

Press Release

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Novel Cell Designs for More Efficient Solar Cells

- **Heraeus Supplies Metallization Paste for a High Performance Solar Cell With an Efficiency Beyond 20%**

Scientists of the Fraunhofer Institute for Solar Energy Systems (Fraunhofer ISE) developed a crystalline solar cell with efficiency greater than 20% using Heraeus metallization paste

Innovation and material technology are the keys to success for increasing the efficiency of solar cells. For the first time ever, scientists accomplished the development of an industry-scale c-Si solar cell with an efficiency greater than 20%. The record cell is based on the combination of two cell design technologies: MWT and PERC. In a joint research project with the Fraunhofer ISE, Heraeus has developed a via paste, which interconnects the front- and back-side of the MWT solar cell. By developing the paste for this project, Heraeus has made a considerable contribution to its success. Heraeus also supplied the front-side paste for this project.

What is an MWT-PERC solar cell?

How does an MWT-PERC cell work? As a crystalline solar cell, the MWT-PERC cell has a silicon wafer at its core. MWT stands for "Metal Wrap Through". For MWT cells, the busbars typically found on the front-side of conventional solar cells, are shifted to the backside of the cell, thereby reducing front-side shading and allowing more light to actually hit the cell. The reduction of shading increases the efficiency. The additional benefit is less paste is required. "PERC" stands for "Passivated Emitter and Rear Cell". For PERC cells, the back-side of this cell is designed so that incoming light is reflected back to the wafer, increasing the amount of energy captured from the cell. The combination of these two technologies creates a cell design that significantly increases a solar cell's efficiency relative to conventional solar cell technologies.

Why silver metallization pastes?

Silver metallization pastes are needed as the initial path for conducting the energy generated in the cell to the electricity grid. Silver is the most electrically conductive element in the periodic table and therefore, is the most widely used component for metallization pastes. The paste is screen-printed on solar cells and subsequently incorporated into the cells during a high temperature process. This process is known as a sintering process. Precisely formulated silver metallization pastes enable an optimized efficiency gain of the solar cell.

Heraeus offers their customers pastes that are specially formulated to be used for novel cell design technologies, such as the MWT-PERC-concept. Of course, there is a broad range of different pastes for the front-side and back-side metallization of conventional crystalline solar cells available. In

2011 Heraeus introduced a new series of pastes for low temperature processing.

Go to www.pvsilverpaste.com to get information on the Photovoltaics Business Unit and its product offerings.

Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global, private company with 160 years of tradition. Our fields of competence include precious metals, materials and technologies, sensors, biomaterials and medical products, as well as dental products, quartz glass and specialty light sources. With product revenues of €4.1 billion and precious metal trading revenues of €17.9 billion, as well as more than 12,900 employees in over 120 subsidiaries worldwide, Heraeus holds a leading position in its global markets.

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