

South Carolina Department of Labor, Licensing and Regulation
Division of Labor
Office of Occupational Safety and Health
Columbia, South Carolina 29211

OSH Program Directive Number 89-1910.304/1926.404-1/1

Subject: Clarification of Subarticle 6, Sections 1910.304 (f) (4) and (f) (5) (v) (c) and Subarticle 7, Sections 1926.404 (f) (6) and (f) (7) (iv) (c), Rules and Regulations, Commissioner of Labor, State of South Carolina.

Cross Reference to Federal Standards: 29 CFR 1910.304 (f) (4) and (f) (5) (v) (c) and 29 CFR 1926.404 (f) (6) and (f) (7) (iv) (c).

Background: This directive clarifies and provides additional information for citing under Subarticle 6, Sections 1910.304 (f) (4) and (f) (5) (v) (c) and Subarticle 7, Sections 1926.404 (f) (6) and (f) (7) (iv) (c).

This directive replaces OSH Program Directive number 81-1910.304/1926.404-1/1, dated June 12, 1981.

Several professional electrical engineers were contacted in regards to these sections, and the opinions expressed by them were unanimous in agreement with the interpretations set forth in this program directive.

a. Sections 1910.304 (f) (4) and 1926.404 (f) (6):

Both of these sections are identical and read as follows:

“Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.”

b. Sections 1910.304 (f) (5) (v) (c) and 1926.404 (f) (7) (iv) (c):

1. Section 1910.304 (f) (5) (v) (c) reads as follows:

(c) “If the equipment is of the following types:

(1) Refrigerators, freezers and air-conditioners;

(2) Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment;

(3) Hand-held motor-operated tools;

- (4) Motor operated appliances of the following types:
Hedge clippers, lawn mowers, snow blowers, and wet scrubbers;
- (5) Cord-and plug-connected appliances used in damp or wet locations or by employees standing on the ground or on metal floors or working inside metal tanks or boilers;
- (6) Portable and mobile X-ray and associated equipment;
- (7) Tools likely to be used in wet and conductive locations; and
- (8) Portable head 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 not over 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes an approved system of double insulation.

2. Section 1926.404 (f) (7) (iv) (c) reads as follows:

- (c) “If the equipment is one of the types listed in paragraphs (f) (7) (iv) (c) (1) through (f) (7) (iv) (c) (5) of this section. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by paragraph (f) (7) (iv) (c) (6).
- (1) Hand held motor-operated tools;
 - (2) Cord-and plug-connected equipment 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;
 - (3) Portable and mobile X-ray and associated equipment;

- (4) Tools likely to be used in wet and/or conductive locations; and
- (5) Portable heat lamps.
- (6) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.”

Interpretation:

- a. Sections 1910.304 (f) (4) and 1926.404 (f) (6) are identical and are not to be used to determine which pieces of cord-and plug-connected electrical equipment is required to be grounded, nor was it intended to do so. Their purpose is to ensure compliance with the conditions stated and are to be cited only for such conditions. Three examples that are to be cited under either of these sections are (1) the use of an ungrounded extension cord to supply power to a tool or appliance required to be grounded; (2) a two-wire receptacle that is supplying a tool or appliance required to be grounded; and (3) a three-wire receptacle without a ground that is supplying a tool or appliance required to be grounded.
- b. Sections 1910.304 (f) (5) (v) (c) and 1926.404 (f) (7) (iv) (c) must be used in conjunction with Sections 1910.304 (f) (5) (v) and 1926.404 (f) (7) (iv), respectively, which, in general, states that under the conditions described in Sections 1910.304 (f) (5) (v) (c) and 1926.404 (f) (7) (iv) (c), exposed noncurrent-carrying metal parts of cord-and plug-connected equipment which may become energized shall be ground.
- c. Section 1910.304 (f) (5) (v) (c) (1) refers specifically to pieces of electrical equipment containing refrigeration or compressor units that must be grounded. This requirement pertains not only to household type refrigerators, but to water cooler refrigerators, horizontal type drink cooler refrigerators and vertical type drink or food refrigerators. All types of cord-and plug-connected freezers and air-conditioners can also be cited under this section.

- d. Sections 1910.304 (f) (5) (v) (c) (2) also refers to five (5) specific pieces of electrical equipment that must be grounded. This requirement is self-explanatory.
- e. Section 1910.304 (f) (5) (v) (c) (3) and 1926.404 (f) (7) (iv) (c) (1) refers to hand-held, motor-operated tools that are required to be grounded. Each tool must be motor-operated tools that are required to be grounded. Each tool must be motor-operated and held in or by hand. Hand-held applies to any type of motor-operated tool that is hand-held for guiding purposes as well as those that can be held in the hand.
- f. Section 1910.304 (f) (5) (v) (c) (4) refers to specific pieces of electrical equipment that must be grounded. This requirement is self-explanatory.
- g. Sections 1910.304 (f) (5) (v) (c) (5) and 1926.404 (f) (7) (iv) (c) (2) refers to cord- and plug-connected appliances and to cord- and plug-connected equipment, respectively, used in four (4) specific types of conductive locations that must be grounded. This is the only general references to appliances in Section 1910.403 (f) (5) (v) (c) and to equipment in 1926.404 (f) (7) (iv) (c). Unless the appliance or the equipment is one of the specific types stated in other paragraphs of Sections 1910.304 (f) (5) (v) (c) or 1926.404 (f) (7) (iv) (c), respectively, then Sections 1910.304 (f) (5) (v) (c) (5) and 1926.404 (f) (7) (iv) (c) (2) are the only citable sections for cord- and plug-connected appliances and equipment, respectively and only if they are located in one of the specific conductive locations stated. For example, if the appliance or equipment body and motor housing is made of plastic and the only metal parts are screws holding the housing together, and such screws are recessed so that they are not normally exposed to the hands during normal operation, then the appliance or equipment body is not likely to become energized and, therefore, it is not citable. Also, the grounding of the plastic housing of the motor would be impracticable.
- h. Sections 1910.304 (f) (5) (v) (c) (6) and 1926.404 (f) (7) (iv) (c) (3) refers specifically to any portable and mobile X-ray and its associated equipment. This requirement is self-explanatory.
- i. Sections 1910.304 (f) (5) (v) (c) (7) and 1926.404 (f) (7) (iv) (c) (4) refers to the grounding of tools likely to be used in both wet and conductive locations that would not be specifically

covered under Sections 1910.304 (f) (5) (v) (c) (5) and 1926.404 (f) (7) (iv) (c) (2). There are several reasonable explanations for interpreting the phrase “in wet and conductive locations” in Section 1910.304 (f) (5) (v) (c) (7) to mean both wet locations and conductive locations. One reason is that this phrase is written in the concept that it covers two conditions, a wet location and a conductive location, for there are numerous more conductive locations that are an electrical hazard which are not wet. All wet locations are normally considered to be conductive locations. Secondly, when the construction electrical standards were revised, Section 1926.404 (f) (7) (iv) (c) (4) was changed to read “wet and/or conductive locations,” making it very plain that the intent is to cover both wet locations and conductive locations.

- j. Sections 1910.304 (f) (5) (v) (c) (5) and 1926.404 (f) (7) (iv) (c) (5) refers to portable handlamps that must be grounded. This requirement is self-explanatory.
- k. The last paragraph of Section 1910.304 (f) (5) (v) (c) and Section 1926.404 (f) (7) (iv) (c) (6) both allow tools used in wet and conductive locations that are supplied through an isolating transformer with an unground secondary of not over 50 volts or double insulated listed tools and listed portable appliances which are distinctively marked as such, not to be grounded.

Effective Date: This instruction is effective upon receipt and will remain in effect until cancelled or superseded by amendment to the Rules and Regulations.

William M. Lybrand, Director
January 5, 1990