Long-period fiber grating etching technology

Overview

This review provides a comprehensive analysis of the primary fabrication techniques enabling this approach, including CO 2 laser inscription, femtosecond laser micromachining, electric-arc discharge, chemical etching, and fusion tapering. This study proposes a facile method for fabricating long-period fiber gratings. Optical designs were created so that laser light could be written into the grating structure on the fiber cladding without the need to remove the protective polyimide (PI) bufer layer. A laser-assisted wet chemical. Structure-Modulated Long-Period Fiber Gratings (SM-LPFGs) represent an advancement in fiber optic sensor technology, moving beyond traditional photosensitivity-based fabrication to achieve enhanced performance through the direct physical modification of the geometry of the fiber. Presented in this research are four types of CLPFG with periods of 660. This study presents a new process using inductively a coupled plasma dry etching method to manufacture a long-period fiber grating filter with exact period, vertical sidewalls, and smooth etched surfaces, and the filter is thus named a perfectly notched long-period fiber grating (NLPFG).

Article Content

May 09, 2026

Square-Wave Long-Period Fiber Grating Fabricated With Double

The novelty of this sensor lies in the square-wave period grating structure created by a different etching rate on the surface of the optical fiber during the laser-assisted wet etching process ...

May 14, 2026

Temperature Stability and Spectral Tuning of Long

Abstract and Figures Long period fiber gratings (LPFGs) were fabricated in a standard single mode fiber (SMF-28e) through femtosecond (fs)

Apr 18, 2026

Photoresist-free, laser-assisted chemical etching

The LLPFG, which has a period of 610 μm, was scanned using a KrF excimer laser. The results showed a resonant-attenuation wavelength of 1551 nm through a fiber

Jun 07, 2026

Long Period Grating based Optical Fiber Sensors: Fabrication Techniques ...

Advantages of long-period grating (LPG) based optical fibers for sensing applications along with different fabrication techniques to draw grating on the core of fiber have been reviewed. Some advantages

Mar 05, 2026

Perfectly notched long-period fiber grating filter based on ICP dry ...

This study presents a new process using inductively a coupled plasma dry etching method to manufacture a long-period fiber grating filter with exact period, vertical sidewalls, and

Aug 28, 2025

Sensitivity-optimized long-period fiber gratings for refractive index ...

A long-period fiber grating sensor was fabricated by periodically changing the structure of single-mode fiber with an electric arc discharge technique. After the fabrication, the refractive index

Apr 10, 2026

Square-Wave Long-Period Fiber Grating Fabricated With Double

This study presents a square-wave double-sided long-period fiber grating sensor that was fabricated using pattern inscription by laser-assisted etching with a KrF 248-nm excimer and an

Apr 11, 2026

Core-modulated long-period fiber gratings formed by heating and ...

1. Introduction Recently, long-period fiber gratings (LPFGs) are optical devices that are extensively used in the fields of structural health monitoring, biomonitoring and artificial intelligence

Dec 31, 2025

Fabrication and application of a novel long period fiber grating with ...

In this paper, a new core modulation method is proposed for the first time. A novel long period fiber grating with arched fiber core is fabricated and the sensing characteristics are

Apr 03, 2026

Novel fabrication method of corrugated long-period fiber gratings by ...

A novel fabrication method for corrugated long-period fiber gratings (CLPFG) is presented in this study. The patterned SU-8 photoresist is used as a double-side stopper layer for a wet-etching process to

Feb 10, 2026

Fabrication and sensing characteristics of arc-induced long-period ...

The fabrication of long period fiber gratings (LPFGs) based on thin-cladding fiber (TCF) has been demonstrated by adopting electric-arc discharge (EAD) technique. In order to analyze the

Mar 06, 2026

Spectral Tuning of Long Period Fiber Gratings Fabricated by ...

The coupling resonant wavelength can easily be controlled by simply tuning the grating period with its period being defined by the laser beam''s modulation frequency and fiber translation

Oct 14, 2025

Photoresist-free, laser-assisted chemical etching

In this process, the laser etching causes tiny long-period notches to be etched on the fiber surface, distinguishing the etching rate of the process from that of standard

Jun 28, 2025

Photoresist-free, laser-assisted chemical etching

In this study, we propose a photoresist-free, laser-assisted wet chemical etching process used to control the grating depth of a long-period fiber

Jan 10, 2026

Perfectly notched long-period fiber grating filter based on ICP dry ...

The results demonstrated that the proposed NLPFG has a much better period precision compared to corrugated LPFG, and it has great potential for a loss-tunable filter and force transducer applications.

Dec 25, 2025

Perfectly notched long-period fiber grating filter

This study presents a new process using inductively a coupled plasma dry etching method to manufacture a long-period fiber grating filter with exact period, vertical sidewalls, and smooth etched

Jan 17, 2026

CO2 laser-induced long-period fiber grating in the dispersion turning ...

A CO 2 laser-induced long-period fiber grating (LPFG) in the dispersion turning point (DTP) has been proposed in this work, which has demonstrated the possibility of fabricating LPFG

Apr 14, 2026

Photoresist-free, laser-assisted chemical etching process for long ...

Abstract: In this study, we propose a photoresist-free, laser-assisted wet chemical etching process used to control the grating depth of a long-period fiber grating (LPFG) termed laser-assisted ...

Mar 10, 2026

Arc-Induced Long-Period Fiber Gratings at INESC TEC. Part I ...

Abstract In this work, we reviewed the most important achievements of INESC TEC related to the fabrication of long-period fiber gratings using the electric arc technique. We focused on the

Jul 10, 2025

Structure-Modulated Long-Period Fiber Gratings: A

This review provides a comprehensive analysis of the primary fabrication techniques enabling this approach, including CO2 laser inscription,

Aug 08, 2025

A facile process for fabricating long-period fiber grating sensors ...

Abstract This study proposes a facile method for fabricating long-period fiber gratings. Optical designs were created so that laser light could be written into the grating structure on the fiber cladding without

Jul 22, 2025

Long Period Fibre Gratings

2. Fabrication methods of long-period fibre gratings The inscription of long-period gratings on optical fibre basically consists in the generation of a periodical perturbation of the refractive index in the

Sep 22, 2025

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Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

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