



DTC-300 THERMAL CONDUCTIVITY METER

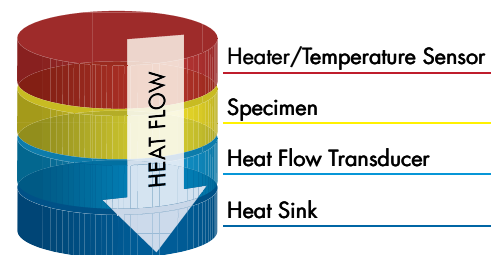


The DTC-300 measures thermal conductivity of a variety of materials, including polymers, ceramics, composites, glasses, rubbers, some metals, and other materials of low to medium thermal conductivity. Only a relatively small test specimen is required. Non-solids, such as pastes or liquids, can be tested using special containers. Thin films can also be tested accurately using a multi-layer technique. The tests are in accordance with the ASTM E1530 Standard.

Guarded Heat Flow Test Method

- A specimen of the material is held under a uniform compressive load between two polished surfaces, each controlled at a different temperature.
- The lower surface is part of a calibrated heat flow transducer.
- The heat flows from the upper surface, through the specimen, to the lower surface, establishing an axial temperature gradient in the stack.
- After reaching thermal equilibrium, the temperature difference across the specimen is measured along with the output from the heat flow transducer. These values and the specimen thickness are then used to calculate the thermal conductivity.

Guarded Heat Flow Test Method



DTC-300 Features

Each DTC-300 is factory calibrated using specimens of known thermal resistance, spanning the particular range. The contact resistance is kept small by applying a reproducible, pneumatic load to the test stack, and a thermally conductive interface compound. A guard furnace surrounds the test stack to reduce the effect of heat transfer across the edges of the specimen.

- Guarded Heat Flow Meter
- -20°C to 300°C
- Fully Computerized Operation
- 2" dia. Specimen
- Conforms to ASTM E1530

For sub-ambient testing, the DTC-300 is supplied with an airtight compartment, keeping the atmosphere relatively moisture-free with dry air purge. Polymers can be tested through the melt using special containment cells. A typical test takes about 45 to 60 minutes to complete at a particular temperature.

Flexible Temperature/Specimen Options

Using tap water, the heat sink provides operation down to a specimen temperature of about 50°C. To fully utilize the range of the instrument an optional chiller circulator can be used to provide a heat sink temperature down to -10°C. The instrument is provided with one of three operating range modules. Each module covers a different thermal resistance region. The various modules are field exchangeable.

System Software

Each DTC-300 system includes Windows™ operating and data analysis software. The user simply specifies certain test parameters, including specimen size and desired test temperatures, and the equipment runs unattended until test completion, when thermal conductivity results are printed and plotted.

DTC-300 Technical Specifications

| | |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Method | Guarded Heat Flow Meter |
| Standard Test Method | ASTM E1530 |
| Specimen Compatibility | solids, pastes, liquids, thin films |
| Specimen Size | |
| Thickness | Maximum 1" |
| Diameter | 50 mm diameter |
| Temperature Range | -20 to 300°C |
| Thermal Conductivity Range | 0.1 to 40 W/mK |
| Thermal Resistance Range (for each module) | [1] Thermal resistance 0.0005 – 0.010 m ² K/W [2] Thermal resistance 0.002 – 0.020 m ² K/W [3] Thermal resistance 0.01 – 0.05 m ² K/W |
| Accuracy | ±3% to 8% depending on thermal resistance |
| Reproducibility | ±1 to 2% depending on thermal resistance |
| Dimensions | 25" (63.5 cm) W x 28" (71.12 cm) D x 37" (93.98 cm) H |

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