



LayTec is among Germany's 50 fastest growing technology companies

We are proud to announce that LayTec ranks 30th in the list of the 50 fastest growing technology companies in Germany nominated by Deloitte - the global network providing audit, tax and financial services. Deloitte's annual ranking is based on the companies' turnover growth for the last 5 years. Between 2004 and 2008 LayTec increased its turnover by 378% and, thereby, also belongs to the 500 fastest growing companies in Europe. We thank all our customers and the LayTec staff for making this success possible!

Conductivity measurements of transparent conductive oxide layers with SolR

LayTec's in-line monitoring system **SolR**, which measures the thickness of each layer throughout the solar cell manufacturing process, also provides information about the conductivity of transparent conductive oxide layers (TCOs) like ZnO:Al or SnO₂:F. The latest measurement results were presented at the 24th European Photovoltaic Solar Energy Conference and Exhibition (EUPVSEC) in Hamburg, Germany.

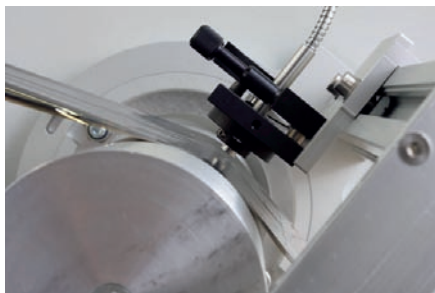


Fig. 1: Optical head of the **SolR** installed in a roll-to-roll system for investigation of CIGS-based structure on foil.

SolR is based on specular spectroscopic reflectance measurements (500–1600 nm) and is applicable basically to all major PV thin-film structures: CIGS- and CdTe-based thin-film solar cells, a-Si/ μ c-Si tandem cells and anti-reflective coatings on mc-Si and c-Si solar wafers.

In case of TCO layers the light absorption by free carriers extends to the near infrared range of the spectrum. The absorption modifies the refractive index dispersion (between 1000 nm and 1600 nm). This, in turn, causes a decrease of the infrared reflected light intensity and of the Fabry-Perot oscillations am-

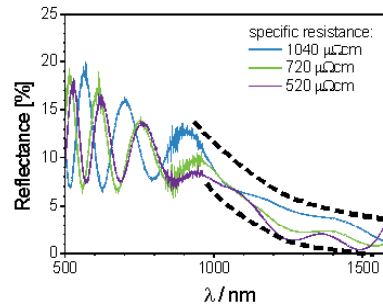


Fig. 2: Reflectance spectra of three TCO layers with different specific resistances on glass substrates.

plitude (see Fig. 2). The effect increases with the concentration of free carriers in the material. Hence, based on ex-situ pre-calibration, the infra-red reflectance provides on-line information on the TCO conductivity.

You will find further information in the poster presented at the EUPVSEC: www.laytec.de/photovoltaics-publications.html

Evaluation of wet-chemical surface texturization by UV-NIR reflectance

Together with the **Helmholtz Center for Materials and Energy** in Berlin (HZB), an optical metrology system developed by LayTec has been tested to monitor surface texturization, nano-roughnesses and interface passivation of mono- and polycrystalline Si substrates. At the EUPVSEC, **Dr. Heike Angermann** of HZT and **Dr. Steffen Uredat** of LayTec presented the results obtained by LayTec's in-line reflectometer equipped with an integrating sphere as optical head.

It was demonstrated that spectral reflectance measurements can be effectively used for characterization of optical properties of the surface texture. Roughness and texture effects on the spectra were successfully separated by a single measurement. The compact design of the optical head and the short measurement time (≤ 1 s) makes the method perfect for in-line metrology in production lines.

You can download the poster presented at the EUPVSEC at www.laytec.de/photovoltaics-publications.html

Open positions at LayTec

LayTec offers the following positions: **product manager** (photovoltaic applications), **sales engineer**, **quality manager** and **electronic engineer**: www.laytec.de/careers.html

You can meet us at the following workshops and conferences:

25–27 November 2009

6th International Conference and Exhibition on PV Production Equipment and Manufacturing (PV-Tech) in conjunction with HI-TECH EXPO (Hall 18, Booth 02) in Milan, Italy
www.hitechexpo.eu/en/index_pvm.asp

2–4 December 2009

Semicon Japan (Hall B4, Booth 405) in Chiba, Japan
www.semiconjapan.org/sj-en/index.htm

10–11 December 2009

DGKK Workshop (German Crystal Growth Society) Berlin, Germany
www.dgkk2009.de