

SCHMID's APCVD Machine proves itself in the Manufacturing of PERC Cells with an Efficiency of 20.74%

- APCVD proves itself with a new efficiency record in the production of the PERC cells
- The unparalleled economic backside passivation with costs less than 0.02US\$/Wafer secures the competitive advantages for cell manufacturers
- APCVD machine enables multiple consecutive coatings for various cell concepts

The SCHMID Group announces an efficiency record of 20.74% in an industry-like production process for PERC solar cells, which has been confirmed independently by the ISE CalLab. The most important features of a PERC solar cell are the passivated selective emitter layer and the backside passivation. The latter was applied with the record cells by means of the economic SCHMID Group APCVD machine which will be exhibited at PVSEC Frankfurt from September 25th to 28th.

The cells with a screen printed 3 busbar frontside were made were of Cz-Si wafers. For SCHMID's recently introduced multi busbar interconnection concept with optimized front side metallization an even higher efficiency potential of 21% is expected. This is emphasized by the fact that SCHOTT Solar has reached an independently confirmed efficiency record of 21% for the first time ever on p-type Cz-Si wafers with industry dimensions of 156mm x 156mm.

SCHMID's APCVD proves its capability in the industrial production of PERC cells. In July SCHMID specified a corresponding production line for the SCHOTT Solar licensed process. The effectiveness of the APCVD generated Al₂O₃ passivation layer is absolutely comparable to PECVD coatings but comes without the expensive vacuum technology.

Therefore, the operating expenses for SCHMID's Al₂O₃ Passivation are, with under 0.02US\$/Wafer, unbeatable - alternative processes like PECVD or ALD machines would cost 3 to 5 times as much. This means that cell manufacturers get an immediate unparalleled economic solution from SCHMID, which will allow them to boost their earnings in a highly competitive market.

The process for the Al₂O₃ backside passivation with the APCVD has been developed by SCHMID Group development engineers in SCHMID's own technology center in the Freudenstadt headquarters. Working together with the University of Konstanz top

performance data of the passivated wafers was demonstrated (carrier life time of 5.8ms).

The APCVD shows itself to be a flexible Platform Technology additionally for various cell concepts like bifacial cells, IBC cells etc. Possibilities are, for example, the deposition of TiO_2 and SiO_2 , PSG and BSG. The latter is especially interesting for the upcoming n-type wafers.

The SCHMID Group offers two APCVD machine generations, in which the first generation has 96 successful machines in operation in the PV industry since 2004. For the PERC process the new machines are fitted with ceramic transport rollers, to further improve the already low operation costs by thermal efficiency. With 5 tracks the system reaches a throughput of up to 4,000 wafers per hour and is available with 2 to 5 injector heads for multiple consecutive coatings. SCHMID also offers a diffusion furnace for PSG and BSG.

The SCHMID Group is able to prove once again its leading role as an innovative system supplier for the photovoltaic industry with the economic passivation process and the flexible product range for further APCVD processes.

Overview of the SCHMID APCVD Advantages

- Single economic Al_2O_3 deposition for mass production
- Inline movement prevents complex handling and secures the lowest breakage rate
- Maintenance friendly design with an uptime of > 98%
- Continuous optimization and research in our own technology center
- APCVD technology is suitable for various cell concepts in the PV industry and for the application in other industries

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SCHMID welcomes you at PVSEC Frankfurt on booth B06 in Hall 3.0.

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