**Thermal Conductivity of Aerated Concrete – Characterization by Means of LFA**

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The most common methods to determine the thermal conductivity of building materials are Heat Flow Meters (HFM) and Guarded Hot Plates (GHP). Both methods work in accordance with national and international standards and are most suitable for insulating materials. One drawback is the relatively long measurement time. Depending on the instrument, the measurement time can vary between ½ hour and several hours. Another aspect is the required sample size, which is necessary for such analyses. In general, sample should be several dozen centimeters in size and several centimeters thick. For quality control, this is often not an issue since insulating materials are available in that size. For the development of new materials, however, the sample size is critical. Often, only small amounts of a material with a new formulation and structure are produced. Therefore, a method which can handle small sample sizes would be beneficial.

The laser flash analysis (LFA) is also a common method for the determination of thermal properties, but usually limited to non-porous and solid materials. With short measurement times of only a few minutes and small standard sample sizes with approx. 10-mm diameter and few millimeters in thickness, the LFA is very well suited for the needs of research and development of new materials with small sample amounts.

The LFA can handle insulation materials using the penetration model for the evaluation of the measurement signal under the following conditions:

The material should have small pores compared to the thickness of the sample.

The material should be prepared with a defined geometry.

The samples should be opaque or should be coated properly with graphite.

Using the example of aerated concrete, a comparison shows good agreement between the well-approved methods HFM, GHP and the LFA method by using the penetration model.