Quick Thermal Conductivity Meter

QTM-500

Probe Sensors to Any of Your Application Needs!
Thermal Conductivity of All Kinds of Sample Materials by Just One TC Meter!

Specification QTM-500

- Type and model name: QTM-500
- Measuring method: Hot Wire method
- Measuring range: 0.023 to 12 W/mK
- Precision: ±5% reading value per reference plate
- Reproducibility: ±3% reading value per reference plate
- Temperature: -10 to 200˚C (Thermal bath is necessary for measurement at different room temperature)
- Measuring time: Standard 60 sec (specimen must be in temperature equilibrium)
- Sensor: PD-11 Box Probe
- Heater current precision: ±0.1% of setup value
- Display: 30 digits × 7 lines LCD with back light
- External communication: RS-232C 1 channel

Environmental conditions:
- Temperature: 5 to 35˚C
- Humidity: Below 85% RH (No condensation)
- Power source: 100 to 240 VAC, 50/60 Hz

Dimensions and weight:
- Main unit: 300(W) × 475(D) × 175(H) (mm), approx. 9 kg
- Box probe: 100(W) × 50(D) × 100(H) (mm)

Supplied parts:
1. PD-11 Box probe
2. Probe constant card
3. Power cord with ground wire
4. Power fuse
5. Reference plate: R1-2 Clear quartz in box, R2-2 silicone rubber in box, R3-2 polyethylene form in box
6. Cooling plate (aluminum)
7. Brush
8. Operating manual

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Quick Thermal Conductivity Meter

All kinds of sample can be measured by two different types of sensor up to your needs!

QTM-500 does quick and easy measurement of all kinds and types of sample materials. Stick sensor probe on sample surface of thermal equilibrium, and press START key. The measurement results will appear on display in 60 seconds.

Principle of measurement

The probe consists of single heater wire and thermocouple. When constant electric power (energy) is given to the heater, the temperature of the wire will rise in exponential progression. Temperature rising curve is plotted in linear line in below figure with time axis scaled in logarithm. The angle of this line increases if the sample has less thermal conductivity, and decreases if it has higher TC. Therefore, TC of a sample can be determined from the angle of the rising temperature graphic line.

\[ \lambda = \frac{q \cdot \ln(t_2/t_1)}{4 \pi (T_2 - T_1)} \]

- \( \lambda \): thermal conductivity of sample [W/mK]
- \( q \): generated heat per unit length of sample/time [W/m]
- \( t_1, t_2 \): measured time length [sec]
- \( T_1, T_2 \): Temperature at \( t_1, t_2 \) [K]

Box type probe (standard)

PD-11

Insulated moisture-proof probe (option)

For measurement of hydrous or electrically conductive material like foods or crude concrete, etc.

PD-13
**Quick Thermal Conductivity Meter**

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**SOFT-QTM5EW**

Software for Measuring Thermal Conductivity of Thin Sheets (Optional)

**Typical example of measurement**

The QTM-500 Thermal Conductivity Meter and a personal computer with Windows® 95 are connected, and SOFT-QTM5EW software is installed. Then, measurements of thermal conductivity can be performed on the following samples: Homogeneous material in film, sheet or thin slabs, such as rubber, plastics, ceramics, paper, textiles or wood.

**Thickness of sample**

30mm to 10mm thick materials in sheet form

**Measuring range**

0.035 – 5.0w/mK

**Measuring equipment**

- CD-ROM: 1pc
- Operating manual: 1copy
- PC connecting cable for DOS-V: 1pc

**Main Menu for Measurement**

- **Measurement on Reference Material**
- **Measurement on Thin Sheet**

**Other Options**

- **Printer DP-500**
  - Sample No., TC and temperature can be printed out.

- **Powder measuring case QTM-PA1**
  - Powder sample can be measured in combination with PD-11 probe.

**Typical example of measurement**

The QTM-500 Thermal Conductivity Meter and a personal computer with Windows® 95 are connected, and SOFT-QTM5EW software is installed. Then, measurements of thermal conductivity can be performed on the following samples: Homogeneous material in film, sheet or thin slabs, such as rubber, plastics, ceramics, paper, textiles or wood.

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