

Article Overview

ITF Technologies manufactures high-quality Fiber Bragg Gratings (FBGs) for both sensing and high-power laser applications, offering customizable optical and mechanical properties.

Overview of Fiber Bragg Gratings

A Fiber Bragg Grating (FBG) is a segment of optical fiber where the refractive index of the core is periodically modulated. This structure acts as a wavelength-specific reflector, reflecting certain wavelengths of light while transmitting others, based on the Bragg condition, which depends on the grating period and the effective refractive index of the fiber core. FBGs can serve as inline optical filters, wavelength-specific reflectors, or sensors for strain, temperature, and other physical parameters.

ITF Technologies' FBG Offerings

High-Power Laser Applications

ITF Technologies produces FBG reflectors designed for high-power fiber lasers. These FBGs feature a low thermal slope and tight wavelength matching, suitable for kilowatt-level laser systems with standard pump power handling up to 3 kW. They can be recoated with robust low-index polymers or packaged in high-power modules. ITF's process allows precise customization of central wavelength, spectral width, and reflectivity, making them ideal for both the High Reflector and Output Coupler in laser cavities.

Sensor Applications

For sensing, ITF Technologies manufactures FBGs with high optical and mechanical performance at low cost. They offer customizable gratings on standard or specialized fibers, including acrylate or polyimide coatings. ITF can provide splice-less FBG arrays over long distances, with control over each grating's optical parameters, suitable for distributed sensing applications.

Customization and Production

ITF Technologies emphasizes flexibility, supporting both low-volume R&D projects and high-volume mass production. Their FBGs can be written on a wide range of fibers, from standard to fully custom, and their "self-matching" FBGs simplify assembly by ensuring compatibility between paired gratings in laser cavities. The company integrates R&D and manufacturing under one roof, enabling rapid prototyping and scalable production.

Applications

- o Industrial and medical lasers: High-power FBG reflectors for precise wavelength control .
 - o Sensing systems: Strain, temperature, and distributed sensing using FBG arrays .
 - o Telecommunications and photonics: Wavelength-specific filtering and signal management .
 - o Advanced research: Custom FBGs for experimental setups and specialized optical fibers .
- ITF Technologies' FBGs combine precision, robustness, and customization, making them suitable for a wide range of photonics and laser applications, from high-power industrial lasers to advanced sensing networks.

SmartFBG A Fibre Bragg Grating (FBG) is a novel optical sensor recorded within the core of a standard optical fibre. It reflects a

A fiber Bragg grating (FBG) is a type of distributed Bragg reflector constructed in a short segment of optical

In this article, Fiber Bragg Grating (FBG) technology used to implement fiber sensors is explained and some

Introduction to Fiber Bragg Gratings Fiber Bragg Gratings (FBGs) are a crucial technology in the field of optics, with a

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

ITF Fiber Bragg Grating reflectors (FBGL) are widely used across the industry. Major laser manufacturers around the world rely on

Therefore, before entering the theory of fiber Bragg grating itself, it is worth to go back one century behind in order to review the

Tilted fiber Bragg gratings (TFBGs) have garnered substantial research attention and have found widespread applications for

Over the years, we have expanded to provide premium components and modules for industrial, medical,

Fiber Bragg Gratings, combiners, sensors, optical components, sub-modules and modules for fiber lasers and amplifiers. We would

Surface-relief Bragg gratings are etched on the cladding above the core of the D-fibers where the interaction remains within

Abstract: In this paper, the mode coupling mechanism of tilted fiber Bragg gratings (TFBGs) is briefly

introduced at first. And a

ITF Technologies product portfolio: Fiber laser components for industrial, medical, sensing, space & defense applications. Multimode

Discover Fiber Bragg Gratings (FBGs) for precise light control, high durability, and compact designs.

ITF Technologies" Fiber Bragg Gratings for sensor applications are manufactured with a robust process that will give you the highest

FBG Principle Fiber Bragg Gratings are made by laterally exposing the core of a single-mode fiber to a periodic pattern of intense

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