Reel Time

Fret Paint

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Paint a picture, paint your wagon, paint your nails or paint your walls -- but don't paint your cable. In far too many instances, when ceilings and walls get painted, so does the exposed cable. Or some contractors will even paint the cable to "match" the décor. In fact, as I was doing on-line research, I came across a company (non-U.S.) that actually offers non-drying custom-color paint for the sole purpose of applying it to cable as a way to uniquely identify it to further prevent theft.

Purposely painting cable, or even if done by accident – such as incidences where walls and ceilings (most often occurring in the telecom room (TR) are being spray painted after the cable is already installed – can alter the cable performance. Water-based paints may contain water, but they typically contain other solvents as well. These solvents can attack the cable jacket, which in turn, can alter the cable's mechanical properties. Ultimately, this can affect the durability of the cable and may even affect its electrical characteristics. In addition, painting the cable covers up legends or markings, including any standards' listing which is critical, especially when installed in plenum spaces. As a result, cable manufacturers cannot guarantee performance if any properties of the cable, including the jacket, has been altered.

JACKET SCIENCE

The jacket, also known as the outer sheath of a telecommunications cable, is tested and rated for certain fire and flame ratings per the NFPA. Cable jackets must be designed for flexibility and long-term stability and are built to meet flame ratings, not water or chemicals.

Cable manufacturers specify the cable jacketing materials based on the installation code requirements. The most popular indoor plenum and riser cable jacket types include:

Polyvinyl Chloride (PVC) – is the most common alloy material for indoor cables, however, in some instances are also used for outdoor cables. It is flexible and fire-retardant;

Polyvinylidene Fluoride (PVDF) – is used for plenum cables because it has better fire-retardant properties and produces little smoke;

Fluorinated Ethylene-Propylene (FEP) – is a thermoplastic material with good electrical insulating properties and chemical and heat resistance. FEP is most often used for limited combustible or chemical resistant constructions and is the most expensive jacket material;

Low Smoke Zero Halogen (LSZH) plastics – are used for a special kind of cable called "LSZH" cables. They produce little smoke and no toxic halogen compounds.

MEETING STRICT STANDARDS

Cable manufacturers precisely mix jacketing compounds that will be tested to pass safety codes which are then classified to determine where they can or cannot be installed. The cable jacket is designed to be the primary barrier to flame propagation while minimizing smoke generation. Adding chemicals to the jacket may disrupt or reduce the ability of the jacket to perform this job.

The marking on the cable jacket indicates that the cable is either UL or ETL listed and contains that organization's listing mark. The UL mark is printed on the cable jacket to specify that the cable was manufactured and tested with the applicable safety requirements. Note these following standards' requirements when specifying and installing cable:

UL444 – is the defining document by Underwriters Laboratories (UL) that dictates physical properties and categorizes CM (non-plenum, non-riser), CMR (riser-rated) and CMP (plenum-rated) as cable types and cable markings. These categories are commonly used in many other diversified documents such as Article 800 of the NFPA 70 (NEC) and are printed on communications cables. This standard specifies the minimum marking required to identify the product for its intended use, for example, the AWG size, flame test classification (CMP or CMR) and the manufacturer. In addition, this standard allows marketing the cable with a temperature rating.

UL 910 – covers the flame test method, more commonly known as the Steiner Tunnel Testing, for determining values of flame-propagation distance and optical smoke density for copper and fiber optic cables that are intended to be installed in ducts, plenums, and other spaces used to transport environmental air without the cables being enclosed in raceways in those spaces;

NFPA 262 – prescribes the methodology to measure flame travel distance and optical density of smoke for insulated, jacketed, or both, electrical wires and cables and optical fiber cables that are to be installed in plenums and other spaces used to transport environmental air without being enclosed in raceways. NFPA 262 was written directly from UL910 with the intent of copying it exactly. By writing a general standard, NFPA opened the door to laboratories, other than UL, to characterize cables for plenum use.

UL1666 – is a fire test for determining values of flame propagation height for copper and fiber optic cables that installed vertically in shafts or in vertical runs that penetrate more than one floor. The purpose of this test is to determine whether the flame propagation characteristics of these "riser" cables are in accordance with the National Electrical Code.

FIELD MODIFICATIONS

The authorized use of the UL or ETL mark is the only way that the manufacturer can visibly declare and verify that the product has been manufactured to applicable requirements before it is shipped from the factory. Once a listed cable is modified after it leaves the manufacturing facility, there is no way to determine if the product continues to comply with the safety requirements used to certify the product, without further investigation and testing of the modified product.

The purpose of the marking is so that the product is easily identifiable to the authority having jurisdiction (AHJ). Obscuring the cable marking by painting inhibits the AHJ from identifying the product and thus may require its replacement. Painting may also be in violation of local building codes enforced by the AHJ. It is the responsibility of the AHJ to investigate the acceptability of the modification is acceptable and the product still meets safety requirements. ■

"Reel Time" addresses cable topics including both copper and fiber constructions, applications, installation practices and standards updates. If you have a particular cable issue, please send an E-mail to: carol.oliver@nexans.com and we will feature the solution in an upcoming issue.