

ARTICLE 500 Hazardous (Classified) Locations

Introduction

A hazardous (classified) location is an area where the possibility of fire or explosion can be created by the presence of flammable gases or vapors, combustible dusts, or ignitable fibers or flyings. Sparks and/or heated surfaces can serve as a source of ignition in such environments.

Article 500 provides a foundation for applying Article 501 (Class I Locations), Article 502 (Class II Locations), Article 503 (Class III Locations), and Article 504 (Intrinsically Safe Systems)—all of which immediately follow Article 500. It also provides a foundation for applying Articles 510 through 516.

Before you apply any of the articles just mentioned, you must understand and apply Article 500. It's a fairly long and detailed article. But don't worry; we'll help you master the concepts.

A Fire Triangle (fuel, oxygen, and ignition) often illustrates this concept. **Figure 500-1**

- Fuel—Flammable gases or vapors, combustible dusts, and ignitable fibers or flyings.
- Oxygen—Air and oxidizing atmospheres.
- Ignition—Electric arcs or sparks, heat-producing equipment such as luminaires and motors, conductor insulation, failure of transformers, coils, or solenoids, as well as sparks caused by metal tools dropping on a metal surface.

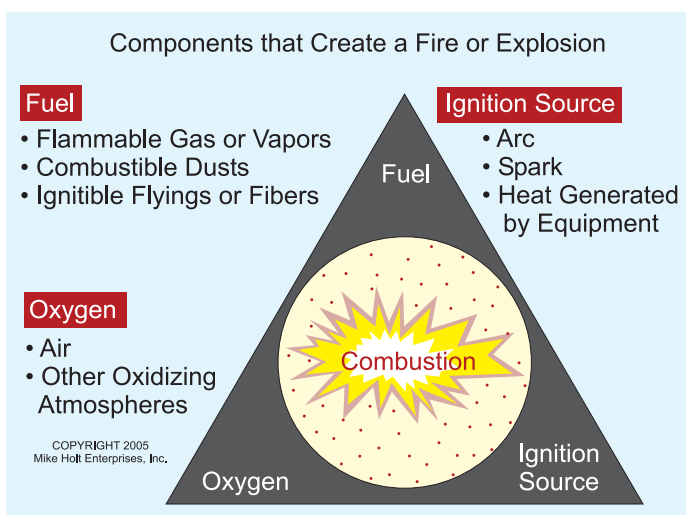


Figure 500-1

500.1 Scope—Articles 500 Through 504. To prevent injury, death, or extensive damage to building structures from fires or explosions, the *NEC* contains stringent requirements for equipment and its installation in a hazardous (classified) location. The specific requirements for electrical installations in hazardous (classified) locations are contained in:

- Article 501. Class I—Flammable Gases or Vapors
- Article 502. Class II—Combustible Dust
- Article 503. Class III—Ignitable Fibers, Particles, or Combustible Flyings
- Article 504. Intrinsically Safe Systems

Author's Comments:

- See Article 100 for the definition of "Structure."
- Locating electrical wiring and equipment outside the classified location provides the safest electrical installation and is often more cost-effective [500.5(A) FPN].

- Many of the graphics contained in Chapter 5 use two shades of red to identify a Class I Division location (medium red for Division 1 and lighter red to identify Division 2). In some cases, these color schemes are used as a background color to help you tell if it applies to Division 1, Division 2, or both (split color background).
- The *NEC* doesn't classify specific hazardous (classified) locations, except as identified in Articles 511 through 517. Determining the classification of a specific hazardous area is the responsibility of those who understand the dangers of flammable, combustible, or ignitable products, such as the fire marshal, plant facility engineer, or insurance adjuster. It isn't the responsibility of the electrical designer, electrical contractor, or electrical inspector. Prior to performing any wiring in or near a hazardous (classified) location, contact the plant facility and design engineer to ensure that proper installation and materials are used. Be sure to review 500.4(B) for additional standards that might need to be consulted.

Other articles in Chapter 5 containing specific installation requirements include:

- Article 505. Class I, Zone 0, 1, and 2 Locations
- Article 511. Commercial Garages, Repair, and Storage
- Article 513. Aircraft Hangars
- Article 514. Motor Fuel Dispensing Facilities
- Article 515. Bulk Storage Plants
- Article 516. Spray Application, Dipping, and Coating Processes
- Article 517. Health Care Facilities

500.2 Definitions. The definitions contained in 500.2 apply to Articles 500 through 504 and Articles 510 through 516.

Dust-Ignitionproof. Equipment enclosed in a manner that excludes dust and doesn't permit arcs, sparks, or heat inside the enclosure to ignite accumulations or atmospheric suspensions of a specified dust on or in the vicinity outside of the enclosure.

Dusttight. Enclosures constructed so that dust will not enter. Examples of dusttight enclosures include FS boxes and Bell boxes. **Figure 500-2**

Electrical and Electronic Equipment. Materials, fittings, devices, and appliances that are part of, or in connection with, the electrical installation.

Author's Comment: See Article 100 for the definitions of "Appliances," "Devices," and "Fittings."

FPN: Portable or transportable equipment with a self-contained power supply, such as battery-operated equipment, could potentially become an ignition source in hazardous (classified) locations. **Figure 500-3**

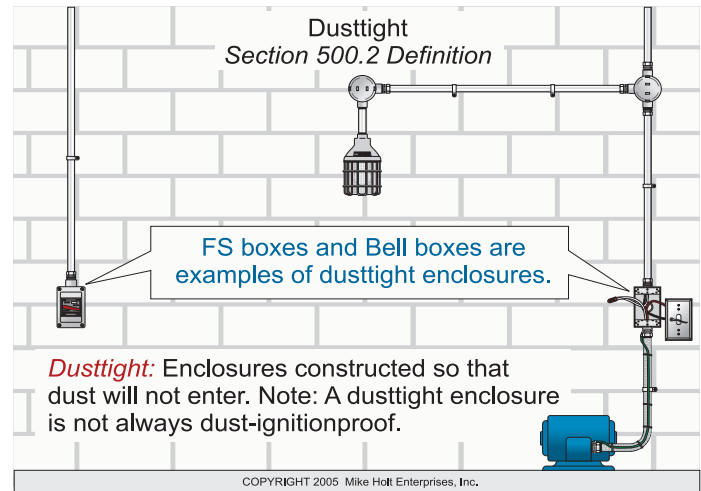


Figure 500-2

Author's Comment: The *NEC* is an "installation standard" and battery-operated equipment does not fall within the scope of this *Code*. Workplace safety enforcement agencies, such as OSHA, can and do regulate the use of battery-operated equipment in hazardous (classified) locations.

Explosionproof Apparatus. Apparatus enclosed in a case that is capable of withstanding an internal explosion of a specified gas or vapor and of preventing the ignition of a specified gas or vapor surrounding the enclosure. It operates so that the external temperature will not ignite the surrounding flammable atmosphere.

Figure 500-04

Hermetically Sealed. Equipment sealed against the entrance of an external atmosphere.

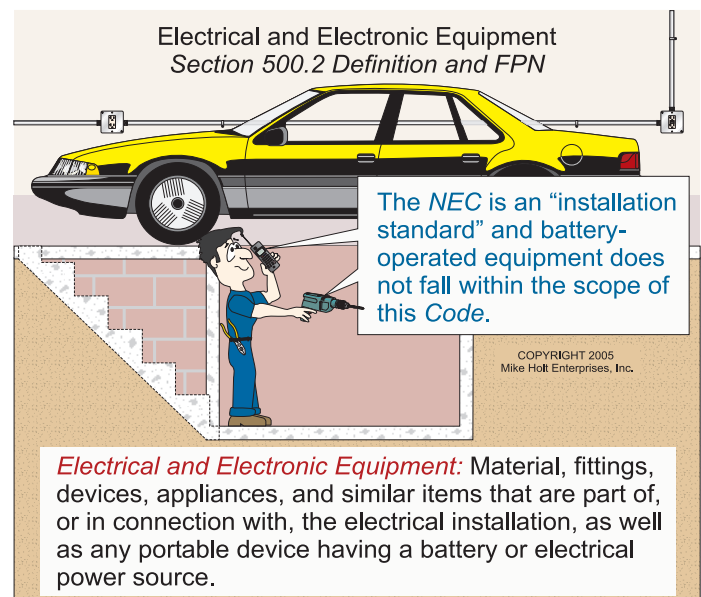


Figure 500-3