



## Thermal conductivity in floor heating systems

Understanding of heat flow and thermal losses is inevitable during building design and engineering of energy-efficient floor heating systems. Thermal conductivity can be improved when for multilayer constructions materials are optimized.

The MF-series heatflux sensors are perfectly suited for optimization of thermal building efficiency research. Since sensor foils are relatively flexible those can easily be applied on curved surfaces. The sensors are suitable for indoors applications, some models made for outdoors purposes and are available in different sizes and thickness. All sensors are extremely flat, which is a big advantage considering the minimum interference with the conditions of the testing area.

## HOW-TO Application Guide

1

Select the right heatflow sensor. A smaller sensor can be selected when the surface space is limited. A larger sensor can be chosen when the surface size allows and the surface structure or heat distribution is less uniform. All sensors are extremely flat, which is a big advantage considering the minimum interference with the conditions of the testing area the thermal dynamics.

2

For In situ measurements heat flow sensors can be integrated. When the sensor is put at the top of a surface the thermal conductivity, thermal transmission, radiation and convection component are measured. When the sensor is placed in between two surfaces inside the object it measures the thermal transmission by means of thermal conduction.

3

If a heat flux sensor does not make good thermal contact with the material to be measured, it will cause a local hot spot to form (or a cold spot in the case where the heat flux is negative). This hot spot will alter thermal gradients and change the convective and conductive heat transfer coefficients. Flat, layered sensors are usually mounted with a thermally conductive adhesive to minimize contact resistance. Simply butting a sensor against a surface may still result in a heat flux reading, but the contact resistance will keep the reading from being particularly meaningful.