

Codes & Certifications

Hazardous Locations

Hazardous locations are those areas where a potential for explosion and fire exist because of flammable gases, vapors or finely pulverized dusts in the atmosphere, or because of the presence of easily ignitable fibers or flyings. Hazardous locations may result from the normal processing of certain volatile chemicals, gases, grains, etc., or it may result from accidental failure of storage systems for these materials. It is also possible that a hazardous location may be created when volatile solvents or fluids used in a normal maintenance routine vaporize to form an explosive atmosphere.

Regardless of the cause of a hazardous location it is necessary that every precaution be taken to guard against ignition of the atmosphere. Certainly no open flames would be permitted in these locations, but what about other sources of ignition?

Electrical Sources of Ignition

A source of ignition is simply the energy required to touch off an explosion in a hazardous location atmosphere.

Electrical equipment, can be a source of this ignition energy. The normal operation of switches, circuit breakers, motor starters, contactors and plugs, and receptacles release this energy in the form of arcs and sparks as contacts open and close; making and breaking circuits.

Electrical equipment such as lighting fixtures and motors, is classified as "heat producing" and it will become a source of ignition if it reaches a surface temperature which exceeds the ignition temperature of the particular gas, vapor or dust in the atmosphere.

It is also possible that an abnormality or failure in an electrical system could provide a source of ignition. A loose termination in a splice box or a loose lamp in a socket can be the source of both arcing and heat. The failure of insulation from cuts, nicks or aging can also act as an ignition source again from sparking, arcing and heat.

Hazardous Locations and the National Electrical Code

The National Electrical Code treats installations in hazardous locations in articles 500 through 517.

Each hazardous location can be classified by the definitions in the NEC, and following are interpretations of these classifications and applications.

Class I Locations

Class I locations are those in which flammable gases or vapors are, or may be present in the air, in quantities sufficient to produce explosive or ignitable mixtures.

Class I, Division 1

These are Class I locations where the hazardous atmosphere is expected to be present during normal operations. It may be present continuously, intermittently, periodically or during normal repair or maintenance operations. Division 1 locations are also those locations where a breakdown in the operation of processing equipment results in the release of hazardous vapors and the simultaneous failure of electrical equipment.

Class I, Division 2

These are Class I locations in which volatile flammable liquids or gases are handled, processed or used, but in which they will normally be confined within closed containers or closed systems from which they can escape only in the case of accidental rupture or breakdown

of the containers or systems. The hazardous conditions will occur only under abnormal conditions.

Class II Locations

Class II locations are those that are hazardous because of the presence of combustible dusts.

Class II, Divisions 1

These are Class II locations where combustible dust may be in suspension in the air under normal conditions in sufficient quantities to produce explosive or ignitable mixtures. This may occur continuously, intermittently or periodically. Division 1 locations also exist where failure or malfunction of machinery or equipment might cause a hazardous location to exist while providing a source of ignition with the simultaneous failure of electrical equipment. Included also, are locations in which combustible dust of an electrically conductive nature may be present.

Class II, Division 2

A Class II, Division 2 location is one in which combustible dust will not normally be in suspension in the air and normal operations will not put the dust in suspension, but where accumulation of the dust may interfere with the safe dissipation of heat from electrical equipment or where accumulations near electrical equipment may be ignited by arcs, sparks or burning material from the equipment.

Class III Locations

Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings, but in which the fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.

Class III, Division 1

These are locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured or used.

Class III, Division 2

These locations are where easily ignitable fibers are stored or handled.

"T" Number Ratings	
"T" NO.	Temp. Range (°C)
T1	351-450
350	326-350
325	301-325
T2	281-300
T2A	261-280
T2B	231-260
T2C	216-230
T2D	201-215
T3	181-200
T3A	166-180
T3B	161-165
T3C	136-160
T4	121-135
T4A	101-120
T5	86-100
T6	up to 85