

Abgeschlossene Ringvergleiche

vom Arbeitskreis Thermophysik durchgeführte Ringvergleiche zur Messung thermophysikalischer Größen

Ringvergleich Wärmeleitfähigkeit eines Blähglas-Granulates: 2015

Material: Granulat aus Blähglas der Firma Liaver GmbH & Co. KG

Gemessene thermophysikalische Eigenschaften:

- Wärmeleitfähigkeit
- Temperaturbereich -170 °C bis 530 °C

Teilnehmende Laboratorien:

- NETZSCH Gerätebau GmbH, Selb,
- Austrian Institute of Technology GmbH (AIT), Wien,
- Deutsches Zentrum für Luft-und Raumfahrt e.V. (DLR), Stuttgart,
- Bayerisches Zentrum für Angewandte Energieforschung e. V. (ZAE Bayern), Würzburg,
- Evonik Industries AG, Hanau-Wolfgang,
- Linseis Messgeräte GmbH, Selb,
- Institut für Wärmetechnik und Thermodynamik an der TU Bergakademie Freiberg (IWTT), Freiberg.

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"Intercomparison of thermal conductivity measurements on an expanded glass granulate in a wide temperature range"

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For laboratories within the scheme of the voluntary surveillance system of technical insulation material in Europe (VDI/Keymark) a proficiency test is the basis of obtaining a "registered laboratory". These laboratories are allowed to conduct measurements to verify the declared thermal conductivity curve of technical insulation materials under the umbrella of the quality mark VDI/Keymark. The initial characterization work on round robin materials for the determination of thermal conductivity at higher temperatures led to the selection of an expanded glass granulate. With all the results of the round robin tests produced by five European laboratories, the expanded glass granulate has become a very important material for establishing a reliable European level of thermal conductivity at higher temperatures with a moderate uncertainty. The German expert group "AK-Thermophysik" of the Association of Thermal Analysis (GEFTA, Gesellschaft für Thermische Analyse e. V.) further initiated a round robin test for thermal conductivity in the year 2012. With this additional use of the expanded glass granulate material, more experience with transient methods and thermal conductivity values in the extended temperature range could be obtained. The thermal conductivity of expanded glass granulates was determined from 170 °C to 530 °C with different methods and apparatuses. Within this temperature range the thermal conductivity increases from about $0.030 \text{ Wm}^{-1} \text{ K}^{-1}$ to $0.160 \text{ Wm}^{-1} \text{ K}^{-1}$. The comparison with the reference curve of the VDI/Keymark indicates very good compliance within 4% for most cases.