

## Thermal Conductivity of Aerocel® EPDM Closed Cell Elastomeric Insulation

An insulation's primary purpose is to reduce heat transfer between one surface and another or a surface to the surrounding environment. Thermal conductivity, also known as a K-Value, measures an insulation's ability to reduce heat transfer.

The industry reference standards for thermal conductivity are:

*ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus*

*ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus*

To calculate an insulation's K-Value, the following calculation is followed:

$$\text{Btu} \cdot \text{in/h} \cdot \text{ft}^2 \cdot ^\circ\text{F} \text{ [W/mK]}$$

Insulation manufacturers report K-Values by "Mean Temperatures" in increments typically ranging from 50°F [10°C] and above. Thermal conductivity K-Values, such as 0.25, are often reported at a mean temperature of 75°F [24°C].

It's important to understand that the lower the K-Value, the more effective the insulation is with reducing heat transfer. For example, an insulation with a K = 0.25 is more thermally efficient than one that reports 0.28. A lower K-Value translates to less insulation that must be installed.

Thermal conductivity directly impacts insulation thickness. When evaluating a mechanical pipe, duct, or equipment insulation for your project, pay special attention to the manufacturer's K-Value by product line.

While some manufacturers' K-Values remain constant from one product line to another, the K-Value of others can change (increase) to meet other code requirements such as ASTM E84 or UL 723 25/50 flame spread/smoke-developed indexes.

Increased insulation thicknesses to meet heat gain/loss, condensation control and energy code requirements directly affect installation space required, material, fabrication, and labor costs.

***Aeroflex USA's Aerocel® brand of EPDM closed cell elastomeric insulation maintains the same thermal conductivity [K-Value] through all insulation product lines and thicknesses.***