

# APPLICATION SHEET

Inorganics · Automotive  
LFA 457 MicroFlash™

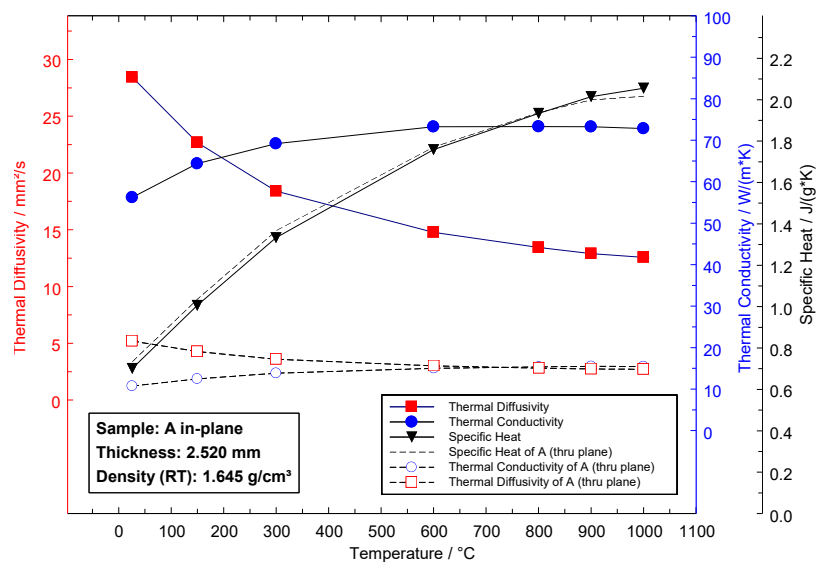


## Carbon Composites – Carbon/Carbon

### Introduction

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-temperature 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.



### 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

### Test 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 fiber orientations shows 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.