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 IEEE 442-2017 and 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.

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 IEEE 442-2017 and 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

Technical Specifications

Thermal Conductivity Sensor TC-S100 and TC-S70	**Range**	: TC-S70: 1.3-10.3 W/m
		TC-S100: 0.8-6 W/m
	Accuracy	: ±5°C
Temperature Sensor	**Storage/Drying range**	: -50 to 120°C
	Operating Range	: -40 to 85°C
	Resolution	: 0.01°C
	Accuracy	: ±0.01%
Heater Current	**Range**	: 20-200 mA
	Resolution	: 10 µA
	Accuracy	: ±0.05%
Heater Power	**Range**	: 0.5-20 W/m (depending on needle sensor)
	Resolution	: 10 mW/m
	Accuracy	: ±0.1%
Communication Specifications	**Computer compatibility**	: Windows 10 or newer
HYPROP Balance Specifications	**Weighing range**	: 1800 g
	Readout	: 0.01 g
	Reproducibility	: 0.01 g
	Linearity	: 0.01 g
	Adjustment	: internally
	Connection to computer	: USB
Compliance (CE Mark)	Manufactured under ISO 9001:2015 EM ISO/IEC 17050:2010	