



CrystAL-N

SUBSTRATES FOR EPITAXY

**BULK
SINGLE-CRYSTALLINE
AlN SUBSTRATES**

Aluminum nitride for electronic devices

Benefits & applications of AIN

„Thanks to the inherent unique physical properties totally new products and markets will emerge by using AIN in LEDs.“

Prof. Dr. A. Winnacker

AIN as substrate for electronic devices strongly increases their performance.

AIN enables a significant improvement of optical output and durability. Furthermore these devices need less energy compared to others based on different substrates.

For the first time high-performance deep-UV LEDs are manufacturable which have diverse applications, for example water and air disinfection.



Water

UV LED based light sources open new markets and applications, including:

- Drinking water production
- Water purification (bathhouses as substitute for chlorine, municipal waste water and sewage treatment, fish hatcheries)
- Recreational water treatment (hotels, ships, campgrounds)



MedTech

Tools and media purification and disinfection, hand disinfection, therapy of dermal cancer, cancer treatment, DNA sequencing, protein analysis, drug discovery.



Lighting

LED based high beam, lighting of facades of buildings and rooms. Pure white LEDs of any spectral color, extremely strong background lighting for displays.



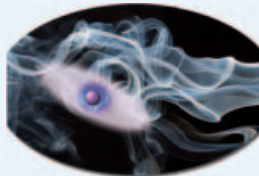
Air conditioning

Air purification in cars, airplanes, hotels and hospitals.



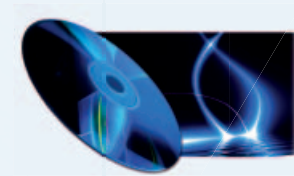
Curing

Curing of varnishes, printing inks and polymers.



Optical Sensors

Optical sensors e.g. gas detection.



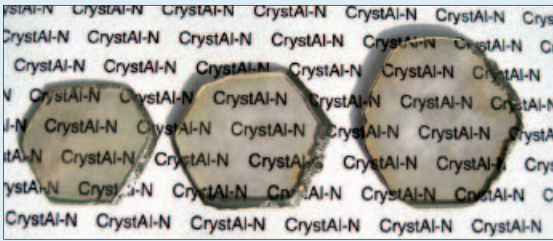
And more...

UV ID tracking, optical storage medias, short range communication.

Material specifications and additional services

„Power is based on quality.“

Dr. B. Epelbaum

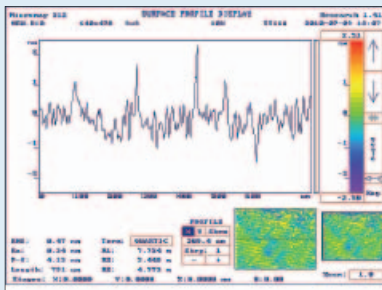


AlN substrates

Available in research and production qualities

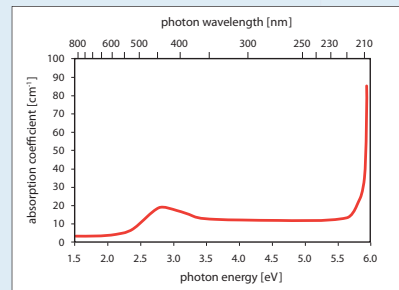
- epi-ready surfaces (Al-polar or N-polar)
- 1/2 inch in diameter, larger size upon request
- 300 μm thick wafers up to 50 % transmission down to 230 nm wavelength
- orientation
(0001) standard, semi-polar and non-polar on request
- dislocation density $< 10^6 \text{ cm}^{-2}$

Our production facilities develop and manufacture substrates with diameters of up to 50 mm in research and production qualities. We sell 1/2 inch in diameter, larger size upon request.



Epi-ready surfaces

Polished surface c-plane (0001) with Ra of $\sim 0.5 \text{ nm}$



UV transparency

low absorption coefficient up to the band edge

We are also ready for a close collaboration and offer the additional service of supporting the whole epitaxy process by reclaiming or replacement of wafers with different specifications.

Company profile

CrystAl-N is focused on developing and producing single-crystalline aluminum nitride (AlN) substrates for high-performance electronic devices. We are dedicated to offer cutting-edge AlN substrate solutions which are always one generation ahead of the competition and to create lasting value for our customers, staff and shareholders.

CrystAl-N was founded in 2010 as a spin-off from the Materials Science Department of the Friedrich-Alexander-University Erlangen-Nuremberg (Germany) with more than 10 years of expertise in AlN bulk crystal growth technology.

The team is led by renowned crystal growth expert Dr. Boris Epelbaum and Dr. Paul Heimann. It is advised by senior scientist Prof. Albrecht Winnacker and serial entrepreneur Horst Linn who previously founded SiCrystal AG, today's second biggest supplier of silicon carbide substrates.





CrystAl-N GmbH
Dr.-Mack-Straße 77
D-90762 Fürth
Germany

Phone +49 (0)911 650 78 650 90
Fax +49 (0)911 650 78 650 93
Mail info@crystal-n.com
Web www.crystal-n.com



It takes an orchestra to play a symphony.
The CrystAl-N team plays the melody for
your success.

Your way to CrystAl-N.



By plane from Nuremberg airport 11 km
or by car exit Nürnberg/Fürth from high-
way A73.

<http://www.crystal-n.com>

For further information visit our website or call +49 (0)911 650 78 650 90