ISOMET 2114

Portable system for measurement of heat transfer properties of materials

⇨ Highlights

- Measurement of **Thermal Conductivity**, **Thermal Diffusivity**, **Volume Heat Capacity** and **Temperature**
- Lightweight compact size
- Color graphic display and alphanumerical keypad
- USB and RS-232 interface
- High capacity internal memory for results
- Transport case with high protection degree

⇨ Description

The **ISOMET 2114** is a portable hand-held measuring instrument for direct measurement of heat transfer properties of a wide range of isotropic materials including cellular insulating materials, plastics, glasses and minerals. It is equipped with two optional types of measurement probes: needle probes for soft materials, surface probes for hard materials. It applies a dynamic measurement method, which enables to reduces the measurement time in comparison with steady state measurement methods.

Built-in menu system on color graphic display and the alphanumeric keypad enable effective interactive communication with the device. Measurement data are stored in the high capacity internal memory. Content of the memory is accessible through the display or it can be transferred into a PC by USB or RS-232 interface. Calibration data in internal memory ensure interchangeability of probes without affecting the measurement accuracy. Supplied software package enables updating of calibration coefficients after recalibration of measurement probes by means of reference materials.

Device can be powered from mains or from internal rechargeable batteries at outdoor, in situ measurements.

⇨ Applications

- Civil Engineering
  - *Measurement of thermal transfer properties of building materials and constructions*
  - *Optimization of development of thermal insulating materials*
- Geological Investigations
  - *Indoor and outdoor measurement of thermal transfer properties of soils, sands, rocks, etc.*
  - *Optimization of development of thermal insulating materials*
- Chemical Industry
  - *Measurement of heat transfer properties of chemical substances, agents, lubricant greases, plastics, suspensions, foam, rubbers, etc.*
- Woodworking Industry
  - *Measurement of heat transfer properties of woods*
  - *Moisture measurement and drying process optimization*
- Textile Industry
  - *Optimization of textile thermal contact comfort*
  - *Textile composition and surface adjustment*
  - *Evaluation of floor plates and carpets*

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⇨ Technical Specification

Measured Quantities					
λ	-	**Thermal conductivity** (W / m·K)	$c\rho$	-	**Volume heat capacity** (J / m^3·K)
a	-	**Thermal diffusivity** (m^2 / s)	T	-	**Temperature** (℃)

Measurement Ranges		Thermal Conductivity	Volume Heat Capacity	Temperature
Needle Probe **IPN 1100**	**/0.015-0.05**	0.015 .. 0.05 W/m·K	4.0.10^4 .. 1.5.10^6 J/m^3·K	-20 .. +70 ℃
	/0.035-0.2	0.035 .. 0.20 W/m·K	4.0.10^4 .. 1.5.10^6 J/m^3·K	
	/0.20-1.0	0.20 .. 1.0 W/m·K	1.5.10^6 .. 4.0.10^6 J/m^3·K	
	/1.0-2.0	1.0 .. 2.0 W/m·K	1.5.10^6 .. 4.0.10^6 J/m^3·K	
Surface Probe **IPS 1100**	**/0.04-0.3**	0.04 .. 0.3 W/m·K	4.0.10^4 .. 1.5.10^6 J/m^3·K	-15 .. +50 ℃
	/0.3-2.0	0.30 .. 2.0 W/m·K	1.5.10^6 .. 4.0.10^6 J/m^3·K	
	/2.0-6.0	2.0 .. 6.0 W/m·K	1.5.10^6 .. 4.0.10^6 J/m^3·K	

Measurement Accuracy	Measurement Range	Accuracy
Thermal Conductivity	0.015 .. 0.70 W/m·K	5 % of reading + 0.001 W/m·K
	0.70 .. 6.0 W/m·K	10 % of reading
Volume Heat Capacity	4.0.10^4 .. 4.0.10^6 J/m^3·K	15 % of reading+1.10^3 J/m^3·K
Temperature	-20 .. +70 ℃	1℃

Measurement Reproducibility	
Thermal Conductivity	3 % of reading + 0.001 W/m·K
Volume Heat Capacity	3 % of reading + 1.10^3 J/m^3·K

General Parameters	
Communication Interfaces	USB and RS-232
Display	3.5" / 320 x 240 pixels / 256 colors
Internal Memory for Data	min. 2 GB (>1000 results)
Operation Temperature	0 .. +40 ℃
Storage Temperature	-25 .. +60 ℃
Power Consumption	approx. 1.5 W
Power Supply	from internal rechargeable accumulators (4xNiMH, AA size) from Power Adapter (100 - 240 V_{AC} / 12 V_{DC})
Degree of Protection	IP-42 *(measuring device)* IP-67 *(transport case)*
Dimensions *(L x W x H)*	210 x 105 x 40 mm *(measuring device)* 406 x 330 x 174 mm *(transport case)*
Weight *(approx.)*	0.5 kg *(measuring device)* 4 kg *(standard setup with one needle and one surface probe in transport case)*

Standard Accessories	
ISOMET 2114	Measuring Device
ISTC 2000	Transport Case
WSPA 2000	Power Adapter (100-240V)
CCU 1000	USB Communication Cable
ISCD	CD-ROM with Manual and Software

Optional Accessories	
IPN 1100	Needle Probe with one meas. range
IPS 1100	Surface Probe with one meas. range
IPNR	Additional meas. range for IPN 1100
IPSR	Additional meas. range for IPS 1100
WSCA 1000	Car Outlet Adapter (12V)
CCS 1000	RS-232 Communication Cable
SOB	Set of Borers for Needle Probes