Heraeus

Heraeus Sensor Technology
Temperature Sensors for the Automotive Industry

Developments in the automotive sector exhibit trends which would have been inconceivable a few years ago. Advanced diesel engine technologies have resulted in significant reductions in both fine-particle and NO_2 emissions. A fundamental requirement for this technology is a precise drift-free temperature measurement, made possible with the Heraeus high-temperature thin film Platinum temperature sensor.

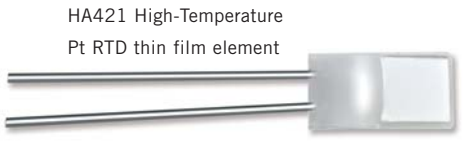
Platinum temperature sensors from Heraeus Sensor Technology improve our quality of life in numerous ways. Their application in car diesel particulate filters, in the oil sump, and in the exhaust feedback loop helps to protect the environment.

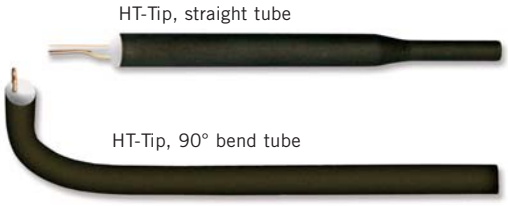
The continuous measurement of the oil temperature is a basic requirement for determining the oil quality. The continuous monitoring of oil quality results in longer intervals between oil changes and improved engine reliability.

Heraeus has also applied thin film Platinum technology to high-temperature flow sensing. Building upon standard automotive air mass-flow sensor technology, Heraeus has developed a high temperature EGR sensor.

High Temperature Pt RTD Elements

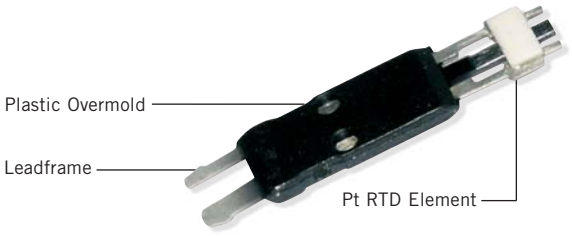
- Wide operating temperature range:
  - – 70 to + 850 °C (Type HDA)
  - – 70 to + 1000 °C (Type HA)
- Pt 200 Ohm resistance
- 3770 ppm temperature coefficient
- Choice of element size:
  - 3.9 mm long x 2 mm wide (HA421)
  - 24 mm long x 2 mm wide (HA2421)
- Excellent long-term stability – less than 5° K drift after 1000 hours @ 1000 °C with a 2 mA source current
- HA421 can be installed in areas where space is a premium
- HA2421 long length isolates the electrical connection from the high-temperature sensing area
- To insure accuracy at high temperature, the element must not be exposed to a reducing atmosphere at temperatures above 650 °C
- If installed in a closed housing, design must allow for exposure to free air
- Available prepackaged in sensor tip specifically designed for incorporation into probe assembly (type HT-Tip)





Oil Temperature Sensor

- All designs tailored to the specific requirements of the application. Design can be based upon an established design template (shown below), or a completely unique configuration
- Exposed element provides a fast response time.
- High long-term stability – less than 0.06 % resistance drift after 1000 h at 170 °C
- High-reliability Pt thin film RTD temperature sensor
- Design can accommodate pick and place assembly equipment
- Temperature range dependent upon materials of construction
- Wider operating temperature than NTC and KTY based designs



Exhaust Gas Recirculation (EGR) Flow Sensor

- Mass flow design – direct flow measurement using thermal properties of gas
- 90% lower power consumption vs. other mass flow designs
- Heater maintained at constant 470 °C temperature. Current flow required to maintain temperature is proportional to mass flow
- "Always hot" heater design prevents soot build-up and results in a very fast time response
- Double heater design allows detection of bidirectional flow and pulsed flow
- Compatible with OEMs' signal processing electronics (Heraeus does not supply signal processing electronics, but basic circuit information is available upon request)
- Available as separate heater and sensor, or with double heater and temperature sensor mounted on single substrate

Germany
Heraeus Sensor Technology GmbH
Reinhard-Heraeus-Ring 23
D-63801 Kleinostheim
Phone: +49 (6181) 35.80 07
+49 (6181) 35.81 39
Fax: +49 (6181) 35.80 65
info.hsnd@heraeus.com
www.heraeus-sensor-technology.com

USA
DWM & Associates, Inc.
1901 Route 130
North Brunswick
NJ 08902, USA
Phone: +1 (732) 940.44 00
Fax: +1 (732) 940.44 45
sales@dwmai.com
www.dwmai.com