

Electrical Sources in Hazardous Locations

Electrical fires can be reduced by using the proper electrical installations and the proper equipment.

Hazardous locations require specially designed electrical equipment to protect people and property against increased fire potential. Certain electrical components and instruments are engineered specifically for locations designated as hazardous due to the possible presence of ignitable quantities of flammable liquids, gases, vapors, combustible dusts, or ignitable fibers.

Hazardous locations are classified as Class I, Class II, or Class III. The class is dependent on the physical properties of the combustible materials that may be expected to be present.

- Class I locations are those in which flammable vapors or gases may be present.
- Class II locations are those in which combustible dusts may be found.
- Class III locations are those in which there are ignitable fibers and filings.

Each of these three classes are divided into two hazard categories, Division 1 and Division 2. The divisions identify the degree of potential for an ignitable atmosphere to exist. Class and Division explanations are detailed in Articles 500 - 503 of the National Electric Code (NEC), and in OSHA 1910.39.

Before selecting electrical equipment and the associated wiring for any hazardous location, the exact nature and concentrations of the flammable materials must be determined. An electrical fitting or device that is safe for installation in an atmosphere of combustible dust may not be safe for operation in an atmosphere containing flammable vapors or gases. These electrical fittings are specifically designed for each hazard.

Class I electrical wiring applications are commonly referred to as "Explosion Proof." Properly installed and maintained Class I equipment will not ignite the dangerous atmosphere surrounding it, and is approved for use in specific hazardous areas. Explosion proof fittings are designed to contain any arcing, intense heat, and explosions. These fixtures are distinctive in appearance. Class II locations may require "Dust-ignition proof" fixtures. These fixtures are designed in such a manner that their construction prohibits ignitable amounts of dust from entering the devices.

Hazardous areas that must have approved electrical installations include, but are not limited to: locations where volatile flammable liquids are transferred from one container to another; interiors of spray booths; in the vicinity of spray painting operations where volatile flammable solvents are used; locations where dangerous concentrations of suspended dust are likely, such as in grain elevators; and gasoline fueling stations.