

WAC 296-24-95711 Hazardous (classified) locations. (1) Scope.

(a) **Applicability.** This section covers the requirements for electric equipment and wiring in locations that are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers that may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Hazardous (classified) locations may be found in occupancies such as, but not limited to, the following: Aircraft hangars, gasoline dispensing and service stations, bulk storage plants for gasoline or other volatile flammable liquids, paint-finishing process plants, health care facilities, agricultural or other facilities where excessive combustible dusts may be present, marinas, boat yards, and petroleum and chemical processing plants. You must consider each room, section or area individually in determining its classification.

(b) **Classifications.**

(i) These hazardous (classified) locations are assigned the following designations:

- (A) Class I, Division 1;
- (B) Class I, Division 2;
- (C) Class I, Zone 0;
- (D) Class I, Zone 1;
- (E) Class I, Zone 2;
- (F) Class II, Division 1;
- (G) Class II, Division 2;
- (H) Class III, Division 1;
- (I) Class III, Division 2.

(ii) For definitions of these locations, see WAC 296-24-990.

(c) **Other sections of this part.** All applicable requirements in this part apply to hazardous (classified) locations unless modified by provisions of this section.

(d) **Division and zone classification.** In Class I locations, an installation must be classified as using the division classification system meeting subsections (3) through (6) of this section or using the zone classification system meeting subsection (7) of this section. In Class II and Class III locations, an installation must be classified using the division classification system meeting subsections (3) through (6) of this section.

(2) **Documentation.** You must properly document all areas designated as hazardous (classified) locations under the class and zone system and areas designated under the class and division system established after August 13, 2007. This documentation must be available to those authorized to design, install, inspect, maintain, or operate electric equipment at the location.

(3) **Electrical installations.** Equipment, wiring methods, and installations of equipment in hazardous (classified) locations must be intrinsically safe, approved for the hazardous (classified) location, or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) **Intrinsically safe.** Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location for which it is approved;

(b) **Approved for the hazardous (classified) location.**

(i) Equipment must be approved not only for the class of location, but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "Groups" characterized by their ignitable or combustible properties.

(ii) You must mark equipment to show the class, group, and operating temperature or temperature range, based on operation in a 40 degree C ambient, for which it is approved. The temperature marking may not exceed the ignition temperature of the specific gas or vapor to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type, such as junction boxes, conduit, and fittings, and equipment of the heat-producing type having a maximum temperature not more than 100°C (212°F) need not have a marked operating temperature or temperature range;

(B) Fixed lighting fixtures marked for use in Class I, Division 2 or Class II, Division 2 locations only need not be marked to indicate the group;

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, that is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature;

(D) Fixed dust-tight equipment, other than lighting fixtures, that is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature; and

(E) You must mark electric equipment suitable for ambient temperatures exceeding 40°C (104°F) with both the maximum ambient temperature and the operating temperature or temperature range at that ambient temperature; and

(c) **Safe for the hazardous (classified) location.** Equipment that is safe for the location must be of a type and design that the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers involved.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations that will meet this requirement. Those guidelines address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections; conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding.

(4) **Conduits.** All conduits must be threaded and must be made wrench-tight. Where it is impractical to make a threaded joint tight, you must utilize a bonding jumper.

(5) **Equipment in Division 2 locations.** Equipment that has been approved for a Division 1 location may be installed in a Division 2 location of the same class and group. General-purpose equipment or equipment in general-purpose enclosures may be installed in Division 2 locations if the employer can demonstrate that the equipment does not constitute a source of ignition under normal operating conditions.

(6) **Protection techniques.** The following are acceptable protection techniques for electric and electronic equipment in hazardous (classified) locations:

(a) **Explosionproof apparatus.** This protection technique is permitted for equipment in the Class I, Division 1 and 2 locations for which it is approved.

(b) **Dust ignitionproof.** This protection technique is permitted for equipment in the Class II, Division 1 and 2 locations for which it is approved.

(c) **Dust-tight.** This protection technique is permitted for equipment in the Class II, Division 2 and Class III locations for which it is approved.

(d) **Purged and pressurized.** This protection technique is permitted for equipment in any hazardous (classified) location for which it is approved.

(e) **Nonincendive circuit.** This protection technique is permitted for equipment in Class I, Division 2; Class II, Division 2; or Class III, Division 1 or 2 locations.

(f) **Nonincendive equipment.** This protection technique is permitted for equipment in Class I, Division 2; Class II, Division 2; or Class III, Division 1 or 2 locations.

(g) **Nonincendive component.** This protection technique is permitted for equipment in Class I, Division 2; Class II, Division 2; or Class III, Division 1 or 2 locations.

(h) **Oil immersion.** This protection technique is permitted for current-interrupting contacts in Class I, Division 2 locations as described in this part.

(i) **Hermetically sealed.** This protection technique is permitted for equipment in Class I, Division 2; Class II, Division 2; and Class III, Division 1 or 2 locations.

(j) **Other protection techniques.** Any other protection technique that meets subsection (3) of this section is acceptable in any hazardous (classified) location.

(7) **Class I, Zone 0, 1, and 2 locations.**

(a) **Scope.** Employers may use the zone classification system as an alternative to the division classification system for electric and electronic equipment and wiring for all voltage in Class I, Zone 0, Zone 1, and Zone 2 hazardous (classified) locations where fire or explosion hazards may exist due to flammable gases, vapors, or liquids.

(b) **Location and general requirements.**

(i) You must classify locations depending on the properties of the flammable vapors, liquids, or gases that may be present and the likelihood that a flammable or combustible concentration or quantity is present. Where pyrophoric materials are the only materials used or handled, these locations need not be classified.

(ii) You must individually consider each room, section, or area in determining its classification.

(iii) All threaded conduit must be threaded with an NPT (National (American) Standard Pipe Taper) standard conduit cutting die that provides 3/4 inch taper per foot. You must make the conduit wrench-tight to prevent sparking when fault current flows through the conduit system and to ensure the explosion proof or flameproof integrity of the conduit system where applicable.

(iv) You must install equipment provided with threaded entries for field wiring connection in accordance with subsection (7)(b)(iv)(A) or (B) of this section.

(A) For equipment provided with threaded entries for NPT threaded conduit or fittings, you must use listed conduit, conduit fittings, or cable fittings.

(B) For equipment with metric threaded entries, you must identify such entries as being metric, or you must provide listed adaptors to permit connection to conduit of NPT-threaded fittings with the equipment. You must use adaptors for connection to conduit or NPT-threaded fittings.

(c) **Protection techniques.** You must use one or more of the following protection techniques for electric and electronic equipment in hazardous (classified) locations classified under the zone classification system.

(i) Flameproof "d"—This protection technique is permitted for equipment in the Class I, Zone 1 locations for which it is approved.

(ii) Purged and pressurized—This protection technique is permitted for equipment in the Class I, Zone 1 or Zone 2 locations for which it is approved.

(iii) Intrinsic safety—This protection technique is permitted for equipment in the Class I, Zone 0 or Zone 1 locations for which it is approved.

(iv) Type of protection "n"—This protection technique is permitted for equipment in the Class I, Zone 2 locations for which it is approved. Type of protection "n" is further subdivided into nA, nC, and nR.

(v) Oil immersion "o"—This protection technique is permitted for equipment in the Class I, Zone 1 locations for which it is approved.

(vi) Increased safety "e"—This protection technique is permitted for equipment in the Class I, Zone 1 locations for which it is approved.

(vii) Encapsulation "m"—This protection technique is permitted for equipment in the Class I, Zone 1 locations for which it is approved.

(viii) Powder Filling "q"—This protection technique is permitted for equipment in the Class I, Zone 1 locations for which it is approved.

(d) **Special precaution.** This subsection requires equipment construction and installation that will ensure safe performance under conditions of proper use and maintenance.

(i) Classification of areas and selection of equipment and wiring methods must be under the supervision of a qualified registered professional engineer.

(ii) In instances of areas within the same facility classified separately, Class I, Zone 2 locations may abut, but not overlap, Class I, Division 2 locations. Class I, Zone 0 or Zone 1 locations may not abut Class I, Division 1 or Division 2 locations.

(iii) A Class I, Division 1 or Division 2 location may be reclassified as a Class I, Zone 0, Zone 1, or Zone 2 location only if all of the space that is classified because of a single flammable gas or vapor source is reclassified.

Note: Low ambient conditions require special consideration. Electric equipment depending on the protection techniques described by (c)(i) of this subsection may not be suitable for use at temperatures lower than -20 °C (-4 °F) unless they are approved for use at lower temperatures. However, at low ambient temperatures, flammable concentrations of vapors may not exist in a location classified Class I, Zone 0, 1, or 2 at normal ambient temperature.

(e) **Listing and marking.**

(i) Equipment that is listed for a Zone 0 location may be installed in a Zone 1 or Zone 2 location of the same gas or vapor. Equipment that is listed for a Zone 1 location may be installed in a Zone 2 location of the same gas or vapor.

(ii) You must mark equipment in accordance with (e)(ii)(A) and (B) of this subsection, except as provided in (e)(ii)(C) of this subsection.

(A) Equipment approved for Class I, Division 1 or Class 1, Division 2 shall, in addition to being marked in accordance with subsection (3)(b)(ii) of this section, be marked with the following:

(I) Class I, Zone 1 or Class I, Zone 2 (as applicable);

(II) Applicable gas classification groups; and

(III) Temperature classification; or

(B) You must mark equipment meeting one or more of the protection techniques described in (c) of this subsection with the following in the order shown:

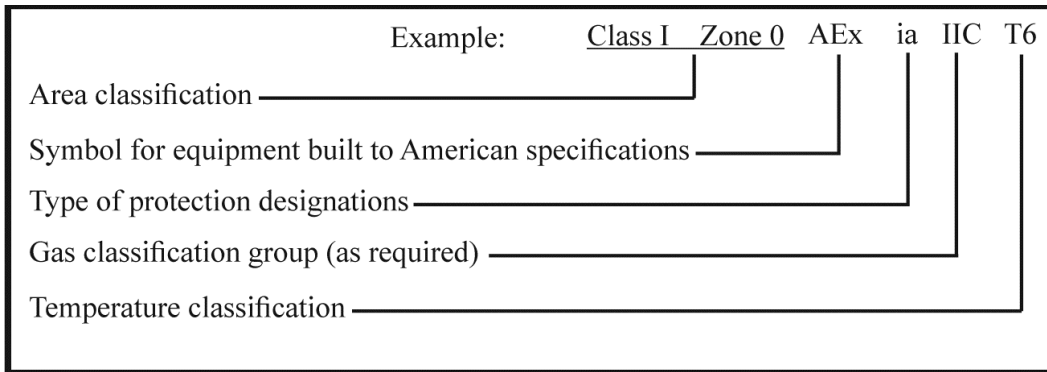
- (I) Class, except for intrinsically safe apparatus;
- (II) Zone, except for intrinsically safe apparatus;
- (III) Symbol "AEx;"
- (IV) Protection techniques;
- (V) Applicable gas classification groups; and
- (VI) Temperature classification, except for intrinsically safe apparatus.

Note: An example of such a required marking is "Class I, Zone 0, AEx ia IIC T6." See Figure S-1 for an explanation of this marking.

(C) Equipment that the employer demonstrates will provide protection from the hazards arising from the flammability of the gas or vapor and the zone of location involved and will be recognized as providing such protection by employees need not be marked.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations that will meet this provision.

Figure S-1—Example Marking for Class I, Zone 0, AEx ia IIC T6



[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, and 49.17.060. WSR 15-24-100, § 296-24-95711, filed 12/1/15, effective 1/5/16. Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, and chapter 49.17 RCW. WSR 12-16-064, § 296-24-95711, filed 7/31/12, effective 9/1/12.]