

## EFFECT OF TEMPERATURE ON K-FACTORS

The k-factor of closed cell foams (elastomeric and polyolefin) decreases (improves) as the mean temperature decreases in a linear fashion. It should be pointed out that k-factors should always be reported for mean temperatures. The testing apparatus used to determine thermal conductivity, “sandwiches” the test sample between two plates. The plates are set at different temperatures: one plate is designated the hot side with the other plate designated as the cold side. The mean temperature is determined by adding the surface temperatures of both plates and dividing by two. When comparing the insulation value of different types of insulation it’s important to look at the k-factor AND the mean temperature.

The k-factor has been tested at the following mean temperatures:

<u>Polyolefin Insulation</u>		<u>Elastomeric Insulation</u>	
<u>Mean Temperature</u>	<u>k-factor</u>	<u>Mean Temperature</u>	<u>k-factor</u>
90°F	0.26	90°F	0.27
75°F	0.25	75°F	0.265
-40°F	0.22	-40°F	0.23
-125°F	0.18	-125°F	0.19
-165°F	0.16	-165°F	0.18
-256°F	0.13	-256°F	0.14
-297°F	0.12	-297°F	0.13

Listed below are the boiling points of several cryogenic substances:

Butane	31.1°F	Oxygen	-297°F
Chlorine	-29.4°F	Propane	-43.8°F
Ethane	-127.5°F	Radon	-79.1°F
Isobutane	12.0°F	Xenon	162.5°F

Caution: Design and installation of any system operating at temperatures below the boiling point of oxygen or other potentially explosive substances should only be performed by highly trained and certified professionals.