Press Release

Jolywood and Heraeus Photovoltaics form new R&D cooperation on future high efficiency n-type metallization solutions

SHANGHAI, CHINA – April 19, 2017 – Heraeus Photovoltaics, a leading provider of technology and service solutions for the renewable energy industry, and Jolywood, a leading manufacturer of advanced solar cell technologies, signed a strategic R&D cooperation agreement to develop next generation metallization solutions for n-type mono bifacial solar cells to significantly improve performance and costs efficiencies.

Jolywood pioneers the PV-industry in high efficient n-type mono solar cells for bifacial glass/glass-module applications. It awarded Heraeus Photovoltaics last year as its preferred paste supplier as the company focuses on high efficiency mono solar cell architectures. The innovative n-type paste solutions for frontside and backside metallization provided by Heraeus enables 21% frontside and 19% backside cell efficiencies in mass production. Under the agreement, both companies share a close cooperation regarding the development of silver pastes and a strong supply relationship to further enhance the efficiencies of bifacial n-type mono cells, which have started becoming an industry trend.

Mr. Lin Jianwei, Chairman of Jolywood, highlighted, “Jolywood is a pioneer in the photovoltaic industry and engaged in such fields as backboards, cells, and power plant investment. Especially in Type-N high-performance mono double-sided cells, we offer huge advantages. To further develop our leading technologies, we are developing strong cooperations with high-quality partners like Heraeus Photovoltaics.”

General Manager Liu Yong of Jolywood said, “Since the establishment of Jolywood, we have been dedicated to exploring the cutting-edge technologies of the industry. The silver paste for the front and back side provided by Heraeus Photovoltaic supported the mass production of Jolywood Type N double-sided cells last year. By our development cooperation we hope to continuously increase the conversion efficiency of bifacial cells.”

Andreas Liebheit, President Heraeus Photovoltaics, comments, “We are very happy to see Heraeus Photovoltaics and Jolywood jointly driving innovations in the PV industry. Our cooperation is another good example how our technology leadership helps our customers to overcome the performance and cost challenges of cutting-edge solar cell technologies.”
Weiming Zhang, Chief Technology Officer, Heraeus Photovoltaics Global Business Units, adds, “The n-type mono double-sided cell currently produced by Jolywood adopts the whole set of our SOL9360A new generation n-type metallizing platform. Our cooperation marks a solid foundation to further drive joint innovation of next generation metallization solutions for high-efficiency solar cell technologies.”

## About the Heraeus Photovoltaics Global Business Unit
The Heraeus Photovoltaics Business Unit is an industry leading developer and manufacturer of silver metallization pastes as well as a provider of solutions and services 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 as well as solutions and services to increase efficiency in wafer production processes. 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. In 2016, it has been awarded one of the ten most important family owned businesses. 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 2015 financial year, Heraeus generated revenues without precious metals of €1.9 bn and a total revenue including precious metal of €12.9 bn. With approximately 12,500 employees worldwide in more than 100 subsidiaries in 38 countries, Heraeus holds a leading position in its global markets.

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