

Hazardous Location Cables

We receive many inquiries about the proper cables to use in “Hazardous Locations”. Hazardous locations are usually found in industrial facilities where explosive liquids, gases or dusts are present. The various types of hazardous locations are defined in Article 500 of the *National Electrical Code* (NEC). Each type of hazardous location requires specific types of cable and/or installation methods.



Hazardous Location Classifications

The first step in selecting a cable for a specific application is to determine the *classification* of the hazardous location in which the cable will be installed. The process of classifying an area is often complex, so it is generally determined by the facility’s engineering staff. “Class I, Division 1” is the most hazardous classification, but “Class I, Division 2” is the type most often of concern to cable users. The various classifications are summarized in the table below. Class I and II materials are further subdivided by the NEC into “Groups” (A, B, C, etc.) as shown. However, the type of Group has no effect on the type of cable required.

Hazardous Location Classifications

Class	Group	Division	
		1	2
I Gases, Vapors and Liquids (Article 501)	A: Acetylene B: Hydrogen, etc. C: Ether, etc. D: Hydrocarbons, fuels, solvents, etc.	Explosive or ignitable gases or vapors are present under normal operating conditions	Explosive or ignitable gases or vapors are not normally present (but may accidentally exist)
II Dusts (Article 502)	E: Metal dusts F: Carbon dusts G: Flour, grain, wood or chemical dusts	Combustible dust is in the air under normal operating conditions	Dust is not normally in the air in ignitable concentrations (but may accidentally exist)
III Fibers and Flyings (Article 503)	Textiles, wood chips, etc. (ignitable but not explosive)	Easily ignitable fibers or flyings are handled, manufactured, or used	Easily ignitable fibers are stored or handled

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OK -- So What Cables Go Where?

After the hazardous location is classified as to Class and Division, the next step is to decide what type(s) of cable to use and how they will be installed. The NEC is very precise in its language in this area since even one misunderstood word can result in the loss of life or increase the cost of a project by millions of dollars. A summary of the wiring methods permitted by the NEC in hazardous locations is shown below. For additional details, please refer to the applicable article of the NEC. Copies of the NEC (NFPA 70) are available from the National Fire Protection Association at 800-344-3555 or from stock (Anixter catalog no. 128685).

Wiring Methods for Hazardous Locations

Class	Division	Methods Permitted by the NEC
I (Article 501-4)	1	<ul style="list-style-type: none"> ● Any suitable type of wire or cable if installed in threaded metallic conduit with approved termination fittings (end seals) ● Type MI (mineral insulated) cable installed with approved termination fittings ● Any suitable type of wire or cable if installed in nonmetallic conduit encased in concrete and buried under at least 2 feet of earth ● In certain industrial establishments, Type MC continuously corrugated aluminum (CCA) sheathed cable having an overall jacket and Listed for use in hazardous locations
	2	<ul style="list-style-type: none"> ● Any suitable type of wire or cable if installed in threaded metallic conduit with approved termination fittings (end seals) ● Type ITC, PLTC, MI, MC, MV, or TC cables if installed with approved termination fittings ● Where limited flexibility is required, any SO series or SE series flexible cord with a grounding conductor if installed with approved bushed fittings
II (Article 502-4)	1	<ul style="list-style-type: none"> ● Any suitable type of wire or cable if installed in threaded metallic conduit with approved termination fittings (end seals) ● Type MI (mineral insulated) cable installed with approved termination fittings ● In certain industrial establishments, Type MC continuously corrugated aluminum cable having an overall jacket and Listed for use in hazardous locations
	2	<ul style="list-style-type: none"> ● Any suitable type of wire or cable if installed in metallic conduit ● Type MC or MI cables if installed with approved termination fittings (end seals) ● Type PLTC, ITC, MC, or TC cables installed in cable trays
III (Article 503-3)	1 and 2	<ul style="list-style-type: none"> ● Any suitable type of wire or cable if installed in metallic conduit ● Type MC or MI cables if installed with approved termination fittings (end seals)

Why not spend a few minutes looking through the Wiring Methods sections of Articles 501, 502 and 503 of the NEC? The Code probably won't keep you "on the edge of your seat" with literary excitement, but it *will* increase your knowledge of the proper cables to use in hazardous locations!