

Carbon Fiber Insulations

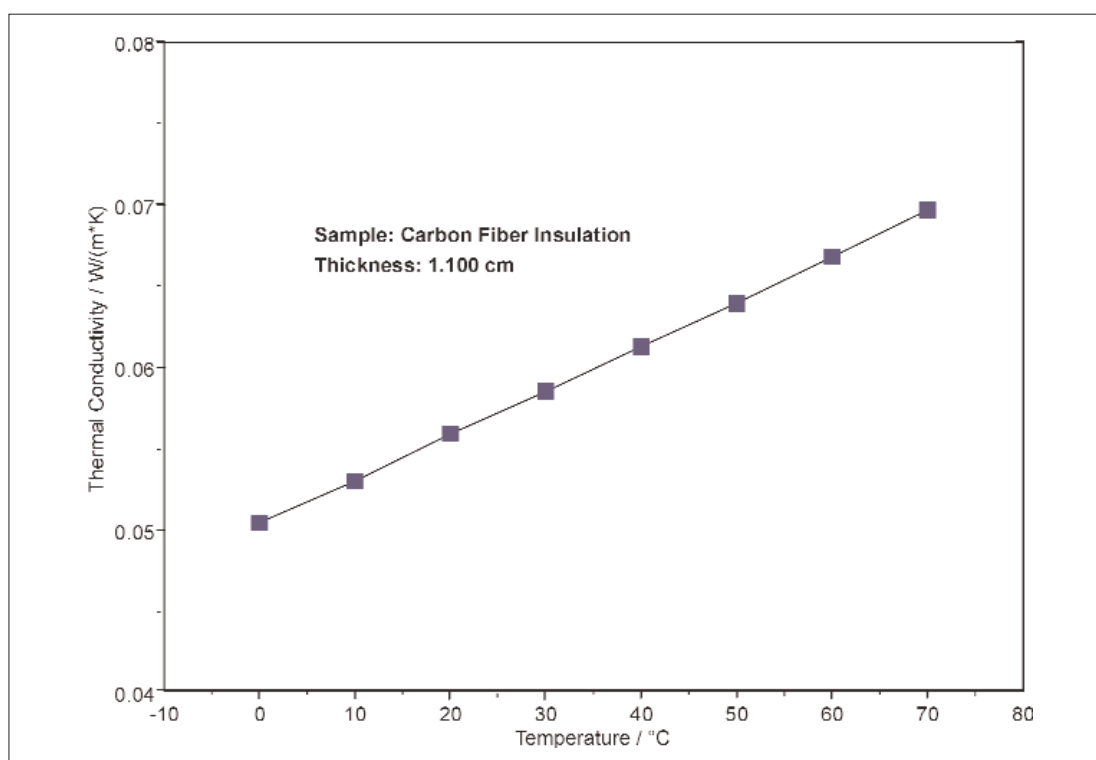
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Using graphite fibers and a carbon binder, a carbon fiber insulation with special properties can be manufactured. Such an insulating material yields low thermal conductivity even at highest temperatures. The reason for the outstanding high-temperature properties is that such insulations significantly suppress radiative heat transfer. Carbon fiber insulations are generally stable in oxidizing atmospheres up to 400 °C, in vacuum up to 2500 °C and under inert atmospheres up to 3000 °C. This insulating material does not undergo compression under normal operating conditions. Therefore, the bulk density remains unchanged throughout the entire temperature range. The insulating properties are constant and no voids, channels or hot spots occur.

Test Conditions:

Temperature range: 0 ... 70°C
Atmosphere: Ar ml/min

Calibration standard: SRM 1450C
Thickness: 1.100 cm



Results:

Presented here is the thermal conductivity of the carbon fiber insulation between 0 and 70°C. The measurement clearly shows that the carbon fiber insulation yields a reasonable thermal conductivity (0.056 W/(m*K) at room temperature (20°C). A nearly linear dependency of the thermal conductivity versus temperature can be seen. This is typical for fiber insulations in this temperature range. Glass fiber insulations, however, generally offer a lower thermal conductivity (0.03 to 0.04 W/(m*K) at this temperature.