

**(C) Connection to Grounding Electrodes.** Where connection to a grounding electrode is required, the grounding electrode shall be as specified in 250.52(A)(1), (A)(2), (A)(3), and (A)(4) and shall comply with 250.30(A)(4). Sections 250.52(A)(5), (A)(7), and (A)(8) shall not be used if any of the electrodes specified in 250.52(A)(1), (A)(2), (A)(3), or (A)(4) are present.

Where a grounding electrode is necessary for associated apparatus, the electrodes specified in 250.52(A)(1) through (A)(4) (metal underground water pipes, metal in-ground support structures, concrete-encased electrodes, and ground rings) are required to be used if present. These electrodes usually provide lower resistance grounds than ground rods and plate electrodes, which are covered in 250.52(A)(5) and (A)(7).

#### See also

**504.50(B)**, Informational Note, for where this connection might be required

### 504.60 Bonding.

**(A) Intrinsically Safe Apparatus.** Intrinsically safe apparatus, if of metal, shall be bonded in the hazardous (classified) location in accordance with 501.30(B), 502.30(B), 503.30(B), 505.30(B), or 506.30(B), as applicable.

**(B) Metal Raceways.** Where metal raceways are used for intrinsically safe system wiring, bonding at all ends of the raceway, regardless of the location, shall be in accordance with 501.30(B), 502.30(B), 503.30(B), 505.30(B), or 506.30(B), as applicable.

**504.70 Sealing.** Conduits and cables that are required to be sealed by 501.15, 502.15, 505.16, and 506.16 shall be sealed to minimize the passage of gases, vapors, or dusts. Such seals shall not be required to be explosionproof or flameproof but shall be identified for the purpose of minimizing passage of gases, vapors, or dusts under normal operating conditions and shall be accessible.

*Exception: Seals shall not be required for enclosures that contain only intrinsically safe apparatus, except as required by 501.17.*

The use of an IS system does not remove the need to seal interconnecting cables. Any cable capable of transmitting material to another location must be sealed. These seals are not required to be explosionproof or flameproof, but they must be identified to minimize the passage of gases or dust and must be accessible.

**504.80 Identification.** Labels required by this section shall be suitable for the environment where they are installed, with consideration given to exposure to chemicals and sunlight.

**(A) Terminals.** Intrinsically safe circuits shall be identified at terminal and junction locations in a manner that is intended to prevent unintentional interference with the circuits during testing and servicing.

**(B) Wiring.** Raceways, cable trays, and other wiring methods for intrinsically safe system wiring shall be identified with permanently affixed labels with the wording “Intrinsic Safety Wiring” or equivalent. The labels shall be located so as to be visible after installation and placed so that they may be readily traced through the entire length of the installation. Intrinsic safety circuit labels shall appear in every section of the wiring system that is separated by enclosures, walls, partitions, or floors. Spacing between labels shall not be more than 7.5 m (25 ft).

*Exception: Circuits run underground shall be permitted to be identified where they become accessible after emergence from the ground.*

Informational Note No. 1: Wiring methods permitted in unclassified locations may be used for intrinsically safe systems in hazardous (classified) locations. Without labels to identify the application of the wiring, enforcement authorities cannot determine that an installation is in compliance with this Code.

Informational Note No. 2: In unclassified locations, identification is necessary to ensure that nonintrinsically safe wire will not be inadvertently added to existing raceways at a later date.

**(C) Color Coding.** Color coding shall be permitted to identify intrinsically safe conductors where they are colored light blue and where no other conductors colored light blue are used. Likewise, color coding shall be permitted to identify raceways, cable trays, and junction boxes where they are colored light blue and contain only intrinsically safe wiring.

## ARTICLE 505

## Zone 0, 1, and 2 Locations

### Δ 505.1 Scope.

**N (A) Covered.** This article covers the requirements for the zone classification system as an alternative to the division classification system covered in 500.1 for electrical and electronic equipment and wiring for all voltages where fire or explosion hazards might exist due to flammable gases, vapors, or liquids for the following:

- (1) Zone 0 hazardous (classified) locations
- (2) Zone 1 hazardous (classified) locations
- (3) Zone 2 hazardous (classified) locations

Informational Note No. 1: The term “Class I” was originally included as a prefix to Zone 0, Zone 1, and Zone 2 locations and references as an identifier for flammable gases, vapors, or liquids to differentiate from Class II and Class III locations. Zone 0, Zone 1, and Zone 2 only apply to flammable gases, vapors, or liquids, so the “Class I” prefix is redundant and has been deleted. However, the marking of “Class I” is left as an optional marking within this Article.

Informational Note No. 2: See NFPA 497-2021, *Recommended Practice for the Classification of Flammable Liquids, Gases, or Vapors and of Hazardous (Classified) Locations for Electrical Installations in Chemical Process Areas*, for extracted text that is