

sensor *report*

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Sensors

Measurement
Technique

Industrial Vision

Factory Automation

Heraeus

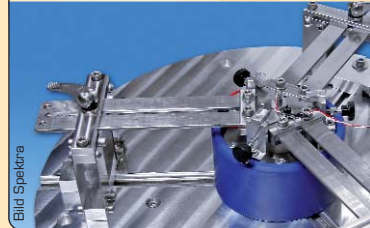


Innovation and new technology for advanced
efficiency in sensor technology

SENSORS

- Ever-Stable Platinum Sensors
- Force measurement made easy
- Force transducers with a high vibration bandwidth

MEASURING AND TESTING



- High-g vibration exciters
- Data under shock
- Confocal laser scanning microscope

APPLICATIONS & PRODUCTS

- Broken wafer edges?
- Protection for sensors inside automobiles
- Extending the life of wireless sensor networks

WDM - PROCESS INSTRUMENTATION

- Where is process automation going?

PANORAMA

- Sensor+Test 2009
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Ever-Stable Platinum Sensors

Heraeus Sensor Technology finds ways out of the raw material price trap.

As market leader in platinum temperature sensors, Heraeus Sensor Technology regards itself well equipped for all market requirements even in turbulent times. Along with further investment in production automation, the use of economical nickel connecting leads opens up new market segments that are especially price-sensitive.

Each year Heraeus Sensor Technology supplies several millions of platinum temperature sensors in thin-film technology as basic components for OEMs throughout the world. The core capabilities of the company are the development, production and international marketing of sensors for temperature and flow rate as well as modules, such as are used for example in the manufacture of gas sensors or biosensors. By far most of the products arise through cooperation with customers.

COST REDUCTION WITHOUT LOSS OF QUALITY. Apart from the high level of automation and the increase of the yield in production – for example through smaller designs for a given size of substrate – the consumption of raw materials for platinum temperature sensors is a decisive factor in the development of strategies for cost reduction and for decoupling the costs from the increasingly varying raw material prices. To date, mainly wires with a nickel core and a sheath of platinum have been used. This has the advantage that the inert properties of platinum also apply to the connecting leads.



Fig. 1: Sensor Type MN222 Pt1000 with Ni- Lead wires (All figures by Heraeus Sensor Technology)

Within the scope of process optimisation Heraeus Sensor Technology has developed a method of preventing the typical oxidation of the surface of the nickel wires during processing. The platinum temperature sensors with nominal resistances of 500 ohms and 1,000 ohms which are provided with nickel wires are already being produced and marketed as the MN series and will shortly be complemented by the Pt100. They have come through all quality tests with flying colours, especially for long-term stability, accuracy and tensile strength of the leads. In order to be able to exploit the best use of various connecting techniques, Heraeus has developed another variant based on nickel wire with a silver coating. The untreated, bare nickel wire is most easily laser welded, resistance welded or brazed, whereas the silver-plated nickel wire is ideally suited to soft soldering and crimping. The MN series of platinum temperature sensors is designed for temperatures from -70 °C to +500 °C (short-term to +550 °C) and the LN series from -50 °C to +400 °C. MN and LN sensors are available in all current tolerance classes and with the temperature coefficients TK3850 and TK3750.

ACCURATE – ROBUST – STABLE – AND ECONOMICAL.

Through a further improvement in the production process Heraeus Sensor Technology has again been able to break through a decisive price barrier for platinum temperature sensors in thin-film technology without compromising quality – thereby asserting its claim as market leader.

The development of the sensors with nickel connecting leads and the resulting reduction in costs also makes it easier for users of NTC and KTY sensors to change to the higher quality platinum sensors.

PT SENSORS ARE EVERYWHERE.

Applications in the automotive industry: for the control of exhaust gas aftertreatment in exhaust gas recirculation systems, in diesel particulate filters, for turbocharger monitoring or engine-oil condition measurement, for the supervision of transmission oil temperature or of auxiliary heating burners.

Applications in household appliances: for pyrolytic cleaning and the control of oven temperature or the monitoring and

control of electrical cooking surfaces and hobs, in moisture measurement probes for laundry dryers.

Applications in process technology: in robust resistance thermometers as replacements for thermocouples up to 850 °C in laboratory and industrial furnaces or in reliable process thermometers for chemical engineering.

Applications in heating – ventilation – air conditioning: for burner temperature control in automatic boilers, calorimetric measurement for bill-charging systems subject to calibration and for the control of circulation pumps in solar thermal systems.

Applications in life sciences: for monitoring cryogenic systems for storing tissue samples, control of sterilisation processes, temperature monitoring in dialysis equipment, for customised multi-sensor platforms or biocompatible gas-mass flow sensors.

Applications in electronics: in head-end transmitters, for optimising circuits for low energy consumption, as reference temperature sensors for transfer standards or in precision amplifiers and data loggers.

CERTIFIED QUALITY. The quality management system at Heraeus Sensor Technology complies throughout with the tough specifications of the directive ISO/TS 16949 for automotive applications. This means that risks are assessed and the production processes at the site in Kleinostheim, situated to the east of the parent company Heraeus in Hanau, are safely controlled. Linking the ERP system to the product monitoring data ensures traceability when failures occur and ultimately produces a new level in product quality.

Environmental protection is an established constituent part of the company's philosophy. The basis here is an environmental management system to ISO 14001 which ensures adherence to the principles of environmentally compatible development and production right from the start.

A finely meshed monitoring system forms the foundation of continual improvement and the company's technological superiority. In this regard the primary objective is the optimum realisation of the customer's wishes. Critical product features are defined together, development times laid down, any required product qualifications carried out and finally the process parameters optimised for large-scale production.



Fig. 2: Application in thermal solar-collectors



Fig. 3: Application in the process industry

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PLATINUM TEMPERATURE SENSORS – THE PRODUCT PORTFOLIO

Each year Heraeus Sensor Technology produces several millions of temperature sensors in platinum thin-film technology. Depending on the field of application four principal groups are available – for cryogenic (-196 °C ... +150 °C), low (up to +400 °C), medium (up to +500 °C) and high (over +1,000 °C) measurement temperatures. Versions with nominal resistance values of 100, 200, 500, 1,000 and 10,000 ohms are available. Depending on the version, the sensors are between 1.7 mm and 9.5 mm long and 1.0 mm to 3.0 mm wide. The height is 1 ±0.1 mm. The standard length of the connecting leads is 10.0 mm. Shorter or longer connecting leads are available on request. For improved labelling of the various sensor ranges, Heraeus Sensor Technology has introduced an unambiguous colour-coding system, which simplifies logistics and avoids errors in production.

Heraeus Sensor Technology supplies both SMD versions (1206, 0805 and 603) and also one type in the transistor case (T092) for the automatic assembly of circuit boards with Pt temperature sensors. Versions with nominal resistance values of 100, 1,000 and 10,000 ohms are available. The main use is temperature acquisition on circuit boards.

For specific applications measurement resistances can be supplied as special versions. Variants are possible with regard to dimensions, nominal resistance, temperature coefficient and measurement tolerance.