

Equipment for Use in Hazardous Locations

Class I Equipment

Equipment for use in Class I hazardous locations, as defined in the NEC (National Electrical Code), is tested with respect to acceptability of operation in the presence of flammable and explosive mixtures of specific vapors and gases with air. For purposes of area classification for Divisions 1 and 2, such mixtures have been grouped on the basis of their characteristics, as follows:

Class I, Group A — Atmospheres containing acetylene.

Class I, Group B — Atmospheres containing acrolein, butadiene, ethylene oxide, propylene oxide, hydrogen, or fuel and combustible process gases containing more than 30 percent hydrogen by volume.

Class I, Group C — Atmospheres containing ethyl ether, ethylene, or gases or vapors of equivalent hazard.

Class I, Group D — Atmospheres containing acetone, ammonia, benzene, butane, cyclopropane, ethanol, gasoline, hexane, methane, methanol, naphtha, propane, or gases or vapors of equivalent hazard.

Class I Temperature Considerations

The marked operating temperature of the equipment is based on either the maximum external temperature or internal temperature of the equipment, depending on the protection method used.

For Class I, Division 1 equipment, in general, the operating temperature is the maximum temperature of external surfaces of the equipment. For Class I, Division 2 equipment, in general, the operating temperature is the maximum temperature of all parts of the equipment, including internal parts, that may be exposed to the flammable material.

Equipment is required to be marked with the operating temperature or operating temperature code if the maximum operating temperature is more than 100°C (212°F).

This temperature marking shall not exceed the ignition temperature of the specific gas or vapor to be encountered.

Class I Equipment in Class II Locations

Equipment Listed or Classified for use in Class I locations is not necessarily acceptable for Class II locations as it may not be dusttight or operate at a safe temperature when blanketed with dust.

Class II Equipment

Dust-ignition-proof equipment for use in Class II hazardous locations, as defined in the NEC, is tested with respect to acceptability of operation in the presence of combustible dusts in air. For purposes of area classification, the NEC groups combustible dust-air mixtures as follows:

Class II, Group E — Atmospheres containing combustible metal dusts, including aluminum, magnesium, and their commercial alloys, or other combustible dusts whose particle size, abrasiveness, and conductivity present an equivalent hazard.

Class II, Group F — Atmospheres containing carbon black, charcoal, coal or coke dusts which have more than 8 percent total volatile material (carbon black per ASTM D1620, charcoal, coal and coke dusts per ASTM D271) or atmospheres containing these dusts sensitized by other materials so that they present an explosion hazard.

Class II, Group G — Atmospheres containing combustible dusts not included in Group E or F, including flour, grain, wood, plastic and chemicals.

Division 1: Location where a flammability or combustible atmosphere is present under normal operating conditions.

Division 2: Location where a flammability or combustible atmosphere is present only under abnormal conditions.