment manufacturer when they meet the requirements of other chapters, including chapter 296-307 WAC, Part Y-5, Respirators.

((-) (viii) Emergency equipment;

- (-) (ix) Emergency response procedures;
  - (-) (x) Decontamination procedures determined by a hazardous materials specialist or other qualified individual;
  - (-) (xi) Methods to critically assess the response and conduct appropriate follow-up.
- (You must:)**
- (2) The employer must make (~~you~~) its written emergency response plan available to employees, their representatives, and WISHA personnel for inspecting or copying.

**Note:** In situations where multiple employers could respond to an incident, all plans should consistently address:

**(\*)** 1. Who will be designated as the incident commander (IC);

**AND**

**(\*)** 2. If, when, and how transfer of the incident commander (IC) position will take place.

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all the following apply. They:</b>
First responder at the awareness level	<ul style="list-style-type: none"> <li>• Are likely to witness or discover a hazardous substance release</li> <li>• Are trained to initiate an emergency response by notifying the proper authorities of the release</li> <li>• Take no further action beyond notifying the authorities</li> </ul>
First responder at the operations level	<ul style="list-style-type: none"> <li>• Respond to actual or potential releases in order to protect nearby persons, property, and/or the environment from the effects of the release</li> <li>• Are trained to respond defensively, without trying to stop the release</li> <li>• May try to:                             <ul style="list-style-type: none"> <li>- Confine the release from a safe distance</li> <li>- Keep it from spreading</li> <li>- Protect others from hazardous exposures</li> </ul> </li> </ul>
Hazardous materials technician	<ul style="list-style-type: none"> <li>• Respond to releases or potential releases, with the intent of stopping the release</li> <li>• Are trained to approach the point of release offensively in order to, either:                             <ul style="list-style-type: none"> <li>- Plug</li> <li>- Patch</li> <li>- Stop the release using other methods</li> </ul> </li> </ul>
Hazardous materials specialist	<ul style="list-style-type: none"> <li>• Respond along with, and provide support to, hazardous materials technicians</li> <li>• Are required to have more specific knowledge of hazardous substances than a hazardous materials technician</li> <li>• Act as the site activity liaison when federal, state, local, and other government authorities participate</li> </ul>
Incident commander	<ul style="list-style-type: none"> <li>• Have ultimate responsibility for:                             <ul style="list-style-type: none"> <li>- Direction</li> <li>- Control</li> <li>- Coordination of the response effort</li> <li>- Will assume control of the incident beyond the first responder awareness level</li> </ul> </li> </ul>
Specialist employee	<ul style="list-style-type: none"> <li>• Are a technical, medical, environmental, or other type of expert</li> <li>• May represent a hazardous substance manufacturer, shipper, or a government agency</li> <li>• May be present at the scene or may assist from an offsite location</li> <li>• Regularly work with specific hazardous substances</li> <li>• Are trained in the hazards of specific substances</li> <li>• Are expected to give technical advice or assistance to the incident commander or incident safety officer, when requested</li> </ul>
Skilled support personnel	<ul style="list-style-type: none"> <li>• Are needed to perform an immediate, specific emergency support task at the site</li> </ul>

<b>Table 1 Roles and Duties of Emergency Responders</b>	
<b>If the employee's role is:</b>	<b>Then all the following apply. They:</b>
	<ul style="list-style-type: none"> <li>• Are skilled in the operation of equipment including:                             <ul style="list-style-type: none"> <li>- Earth moving equipment</li> <li>- Cranes</li> <li>- Hoisting equipment</li> </ul> </li> </ul>
Incident safety officer	<ul style="list-style-type: none"> <li>• Are designated by the incident commander</li> <li>• Are knowledgeable in operations being implemented at the site</li> <li>• Have specific responsibility to                             <ul style="list-style-type: none"> <li>- Identify and evaluate hazards</li> <li>- Provide direction on employee safety matters</li> </ul> </li> </ul>

**AMENDATORY SECTION** (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70415 Training.**

**Train ~~(you)~~ employees.**

**Notes:** ((\*) 1. Use Tables 3 through 6 to identify ~~(you)~~ employees' training competencies.  
~~(You)~~ 2. The employer may conduct training internally, or use outside training services to comply with this section.  
 (-) When outside trainers are hired, ~~(you are)~~ the employer is still responsible for making sure the requirements of this section are met. For example, employers may compare the course outline to the competencies listed in Tables 3 through 6.

~~(You must:~~

**\*) (1) The employer must make sure employees are appropriately trained for their assigned roles and duties as follows:**

**Exemption:** Skilled support employees are not covered by the training requirements of this section (see WAC 296-307-70440).

(2) The employer must provide initial training:

**((\*) (a) Provide initial training before the employee is allowed to participate in an actual emergency response operation.**

**Note:** When first responders at the awareness or operations level have sufficient experience to objectively demonstrate competencies specified in Table 3, you may accept experience instead of training.

**((\*) (b) Make sure initial training adequately addresses the competencies in Tables 3 through 6 and the minimum training durations in Table 2.**

**((\*) (c) Certify that employees objectively demonstrate competencies specified in Tables 3 through 6 (except for employees trained as first responders at the awareness level).**

~~(You must:~~

**(3) The employer must provide retraining (refresher) training:**

**((\*) (a) Provide retraining annually.**

**((\*) (b) Make sure retraining covers necessary content.**

**((\*) (c) Document training or demonstrated competency.**

**Note:** Retraining is not required when employees demonstrate competencies annually and a record is kept of the demonstration methodology used.

~~(You must:~~

**(4) For trainer qualifications, the employer must:**

**((\*) (a) Verify trainers have satisfactorily completed an instructors' training course for the subjects they teach. For example, courses offered by the United States National Academy, or equivalent courses are acceptable.**

**OR**

**((\*) (b) Have the educational and instructional experience necessary for training.**

**(5) For specialist employees, the employer must:**

**((\*) Specialist employees who have been sent to the scene to advise or assist must receive training or demonstrate competency in their specialty, annually.**

<b>Table 2 Minimum Training Durations for all Responders</b>	
<b>If you are a:</b>	<b>Then:</b>
First responder at the awareness level	Training duration needs to be sufficient to provide the required competencies
First responder at the operations level	You need a minimum of 8 hours training (see Table 3)
Hazardous materials technician	You need a minimum of 24 hours training (see Table 4)
Hazardous materials specialist	You need a minimum of 24 hours training (see Table 4)
Incident commander	You need a minimum of 24 hours training (see Table 5)



**Table 3**  
**Competencies for First Responders at the Awareness Level and Operations Level**

<b>Employees must be able to show they:</b>	<b>When they are designated as First Responders at the:</b>	
	<b>Awareness Level</b>	<b>Operations Level</b>
Understand what hazardous substances are and their associated risks.	X	X
Recognize the presence of hazardous substances in an emergency.	X	X
Can identify the hazardous substances, when possible.	X	X
Understand the potential consequences of hazardous substances in an emergency.	X	X
Understand the role of a first responder at the awareness level as described in: <ul style="list-style-type: none"> <li>• The employer's emergency response plan, including site security and control.</li> <li>• The United States Department of Transportation's Emergency Response Guidebook. (<i>Search at: <a href="http://www.dot.gov">http://www.dot.gov</a></i>)</li> </ul>	X	X
Can use The United States Department of Transportation's Emergency Response Guidebook.	X	X
Recognize the need for additional resources and the need to notify the incident's communication center accordingly.	X	X
Know basic hazard and risk assessment techniques.		X
Can select and use personal protective equipment (PPE) appropriate for first responder operations level.		X
Understand basic hazardous materials terms.		X
Can perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can implement decontamination procedures to their level of training.		X
Understand relevant standard operating and termination procedures.		X

**Table 4**  
**Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist**

<b>Employees must be able to show they:</b>	<b>When they are designated as a Hazardous Materials:</b>	
	<b>Technician</b>	<b>Specialist</b>
Have the competencies specified for the first responder operations level. (See Table 3)	X	X
Can implement an employer's emergency response plan.	X	X
Can function within their assigned role in the incident command system.	X	X
Understand hazard and risk assessment techniques.	X	X
Understand basic chemical and toxicological terminology and behavior.	X	X
Can use field survey instruments and equipment to classify, identify, and verify materials at the incident.	X	X
Can select and use personal protective equipment (PPE) appropriate for hazardous materials technicians.	X	X
Can perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available.	X	X
Can implement decontamination procedures to their level of training.	X	X
Understand termination procedures.	X	X

Table 4 Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist		
Employees must be able to show they:	When they are designated as a Hazardous Materials:	
	Technician	Specialist
Can implement the local emergency response plan.		X
Know of the state emergency response plan.		X
Can develop a site safety and control plan.		X
Understand chemical, radiological, and toxicological terminology and behavior.		X
Understand in-depth hazard and risk techniques.		X
Can use advanced survey instruments and equipment to classify, identify and verify materials at the incident.		X
Can select and use proper specialized chemical PPE given to hazardous materials specialists.		X
Can perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can determine decontamination procedures.		X

Table 5 Competencies for Incident Commanders	
<b>Employees designated as Incident Commanders must be able to show they:</b>	
• Have competencies specified for the First Responder Operations Level. (See Table 3.)	
• Know of the state emergency response plan and the Federal Regional Response Team.	
• Can implement the local emergency response plan.	
• Can implement the employer's emergency response plan.	
• Have knowledge of the incident command system (ICS) and understand how they relate to it.	
• Can implement the employer's ICS.	
• Understand the hazards and risks associated with employees working in chemical protective clothing.	
• Understand the importance of decontamination procedures.	
<b>Note:</b> If the first employee arriving at the scene is not trained as an IC, they may take control of the incident within their designated role and training level.	

Table 6 Competencies for Specialist Employees	
<b>Employees designated as Specialist Employees must be able to show they:</b>	
• Have current knowledge in their field regarding safety and health practices relating to the specific hazardous substances.	
• Have the knowledge of the ICS and understand how they relate to it.	
• Understand the care and use of personal protective equipment (PPE).	

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70420 Medical surveillance. Provide medical surveillance to employees.**

~~((You must:))~~

(1) The employer must provide medical surveillance for employees to comply with Tables 7 and 8, and the following:

((\*) (a) Make medical surveillance available at:

((-) (i) Reasonable times and places.

((-) (ii) No cost to employees, including travel associated costs such as mileage, gas or bus fare if the employee is required to travel off site.

AND

((-) (iii) Wages for additional time spent outside of employees' normal work hours.

((\*) (b) Make sure a licensed physician performs or supervises exams and procedures.

((\*) (c) Give complete information to the examining physician including:

((-) (i) A copy of this section.

((-) (ii) A description of the employee's duties that relate to hazardous substance exposure.

((-) (iii) The hazardous substance exposure levels anticipated for the employee.

((-) (iv) A description of the personal protective equipment (PPE) the employee could use.

((-) (v) Information available from previous medical examinations.

((-) (vi) The medical evaluation information required by chapter 296-307 WAC, Part Y-5, Respirators.

((\*) (d) Medical exams must include, at a minimum:

((-) (i) A medical history.

((-) (ii) A work history (or updated history if on file).

((-) (iii) A special emphasis on:

((\*) (A) Assessment of symptoms related to handling hazardous substances.

((\*) (B) Health hazards.

((\*) (C) Evaluation of fitness for duty (including the ability to wear any personal protective equipment (PPE) or other conditions that may be expected at the workplace).

((-) (iv) Other content as determined by the examining physician.

**Note:** The physician should consult the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* and the *Medical Management Guidelines for Acute Chemical Exposure* (search OSHA website: <http://www.osha.gov>).

~~((You must))~~

(2) The employer must obtain the physician's written opinion and give a copy to the employee that includes:

((\*) (a) A statement of whether or not medical conditions were found which would increase the employee's risk for impairment during emergency response work or respirator use.

((-) Do not include specific findings or diagnoses unrelated to occupational exposures.

((\*) (b) Limitations recommended to the employee's assigned work, if any.

((\*) (c) Exam and test results if the employee requests this information.

((\*) (d) A statement that affirms the employee has been confidentially informed of medical exam results (including medical conditions requiring follow-up).

<b>Table 7 Medical Surveillance for Employee Categories</b>	
<b>If the employee is covered by this section and is:</b>	<b>Then you must:</b>
<ul style="list-style-type: none"> <li>• Exposed for at least 30 days a year to health hazards or hazardous substances at or above the permissible exposure limit or published exposure levels (even when respirators are used),</li> <li><b>OR</b></li> <li>• Required to wear a respirator for at least 30 days a year.*</li> </ul>	<ul style="list-style-type: none"> <li>• Offer standard medical surveillance as specified in Table 8.*</li> </ul>
<ul style="list-style-type: none"> <li>• A hazardous materials (HAZMAT) team member.</li> <li>• A hazardous materials specialist.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide standard medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• An emergency responder who shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide incident-specific medical surveillance as specified in Table 8.</li> </ul>
<ul style="list-style-type: none"> <li>• Not an emergency responder and:                             <ul style="list-style-type: none"> <li>- May be injured.</li> <li>- Shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances.</li> <li>- May have been exposed to hazardous substances at concentrations above the permissible exposure limits (PELs) or the published exposure levels without appropriate PPE.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Offer incident-specific medical surveillance as specified in Table 8.</li> </ul>

\*Note: A medical evaluation for respirator use is required by chapter 296-307 WAC, Part Y-5, Respiratory protection, for those employees who have not been cleared for respirator use during medical surveillance activities.

<b>Table 8 Frequency of Exams and Consultations</b>	
<b>If the employee is covered by:</b>	<b>Then medical surveillance must include:</b>
<ul style="list-style-type: none"> <li>• Standard medical surveillance</li> </ul>	<p>Exams and consultations:</p> <ul style="list-style-type: none"> <li>• Before assignment.</li> </ul> <p><b>Note:</b> If the employee is a hazardous materials (HAZMAT) team member or a hazardous materials specialist, the employee must receive a baseline physical examination.</p> <ul style="list-style-type: none"> <li>• At least once every 12 months after their initial assignment unless the physician believes a shorter, or longer interval (but no more than 24 months) is appropriate.</li> <li>• Whenever employees are reassigned to an area where they will no longer be covered by medical surveillance and they have not been examined within the past 6 months.</li> <li>• As soon as possible after an employee reports:                             <ul style="list-style-type: none"> <li>- Signs or symptoms of possible overexposure to hazardous substances or health hazards.</li> <li>- Injury.</li> <li>- Exposure above the permissible exposure limits or published exposure levels.</li> </ul> </li> <li>• At the termination of their employment unless they were examined within the past 6 months.</li> </ul>
<ul style="list-style-type: none"> <li>• Incident-specific medical surveillance</li> </ul>	<p>Medical consultations and exams:</p> <ul style="list-style-type: none"> <li>• As soon as possible following the incident or development of signs or symptoms.</li> <li>• At additional times, if the physician determines follow-up is medically necessary.</li> </ul>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70425 Keep records.**

~~((You must:))~~

•) The employer must keep a record of:

- ((-)) (1) Name and Social Security number of the employee receiving medical surveillance;
- ((-)) (2) Physicians' written opinions, recommended limitations, and results of examinations and tests;
- ((-)) (3) Any employee medical complaints regarding hazardous substance exposures;
- ((-)) (4) A copy of all information given to the examining physician (except a copy of this section).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70430 Incident requirements. Recognize emergencies and initiate a response.**

~~((You must:))~~

- ) The employer must make sure employees follow procedures in your emergency response plan to:
  - ((-)) (1) Recognize when an emergency response must be initiated;
  - ((-)) (2) Notify employees, and others designated in your plan, of the release;
  - ((-)) (3) Follow immediate emergency procedures;
  - ((-)) (4) Prevent the incident from increasing in severity or to secure the operation.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70435 Implement and maintain an incident command system (ICS).**

~~((You must:))~~

(1) The employer must make sure a single individual, acting as the incident commander (IC), is in charge of the site-specific incident command system (ICS) and acts within their designated role and training level.

- Note:**
- ((\*) For multiemployer worksites:
    - ((-)) 1. The IC has responsibility for controlling emergency response operations at the site for all employers.
    - ((-)) 2. Emergency response plans should be consistent in designating who assumes the IC position.
    - ((■)) 3. If the first employee arriving at the scene is not trained as an IC (see Table 5, Training Requirements for Incident Commanders and Specialist Employees, WAC 296-307-70415), they may take control of the incident within their designated role and training level.

~~((You must:))~~

(2) The employer must make sure all employers' emergency responders and their communications are coordinated and controlled by the IC.

- Note:** The IC may delegate tasks to subordinates (within their training level).

~~((You must:))~~

- (3) The employer must make sure each employer at the scene has designated a representative to assist the IC.
- (4) The employer must establish security and control of the site as specified in your written emergency response plan.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70440 Prepare skilled support personnel.**

- Note:** The duties of skilled support personnel are described in Table 1, Roles and Duties of Emergency Responders.

~~((You must:))~~

(1) The employer must make sure that ~~((you))~~ their skilled support personnel (including those employees who are not regularly employed by you) who could be exposed to on-scene hazards are given an initial briefing at the site before they participate in any emergency response. The initial briefing must include:

(\*) (a) What chemical hazards are involved;

(\*) (b) What duties are to be performed;

(\*) (c) Instruction in the wearing of appropriate personal protective equipment.

**Note:** Skilled support personnel do not need to comply with the other training requirements of this section.

~~((You must:))~~

(2) The employer must make sure the safety and health precautions given to your employees are also given to skilled support personnel.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70445 Make sure the incident commander oversees activities during the response. The employer of the incident commander (IC) must:**

(1) Identify all hazardous substances and conditions present, within their training level, using site analysis and maximum exposure limits, when appropriate.

(2) Implement emergency response procedures appropriate to the hazardous substances and conditions present, such as:

(\*) (a) Procedures that address the use of engineering controls, hazardous substance handling, and new technologies;

(\*) (b) Procedures that address decontamination;

(\*) (c) Procedures that address PPE;

(\*) (d) Procedures that limit the number of personnel to those who are actively performing emergency response operations, in areas where exposure could exist.

(3) Designate an incident safety officer (ISO).

(\*) Make sure the ISO demonstrates knowledge about operations being implemented at the emergency response site. They must:

(-) (a) Identify and evaluate hazards;

(-) (b) Communicate with the IC about hazards, immediately informing the IC of corrective actions that must be taken when conditions are judged to be:

(\*) (i) An imminent danger;

OR

(\*) (ii) Immediately dangerous to life or health (IDLH).

(-) (c) Provide direction about the safety of operations.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70450 Use the buddy system in danger areas.**

~~((You must:))~~

\*) The employer must make sure operations and tasks (including limited actions) in danger areas are conducted using the buddy system in teams of two or more.

**Definition(\*)** Danger areas are areas where conditions pose a serious danger to employees, such as areas where:

(\*) (a) Immediately dangerous to life or health (IDLH) conditions could exist.

OR

(\*) (b) High levels of exposure to toxic substances could exist.

OR

(\*) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL) of a hazardous substance.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70455 Provide rescue and medical assistance.**

~~((You must:))~~

(1) The employer must provide stand-by employees equipped with the same level of personal protective equipment (PPE) as the entrants, for assistance or rescue.

**Notes:** (\*) 1. The buddy system applies to stand-by employees (WAC 296-307-70450).

(\*) 2. One of the two stand-by employees can be assigned to another task provided it does not interfere with the performance of the stand-by role.

(\*) 3. Rescue equipment should be selected and provided based on the types of rescue situations that could occur.

~~((You must:))~~

(2) The employer must make sure employees trained in first aid are readily available with necessary medical equipment and have a way to transport the injured.

**Note:** (\*) Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70460 Personal protective equipment.**

**Notes:** (\*) 1. Only properly trained employees should select PPE. Hazardous materials technicians and hazardous materials specialists can select PPE within the competencies specified in Table 4.

(\*) 2. Selection requirements in other PPE rules also apply, including:

(-) a. Chapter 296-307 WAC, Part Y-5, Respirators.

(-) b. Chapter 296-305 WAC, Safety standards for firefighting.

~~((You must:))~~

\*) (1) The employer must provide employees with appropriate PPE and make sure it is used if hazards could be present.

(\*) (2) The employer must select PPE (such as respirators, gloves, protective suits and other PPE) based on:

(-) (a) An evaluation of the performance characteristics (such as breakthrough time and hazardous substance-speci-

ficity of the material or item) relevant to the requirements and limitations of the site.

((-) (b) Task-specific conditions and durations.

((-) (c) The hazards and potential hazards of the site (see Table 9, Selecting PPE for Specific Hazards).

((\*) (3) The employer must select totally encapsulating chemical protective (TECP) suits, as specified in Table 9, that:

((-) (a) Maintain positive air pressure.

((-) (b) Prevent inward test gas leakage of more than 0.5 percent.

**Note:** Follow the manufacturer's recommended procedure for testing a TECP suit's ability to maintain positive air pressure and prevent inward gas leakage. Other established test protocols for these suits, for example NFPA 1991 and ASTM F1052-97, may also be used.

<b>Table 9 Selecting PPE for Specific Hazards</b>	
<b>If:</b>	<b>Then use:</b>
<ul style="list-style-type: none"> <li>Inhalation hazards could be present.</li> </ul>	<ul style="list-style-type: none"> <li>Positive-pressure (pressure-demand) self-contained breathing apparatus (SCBA)</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>A decreased level of respiratory protection only when the incident commander determines, from air monitoring results, that employees will be adequately protected.</li> </ul>
Chemical exposure levels will create a substantial possibility of: <ul style="list-style-type: none"> <li>Immediate death.</li> <li>Immediate serious illness or injury.</li> <li>Reduced ability to escape.</li> </ul>	Either positive-pressure (pressure-demand): <ul style="list-style-type: none"> <li>SCBA</li> <li>Air-line respirators equipped with an escape air supply.</li> </ul>
Skin absorption of a hazardous substance may result in a substantial possibility of: <ul style="list-style-type: none"> <li>Immediate death.</li> <li>Immediate serious illness or injury.</li> <li>Reduced ability to escape.</li> </ul>	Protection equivalent to Level A including a totally encapsulating chemical protective (TECP) suit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70465 Control hazards created by personal protective equipment (PPE).**

~~((You must~~

\*) The employer must control hazards created by the use of PPE, including:

((-) (1) Heat stress due to extremely high temperatures.

((-) (2) Any other employee health hazard and consideration.

((\*) (b) You need a supplemental air supply;

((\*) (c) The cylinders are of the same capacity and pressure rating.

(4) The employer must make sure compressed air cylinders used with SCBAs meet the testing and service life requirements of the United States Department of Transportation (USDOT). Search at: <http://www.dot.gov>.

**Note:** You can also check with the cylinder manufacturers to obtain USDOT test and service life specifications.

~~((You must~~

(5) The employer must make sure PPE is maintained in a safe and reliable condition using your plan's procedures. PPE maintenance includes:

((\*) (a) Decontamination;

((\*) (b) Cleaning;

((\*) (c) Inspection;

((\*) (d) Identification of damage or defects;

((\*) (e) Parts repair or replacement;

((\*) (f) Storage or disposal.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70470 Use personal protective equipment (PPE) properly.**

~~((You must~~

(1) The employer must make sure employees inspect PPE before, during and after use, following your plan's procedures.

(2) The employer must make sure employees put on (don) and remove (doff) PPE following your plan's procedures.

(3) The employer must make sure employees do not interchange self-contained breathing apparatus (SCBA) air cylinders from different manufacturers, unless all of the following apply:

((\*) (a) There is a life-saving emergency;

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70475 Postemergency response.**

**IMPORTANT:**

Postemergency response is the stage of the emergency response where the immediate threat from the release has

been stabilized or eliminated, and cleanup of the site has started.

When cleanup is done by the employees who were part of the initial emergency response, the employees are not covered by this section (however, training, PPE and other requirements in WAC 296-307-70460 through 296-307-70470 apply to these employees).

~~((You must))~~

(1) The employer must follow Table 10 to determine which requirements apply to ~~((your))~~ postemergency response activities.

(2) The employer must maintain clean-up equipment as specified in Table 10.

<b>Table 10</b> <b>Rules that Apply to Postemergency Response Activities</b>	
<b>When postemergency response cleanup is performed by employees who were not part of the initial emergency response and:</b>	<b>The following rules or requirements apply:</b>
It is necessary to remove hazardous substances, health hazards and contaminated materials (example: Soil) from the site.	Chapter 296-843 WAC, Hazardous waste operations.
Cleanup is done on plant property using plant or workplace employees <b>AND</b> It is not necessary to remove hazardous substances, health hazards and contaminated materials from the site.	For training: <ul style="list-style-type: none"> <li>• WAC 296-307-35015 and 296-307-35018, Employee emergency action plans</li> <li>• Chapter 296-307 WAC, Part Y-5, Respiratory protection</li> <li>• WAC 296-307-550, Employer chemical hazard communication</li> <li>• Other appropriate training requirements relevant to personal protective equipment (PPE) and decontamination</li> </ul> For equipment: <ul style="list-style-type: none"> <li>• Make sure that all equipment used for clean-up work is serviced and inspected before use.</li> </ul>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

**WAC 296-307-70480 Definitions.** The following definitions are specific to this section:

**Annually.** Any twelve-month cycle.

**Buddy system.** A system of organizing employees (who enter or stand by danger areas) into work groups, so each employee can be observed by at least one other member of the group. The purpose of this system is to provide rapid assistance to employees in an emergency.

**Clean-up operation(s).** An operation where hazardous substances are removed, contained, incinerated, neutralized, stabilized, cleared up or, in any other manner, processed or handled with the goal of making the site safer for people or the environment.

**Danger area.** Areas where conditions pose a serious danger to employees, such as areas where:

((★)) (a) Immediately dangerous to life or health (IDLH) conditions could exist;

**OR**

((★)) (b) High levels of exposure to toxic substances could exist;

**OR**

((★)) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

**Decontamination.** Removing hazardous substances from employees and their equipment so potential adverse health effects will not occur.

**Emergency response.** An organized response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

**Emergency response plan.** A written plan that requires coordination between emergency response participants, and contains procedures, criteria, and other information that will be applied to emergency response operations. Each employer's plan should be compatible with local and state plans.

**Engineering controls.** Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants.

**Hazardous materials team (HAZMAT team).** A group of employees who are expected to perform responses to releases, or possible releases, of hazardous substances for the purpose of control and stabilization. As a result of their duties, HAZMAT team members may have close contact with hazardous substances.

**Note:** A HAZMAT team may be a separate component of a fire brigade or fire department.

**Hazardous substance.** Any of the following substances that could adversely affect an exposed employee's health or safety:

((★)) (a) Substances defined under section 101(14) of the Comprehensive Environmental Response, Compensation and

Liability Act of 1980 (CERCLA) or "Superfund" Act (visit: (<http://www.epa.gov>)) <https://www.epa.gov>)

((\*) (b) Biological or other disease-causing agents released that could reasonably be expected to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in a person or their offspring when the person:

((-) (i) Is directly exposed to the agent in the environment;

((-) (ii) Directly ingests, inhales, or assimilates the agent from the environment;

((-) (iii) Indirectly ingests the agent through a food chain;

((\*) (c) Substances listed by the United States Department of Transportation as hazardous materials under Title 49 (Transportation) in the Code of Federal Regulations (C.F.R.), Part 172, section 101 and appendices (visit: <http://www.nara.gov> and search for "List of C.F.R. subjects");

((\*) (d) Hazardous wastes as defined in this section.

**Hazardous waste.** A substance designated by chapter 173-303 WAC, Dangerous waste regulations, department of ecology, as a dangerous waste or an extremely hazardous waste and any waste fitting the definition of "health hazard" in this section.

**Note:** For department of ecology regulations, visit: <http://www.ecy.wa.gov>.

**Health hazard.** A chemical, a mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted according to established scientific principles, that acute or chronic health effects may occur in exposed employees.

The term "health hazard" includes stress due to temperature extremes and chemicals that are:

((\*) (a) Carcinogens;

((\*) (b) Toxic or highly toxic agents;

((\*) (c) Reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, or neurotoxins;

((\*) (d) Agents acting on the hematopoietic system agents that damage lungs, skin, eyes, or mucous membranes. (Detailed definitions of these chemical terms can be found in the Safety and health core rules, WAC 296-307-550, chemical hazard communication.)

**Immediately dangerous to life or health (IDLH).** Any atmospheric condition that would:

((\*) (a) Cause an immediate threat to life;

OR

((\*) (b) Cause permanent or delayed adverse health effects;

OR

((\*) (c) Interfere with an employee's ability to escape.

**Incident command system (ICS).** An organized approach to control and manage operations at an emergency response incident.

**Incidental release.** A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

**Note:** Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

**Limited action.** Action necessary to:

((\*) (a) Secure an operation during emergency responses;

OR

((\*) (b) Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

**Lines of authority.** A preestablished ranking of individuals, qualified to assume a commanding role during an emergency response, noted in an emergency response plan and implemented during a response. This is most important when responders from multiple employers could participate in an emergency response.

**Lower explosive limit (LEL).** See lower flammable limit (LFL).

**Lower flammable limit (LFL).** The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent (by volume) of the material in air (or other oxidant).

**Must.** Must means mandatory.

**Permissible exposure limit (PEL).** Means the established time-weighted-average (TWA) concentration or ceiling concentration of a contaminant that must not be exceeded.

The exposure, inhalation, or dermal permissible limit specified in chapter 296-307 WAC, Part Y-6, Respiratory hazards.

**Personal protective equipment (PPE).** Protective items designed to be worn by the user to protect them against airborne, skin contact and other hazards. This includes items such as respiratory protection, protective suits, gloves, eye protection, etc.

**Postemergency response.** The stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

**Published exposure level.** Exposure limits published in "National Institute for Occupational Safety and Health (NIOSH) Recommendations for Occupational Safety and Health" (DHHS publication #92-100, 1992).

If an exposure limit is not published by NIOSH, then "published exposure level" means the exposure limits published by the American Conference of Governmental Industrial Hygienists (ACGIH) in "TLVs and BEIs-Threshold Limit Values for Chemical Substances and Physical Agents" (1999 edition).

**Note:** Additional exposure levels published by recognized organizations such as the American Industrial Hygiene Association are not required to be observed by this rule; however, they may be a useful resource when a hazardous substance is not covered by NIOSH and ACGIH publications.

**Release.** A spill, leak, or other type of hazardous substance discharge.



**Uncontrolled release.** A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

(a) Examples of conditions that could create a significant safety and health risk:

(i) Large-quantity releases;

(ii) Small releases that could be highly toxic;

(iii) Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

(b) Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

**Workplace.**

(\*) (a) A fixed facility;

OR

(\*) (b) A temporary location (such as a traffic corridor);

OR

(\*) (c) Locations where employees respond to emergencies.

**WSR 20-21-100**

**PERMANENT RULES**

**DAIRY PRODUCTS COMMISSION**

[Filed October 21, 2020, 7:30 a.m., effective November 21, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The purpose of this expedited rule making is to clarify how travel costs are reimbursed by the commission.

Citation of Rules Affected by this Order: Amending WAC 142-40-040.

Statutory Authority for Adoption: RCW 15.44.038 and 15.44.060.

Other Authority: Chapter 34.05 RCW.

Adopted under notice filed as WSR 20-17-039 on August 10, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 1, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 1, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 21, 2020.

Celeste Piette  
Sr. Director Operations  
and Business Management

AMENDATORY SECTION (Amending WSR 20-13-026, filed 6/9/20, effective 7/10/20)

**WAC 142-40-040 Travel.** (1) Except as provided in subsections (7) and (8) of this section, all overnight or out-of-state travel by commissioners and by commission staff must be approved in accordance with commission policy in advance of departure to be eligible for travel expense reimbursement.

(2) All travel expenses must be within the preapproved budget limits as provided for in WAC 142-40-030(1).

(3) Reimbursement for transportation expenses shall be at actual cost subject to the following limitations:

(a) If an employee chooses not to use the state's travel services, travel must be booked at the lowest commercially reasonable cost and exclude any fees due to personal preference or convenience not necessary or critical to commission business.

(b) If an employee chooses not to use the state's travel services, coach airfare will be reimbursed with the expectation that the lowest commercially reasonable fare is found.

(c) If a commissioner or commission employee uses his or her automobile for transportation, mileage shall be reimbursed at the current rate set by the GSA for business travel.

(d) Car rentals up to full-size cars and related fuel expenses. Larger or different types of vehicles require prior approval.

(e) Other transport, including public transit, taxi, and rideshare services, related to commission business travel shall be reimbursed.

(f) Customary tips for transport and meals shall be reimbursed in accordance with commission policy.

(4) Reimbursement for lodging expenses shall be at actual costs and travelers should adhere to the GSA per diem rates as closely as possible. Accommodations should be standard rooms and must be the lowest commercially reasonable cost and exclude any fees due to personal preference or convenience not necessary or critical to commission business.

(5) Reimbursement for meals shall be at actual costs, plus tip, provided that such costs are reasonable for the particular market in which the expense is incurred.

(6) Each person traveling on official commission business shall submit request for reimbursement in accordance with commission policy. Receipts for each expense for which reimbursement is requested must accompany the reimbursement request. Expenses will not be reimbursed unless such a request, accompanied by receipts where required, is timely submitted. Receipts may not be required for expenses under a

certain dollar threshold as stated by the Washington dairy products commission policies, which are to be reviewed annually.

(7) No advance approval of travel and related expenses is required for attendance at regular or special meetings of the commission or a committee thereof within the state of Washington.

(8) Day trips by commissioners and commission staff, as well as overnight travel within Washington state by commission staff for commission business, do not require approval in advance of departure and travel-related costs for day trips are reimbursable as provided under ((WAC 142-40-040(5))) this section.

### WSR 20-21-104

#### PERMANENT RULES

#### DEPARTMENT OF REVENUE

[Filed October 21, 2020, 9:57 a.m., effective November 21, 2020]

Effective Date of Rule: Thirty-one days after filing.

Purpose: The department is amending WAC 458-20-169 to incorporate 2020 legislation, SB 6312, section 1. This legislation eliminated the expiration date on the use tax exemption for items purchased or received as a prize at a qualifying nonprofit organization or library fundraising event, and added new requirements for calculating the value threshold.

Citation of Rules Affected by this Order: Amending WAC 458-20-169.

Statutory Authority for Adoption: RCW 82.32.300, 82.01.060.

Adopted under notice filed as WSR 20-17-050 on August 11, 2020.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 1, Repealed 0.

Number of Sections Adopted at the Request of a Non-governmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.

Date Adopted: October 21, 2020.

Atif Aziz  
Rules Coordinator

AMENDATORY SECTION (Amending WSR 18-13-094, filed 6/19/18, effective 7/20/18)

**WAC 458-20-169 Nonprofit organizations.** (1) **Introduction.** Unlike the tax systems of most states and the federal government, Washington's tax system, including its primary

business tax, applies to the activities of nonprofit organizations. Washington's business and occupation (B&O) tax is imposed on all entities that generate gross receipts or proceeds, unless there is a specific statutory exemption or deduction. This rule explains how the B&O, retail sales, and use taxes apply to activities often performed by nonprofit organizations. Although some nonprofit organizations may be subject to other taxes (e.g., public utility or insurance premium taxes on income from utility or insurance activities), these taxes are not discussed in this rule. The rule describes the most common B&O, retail sales, and use tax exemptions and deductions that are specifically provided to nonprofit organizations by state law. Other exemptions or deductions not specific to nonprofit organizations may also apply.

(a) **Examples.** This rule contains examples that identify a number of facts and then state a conclusion. These examples should be used only as a general guide. The tax results of other situations must be determined after a review of all facts and circumstances.

(b) **Other rules that may be relevant.** Rules in the following list may contain additional relevant information for nonprofit organizations:

(i) WAC 458-20-167 Educational institutions, school districts, student organizations, and private schools;

(ii) WAC 458-20-168 Hospitals, nursing homes, assisted living facilities, adult family homes and similar health care facilities;

(iii) WAC 458-20-183 Amusement, recreation, and physical fitness services;

(iv) WAC 458-20-249 Artistic or cultural organizations; and

(v) WAC 458-20-256 Trade shows, conventions and seminars.

(2) **Registration requirements.** Nonprofit organizations with \$12,000 or more per year in gross receipts from sales, and/or gross income from services subject to the B&O tax, or that are required to collect or pay to the department of revenue (department) retail sales tax or any other tax or fee which the department administers (regardless of the level of annual gross receipts) must register with the department. Nonprofit organizations with less than twelve thousand dollars per year in gross receipts and that are not required to collect retail sales tax or any other tax or fee administered by the department are not required to register with the department. For more information on whether registration with the department is required see WAC 458-20-101.

(3) **Filing excise tax returns.** Nonprofit organizations making retail sales that require the collection of retail sales tax must file an excise tax return, regardless of the annual level of gross receipts or gross income and whether or not any B&O tax is due. For information on when a taxpayer may qualify for a small business B&O tax credit, see WAC 458-20-104. The excise tax return with payment is generally filed on a monthly basis. Under certain conditions the department may authorize taxpayers to file and remit payment on either a quarterly or an annual basis. For information on how reporting frequencies are assigned to taxpayers see WAC 458-20-22801.

Nonprofit organizations that do not have retail sales tax to remit, but are required to register, do not have to file an

excise tax return if they meet certain statutory requirements (e.g., annual gross income of less than \$28,000) and are placed on an "active nonreporting" status by the department. For additional information on whether an organization qualifies for the "active nonreporting" status see WAC 458-20-101.

(4) **General tax reporting responsibilities.** While Washington state law provides some tax exemptions and deductions specifically for nonprofit organizations, these organizations otherwise have the same tax-reporting responsibilities as for-profit organizations.

(a) **Business and occupation tax.** Chapter 82.04 RCW imposes a B&O tax on every person with substantial nexus in Washington (see RCW 82.04.067) engaged in business activities within this state, unless the income is specifically exempt or deductible under state law. The B&O tax applies to the value of products, gross proceeds of sales, or gross income of the business, as the case may be. RCW 82.04.220.

(i) **Common B&O tax classifications.** Chapter 82.04 RCW provides a number of classifications that apply to specific activities. The most common B&O tax classifications applying to income received by nonprofit organizations are the retailing, wholesaling, and service and other activities classifications. RCW 82.04.250, 82.04.270, and 82.04.290. If an organization engages in more than one kind of business activity, it must report the gross income from each activity under the appropriate tax classification. RCW 82.04.440(1).

(ii) **Measure of tax.** The most common measures of the B&O tax are "gross proceeds of sales" and "gross income of the business." RCW 82.04.070 and 82.04.080, respectively. These measures include the value proceeding or accruing from the sale of tangible personal property or services rendered without any deduction for the cost of property sold, cost of materials used, labor costs, discounts paid, delivery costs, taxes, losses, or any other expenses.

(b) **Retail sales tax.** A nonprofit organization must collect and remit retail sales tax on all retail sales, unless the sale is specifically exempt by statute. Examples of retail sales tax exemptions that may apply to nonprofit organizations are those for sales of certain food products (see WAC 458-20-244, Food and food ingredients), construction materials purchased by a health or social welfare organization for new construction of alternative housing to be licensed as a family foster home for youth in crisis (see RCW 82.08.02915), and fund-raising activities (see subsection (5)(g) of this rule). New construction includes renovating an existing structure to provide new housing for youth in crisis.

A nonprofit organization must pay retail sales tax when it purchases goods or retail services for its own use as a consumer, unless the purchase is specifically exempt by statute. Items purchased for resale without intervening use are purchases at wholesale and are not subject to the retail sales tax if the seller takes from the buyer a copy of the buyer's reseller permit. The reseller permit documents the wholesale nature of any sale. Reseller permits replaced resale certificates effective January 1, 2010. For additional information on reseller permits see WAC 458-20-102.

(c) **Use tax.** The use tax is imposed on every person, including nonprofit organizations, using tangible personal property within this state as a consumer, unless such use is

specifically exempt by statute. The use tax applies only if retail sales tax has not previously been paid on the item. The rate of tax is the same as the sales tax rate that applies at the location where the property is first used.

A common application of the use tax occurs when items are purchased from an out-of-state seller who has no presence in Washington. When the out-of-state seller does not collect Washington's retail sales or use tax, the buyer is statutorily required to remit use tax directly to the department. For more information on use tax and the use of tangible personal property see WAC 458-20-178.

Except for fund-raising, use tax exemptions generally correspond to retail sales tax exemptions. For example, the use tax exemption for construction materials acquired by a health or social welfare organization for new construction of alternative housing for youth in crisis, to be licensed as a family foster home (RCW 82.12.02915) corresponds with the retail sales tax exemption described in subsection (4)(b) of this rule for purchasing these construction materials.

(i) **Use tax exemption for donated items.** RCW 82.12.-02595 provides a use tax exemption for personal property donated to a nonprofit charitable organization. This exemption is available for the nonprofit charitable organization and the donor, if the donor did not previously use the personal property as a consumer. It also applies to the use of property by a donor who is incorporating the property into a nonprofit organization's real or personal property for no charge.

The exemption also applies to another person using property originally donated to a charitable nonprofit organization that is subsequently donated or bailed to that person by the charitable nonprofit organization, provided that person uses the property in furtherance of the charitable purpose for which the property was originally donated to the charitable nonprofit organization. For example, a hardware store donates an industrial pressure washer to a nonprofit community center for neighborhood cleanup, the community center bails this washer to people enrolled in its neighborhood improvement group for neighborhood clean-up projects. No use tax is due from any of the participants in these transactions. An example of a gift that would not qualify is when a car is donated to a church for its staff and the church gives that car to its pastor. The pastor must pay use tax on the car because it serves multiple purposes. It serves the church's charitable purpose, but it also acts as compensation to the pastor and is available for the pastor's personal use. The subsequent donation of property from the charity to another person must be solely for a charitable purpose. If the property is donated or bailed to the third party for a charitable purpose in line with the nonprofit organization's charitable activities, generally, no additional proof is required that this was the charitable purpose for which the property was originally donated.

(ii) **Use tax implications with respect to fund-raising activities.** Subsection (5)(g) of this rule explains that a retail sales tax exemption is available for certain fund-raising sales. However, there is usually no comparable use tax exemption provided to the buyer/user of property purchased at these fund-raising sales. While the nonprofit organization is not obligated to collect use tax from the buyer, the organization is

encouraged to inform the buyer of the buyer's possible use tax obligation.

(iii) ~~((From October 1, 2013, through October 8, 2015;)) RCW 82.12.225 ((provided)) provides a use tax exemption for the use of any article of personal property, ((valued at less than ten thousand dollars;)) purchased or received as a prize in a contest of chance, as defined in RCW 82.04.285, from a nonprofit organization or a library, if the value is less than the current value limit. ((Effective October 9, 2015, chapter 32, Laws of 2015 3rd Sp. Sess. (ESB 6013), the exemption applies to qualifying personal property valued at less than twelve thousand dollars.)) This exemption only applies if the gross income from the sale by the nonprofit organization or library is exempt under RCW 82.04.3651. ((This exemption is scheduled to expire July 1, 2020.))~~

(A) The current value limit is twelve thousand dollars. Beginning in 2020, the value limit must be adjusted annually each December for inflation. The department will calculate an adjusted value limit for use in the next calendar year, using the consumer price index for the Seattle area. Adjusted value limits may not decrease from one year to the next. If an adjusted value limit calculation based on the consumer price index results in less than the current year's value limit, the current year's value limit will apply in the following calendar year. Adjusted value limits are published on the department's website and take effect January 1st for the following year.

(B) The following definitions apply to this subsection unless the context clearly requires otherwise:

(I) "Consumer price index" means the consumer price index for all urban consumers, all items, (CPI-U) as calculated by the United States Bureau of Labor Statistics or successor agency.

(II) "Seattle area" means the geographic area sample that includes Seattle and surrounding areas.

(5) **Exemptions.** The following sources of income are specifically exempt from tax. As such, they should not be included or reported as gross income if the organization is required to file an excise tax return.

(a) **Adult family homes.** RCW 82.04.327 exempts from B&O tax amounts received by licensed adult family homes or adult family homes that are exempt from licensing under rules of the department of social and health services.

(b) **Nonprofit assisted living facilities.** RCW 82.04.-4264 exempts from B&O tax amounts received by a nonprofit assisted living facility licensed under chapter 18.20 RCW for providing room and domiciliary care to residents of the assisted living facility. Nonprofit assisted living facilities were formerly known as "nonprofit boarding homes" in the statute.

(c) **Camp or conference centers.** RCW 82.04.363 and 82.08.830 respectively exempt from B&O tax and retail sales tax amounts received by a nonprofit organization from the sale or furnishing of certain items or services at a camp or conference center conducted on property exempt from the property tax under RCW 84.36.030 (1), (2), or (3). For information about property tax exemptions that may apply see: WAC 458-16-210 (Nonprofit organizations or associations organized and conducted for nonsectarian purposes); WAC 458-16-220 (Church camps); and WAC 458-16-230 (Character building organizations).

Amounts received from the sale of the following items and services are exempt:

(i) Lodging, conference and meeting rooms, camping facilities, parking, and similar licenses to use real property;

(ii) Food and meals;

(iii) Books, tapes, and other products, including electronically transferred items, available exclusively to the participants at the camp, conference, or meeting and not available to the public at large.

(d) **Child care resource and referral services.** RCW 82.04.3395 exempts from B&O tax amounts received by nonprofit organizations for providing child care resource and referral services. Child care resource and referral services do not include child care services provided directly to children.

(e) **Credit and debt services.** RCW 82.04.368 exempts from B&O tax amounts received by nonprofit organizations for providing specialized credit and debt services. These services include:

(i) Presenting individual and community credit education programs including credit and debt counseling;

(ii) Obtaining creditor cooperation allowing a debtor to repay debt in an orderly manner;

(iii) Establishing and administering negotiated repayment programs for debtors; and

(iv) Providing advice or assistance to a debtor with regard to (i), (ii), or (iii) of this subsection.

(f) **Day care provided by churches.** RCW 82.04.339 exempts from B&O tax amounts received by a church for the care of children of any age for periods of less than twenty-four hours, provided the church is exempt from property tax under RCW 84.36.020.

(g) **Fund-raising.** RCW 82.04.3651 and 82.08.02573, respectively, exempt from B&O tax and retail sales tax amounts received from certain fund-raising activities.

These exemptions apply only to the fund-raising income received by the nonprofit organization. For example, commission income received by a nonprofit organization selling books owned by a for-profit entity on a consignment basis is exempt from tax only if the statutory requirements are satisfied. The nonprofit organization is generally responsible for collecting and remitting retail sales tax on the gross proceeds of sales when selling items for another person. For additional information on the taxability of sales by agents, auctioneers and other similar types of sellers see WAC 458-20-159.

(i) **What nonprofit organizations qualify?** Nonprofit organizations that qualify for this exemption are those that are:

(A) A tax-exempt nonprofit organization described by section 501 (c)(3) (educational and charitable), 501 (c)(4) (social welfare), or 501 (c)(10) (fraternal societies operating as lodges) of the Internal Revenue Code; or

(B) A nonprofit organization that would qualify for tax exemption under section 501 (c)(3), (4), or (10) except that it is not organized as a nonprofit corporation; or

(C) A nonprofit organization that does not pay its members, stockholders, officers, directors, or trustees any amounts from its gross income, except as payment for services rendered, does not pay more than reasonable compensation to any person for services rendered, and does not engage in a substantial amount of political activity. Political activity

includes, but is not limited to, influencing legislation and participating in any campaign on behalf of any candidate for political office.

(ii) **Qualifying fund-raising activities.** For the purpose of this exemption, "fund-raising activity" means soliciting or accepting contributions of money or other property, or activities involving the anticipated exchange of goods or services for money between the soliciting organization and the organization or person solicited, for furthering the goals of the nonprofit organization.

(A) Money raised by a nonprofit charitable group from its annual telephone fund drive to fund its homeless shelters where nothing is promised in return for a donor's pledge is exempt as fund-raising contributions of money to further the goals of the nonprofit organization.

(B) A nonprofit group organized as a community playhouse has an annual telephone fund drive. The group gives the caller a mug, jacket, dinner, or vacation trip depending on the amount of pledge made over the phone. The community playhouse does not sell or exchange the mugs, jackets, dinners, or trips for cash or property, except during this pledge drive. The money is used to produce the next season's plays. The money earned from the pledges is exempt from both B&O tax and retail sales tax to the extent these amounts represent an exchange of goods and services for money to further the goals of the nonprofit group. The money earned from the pledges above the value of the goods and services exchanged is exempt as a fund-raising contribution of money to further the goals of the nonprofit organization.

(C) A nonprofit group sells ice cream bars at booths leased during the two-week runs of three county fairs, for a total of six weeks during the year, to fund youth camps maintained by the nonprofit group. The money earned from the booths is exempt from both B&O tax and retail sales tax as a fund-raising exchange of goods for money to further the goals of the nonprofit group.

(iii) **Contributions of money or other property.** The term contributions includes grants, donations, endowments, scholarships, gifts, awards, and any other transfer of money or other property by a donor, provided the donor receives no significant goods, services, or benefits in return for making the gift. For example, an amount received by a nonprofit educational broadcaster from a group that conditions receipt on the nonprofit broadcaster airing its seminars is not a contribution regardless of how the amount paid is titled by the two organizations.

It is not unusual for the person making a gift to require some accountability for how the gift is used as a condition for receiving the gift or future gifts. Such gifts remain exempt, provided the "accountability" required does not result in a direct benefit to the donor (examples of direct benefits to a donor are: Money given for a report on the soil contamination levels of land owned by the donor, medical services provided to the donor or the donor's family, or market research benefiting the donor directly). This "accountability" can take the form of conditions or restrictions on the use of the gift for specific charitable purposes or can take the form of written reports accounting for the use of the gift. Public acknowledgment of a donor for the gift is not a significant service or benefit.

(iv) **Nonqualifying activities.** Fund-raising activity does not include the operation of a regular place of business in which services are provided or sales are made during regular hours such as a bookstore, thrift shop, restaurant, legal or health clinic, or similar business. It also does not include the operation of a regular place of business from which services are provided or performed during regular hours such as the provision of retail, personal, or professional services. A regular place of business and the regular hours of that business depend on the type of business being conducted.

(A) In the example demonstrating that an amount received by a nonprofit broadcaster was not a contribution because services were given in return for the funds, this activity must also be examined to see whether the exchange was for services as part of a fund-raising activity. The broadcaster is in the business of broadcasting programs. It has a regular site for broadcasting programs and broadcasts twenty-four hours every day. Broadcasting is a part of its business activity performed from a regular place of business during regular hours. The money received from the group with the requirement that its seminars be broadcast would not qualify as money received from a fund-raising activity even though the parties viewed the money as a "donation."

(B) A nonprofit organization that makes catalog sales throughout the year with a twenty-four hour telephone line for taking orders has a regular place of business at the location where the sales orders are processed and regular hours of twenty-four hours a day. Catalog sales are not exempt as fund-raising amounts even though the funds are raised for a nonprofit purpose.

(C) A nonprofit group organized as a community playhouse has three plays during the year at a leased theatre. The plays run for a total of six weeks and the group provides concessions at each of the performances. The playhouse has a regular place of business with regular hours for that type of business. The concessions are done at that regular place of business during regular hours. The concessions are not exempt as fund-raising activities even though amounts raised from the concessions may be used to further the nonprofit purpose of that group.

(D) A nonprofit student group, that raises money for scholarships and other educational needs, sets up an espresso stand that is open for two hours every morning during the school year. The espresso stand is a regular place of business with regular hours for that type of business. The money earned from the espresso stand is not exempt, even though the amounts are raised to further the student group's nonprofit purpose.

(v) **Fund-raising sales by libraries.** RCW 82.04.3651 provides that the sale of used books, used videos, used sound recording, or similar used information products in a library is not the operation of a regular place of business, if the proceeds are used solely to support the library. The library must be a free public library supported in whole or in part with money derived from taxes. RCW 27.12.010. In addition to the B&O tax exemption under RCW 82.04.3651, RCW 82.08.02573 provides a comparable retail sales tax exemption for the same sales made by a library.

(h) **Group training homes.** RCW 82.04.385 exempts from B&O tax amounts received from the department of

social and health services for operating a nonprofit group training home. The amounts excluded from gross income must be used for the cost of care, maintenance, support, and training of developmentally disabled individuals. As defined in RCW 71A.22.020, a nonprofit group training home is an approved facility equipped, supervised, managed, and operated on a full-time nonprofit basis for the full-time care, treatment, training, and maintenance of individuals with developmental disabilities.

(i) **Sheltered workshops.** RCW 82.04.385 also exempts from B&O tax amounts received by a nonprofit organization for operating a sheltered workshop.

(i) **What is a sheltered workshop?** A sheltered workshop is that part of the nonprofit organization engaged in business activities that are performed primarily to provide evaluation and work adjusted services for a handicapped person or to provide gainful employment or rehabilitation services to a handicapped person. The sheltered workshop can be maintained on or off the premises of the nonprofit organization.

(ii) **What is meant by "gainful employment or rehabilitation services to a handicapped person"?** Gainful employment or rehabilitation services must be an interim step in the rehabilitation process that is provided because the person cannot be readily absorbed into the competitive labor market or because employment opportunities for the person do not exist during that time in the competitive labor market.

"Handicapped," for the purposes of this exemption, means a physical or mental disability that restricts normal achievement, including medically recognized addictions and learning disabilities. However, this term does not include social or economic disadvantages that restrict normal achievement (e.g., prior criminal history or low-income status).

(j) **Student loan services.** RCW 82.04.367 exempts from B&O tax amounts received by nonprofit organizations that are exempt from federal income tax under section 501(c)(3) of the Internal Revenue Code that:

(i) Are guarantee agencies under the federal guaranteed student loan program or that issue debt to provide or acquire student loans; or

(ii) Provide guarantees for student loans made through programs other than the federal guaranteed student loan program.

(k) **Grants received to fund education programs pertaining to litter control, waste reduction, recycling, and composting.** Effective July 24, 2015, RCW 82.04.755 provides a B&O tax exemption for grants received by a nonprofit organization from the matching fund competitive grant program established in RCW 70.93.180 (1)(b)(ii). This program provides funding for local or statewide education programs designed to help the public with litter control, waste reduction, recycling, and composting of primarily products upon which litter tax is imposed. For information on the state litter tax program, see chapter 82.19 RCW. The requirements for the grants are listed in RCW 70.93.180 (1)(b)(ii). Chapter 15, Laws of 2015 (ESHB 1060).

(6) **B&O tax deduction of payments made to health or social welfare organizations.**

(a) **Compensation from public entities.** RCW 82.04.-4297 provides a B&O tax deduction to health or social welfare organizations for amounts received from the United States, any instrumentality of the United States, the state of Washington, or any municipal corporation or political subdivision of the state of Washington as compensation for or to support health or social welfare services, rendered by a health or social welfare organization, as defined in RCW 82.04.431, or by a municipal corporation or political subdivision. These deductible amounts should be included in the gross income reported on the excise tax return, entered on the deduction page, and then deducted on the return when determining the amount of the organization's taxable income. A deduction is not allowed, however, for amounts that are received under an employee benefit plan.

(b) **Mental health services or chemical dependency services under a government-funded program.** RCW 82.04.4277 provides a B&O tax deduction for health or social welfare organizations for amounts received as compensation for providing mental health services or chemical dependency services under a government-funded program.

(i) The following definitions apply to (b) of this subsection unless the context clearly requires otherwise:

(A) "Chemical dependency" has the same meaning as provided in RCW 70.96A.020;

(B) "Health and social welfare organization" has the meaning provided in RCW 82.04.431; and

(C) "Mental health services" and "behavioral health organization" have the meanings provided in RCW 71.24.-025.

(ii) The deduction for amounts received as compensation for providing chemical dependency services under a government-funded program is effective April 1, 2016. Regional support networks, which are renamed behavioral health organizations effective April 1, 2016, may also deduct from the measure of tax amounts received from the state of Washington for distribution to health or social welfare organizations eligible to deduct the distribution under RCW 82.04.4277.

(iii) Persons claiming deductions under RCW 82.04.-4277 must file an annual tax performance report with the department. Refer to RCW 82.32.534 and WAC 458-20-267 for information regarding filing an annual tax performance report.

(iv) These deductions are scheduled to expire January 1, 2020.

(c) **Child welfare services.** RCW 82.04.4275 provides a B&O tax deduction for health or social welfare organizations for amounts received as compensation for providing child welfare services under a government-funded program. Persons may also deduct from the measure of tax amounts received from the state of Washington for distribution to health or social welfare organizations eligible to deduct the distribution under RCW 82.04.4275(1).

(d) **What is a health or social welfare organization?** A health or social welfare organization is an organization, including any community action council, providing health or social welfare services as defined in subsection (6)(c) of this rule. To be exempt under RCW 82.04.4297, a corporation must satisfy all of the following conditions:

(i) Be a corporation sole under chapter 24.12 RCW or a domestic or foreign not-for-profit corporation under chapter 24.03 RCW. A corporation providing professional services as authorized under chapter 18.100 RCW does not qualify as a health or social welfare organization;

(ii) Be governed by a board of not less than eight individuals who are not paid corporate employees when the organization is a not-for-profit corporation;

(iii) Not pay any part of its corporate income directly or indirectly to its members, stockholders, officers, directors, or trustees except as executive or officer compensation or as services rendered by the corporation in accordance with its purposes and bylaws to a member, stockholder, officer, or director or as an individual;

(iv) Only pay compensation to corporate officers and executives for actual services rendered. This compensation must be at a level comparable to like public service positions within Washington;

(v) Have irrevocably dedicated its corporate assets to health or social welfare activities. Upon corporate liquidation, dissolution, or abandonment, any distribution or transfer of corporate assets may not inure directly or indirectly to the benefit of any member or individual, except for another health or social welfare organization;

(vi) Be duly licensed or certified as required by law or regulation;

(vii) Use government payments to provide health or social welfare services;

(viii) Make its services available regardless of race, color, national origin, or ancestry; and

(ix) Provide access to the corporation's books and records to the department's authorized agents upon request.

(e) **Qualifying health or welfare services.** The term "health or social welfare services" includes, and is limited to:

(i) Mental health, drug, or alcoholism counseling or treatment;

(ii) Family counseling;

(iii) Health care services;

(iv) Therapeutic, diagnostic, rehabilitative, or restorative services for the care of the sick, aged, physically disabled, developmentally disabled, or emotionally disabled individuals;

(v) Activities, including recreational activities, intended to prevent or ameliorate juvenile delinquency or child abuse;

(vi) Care of orphans or foster children;

(vii) Day care of children;

(viii) Employment development, training, and placement;

(ix) Legal services to the indigent;

(x) Weatherization assistance or minor home repairs for low-income homeowners or renters;

(xi) Assistance to low-income homeowners and renters to offset the cost of home heating energy, through direct benefits to eligible households or to fuel vendors on behalf of eligible households; and

(xii) Community services to low-income individuals, families and groups that are designed to have a measurable and potentially major impact on causes of poverty in communities of the state of Washington; and

(xiii) Temporary medical housing, as defined in RCW 82.08.997, if the housing is provided only:

(A) While the patient is receiving medical treatment at a hospital required to be licensed under RCW 70.41.090 or at an outpatient clinic associated with such hospital, including any period of recuperation or observation immediately following such medical treatment; and

(B) By a person that does not furnish lodging or related services to the general public.