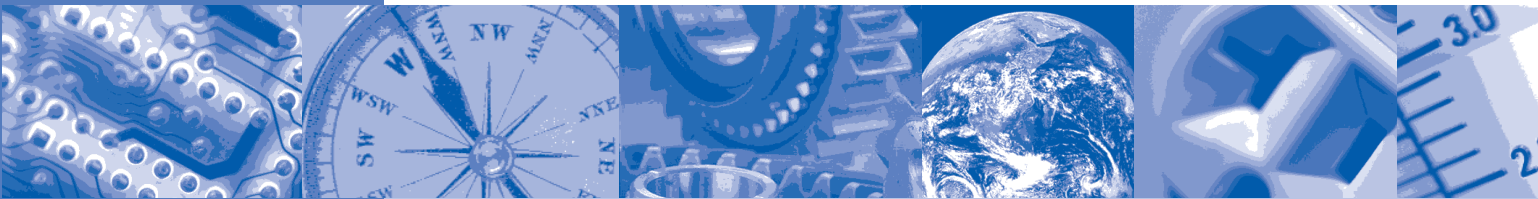


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Electrical Equipment in a Class I, Division 2/Zone 2 Hazardous Location



Approved 15 June 1999

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ISA
67 Alexander Drive
P.O. Box 12277
Research Triangle Park, North Carolina 27709

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1 Introduction

1.1 When electrical equipment is used in locations in which fire or explosion hazards may exist due to flammable gases or vapors, flammable liquids, combustible dust, or ignitable fibers or flyings, the National Electrical Code (NEC), ANSI/NFPA 70 requires special precautions to be taken in equipment construction and installation to minimize risks of fire and explosions. There are several protection techniques in common use, each of which has its own set of advantages and disadvantages. Other countries, including Canada, utilize varying wiring methods, so the contents of this report may not be applicable to countries other than the United States.

1.2 A location in which the fire or explosion hazard exists infrequently and for short periods is designated as a Division 2/Zone 2 location. One suitable protection technique for a Division 2/Zone 2 location is "Nonincendive Equipment." This Technical Report is intended to explain this protection technique and to clarify the associated terminology. Clarification of the term "Nonincendive Equipment" is very important since it has been used in two different ways. This Technical Report also addresses field wiring for Division 2/Zone 2 locations.

1.3 The term "flammable material" will be used throughout this Technical Report to refer to any of the materials mentioned above, i.e., flammable gases or vapors, flammable liquids, combustible dusts, or ignitable fibers or flyings. Similarly, the term hazardous location will be used in place of the phrase hazardous (classified) location used in the NEC. Finally, although flammable materials pose a fire hazard, the primary concern is an explosion.

2 Hazardous locations

2.1 To understand this Technical Report, it is necessary to know the terminology associated with hazardous locations as defined in the NEC. Although there are numerous hazards such as high voltages, carcinogens and moving objects, the term "hazardous locations" only refers to areas made hazardous by the presence of a flammable material that may create an explosion hazard when mixed with air.

2.2 A much fuller discussion of hazardous locations can be found in numerous publications, including ISA standard S12.1.01, "Definitions and Information Pertaining to Electrical Apparatus in Hazardous (Classified) Locations." The following is provided as an overview. In some cases, terms have been defined in a simplified manner to ease understanding. There are three general terms used to describe a hazardous location in North American terminology: class, division, and group. The international terminology primarily uses only two terms: zone and group. The term "zone" has been adopted in the National Electrical Code as Article 505.

2.3 Class - Hazardous locations are divided into three classes:

- Class I for flammable gases or vapors.
- Class II for combustible dusts.
- Class III for ignitable fibers.

2.4 Division - Each class is further divided into two divisions:

- Division 1 hazardous locations, for the most part, are areas in which the flammable atmosphere occurs during normal operation. Examples of Division 1 areas are locations in which paint-spraying operations occur or in which flammable liquids could escape from open tanks, and inadequately ventilated locations containing pumps handling flammable fluids.