

# Press Release

## **NETZSCH Compares Thermal Conductivity ( $\lambda$ ) Measurement Methods for Graphite Granulate**

NETZSCH has conducted a study to compare the results for determining the thermal conductivity ( $\lambda$ ) of graphite granulate using two different standard measurement methods, the Laser Flash Technique and the Hot Wire Method.

The NETZSCH instruments LFA 427 and TCT 426 were used in the study to represent the respective techniques, and it was concluded that both are suitable for the purpose. The allowable temperature range and sample grain size (shape and dimension), however, differed between the methods. It was possible to conduct measurements on the LFA 427 in the temperature range from RT to 2000°C, but only on granulate with a grain size no larger than 0.1 mm. Measurements on the TCT 426, on the other hand, could be conducted from RT to only 1000°C, but on a grain size of up to several millimeters. The two selected methods also differed in the holding time of the sample at the test temperature.

Both methods indicated an increase in the thermal conductivity of graphite as temperature rises.

It is possible to measure samples of graphite granulate with different bulk densities, which will have an effect on the thermal conductivity results. It is also important to protect the sample from oxidation during the test.

Graphite granulate, with its high-temperature resistance, is used in certain technological processes as an insulation material. Since it is such a friable material, it is difficult to test. Thermal conductivity is an important parameter for the characterization of graphite granulate in this application. The granulate is often comprised of an inhomogeneous mixture of grains of various sizes, with the maximum grain size often being a few millimeters in diameter.

Graphite has an unusual combination of properties, both of a metal and of a non-metal. It is flexible but not elastic, has a high thermal and electrical conductivity, and is highly refractory and chemically inert. It exists in a variety of different material forms, including composite materials. Its thermal conductivity values differ depending upon its form.

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