

Cable Trays and Optical Cables

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The purpose of this AE Note is to outline the use of fiber optic cables in “tray rated” environments. The question arises as to what listing is required for an optical fiber cable installed in a cable tray. While there are several specific types of listings for power cables, specifically for tray applications, there is no equivalent tray rating for optical fiber cables. According to the 2014 National Electric Code® (NEC), any listed optical fiber cable is acceptable for a tray application.

Cable Trays

Cable trays are frequently used for both power and communications cables in industrial applications. A cable tray allows for easy access and simplified installation, particularly in overhead areas where cosmetic appearance is not a primary concern.

Industry trade groups developed the NEC, National Electric Code (also known as NFPA 70) to set standards for the safe installation and use of electrical wiring. A key component of these standards for industrial applications is a communication cable's tray-rating, which evaluates and certifies the mechanical performance of the cable carried in an open tray and specifically, the resistance of the cable jacket in that setting to:

- Extremes of heat and cold, overtime
- Material degradation due to sunlight exposure
- Impact resistant
- Pressure resistance
- Oil and water infiltration resistance.

To obtain the NEC-Tray rating, cables are subject to standard tests designed to simulate long-term environmental and usage impacts on the cable jacket that can degrade the jacket's integrity. Primarily, this is done for safety reasons- to prevent shock, short circuits or electrical fire risks from splits or broken electrical cable.

The NEC recognizes a cable tray as being different from a cable raceway in that a raceway is fully enclosed and a tray is not. There are four general types of trays mentioned in the NEC, ladders, troughs, channels, and solid bottom trays. Each of these is characterized by having at least one face that is completely open after the cable is installed, but these designs are still not considered sealed or fully enclosed, as is a raceway. The 2014 NEC code clarifies that trays are not limited to only industrial environments.

Article 392 of the NEC code defines cable trays. It includes numerous guidelines and restrictions on the maximum fill area, grounding, and total capacities that pertain to cabling in trays. Different types of cables are allowed to be mixed in cable trays. Section 392-22(a) outlines limitations for various scenarios.

Section 392-10(a) permits optical fiber cables in tray systems subject to conditions of Article 770. Article 770 is the portion of the NEC that addresses optical fiber cables in depth. Section 770-113(h), "Cable Trays" reads as follows:

"The following cables shall be permitted to be supported by cable trays."

Section 770-113(h) subsequently lists the full range of listings that pertain to optical cable. These include OFNP, OFCP, OFNR, OFCR, OFNG, OFCG, OFN and OFC. Therefore, cable having any of these listings may be installed in a cable tray. There is no specific listing for a tray rated optical fiber cable. However, restrictions that would otherwise apply to the optical cable continue to be applicable when the cable is installed in a tray. For example, if a tray is installed in a plenum area, then the cable must also be plenum rated.

Note: The NEC is advisory in nature. The applicability and interpretation of NEC guidelines are secondary to local ordinances and building codes.

References

- 1) *NFPA 70: National Electric Code Handbook*. 2014 ed. Quincy: National Fire Protection Agency, 2013