

Tray Cable Fittings vs. Tray Cable - Oil Resistant Ratings and Conductor Ampacity

Synopsis - *There may be confusion when the cable's temperature rating differs from the temperature associated with an "Oil Resistant" rating for the cable and/or cable fitting. To avoid any confusion, the following guidelines are provided. The cable's ampacity is determined by the temperature ratings of the cable unless modified by factors such as the temperature rating of the connected terminals or NEC requirements for specific wiring methods. The temperature ratings of the cable determine ampacity and should not be correlated with the temperature associated with an "Oil Resistant" rating for the cable and/or cable fitting.*

What are "Oil Resistant" ratings, and what do they mean in terms of their application to Tray cable and associated fittings, and how do these ratings relate to the ampacity of the conductors in the cable?

Tray cable fittings are evaluated to UL514B, the Standard for Conduit, Tubing, and Cable Fittings, and are covered in multiple UL product categories. Some fittings for tray cable are covered in the UL category "Outlet Bushings and Fittings." This category's UL Guide Information Page does not mention "Oil Resistant" ratings. Cable fittings specifically for use with tray cable are covered in the UL category, "Power and Control Tray Cable Connectors." The UL Guide Information Page for this category states that tray cable connectors or cartons may be marked "Oil Resistant I" or "Oil Resistant II." Cable connectors marked "Oil Resistant I" are suitable for exposure to mineral oil at 60°C. Cable connectors marked "Oil Resistant II" are suitable for exposure to mineral oil at 75°C. This seems to imply that "Oil Resistant I" equates to a 60C rating for the cable fitting, and "Oil Resistant II" equates to a 75C rating for the cable fitting.

Tray cable is evaluated to UL 1277, the Standard for Electrical Power and Control Tray Cables with Optional Optical-Fiber Members. Tray cable is covered in the UL Product category "Power and Control Tray Cable. The UL Guide Information Page for this category states that cable surface marked "Oil Resistant I" (or "Oil Res I") is suitable for exposure to mineral oil at 60°C. Cable surface marked "Oil Resistant II" (or "Oil Res II") is suitable for exposure to mineral oil at 75°C. Like the fittings, these statements imply that "Oil Resistant I" equates to a 60C rating for the cable fitting, and "Oil Resistant II" equates to a 75 C rating for the cable fitting.

Taking into account the marking information in the UL Guide Information Pages for UL categories Power and Control Tray Cable Connectors and Power and Control Tray Cable, as well as the requirements in UL 1277 for Power and Control Tray Cable, an "Oil Resistant" rating is the temperature of the oil that is contacting the cable jacket or the cable fitting. "Oil Resistant" should not be associated with a "temperature rating." If it were, this could result in someone derating the combination tray cable and connected fitting to 60 C if either the tray cable or its

associated tray cable fitting has an "Oil Resistant I" rating. Further, derating of allowable conductor ampacity could occur. This would be unnecessary and quite unfortunate.

"Oil Resistant" ratings are not associated with and should not be confused with the ampacity temperature rating for conductors.

The photo below of a section of tray cable shows it marked with an "Oil Resistant I" rating. The cable is rated 75 C dry and wet, and it has the "Oil Resistant I" rating. The cable is connected to a tray cable fitting, which has an "Oil Resistant I" rating.

If this combination of tray cable and fitting is used in an application with no oil in contact with the cable or fitting, the "Oil Resistant I" rating will not apply. In this application, the cable conductor ampacity could be based on 75 C (assuming the terminals of the connected equipment are also rated 75 C), as the cable is rated 75 C wet/dry, and the fitting is rated -40 C to 100 C.

If the combination tray cable and fitting are used in an application where either the tray cable or fitting is exposed to oil, the "Oil Resistant I" rating will limit the temperature of the oil to 60 C. However, there is no need to derate conductor ampacity. In this application, the cable conductor ampacity could be based on 75 C. If the temperature of the oil the tray cable or fitting were exposed to exceeded 60 C, the combination tray cable and fitting would not be suitable for this application.



In summary, there may be confusion when the cable's temperature rating differs from the temperature associated with an "Oil Resistant" rating for the cable and/or cable fitting. To avoid any confusion, the following guidelines are provided. **The temperature ratings of the cable determine ampacity and should not be correlated with the temperature associated with an "Oil Resistant" rating for the cable and/or cable fitting.**

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