

§ 1910.302

29 CFR Ch. XVII (7-1-06 Edition)

(a) *Design safety standards for electrical systems.* These regulations are contained in §§ 1910.302 through 1910.330. Sections 1910.302 through 1910.308 contain design safety standards for electric utilization systems. Included in this category are all electric equipment and installations used to provide electric power and light for employee workplaces. Sections 1910.309 through 1910.330 are reserved for possible future design safety standards for other electrical systems.

(b) *Safety-related work practices.* These regulations will be contained in §§ 1910.331 through 1910.360.

(c) *Safety-related maintenance requirements.* These regulations will be contained in §§ 1910.361 through 1910.380.

(d) *Safety requirements for special equipment.* These regulations will be contained in §§ 1910.381 through 1910.398.

(e) *Definitions.* Definitions applicable to each division are contained in § 1910.399.

[46 FR 4056, Jan. 16, 1982; 46 FR 40185, Aug. 7, 1981]

DESIGN SAFETY STANDARDS FOR ELECTRICAL SYSTEMS

§ 1910.302 **Electric utilization systems.**

Sections 1910.302 through 1910.308 contain design safety standards for electric utilization systems.

(a) *Scope—(1) Covered.* The provisions of §§ 1910.302 through 1910.308 of this subpart cover electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises including:

- (i) Yards,
- (ii) Carnivals,
- (iii) Parking and other lots,
- (iv) Mobile homes,
- (v) Recreational vehicles,
- (vi) Industrial substations,
- (vii) Conductors that connect the installations to a supply of electricity, and
- (viii) Other outside conductors on the premises.

(2) *Not covered.* The provisions of §§ 1910.302 through 1910.308 of this subpart do not cover:

- (i) Installations in ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(ii) Installations underground in mines.

(iii) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communication purposes.

(iv) Installations of communication equipment under the exclusive control of communication utilities, located outdoors or in building spaces used exclusively for such installations.

(v) Installations under the exclusive control of electric utilities for the purpose of communication or metering; or for the generation, control, transformation, transmission, and distribution of electric energy located in buildings used exclusively by utilities for such purposes or located outdoors on property owned or leased by the utility or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(b) *Extent of application.* (1) The requirements contained in the sections listed below shall apply to all electrical installations and utilization equipment, regardless of when they were designed or installed.

Sections:

1910.303(b)	Examination, installation, and use of equipment.
1910.303(c)	Splices.
1910.303(d)	Arcing parts.
1910.303(e)	Marking.
1910.303(f)	Identification of disconnecting means.
1910.303(g)(2)	Guarding of live parts.
1910.304(e)(l)(i)	Protection of conductors and equipment.
1910.304(e)(l)(iv)	Location in or on premises.
1910.304(e)(l)(v)	Arcing or suddenly moving parts.
1910.304(f)(l)(ii)	2-Wire DC systems to be grounded:
1910.304(f)(l)(iii) and 1910.304(f)(l)(iv)	AC Systems to be grounded.
1910.304(f)(l)(v)	AC Systems 50 to 1000 volts not required to be grounded.
1910.304(f)(3)	Grounding connections.
1910.304(f)(4)	Grounding path.
1910.304(f)(5)(iv)(a) through 1910.304(f)(5)(iv)(d)	Fixed equipment required to be grounded.
1910.304(f)(5)(v)	Grounding of equipment connected by cord and plug.
1910.304(f)(5)(vi)	Grounding of nonelectrical equipment.
1910.304(f)(6)(i)	Methods of grounding fixed equipment.
1910.305(g)(l)(i) and 1910.305(g)(1)(ii)	Flexible cords and cables, uses.
1910.305(g)(l)(iii)	Flexible cords and cables prohibited.
1910.305(g)(2)(ii)	Flexible cords and cables, splices.

1910.305(g)(2)(iii)	Pull at joints and terminals of flexible cords and cables.
1910.307	Hazardous (classified) locations.

(2) Every electric utilization system and all utilization equipment installed after March 15, 1972, and every major replacement, modification, repair, or rehabilitation, after March 15, 1972, of any part of any electric utilization system or utilization equipment installed before March 15, 1972, shall comply with the provisions of §§ 1910.302 through 1910.308.

NOTE: "Major replacements, modifications, repairs, or rehabilitations" include work similar to that involved when a new building or facility is built, a new wing is added, or an entire floor is renovated.

(3) The following provisions apply to electric utilization systems and utilization equipment installed after April 16, 1981:

§ 1910.303(h)(4) (i) and (ii)	Entrance and access to workspace (over 600 volts).
§ 1910.304(e)(1)(vi)(b) ..	Circuit breakers operated vertically.
§ 1910.304(e)(1)(vi)(c) ..	Circuit breakers used as switches.
§ 1910.304(f)(7)(ii)	Grounding of systems of 1000 volts or more supplying portable or mobile equipment.
§ 1910.305(j)(6)(ii)(b)	Switching series capacitors over 600 volts.
§ 1910.306(c)(2)	Warning signs for elevators and escalators.
§ 1910.306(i)	Electrically controlled irrigation machines.
§ 1910.306(j)(5)	Ground-fault circuit interrupters for fountains.
§ 1910.308(a)(1)(ii)	Physical protection of conductors over 600 volts.
§ 1910.308(c)(2)	Marking of Class 2 and Class 3 power supplies.
§ 1910.308(d)	Fire protective signaling circuits.

[46 FR 4056, Jan. 16, 1981; 46 FR 40185, Aug. 7, 1981]

§ 1910.303 General requirements.

(a) *Approval.* The conductors and equipment required or permitted by this subpart shall be acceptable only if approved.

(b) *Examination, installation, and use of equipment—(1) Examination.* Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be

evidenced by listing or labeling for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(2) *Installation and use.* Listed or labeled equipment shall be used or installed in accordance with any instructions included in the listing or labeling.

(c) *Splices.* Conductors shall 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 shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device suitable for the purpose.

(d) *Arcing parts.* Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(e) *Marking.* Electrical equipment may not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment. Other markings shall be provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(f) *Identification of disconnecting means and circuits.* Each disconnecting means required by this subpart for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is