



Geotechnical Testing Equipment

Thermal Conductivity Equipment

ASTM D5334. ASTM D5930



It is a portable thermal conductivity meter used to measure thermal conductivity and thermal resistivity. Perfect for testing the thermal conductivity of soil, polymers, viscous liquids, and other soft materials; as well as testing the thermal conductivity of concrete, rock, stone, or other hard materials. Tests can be performed with the push of a button. The collected data is automatically analyzed and results are displayed immediately.

The ASTM D5334. ASTM D5930 The sensor needle consists of a thin heating wire and temperature sensor sealed in a 100 or 50 mm steel tube. The sensor is completely inserted into the sample to be tested. Heat is delivered to the sample using a constant current source (q) and the temperature rise is recorded over a defined period of time. The slope (a) from a plot of temperature rise versus the logarithm of time is used in the calculation of thermal conductivity (k). The higher the thermal conductivity of a sample, the lower the slope. For samples of low thermal conductivity, the higher the slope.

PORTABLE THERMAL CONDUCTIVITY METER SPECIFICATIONS

Materials	Soil, Rock, Concrete, & Polymers
Measurement Capabilities	Bulk Properties
Thermal Conductivity	0.1 to 5 W/mK
Thermal Resistivity	0.2 to 10 mK/W
Measurement Time	3 min. (100mm) / 5 min. (50mm)
Reproducibility	Typically better than 2%
Accuracy	Typically better than 5%
Temperature Range	-40 to 100°C
Smallest Sample (100 mm)	50 mm (diameter or square) x 100 mm
Smallest Sample (50 mm)	50 mm (diameter or square) x 50 mm
Largest Sample Size	Unlimited
Standards	ASTM D5334, ASTM D5930, & IEEE 442-1981

SOIL THERMAL CONDUCTIVITY TESTING STANDARD 100 MM SENSOR

The instrument comes with the standard 100 mm sensor for testing for the thermal conductivity of soil, soft materials, viscous liquids, and easy to drill materials. The needle sensor is fully inserted into an isothermal sample and a measurement is made with the push of a button. In 180 seconds, results are displayed for thermal conductivity and thermal resistivity. Saved results can also be exported to a computer, via Micro-SD card or USB connection.

Thermal Dryout Curves soil can be prepared by measuring the thermal conductivity of a sample at different moisture contents as the sample dries from saturation. The typical approach involves drying the soil by heating it at an elevated temperature to speed up the drying process. Sample is removed, weighed, and measured for thermal conductivity at different time intervals until the sample is fully dried.

THERMAL CONDUCTIVITY OF CONCRETE TESTING: OPTIONAL 50 MM SENSOR

The 50 mm sensor was designed for testing thermal conductivity of concrete, rock, and other hard samples. Drilling the required 4 mm diameter x 50 mm hole in rigid samples is easy with the included masonry drill bit. When testing hard samples, a contact grease is used to improve contact between the sensor and sample.