



METER
ENVIRONMENT

THERMAL PROPERTIES TESTING SERVICES

DON'T HAVE TIME TO BE A THERMAL PROPERTIES TESTING EXPERT?

Let experts with 40 years of thermal properties measurement experience do it for you. We characterize thermal properties of soil, grout, fluidized thermal backfill (FTB), small-grained fill materials, concrete, rock, and more.

LEAVE COMPLEXITY BEHIND

Our TEMPOS thermal properties analyzer makes measurements easy. However, establishing an effective measurement protocol and carefully controlling important factors that affect thermal properties can be difficult and time consuming. METER scientists have over 40 years of experience making high-quality thermal properties measurements. If you don't have the time or aren't completely comfortable making thermal properties measurements, request a quote for the appropriate service below.

ACCURATE READINGS. SPEEDY TURNAROUND.

- Never wait on results
- Underbid competitors
- Always be compliant

BENEFITS

- Standard two-week turnaround (expedite possible)
- Report contains test methods and data – no proprietary procedures
- Extremely price competitive
- Custom testing available

MEASUREMENTS

- Thermal resistivity, rho (ASTM D5334 and IEEE 442 compliant)
- Thermal conductivity (ASTM D5334 and IEEE 442 compliant)
- Thermal dryout curves (ASTM D5334 and IEEE 442 compliant)
- Thermal diffusivity
- Volumetric specific heat

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DETAILED DESCRIPTION OF SERVICES

BASIC THERMAL RESISTIVITY/CONDUCTIVITY TESTING

(ASTM D5334, IEEE 442)

The thermal resistivity/conductivity of a customer-supplied sample is measured at the moisture and density conditions at which the sample is received. Measurements are made at three locations in the sample at room temperature and are conducted in accordance to ASTM Test Method D5334 and IEEE 442. A brief report describing the test method and results is emailed to the customer within 10 working days of sample receipt at METER. Testing and delivery of results can be expedited for a fee. Soil samples should be shipped in confined containers to preserve desired bulk density. Minimum sample size is 4 cm diameter X 10 cm length.

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THERMAL RESISTIVITY TESTING: “AS-RECEIVED” WATER CONTENT PLUS OVEN DRY

(ASTM D5334, IEEE 442)

The thermal resistivity/conductivity of a customer-supplied sample is measured at the moisture and density conditions at which the sample is received, and at the oven-dry condition to characterize the worst-case thermal scenario. Measurements are made at three locations in the sample at room temperature and are conducted in accordance to ASTM Test Method D5334 and IEEE 442. The as-received water content and dry bulk density are also reported. A brief report describing the test method and results is emailed to the customer within 10 working days of sample receipt at METER. Testing and delivery of results can be expedited for a fee. Soil samples should be shipped in confined containers to preserve desired bulk density. Minimum sample size is 4 cm diameter X 10 cm length.

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THERMAL DRYOUT CURVE

(ASTM D5334, IEEE 442)

The thermal dryout curve (thermal resistivity vs. water content relationship) is determined on a customer-supplied sample.

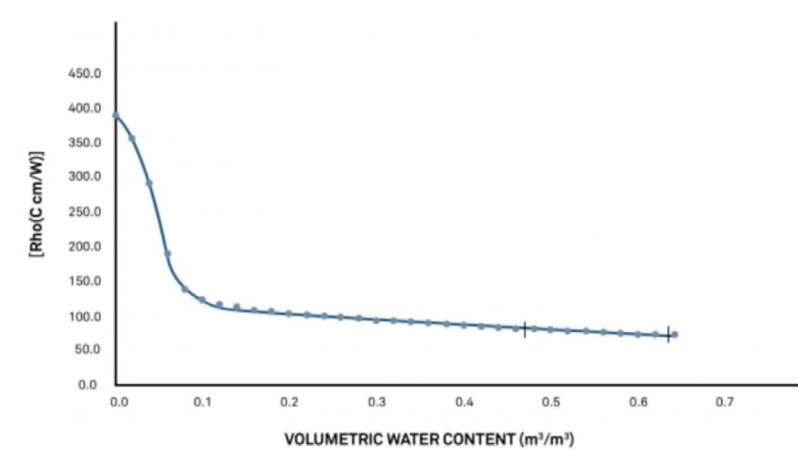


Figure 1. Thermal dryout curve

Thermal resistivity measurements conforming to ASTM Test Method D5334 and IEEE 442 are made at the as-found water content, saturated, and oven-dry conditions at room temperature. The thermal dryout curve is then interpolated using the combination method described [here](#). The sample dry bulk density is also reported. A brief report describing the test method and results is emailed to the customer within 10 working days of sample receipt at METER. Testing and delivery of results can be expedited for a fee. Soil samples should be shipped in confined containers to preserve desired bulk density. Minimum sample size is 4 cm diameter X 10 cm length.

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THERMAL CONDUCTIVITY, RESISTIVITY, DIFFUSIVITY, AND VOLUMETRIC SPECIFIC HEAT

The thermal conductivity, resistivity, diffusivity, and volumetric specific heat are determined on a customer-supplied sample in the as-received condition using the dual needle heat pulse method. All measurements are made at room temperature. A brief report describing the test method and results is emailed to the customer within 10 working days of sample receipt at METER. Testing and delivery of results can be expedited for a fee. Note that the sample needs to be at least 2.5 cm X 2.5 cm X 3 cm, and soft enough for direct sensor insertion or able to be drilled with 1.27 mm diameter X 3 cm long hole. Please [contact METER](#) to discuss size and material limitations.

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SAMPLE TEMPERATURE CONTROL

Sample temperature can be controlled for any of the thermal testing procedures that are available through METER Lab Services. The range of available temperature control is -40 C to +150 C. Please [contact METER](#) to discuss temperature control needs.

EXPEDITE FEE

Any thermal testing procedure that is available through METER Lab Services can be expedited from the typical 10 working day turnaround time. Most services can be expedited to 3-4 working days, but some services that require drying of large soil samples may require longer. [Contact METER](#) for expedited turnaround time estimates.

SAMPLE COLLECTION

See [Instructions for collecting samples for thermal analysis](#).