



News

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US funds speed AlN substrate firm into UV-LEDs

Hexatech hopes to make the best-quality bulk AlN, which the US government is pushing hard to deploy in LEDs for UV water treatment.

North Carolina State University spin-out Hexatech has won a \$2 million award to develop UV-LEDs, despite not yet having a single commercially available product.

The company is focused on perfecting the production of its single crystal AlN substrates, which won't happen until some time after the LED project commences in November.

"It's a three year program," commented Hexatech's CEO Jim LeMunyon. "During that we would plan to have substrates for sale as well as UV-LED devices that can be demonstrated."

"The ATP (Advanced Technology Program) grant does two things," LeMunyon told *compoundsemiconductor.net*. "It validates that what we're working on is the real deal, and it's going to let us do some things sooner than we otherwise would."

Founded in 2001, Hexatech makes its substrates using a sublimation process that LeMunyon says is kept under "exceptional control" to assure the highest crystal quality.

The high-quality AlN substrates will be a close lattice-match for high-aluminum-content AlGaN. Increasing aluminum content provides shorter-wavelength LEDs but also increases lattice mismatch with conventional substrates like sapphire, consequently lowering output power.

The ATP project, which is managed by the US National Institute of Standards and Technology (NIST), will see Hexatech using external epitaxy suppliers to make devices.

Hexatech's substrates can be used either for UV optoelectronics or high-power RF devices. Beyond the ATP project, a number of partners are interested in using Hexatech's high-quality AlN.

"We've seen others roll out with any old 2-inch wafer and the crystal quality just isn't there," LeMunyon commented. "A lot of device-type customers feel burned by that, with good reason."

However, LeMunyon explained that the US Environmental Protection Agency is putting its weight behind UV-based water treatment, making UV-LEDs a major opportunity.

As an example of the size of the opportunity, LeMunyon points to an ongoing deployment of UV treatment facilities in New York that will treat 2.2 billion gallons of water per day.

"They have to use what are effectively UV fluorescent tubes," LeMunyon said. "The tubes have lifetimes in the order of one year and, by their nature, have small amounts of mercury in them, so they create a disposal problem."

"The opportunity in this industry is to basically remove the tube and replace it with solid state."