Strip-shaped fiber optic sensor



Overview

The sensor consists of a thin, flexible sheet with optical fibers embedded in the upper and lower surfaces of the sheet, and it can monitor out-of-plane bending deformation in composite materials during consolidation. Carbon fibers and resin used in manufacturing carbon fiber-reinforced plastic composite structures flow before the resin solidifies, resulting in disrupted fiber orientation and non-uniform thickness. These are reliable and easy-to-use devices that have high power, can automatically adjust to real-time conditions, and have a straightforward display that eliminates any guesswork. This process, known as consolidation, is critical for the quality of the composite structure, but. Fiber optic shape sensing has an outstanding capability to sense curvature and shape in 2D and 3D. The following is a classification example of KEYENCE's fibre units (FU Series).

Article Content

Strip-Type Embeddable Shape Sensor Based on Fiber Optics for In

This study proposes a strip-type embed-dable shape sensor based on fiber optics for in situ monitoring of consolidation deformation. The sensor consists of a thin, flexible sheet with optical fibers

Fiber Optic Sensors

Fiber optic sensors are compact because the detection circuit is located in the amplifier, allowing for detection even in narrow spaces. Installation and adjustment are easy and the devices have high

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Fiber Optic Shape Sensors: A comprehensive review

This paper presents a review of the state of the art of Fiber Optic Shape Sensors. The paper aspires to be an exhaustive guide for anyone interested in the field.

FIBER-OPTIC SENSORS

Our global manufacturing network for fiber optic sensors in Ayabe (Japan), Shanghai (China) and Nufringen (Germany) focuses on continuously optimising methods for small and large volume

Deep learning-based approach for high spatial

These findings are the preliminary steps toward a low-cost yet accurate fiber shape sensing solution for detecting complex multi-bend

Fiber optic shape sensing

The key constituent for this type of sensing is based on simultaneous and real-time monitoring of the induced strain in a multi-core optical fiber with included draw tower grating sensors (MCF-DTG®)

Type of fibre optic sensors | Sensor Basics: Principle

Fibre units have many variations. Because the fibre does not house any of the electronic components, there are very few limitations on size and shape. The

Theoretical assessment of D-shaped optical fiber chemical sensor ...

In present work, we propose a surface plasmon resonance based D-shaped fiber for the chemical sensor using nanoscale silver strip deposited over polished surface of single mode fiber.

Au-strip structure dependent performance investigation of D-shaped

Thus, the SPR signal strength depends on the metal''s optical properties as well as the surrounding dielectric medium. This work thoroughly investigates the performance of a single mode

2D-Vector Magnetic Sensing Based on Ring-Shaped

In this work, a novel fiber-optic sensor for 2D magnetic sensing is explored based on nanostructured magnetic fluid. The fiber-optic sensor

Fiber Optic Shape Sensors: A comprehensive review

Fiber optic shape detection can be considered as a promising method as it can detect stress, bending and strength, but equipment and constraints

A High-Sensitivity U-Shaped Optical Fiber SPR Sensor

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This paper proposes a high-sensitivity U-shaped optical fiber sensor based on indium tin oxide (ITO) for surface plasmon resonance (SPR) sensing.

High-Sensitivity U-Shaped Optical Fiber Strain Sensor With

To achieve highly sensitive measurements of strain, a U-shaped optical fiber sensor (OFS) based on seven-core photonic crystal fiber (SCPCF) was designed. The proposed Mach-Zehnder-based

U-shaped plastic optical fiber sensor for phosphate ...

Evanescent wave optical fibre sensors have attracted a lot of attention for the detection of chemical species due to their sensitivity, selectivity, and repeatability. In addition, plastic optical fibre

Fiber-optic sensor

A fiber-optic sensor is a sensor that uses optical fiber either as the sensing element ("intrinsic sensors"), or as a means of relaying signals from a remote sensor to the electronics that process the signals

Trends and Applications of U-Shaped Fiber Optic Sensors: A Review

Intrinsic U-shaped fiber optic sensors (FOSs) are well established in the field. With greater penetration depth and evanescent power, these sensors exhibit profound sensitivity and have supported a wide

A rigorous theoretical model of fluorescence-based fiber optic sensors ...

Using this model, a fiber optics sensor, consisting of a D-shaped fiber sandwiched between an input and output fiber, is simulated to investigate the effects of core size, excitation

High-Accuracy 3D Shape Sensor Based on Anti-Twist ...

Abstract Improving the accuracy of shape sensors based on multicore fibers (MCFs) is challenging but of great importance for real-time 3D shape detection, especially in visually inaccessible areas. In this

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