



Non-Heating Wires Within a Tube Bundle

For many years tubing bundles have been the product of choice for process instrument impulse lines and extractive analyzer sample tubing. They are most often designed to reduce heat loss from the tube(s) to ambient, and often include electrical heat tracing to maintain design temperatures. Compared to bare tubing that is field traced and insulated, most know that prefabricated tube bundles increase the overall long term reliability and safety of the entire system.

Many engineers and designers have come to realize that they can further reduce the overall installed cost of an instrument installation by including auxiliary conductors within the bundle. These may supply power to equipment and/or instrumentation associated with an analyzer or other equipment.

Occasionally questions are asked about this practice and whether it meets the requirements of the National Electrical Code (NEC). The NEC specifications are quite similar to Global standards, but individual country or group requirements may vary.

Heat Trace Requirements in Tubing Bundles

Electric trace heating standards such as IEEE-515 and IEC/IEEE 60079-30 now specifically permit the use of heat tracing in tubing bundles. Specifications for Electric Heating Equipment are covered by Article 427 of the NEC. Specifically in 427.18 (C) for Interconnecting Power Supply Leads states "Interconnecting nonheating leads connecting portions of the heating system shall be permitted to be covered by thermal insulation in the same manner as the heaters." Note that NEC Article 300 for Wiring Methods is not applicable as it indicates that "The provisions of this article are not intended to apply to the conductors that form an integral part of ...factory assembled control equipment..."

Thermon generally recommends that only Hard service cords intended for Extra-hard usage, as specified in Table 400.4 of the NEC, be provided for connections. These cords and their connections need to be suitable for the minimum and maximum temperatures expected to be encountered in service.

Hazardous (Classified) Areas

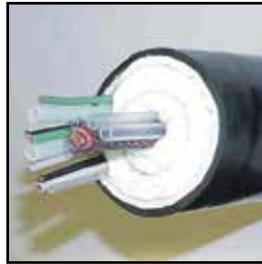
Thermon heat tracing systems, including electrical heat tracing, connections, and sensors, are covered by numerous worldwide certifications including IECEx and ATEX, for use in piping and tubing applications. Limitations on maximum operating temperatures are assured through the use of product T-ratings, stabilized designs, and controlled designs through utilization of Thermon's proprietary design software. In conjunction with the heat tracing systems, Thermon tubing bundles are acceptable for use over a wide range of applications and configurations, and in most hazardous (classified) locations.

For use in hazardous (classified) areas in accordance with the NEC, including Class I, Division 2, Zone 1 and Zone 2 areas, flexible wiring methods are permitted by 501.10(B) and 505.17(A) which include MC, MV, TC and TC-ER cables.

Alternately, Thermon constructs equipment with components that are approved by a nationally recognized testing laboratory. This is consistent with tube bundles that contain electrical heat tracing approved for use in hazardous (classified) areas. In addition, for these areas, flexible wiring methods are permitted by 501.10(B) and 505.17(A) which include MI, MC, MV, TC and TC-ER cables.

Conclusion

The spirit of the NEC is to provide guidelines for safe wiring practices. Installing non-heating insulated conductors in an instrument tubing bundle that has been designed and manufactured to be safe, and appropriately labeled along its entire length, is consistent with these objectives.



TubeTrace Pre-Insulated and Heat Traced Tubing



Type TC Tray Cable

PRODUCT / APPLICATION INFORMATION



THERMON The Heat Tracing Specialists®

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