

Heraeus



60 Seconds.....A Minute of Technology Updates Heraeus Thick Film Materials Division

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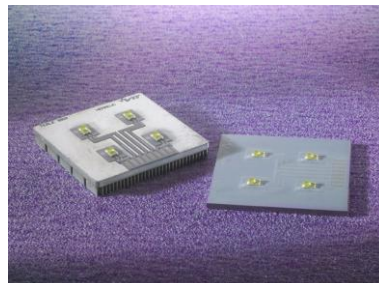
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Message From Heraeus

Although there are reports of growth and activity in some sectors, the latest news shows that the U.S. economy is still struggling with a slow recovery. This trend unfortunately holds true in the electronics market on a global scale.

Despite the struggling economy, we continue to be committed to partnering with our clients on new developments as well as providing a high level of customer support. While many companies have been forced or chosen to diminish these efforts, we have expanded our R&D and Technical Services teams to increase our response to

Two New Products Launched To Meet Customer Needs



Two new product lines have successfully launched at Heraeus. Here are the details on **IAMS**, an **Insulated Aluminum Materials System**, and our **Thick Print Copper System**.

IAMS is a Thick Film Materials System that Heraeus Materials Technology

LLC Thick Film Division developed as an insulation system for aluminum substrates. This single-part system offers selective deposition and low design-change costs compared to metal-core PCBs. It offers excellent heat dissipation for high-power applications in a variety of applications including LED substrates; signals, signs and displays; and heaters. The system is compatible with 3000, 4000 and 6000 series aluminum substrates, and all materials can be fired at less than 550 degrees C. Its unique glass system minimizes bowing on aluminum while providing high dielectric breakdown strength and good thermal conductivity. Recently, the IAMS system was the subject of an article published in *LEDinside*, a major publication for the LED industry. Please click [here](#) for a link to the article.

Thick Printing Cu Conductor Paste System

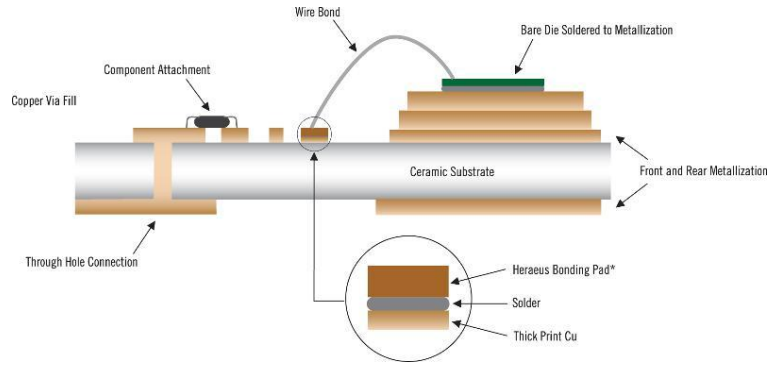
customer requests as well as help bring new thick film developments to market. Further, we are pleased to report that the addition of the cermet businesses purchased from LORD Corporation and BASF has gone well and these materials are now fully integrated into the Heraeus manufacturing and support systems.

As we enter the second half of 2011, we are optimistic that a commitment to excellence and partnering spirit with clients will help us all build success. We look forward to hearing about your needs and working with you.

Sincerely,

David Malanga

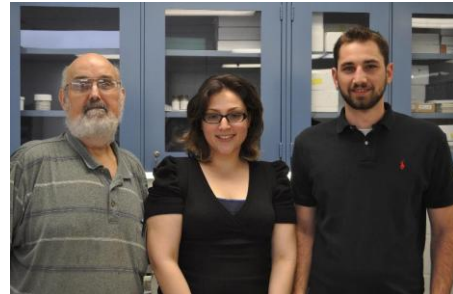
Vice President, Business Unit
Manager Americas, Thick
Film



Heraeus' Thick Printing Cu Conducting Paste System has been developed for power electronic applications that require excellent print quality, thermal conductivity and soldering properties. The thick print copper system can be applied on alumina and some aluminum nitride substrates. Heraeus' paste has been optimized for 75-micron fired thickness, with one Print-Dry-Fire (PDF) cycle. It is an ideal alternative to Direct Bond Copper (DBC) based products. This product offers the advantages of an additive process (screen printing) with no chemical residue, improved line resolution, and more than 1,000 thermal cycles with zero failures. The system can be used in a wide variety of power dissipation and demanding thermal shock applications including high-brightness LED packaging, solid-state power circuits, battery chargers, and electronic heating devices. It also has applications in IGBT (Insulated Gate Bipolar Transistor) modules where AC-to-DC and DC-to-AC conversion is required.

Welcome to Our Team!

Please join us in welcoming three new hires to Heraeus: **Rick Busch, Roger Lai and Catherine Munoz**; and in congratulating **Steve Grabey** on his promotion.



From left: Rick Busch, Catherine Munoz, Steve Grabey

Rick Busch joined Heraeus from Paralec, a company involved in producing low-temperature cure,

electrically conductive ink for printed electronics. He has an extensive background in the development and synthesis of polymers, both solvent-based and water-miscible, for the ink, paint and electronics industries. Rick received a bachelor's degree in biology from Gettysburg College, Pa. At Heraeus, Rick will be part of the thick-film technology team as a research scientist specializing in polymer chemistries.

Roger Lai has been hired as a

New Production Expansion

Heraeus has just completed an upgrade of more than \$10-million at our headquarters in West Conshohocken, Pa. We have doubled production capacity from 60-metric tons per month to 120-metric tons per month, and doubled personnel to 150 employees.

The expansion will allow Heraeus to accommodate planned growth to meet

customer demand.

Out and About

Heraeus will be participating at several major industry events over the next few months. If you are attending any of these events, we invite you to visit us at these shows and meet the Heraeus team.

Strategies in Light Europe

Crowne Plaza Linate
Milan, Italy
October 4-6, 2011

IMAPS 2011

Long Beach Convention
Center
Long Beach, Calif.
October 9-13, 2011
Booth #310

Thick-Film Technical Service Engineer for Heraeus in Asia. Roger's engineering experience in ceramic thermal substrates, and LTCC and PCB products will help him in his role as a customer service engineer as he guides Heraeus customers in their use of our products. He has a Bachelor of Science degree in math and statistics, and a Masters in engineering from National Central University, Taiwan.



Roger Lai

Catherine Munoz is a recent graduate from Rutgers University, where she earned an engineering degree in applied science. She has previous experience as a laboratory technician for the Department of Materials Science and Engineering where she created and tested a variety of material samples including oxide powders, such as alumina, titania, and carbide compounds. Catherine will support the Thick Film Technology Group as a Technical Services Technician.

Steve Grabey has accepted a position in the Thick Film Technology Group as an R&D Engineer. He began his career at Heraeus as a temporary Production Technician in March 2010 and became a full time employee in October 2010. Since joining Heraeus, Steve has provided leadership support and has contributed to many project assignments including the coordination of new equipment installation. Steve has a Bachelor of Science in Mechanical Engineering from Temple University, Pa.

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Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global private company in the business segments of precious metals, dental health, sensors, quartz glass, and specialty lighting sources. With revenues of 12 billion Euro and over 11,000 employees, Heraeus has stood out for more than 150 years as one of the leading companies involved in precious metals and materials technology.