

Ferro Launches More Than a Dozen Metallization Pastes at PVSEC That Improve Electrical Efficiency and Manufacturing of Solar Cells

25 new product introductions during the second half of 2011

CLEVELAND, OH—SEPTEMBER 12, 2011—Ferro Electronic Materials, a leading supplier of materials for fabricating photovoltaic silicon solar cells for more than 30 years, introduced more than a dozen metallization pastes at the 26th European Photovoltaic Solar Energy Conference and Exhibition (PVSEC), held September 5-8 in Hamburg, Germany. The new products make solar energy more cost-competitive by providing higher electrical efficiencies and/or reducing material usage. The pastes introduced at PVSEC are part of 25 product launches planned by Ferro in the second half of 2011.

“We’re helping our customers reduce their production cost per Watt,” said Jeff Edel, Global Business Director for Ferro’s Electronic Materials business. “The products we’ve just introduced offer improvements for several technologies, including traditional crystalline silicon cells, next-generation cell designs such as metal wrap through and back-side passivated cells, and low-temperature applications like thin film, module, amorphous silicon, and ITO- or TCO-coated wafers.

“We received a very positive response from cell manufacturers at PVSEC. Across a wide variety of specific customer applications, Ferro’s solutions drew strong interest.”

Double Print Front Silver Contact Pastes

Ferro’s new NS 3132 BP bottom layer and NS 3133 TP top layer double print pastes have excellent compatibility and enable printing of taller, narrower grid lines that boost conductivity and reduce shading to enhance efficiency. Ferro, in collaboration with Applied Materials, Inc., whose Applied Baccini™ Cell Systems is the screen-printing solutions leader, has formulated these pastes for higher electrical efficiency and improved paste usage.

High Efficiency Front Silver Contact Pastes

Ferro’s new NS 3130 and NS 3131 front silver pastes reduce costs while providing high efficiency, durability, and manufacturability. The products provide up to 20% savings on material usage and 0.40% absolute gains in electrical efficiency.

MWT Paste System for p-Type Cells

MWT cell technology has the potential to boost the electrical efficiency of polycrystalline silicon-based solar cells to more than 18%. Ferro’s new optimized materials system includes a next-generation rear silver plug hole paste, NS 3166 MWT, which also can be used as the p-contact paste. Its novel glass chemistry provides excellent shunt resistance to improve conductivity and strong adhesion to the silicon wafer. AL 5161 MWT back contact aluminum paste provides high open voltage current and a strong, uniform back surface field with lower material deposition over wide process conditions. It delivers excellent adhesion to both silicon and EVA films, with low

bow for wafers 180 microns thick. NS 3130 and NS 3131, described above, are cost-saving, high efficiency front silver contact pastes designed to be fully compatible with Ferro's MWT paste system.

Next-generation Aluminum Pastes

In addition to AL 5161 MWT, Ferro introduced two new aluminum pastes that enhance efficiency of next-generation cell architectures by maintaining the passivation and quality of silicon nitride antireflective coatings. AL 5169 is designed for back-side passivated cells with open vias, and is suitable for use with thin wafers. AL 5168 is a non fire-through reflector paste for passivated cell designs that is suitable for laser-fired contact geometries.

Low Temperature Silver Materials for Solar Cells

Ferro's new silver and polymer silver materials improve electrical conductivity and printability in thin film, module, and next-generation cell architecture applications. LF 7115 offers the lowest firing temperature for a silver conductor paste and provides excellent adhesion to ITO-coated or bare crystalline or amorphous silicon substrates. LF 7116 silver conductor paste fires at low temperatures on silicon and on aluminum. LF 7122 is a low temperature curable polymer silver designed for thin film tabbing and contacting TCO coatings that offers low contact resistance to TCO and low bulk conductivity. LF 7123 low temperature thermoset polymer silver is suitable for n-type wafer configurations and provides increased electrical efficiency and excellent adhesion to fired aluminum surfaces. LF 7125 low temperature curable epoxy silver is designed for dispensable applications with amorphous silicon modules such as external bus bars for TCO-coated cells.

About Ferro Corporation

Ferro Corporation (www.ferro.com) is a leading global supplier of technology-based performance materials for manufacturers. Ferro materials enhance the performance of products in a variety of end markets, including electronics, solar energy, telecommunications, pharmaceuticals, building and renovation, appliances, automotive, household furnishings, and industrial products. Headquartered in Cleveland, Ohio, the Company has approximately 5,000 employees globally and reported 2010 sales of \$2.1 billion.

#

MEDIA CONTACTS:

Mary Abood
Director, Corporate Communications, Ferro Corporation
Phone: 216-875-6202
E-mail: aboodym@ferro.com

INVESTOR CONTACT:

David Longfellow
Director, Investor Relations, Ferro Corporation
Phone: 216-875-7155
E-mail: longfellowd@ferro.com