And Non-hazardous Locations

NEC changes allow companies to save with new alternative

‘The NEC permits ITC cable to be used in cable trays, raceways, hazardous locations, or as open wiring in specified circumstances.’‘Implementing cabled systems offers a simpler, less labor intensive installation, accelerating project cycle times.’ By Randy Durick and Karen Keller

Utilizing cables, like Type ITC cable, in hazardous and non&#151hazardous locations benefits users by decreasing costs associated with installation time, commissioning, and maintenance. By nature, systems using rigid metal conduit require more time to install because wires must be pulled and cut, and the conduit must be bent and fitted. Additionally, sealing and boundary fittings may be required in hazardous locations. This is generally not an issue when using cables, and those like Type ITC with quick&#151disconnects may not require precautionary measures (like sealing) to pass from hazardous to non&#151hazardous locations. Rigid metal conduit also requires hand wiring terminations, and is therefore more susceptible to human error, whereas pre&#151molded cables with quick&#151disconnects can be installed much more easily.

What is ITC cable?

NEC permitted uses of ITC cable include installation in classified (hazardous) locations including those where fire or explosion may occur due to flammable gas, vapors or liquids. The NEC allows ITC cable to be used in Class I, Division 1 locations, along with the traditional practice of using threaded rigid metal conduit, and in Class I Division 2 locations per NEC 501.10. In Class II locations, permitted wiring methods include both ITC cable along with rigid metal conduit. Other locations where ITC cable can be used include Class III Division 1, Class I Zone 1, and other intrinsically safe locations. ITC cable may also be used for nonincendive field wiring to low&#151voltage, low&#151energy nonincendive circuit or equipment connections for Class I, Division 2 locations. As outlined by the NEC, wiring methods suitable for ordinary (non&#151hazardous) locations can be used for nonincendive field wiring. Seals are required in conduit and cable systems to eliminate the propagation of an explosion, or passage of flammable gases from hazardous locations to non&#151hazardous locations. Manufacturers use different sealing compounds for different applications, as compounds have different rates of

expansion/contraction that may affect their performance within a given fitting. Even after the conduit is sealed, the NEC asserts that in hazardous locations it is nearly impossible to make conduit joints gas tight due to temperature fluctuations that cause expansion/contraction and can allow gases and vapors to permeate the conduit resulting in an explosive mixture. If an explosion occurs, enclosures must be able to contain the explosion and minimize the passage of hot gases. Enclosures have been designed to withstand internal explosions so any explosive mixture outside the enclosure/conduit system could not be ignited. Assembly is equally important in these locations, since conduit must be constructed so that arcing between the conduit and enclosures does not occur, as this can also cause an explosion. Joints within the system must be wrench&#151tight at couplings, threaded hubs of junction boxes, conduit bodies (among other things) per NEC 501.10. Conduit entering and exiting an explosion&#151proof enclosure or pressurized enclosure requires that conduit to be sealed within 450 mm (18 in.) from the enclosure. Conduit must also be sealed within 450 mm (18 in.) when entering and exiting a hazardous area.

The ITC advantage