

Howard Talks Tech

Hazardous Location Seal Fittings- EYS's

General-purpose electrical equipment can cause explosions in certain atmospheres. Equipment used in areas where explosive concentrations of vapors may exist must be equipped with special wiring and other electrical equipment. Most safety practitioners work in areas where the applicable classification is: Class I, Division I, Group D, (Flammable vapors).

- **Class I:** Locations in which flammable gases or vapors may or may not be in sufficient quantities to produce explosive or ignitable vapors
- **Division 1:** When the atmosphere of an area or location is expected to contain explosive mixtures of gases, vapors, or liquids during normal working operations.
- **Group: D:** Hydrocarbons, Fuels, Solvents,

The specific hazardous atmosphere must be considered when deciding what type of equipment to use in those areas. The equipment must be designed and tested to ensure it will perform properly and not cause additional hazards in that environment.

Explosion proof: This term is often seen when describing Class I, Division 1 equipment. There are basically two requirements for components to be considered explosion proof for Class I Division 1, atmospheres. First, the device must be able to withstand an internal explosion, if it should occur and secondly, it must work to **prevent the spread of the internal explosion** to the surrounding saturated atmosphere. This is typically accomplished by joints and **closures built into the actual device**. That leads me to the focus of this particular article.



Why the need for seal-offs? A conduit system isn't vapor-tight, so the gases inside and outside a conduit can be of the same concentration. When activated, an arc-spark-producing device; such as a switch or breaker; can ignite these gases in the enclosure and conduit system. For this reason, unless the device is factory-sealed, you must install seal-offs within 18 inches of any enclosure containing arcing or sparking devices



Seal-offs prevent explosions from spreading through conduit systems and igniting outside atmospheres. When properly installed and filled with a UL-listed sealing compound, they create a physical barrier that minimizes passage of explosions from traveling freely through the conduit.

Seal barriers also limit the passage of vapors from classified to non-classified locations. Guidance concerning seal-off use is in the NEC; (NFPA 70) Sec. 501-5 (Sealing and Drainage), subsections (a) through (f) for detailed requirements. **Marking the poured seal** allows inspectors to see what is done. Usually an "X" on the fitting, with one line "/" being for packed but not poured, and completing the "X" when it is done. Or painting the plugs is also done.

The seal-off provides a barrier so that these explosions and vapors don't continue to travel throughout the conduit system. By localizing the gases in the enclosure, vapors and flames can cool below outside ignition levels as they dissipate through the explosion-proof construction of an enclosure. It is vitally important that seal use and installation is understood. The sealing compound type is critical, as is the fill level. Done incorrectly; no seal: no seal; no protection: no protection; the greater the risk of explosion when an unpredictable exposure occurs.