

§ 111.105-3 General requirements.

All electrical installations in hazardous locations must comply with the general requirements of section 43 of IEEE Std 45 and either the NEC articles 500-505 or IEC series 79 publications. When installations are made in accordance with the NEC articles, marine shipboard cable that complies with subpart 111.60 of this chapter may be used instead of rigid metal conduit, if installed fittings are approved for the specific hazardous location and the cable type.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-5 System integrity.

In order to maintain system integrity, each individual electrical installation in a hazardous location must comply specifically with NEC articles 500-505, as modified by § 111.105-3, or IEC series 79 publications, but not in combination in a manner that would compromise system integrity or safety. Hazardous location equipment must be approved as suitable for use in the specific hazardous atmosphere in which it is installed. The use of non-approved equipment is prohibited.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-7 Approved equipment.

When this subpart or the NEC states that an item of electrical equipment must be approved or when IEC 79-0 states that an item of electrical equipment must be tested or approved in order to comply with IEC 79 series publications, that item must be—

(a) Listed or certified by an independent laboratory as approved for use in the hazardous locations in which it is installed; or

(b) Purged and pressurized equipment that meets NFPA No. 496 or IEC 79-2.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-9 Explosionproof and flameproof equipment.

Each item of electrical equipment that is required in this subpart to be explosionproof under the NEC classification system must be approved as meeting UL 1203. Each item of electrical equipment that is required in

this subpart to be flameproof must be approved as meeting IEC 79-1.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-11 Intrinsically safe systems.

(a) Each system required under this subpart to be intrinsically safe must use approved components meeting UL 913 or IEC 79-11(I_a).

(b) Each electric cable of an intrinsically safe system must—

(1) Be 50 mm (2 inches) or more from cable of non-intrinsically safe circuits, partitioned by a grounded metal barrier from other non-intrinsically safe electric cables, or a shielded or metallic armored cable; and

(2) Not contain conductors for non-intrinsically safe systems.

(c) As part of plan approval, the manufacturer must provide appropriate installation instructions and restrictions on approved system components. Typical instructions and restrictions include information addressing—

(1) Voltage limitations;

(2) Allowable cable parameters;

(3) Maximum length of cable permitted;

(4) Ability of system to accept passive devices;

(5) Acceptability of interconnections with conductors or other equipment for other intrinsically safe circuits; and

(6) Information regarding any instructions or restrictions which were a condition of approval of the system or its components.

(d) Each intrinsically safe system must meet ISA RP 12.6, except Appendix A.1.

[CGD 94-108, 61 FR 28284, June 4, 1996, as amended at 62 FR 23909, May 1, 1997]

§ 111.105-15 Additional methods of protection.

Each item of electrical equipment that is—

(a) A sand-filled apparatus must meet IEC 79-5;

(b) An oil-immersed apparatus must meet either IEC 79-6 or NEC article 500-2;

(c) Type of protection “e” must meet IEC 79-7;

(d) Type of protection “n” must meet IEC 79-15; and

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(e) Type of protection “m” must meet IEC 79-18.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-17 Wiring methods for hazardous locations.

(a) Through runs of marine shipboard cable meeting subpart 111.60 of this part are required for all hazardous locations. Armored cable may be used to enhance ground detection capabilities. Additionally, Type MC cable may be used subject to the restrictions in § 111.60-23.

(b) Where conduit is installed, the applicable requirements of either the NEC or IEC 79 must be followed.

(c) Each cable entrance into explosionproof or flameproof equipment must be made with approved seal fittings, termination fittings, or glands that meet the requirements of § 111.105-9.

(d) Each cable entrance into Class II and Class III (Zone 10, 11, Z, or Y) equipment must be made with dust-tight cable entrance seals approved for the installation.

[CGD 94-108, 61 FR 28284, June 4, 1996, as amended at 62 FR 23909, May 1, 1997]

§ 111.105-19 Switches.

A switch that is explosionproof or flameproof, or that controls any explosionproof or flameproof equipment, under § 111.105-19 must have a pole for each ungrounded conductor.

[CGD 94-108, 61 FR 28284, June 4, 1996]

§ 111.105-21 Ventilation.

A ventilation duct which ventilates a hazardous location has the classification of that location. Each fan for ventilation of a hazardous location must be nonsparking.

[CGD 94-108, 61 FR 28285, June 4, 1996]

§ 111.105-27 Belt drives.

Each belt drive in a hazardous location must have:

- (a) A conductive belt; and
- (b) Pulleys, shafts, and driving equipment grounded to meet NFPA No. 77.

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§ 111.105-29 Combustible liquid cargo carriers.

(a) Each vessel that carries combustible liquid cargo with a closed-cup flashpoint of 60 degrees C (140 degrees F) or higher must have:

(1) Only intrinsically safe electric systems in cargo tanks; and

(2) No storage battery in any cargo handling room.

(b) If a submerged cargo pump motor is in a cargo tank, it must meet the requirements of § 111.105-31(d).

(c) Where the cargo is heated to within 15°C of its flashpoint, the cargo pumphouse must meet the requirements of § 111.105-31(f) and the weather locations must meet § 111.105-31(l).

[CGD 74-125A, 47 FR 15236, Apr. 8, 1982, as amended by CGD 94-108, 61 FR 28285, June 4, 1996; 61 FR 36787, July 12, 1996; 61 FR 39695, July 30, 1996]

§ 111.105-31 Flammable or combustible cargo with a flashpoint below 60 degrees C (140 degrees F), liquid sulphur carriers and inorganic acid carriers.

(a) *Applicability.* Each vessel that carries combustible or flammable cargo with a closed-cup flashpoint lower than 60 degrees C (140 degrees F) or liquid sulphur cargo, or inorganic acid cargo must meet the requirements of this section, except—

(1) A vessel carrying bulk liquefied flammable gases as a cargo, cargo residue, or vapor which must meet the requirements of § 111.105-32; and

(2) A vessel carrying carbon disulfide must have only intrinsically safe electric equipment in the locations listed in paragraphs (e) through (l) of this section.

(b) *Cable location.* Electric cable must be as close as practicable to the centerline and must be away from cargo tank openings.

(c) *Lighting circuits.* An enclosed hazardous space that has explosionproof lighting fixtures must:

(1) Have at least two lighting branch circuits;

(2) Be arranged so that there is light for relamping any deenergized lighting circuit; and

(3) Not have the switch within the space for those spaces containing explosionproof lighting fixtures under