

Press release

Hanau, May 7, 2019

Technological advance in for the semiconductor industry

A challenge for semiconductor wafer testing: Heraeus now offers ultrafine testing wires with six-fold conductivity for maximum production yield in the very latest microprocessors

With up to six-fold conductivity and a diameter reduced by 50 percent, the new testing wires made of a rhodium alloy from Heraeus Precious Metals surpass the standard materials for quality control in the semiconductor industry. The technology group is thereby introducing a new dimension of quality assurance in microprocessor fabrication.

The ultrafine wires from Heraeus Precious Metals in Hanau can be used even when standard wires have long reached their limits. The manufacturers of probe cards for the semiconductor and electronics industry need this wire to fabricate needles for testing semiconductor wafers. They must adapt their probe cards to meet the challenges of progressive miniaturization.

More than two- to six-fold conductivity

The key characteristics of a good testing wire are its electrical conductivity, hardness and thin geometry. In regard to conductivity, the innovations from Hanau surpass the alloys available on the market. The conductivity of the Heraeus products is greater than 30 percent IACS, while that of conventional wires is only 5 to 14 percent IACS. The wires are elastic while exhibiting high mechanical strength even at high temperatures, and as a result, they can be used for many load cycles. Depending on need, the technology group uses different precious metals, such as palladium, platinum and rhodium, to make straight wires on spools or as wire rods.

Up to 50 percent finer than the standard

Quality control is the core element of semiconductor production. A single wafer contains as many as several hundred semiconductor chips, and every single one must be tested for 100 percent functionality. Because of the continual miniaturization of the transistors on a chip and the accompanying increase in the number of transistors per chip, ever thinner probe needles are necessary in the narrowest of spaces. At present, this means up to 30,000 on an area the size of a postage stamp. The new wires from Heraeus are less than 20 thousandths of a millimeter (μm) in diameter, which is only about one quarter the thickness of a human hair and up to 50 percent

finer than standard wires. As a result, they make it possible to set new standards for quality control in semiconductor production.

“Our new testing wires are high-performance materials. They offer our customers entirely new possibilities for quality assurance in microprocessor fabrication, thereby strengthening their pole position,” explains André Christl, president of Heraeus Precious Metals. “The new chip technologies in mobile communications – such as the current 5G – are presenting the manufacturers of smartphones and tablets with a growing need for more powerful and ever smaller chips. Heraeus aims to tap this business potential with our customers in Asia, the USA and Europe.”

Heraeus will present its new testing wires at the Semiconductor Wafer Test Workshop (SWTW) in San Diego, USA, June 2 to 5, 2019.

Manufacturing products for the semiconductor and telecommunications industry requires precision, experience, and materials and process expertise, along with the appropriate hardware. Heraeus has led the way in the production of ultrafine wire for more than 50 years. Specialty wire from Hanau is used in airbags, for example. Electrical sliding contacts are likewise a component of the product portfolio. In addition, Heraeus has decades of experience in producing high-purity quartz glass for optical fibers for the semiconductor and telecommunications industry.

More information

[Electrical Contacts and Semifinished Products](#)

About Heraeus Precious Metals

Heraeus Precious Metals – a global business unit within the Heraeus group – is a world-wide leading provider of precious metals services and products. It combines all activities related to its comprehensive expertise in the precious metals loop – from trading to precious metals products to recycling. Heraeus Precious Metals is among the world's largest refiners of platinum-group metals (PGMs) and an authority in industrial precious metals trading.

About Heraeus

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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