

# FemtoFBG

Laser workstation for fiber  
Bragg gratings writing



- ↓ Direct writing
- ← ||| → Up to 160 mm length FBGs
- ○ ○ Variety of optical fibers
- ⊕ Precise fiber tension control
- ⚙ Easily tunable FBG parameters
- 🎯 Fiber core autofocus
- ↓ Femtosecond FBG writing

# FemtoFBG

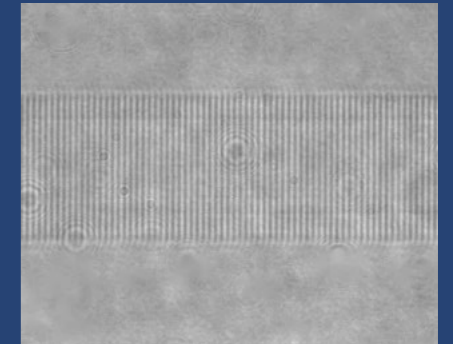
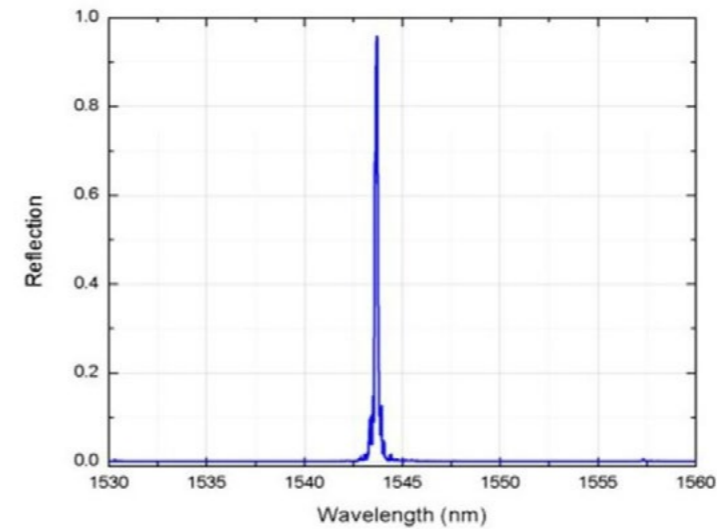
Femtosecond FBG writing is a proven technology for universal Bragg Gratings writing in various optical fibers, including not UV-sensitized fibers.

The main advantage of femtosecond laser writing is the ease of process tuning compared to a process using a UV phase mask.

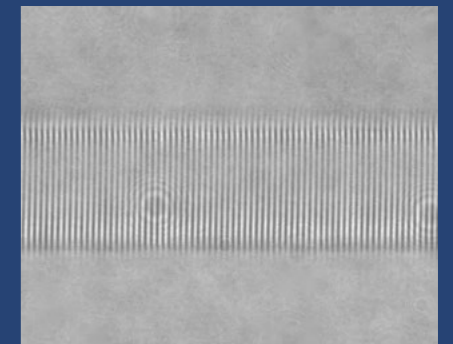
FemtoFBG is a perfect choice for scientific laboratories, R&D centers, and industrial clients working with telecommunications, distributed sensors, and Bragg Grating based devices development.

## Main features:

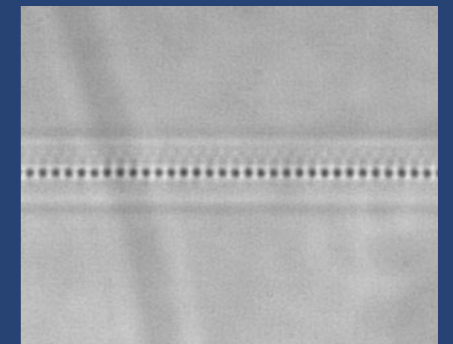
- Direct writing (point-by-point, line-by-line)
- Wide range Reflection / Transmission parameters control
- Variety of standard optical fibers



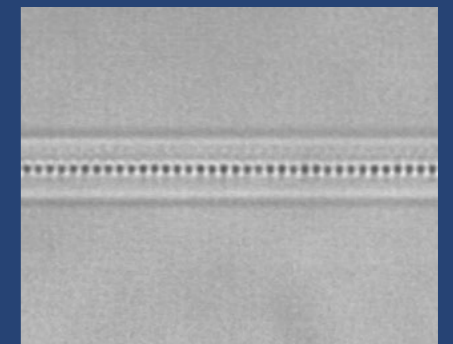
Line-by-Line (LbL) inscribed FBG top view



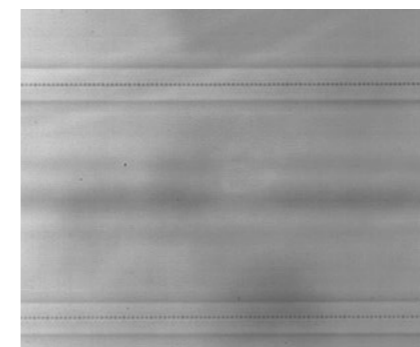
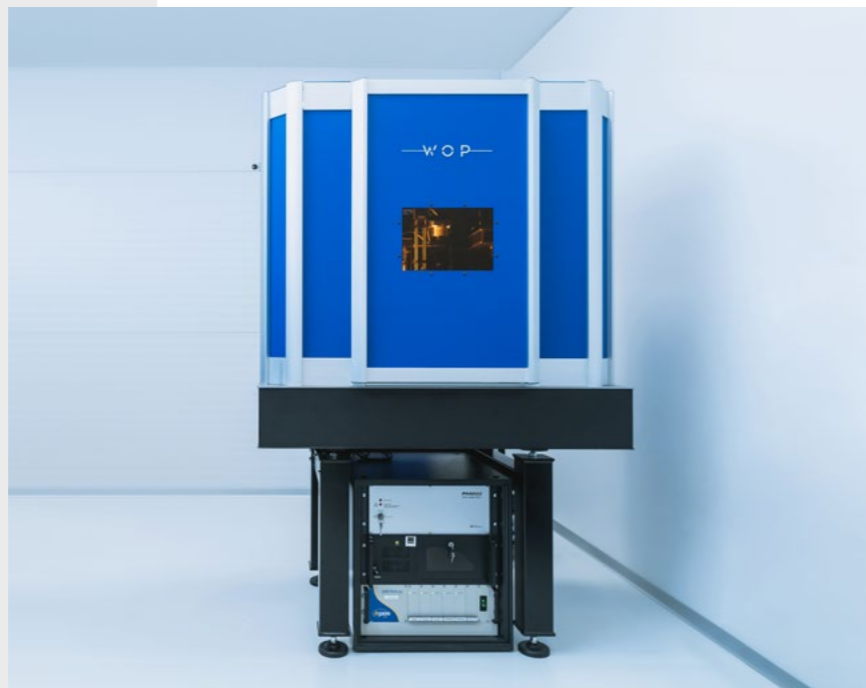
Line-by-Line (LbL) inscribed FBG view rotated by 90°



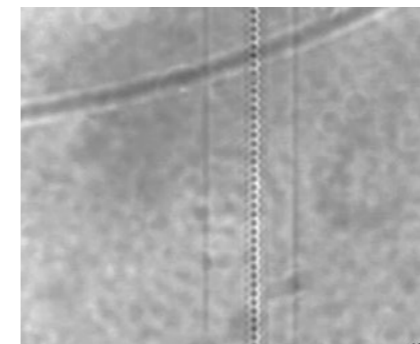
Point-by-Point (PbP) inscribed FBG top view



Point-by-Point (PbP) inscribed FBG view rotated by 90°

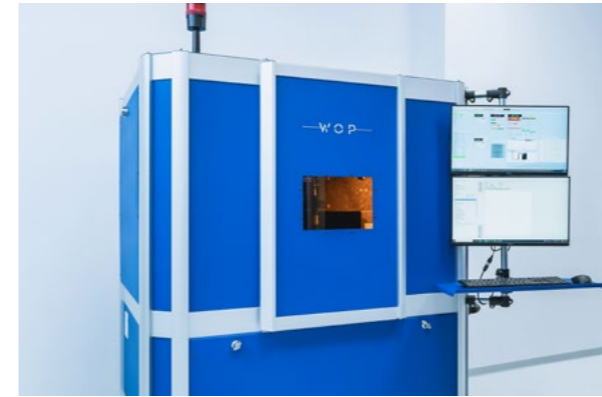
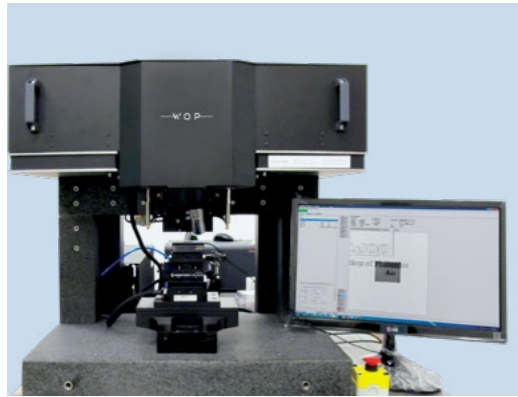


Multicore fiber



FBG writing in SMF

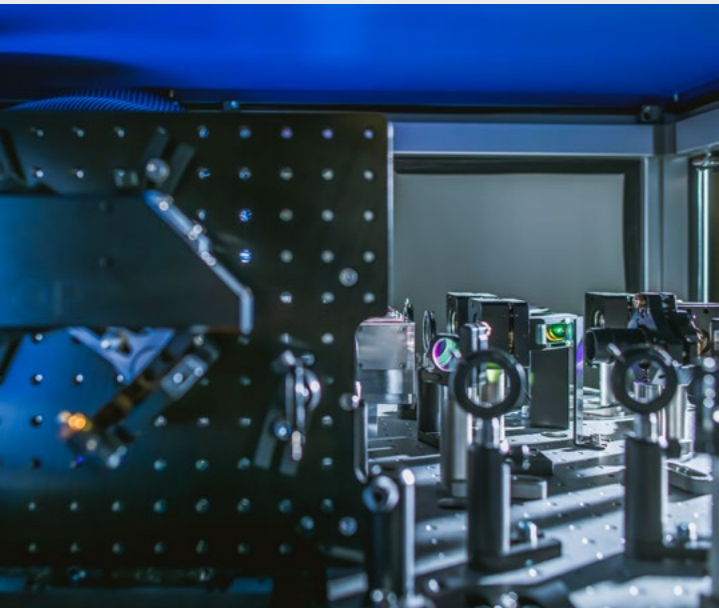
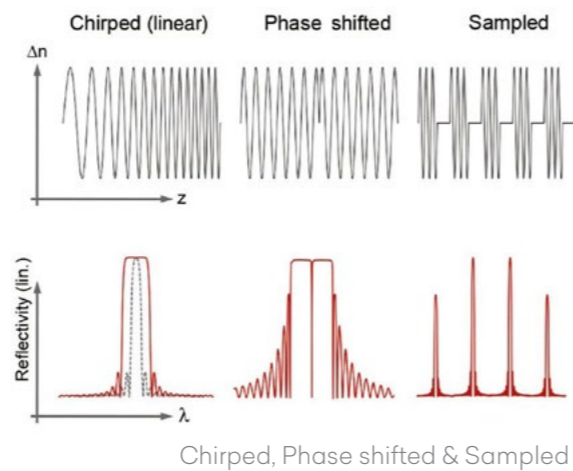
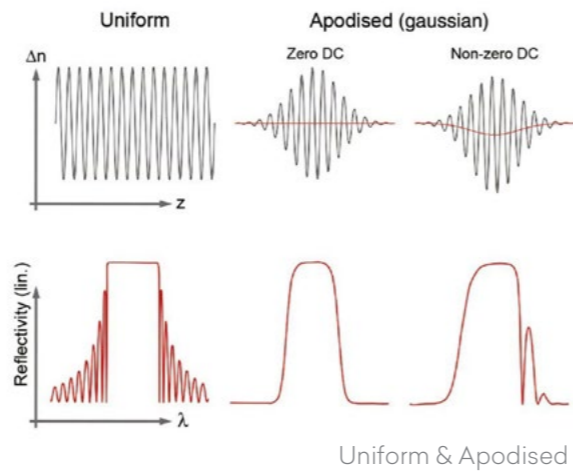
# FemtoFBG | Configurations



	Standard	Advanced	Custom
<b>Micromachining technologies</b>	Direct laser writing	Direct laser writing	The system can include fiber drilling, marking, phase mask writing, and other functionalities
<b>Laser</b>	Single-wavelength	Dual-wavelength	Design wavelengths   wavelengths can be chosen, including integration of customer's provided laser source
<b>FBG writing options</b>	Point-by-Point (PbP) Line-by-Line (LbL)	Point-by-Point (PbP) Line-by-Line (LbL)	Optional inclusion of alternative writing techniques or techniques
<b>Fibers</b>	Single-mode fibers	Single-mode fibers	Multicore fibers, dual-cladding fibers
<b>Maximum FBG length</b>	70 mm	150 mm	Customer's choice
<b>XY working range, mm</b>	160x160x60	160x160x60	Up to 300x300
<b>Flat samples processing</b>	Included	Included	Optional
<b>Fiber core autofocus</b>	–	Included	Digital
<b>Fiber tension control</b>	–	Included	Holder designed according to individual requirements
<b>Polarization control</b>	–	Motorized	Motorized Linear Polarization rotation, Circular, Elliptical, Azimuthal, or other
<b>Writing</b>	With positioning system	With a positioning system and/or scanning unit	Positioning and scanning units can be chosen by the customer
<b>Power control</b>	Integrated external control	Integrated external control	Option for single pulse energy measurement
<b>Vibration control</b>	Passive	Passive	Passive/Active
<b>Fiber feeding</b>	Manual	Manual	Reel-to-reel mechanism for writing without immersion oil

# Advantages of using FemtoFBG

- Writing through the cladding – no need to strip the fibers before FBG inscription.
- All fiber types – no need for UV photosensitivity.
- Easy process tuning for different gratings – the mask is not required.
- Nearly no system maintenance costs compared to excimer laser-based system



**20 years of expertise**  
in femtosecond laser micromachining with a high focus on glass



**50+ professionals**  
6 Ph.D., 40 M.S. and B.S.



**Patent family of 13 in-house and 2 licensed patents**



**R&D studies**  
continuous projects with academic and research partners

Our FemtoFBG clients:



Politecnico di Torino

