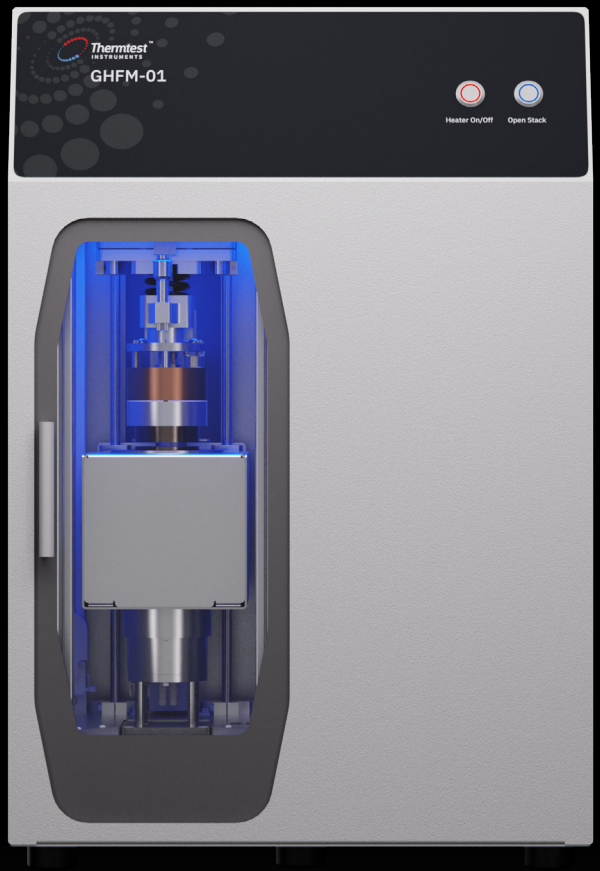
GHFM-01

Thermal conductivity meter for measurement of metals, polymers, composites, and pastes.

ASTM E1530.



Thermtest™
INSTRUMENTS

Thermtest.com

METHOD

The Guarded Heat Flow Meter (GHFM-01) adheres to ASTM E1530 standards for accurately measuring thermal resistance and thermal conductivity of solids like metals, polymers, composites, and pastes.

With advanced motor control replacing traditional pneumatic movement, the GHFM-01 automates control of sample thickness and applied force. This method allows precise thermal conductivity calculation by establishing a steady-state temperature gradient across the sample, capturing mature heat transfer properties.

Using Fourier's Law, calibrated measurements of thermal resistance and conductivity provide reliable, accurate results for heterogeneous materials.

$$R_S = F\left[\frac{T_U - T_L}{T_L - T_H}\right] - R_{int} \Rightarrow R_S = F\left[\frac{\Delta T_S}{\Delta T_B}\right] - R_{int}$$

Equation is the working equation of the instrument in linear form.

FEATURES

Easy to Change Heat Flux Stack

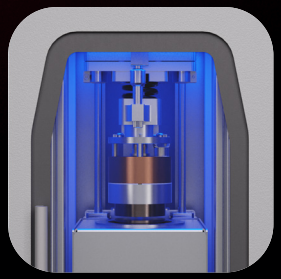
No tools are required to change the lower Heat Flux Stack, which forms a calibrated Heat Flux Transducer.

Housing multiple thermocouples to monitor temperature for confirmation of steady-state condition of the temperature gradient across the sample is achieved.

Thickness Measurement

Our proprietary gimbal design has the advantage of either automatic determination of sample thickness for rigid materials or a user defined sample thickness for compressible materials.

Sample thickness is measured using digital optical encoder technology.



Temperature Control

Optimally selected heaters cooled by heat exchangers matched with thermocouples are positioned in the upper and lower stack to accurately control plate temperatures.

Lateral heat loss is minimized with the use of a guard oven. Upper and lower plates along with guard oven temperatures are controlled by the convenient software.

Clamping Control

Plates automatically clamp together for optimum sample contact for rigid materials. When testing compressible materials, the desired height, force, or pressure is set in the software and the plate will automatically stop once desired sample height, or pressure is achieved.

SPECIFICATIONS

Materials	Metals, polymers, composites, and pastes
Type of sensors	Thermocouples (x6)
Direction	Through-thickness
Thermal conductivity (W/m·K)*	0.1 to 100
Sample diameter (mm)	50 to 50.8
Sample thickness (mm)	Up to 25 | Thin-films down to 0.1 mm with optional software
Test time (minutes)	40 to 60
Accuracy (Thermal conductivity)	3%
Repeatability (Thermal conductivity)	1 to 2%
Temperature range (°C)**	-20 to 310
Pressure (kPa | psi)	Automated up to 379 kPa (55 psi)
Standard	ASTM E1530-19

*Above 60 W/m·K, the material should be a minimum of 12.5 mm thick

**Chilled circulator included with each system

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