



Manz: update about the CIGS*fab* at Intersolar Europe

Reutlingen, June 20, 2018. Manz AG is sharing information about the technological development of its turnkey thin-film solar module factory, CIGS*fab*, at the leading European solar industry trade fair, Intersolar Europe, from June 20-22, 2018. The high-tech equipment manufacturer is also providing an update on the two large-scale projects CIGS*fab* in Chongqing and CIGS*lab* in Peking, which Manz is currently carrying out in the People's Republic of China.

As a global technological leader in production systems for CIGS thin-film solar modules, Manz is currently building two modular and configurable turnkey production lines in China. The CIGS*fab* in Chongqing, with an annual production capacity of 306 MW or roughly three million modules, will begin operations in the summer of 2019. Just a little over one year since launching the project and five months after first breaking ground in January, Manz is currently getting the equipment ready for the nearly 60,000 square meter production facility. The operator of the CIGS*fab* in Chongqing will be Chongqing Shenhua Thin Film Solar Technology Co. Ltd., its main shareholder is the world's largest energy company, the Shenhua Group.

"Everything is progressing according to plan. 3,500 tons of high-tech equipment are making their way to the Yangtze – an amount equal to about 300 containers", says Hannes Reinhardt, Vice President of the Solar business unit at Manz.

Manz's second CIGS project in China is the research line in Beijing called CIGS*lab*, which will boast an annual capacity of 44 MW. Within the joint venture NICE PV Research Ltd. Manz will work together with its partners Shanghai Electric Group Co. Ltd. and Shenhua Group Co. Ltd., to further develop the CIGS thin-film technology. The CIGS*lab* in Peking will commence production operations in the third quarter of 2019.

Manz combines expertise from its global network for the large-scale CIGS project

The project volume for the CIGS*fab* in Chongqing is roughly 260 million euros, making it the largest factory for CIGS thin-film solar modules in all of China. The key success factor lies in



Manz's internationally integrated engineering and project management. The equipment has been manufactured at various Manz locations, including the sites in Germany, Slovakia, Hungary, Taiwan and the Chinese site in Suzhou.

The joint venture NICE PV Research, founded with Shanghai Electric and Shenhua in 2017, has also operated the research line CIGS*innoline* in Schwäbisch Hall since last year. The German location and the CIGS*lab* in Peking together form the world's largest research center for CIGS technology. Technological optimization of production equipment for individual CIGS module production steps will be continuously accelerated on both lines.

"Among all the types of solar technology, CIGS holds the greatest potential for further increasing the module efficiency: an efficiency of nearly 23 percent has already been achieved in laboratories, such as those of our research partner ZSW, the Center for Solar Energy and Hydrogen Research in Stuttgart. Of course, our goal is to close the gap between the efficiency achieved in production and in the laboratories. We will make upgrade packages available to the operators of the CIGS*fabs* so they can benefit from these innovations and further improve the profitability of their lines" explains Hannes Reinhardt from Manz.

Manz is one of the few providers of scalable turnkey CIGS production lines for thin-film solar modules across the globe and offers operators a guaranteed level of output for quality-certified modules.

Photos:



Image 1: Hannes Reinhardt, Vice President of the business segment Solar at Manz AG.



Image 2: 3,500 tons of high-tech equipment for the CIGSfab in Chongqing and the CIGSfab in Peking: Manz is currently starting to ship equipment for the two production lines in the People's Republic of China.



Image 3: Layout of a Manz CIGSfab, just like the one currently under development in Chongqing. Through its global production network, the German high-tech equipment manufacturer is able to cover all of the essential steps required to produce CIGS thin-film solar modules on glass substrates.



Image 4: Manz's exhibition booth at Intersolar in Munich: The Reutlingen company informs attendees about the potential of its turnkey thin-film solar production line *CIGSfab* and the progress of current projects in Chongqing and Peking.

Both sites will commence production operations in the summer of 2019.



Company profile:

Manz AG – passion for efficiency

As a globally leading high-tech equipment manufacturer, Manz AG, based in Reutlingen, Germany, is a pioneer of innovative products in fast-growing markets. Founded in 1987, the company has expertise in five technology sectors: automation, laser processing, and measurement technology, as well as wet chemical and roll-to-roll processes. These technologies are deployed and continuously developed by Manz in three strategic business segments: "Electronics," "Solar," and "Energy Storage."

The company has been listed on the stock exchange in Germany since 2006 and currently develops and manufactures in Germany, China, Taiwan, Slovakia, Hungary, and Italy. It also has sales and service branches in the USA and India. Manz AG currently has around 1,700 employees, about half of which are located in Asia. With its claim "passion for efficiency", Manz makes the following service promise to its customers active in dynamic future-oriented industries: offering production equipment with the highest degree of efficiency and innovation. With Manz AG's comprehensive expertise in the development of new production technologies along with the equipment required for this, the company makes a significant contribution to reducing the production costs for end products and making these accessible to a broad range of buyers around the world.

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