

Fiber Bragg Grating 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 inserted. 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. FBGs are optical structures made by periodical changes of the refractive index of the optical fibre core^{1,2}. 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 ($\lambda_B = 2n_{eff}$). 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 presented.

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 force^{12,13,14,15,16}. This type of force results in an attraction between molecules, ge.

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Therefore, packaging and protective coatings have become a significant area of research. Studies by Lin et al. focused on developing advanced packaging techniques to enhance the ...



The sensing principle and performance tests of the tilt sensor have been described in detail. The tilt sensor shows good linearity and repeatability. The presented packaging technology shows good ...



In this paper, a packaging structure with a microstructure array is proposed to protect FBG sensors, while providing gecko-inspired dry adhesive capabilities through van der Waals force.



Fiber Bragg gratings are reflective structures in the core of an optical fiber with a periodic or aperiodic perturbation of the effective refractive index.



In this paper, in order to investigate the influence of the packaging on FBG, we proposed a fiber Bragg grating packaging technology based on 3D printing, and the feasibility of this packaging ...



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 ...



Fiber Bragg gratings are reflective structures in the core of an optical fiber with a periodic or aperiodic perturbation of the effective refractive index.



We specialize in custom fabrication of fiber optical gratings (FBG) across wavelengths from 400 nm to 2000 nm, tailored to precise customer specifications.



AtGrating is a professional company for optical fiber sensing. AtGrating offers industrial solutions by providing customized sensors and sensing instruments that add value, reduce uncertainty, and ...



Fiber Bragg Grating Products Using our advanced FBG writing technologies with holographic phase mask and ebeam phase mask, we are able to write many different types of fiber Bragg grating such ...

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