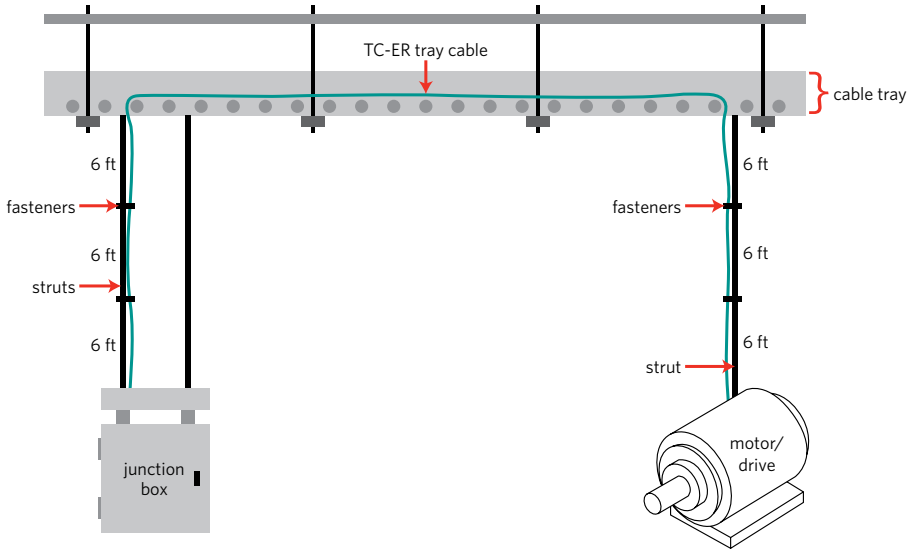
"TC-ER" Tray Cable Rating

What is an ER Rating?

In the 1990s, an "ER" rating for unarmored, physically rugged instrumentation and control tray cables was made possible by changes in NEC1 and UL2 requirements. The "-ER" suffix stands for "Exposed Run." The rating was created for type "TC" tray cables, type "ITC" instrumentation tray cables, and for type "PLTC" power limited tray cables. If these UL cable types meet certain additional crush and impact test requirements, UL permits the manufacturer to add an "-ER" suffix to the basic listing printed on the cable, i.e., TC-ER, ITC-ER, or PLTC-ER. The "-ER" signifies that the cable is sufficiently rugged to permit its use as exposed wiring. Exposed wiring is wiring that is not installed in a tray, conduit or other raceway. Exposed run cables were formerly referred to as Open Wiring, and printed with the words, "Open Wiring" instead of the "-ER" suffix. Some people still use the term "Open Wiring" today. Simply be aware that this is synonymous with TC-ER. Similarly, some people may use the following terms: Exposed Reach, Extended Reach, or Extended Run.

What are the Benefits of Having ER Rated Cables?

Tray cable types TC, ITC and PLTC are permitted in cable trays by the NEC. However, if more than 1.8 meters (6 ft) of cable extends from the tray for a connection to a motor or other electrical device, cables without an ER rating must be either armored (type MC) or installed in conduit or another type of raceway. On the contrary, cables with an ER rating can extend up to 50 feet outside the tray if given adequate protection and support. Thus, in some applications, the use of ER rated cables can eliminate the cost of installing conduit between the tray and an electrical device or the cost of using armored cables. The electrical specifying engineer has the opportunity to value-engineer a project simply by specifying ER rated tray cable, and potentially generating substantial cost savings in the process.



Cable Jacket Print Legend

The jacket of ER rated tray cables must be printed with the letters "TC-ER," "ITC-ER," or "PLTC-ER" as appropriate for the specific cable. Industry codes and standards require the markings so the electrical inspector at a job site can confirm that the cable meets applicable requirements.

Grounding Conductor Requirements

With TC-ER cables, the NEC requires that an equipment grounding conductor be provided within the cable (2005 NEC Article 336.10(7)). However, in 6 AWG and smaller cables, any insulated conductor in the cable is permitted to be identified as the equipment grounding conductor at the time of installation. This can be accomplished by stripping the insulation from the entire exposed length, coloring the exposed insulation green, or marking the exposed insulation with green tape or green labels (2005 NEC Article 250.119(B)). Cable types ITC-ER and PLTC-ER are not required to have an equipment grounding conductor (2005 NEC Articles 725.2 and727.2).

Additional Requirements

The NEC has several additional requirements that must also be met before ER rated cables can be used in exposed runs.

- Exposed runs are permitted only in industrial establishments where the conditions of maintenance and supervision ensure that qualified persons service the installation.
- The exposed run must be between a cable tray and equipment such as a motor.
- Type ITC cables are limited to 15.2m (50 ft) in length between tray and equipment. Types TC and PLTC cable have no length restrictions.
- Cables must be supported and protected against physical damage using mechanical protection such as struts, angles, or channels.
- Cables must be secured at least every 1.8 m (6 ft).