



## PRESS RELEASE

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### **Leybold Optics at the PVSEC in Hamburg**

Innovative thin film products

The 26<sup>th</sup> European Photovoltaic Solar Energy Conference and Exhibition (PVSEC) is taking place between the 5<sup>th</sup> and 9<sup>th</sup> September 2011 in the CCH Congress Centre and International Fair in Hamburg. The PVSEC is an international convention for research and development, industry and applications and is also one of the most important industrial fairs.

Leybold Optics GmbH from Alzenau/Germany, one of the world's most reputed manufacturers of vacuum systems in the fields of glass & solar and optics, has its own booth at the PVSEC convention and will be presenting innovative, practical products and solutions for all current standard thin film systems (a-Si/ $\mu$ c-Si, CIGS, CIGS-Flex, CdTe).

The Glass & Solar division at Leybold Optics has been developing and producing vacuum systems for the photovoltaic industry and machines for architecture glass coating displays and other large-format applications since 2005. Leybold Optics ensures that its 160 years of experience in vacuum coating also flows into the thin film technologies for photovoltaic systems. The company specialises in areas such as sputtering, PECVD (plasma-enhanced chemical vapour deposition), plasma assisted evaporation, machine automation and software. It has a unique portfolio of thin film applications and is flexible in the substrate size - from one cm<sup>2</sup> to 19 m<sup>2</sup> - innovative leadership is one of Leybold Optics' top priorities.

### **CIGS technology**

CIGS, also known as CIS, is an abbreviation for the elements that are used: copper, indium, gallium, sulphur and selenium. Compared to crystalline silicon solar cells that have a wafer thickness of around 150  $\mu$ m, the CIGS technology is only around 3  $\mu$ m thick which means much less semi-conductor material is used. Leybold Optics offers the full range of vacuum equipment for this thin film technology: the front contact, absorber layer, back contact, etc. for all necessary processes. CIGS systems from Leybold Optics are already being used in large production facilities by world market leaders. They stand out thanks to their process-optimized concept and their high level of reliability and availability.



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### **Roll-to-roll procedure**

Leybold Optics offers Roll-to-roll coating system, also called web-coater for complex flexible applications. The procedure is designed for substrates, such as metal films or flexible plastics, and allows coating methods such as sputtering, evaporation, CVD or a combined solution. The substrates are transported via a conveyor from roll to roll during which they are coated in vacuum; the coated surface remains completely untouched. The patented Leybold technology with its 360° design is a fully automatic process that not only allows the production of flexible solar cells but also other applications too.

### **EAE technology**

The Ruhr University Bochum and Leybold Optics have been working closely to examine the technical feasibility of the electrical asymmetry effect (EAE) for industrial applications used to produce silicon thin film solar cells. The objective is the technical application of the innovative effect to achieve a much higher deposition rate whilst maintaining the good layer properties. Another much more important advantage of the new procedure is that it is possible to continue using the existing plasma systems.

Leybold Optics is a licensee of this patented technology which can be used to control the plasma more effectively. It is believed that it will be possible to significantly increase the disposition rate for micro-crystalline silicon by a factor of two. The coating system Phoebus from Leybold Optics (PECVD) will be equipped with the new EAE technology in the future. The technology can be retrofitted to existing installed systems. This hardware upgrade also plays an important role in ensuring that Phoebus can be used even more efficiently. Leybold Optics presented the adaption of this new technology to a scientific public for the first time in July 2011 during the 11<sup>th</sup> International Symposium on Sputtering & Plasma Process (ISSP) of the University of Tokyo (The Institute for Solid State Physics) in Kyoto.

#### **Image file:**

Leybold Optics GmbH, Headquarters, Alzenau/Germany

#### **Image source:**

Leybold Optics GmbH, Alzenau/Germany



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### **Meeting point: Leybold Optics**

26 EU PVSEC, CCH Congress and International Fair, Hamburg  
Exhibition: Monday, 5.09.2011 to Thursday, 8.09.2011, booth: A1 C2

### **Contact partners:**

Patrick Candala, Director Sales and Marketing Division Glass & Solar  
Dr. Günter Grabosch, VP Product Management Division Glass & Solar  
Jörg Hahn, Manager Sales and Marketing Division Glass & Solar

### **Lecture: PV Production Forum 2011**

Thin Film Session, Tuesday 6th September 2011, 1.30 pm – 6 pm  
Jörg Hahn, Manager Sales and Marketing Division Glass & Solar, Leybold Optics  
Subject: Advanced Equipment for Thin Film PV Coatings on Glass

### **Company Profile:**

Leybold Optics GmbH is one of the world's leading suppliers of vacuum technology. It also develops processes and manufactures complex high-end coatings. This reputed thin film specialist sets milestones in the fields of sputtering, PEVCD, plasma assisted evaporation, automation and software. It is organised into two divisions: Optics and Glass & Solar. The Glass & Solar division portfolio comprises vacuum systems for the photovoltaic industry and machines that are used to coat architecture glass, displays and other large-format applications. The Optics division markets deposition systems for precision optics, eyeglass coating, the automotive and the electronics industry.

The foundation stone of its success was laid over 160 years ago by the founders and inventors Ernst Leybold and Wilhelm Carl Heraeus. Their pioneering spirit and dedication to research and the development of new production procedures is reflected in the market standards that have gained worldwide recognition since the company was founded. Today, Leybold Optics, which is traditionally committed to innovation and quality, is a global company that has more than 500 employees across the world.

### **Company Contact:**

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