

SoLayTec sells lab-to-fab tools for Al₂O₃ ultrafast ALD

Imec, Fraunhofer ISE and two Asian cell manufacturers have shown their trust in the ultrafast ALD technology from SoLayTec. SoLayTec announced that the first four Process Development Tools (PDT) are sold and will be installed at customer sites in the third and fourth quarter of 2011.

Research institutes work with ultrafast ALD

These two institutes are working on Al₂O₃ for c-Si solar cells for some years already and have shown good results on efficiency improvement for new cell concepts. This was mainly done with their standard thermal ALD research reactors. In the past year it was shown that the quality of Al₂O₃ deposited by SoLayTec's ultrafast ALD is equal to standard thermal research reactors, but at over 50 times higher output. The passivation properties are also better than those deposited by PECVD. Now these two institutes add to their process portfolio ultrafast ALD from SoLayTec, which is the enabler for Al₂O₃ for mass production. The main reasons why these institutes have chosen for SoLayTec are the good layer quality, a compact tool, the ease of use and the flexibility in layer thickness and recipe choice. Equally important is the scalability of SoLayTec's technology from low to high volume production.

Asian cell manufacturers

Furthermore, two Asian cell manufacturers will soon apply ultrafast ALD Al₂O₃ for their own research. They will integrate the Al₂O₃ layer, applied by SoLayTec's machine, into their cell design. The resulting process will be introduced in their mass production in 2012, utilising SoLayTec's high volume tool.

Benefits of Al₂O₃ and ultrafast ALD

The next generation of industrial silicon solar cells aims at efficiencies of 20% and above. To achieve this goal using ever-thinner silicon wafers, a highly effective surface passivation of the cell (front and rear) is required. Al₂O₃ is well known in the PV community for its excellent surface passivation properties. Using ALD, Al₂O₃ will be deposited layer by layer, resulting in a very dense and uniform layer.

Most research institutes and solar cell manufacturers of c-Si solar cells are still in a phase of optimising the process recipe for Al₂O₃. As the research and development requires low volumes, the PDT (100 wph) is viewed as the best option for this job. When the processes have been optimised, ramping up to high volume will be possible installing the high volume tool from SoLayTec, ready for 3,600 wph.

SoLayTec's ultrafast spatial ALD principle is significantly faster than traditional ALD, making it suitable for industrial application. The wafers are transported at atmospheric pressure on a stream of gas, preventing contamination of the reactor. Moreover the tool has been designed for the lowest cost of ownership, compared to any existing deposition technique (e.g. PVD, and PECVD).

SoLayTec

SoLayTec is a spin-off company from the Dutch research organisation TNO and established in 2010. The company develops, delivers and services machines for atomic layer deposition (ALD) on solar cells worldwide. The SoLayTec ALD machines are intended for industrial production in the solar market. SoLayTec high volume production equipment will be exclusively sold by RENA GmbH on the market. RENA GmbH is a leading equipment manufacturer in the field of wet chemical processing for the PV industry.

For more information, visit the SoLayTec website: www.solaytec.org

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