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Fox Group lands research sales for AlN material

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The Fox Group begins shipping 15 mm-diameter monocrystalline AlN substrates primed for epitaxial growth.

Californian LED and materials company The Fox Group says that it now has multiple customers buying its AlN substrates.

The monocrystalline material is produced using a bulk crystal growth process, and researchers are using substrates measuring 15 mm in diameter to develop advanced nitride devices.

According to The Fox Group, epi-ready wafers of between 300 micron and 700 micron thickness are now available, with a quoted dislocation density below $10^7 cm^{-2}$.

While blue nitride LEDs and lasers based on sapphire substrates are now commonplace, a number of new applications should become possible through the fabrication of devices grown on so-called "native" nitride substrates.

Although still in the early stages of development and only available in relatively small wafer sizes, AlN and GaN crystals should lead to higher-quality ultraviolet LEDs, which could be used to detect biological agents, cure industrial materials and sterilize dirty water.

Other optoelectronic devices based on these materials that are set to be actively researched through US Department of Defense funding include ultraviolet avalanche photodiodes and solar-blind windows.

On the microelectronics side, the US military has already funded programs through both DARPA and the Missile Defense Agency to develop advanced radar systems based on nitride transistors grown on native material (see related story).

According to Barney O'Meara at The Fox Group, the challenge now is to improve both material quality and reproducibility while increasing the size of the wafers.

That effort will take place at the company's Deer Park, NY, laboratory, using a patented tantalum carbide crucible technology that is said to be critical to the AlN crystl growth.

Other companies developing similar nitride materials include Crystal IS, Kyma Technologies and Cree in the US, as well as Poland's TopGaN.