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## Kyma Ships Record Aluminum Nitride Template Order

Raleigh, NC / November 15, 2007 – Kyma Technologies, Inc., a leading supplier of ultra-high purity crystalline gallium nitride (GaN) and aluminum nitride (AlN) materials and related products and services, announced their recent volume shipment of 2” diameter c-plane AlN template substrates.

Kyma's AlN templates are available with a 0.5 micron thick AlN layer of highly-oriented AlN deposited on sapphire, or other substrates, and are available up to 100mm in diameter. They represent an excellent substrate for production of several different types of advanced nitride semiconductor devices.

"Kyma's nitride-based templates offer a low cost substrate approach to achieving a dislocation density of  $10^7 \text{ cm}^{-2}$  while eliminating the need for expensive buffer layer processes that are difficult to control," commented Dr. Ed Preble, Kyma's Chief Operating Officer. "The use of our AlN templates offers customers an attractive alternative to traditional two-temperature or direct nucleation schemes on sapphire, SiC or silicon substrates."

“Our AlN templates have been shown to present excellent starting surfaces for subsequent growth of GaN layers by metalorganic chemical vapor deposition (MOCVD) and also by hydride vapor phase epitaxy (HVPE),” added Dr. Drew Hanser, Kyma’s Chief Technology Officer and VP Business Development. “We also have customers testing our AlN templates in molecular beam epitaxy (MBE) based processes and we are confident about the results.”

Many of Kyma’s AlN templates are produced on c-plane sapphire which leaves the AlN with a c-axis preferred orientation which possesses ideal properties for nucleating GaN thin films. Other combinations of AlN orientation and substrate orientation are also available. Recent shipments include a-plane oriented AlN grown on r-plane sapphire, c-plane AlN grown on conductive SiC, as well as c-plane AlN grown on 100mm silicon.

Kyma prides itself in customer focus and offers flexible business models that can be tailored to ensure full customer satisfaction. Dr. Keith Evans, Kyma’s president and CEO explains, “In today’s world, speed and flexibility are of key importance. Thus, while we are happy to simply supply the substrates, we are also happy to establish AlN template manufacturing capacity at the customer’s site and to subsequently maintain either a close or a distant relationship, depending on exactly what the customer desires.”

The manufacturing processes used by the company to make AlN templates benefit from intellectual property (IP) exclusively licensed from North Carolina State University, as well as additional patent-pending IP developed at Kyma.

## About Kyma Technologies

Kyma was launched in 1998 as a spin out of North Carolina State University's Materials Science and Engineering Department to pursue the development of gallium nitride (GaN) and aluminum nitride (AlN) substrates for a broad range of high performance nitride semiconductor device applications.

Kyma's diversified product offering includes: ultra-low defect density native (free-standing) GaN in customer-defined orientation including polar (c-plane Ga-face or N-face) and non-polar (a-plane and m-plane), GaN and AlN templates grown on sapphire and other substrates, and ultra-high purity polycrystalline GaN.

The market for nitride semiconductor devices is expected to surpass \$9B by 2010. The combined addressable market for GaN and AlN substrates is expected to surpass \$500M by 2010.

For more information about Kyma Technologies, visit [www.kymatech.com](http://www.kymatech.com), e-mail [info@kymatech.com](mailto:info@kymatech.com), or call the company directly at 919.789.8880.

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