

Determine Thermal Conductivity of Fluids

with the

Lambda Measuring System



Measuring System Lambda with LabTemp 30190

Characteristics

- For fluid, powder, gel and nano fluid
- Determination of thermal conductivity and diffusivity based on ASTM D 2717
- -30 ... 190 °C (-22 ... +374 °F)
Ambient ... +300 °C (Amb. ... +572 °F)
no external cryostat required
- Down to -50 °C (-58 °F) with pre-cooler
- Ambient pressure or pressurized up to 35 / 200 bar (500 / 2.900 psi)
- Sample volumes of 45 ml

Fluid, powder, gel and nano particle

The Measuring System Lambda with the thermostating units LabTemp 30190 and LabTemp 300 enables you to measure the thermal conductivity of fluids, powders, gels and nano particles based on ASTM D 2717.

New: High temperature up to +300 °C

Our Measuring System Lambda with thermostat unit LabTemp 300 can measure from ambient (room temperature) up to +300 °C (+572 °F) and with the pressure cell at conditions up to 100 bar (1.450 psi).

No external cryostat required

In a wide temperature range of -30 to 190 °C (-22 to +374 °F) no additional cryostat or special cooling liquids are required. The temperature range is covered by use of thermoelectric modules with tap water as cooling medium. This is an advantage especially for temperatures below 0 °C (32 °F) and above 100 °C (212 °F), because no change of cooling liquid is needed.

A cooling water supply of 800 ml/min at a water temperature of +8 °C (+47 °F) is sufficient to reach the minimal temperature of -30 °C (-22 °F). At a higher throughput or lower water temperature the minimum temperature can even be lower than that.

For extended temperature range down to -50 °C (-58 °F) you can use a cooling-water pre-cooler – a cost-effective alternative to cryostats with the same capacity.

The thermal conductivity is measured directly in the sample. The homogeneous temperature control excludes convective influences.

Short measuring times

Due to the very high speed of the thermo-electric heating/cooling and the extreme temperature homogeneity of the LabTemp 30190 short measuring times are achieved, thereby the measuring frequency is increased significantly. Only small volumes of sample (approx. 45 ml) are sufficient to execute reliable measurements.



Lambda with LabTemp 300 – for high temperatures

Ambient or pressurized

The Lambda Measuring Site can be used for unpressurized, pressurized measurements up to 35 / 200 bar (500 / 2.900 psi) – up to 100 bar (1.450 psi) with LabTemp 300 – or in relation to an inert gas flushing.

The measuring principle with an instationary heat wire allows for precise measurement of heat conductivity as well as the determination of thermal diffusivity. If the density of the sample is known the specific heat capacity as well as thermal diffusivity can also be determined.

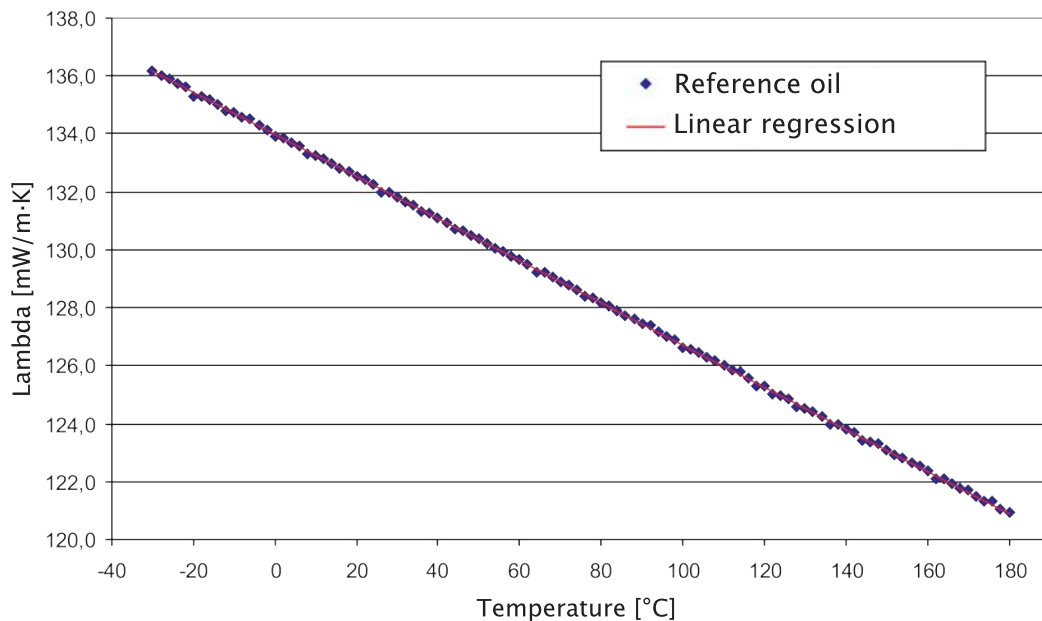
More comfort with software

The control software *LamWin* enables fast, automated measurements via PC. Measured data are visualised graphically and tabularly and can be converted to a spreadsheet compatible format.

Five measuring modes are possible: single or continuous measuring, time interval, constant temperature, temperature ramp.

Calibration Thermometer

With the certified calibration thermometer provided by PSL both LabTemp models can be automatically calibrated. This ensures permanent reliable measuring results.



Measurement example for thermal conductivity vs. temperature

Specifications:

	LM 30190	LM 300
Media:	Fluids, nano fluids, powders, gels	
Standard:	Based on ASTM D 2717 – instationary hot wire method	
Temperature range:	-30 ... +190 °C (-22 ... +374 °F)	Ambient ... +300 °C (Amb. ... +572 °F)
Resolution / Accuracy:	0,1 °C / 0,1 °C	
Measuring range:	10 mW / mK ... 2.000 mW / mK	
Reproducibility:	1 %	
Pressure range:	Amb. / 35 / 200 bar (Amb. / 500 / 2.900 psi)	Amb. / 100 bar (Amb. / 1.450 psi)
Cooling/heating power (LabTemp):	Cooling max. 400 W, heating max. 1.400 W	Heating max. 1.400 W
Counter cooling (LabTemp):	Tap water, +3 ... +25 °C (+37 ... +86 °F) @300 ... 800 ml/min	no cooling implemented
Power consumption:	LabTemp 30190: 1.900 W	Lambda: 10 W LabTemp 300: 1.500 W
Voltage input:	85 ... 264 V~ (47 ... 63 Hz) – wide range	
Weight:	LabTemp 30190: 10 kg	Lambda: 3 kg LabTemp 300: 16 kg
Dimensions (WxDxH):	Lambda: 26 x 38 x 16 cm	
	LabTemp 30190: 26 x 38 x 16 cm	LabTemp 300: 47 x 39 x 28 cm