

Manz Holds Triple World Record in CIGS Technology

- World record: thin-film solar module with 14 percent module efficiency
- CIGSfab with highest efficiency in mass production
- Manz research partner ZSW with world record efficiency of 20.3 percent

Hamburg/Reutlingen, September 5, 2011. Manz AG is presenting a thin-film solar module at the EU PVSEC 2011 trade show with an aperture efficiency of 15.1 percent, something never before achieved. This level of efficiency refers to the photosensitive area of a module, and corresponds to a module efficiency of 14 percent. This value currently marks the world record and is the result of an intensive one-year partnership between Manz, the Centre for Solar Energy and Hydrogen Research Baden-Württemberg (ZSW) based in Stuttgart, and the module manufacturer Würth Solar from Schwäbisch Hall.

The world record module presented by Manz in an optimized design is based on CIGS thin-film technology, in which a sunlight-absorbing copper indium gallium selenide (CIGS) layer is vapor deposited on the substrate. CIGS technology is currently considered the technology with the largest cost-cutting potential among the competing thin-film technology such as amorphous silicon (aSi) or cadmium telluride (CdTe). In a laboratory setting, CIGS cells have already reached an efficiency of over 20 percent today, as demonstrated by the world record cell from Manz's partner ZSW, which has an efficiency of 20.3 percent.

"The challenge of our partnership is now to significantly close the gap between the laboratory values and the levels of efficiency achieved in mass production," explains Dieter Manz, founder and CEO of the company.

With the world record module presented at the PVSEC in Hamburg, Manz has established itself as a technological leader for CIGS. The company is currently the only supplier of a fully integrated production line for CIGS thin-film solar modules that can be operated profitably today: Manz's CIGSfab. The CIGS solar module presented at the trade show, which has an original production size of 600 × 1,200 mm, offers an output of more than 100 watts and was mass-produced at Würth Solar's factory in Schwäbisch Hall.

"Since worldwide module manufacturers are currently facing a considerable decline in prices, the only manufacturers who will survive financially are those who position themselves as cost leaders and can offer products with the best possible efficiency. Our CIGSfab perfectly meets these two demands and, in addition, is also based on the thin-film technology with the most potential," explains Mr. Manz.

Manz will provide information on previously achieved innovations at the CIGSforum during the EU PVSEC. The event is being held on Tuesday, September 6, 2011, at 11:30 a.m. in the Hamburg Congress Center's Marseille conference room. Please register online at www.manz.com/cigsforum.

About Manz

Manz AG, headquartered in Reutlingen, Germany, is one of the world's leading high-tech engineering firms. Founded in 1987, in recent years the company has grown from an automation specialist into a supplier of integrated production lines for crystalline solar cells and thin-film solar modules as well as lines for manufacturing flat panel displays. One of its newest areas of business is the development and manufacture of production systems for lithium-ion batteries. The company, led by founder Dieter Manz, has been listed on the stock exchange in Germany since 2006, and currently operates production facilities in Germany, China, Taiwan, Slovakia, and Hungary. At the end of the second quarter 2011, Manz AG had approximately 1,900 employees, 800 of which work in Asia. With its slogan, "Passion for Efficiency," Manz's engineers are making a promise to offer its customers – all companies active in important future markets – increasingly efficient production equipment.

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