

## LayTec launches a new version of EpiCurve® TT

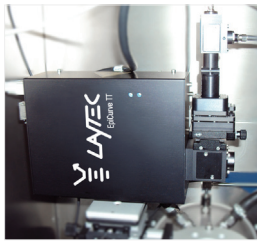


Fig. 1: EpiCurve® TT used in Magdeburg, Germany

A major challenge of in-situ metrology on single-port reactors with small viewport geometries is the combination of curvature measurements by a blue laser with reflectance measurement at 405 nm. The blue laser is a must for patterned sapphire substrates (PSS) and double-side polished substrates.

The 405 nm reflectance is indispensable for monitoring of InGaN MQW growth. Until now, it was impossible to have both features for reactors with only one small optical access because of the cross-talk effect. The new optical and electronic design of EpiCurve® TT eliminates this problem. The latest version of the tool has been installed on an Aixtron 200-4 RF/S reactor with only 5 mm hole in the ceiling

at Otto-von-Guericke University of Magdeburg (Germany). The team of Prof. Alois Krost and Prof. Armin Dadgar uses the tool in development projects for in-situ monitoring of various GaN based optoelectronic and power electronic device structures on silicon and sapphire substrates. This EpiCurve® TT is equipped with a blue laser (405 nm) for wafer bow control and a triple wavelength reflectance (405, 633 and 950 nm) for a precise monitoring of MQW layers, AlN interlayers, AlGaIn buffer and further features.

After several years of experience with LayTec systems, Prof. Krost is convinced that “EpiCurve® TT is the best in-situ tool available on the market to control strain, temperature uniformity, MQW formation and surface morphology during III-N device growth.” LayTec CTO Dr. Kolja Haberland thanked the team in Magdeburg for the long year research cooperation and for testing the new product in the field.

## Fast and easy growth analysis on Patterned Sapphire Substrates (PSS)

In the next years, the use of PSS will further increase due to its high light extraction efficiency. Following this trend, LayTec’s in-situ metrology software EpiNet 2 can be individually customized for various kinds of PSS. Our users can expand the substrate database by themselves. LayTec’s Calibration Manual explains how to measure PSS reflectance in different pockets in one single calibration run. If required, LayTec also offers related customer trainings. Once the initial reflectance values of the PSS substrates are uploaded, the operator can choose the needed substrate in the RunType’s Material Spec window (Fig. 2). As a result, all PSS wafers can be monitored with the same accuracy as standard sapphire substrates.

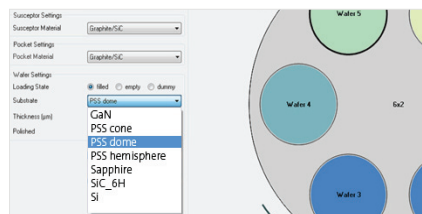


Fig. 2: Extract of a RunType’s Material Spec window of LayTec’s EpiNet 2 software with a customized database extended by additional PSS types.

Fig. 3 shows a GaN growth on PSS. The initial 405 nm reflectance on the bare PSS substrate is „noisy“ because it senses the local non-uniformity of the PSS structure. As soon as GaN buffer is thick enough, this „noise“ reduces because the 405 nm light does not reach the PSS pattern anymore through the UV absorbing GaN. The increasing reflectance of all 3 wavelengths after ~4000 s shows the coalescence process of GaN. After ~8050 s, the 405 nm reflectance stays stable at 15.5%, which is an indication of the GaN surface

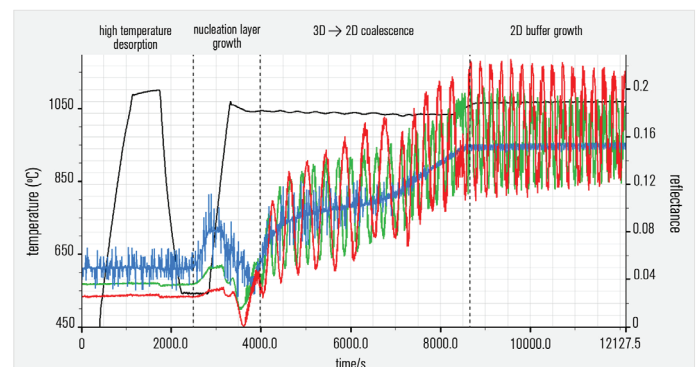


Fig. 3: GaN growth on PSS measured by EpiCurve®TT at FBH, Berlin, Germany: reflectance at 405 nm (blue), 633 nm (green), 950 nm (red); True Temperature (black).

quality improvement. However, the interference patterns of the 633/950 nm reflectance look „noisy“ during 2 D buffer growth. Obviously, the initial non-uniformity of the PSS structure causes a certain non-uniformity in the GaN thickness. Alongside with the customized database, EpiNet 2 also provides fitting of thin layers, wafer bow calculation and many further features indispensable for growth on PSS. Learn more in EpiNet 2 datasheet by contacting sales@laytec.de.

You can meet us at the following workshops, conferences and trade fairs:

19 – 21 March 2013 | SEMICON China | semiconchina.org

15 – 17 April 2013 | European Advanced Process Control and Manufacturing Conference | Germany | apcm-europe.eu

7 – 9 May 2013 | SEMICON Singapore | semiconsingapore.org