

Press release

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Reliable temperature measurement in electric vehicles

Sensor China Expo 2018: Platinum temperature sensors by Heraeus ensure precise, stable temperature monitoring—in batteries, charging plugs, motors and power electronics

Temperature management is one of the keys to making electric vehicles reliable, efficient and durable. Precise temperature measurement is an important prerequisite for operating electric motors close to their performance limits, achieving high charging and discharging currents, while simultaneously improving battery life. Heraeus sensors accomplish this through the use of platinum thin-film technology. [Platinum temperature sensors](#) ensure exact temperature management by being precise, drift-stable, durable, and usable in measurement ranges up to 1.000° C. Why is it so essential to reliably monitor the temperature of electric vehicle components?

Measuring temperature in real time in every cell of the battery

Achieving uniform temperature in all individual cells of the battery is a major challenge. Maximum service life can only be ensured if the temperatures of individual cells do not vary from one another by more than two degrees Celsius. The temperature must therefore be measured directly on the cell in real time. Heraeus platinum sensors are positioned and interconnected on flex boards, and the elements can be positioned directly on the hotspots with self-adhesive film.

Helping to create the infrastructure for electromobility

Charging plugs have to handle high load currents, particularly during quick charging and with consistent charging power. The heat created in this process must be effectively dissipated to prevent the battery cells from overheating and being damaged. If the temperature exceeds 55° C, the load current must be reduced, which then lengthens the charging process. Heraeus pre-fits its [sensors to circuit boards](#) which can then be positioned on the existing pin design with heat-shrink tubing or a metal spring.

Key component of electric vehicles

The electric motor and the nearby power electronics are the key components of electric vehicles and therefore of the [electromobility](#) of the future. Consistent temperature, minimal mechanical forces such as vibration, and compact design are critically important in this area. Heraeus platinum sensors are equipped with a casing and are mechanically protected. Various setup options facilitate compact, direct positioning, for example inside the engine case.

Infobox: Heraeus at the Sensor China Expo 2018

Heraeus Sensor Technology is exhibiting various product solutions for the electromobility, automotive and household sectors, as well as circuit boards in heat and water meters at booth D019.

“Electromobility requires interdisciplinary expert knowledge”

Sensor China Expo: In an interview, Dr. Andreas Schreiber of Heraeus Sensor Technology explains how manufacturers can overcome obstacles in electromobility and how the market could develop by 2040.

How do you currently assess the market for electromobility?

Today in China alone there are one million electric vehicles on the road. The government's quota system for electric cars is an essential driver in the Chinese market. Starting in 2019, foreign automobile manufacturers that produce in China must also reach minimum goals for alternative drive systems. We are convinced that the number of electric vehicles worldwide will increase from 3.2 million today to around 41 million by 2040.

Limited ranges, high purchase prices, limitations in comfort, inadequate charging infrastructure: How can manufacturers overcome the obstacles to electromobility?

First, by removing barriers to the development of product systems. That requires interdisciplinary expert knowledge, above all. That is the great strength at Heraeus: the collaboration between various fields of business and various fields of knowledge in the areas of metal, ceramics and glass. That is how we, in our capacity as partners, can cover all phases from the very beginning: development, integration, testing, and delivery. This includes, in equal measure, standardized product solutions and [product solutions that are tailored to customers' requirements](#)—both with the same high-quality “made in Germany” standards.

Where are Heraeus sensors already being used in electric vehicles?

Our sensors are already being used in electric buses and trucks in China—for winding the motor and managing battery temperature. We also have cooperative development agreements, in which we work together with manufacturers on solutions for various applications. In addition, we are currently conducting negotiations with an internationally leading manufacturer of electric vehicles in regard to special temperature sensors for its standard production vehicles.

About Dr. Andreas Schreiber:

Dr. Andreas Schreiber is Head of Sales at Heraeus Sensor Technology. He is responsible for marketing a broad portfolio of products for the automobile industry, electronics, life sciences and process technology. Visit Dr. Andreas Schreiber at booth D019 at Sensor Expo China 2018.

A globally leading technology group, Heraeus is headquartered in Hanau, Germany. Founded in 1851, it is a family-owned portfolio company which traces its roots back to a pharmacy opened by the family in 1660. Today, Heraeus combines businesses in the environmental, energy, electronics, health, mobility and industrial applications sectors.

In the 2017 financial year, Heraeus generated revenues of €21.8 billion. With approximately 13.000 employees in 40 countries, the FORTUNE

Global 500-listed company holds a leading position in its global markets. Heraeus is one of the top 10 family-owned companies in Germany. With technical expertise, a commitment to excellence, a focus on innovation and entrepreneurial leadership, we are constantly striving to improve our performance. We create high-quality solutions for our clients and strengthen their long-term competitiveness by combining unique material expertise with leadership in technology.

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