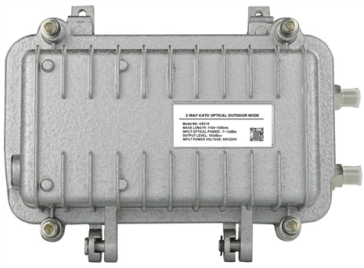
BlazingFast Photonics

Fiber Bragg Grating Temperature Sensor Packaging



Overview

The packaging proposed in this work is made of PDMS with a microarray adhesive structure on one of the surfaces. In addition, a polyamide (PI) capillary is placed in the middle of the packaging, where the FBG sensor is inserte. The packaging proposed in this work is made of PDMS with a microarray adhesive structure on one of the surfaces. In addition, a polyamide (PI) capillary is placed in the middle of the packaging, where the FBG sensor is inserted to remain loose inside. This microarray structure allows one face of the PDMS packaging to strongly attach to the object o. FBGs are optical structures made by periodical changes of the refractive index of the optical fibre core1,2. The axial period of the grating defines a resonance wavelength, known as Bragg wavelength, for which incoming light is reflected in phase, while all other wavelengths are transmitted through. The Bragg wavelength ({uplambda }_{B}=2{n}_{eff. To reduce the strain that is transferred from the monitored structure to the FBG sensor, a PDMS packaging is proposed here with an embedded PI capillary, where the optical fibre containing an FBG sensor is inserted. To better analyse the strain reduction process, simulations through a three-dimensional finite element method (3D-FEM) are first prese. Over the last decade gecko-inspired dry adhesives have been getting a great deal of attention. They are essentially based on mimicking the nano- and micro-structures existing in gecko's feet, which can dynamically attach to different materials using van der Waals force12,13,14,15,16. This type of force results in an attraction between molecules, ge.

Article Content

Gecko-inspired self-adhesive packaging for strain-free temperature ...

FBG sensors are fragile and must be normally protected for real-field applications, although challenging packaging designs are required to mitigate temperature-strain cross-sensitivity

Fiber Bragg Grating Temperature Sensor and its

Fiber Bragg grating, Temperature sensor, Interrogation techniques, Optical fiber interferometry, Edge filters, TDM, WDM. In this comprehensive

Packaging and Temperature Compensation of Fiber

This paper summarizes the packaging methods and corresponding temperature compensation methods of the currently reported strain sensing

Athermally packaged fiber Bragg grating for sensor and DWDM ...

Fiber Bragg gratings (FBG) are important for controlling transmitted light wavelengths in optical sensing systems due to their small and compact size, high sensitivity, stability, high

A novel fiber Bragg grating sensor packaging design for ultra-high ...

A novel fiber Bragg grating sensor packaging design for ultra-high temperature sensing in harsh environments November 20, 2020

Metallic-packaging fiber Bragg grating sensor based on ...

Mentioning: 1 - In this paper, a metallic-packaging fiber Bragg grating temperature sensor characterized by a strain insensitive design is demonstrated. The sensor is fabricated by the one-step ultrasonic

Design and Performance Analysis of Fiber Bragg

The Fiber Bragg Grating (FBG) sensor has become a widespread sensing device because of its small size, passive design, immunity to

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All-Silicon Packaging Technology for Fiber Bragg Gratings and Its ...

A fiber Bragg grating (FBG) sensor includes three main parts, an FBG, a sensor substrate, and a packaging material. The most commonly used packaging material is epoxy resin adhesive, which is

Improved temperature compensation of fiber Bragg grating-based sensors ...

Fiber Bragg grating (FBG) based sensors have been extensively used to monitor the deformation of structures (i.e., aircrafts, ocean platforms, bridges

Fiber Bragg Grating Temperature Sensor Package Design for

To address movable contact temperature detection in current transformer verification devices, this study proposes an fiber Bragg grating (FBG) temperature sensor and fiber lead packaging design.

Development of fiber Bragg grating strain sensor with temperature ...

The designed sensor has a longer compressive fatigue life than the foil strain gauge. It is important to discriminate between mechanical strain and thermal output (apparent strain) in fiber

Packaging process of fiber Bragg grating strain sensors for use in high ...

In this paper, we report the development of a new bonding agent and method for the surface mounting of optical fiber Bragg grating (FBG) strain and temperature sensors for use in high temperature

Fiber Bragg Grating Sensors: Design, Applications, and

Fiber Bragg grating (FBG) sensors have emerged as advanced tools for monitoring a wide range of physical parameters in various fields, including

Self-adhesive Fibre Bragg Grating Strain-Free

A fiber Bragg grating (FBG) strain-free temperature sensor packaged with glass fiber reinforced plastics (GFRP) has been designed. The self-adhesive

A technique to package Fiber Bragg Grating Sensors for

This paper reports an effective method of packaging a fiber Bragg grating (FBG) for the simultaneous measurement of temperature and strain. The

Packaging, characterization and calibration of fiber

Packaging, characterization and calibration of fiber Bragg grating temperature sensors Fernando Bortolotti, Kleiton Morais Sousa and Jean Carlos

(PDF) Design and Simulation of Fiber Bragg Grating

Fiber Bragg Grating (FBG) sensors are categorized as a reliable solution for industrial temperature monitoring due to their exceptional sensitivity,

Review of fabrication and packaging of UV-induced FBGs for high ...

The demand for temperature sensors has been steadily rising as industry progresses. The miniature size of fiber Bragg grating (FBG) temperature sensor

Packaging and Temperature Compensation of Fiber Bragg Grating for ...

This paper summarizes the packaging methods and corresponding temperature compensation methods of the currently reported strain sensing FBGs, focusing especially on fully pasted FBG, pre-stretched

Recent advancements in fiber Bragg gratings based temperature and ...

In this paper, our objective is to review the various techniques to measure the temperature and strain using FBGs in different industrial sectors. An In-depth analysis of FBG is also incorporated

Packaging and Temperature Compensation of Fiber Bragg Grating for ...

<p>During last decades, sensor elements based on the fiber Bragg grating (FBG) have been widely studied and developed due to the advantages of immunity to electromagnetic interference, compact

Review of fabrication and packaging of UV-induced FBGs for high ...

This paper provides a comprehensive review of FBG sensors and their use at high temperatures. The article begins by giving a brief introduction to the principle of FBG thermal

Packaging and Temperature Compensation of Fiber

During last decades, sensor elements based on the fiber Bragg grating (FBG) have been widely studied and developed due to the advantages of

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