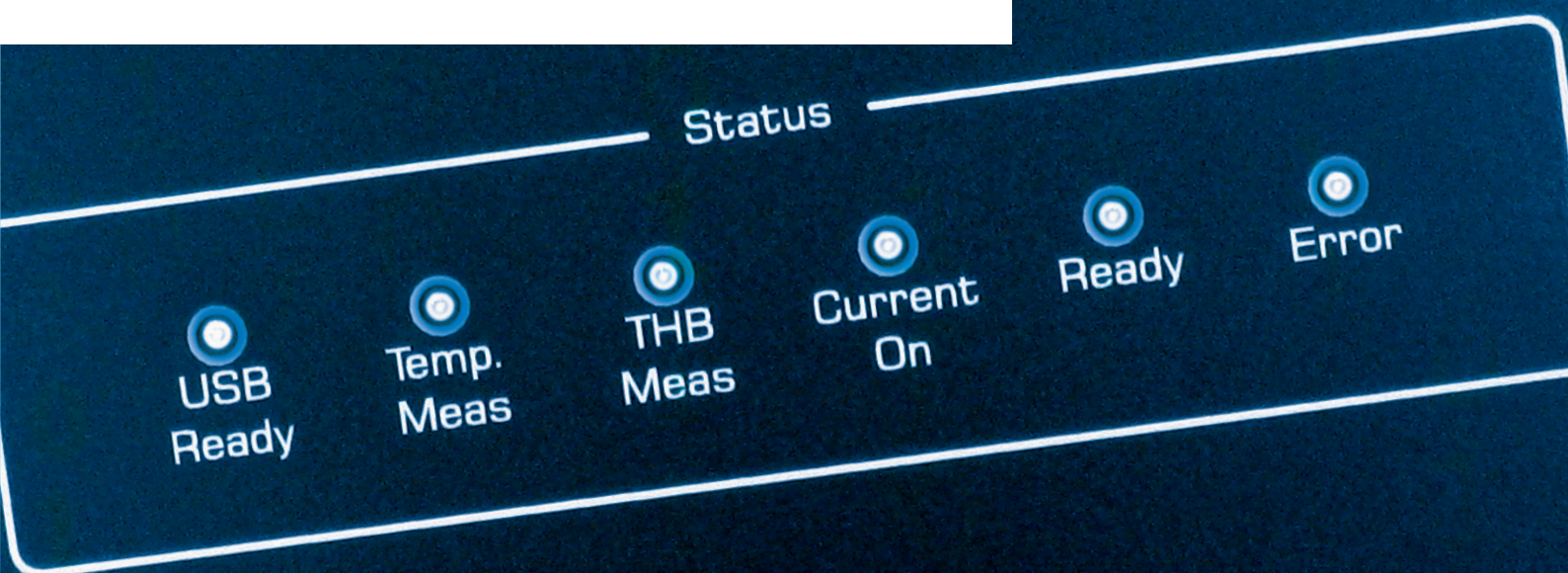


THB-1000 / THB-1000 HS Transient Hot Bridge

Measuring instrument for thermal conductivity,
thermal diffusivity and specific thermal capacity



INSEIS

THB — Transient Hot Bridge

In view of vanishing primary energy resources and global warming, the thermo-physical properties of substances increasingly gain in importance. Knowledge of the specific heat is indispensable, above all for an economic energy use; thermal conductivity and thermal diffusivity are the most important parameters of new, more efficient working materials in the field of energy management, process engineering, biogenic fuels and effective insulators for constructional energy saving. As fuels and insulators, renewable raw materials offer ecologic advantages. Their contribution to the protection of the environment and the climate as well as to the protection of finite fossil fuels still depends considerably on their thermo-physical properties which, until now, have been unknown in many cases.

The Transient Hot Bridge technique enables thermal conductivity, thermal diffusivity and specific heat measurements on various sample geometries and materials.

This LINSEIS measuring instrument provides the three material properties simultaneously after just a few minutes regardless of whether you have used the patented sensor in a solid matter (incl. bulk material, gels, pastes) or in a liquid.

The preparation of solid samples is pretty simple: One plane surface of two sample halves is sufficient for the sensor. Reference or calibration measurements are a thing of the past. As a matter of course, the THB measures absolute values, with an uncertainty which is equal to that of conventional plate or our laser flash devices.

Different sensors, easily to be exchanged, are available for laboratory and field use.

The THB measures is fully automatic. Its software control optimizes the measurement process independently, aiming at a short duration and a minimum uncertainty. In addition, it continuously monitors a possible temperature drift of the sample. Due to the short measurement times, serial measurements can be performed at a forced sequence and with a high sample output.

In addition to the measurement values, the Software calculates and displays the associated measurement uncertainties in accordance with the international ISO standard.

Advantages

- Highest Accuracy
- Absolute technique (no calibration or reference sample required)
- Fast measurement cycles
- Non destructive measurement
- Broad measuring range
- Broad temperature range
- Easy handling (no trained staff required)
- Simple sample preparation
- Applicable for solids, liquids, powders and pastes
- No influence of sensor contact pressure on measurement
- Easy measurement of porous and transparent samples



THB 1000

Technical Data

Principle of measurement

Transient strip sources according to a patented transient-hot-bridge procedure (THB), disturbing effect compensated, free from offset.



Hardware

- State of the art Laptop
 - Minimum CPU (i7) 6M
 - 50 GB Hard Disk
 - 8 GB RAM
 - Windows 7® original copy
 - 17" TFT display
- Color laser printer
- LINSEIS Thermal Properties Software Package TA-WIN

Specifications

THB 1000

Table Top System (Thermal Conductivity Analyzer) complete with software and hardware including standard kits and accessories

Data acquisition software to control system with full parameter setup

Measuring method Transient Hot Bridge

Measuring range

Thermal Conductivity 0.1 up to 1000/1800W/(m·K) or better
Thermal Diffusivity 0.1 up to 1000mm²/s or better
Specific Heat up to 5MJ/(m³·K)

Temperature range -125° up to 1000°C or more

Sample Size

Minimum sample size 17mm diameter
Maximum sample size unlimited

Precision better than 1%

Reproducibility typically better than 1%

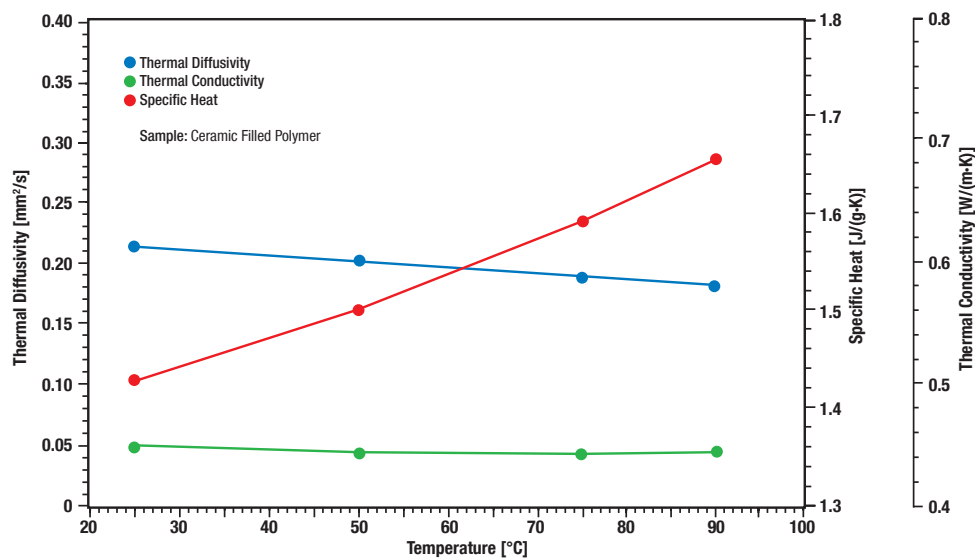
Accuracy better than ±5 %

Temperature measurement accuracy ±1°C or better

Extra Hook-Ups required none

Software

- Intuitive Windows® based software interface
- Easy data export to Microsoft Excel®
- Calculation of other Thermophysical properties via Measurement or data input (Thermal Diffusivity, Heat, Capacity and Density)



THB equipment

Sensor types






Sensor type	Sensor size	Min. Sample size	Temperature range	Measuring range	suitable for...
THB/Sensor/A 	82 x 42 mm	20 x 40 x 5 mm	-150 up to 200°C	0.01 – 1 W/m·K	liquids, powders, gases
THB/Sensor/A/Metal 	105 x 42 mm	20 x 40 x 5 mm	-150 up to 200°C	0.01 – 1 W/m·K	liquids, powders, gases
THB/Sensor/B 	42 x 22 mm	10 x 20 x 3 mm	-150 up to 200°C	0.01 – 1 W/m·K	liquids, powders, gases
THB/Sensor/B/Metal 	54 x 22 mm	10 x 20 x 3 mm	-150 up to 200°C	0.01 – 1 W/m·K	liquids, powders, gases
THB/Sensor/C 	300 x 3 mm	10 x 10 x 10 mm	-150 up to 700°C	0.01 – 1 W/m·K	liquids, powders
THB/Sensor/D/QSS 	42 x 22 mm	22 x 42 x 3 mm	-150 up to 200°C	0.2 – 1800 W/m·K	liquids, powders, gases
THB/Sensor/E/QSS 	42 x 22 mm	22 x 42 x 3 mm	-150 up to 200°C	0.2 – 1800 W/m·K	liquids, powders, gases
THB/Sensor/F/QSS 	28 x 15 mm	2.0 ml 30 x 15 x 6 mm	-150 up to 700°C	0.2 – 100 W/m·K	liquids, powders; electric isolating media
THB/Sensor/G/HOTPOINT/Kapton 	65 x 5 mm	3 x 3 x 2 mm	-150 up to 200°C	0.01 – 1 W/m·K	liquids, powders, gases

more sensors on request

The minimum sample thickness amounts for the sensor THB6N (82x42 mm) 5 mm and for the other sensors 3 mm. Sensor with metal

frame (MFR) and the high temperature Hotpoint (HT) are only used for liquids, powders and pastes.

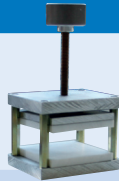

Sensor types

Sensor type	Sensor size	Min. Sample size	Temperature range	Measuring range	suitable for...
Sensor THB6N 	82 x 42 mm	20 x 40 x 5 mm	RT up to 700°C	0.01 – 1 W/m·K	liquids, powders, gases
Sensor THB6K 	42 x 22 mm	10 x 20 x 3 mm	RT up to 700°C	0.01 – 1 W/m·K	liquids, powders, gases
Sensor QSS MC 	42 x 22 mm	22 x 42 x 3 mm	RT up to 700°C	0.2 – 1800 W/m·K	liquids, powders, gases
Sensor QSS HC 	42 x 22 mm	22 x 42 x 3 mm	RT up to 700°C	0.2 – 1800W/m·K	liquids, powders, gases
Sensor Hotpoint HT 	300 x 3 mm	10 x 10 x 10 mm	RT up to 700°C	0.01 – 1 W/m·K	liquids, powders, gases

THB furnace

Furnace	Temperature range
Furnace 1 	-70 up to 200°C
Furnace 2 	-40 up to 160°C water waper option
Furnace 3 	RT up to 200°C
THB/FURN/LT 	-150 up to 1000°C
THB/FURN/HT 	RT up to 1000°C

Accessory

Type	Temperature range
Sample holder 	up to 200°C
THB/LG Attachment Liquid & gas adapter 	—

Standards

1. ASTM D 5930-01

Standard test method for thermal conductivity of plastics by means of a transient linesource technique.

2. ASTM C1113

Standard Test Method for Thermal Conductivity of Refractories by Hot Wire(Platinum Resistance Thermometer Technique)

3. DIN EN 993-15

Methods of test for dense shaped refractory products - Part 15: Determination of thermal conductivity by the hot-wire (parallel) method



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