

METER



Thermal conductivity-simplified

Constructing a thermal dryout curve is a painstaking process with the potential for human error. Time and effort go into acquiring and setting up the right components, plus you spend hours mixing samples, taking measurements, and fitting the data into a curve. VARIOS is introduced to do all this work more accurate, more reliable and more automated.

Engineered for accuracy

VARIOS was specifically designed to create thousands of thermal dryout curves for the 400 mile Suedlink underground cable installation in Germany. So it's engineered to be accurate, affordable, and low maintenance. It combines legendary TEMPOS and HYPROP technology to measure thermal conductivity as a function of soil water content. And it's easy. Just insert the needle into a saturated soil sample, and put it on the balance. VARIOS automatically makes hundreds of precision thermal conductivity measurements while the water evaporates from the sample. The mean water content is calculated based on a continuous recording of the sample weight change. Powerful software does all the calculations, visualization, and fitting automatically, reducing the possibility of error.

Reliable and compliant all-in-one solution

The ASTM D5334 compliant VARIOS uses the transient line heat source method. That means it's a reliable measurement with short heating phases and low heating power. This reduces water movement due to heating and convection and reduces the measurement time. It automatically corrects for temperature drift, and heating power and time can be optimized for specific materials or properties. Plus, every dryout curve has hundreds of data points, so you get the detailed information you need to make the right decisions. And VARIOS is an all-in-one solution. It comes with everything you need to make complete thermal dryout curves including cables, installation tool, and software.



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VARIOS AUTOMATED THERMAL DRYOUT CURVES

METER

Features

- Low cost, flexible, robust, and easy to use
- Automated measurement saves time and effort
- Continuous and precise weight measurements make it possible for a direct correlation between thermal conductivity and water content
- Ability to define relevant parameters for your specific application
- Two measurement methods: continuous and point by point
- Space saving design and ability to measure smaller samples
- All in-one, user-friendly data acquisition and evaluation software
- Conforms to industry standards ASTM D5334
- Reliable measurement with short heating phases and low heating power
- Temperature measurement accuracy ± 0.1 °C and resolution 0.01 °C
- Automatic temperature drift correction
- High measurement accuracy and wide range of application with adjustable measurements
- Heating power and time can be optimized for specific materials/properties
- Can perform parallel weight measurements
- Use the HYPROP/VARIOS Connector to calculate soil moisture release curves and thermal dryout curves simultaneously.

Thermal Conductivity Sensor TC-S100 and TC-S70	Range Accuracy	: TC-S70 se TC-S100 s : ±5°C	ensor sensor	1.3-10.3 W/m 0.8-6.0 W/m
Temperature Sensor	Storage/Dryi Operating Ra Resolution Accuracy	ngrange:- ange: :0 :±	-50 to 12 40 to 85).01°C :0.1°C	20°C 5°C
Heater Current	Range Resolution Accuracy	: 20-200 mA : 10 µA : ±0.05%	Ą	
Heater Power	Range Resolution Accuracy	: 0.5-20 W/r : 20 mW/m : ±0.1%	n (depe	nding on sensor needle)
Communication Specifications	Computer con	npatibility	: Windo	ows 10 or newer
LABROS Balance Specifications	Weighing rar Readout Reproducibil Linearity Adjustment Connection t	nge lity to computer	: 2,200 : 0.01 (: 0.01 (: 0.01 (: intern : USB) g g g g nally
Compliance (CE Mark)	Manufactured under EM ISO/IEC 17050:2010			

Technical Specifications

