

Thermal conductivity within several minutes ...



Portable Transient Tester Model RTP 1.01

Temperature range:
-40°C up to 200°C
-40°F up to 392°F

Measuring conditions:
Environmental conditions



Range of the parameters and the measurement accuracy

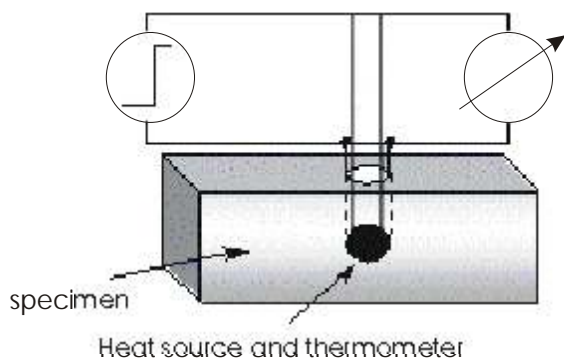
Thermal conductivity	0.01 - 5 [W/m K]	5 %
----------------------	------------------	-----



Institute of Physics SAS
845 11 Bratislava, Slovakia
Tel.: (+421) 2 59410576
Fax: (+421) 2 54776085
Email: kubicar@savba.sk

APPLICATION AND FEATURES

Instrument Portable Transient Tester – Model RTP 1.01 is based on the Hot Ball Transient Method that belongs to the dynamic ones. Theory of the method is described in paper . Kubi ár. V. Vretenár, V Bohá : Theory and application of the Hot Ball Method for measuring the thermal conductivity.



PRINCIPLE OF THE HOT BALL TRANSIENT METHOD

The measuring process by the Hot Ball Transient Method can be described as follows: The temperature of the specimen is stabilized and uniform. Under these conditions, a small disturbance is applied to the specimen generated in Hot Ball sensor in a form of step-wise function. From the temperature response to this small disturbance that is measured by the same sensor the thermal conductivity is calculated.

CHARACTERISTICS OF INSTRUMENT

The instrument performs measurements of materials exposed to environmental condition. a chosen atmosphere (air, vacuum, inert) and at a controlled temperature regime (isothermal, nonisothermal). Instrument can be connected with PC computer that allows automatic measurements in measuring cycles, data storage and a detailed data analysis. A set of sensors for different ranges of thermal conductivity is used. Plug-in the appropriate sensor, instrument automatically optimizes experimental parameters for the corresponding range of materials. The measurements are realized within the measuring cycles. Due to start of a measuring cycle a specimen temperature is measured, a heat flux is generated and a temperature response is scanned. After stabilizing the material temperature, the next measuring cycle starts. The thermal conductivity is calculated by an evaluation procedure.

SPECIMENS

Material in the form of plates, blocks or semi-infinite medium can be tested. Sensors can be fixed in materials for continuously testing.

SOFTWARE

A communication program allows a comfortable data transmission into PC computer in which a detailed data analysis can be performed and data storage in laboratory data-base can be done. Basic version is aimed for manual operation, advanced one for automatic measurement (measuring in cycles) that outputs data into laboratory data base. Laboratory data base allows data archive with retrieving facilities upon various criteria using instantaneous graphical representation.

OPTIONAL

Two testing specimen sets including corresponding sensors allow to masters the measurement technique by Hot Ball Transient Method quickly and comfortably.

CONSULTANCY

The Internet page <http://thermophys.savba.sk> and the e-mail

address wiliam.vretenar@savba.sk offer basic information and help in the instrument operation and data evaluation, respectively.

APPLICATION

The instrument is aimed for testing at industrial condition, different atmospheres and moisture content in porous. Structural relaxation - material aging and the investigation of the thermal conductivity for the optimization of the technological processes and materials testing. The instrument can be applied for investigation of thermal insulation, porous structures, materials for civil engineering, composites, polymers, ceramics, glasses and products of the powder metallurgy.

SPECIFICATIONS

Temperature range and resolution	-40 °C to +200 °C, 0.1 °C -40 °F to +392 °F, 0.18 °F
Measuring regimes:	isothermal
Temperature stability:	± 0.05 K
Measuring conditions:	Air, Inert gas
Range of experimental parameters:	
Heat power:	0.1 to 1 W
Temperature response:	0.5 to 5 °C
Range of thermal conductivities and accuracy:	
Thermal conductivity:	0.01 to 5 W m ⁻¹ K ⁻¹ 5 %

ORDERING INFORMATION

Catalog #	Description
RTP-1.01	Basic model includes instrument, sensor and basic control software.
RTP-1.02	PC computer with professional software version including Laboratory Database and data analysis procedures.
ST-LOW	Kit with testing specimen (PERSPEX)
ST-HIGH	Kit with testing specimen (Al ₂ O ₃ ceramics)
RTP-CH	Optional chamber RTB

ADDRESS

Department of thermophysics
Institute of Physics, Slovak Academy of Sciences,
Dúbravská cesta 9, 845 11 Bratislava, SLOVAKIA, EU
Tel.: (421) 2 5941 0576 FAX: (+421) 2 5477 6085
Contact: Dr. Kubícar - Ludovit.Kubicar@savba.sk
Web: <http://thermophys.savba.sk>