

TLS-100

Thermal conductivity meter for soil, rock, concrete, and polymers.
ASTM D5334, IEEE 442.



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



Soil



Solids



Pastes



Powders

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



Rock



Concrete



Polymers

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



Soil



Solids



Pastes



Powders

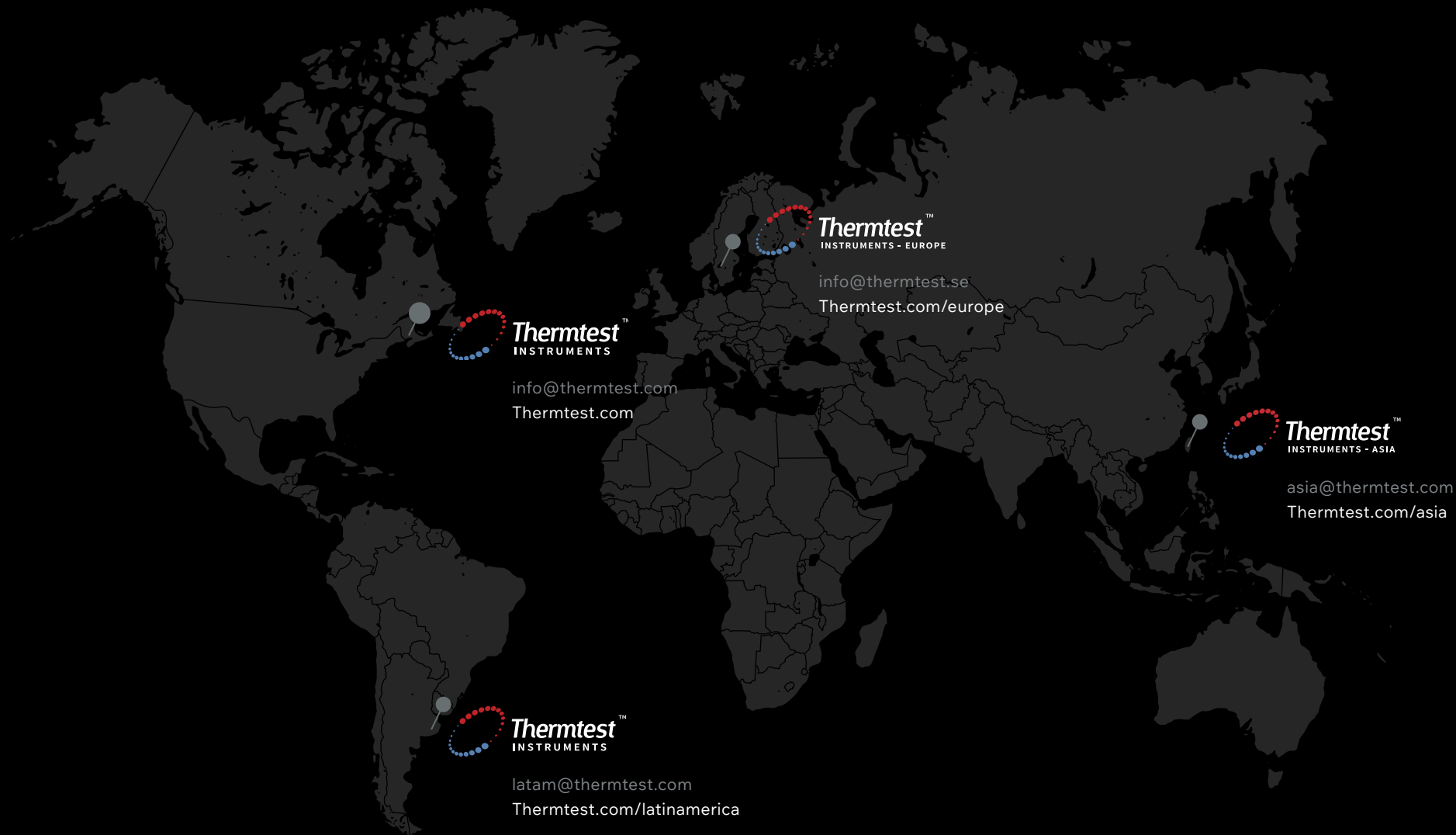
The optional 150 mm sensor is used for in-lab and in-field testing of soil and soft materials according to IEEE 442. The needle is fully inserted into an isothermal sample and measurement is made with the push of a button.

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/m³K) | 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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