

MICROCOIL™ Thermocouple

Accurate, Repeatable, Fast Response in Perpendicular Surface Measurement

The MICROCOIL™ miniature thermocouple from Watlow® provides surface temperature measurements that deliver an unparalleled degree of accuracy. This patented technology achieves critical isothermal surface temperature measurement and offers superior design flexibility.

Typical sensor-to-sensor repeatability of one to two percent (DT) can be achieved with the MICROCOIL because sensor areas that are vulnerable to normal production variances are not inside of the thermal gradient. Weld location, insulation thickness and welded tip thickness no longer impact measurement in an isothermal environment. Therefore, the inherent challenges of measuring surface temperatures no longer exist.

The MICROCOIL thermocouple utilizes Watlow's XACTPAK® mineral insulated thermocouple cable. When used with an ungrounded junction, the sensor is electrically isolated from the surface being measured. For higher voltage applications, the aluminum nitride sensor disc option can be used for additional protection.

The helix design of the MICROCOIL thermocouple elicits a faster response time because the surface temperature conducts only through the diameter of the cable and the width of the sensor disk.

Thermal analysis demonstrates the superior performance of the MICROCOIL technology. This patented process achieves critical isothermal area for a long length of a very small cable, ensuring accurate and repeatable measurement.

Standard straight sensors experience poor accuracy of response time, non-repeatable results as well as errors ranging from 20 to 30 percent and higher.



Features and Benefits

Miniature size

- Allows for precision measurement in tight spaces

XACTPAK mineral insulated thermocouple cable

- Electronically isolated and shielded 1292°F (700°C) maximum continuous temperature
- Offers exact measurement for demanding applications

Self leveling and loading

- Provides superior repeatability of measurement for a wide variety of surfaces

Typical Applications

- Environmental chambers
- Chip cases
- Heat sinks
- Packaging
- Platens

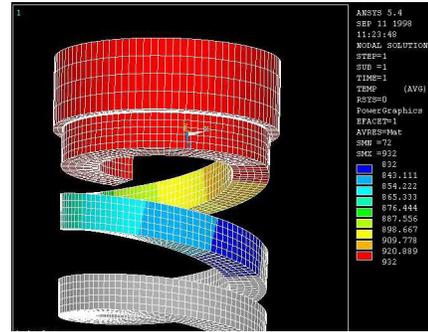
The helix design of the MICROCOIL demonstrates a faster response time because the surface temperature needs to conduct only through the diameter of the cable and the thickness of the sensor disk.

The thermal analysis to the right demonstrates the superior performance of the MICROCOIL technology. This thermocouple achieves the critical isothermal area for a long length of the very small cable, therefore insuring accurate and repeatable measurement.

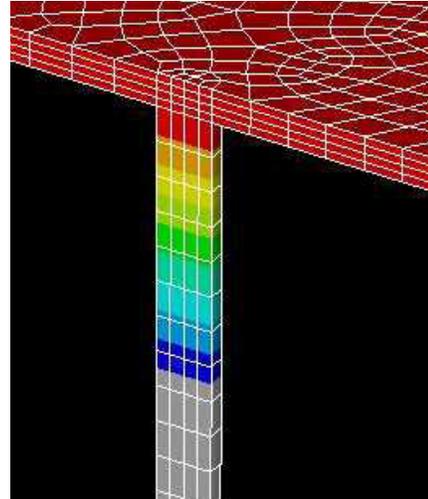
Standard straight sensors exhibit problems including poor accuracy response time and non-repeatable results as well as errors of 20, 30 percent or more.

Options

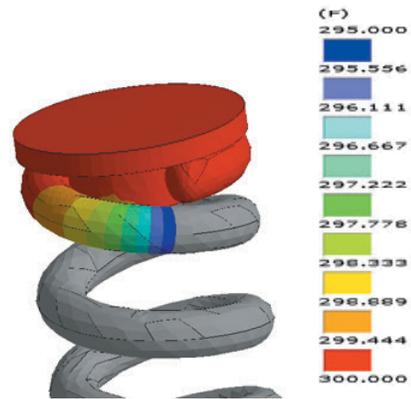
- Dual, isolated thermocouples in the same sensor
- Ungrounded or grounded junction(s)
- Type J or Type K
- RF / IR shield
- Shielded lead wire with drain, either isolated from or connected to the sensor sheath
- Individual sensor calibration



MICROCOIL Thermal Analysis



Straight Thermocouple Thermal Analysis



MICROCOIL Thermal Analysis using ANSYS DesignSpace

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