

## Press Release

Taipei, Taiwan 13.10.2015

### **Heraeus Photovoltaics and SAS Sunrise Announce Perc Paste Joint Partnership**

- **Companies agree to collaborate to create higher efficiency PERC cells**

(TAIPEI, TAIWAN)- Heraeus Photovoltaics, the worldwide leading supplier of metallization solutions to the PV industry, today announced a joint development agreement with Sunrise Global Solar Energy (part of Sino-American Silicon Products Inc./SAS), a leading designer and manufacturer of advanced photovoltaic solar energy products. Under the terms of the joint development agreement, the two companies will collaborate on research efforts the design and formulation of front-side metallization pastes for high efficiency passivated emitter rear contact (PERC) solar cells.

With this partnership, the two companies plan to work in close collaboration to customize Heraeus' paste formulation to Sunrise's CELCO solar cell and optimize the metallization process to maximize their cell's output. Sunrise CELCO technology, a combination of PERC method and proprietary know-how developed by Sunrise, has already achieved peak cell efficiency of 21.5% in mass production of p-type monocrystalline cells, and its next milestone is to push average cell efficiency to 21.0%.

One of the unique advantages of this partnership will be the ability to leverage Heraeus Photovoltaics' track record in accelerating development from the research lab to the real world. According to Dr. Weiming Zhang, Senior Vice President Research and Development, Heraeus Photovoltaics, "Achieving maximum performance from cell designs cannot occur from innovation alone, which is why we relentlessly focus on a rapid R&D and commercialization strategy. We're very excited to partner with Sunrise to jointly develop front-side metallization pastes and to advance future performance of their PERC product line because they share that same fast-track mindset."

By leveraging Sunrise's being global leadership in the development solar cells and modules, Heraeus Photovoltaics will work to customize their highly successful SOL9621 Series for their PERC cell design. The goal will be to enable Sunrise to increase output and improve other performance parameters for their customers worldwide.

#### About the Heraeus Photovoltaics Global Business Unit

The Heraeus Photovoltaics Business Unit is an industry leading developer and manufacturer of silver metallization pastes for the photovoltaic industry. For over 40 years, Heraeus has built a reputation of innovation, extensive research and new product development in thick film technologies for some of the most prominent companies within a variety of industries. In the field of

photovoltaics, the Heraeus Photovoltaics Business Unit applies this history and its innovative technology to offer metallization pastes for solar cell applications. The Heraeus SOL Series of silver pastes is specially formulated to provide higher efficiencies and wider processing windows, resulting in better yields and higher output for cell manufacturers.

Heraeus, the technology group headquartered in Hanau, Germany, is a leading international family-owned company formed in 1851. With expertise, a focus on innovations, operational excellence and an entrepreneurial leadership, we strive to continuously improve our business performance.

We create high-quality solutions for our clients and strengthen their competitiveness in the long term by combining material expertise with technological know-how. Our ideas are focused on themes such as the environment, energy, health, mobility and industrial applications. Our portfolio ranges from components to coordinated material systems which are used in a wide variety of industries, including the steel, electronics, chemical, automotive and telecommunications industries.

In the 2014 financial year, Heraeus generated product revenues of €3.4 bn and precious metal revenues of €12.2bn euros. With around 12,600 employees worldwide in more than 100 subsidiaries in 38 countries, Heraeus holds a leading position in its global markets.

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**Trade Press Contact:**

Kevin Chen  
Corporate Communications Manager  
Heraeus Holding  
Phone: + 86 21 3357 5261  
Fax: + 86 21 3357 5230  
E-Mail: [kevin.chen@heraeus.com](mailto:kevin.chen@heraeus.com)  
Website: [www.heraeus.com](http://www.heraeus.com)

**For additional information, please contact:**

Michael Treutel  
Head of Marketing  
Heraeus Precious Metals GmbH & Co. KG  
Heraeus Photovoltaics Global Business Unit  
63450 Hanau, Germany  
Phone: +49 (6181) 35-2295  
[michael.treutel@heraeus.com](mailto:michael.treutel@heraeus.com)

Website: [www.pvsilverpaste.com](http://www.pvsilverpaste.com)