



# WORKPLACE SAFETY

A W A R E N E S S C O U N C I L

## Hazardous (Classified) Locations

The National Electrical Code (NEC) defines hazardous locations as those areas "where fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings."

### **Hazardous Location Types**

We'll first examine the various "Types" of hazardous locations. There are three types of hazardous locations.



### Class I Locations

A "Class I Location" is created by the presence of flammable gases or vapors in the air in sufficient quantities to be explosive or ignitable. When these materials are found in the atmosphere, a potential for explosion exists if an electrical or other source of ignition is present. Some typical Class I locations are:

- Petroleum refineries, and gasoline storage and dispensing areas;
- Dry cleaning plants where vapors from cleaning fluids can be present;
- Spray finishing areas;
- Aircraft hangars and fuel servicing areas; and
- Utility gas plants, and operations involving storage and handling of liquified petroleum gas or natural gas.

### Class II Locations

The second type of hazardous location is called a "Class II Location". This classification is created by the presence of combustible dust in the air in sufficient quantities to be explosive or ignitable. Some typical Class II locations are:

- Grain elevators;
- Flour and feed mills;
- Plants that manufacture, use or store magnesium or aluminum powders;
- Producers of plastics, medicines and fireworks;
- Producers of starch or candies;

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## Class III Locations

The third type of hazardous location is called a “Class III Location”. This classification is created by the presence of easily ignitable fibers or flyings. Typically these fibers and flyings are not suspended in the air, but can collect around machinery or on lighting fixtures and where heat, a spark or hot metal can ignite them. Some typical Class III locations are:

- Textile mills, cotton gins;
- Cotton seed mills, flax processing plants; and
- Plants that shape, pulverize or cut wood and create sawdust or flyings.

## **Sources of Ignition**

Previously, we’ve established the fact that electrical equipment can become a source of ignition in a hazardous location. Typically there are three root causes of ignition:

- Arcs and sparks produced by the normal operation of equipment (i.e. motor starters, contactors, and switches)
- The high temperatures of some heat-producing equipment (i.e. lamps and lighting fixtures)
- Electrical equipment failure (i.e. shorting of a terminal)

## **Equipment Design and Construction**

Standards have been developed that identify what equipment may be used in the hazardous locations. As you might expect, what equipment you can install will be based on the Classification (i.e. Class I, Class II or Class III) of the hazardous location.

**Fast Fact:** Be very careful when shipping, handling, installing or maintaining explosion proof equipment. Even slight damage to a flame path can permit burning gases to escape, igniting the surrounding atmosphere.

**Fast Fact:** The build-up of dust collecting on top of the device can cause it to run "hot" and ignite the surrounding atmosphere. Class II equipment must be able to accommodate for this “dust blanket”