THW-L2 Transient Hot-Wire

Portable Thermal Conductivity Meter for measurement of **liquids and pastes**.

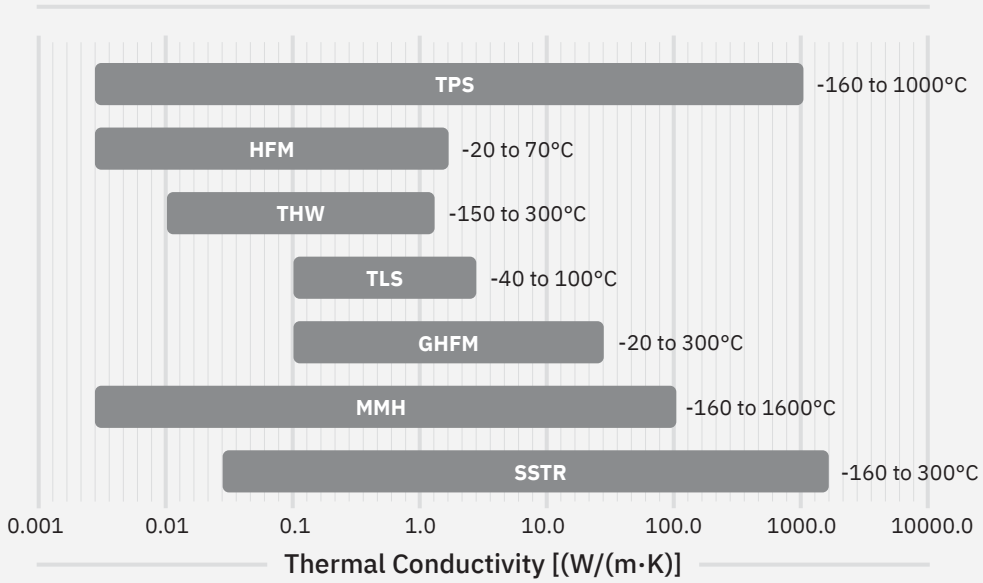
Conforms to standard ASTM D7896 -19

Liquids

Pastes

Thermtest™ PORTABLE

Thermtest.com



Thermtest™ INSTRUMENTS

THERMAL CONDUCTIVITY:
HFM-100 (Heat Flow Meter)
THW-L1 (Transient Hot Wire)
GHFM-01 (Guarded Heat Flow Meter)
MMH-1600 (Monotonic Heating)
SSTR-F (Steady State Thermoreflectance)

Thermtest™ PORTABLE

TLS-100 (Transient Line Source)
THW-L2 (Transient Hot Wire)
TPS-EFF (Transient Plane Source)
GHFM-02 (Guarded Heat Flow Meter)
MP-2 (Measurement Platform)
HFM-25 (Heat Flow Meter)

Thermtest has been advancing the measurement of thermal conductivity, thermal diffusivity, and specific heat since 2005. With more than 2000 satisfied customers worldwide, our unique combination of advanced thermal conductivity instrumentation for the laboratory, portable meters for the field, and accessories enables us to provide ideal solutions to fit any material testing application and budget.

Featured **Transient Hot Wire Capabilities**

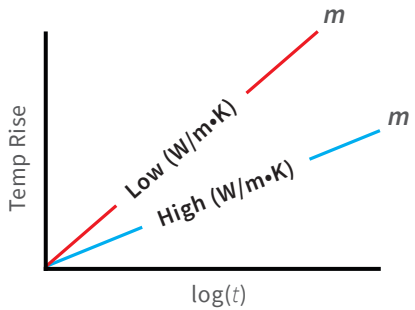
The Transient Hot Wire (THW-L2) Liquid Thermal Conductivity Meter is an advanced measurement system for direct determination of the thermal conductivity of liquids and pastes in accordance with ASTM D7896-19. The THW-L2 was designed with speed and operational simplicity in mind. With a single measurement of less than 2 seconds in duration, small volumes of liquids and pastes can be accurately and precisely measured for thermal conductivity. The THW-L2 utilizes a non-stationary measurement approach and rapid test times to limit convective effects for samples with a wide range of viscosities. The THW sensor consists of a thin heating wire 60 mm in length and is completely inserted into the sample to be tested. The sensor wire is heated using a constant current source (q) and the temperature rise is recorded by monitoring the change in electrical resistance of the wire. The slope (m) from the plot of temperature rise vs. logarithm of time is used in the calculation of thermal conductivity (λ). For liquid samples of high thermal conductivity, the lower the slope. For liquid samples of low thermal conductivity, the higher the slope.

$$\lambda = \frac{q}{4\pi m}$$

λ = thermal conductivity (W/m•K)

q = heating power (W/m)

m = slope



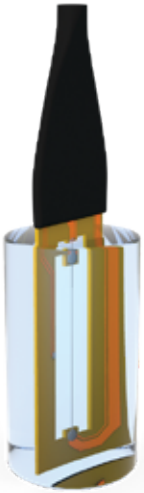
- **Follows international standard ASTM D7896-19**
- **Portable, Economical, and Accurate**
- **Results without the effects of convection**
- **Easy to use**
- **Optional thermoelectric dry bath for automated temperature testing**

THW-L2 Specifications

Materials	Liquids and Pastes
Measurement Capabilities	Bulk Properties
Thermal Conductivity	0.01 to 2 W/m•K
Measurement Time	< 2 seconds
Reproducibility	Typically better than 2%
Accuracy	Typically better than 5%
Temperature Range[1]	-50 to 100°C
Pressure	Ambient
Smallest Volume	15 mL
Largest Sample Size	Unlimited
Standard	ASTM E1530 -19

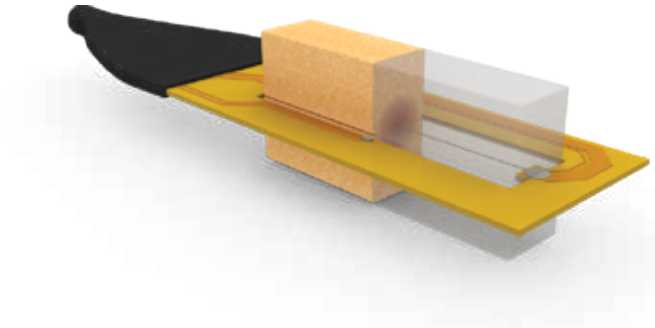
[1]Requires heating/cooling apparatus

Portable. Economical. Accurate.



Standard THW-L2 Sensor

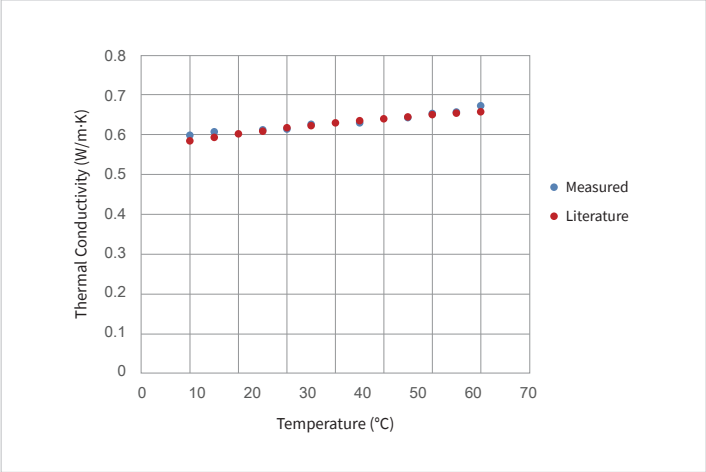
The THW-L2 comes with the standard 60 mm sensor for testing of liquids and pastes. The sensor is fully inserted into an isothermal sample and measurements are made with the push of a button. In less than 2 seconds, results are displayed for thermal conductivity. Volumes as small as 15 mL can be tested. The easy to use THW software enables measurements to be controlled via a computer. When used in conjunction with the optional thermoelectric dry bath, the software can even automate measurements of thermal conductivity with temperature.

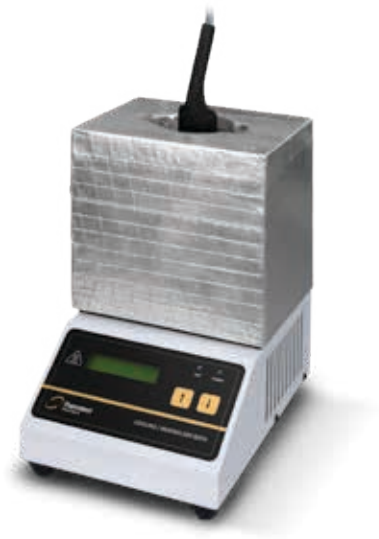


Thermal Conductivity of Insulation

The THW-L2 is capable of testing low thermal conductivity, compressible insulations, without the liquid sample holder. Samples with minimum dimensions of 65 mm in length and 2 mm in thickness can be tested in a horizontal configuration, with the sensor sandwiched between the samples. Using the THW-L2, expanded polystyrene was measured as 0.031 W/m•K, which is within 5% of the literature values.

Testing Sensor and Optional Dry Bath





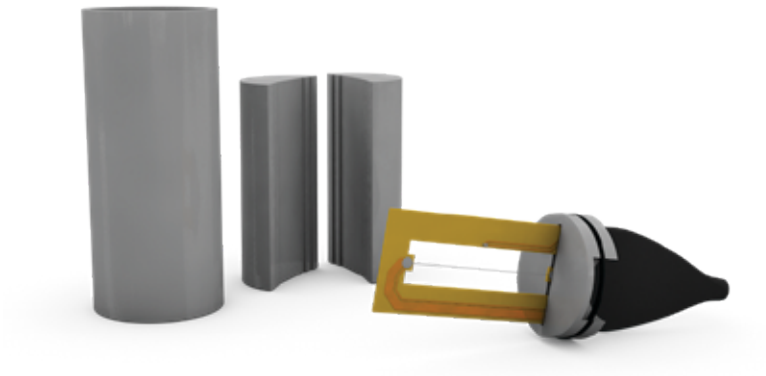
Liquids vs. Temperature

Using the Thermoelectric Dry Bath, the Thermtest THW-L2 is capable of testing liquids over a wide temperature range. In this application, deionized ultra-filtered (DIUF) water was tested from 10 to 70˚C, using the THW-L2. All test results were within 5% of the literature values.

Optional Dry Bath

The optional dry bath allows for automated measurements of thermal conductivity with temperature (-10 to 90°C or 0 to 100°C). The THW software automatically controls the increments of temperature steps between the desired start and end temperatures to ensure isothermal conditions and test results are free of temperature drift effects. For wider temperature ranges, additional cooling/heating options are available.

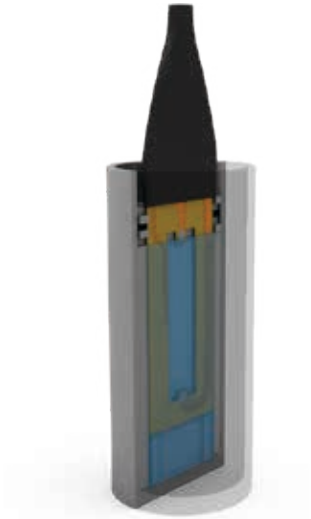
Sample Measurements



1 The Sample

Using the THW-L2, liquid samples of unlimited size can be tested. With the small volume cell insert, volumes as small as 15 mL can be measured. The instrument's ability to control convection, using short test times, allows accurate measurements of a wide range of samples, with varying viscosities.

1 min.

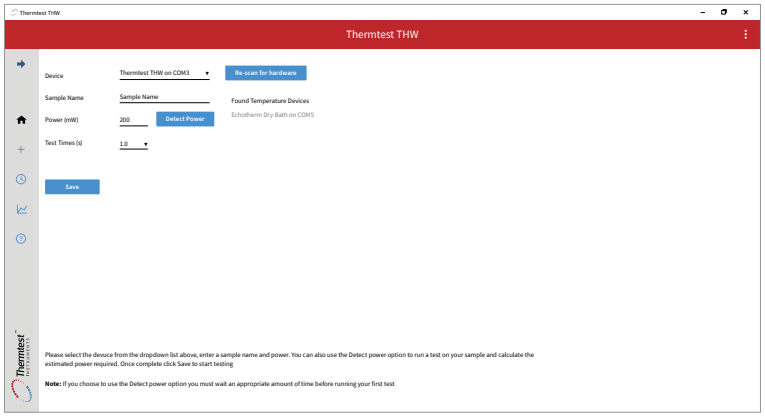


2 Insert Sensor

Once the liquid has been poured into the sample holder, the sensor can be vertically inserted in place. For smaller sample volumes, position the small volume cell into the sample holder, prior to the addition of the sample and sensor.

< 1 min.

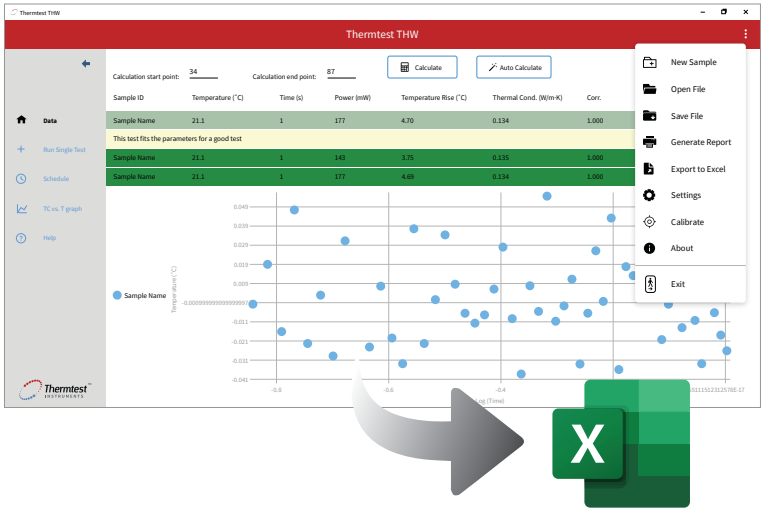
Efficiency with Ease



3 Run Experiment

The instrument can be controlled through the front panel with the push of a button, or through a Windows based computer software. Single temperature point measurements, as well as scheduled temperature intervals may be performed using the easy to use THW-L2 software.

< 1 min.



4 Exporting Results

Using the Windows based software, users can save, print, and export test results to Microsoft Excel, for further processing once testing is complete.

1 min.

RIFERIMENTO PER L'ITALIA

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