Blue Road Research leads the industry in nondestructive evaluation of composite structures with our innovations in strain field imaging, crack detection and multi-dimensional sensing.

Our systems are being tested in a variety of aerospace and military structures, from composite patches on aging aircraft to composite missile bodies.

Our unique multi-axis technology allows the customer to get a quantitative and accurate strain field map on demand without the extensive set-up required by eddy current and ultrasound technologies.

Our embedded grating arrays can be used to monitor the cure cycle, to check for delaminations and cut tow defects created during manufacturing, as well as impact damage during service.

Fiber Grating Sensor Advantages:

- **Superior resistance to EMI and corrosion compared to conventional electric sensors**
- **Intrinsic safety in highly combustible environments**
- **Lighter weight and easier installation compared to conventionally wired technologies**
- **Customizable range and sensitivity to meet sensing demands**
- **Multiplexing capabilities that allow multiple sensors to be monitored on a single fiber**

EDUCATION

We highly recommend that potential customers attend our Fiber Optic Sensor "Hands On" Course as a rapid and cost-effective introduction to this technology. As a customer, you will receive a comprehensive look at the latest advancements in this technology, and the knowledge base Blue Road Research can provide.

Fiber Optic Sensor "Hands On" Course

Participants learn the capabilities and potential uses of this rapidly expanding technology by exploring, through hands-on experience, how fiber sensors are used in various industries. This three-day course provides an overview of the technology and makes extensive use of laboratories and demonstrations to give participants an understanding of how these devices are built and function. Mornings are devoted to classroom discussion, while afternoons are spent in the sensor laboratories using Blue Road Research educational and development kits.

Past attendees include:

- **Boeing**
- **Corning**
- **Westinghouse**
- **Ford Motor Company**
- **Department of Energy**
- **Sandia National Laboratory**
- **Los Alamos National Laboratory**

Please call us or visit our website for current course dates

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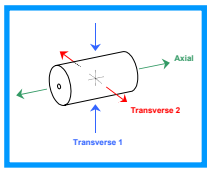
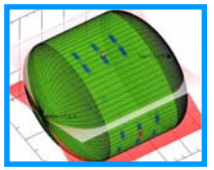
BLUE ROAD RESEARCH

Fiber Optic Sensor Solutions for Aerospace

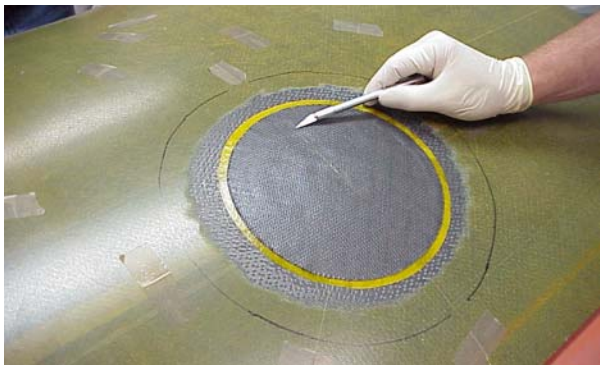




Unmanned Combat Air Vehicle

BLUE ROAD RESEARCH is working to integrate our sensors with complete interrogation systems for both on-the-ground periodic structural integrity monitoring as part of a routine inspection and maintenance program, as well as in-flight dynamic structural performance monitoring which may be used to augment flight control and other dynamic vehicle systems.

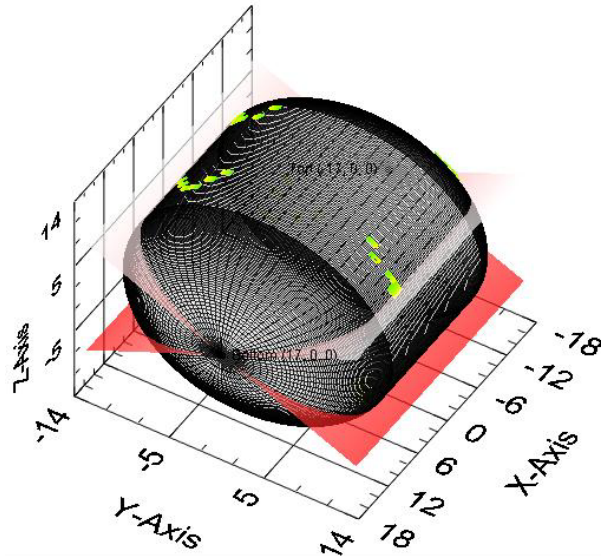
Our current efforts include both surface-mount and embedded strain field measurements in advanced composite airframes, cryogenic fuel tanks, rocket booster fuel casings and composite patches on aging structures, and conformal deformation analysis of multi-purpose aerospace structures, as well as temperature, pressure and moisture monitoring.



Adhesive Patch with Embedded
Fiber Grating Strain Sensor

Casing with Embedded Fiber Grating Strain Sensors

BLUE ROAD RESEARCH provides its customers with sensors that are intrinsically safe for use near combustible fuels and in high E&M fields. They are light weight and mechanically stable, making them ideal for aerospace applications.



Strain Imaging Software

TECHNOLOGY

Fiber Bragg Gratings are a distributed resonant mirror structure written into the optical fiber core with an ultraviolet laser. The gratings reflect light at a discrete optical frequency that is intrinsically dependent on the strain state and temperature of the optical fiber.

Sagnac Interferometric Sensors use the interference between counter propagating beams in a fiber loop to sense directional dependent perturbations to path length. These sensors are more stable and less sensitive to ambient temperature and strain changes than other interferometers and make ideal candidates for intrusion monitoring systems.

PRODUCTS

Blue Road Research offers a selection of both fiber optic sensors and readout systems for strain (axial, transverse and shear), temperature, pressure and moisture measurement. High speed fiber strain sensing systems at speeds in the range of 10 kHz to 2 MHz are standard, with custom options in the 10 MHz to 20 MHz range. The sensors and systems are suitable for either laboratory experimentation or product line development. We provide our customers with equipment, documentation, software and technical assistance.

Blue Road Research Dual Axis
Fiber Grating Demodulation Unit

Call one of our application specialists today or visit our web site at **www.blueroadresearch.com**