

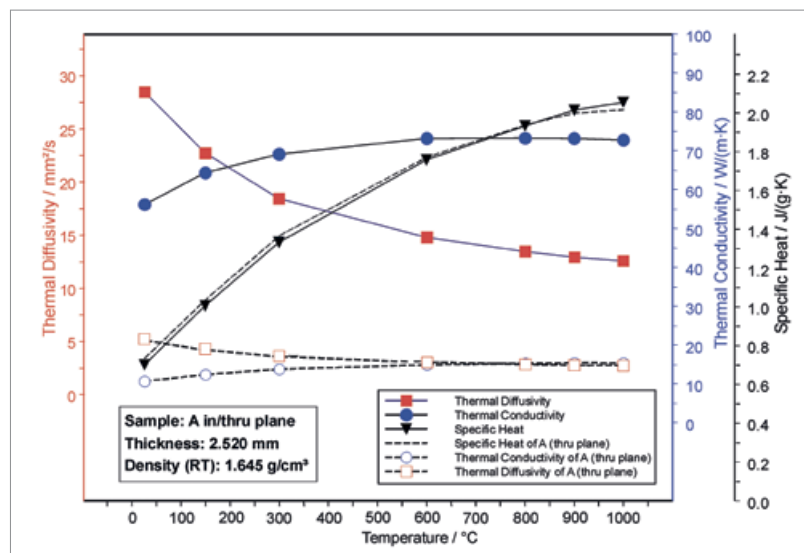
APPLICATION SHEET

ORGANICS – AUTOMOTIVE

CARBON COMPOSITES - CARBON/CARBON

Carbon/Carbon products were developed 30 decades ago to replace metal components in high-performance, military aircraft engine afterburners. Nowadays, these composites are used as aircraft and other brakes (e.g. racing brakes), vacuum furnace parts, in chemical reactors and hosts of other industrial applications. Carbon/Carbon materials are used when light weight, chemically inert and/or high tem-

perature strength are important issues. For example, these materials surpass superalloys in specific strength, and copper and gold in thermal conductivity. The composite properties are largely a function of the fiber orientation. This application sheet shows the thermophysical properties of a Carbon/Carbon material in different directions measured with the LFA 457.



Instrument

LFA 457 MicroFlash®

Test Conditions

| | |
|-----------------------------------|------------------|
| Temperature range | RT ... 1000°C |
| Sample holder | 12.7 mm diameter |
| Sample thickness | 2.52 mm |
| Sample surface preparation | Graphite |
| c _p from LFA, standard | Poco graphite |

Results

The results show significant differences for the thermal diffusivity and thermal conductivity in dependence on the measurement direction. The presented specific heat for two different samples with different fibre orientations shows a good agreement and reproducibility. The specific heat increases over the entire temperature range as expected from the Debye theory; the values are typical for graphite composites. The example clearly demonstrates that the LFA 457 can analyze inhomogeneous composites without any problems.