

WSR 24-23-102

PERMANENT RULES

BUILDING CODE COUNCIL

[Filed November 20, 2024, 9:55 a.m., effective December 21, 2024]

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

Purpose: The building code council was petitioned to amend items 5 and 7 of Section C403.1.4 in the 2021 Washington State Energy Code, commercial provisions, to include options other than electric resistance heaters as supplemental heating for air-to-air heat pumps and ground-source heat pumps.

Citation of Rules Affected by this Order: Amending WAC 51-11C-40314.

Statutory Authority for Adoption: RCW 19.27A.020, 19.27A.025.

Other Authority: RCW 19.27A.020, 19.27A.025.

Adopted under notice filed as WSR 24-16-146 on August 7, 2024.

Changes Other than Editing from Proposed to Adopted Version: Two options had been presented in the CR-102. Option 1 was no change to the WAC and option 2 was the changes as presented in the petition. Option 2 was selected.

A final cost-benefit analysis is available by contacting Dustin Curb, 1500 Jefferson Street S.E., Olympia, WA 98504-1449, email sbcc@des.wa.gov, website sbcc.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Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Nongovernmental Entity: New 0, Amended 1, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 0, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 0, Repealed 0.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: November 15, 2024.

Daimon Doyle  
Council Chair

**OTS-5623.2**

AMENDATORY SECTION (Amending WSR 24-03-085, filed 1/16/24, effective 3/15/24)

**WAC 51-11C-40314 Section C403.1.4—HVAC heating equipment.**

**C403.1.4 Use of electric resistance and fossil fuel-fired HVAC heating equipment.** HVAC heating energy shall not be provided by electric resistance or fossil fuel combustion appliances. For the purposes of this section, electric resistance HVAC heating appliances include, but are not limited to, electric baseboard, electric resistance fan coil and VAV electric resistance terminal reheat units and electric resist-

ance boilers. For the purposes of this section, fossil fuel combustion HVAC heating appliances include, but are not limited to, appliances burning natural gas, heating oil, propane, or other fossil fuels.

## EXCEPTIONS:

1. **Low heating capacity.** Buildings or areas of buildings, other than *dwelling units* or sleeping units, that meet the interior temperature requirements of Chapter 12 of the *International Building Code* with a total installed HVAC heating capacity no greater than 8.5 Btu/h (2.5 watts) per square foot of *conditioned space* are permitted to be heated using electric resistance appliances.
2. **Dwelling and sleeping units.** Dwelling or sleeping units are permitted to be heated using electric resistance appliances as long as the installed HVAC heating capacity in any separate space is not greater than:
  - 2.1. Seven hundred fifty (750) watts in Climate Zone 4, and 1000 watts in Climate Zone 5 in each habitable space with fenestration.
  - 2.2. One thousand (1,000) watts in Climate Zone 4, and 1300 watts in Climate Zone 5 for each habitable space that has two primary walls facing different cardinal directions, each with exterior fenestration. Bay windows and other minor offsets are not considered primary walls.
  - 2.3. Two hundred fifty (250) watts in spaces adjoining the *building thermal envelope* but without fenestration.
 For the purposes of this section, habitable space is as defined in the *International Building Code*. For buildings in locations with exterior design conditions below 4°F (-16°C), an additional 250 watts above that allowed for Climate Zone 5 is permitted in each space with fenestration.
3. **Small buildings.** Buildings with less than 2,500 square feet (232 m<sup>2</sup>) of *conditioned floor area* are permitted to be heated using electric resistance appliances.
4. **Defrost.** Heat pumps are permitted to utilize electric resistance heating when a heat pump defrost cycle is required and is in operation.
5. **Air-to-air heat pumps.** Buildings are permitted to utilize (~~electric resistance~~) supplemental heating for air-to-air heat pumps that meet all of the following conditions:
  - 5.1. Internal electric resistance heaters have controls that prevent supplemental heater operation when the heating load can be met by the heat pump alone during both steady-state operation and setback recovery.
  - 5.2. The heat pump controls are configured to use the compressor as the first stage of heating down to an outdoor air temperature of 17°F (-8°C) or lower except when in defrost.
 EXCEPTIONS TO 5.2:
  1. Packaged terminal heat pumps (PTHPs) that comply with the minimum heating efficiency requirements in Table C403.3.2(4) are exempt from heating pump controls capable of operating the compressor as the first stage of heating down to an outdoor air temperature of 17°F (-8°C) or lower.
  2. Heat pumps whose minimum efficiency is regulated by NAECA and whose ratings meet the requirements shown in Table C403.3.2(2) and include all usage of internal electric resistance heating are exempt from heat pump controls capable of operating the compressor as the first state of heating down to an outdoor air temperature of 17°F (-8°C) or lower.
- 5.3. The heat pump complies with one of the following:
  - 5.3.1. Controlled by a digital or electronic thermostat designed for heat pump use that energizes the supplemental heat only when the heat pump has insufficient capacity to maintain set point or to warm up the space at a sufficient rate.
  - 5.3.2. Controlled by a multistage space thermostat and an outdoor air thermostat wired to energize supplemental heat only on the last stage of the space thermostat and when outdoor air temperature is less than 32°F (0°C) except when in defrost.
  - 5.3.3. The minimum efficiency of the heat pump is regulated by NAECA, its rating meets the requirements shown in Table C403.3.2(2), and its rating includes all usage of internal electric resistance heating.
- 5.4. The heat pump rated heating capacity is sized to meet the heating load at an outdoor air temperature of 32°F (0°C) or lower and has a rated heating capacity at 47°F (8°C) no less than 2 times greater than supplemental heating capacity in Climate Zone 4 and no less than the supplemental heating capacity in Climate Zone 5, or utilizes the smallest available factory-available internal electric resistance heater.
6. **Air-to-water heat pumps.** Buildings are permitted to utilize electric resistance (for Climate Zone 4 or 5) or fossil fuel-fired (for Climate Zone 5) auxiliary heating to supplement heat pump heating for hydronic heating systems that meet all of the following conditions:
  - 6.1. Controls for the auxiliary heating sources are configured to lock out the supplemental heat when the outside air temperature is above 36°F (2°C), unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
  - 6.2. The heat pump controls are configured to use the compressor as the first stage of heating down to the lowest exterior design temperature for which the equipment is rated except during startup or defrost operation.
  - 6.3. The heat pump rated heating capacity at 47°F (8°C) is no less than 75 percent of the design heating load at 29°F (-2°C).
7. **Ground source heat pumps.** Buildings are permitted to utilize (~~electric resistance~~) supplemental heating for heat pump heating for hydronic heating systems with ground source heat pump equipment that meets all of the following conditions:
  - 7.1. Controls for the auxiliary heating sources are configured to lock out the supplemental heat when the equipment source-side entering water temperature is above 42°F (6°C), unless the hot water supply temperature setpoint to the building heat coils cannot be maintained for 20 minutes.
  - 7.2. The heat pump controls are configured to use the compressor as the first stage of heating.
  - 7.3. The ground source heat exchanger shall be sized so that the heat pump annual heating output is no less than 70 percent of the total annual heating output in the final year of a 30-year simulation using IGSHPA listed simulation software.
8. **Small systems.** Buildings in which electric resistance or fossil fuel appliances, including decorative appliances, either provide less than 5 percent of the total building HVAC system heating capacity or serve less than 5 percent of the *conditioned floor area*.
9. **Specific conditions.** Portions of buildings that require fossil fuel or electric resistance space heating for specific conditions *approved* by the *code official* for research, health care, process or other specific needs that cannot practically be served by heat pump or other space heating systems. This does not constitute a blanket exception for any occupancy type.
10. **Kitchen make-up air.** Make-up air for commercial kitchen exhaust systems required to be tempered by Section 508.1.1 of the *International Mechanical Code* is permitted to be heated by using fossil fuel in Climate Zone 5 or electric resistance in Climate Zone 4 or 5.
11. **District energy.** Steam or hot water district energy systems that utilize fossil fuels as their primary source of heat energy, that serve multiple buildings, and that were already in existence prior to the effective date of this code, including more energy-efficient upgrades to such existing systems, are permitted to serve as the primary heating energy source.
12. **Heat tape.** Heat tape is permitted where it protects water-filled equipment and piping located outside of the *building thermal envelope*, provided that it is configured and controlled to be automatically turned off when the outside air temperature is above 40°F (4°C).
13. **Temporary systems.** Temporary electric resistance heating systems are permitted where serving future tenant spaces that are unfinished and unoccupied, provided that the heating equipment is sized and controlled to achieve interior space temperatures no higher than 40°F (4°C).
14. **Pasteurization.** Electric resistance heat controls are permitted to reset the supply water temperature of hydronic heating systems that serve service water heating heat exchangers during pasteurization cycles of the service hot water storage volume. The hydronic heating system supply water temperature shall be configured to be 145°F (63°C) or lower during the pasteurization cycle.
15. **Freeze protection.** Heating systems sized for spaces with indoor design conditions of 45°F (7°C) and intended for freeze protection are permitted to use electric resistance. The building envelope of any such space shall be insulated in compliance with Section C402.1.
16. **DOAS ERV auxiliary heat.** Dedicated outdoor air systems with energy recovery ventilation are permitted to utilize fossil fuel for Climate Zone 5 or electric resistance in Climate Zone 4 or 5 for auxiliary heating to preheat outdoor air for defrost or as auxiliary supplemental heat to temper supply air to 55°F (13°C) or lower for buildings or portions of buildings that do not have hydronic heating systems.

17. **Low-carbon district energy systems.** Low-carbon district energy systems that meet the definitions of *low-carbon district energy exchange system* or *low-carbon district heating and cooling or heating only systems*.
18. **Essential facilities.** Groups 1-2 and 1-3 occupancies that by regulation are required to have in place redundant emergency backup systems.