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!

KYOTO ELECTRONICS

Quick Thermal Conductivity Meter

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

QTM-500

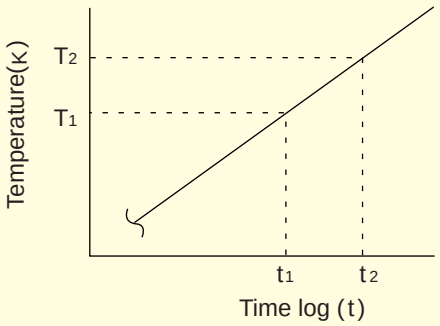
QTM-500 does quick and easy measurement of all kinds and types of sample materials. Stick sensor probe on sample surface of thermal equilibrium, and press START key. The measurement results will appear on display in 60 seconds.

Principle of measurement

The probe consists of single heater wire and themocouple. 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.

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

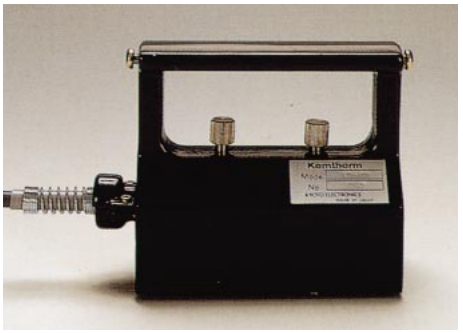
λ	: thermal conductivity of sample	[W/mK]
q	; generated heat per unit length of sample/time	[W/m]
$t_1.t_2$	; measured time length	[sec]
$T_1.T_2$	: Temperature at $t_1.t_2$	[K]



Probe

●Box type probe (standard)

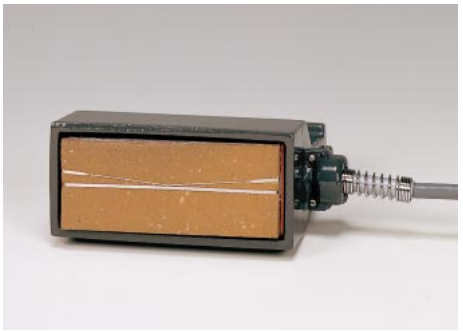
PD-11



●Insulation damp - proof probe (option)

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

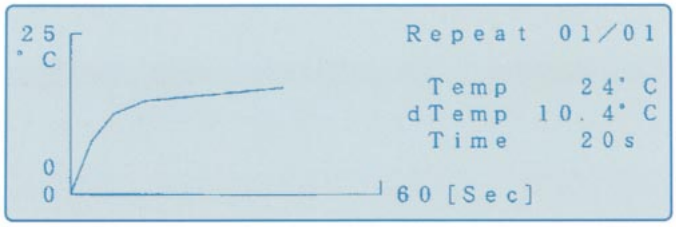
PD-13



Examples of LC Display

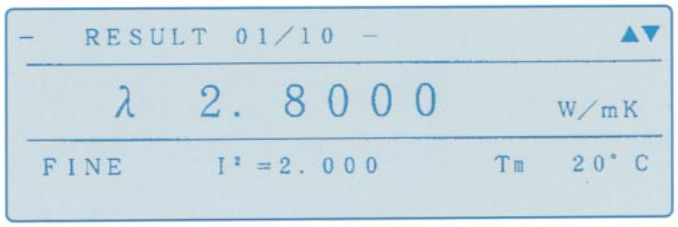
●Start measurement

When START button is pressed, the heater is supplied with constant power by heater current. The graphic curve shows realtime thermal progression of sample surface (heater temperature).



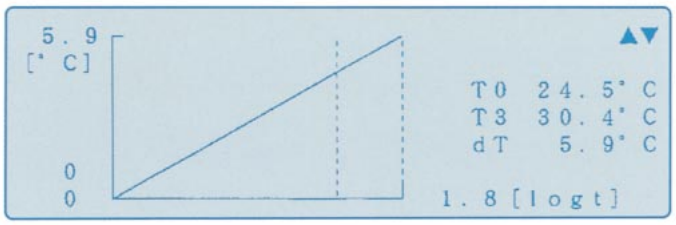
●Measurement result

The measurement results will be shown on display immediately after the measurement is finished.



●Measurement results (Temperature graphic for time log)

Temperature change can be confirmed by linear graphic line for time in logarithm.



Other Options

Printer DP-500

Sample No.,TC and temperature are printed out.

Powder measuring case QTM-PA1

Powder sample can be measured by combination of this case and PD-11 probe.

SOFT-QTM5EW

Software for Measuring Thermal Conductivity of Thin Sheet (Optional parts)

Typical example of measurement

The QTM-500 Thermal Conductivity Meter and a personal computer with Windows® 95 were connected, and SOFT-QTM5EW software was installed. Then, measurements for thermal conductivity were performed on the following samples; Homogeneous material in film, sheet or thin board form, of those sample like rubber, plastics, ceramics, paper, textile or wood.

Thickness of sample

30μm to 10mm thick materrial in sheet form

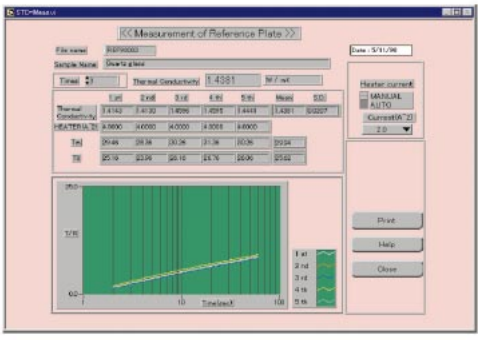
Measuring range ——— 0.035 ~ 5.0w/m K

Measuring equiment

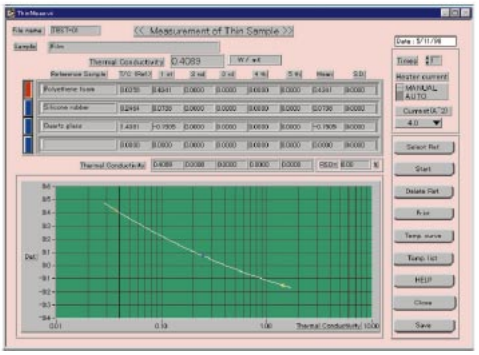
CD-ROM ——— 1pce
Operating manual ——— 1copy
PC connecting cable for DOS-V ——— 1pce

●Main Menu for Measurement

●Measurement of Reference Material



●Measurement of Thin Sheet



■Specification QTM-500

Type and model name	QTM-500 Quick Thermal Conductivity Meter
Measuring method	Hot Wire method
Measuring range	0.023 to 12W/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 60sec (specimen must be in temperature equilibrium)
Sensor	PD-11 Box Probe Constantan heater wire and chromel-alumel thermocouple
Heater current precision	±0.05% of setup value
Display	30 digits × 7 lines LCD with back light Display: Thermal conductivity: 0. XXXX～XXX. XW/mK Measuring temperature: −100 to 1000˚C Guiding message for measurement
Minimum sample required	Approx. 100(W)×50(L)×20(Thickness) (mm)
External communication	RS-232C 1 channel

Ambient condition	Temperature: 5 to 35˚C Humidity: Below 85%RH (No condensation)	
Power source	100 to 240VAC, 50/60Hz	
Power consumption	Approx. 60W	
Dimension	Main unit: 300(W)×475(D)×175(H) (mm) Box probe: 100(W)×50(D)×100(H) (mm)	
Weight	Approx. 9kg	
Supplied parts	1. PD-11 Box probe	1pc
	2. Probe constant card	1pc
	3. Power cord with ground wire	1pc
	4. Power fuse	2pcs
	5. Reference plate:	
	R1-2 Clear quartz in box	1pc
	R2-2 silicone rubber in box	1pc
	R3-2 polyethylene form in box	1pc
	6. Cooling plate (aluminum)	1pc
	7. Brush	1pc
	8. Operating manual	1copy

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