Heraeus

15

AWARD WINNERS

Innovation is the engine that drives our business success. Since 2003, the **Heraeus Innovation Award** has recognized the outstanding ideas and achievements of the company's researchers and developers. These 15 extraordinary products provide proof that a spirit of discovery and interdisciplinary thinking generate exciting new innovations.

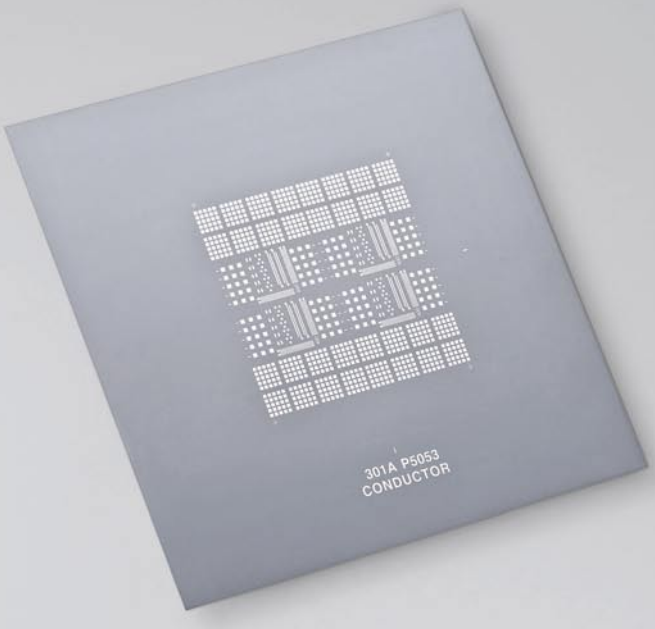
“Innovations are a key element of our growth strategy. They should open new market segments and generate new technologies for our companies — and that is exactly what our Innovation Award winners have done.”

Dr. Frank Heinricht,
Board of Management of Heraeus Holding GmbH

2003 // Danny Habets, Heraeus Electro-Nite

SENSOR FOR MEASURING SULFUR CONTENT

Heraeus' Celox® Hot Metal Probe sensor makes it possible to directly determine the sulfur content of molten steel. Sulfur is an unwanted component of steel that can make it brittle, and faster measurement of sulfur content means fewer delays in the production process. The sensor is directly submerged in the molten steel and determines the sulfur content in seconds using an electrochemical measuring method.



2003 // Christina Modes, W. C. Heraeus

HERALOCK®– GLASS CERAMIC TAPE WITH ZERO-SHRINK TECHNOLOGY

LTCC tapes (Low Temperature Cofired Ceramics) play a key role as a base material in complex, miniaturized circuits. With the patented HeraLock® LTCC material system, Heraeus has developed a glass ceramic tape that makes it possible to utilize nearly the entire available size of substrates. The reason: The tape barely shrinks at all during the sintering process.

2003 // Dr. Ralph Sattmann, Heraeus Quarzglas

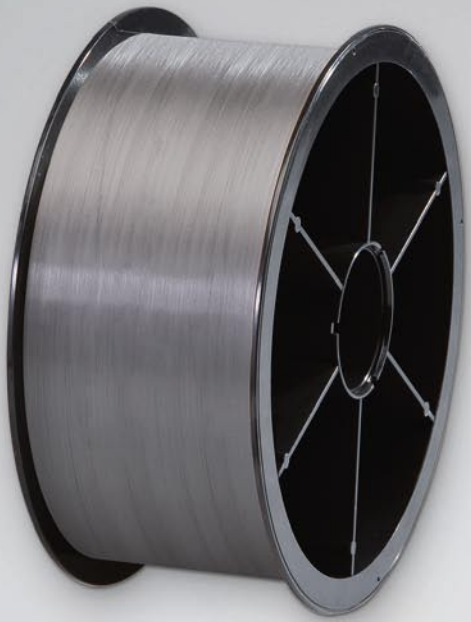
ONLINE RIC TECHNOLOGY

High-purity fused silica cylinders and tubes serve as preforms for the production of high-performance optical fibers for optical data transmission in the telecommunications industry. Heraeus' online RIC technology — RIC stands for "rod in cylinder" — significantly reduces production costs for optical fibers. Just one RIC preform is sufficient to draw a glass fiber 6,000 kilometers long.

2004 // Paul Verstreken, Heraeus Electro-Nite

ALZIN SENSOR FOR MEASURING ALUMINUM IN LIQUID ZINC

Zinc is used to prevent corrosion in steel. Small amounts of aluminum are added to the zinc for stability. With the AlZin sensor, Heraeus has made it possible to directly and continuously measure the aluminum concentration in zinc baths without the need for time-consuming sampling processes. Producers can immediately adjust the amount of aluminum in the event of a deviation — reducing waste and providing time and cost savings for the steel industry.



2004 // Bernd Spaniol, W.C. Heraeus

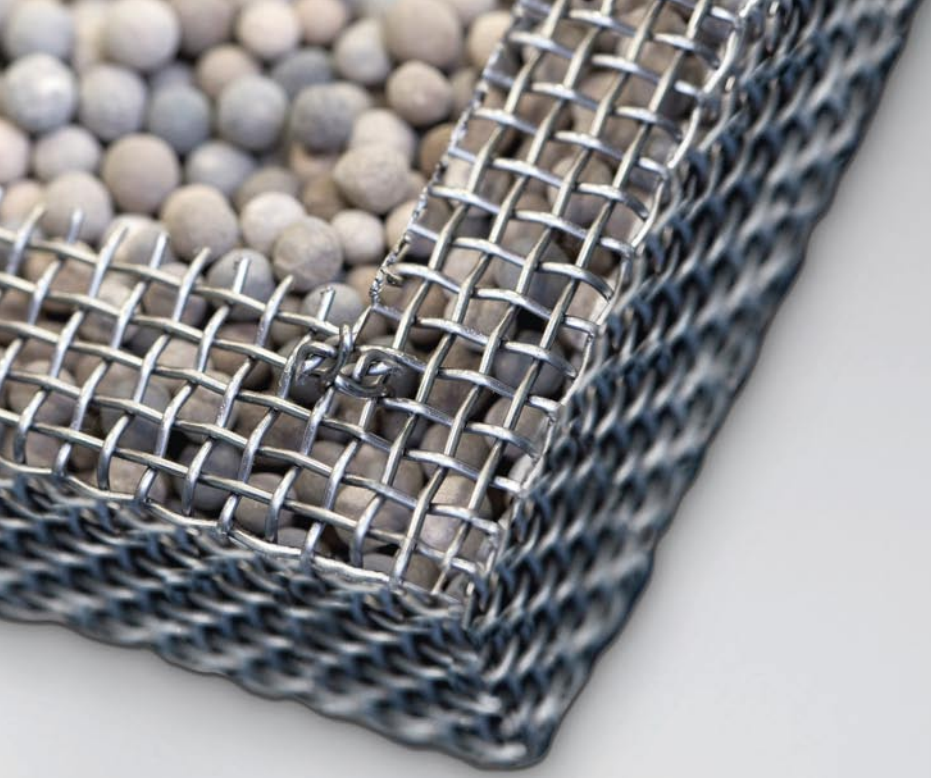
NIOBIUM PHOSPHORUS CONTACT WIRE

The high temperature-resistant niobium phosphorus contact wire — suitable as a contact wire for standard capacitors in the electronics industry — is a cost-effective alternative to commonly used tantalum wire. The production rate for tantalum is 20 times lower than that for niobium, which contributes to significant cost increases during boom periods in the electronics industry. As a result, capacitor manufacturers are vulnerable to fluctuations in the price of tantalum.

2004 // Jeremy Woffendin, Heraeus Noblelight

LASER EXCITATION LAMP

When a laser excitation lamp for industrial lasers lasts six times longer than standard models, users such as the automotive industry realize a significant financial advantage. Heraeus collaborated with a university to develop a pulsed laser lamp with a lifetime of 1,500 hours instead of just 250 hours.



2005 // Dr. Uwe Jantsch, W.C. Heraeus

MULTIPHASE CATALYST FOR SELECTIVE ELIMINATION OF NITROUS OXIDE

Nitrous oxide — a greenhouse gas with 310 times the damaging potential of carbon dioxide — is an unwanted byproduct of chemical fertilizer production. Heraeus has developed a multiphase catalyst that selectively destroys nitrous oxide during the production process. A secondary catalyst made from ceramic and coated with precious metal cuts emissions of this greenhouse gas by more than 90%, making an important contribution to environmental protection.

2005 // Martin Kendall, Heraeus Electro-Nite

CASTEMP™ – THROUGH-WALL SENSOR

In continuous casting, the most modern steel production process, the key is to maintain an exact temperature of 1,550°C while casting the molten steel. With the CasTemp™ sensor system developed by Heraeus, steel manufacturers can directly and continuously measure the temperature of liquid steel during this production step. The advantages for the steel industry: higher process reliability, improved product quality, energy cost savings, and less waste due to prematurely cooled steel.

2005 // Wolfgang Schmitt, W. C. Heraeus

SOLDER PASTES WITH RESIN- AND RESIDUE-FREE FLUXES

Resin-free solder paste gel makes it possible for manufacturers to assemble circuit boards (e.g. for power electronics) without unwanted resin or flux residue. Heraeus was able to reduce flux residue from 35 to 2 percent by volume with its new solder paste. This advance has significantly reduced circuit board contamination, improving the overall quality of tracks and contacts in electronic components.

2006 // Johan Knevels, Heraeus Electro-Nite

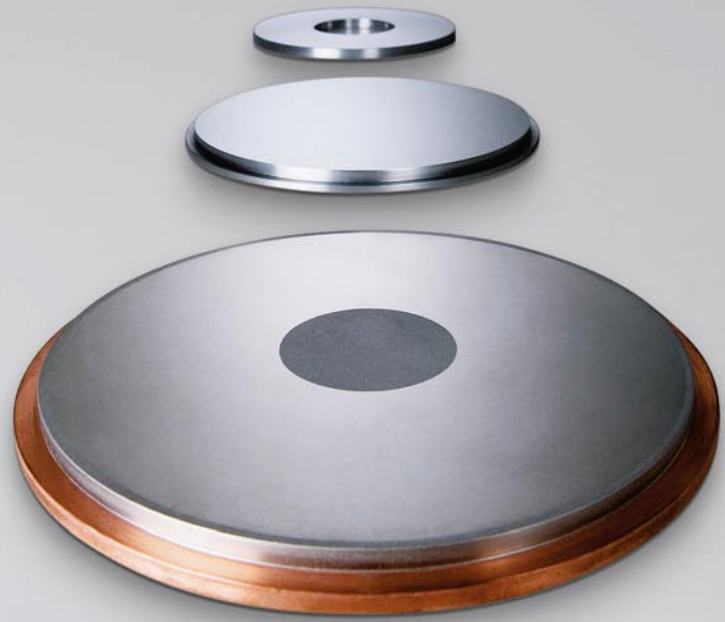
DELTA DIST® FOR THE STEEL INDUSTRY

Delta Dist®, the smart disposable sensor with an electromagnetic measuring system, determines the filling level of molten steel in transport containers in seconds. This allows the ladles (converters with a capacity of over 300 tons) to achieve the optimum fill level. Steel manufacturers save time and costs, because they can boost productivity by up to five tons more steel per ladle.

2006 // Dr. Andreas Utterodt, Heraeus Kulzer

UNIVERSAL COMPOSITE FOR PERFECT DENTAL FILLINGS

The better a dental filling material can seal a cavity, the longer the tooth can remain healthy and functional. Filling materials also have to withstand the impact of sustained chewing and be biologically compatible. An innovative universal composite with nanotechnological know-how meets all of these requirements. It demonstrates a significant reduction in shrinkage and can be used for fillings in both incisors and molars.



2006 // Kyung H. Chung, W.C. Heraeus

MANUFACTURING PROCESS FOR COATING MATERIAL

Special metallic alloys used for magnetic data storage are applied in thin layers with sputtering targets. Heraeus has developed a new production process for alloys consisting of cobalt, platinum, chrome, and ceramic components with a special microcrystalline structure and specific magnetic properties. The hard drive industry can use these sputtering targets to dependably produce the next generation of data storage media (vertical recording), increasing storage density up to tenfold.

2007 // Silvia Werner, W. C. Heraeus

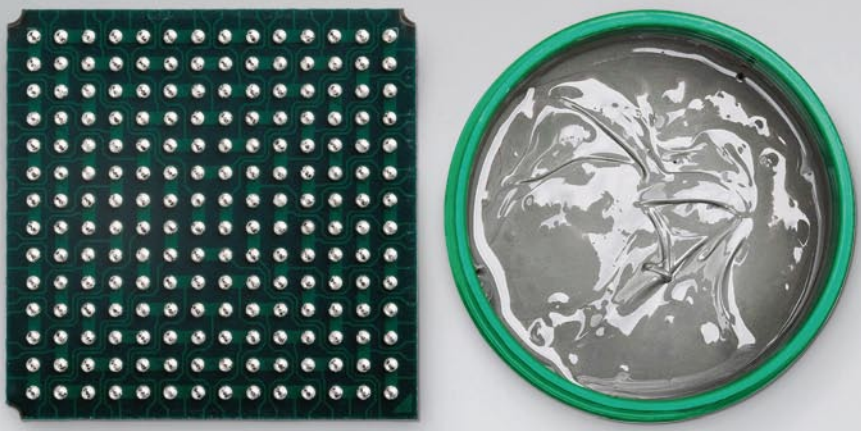
QUARTZ GLASS MICROPHOTOREACTOR GENERATES HIGH YIELDS OF ACTIVE INGREDIENTS FOR CHEMOTHERAPY DRUGS

A quartz glass microphotoreactor can manufacture high yields of key molecules for pharmaceutical ingredients such as irinotecan, which is used to treat colorectal cancer. In contrast to existing photolytic reactors, the system developed by Heraeus permits continuous synthesis. It also conserves space and reduces costs, because it uses concentrated reaction solutions and therefore requires less solvent.

2007 // Dr. Stephan Thomas, Heraeus Quarzglas

SUPRASIL® 501 — DURABLE QUARTZ GLASS FOR MICROLITHOGRAPHY

With Suprasil® 501, Heraeus has developed an especially durable generation of quartz glass for microlithography lens systems for manufacturing microchips. In its lifetime as a wafer in stepper optics, fused silica must withstand more than 200 billion laser pulses. Suprasil® 501 meets these specifications. The reason: Hydrogen molecules present in the glass can repair laser-induced defect centers that would otherwise degrade its outstanding optical properties.



2007 // Paul Niemczura, W.C. Heraeus

INNOVATIVE FLUX FOR CIRCUIT BOARDS

Modern electrical circuits consist of many tiny components that are soldered to the appropriate tracks with spheres containing tin to form an electrical connection. However, the spheres can roll off the substrate during the soldering process, creating defects that can later cause the component to malfunction. This innovative combination of flux and ultrafine-pitch solder powder holds the solder paste spheres in place, preventing them from rolling off the circuit board.

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