

kyma[®]
technologies

UVAIN[™]

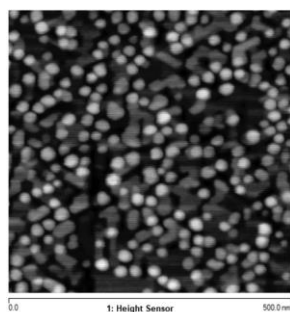


Kyma's Technology

Kyma UV-AIN templates are grown using a modified plasma vapor deposition nanocolumnar process (PVDNC™) that produces a high quality AlN buffer for subsequent AlN or AlGaIn device epitaxy. Typically utilized in UV- LEDs, the templates are also suitable for use in electronic devices, and for basic research. Kyma UV-AIN templates have several advantages over MOCVD and HVPE grown-templates which include

- Increase in MOCVD throughput by eliminating the sapphire pre-treatment and AlN template layer growth steps
- Lower cost and improved scalability vs MOCVD or HVPE AlN templates
- Superior asymmetric (102) crystalline properties
- Availability up to 150mm diameter on SSP or DSP sapphire

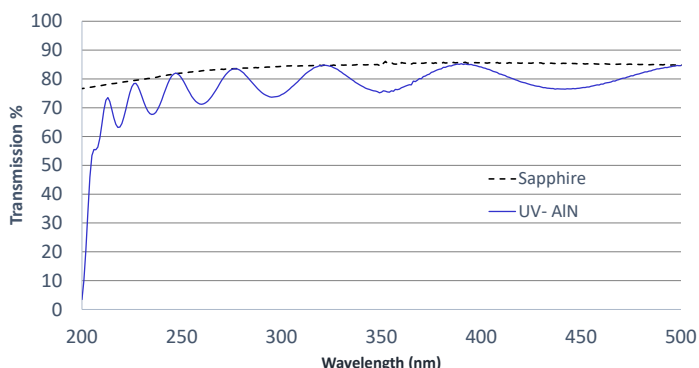
AFM



- The surface of UV AlN is made of nanocolumns of AlN.
- These nanocolumns allow the epi-grower to employ a wider range of growth temperature and precursor supersaturation for subsequent epilayers

- The RMS of these surfaces is around 1 nm

Transparency



- UV AlN has almost zero absorption until 200 nm

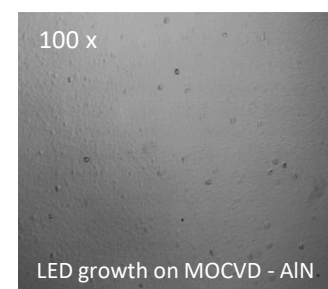
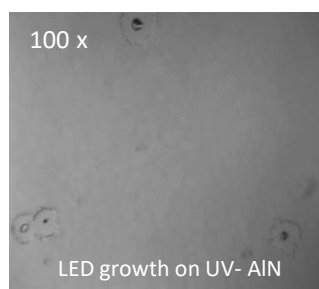
Sapphire (SSP or DSP)

Wafer Diameter	50 mm, 100 mm, 150 mm
Orientation	c-axis (001) + 0.2°

AlN

Thickness (standard)	400 nm
	Custom thickness upon request
Crystal Quality (FWHM)	
[002] XRD Linewidth	< 100 arcsec
[102] XRD Linewidth	< 300 arcsec
Exclusions Zone	
50 mm	1 mm
100mm, 150mm	5 mm
Surface Morphology (Al-Face, Epi-ready)	
AFM (R _z)	1 nm

Optical Micrographs



- Improved surface flatness and reduction of hillocks on UV AlN compared to baseline MOCVD template

Testimonials from UV-C LED manufacturers

"The surface of LED grown on Kyma AlN template is as good as (if not better than) the surface from our standard high power UVC LED grown directly on sapphire."

"There is no doubt that UV-AIN can be used to grow high quality high power UVC LEDs."

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