

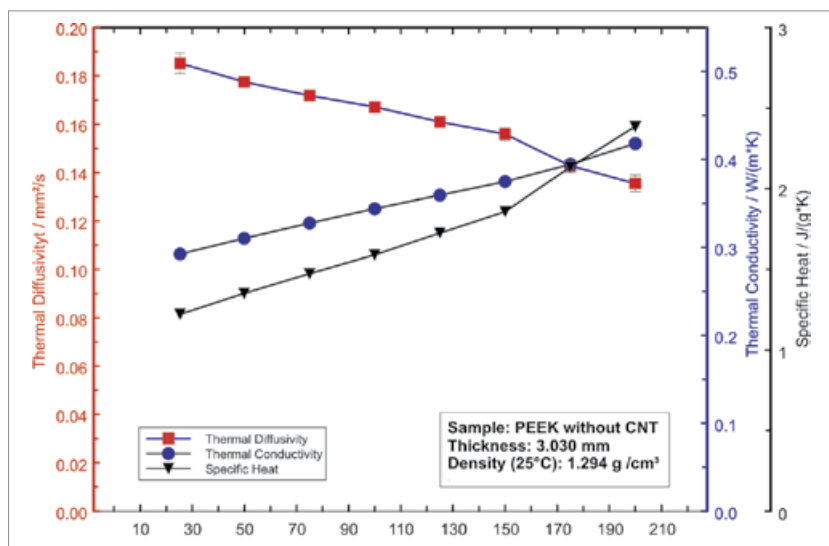
APPLICATION SHEET

POLYMERS – POLYMER MANUFACTURING

POLYETHERETHERKETONE (PEEK)

PEEK is a thermoplastic material with extraordinary thermal and mechanical properties. The material is also resistant to both organic and aqueous environments, and is used in bearings, piston parts, pumps, compressor plate valves, and cable insulation applications. PEEK is considered an advanced biomaterial used in medical implants, often in reinforced format using bio-compatible fiber fillers such as carbon. Also in carbon fiber reinforced form,

PEEK has come under consideration as an aerospace structural material due to its high strength-to-weight ratio. Electronic circuitry also has a high demand for PEEK's large temperature range. The results of the LFA measurements are shown in this application sheet. The thermal conductivity of a pure PEEK was calculated by multiplying the measured values for the bulk density, specific heat and thermal diffusivity.



Instrument

LFA 447 NanoFlash®

Test Conditions

Temperature range	RT ... 200°C
Sample holder	12.7 mm diameter
Sample thickness	3.030 mm
c_p from LFA, standard	pyroceram

Results

The thermal diffusivity decreases with an increasing temperature. The specific heat shows increasing values up to 200°C. Between 150°C and 170°C, steps were detected in both thermophysical properties due to the glass transition. However, the thermal conductivity increases linearly without any slope changes within the range of the glass transition. This example clearly demonstrates that the LFA 447 can analyze polymers without any problems. It was shown that the LFA 447 is also capable for investigations of structural changes.