



C3 PROZESS- UND  
ANALYSENTECHNIK GmbH

PRODUKTINFORMATION

# Hot Disk Sensoren

Unterschiedliche Sensormaterialien und Sensorgrößen

# Sensors for Thermal Conductivity Measurements



## The Hot Disk sensor

The Hot Disk sensor, at its core, is an insulated nickel double spiral, which is utilized for both transient heating and precise temperature readings. The insulation material makes the sensor mechanically stable and very durable, and the use of nickel metal in the spiral makes the thermal conductivity measurements very accurate. To accommodate different material types and sample geometries, sensors with radii from 0.5 mm up to 30 mm are available. Furthermore the sensors' insulation material can be Kapton (polyamide), mica (sheet silicate minerals) or Teflon (polytetrafluoroethylene - PTFE) to tackle different temperature ranges and/or extreme conditions.

## Kapton sensors

The Kapton-insulated sensors are the most versatile in the Hot Disk sensor portfolio. They have a very long lifetime, if handled with care, even when employed at temperatures as high as 300 °C in air. To ensure functionality the sensor should not be ripped or folded. The sensor should also be kept in its protective sheet when not in use.

Kapton sensors for Isotropic, Anisotropic, Slab, One-dimensional and Structural Probe measurements, operating temperature from -196 °C up to 300 °C (400 °C in vacuum):

Sensor design: Radius (mm):

7531 *	0.492
7577 *	2.001
5465	3.189
5465Q **	3.189 with extended Kapton
5501	6.400
5501Q **	6.400 with extended Kapton
8563	9.908
4922	14.61
4922L ***	14.61 with extended leads
5599	29.40
5599L ***	29.40 with extended leads

- \* Not for anisotropic measurements.
- \*\* For special applications and easier suspension in liquids or melts.
- \*\*\* Intended for large and very high-conducting samples.



Sensor design 5501

Kapton sensors for thin film measurements, operating temperature from -196 °C up to 300 °C (400 °C in vacuum):

Sensor design: Radius (mm):

7854	10.72
7280	14.97
7281	30.00

Also available: Specific heat capacity sensor equipped with gold cell sample holder. Ships with low density foam insulation, for use at maximum 150 °C. Maximum sample size in the gold cell: 19 mm diameter and 5 mm thickness.

All Kapton-insulated sensors can be acquired with or without attached cables. Standard cables can be used up to 50 °C while high temperature silicone cables are available for temperatures up to 180 °C. Sensors without cable can be mounted in dedicated sensor holders for use up to 300 °C (400 °C in vacuum or inert atmosphere).

## Mica sensors

The mica-insulated sensors are designed for measurements at elevated temperatures, typically above 300 °C and up to a maximum of 1000 °C. Due to the strain exerted on the sensors under these circumstances, the lifetime of mica-insulated sensors is limited and they should be considered disposable.

Sensors for Isotropic, Anisotropic, Slab and One-dimensional measurements, operating temperature from 300 °C up to 1000 °C:

Sensor design: Radius (mm):

5465 *	3.189
5082	6.631
4921	9.719
4922	14.61
4922L **	14.61 with extended leads
5599	29.40
5599L **	29.40 with extended leads

- \* For applications with thermal conductivity larger than 5 W/(mK), the Cp-value must be known beforehand.
- \*\* Intended for large and very high-conducting samples.



Sensor design 4921

The mica-insulated sensors are delivered without cables and the sensors are instead mounted in special sensor holders to which electrical leads are attached.

## Teflon sensors

Teflon-insulated sensors are designed for use in extreme conditions, such as acidic or corroding environments, or with sticky and reactive samples. These sensors otherwise have features similar to the Kapton sensors.

Teflon sensors for Isotropic, Anisotropic, Slab, One-dimensional and Structural Probe measurements, operating temperature from -196 °C up to 250 °C:

Sensor design: Radius (mm):

7577 *	2.001
5465	3.189
5501	6.400

- \* Not for anisotropic measurements.



Sensor design 5465

The Teflon-insulated sensors can be acquired with or without attached cables. Standard cables can be used up to 50 °C, while high-temperature silicone cables are available for temperatures up to 180 °C. Sensors without cable can be mounted in dedicated sensor holders for use up to 250 °C.

## Cables



Kapton Sensor with standard 50°C cable.



LEMO Connector (for Standard Cable)



Kapton Sensor with silicone cable, for use in temperatures up to 180°C.



LEMO-FP Connector (for Silicone Cable).



Kapton Sensor with Silicone 180°C cable, connected to LEMO-to-LEMOP Adaptor Cable.



2 m LEMO-to-LEMOP extension cable (for use with Standard Cable).





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