

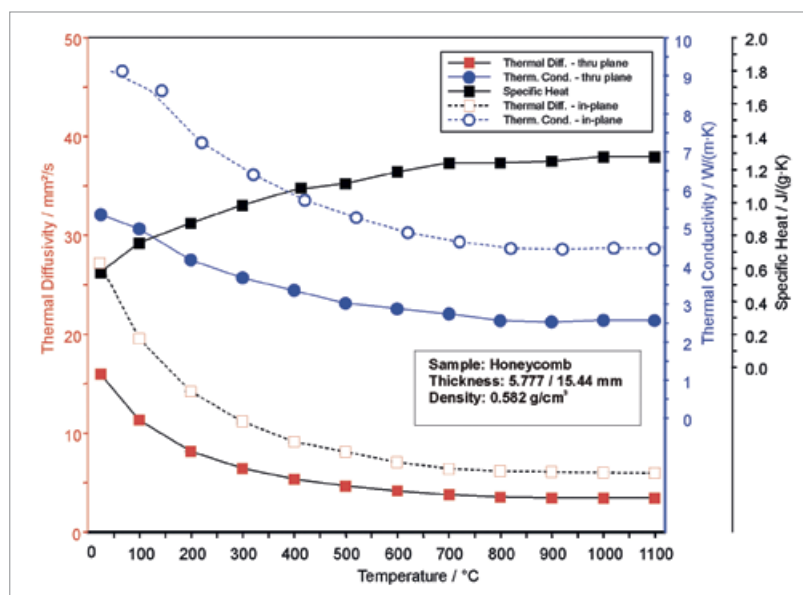
# APPLICATION SHEET

## CERAMICS – AUTOMOTIVE

### SiC HONEYCOMB STRUCTURE

In the last few years, the environmental protection has become increasingly important. For this, permanent improvement of exhaust systems of Diesel engines is, for example, necessary. Presented in this application sheet is an example for measurements on a part from particulate filter with a honeycomb structure. Due to the high thermal loads of this parts under operating conditions, the knowledge of the thermal conductivity is important e.g. for

the generation process of the filter system. For LFA measurements, a homogeneous sample surface is necessary. For the in-plane measurements, the honeycomb structure was closed using a special SiC paste (square sample). Concerning the heat transfer during the measurement, no influence of additional SiC material would be expected because only the free space within the surface structure is filled.



#### Instrument

LFA 457 *MicroFlash*®

#### Test Conditions

Temperature range	RT ... 1100°C
Sample holder	12.7 mm diameter
Sample thickness	5.77 / 15.44 mm
Sample surface preparation	SiC / graphite
$c_p$ from LFA, standard	Alumina

#### Results

The results show significant differences for the thermal diffusivity and thermal conductivity dependent on the measurement direction. The specific heat was measured using a round sample (through plane, without SiC paste). The specific heat increases over the entire temperature range as expected from the Debye theory and the values are typical for SiC ceramics. The example clearly demonstrates that the LFA 457 can analyze inhomogeneous materials (honeycomb structures) without any problems.