MATERIAL DATASHEET | SINGLE CRYSTALLINE ALUMINIUM NITRID SUBSTRATES

Single Crystalline Aluminium Nitrid (AlN)
is a promising material for various modern applications. Its outstanding properties include a wide band gap, high thermal conductivity and chemical stability. This makes it suitable for applications in optoelectronics , power electronics, high frequency technology for wireless communication and temperature or force sensing in high temperature processes.
The high lattice matching of single crystalline AlN substrates to functional Al-rich AlGaN layers allows the fabrication of high quality AlN / AlGaN heterostructures, which are of central importance for the performance of the mentioned devices in the diverse applications.
IKZ has developed processes and technologies for the preparation of AlN substrates with low dislocation density, high UV transparency and high surface quality. Epi-ready single crystalline wafers are available in different quality grades for research purposes and technology development.

ADVANTAGES

- Wide bandgap (6.2 eV)
- High UV transparency at 265 nm and 230 nm
- High thermal conductivity (170-230 W/mK)
- Thermal expansion coefficient similar to Si
- High chemical stability
- High critical field strength

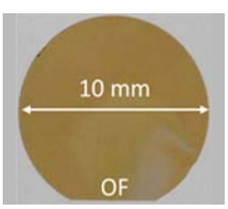
APPLICATIONS | TECHNOLOGIES

- Optoelectronics
- Power electronics
- High frequency technology
- High temperature sensor technology

PATENTS

- A. Dittmar, C. Hartmann, J. Wollweber, M. Bickermann: (Sc, Y):AlN Einkristalle für Gitterangepasste AlGaN Systeme; DE102015116068A1

GENERAL BULK PROPERTIES



Density	**3.2**
Bandgap Width [eV]	**6.2**
Thermal Conductivity [W/cmK]	**3.0**
Resistivity [Ohmcm]	**> 10^{13}**
Dielectric Constant	**8.5**
Breakdown Field Strength [MV/cm]	**14**
Thermal Expansion Coefficient [1/K]	**$4.5*10^{6}$**

more information at:
www.ikz-berlin.de/en/offer/aluminum-nitride

The Leibniz-Institut für Kristallzüchtung (IKZ)
is an international competence center for science & technology as well as service & transfer for innovations in and by crystalline materials.
The IKZ provides innovations in crystalline materials to achieve highest-quality crystalline materials with tailored properties. These comprise volume crystals as well as crystalline layers and nanostructures.
The R&D spectrum ranges from basic over applied research activities up to production-relevant development. Together with partners from research and industry, the institute is also driving innovation by crystalline materials, namely the reliable evaluation and benchmarking of innovative crystalline prototype materials for disruptive technology approaches.

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