

Oerlikon Solar Wins Cell Award 2009

**“Best Technical Product For Thin-Film Module Manufacturing”
For Oerlikon Solar KAI 1200 Deposition System**

- **Industry-leading 40 MHz technology**
- **30% cycle time improvement**
- **Improved absorber layer quality**
- **Highest thin film silicon efficiency on the market**

MUNICH, 5 June 2009. – [Oerlikon Solar](#), the world’s leading supplier of thin film silicon photovoltaic (PV) process and production equipment, has been named winner of the [2009 CELL AWARD](#), presented at the Intersolar 2009 Conference in Munich. The jury selected Oerlikon Solar’s KAI 1200 PECVD system as “the best technical product for thin film manufacturing”. “We are very proud of this achievement and recognition of Oerlikon Solar’s technology leadership and production worthy equipment” said Jeannine Sargent, CEO of Oerlikon Solar. “The award reflects our intensive research and development in thin film PV. Oerlikon Solar is committed to continue its technology leadership in executing its industry leading roadmap to make solar power economically viable”. Oerlikon Solar is the world leader in silicon-based thin film solar technology and end-to-end manufacturing solutions with 10 established customers in operation or ramp up worldwide representing 600 MWp of yearly production capacity, enough to power 480,000 households.

Oerlikon Solar’s KAI 1200 PECVD technology (Plasma Enhanced Chemical Vapor Deposition) is a machine used to deposit the silicon absorber layers that are at the heart of Oerlikon Solar’s Micromorph® thin film silicon PV technology. The deposition of these layers is one of the most critical steps in the production of thin film, and the quality of this manufacturing step determines to a large extent the overall efficiency and performance of thin film PV modules. In addition to producing high quality absorber layers, the



Page 2 KAI 1200 is designed to significantly improve the speed of manufacturing, reducing the process cycle time by over 30 percent. The improvements resulting from the KAI 1200 are a major factor in reducing the total cost of manufacturing on the path to grid parity.

Reengineered to Optimize Solar PV Production

The KAI 1200 PECVD was derived from another semiconductor manufacturing application, the production of thin film transistor (TFT) displays. Modifying and optimizing this proven PECVD technology for the production of thin film silicon PV required mastering some significant technical challenges, in particular increasing the frequency of the plasma source to improve deposition speed, while ensuring that the “standing wave effect” associated with higher plasma source frequency did not cause a loss of uniformity and sub-optimal module efficiency. Oerlikon Solar engineers successfully developed a process for using a plasma source RF excitation frequency of 40 MHz, several times higher than the industry norm of 13.56 MHz. Based on its research in partnership with the IMT in Neuchatel, Switzerland and the EPFL in Lausanne, Switzerland, Oerlikon invented a dielectric lens compensation that compensates the standing wave effect.

Record Efficiencies and Improved Absorber Layers

“The 40 MHz VHF technology incorporated into our patented Plasma Box[®] has considerably increased deposition rates and improved the absorber layer quality, resulting in record efficiency levels for Oerlikon Solar’s thin film silicon technology”, stated Dr. Juerg Henz, Head of Thin Film Engineering and Operations. Where typical deposition rates of one to two Ångstroms were reported previously, the KAI 1200 allowed Oerlikon Solar to double the deposition rate on its 1.4m² solar panels at best-in-class layer quality. Amorphous single-junction modules have shown an initial aperture efficiency of 9.6 percent, Micromorph[®] cells are already by 11 percent.



Page 3 From the first concepts in early 2000, Oerlikon Solar successfully implemented this new plasma source into mass production. Since then over 900,000 thin film silicon solar modules have been produced applying Oerlikon Solar's patented Plasma Box[®] 40 MHz technology.

"Just one more milestone in Oerlikon Solar's mission to make Solar Power economically viable."

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[Oerlikon Solar](#) offers cost-effective, field proven end-to-end solutions for the mass production of thin-film silicon solar modules. These fully automated manufacturing solutions are focused on reducing device cost and maximizing productivity. They are available as modular end-to-end solutions with metrology and upgradeability in throughput and process technology.

Oerlikon Solar has developed a unique and innovative technology based on its leadership in thin film technology and close cooperation with its customers.

Oerlikon Solar is headquartered in Trubbach, has around 800 employees in 13 locations world wide and maintains sales and service centres in the USA, Europe, China, Korea, Taiwan and Japan.

About Oerlikon

[Oerlikon \(SWX: OERL\)](#) is one of the world's most successful high-tech industrial groups specializing in machine and plant engineering. The company is a leader in the field of industrial solutions and innovative technologies for textile manufacture, thin-film solar and thinfilm coating, drive, precision and vacuum systems. With roots in Switzerland and a long tradition stretching back 100 years, Oerlikon is a global player with a workforce of more than 19,000 at 170 locations in 35 different countries. The company's sales amounted to CHF 5.6 billion and it ranks either first or second in the respective global market.