TLS-100

Thermal conductivity meter for soil, rock, concrete, and polymers.

ASTM D5334, IEEE 442.

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INSTRUMENTS

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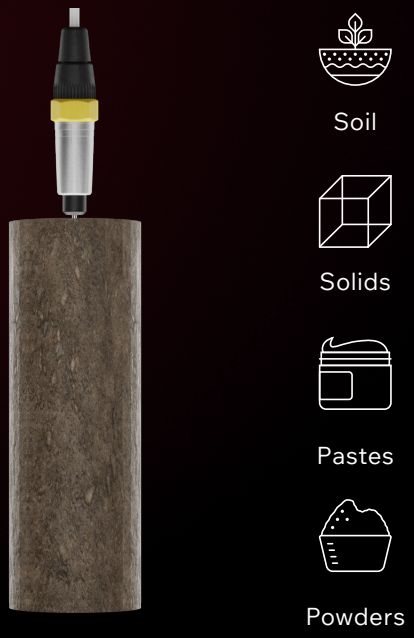
FEATURES

The TLS-100 is a portable meter used to measure thermal conductivity and thermal resistivity of a variety of samples, including soil, rock, concrete and polymers. Tests are performed with the push of a button and results are displayed instantly. The TLS-100 features sensors that are auto-recognized with corresponding testing parameters automatically loaded.

The TLS-100 follows ASTM D5334 and IEEE 442. The sensor consists of a thin heating wire and temperature sensor sealed in a 150, 100 or 50 mm steel tube. The sensor is completely inserted into the sample to be tested.

SENSORS

Transient Line Source (TLS-100 mm) Sensor



Each TLS-100 comes equipped with the standard 100 mm sensor. The sensor is fully inserted into an isothermal sample and a measurement is made with the push of a button.

After 180 seconds, results are displayed for thermal conductivity and thermal resistivity. Saved results can also be exported to a computer via convenient utility software and USB connection.

Transient Line Source (TLS-50 mm) Sensor

The 50 mm sensor was designed for testing hard samples like rock and concrete. Drilling the required 4 mm diameter x 50 mm hole in rigid samples is easy with the provided masonry drill bit.

When testing hard samples, a thermal contact grease is used to enhance contact between the sensor and sample.

Transient Line Source (TLS-150 mm) Sensor

The optional 150 mm sensor is used for in-lab and in-field testing of soil and soft materials according to IEEE 442. The needle is fully inserted into an isothermal sample and measurement is made with the push of a button.

After 180 seconds, results are displayed for thermal conductivity and thermal resistivity.

SPECIFICATIONS

Method	TLS-100 (included)	TLS-50	TLS-150	TLS-100 vCp
Materials	Soil, solids, pastes, and powders	Rock, concrete, and polymers	Soil, solids, pastes, and powders	Soil, solids, pastes, and powders
Thermal conductivity (W/m·K)	0.1 to 5	0.03 to 5	0.1 to 3	N/A
Thermal resistivity (mK/W)	0.2 to 10	0.2 to 3.3	0.3 to 10	N/A
Volumetric specific heat (MJ/m^3K)	N/A	N/A	N/A	Up to 2.5
Smallest sample size (mm)	100 length, 50 diameter	50 length, 50 diameter	150 length, 50 diameter	100 length, 50 diameter
Largest sample size (mm)	Unlimited	Unlimited	Unlimited	Unlimited
Test time (minutes)	3	3	3	N/A
Accuracy (Thermal conductivity)	5%	5%	5%	15%*
Repeatability (Thermal conductivity)	2%	2%	2%	2%
Temperature range (°C)	-40 to 100	-40 to 100	-40 to 100	-40 to 100
Standard	ASTM D5334-22a, IEEE 442-1981	N/A	ASTM D5334-14, IEEE 442-2017	N/A

*Specific heat.

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