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### **Xenics on Course as Key Supplier to Future Generations of Airbus**

*Today's aircraft manufacturers rely not just on large firms as suppliers for parts and services. They increasingly take advantage of the highly innovative contributions of medium-size companies to maintain, and even accelerate, their technological lead well into the future. A typical example for this trend is the recent order that Airbus Industries has placed with Xenics and FOS&S to jointly develop novel measurement concepts for tension, compression and temperature in the realm of advanced fiber reinforced composite materials.*

#### **Fiber reinforced materials and fiber optic sensors – a winning combination**

At Airbus industries, the use of fiber reinforced components for aircraft building has a well established tradition. A result of this long lasting commitment to novel materials is that now up to 40 percent of all components and structures in the latest airplane models are made of carbon fiber reinforced plastic (CFRP) and glass fiber reinforced aluminum (GLARE). GLARE is a layered structure of aluminum and glass-fiber reinforced plastic materials.

At first look, such novel materials mainly seem to serve as weight savers, because they are up to 25 percent lighter than aluminum, which has been the standard building material for large planes. Going a step beyond this weight-saving perspective, the new materials also support the current efforts of increasing the materials' operational safety. In GLARE, the velocity of crack forming actually decreases when the cracks grow longer over time. In aluminum, on the other hand, crack velocity tends to increase with crack length.

The concept of building planes of both lightweight and safe materials, which Xenics fully supports, has evolved a new structural dimension: long, fiber-like sensors are now being integrated within the fiber reinforced plastic components of an airplane. These in-situ embedded sensors deliver real-time information on the health and performance of these structures when they are impacted in-flight by pressure, pull, and temperature. Given the fiber structure of carbon reinforced plastic composites, it is only logical to also use fiber-shaped sensors which can be smoothly embedded in these materials. A viable embedded sensor measurement technology, developed at Xenics and FOS&S, is reaching far into the future of aircraft building. It is based on Fiber Bragg Gratings (FBG).

Fiber optic sensors work well in the near infrared spectrum and therefore fit the product range of Xenics, based in Leuven, Belgium, Europe's leading designer of innovative infrared detectors and imaging devices. In a cooperation with FOS&S, Xenics has gained far reaching knowledge in the evaluation of fiber optic sensor signals. This knowledge base has led to a novel in-flight aircraft structural analysis (IFSA) system that can monitor the internal health of crucial structural components in advanced aircraft – continuously, in-flight. Another example of Xenics' special expertise in fiber optics is DynoSense 300. This very practicable, fast and versatile interrogation system for fiber optic sensor signals derives tension, compression and temperature measurements from specific spectral shifts in the wavelength of the applied infrared light.

This special expertise of Xenics and FOS&S was a decisive factor for Airbus Industries to admit Xenics as a program partner for future generations of Airbus planes. A key objective is to optimize the sensor system's dynamic behavior since one fiber carries multiple sensor measurement data separated by frequency multiplex. To detect higher-frequency mechanical vibrations with this multiplex principle, the scan rate and resolution should be as high as possible. In this regard, having a scan rate of 3.3 kHz, the Xenics DynoSense 300 sets new standards. Equally important is its broad wavelength range covering 1520 to 1580nm, its high resolution of less than 1 pm, and the simultaneous evaluation of up to 40 sensor fields within one fiber.

With this broad portfolio of advanced technologies, Xenics is well prepared for the future in terms of higher resolution and shorter readout time of its evaluation systems for infrared sensor arrays. Thus, Xenics is significantly contributing to the ever higher standards in comfort and safety that future Airbus planes will provide.

**About Xenics:**

Xenics is the leading developer of innovative infrared detection solutions for a wide range of applications. Xenics designs, manufactures and sells infrared detectors and cameras, both line-scan and 2D, covering the infrared wavelength ranges from 1 to 14 micrometers. In addition, Xenics delivers custom products according to the agreed specification and planning.

**More information:**

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