A new wafer coating system is born

VON ARDENNE develops and manufactures advanced vacuum coating equipment for the deposition of ultra-thin functional layers on materials such as glass, metal strip, wafers and polymer films. In this article, we take an exclusive look at the company and its latest product, XEA|nova – set to be introduced at this year’s Intersolar Europe.

The German family-owned company VON ARDENNE’s key technologies are magnetron sputtering and electron beam evaporation and it holds more than 750 patents worldwide.

The company was founded in 1991 as a spin-off of the former Manfred von Ardenne Research Institute in Dresden, Germany. A consequence of this was that the expertise in plasma and electron beam technologies that had been acquired over decades could be used and developed further.

The company owes its name to Manfred von Ardenne, a highly gifted, visionary and dedicated scientist and inventor born in 1907. His contribution to inventions such as the radio receiver, the television, and the scanning electron microscope is extraordinary. He held approximately 600 patents in radio and television technology, electron microscopy, nuclear plasma, and medical technologies and was the author of countless books and publications – without holding a degree or even a high school diploma. It was thanks to his farsightedness and hard work that he became such a famous scientist.

Today, VON ARDENNE focuses on reliable technologies to deposit thin layers on large areas and very large substrates homogeneously and in nanometer and micrometer scale to realise specific functional behaviours for the advanced products of its customers. VON ARDENNE is constantly identifying and analysing market trends throughout the industries. In the last years, the market for energy generation, energy saving and lately also the energy storage industry strengthened and broadened its technology portfolio.

At the upcoming solar exhibition Intersolar Europe 2014 in Munich, VON ARDENNE will introduce its latest vacuum wafer coating platform: the XEA|nova. Wafer based photovoltaics has been the workhorse in solar energy generation for years. At this exhibition, however, we will see the latest ultra-thin, highly efficient crystalline solar cell designs.

As a leading developer and manufacturer of vacuum coating equipment for the PV industry, VON ARDENNE has incorporated its superior know-how into a new modular platform, especially designed for these products. The necessary know-how has been gained from over 100 industry proven photovoltaic systems.

XEA|nova is the answer for customers looking for highly productive equipment with tried and tested technology and design. The new system accommodates the special requirements of the solar cell producing industry and allows the deposition of transparent conductive oxide (TCO) and metal layers using physical vapour deposition.
The XEA|nova can be applied for front and backside deposition of contact layers, passivation layers, barrier layers and cap layers.

The substrates are either simultaneously or sequentially coated on the front and on the back side in a continuous process. Once the process setup is complete, the coater can run for days without interruption. The length of the campaign time depends mostly on the sputtering target material thickness and utilisation as well as on the target design itself. Furthermore, substrate heating or cooling is possible. The customer can choose between different carrier materials depending on the application.

Using cylindrical instead of planar targets can contribute tremendously to prolonging the campaign time as the target utilisation of up to 85% and material inventory is much higher compared to planar targets.
That means that more target material can be used for the coating processes before the targets need to be exchanged. Additionally – based on the sputter characteristics of rotatable magnetrons – the particle generation is much lower compared to planar targets.

The horizontal XEA|nova wafer coating system can be implemented into an existing production environment thanks to the VON ARDENNE rotatable magnetron technology in sputter-up and sputter-down arrangement and a successfully completed in-house research and development program.

Today, VON ARDENNE offers a wide range of advanced vacuum coating equipment such as:

- The PIA|nova and the GC60V coating platforms as the industry proven solution for applying thin metal and transparent oxide (TCO) layers on thin-film based solar cells
- The horizontal glass coating systems GC254H and GC330H mainly used in the architectural glass industry where it has been established as the industry benchmark
- The metal strip coating system MCS1250 for depositing functional layers on aluminium, copper and stainless steel strip for a huge variety of application
- The web coating system FOSA1600 as coating platform in the field of polymer film applications
- The steel tube coater TSS4000 for the concentrated solar power market
- Inline and cluster systems for use in a small scale production environment or in research and development.
- Over the last decade, VON ARDENNE has developed its own planar and rotatable magnetron technology and
has integrated it successfully into its coating systems, which are sold all over the world.

VON ARDENNE offers:

- Rotatable dual magnetrons for alternate current (AC) sputter processes for the deposition of many low-conductivity or non-conductive layers
- Rotatable single magnetrons in double or single arrangement for direct current (DC) processes for the deposition of conductive layers
- The VON ARDENNE dual anode sputter system (DAS) in combination with rotatable single magnetrons, which enables customers to run long term stable sputter processes depositing very low/non-conductive materials with direct current
- Proven planar magnetron technology with different magnetic field characteristics for a wide range of materials

The new magnetron generation can be equipped with integrated turbomolecular pumps, which allows an even more compact coater design.

At Intersolar Europe 2014, visitors will have a chance to meet VON ARDENNE experts and to get some first-hand information about the company and its innovative products.

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