

WAC 296-24-68503 Application of arc welding equipment.

Note: Assurance of consideration of safety in design is obtainable by choosing apparatus complying 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) Environmental conditions.

(a) 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 does not exceed 40°C (104°F) and where the altitude does not exceed 3,300 feet, and must be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

(b) Unusual service conditions may exist, and in such circumstances machines must be especially designed to safely meet the requirements of the service. Chief among these conditions are exposure to:

- (i) Unusually corrosive fumes.
- (ii) Steam or excessive humidity.
- (iii) Excessive oil vapor.
- (iv) Flammable gases.
- (v) Abnormal vibration or shock.
- (vi) Excessive dust.
- (vii) Weather.
- (viii) Unusual seacoast or shipboard conditions.

(2) **Voltage.** 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. You must not exceed the following limits:

- (a) Alternating-current machines.
 - (i) Manual arc welding and cutting—80 volts.
 - (ii) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (b) Direct-current machines.
 - (i) Manual arc welding and cutting—100 volts.
 - (ii) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (c) When special welding and cutting processes require values of open circuit voltages higher than the above, you must provide means 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.

(3) Design.

(a) A controller integrally mounted in an electric motor driven welder must have capacity for carrying rated motor current, must be capable of making and interrupting 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 296-24 WAC Part L, and WAC 296-800-280. 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 of several motors upon return of voltage.

(b) 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.

(c) Input power terminals, tap change devices and live metal parts connected to input circuits must be completely enclosed and accessible only by means of tools.

(d) Terminals for welding leads should be protected from accidental electrical contact by employees or by metal objects i.e., vehicles, crane hooks, etc. Protection may be obtained by use of: Dead-front receptacles for plug connections; recessed openings with nonremovable hinged covers; heavy insulating sleeving or taping or other equivalent electrical and mechanical protection. If a welding lead terminal which 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.

(e) 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.

(f) You must not use auto transformers or a.c. reactors to draw welding current directly from any a.c. power source having a voltage exceeding 80 volts.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-68503, filed 12/1/15, effective 1/5/16. Statutory Authority: RCW 49.17.010, [49.17].040, and [49.17].050. WSR 01-11-038, § 296-24-68503, filed 5/9/01, effective 9/1/01. Statutory Authority: Chapter 49.17 RCW. WSR 91-24-017 (Order 91-07), § 296-24-68503, filed 11/22/91, effective 12/24/91; Order 73-5, § 296-24-68503, filed 5/9/73 and Order 73-4, § 296-24-68503, filed 5/7/73.]