News **27th January 2011**

MVS receives orders for Cluster Tool systems for thin film silicon solar cell development from China and US and an award from US Department of Energy.

Golden, Colorado, USA: MVSystems, Inc. is pleased to announce that it has received a Cluster Tool system order from **Hebei University, Baoding, China.** The system (consisting of many PECVD and sputtering process chambers) and will be used for the development of solar cells using amorphous and nano-crystalline Silicon materials.

The University of Toledo, Ohio, has also ordered an additional chamber to expand the capability of their Cluster Tool (for rigid and flexible substrates using reel to reel cassette approach) which MVS had installed in 2009.

A Cluster Tool system, for thin film Si solar cell development was installed during Jan. 2011 at **Tian Wei Solar Films Co. Ltd., Baoding, China.**

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2 year award extension from US Department of Energy for Solar to Hydrogen conversion

MVS (with its subcontractor **The University of Hawaii- Hawaii Natural Energy Institute**) has been awarded a two year extension from the **US Department of Energy** to continue the development of photo-electrochemical cells for solar to hydrogen conversion. $1.461 million award is for the period Jan. 2011 to Dec 2012; the four year award by the end of Dec. 2012 would total $3.79 million. The focus of the work is to develop WO3, CIGS and amorphous carbide photoelelctrode driven by thin film Si tandem solar cells. The work is conducted with its partner, **National Renewable Energy Laboratory,** Golden, Colorado.

MVS is also developing a novel high efficiency thin film solar cell sponsored by **National Science Foundation**.

Products and Foundry Service provided by MVSystems Inc.

Cluster Tool systems for rigid substrates (size: 15 cm x15 cms and 30cmx40cm): different process modules such as **PECVD (fixed at 13.56MHz, pulsed, VHF), sputtering, Hot Wire CVD, rapid anneal etc. can be integrated** around a central evacuated chamber which houses a robotic arm which inserts and extracts the substrates from the process chambers.

Cluster Tool systems for flexible substrates (web width: 15cm or 30cm)-patent #6,258,408 B1: this uses a cassette which houses a flexible material. The cassette is engaged for movement of the flexible material from one reel to another during the deposition. At the end of deposition, the cassette is locked into position and disengaged from the chamber for transport to another process chamber. Hence cross contamination is eliminated for fabrication of devices (e.g. solar cells or thin film transistors) on flexible substrates. The system also allows the use of rigid substrates.

In line PECVD systems for low volume manufacture of SiNx coatings on multicrystalline Si solar cells and high efficiency hetrojunction devices (throughput ~ 500 wafers/hr.).

Foundry service: thin film Si (p,i,n), SiNx, SiOx, ZnO, ITO depositions from the in-house Cluster Tool which can handle up to 30cm x 40cm sized substrates or multiple smaller substrates in each run.

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