

## HIGH-TECH EQUIPMENTS FOR

### Design Studies

- High-performance computing station for accurate modelling

### Fibre and Preform Fabrication

- MCVD lathe with rare earth vapor phase deposition system
- Glass-working lathe
- Two 12-metre-tall drawing towers
- Acrylate, polyimide, metal and carbon coating capability while drawing

### Component Fabrication

- Bragg Gratings photo-inscription setup (UV laser) during fibre drawing
- 8-metre-tall stretching draw tower for rods and capillaries
- Glass processing by filament fusion, plasma advanced control or CO<sub>2</sub> laser splicers

### Characterisation

- Preform analyser (PK)
- Interferometric fibre analyser (IFA)
- Scanning electron microscope with energy dispersive spectrometer (MEB-EDS)
- Optical fibre rewinder with proof-testing capabilities
- Tensile test machine (Weibull test)
- Spectral attenuation measuring system (Bentham, OTDR, custom in-house setups)
- Optical Backscatter Reflectometer (OBR)
- Dispersion measuring system (400-2400 nm)
- Supercontinuum sources
- Spectrometers (UV-Visible-IR and Raman)
- Laser test benches

## CONTACT US

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## ABOUT US

Located in a unique French Photonics Park in Lannion (Brittany), Photonics Bretagne is a Photonics Innovation Hub which gathers:

### A Research and Technology Organisation

High level of expertise in specialty optical fibres, components and biophotonics. Services include technology consultancy, POCs, design of fibre and fibre-based sensor systems.

### An Innovation Cluster

Coordination of a network of more more than 100 members: companies, research centres, schools and support agencies. Tailor-made training offer on fibre and laser technologies for employees and job seekers.



## DISTRIBUTORS

### FRANCE & WORLDWIDE

Exail (formerly iXblue)

Website: <https://www.exail.com>

### USA

Cybel

Email: [contact@cybel-llc.com](mailto:contact@cybel-llc.com)

Website: <https://cybel-llc.com>

### CHINA

Aunion Tech

Email: [info@auniontech.com](mailto:info@auniontech.com)

Website: <https://www.auniontech.com>

## FUNDERS



## CUSTOM SPECIALTY OPTICAL FIBRES

Modelling | Preform Fabrication | Fibre Drawing  
Characterisation | Components



# DEVELOPING CUSTOM SOLUTIONS SPECIALTY OPTICAL FIBRES AND COMPONENTS

Our skilled team of technicians, engineers and PhDs with expertise in all key areas offers a fully tailored fibre service: from design studies to prototyping and characterisation.

## CAPABILITIES

### Bibliography

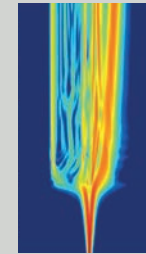
#### Bibliographic studies

- Overview of the state of the art in technologies of interest

### Modelling

#### Standard and proprietary fibre designs

- Spectral attenuation, bending losses
- MFD, modal content
- GRIN geometry, birefringence
- Nonlinear pulse propagation



### Preform Fabrication, Stack and Draw Assembly

#### Complex preforms from our in-house innovative processes

- Active (erbium, ytterbium, bismuth...)
- Polarisation maintaining
- Photonic crystal and Multicore
- Boron stress rods

### Fibre Drawing

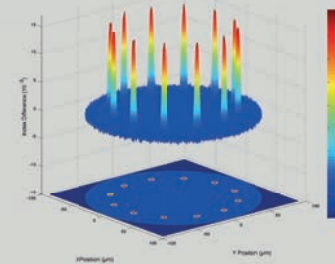
#### From in-house or customer-supplied preform, Up to kilometer-long fibres for a wide range of applications

- Capabilities: all type of silica glass preform
- Various coatings: polymer or metal with optional carbon layer
- Taperised fibres

### Characterisation

#### Fully verified and operational fibres

- Refractive index profile on preforms and fibres
- SEM geometry
- EDS chemical composition
- Optical attenuation and reflectivity
- MFD, M<sup>2</sup>, dispersion
- PER, birefringence
- Laser expertise



### Components

#### Plug-and-play solutions

- Draw Tower Bragg Gratings
- Tapers and combiners
- Capillaries
- Endcaps and patchcords
- Mode field adaptors (MFA)
- Packaged fibre units (SUP, VLMA...)
- Custom splicing



## FIBRES AND COMPONENTS *Product line* **PERFOS®**

Our fibres are fully designed, manufactured and characterised in-house. Custom products can be developed through specific orders or R&D projects.

## MICROSTRUCTURED FIBRES

### SOLID-CORE

#### Supercontinuum | SUP \*

##### Supercontinuum and nonlinear wavelength conversion



- Optimised for pumping near 780 nm and 1060 nm
- Low background loss
- Small effective area
- High nonlinear coefficient

#### Endlessly Single-Mode | ESM

##### White light delivery for life sciences



- Single-mode at all wavelengths
- Wavelength-independent mode-field diameter
- Available in polarisation-maintaining version

#### Airclad | ACF

##### Power delivery, spectroscopy

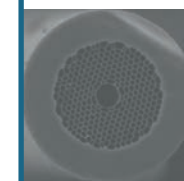


- Multimode
- Ultra-high numerical aperture

### HOLLOW-CORE

#### Photonic Bandgap | HCF

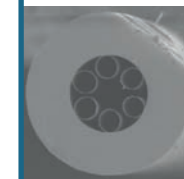
##### Gas detection



- Different transmission bands in Near-IR with low background loss
- Ultra-low nonlinearity
- High damage threshold
- >98% of the optical power in the core
- Ultra-low bend loss

#### Anti-Resonant | ARF

##### Low latency transmission, power delivery



- Various spectral transmission bands (700-3150 nm) with ultra-low dispersion
- High damage threshold
- ~99% of the optical power in the core
- Nearly single-mode guidance

## CABLE

#### Hollow-Core Fibre Optic Cables

##### Low latency data transmission



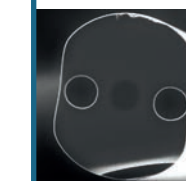
- Large bandwidth transmission at 1310 nm, over the full C/L bands and beyond
- Low loss
- Easy integration into existing networks

## ALL SOLID FIBRES

#### Very Large Mode Area | VLMA \*

##### Ytterbium Doped Fibre

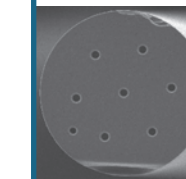
##### High power ultra-fast pulsed fibre lasers/amplifiers



- All-solid step-index fibre
- Truly single-mode PM
- Mode area ~750 μm<sup>2</sup>
- Photodarkening-free silica matrix
- Cladding absorption >7 dB/m
- Passive version available on request

#### Multicore | MCF

##### Sensing, telecom, lasers



- 7 and 12 cores
- Excellent fibre geometry
- Passive, photosensitive, erbium or ytterbium doped cores

## COATINGS

#### Metal Coated Fibres

##### Sensing, amplifiers, lasers

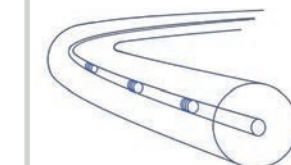


- Multi/single-mode fibres with aluminium or carbon+copper coating
- Wide temperature range and water/hydrogen sealing barrier

## COMPONENTS

#### Draw Tower Bragg Gratings

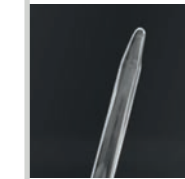
##### Temperature and strain sensors



- Single or multicore fibres
- Weak reflectivity
- Customisable FBG length and spacing

#### Boron Stress Rods

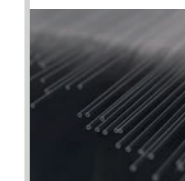
##### For polarisation maintaining fibres



- Highly doped
- Various core diameters and lengths

#### Capillaries

##### Combiners, biophotonics



- High-precision homogeneous vertical drawing
- Pure or doped (fluorine, boron, germanium...) silica

\* Also plug-and-play modules available on request

