

## Corporate News

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**centrotherm presents groundbreaking products and processes for the manufacturing of high-efficiency solar cells at the SNEC PV in Shanghai**

- **centrotherm c.REG regeneration furnace for the reduction of light induced degradation (LID)**
- **PECVD process for aluminum oxide coating (AlO<sub>x</sub>)**
- **Low-pressure boron diffusion for bifacial n-type solar cells**

*Blaubeuren, April 27, 2015* – From April 28 to 30 centrotherm will be presenting new pioneering products and processes for the production of crystalline solar cells at the main Asian photovoltaic trade fair SNEC PV in Shanghai. These allow manufacturers the next step from the standard solar cell to the production of highly efficient PERC and n-type solar cells. The newly developed centrotherm products and processes can be optimally integrated into existing mass production and achieve cell efficiencies of more than 20%.

### **Newly developed regeneration furnace c.REG reduces significantly light induced degradation (LID)**

After first exposure to light mono-crystalline p-type solar cells might suffer performance losses due to light induced degradation (LID). This effect is ascribed to recombination active boron oxygen (B-O) complexes in the wafer bulk that reduce conversion efficiency substantially.

To passivate B-O-defects centrotherm developed a regeneration process and corresponding equipment that is applied directly after fast firing, after sorting or even before module manufacturing. LID is significantly reduced with the belt furnace c.REG. A particularly efficient and quick regeneration can be achieved in connection with the direct plasma process of the centrotherm PECVD system c.PLASMA.

### **centrotherm aluminum oxide PECVD process for the manufacture of PERC solar cells**

Many cell manufacturers are turning towards more complex cell architectures with higher efficiencies. Therefore, the next generation of crystalline solar cells requires a highly effective surface passivation of front and rear side of the wafer.

The newly developed centrotherm process for the rear side passivation by AlO<sub>x</sub>/SiN<sub>x</sub> stacked layers is characterized by excellent surface passivation properties. Furthermore, the centrotherm c.PLASMA PECVD system provides improved process flexibility for further dielectric layers (SiON<sub>x</sub>, SiO<sub>x</sub>, etc.) in both mono and multi solar processing.

The process is offered as an upgrade package for the centrotherm PECVD system c.PLASMA as well as in new systems.

## **Low-pressure boron diffusion for bifacial n-type solar cells**

N-type solar cells are increasingly getting into the focus of solar cell manufacturers as they have a higher efficiency potential and show no light induced degradation. In the framework of the BiSoN alliance with the ISC Constance, centrotherm is offering process and system packages for the mass production of this cell concept since last year. Now, centrotherm launches an additional new low-pressure process for highly efficient boron doping with its R&D partner in Constance.

The formation of a well passivated boron emitter is achieved with this process, which is crucial for many n-type cell structures. In addition, solar cell manufacturers achieve significant cost reductions while maintaining high quality production. On the one hand by the reduction of boron consumption by up to 75% and on the other hand by eliminating the boron silicate glass (BSG) removal.

The process is offered as an upgrade package for the centrotherm diffusion furnace c.DIFF as well as in new systems.

„With our product and process innovations we offer our customers solutions to their manifold and very different requirements on their path to highly efficient solar cell concepts,” notes Dr. Josef Haase, Senior Vice President Technology Photovoltaics, before adding: „It is essential for the customer, that centrotherm systems deployed in their production can be upgraded to the latest state-of-the-art with process and hardware packages. That offers the customer flexibility for the future along with the performance of our systems and processes.

**centrotherm at SNEC PV Power Expo – April 28 – 30, 2015: Hall E3/Booth 360**

## **About centrotherm photovoltaics AG**

centrotherm has been developing and realizing innovative thermal solutions for over 50 years. As a leading and globally operating technology group, we offer production solutions for the photovoltaic, semiconductor and microelectronic industries.

The continuous further development of our successful solutions in thermal processing and coating, such as for manufacturing crystalline solar cells and power semiconductors, form the basis for our successful partnerships with industry, research and development.

Our customers worldwide appreciate our production systems' process stability, scalability and availability in mass production. Above and beyond this, our work is distinguished by the fact that we create high-end process technology solutions which are specific for our customers and tailored to their requirements, and the fact that we are outstanding in system building.

We jointly confront the daily challenges of setting new trends, maximizing the efficiency of producing, for example, solar cells and semiconductors, and, coupled with our long machine durations, of securing investments.

In this way, we generate valuable competitive advantages for our customers through targeted innovations to processes and production solutions.

Our more than 700 staff worldwide are committed to the further development of high-tech solutions for key markets.

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