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Thermal Expansion of Penn Aluminum **BLUE LIGHTNING** EMT

(also applies to Penn Aluminum Rigid Aluminum Conduit)

Penn Aluminum **BLUE LIGHTNING** Electrical Metallic Tubing (EMT) has thermal expansion characteristics different from Galvanized Rigid Steel Conduit and PVC Conduit.

As temperature rises, Galvanized Rigid Steel Conduit will not expand as much as **BLUE LIGHTNING** EMT, while PVC Conduit will expand considerably more.

Each material has an independent coefficient of thermal expansion that generates its specific response characteristic.

When a conduit material is subjected to temperature change, it responds by changing size. This change is recognized as thermal expansion or contraction. The change in size is bigger as the temperature increases and reduces in size when the temperature lowers. For electrical conduit products, this increase in temperature will lengthen the run of conduit at higher temperatures.

Penn Aluminum **BLUE LIGHTNING** EMT and Rigid Conduit raceways have a coefficient of thermal expansion of 1.3×10^{-5} in./in./°F resulting in 0.000013 inch per inch of conduit for each degree F in temperature.

This coefficient of thermal expansion is well understood in the electrical industry and the calculations and charts for length changes of different conduit materials are readily available to electricians.

Key references for the industry to confirm proper installation of Penn Aluminum **BLUE LIGHTNING** EMT and Penn Aluminum Rigid Aluminum Conduit are the following:

National Electrical Code (NEC) Handbook, Section 300.7 (B), *Raceways Exposed to Different Temperature – Expansion, Expansion-Deflection, and Deflection Fittings*

National Electrical Manufacturers Association (NEMA), Standard FB 2.40-2019, *Installation Guidelines for Expansion and Expansion/Deflection Fittings*, Appendix B, Section B3.s, Table B-5

NOTE: Penn Aluminum **BLUE LIGHTNING** Electrical Metallic Tubing (“EMT”) is manufactured to UL 797A.

Penn Aluminum EMT is a general use product.

It is up to the architect, general contractor, and/or project manager to determine whether the EMT is appropriate for a specific application, or what additional requirements might be necessary for the use of EMT in a specific application.



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