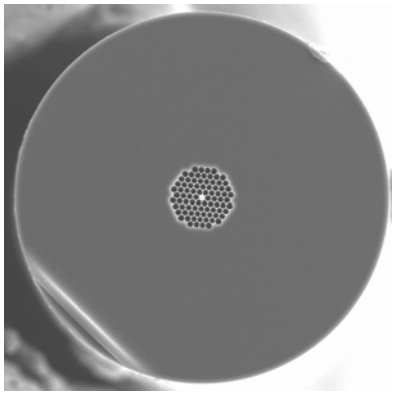
Photonic Crystal Fibers by

CRYSTAL FIBRE

NL-1.8-730-02

Highly nonlinear PCF



Our highly nonlinear photonic crystal fibers guide light in a small solid silica core, surrounded by a microstructured cladding formed by a periodic arrangement of air holes in silica. The optical properties of the core closely resemble those of a rod of glass suspended in air, resulting in strong confinement of the light and, correspondingly, a large nonlinear coefficient. By selecting the appropriate core diameter, the zero-dispersion wavelength can be chosen over a wide range in the visible and near infrared spectrum, making these fibers particularly suited to supercontinuum generation with Ti:Sapphire or diode-pumped Nd^{3+}-laser sources.

Nonlinearity: 122 W^{-1} km^{-1}
Zero dispersion λ=730nm
Single material
Spliceable

Unique properties of Highly nonlinear PCF

- Zero dispersion wavelengths from 670-880 nm available
- Nonlinear coefficients up to 190 $W^{-1}km^{-1}$ available (cf 1.1 $W^{-1}km^{-1}$ for SMF 28 at 1550 nm)
- Near-Gaussian mode profile

Applications

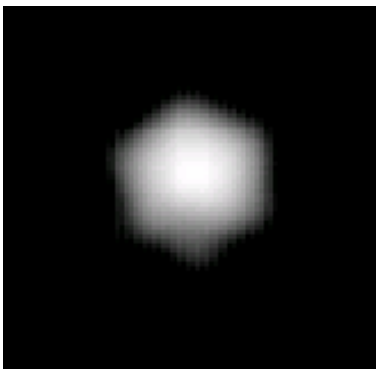
- Supercontinuum generation for frequency metrology, spectroscopy or optical coherence tomography
- Four-wave mixing and self-phase modulation for switching, pulse-forming and wavelength conversion applications
- Raman amplification

To contact Crystal Fibre A/ S, please visit our website www.crystal-fibre.com or send an email message to contact@crystal-fibre.com

CRYSTAL FIBRE

CRYSTAL FIBRE

CRYSTAL FIBRE



Typical measured near field profile (log scale)

Optical properties

• Zero dispersion wavelength (λ_0)			730±5 nm
• Dispersion slope at λ_0			0.8 ps·nm^{-2}·km^{-1}
• Attenuation	λ_0	<	50 dB/km
	1550 nm	<	20 dB/km
	1380 nm	<	300 dB/km
	1000 nm	<	30 dB/km
	600 nm	<	50 dB/km
• Mode field diameter[1] at λ_0			1.4±0.1 µm
• Numerical aperture[2] at λ_0			0.4
• Effective nonlinear area[3]			1.76 µm^2
• Nonlinear coefficient[4] at λ_0			122 W^{-1}·km^{-1}

Physical properties

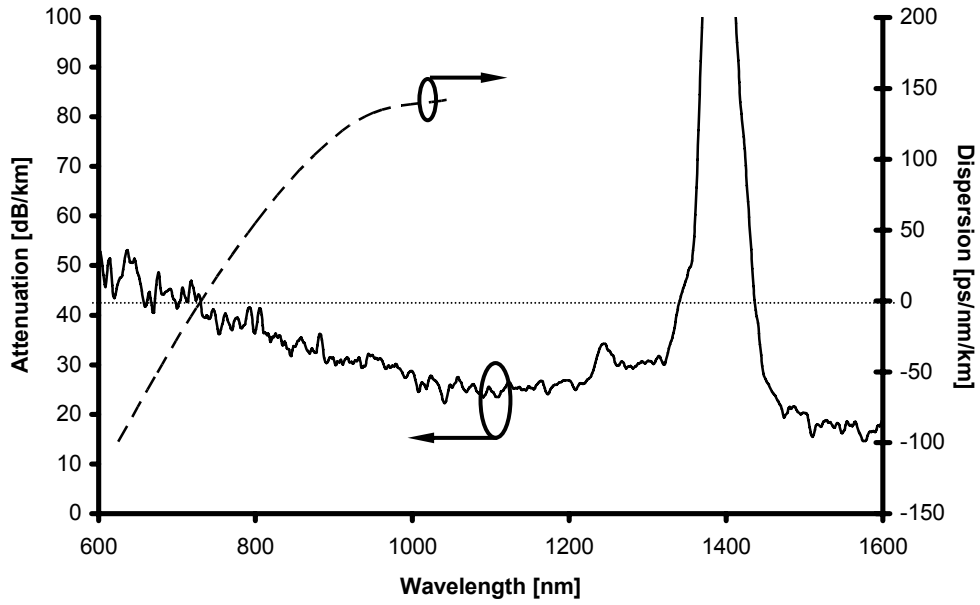
• Core diameter (average)	1.8±0.1µm
• Pitch (distance between cladding holes)	2.0 µm
• Air Filling Fraction in the holey region	>88%
• Width of struts holding the core	100 nm
• Diameter of holey region	21 µm
• Diameter of outer silica cladding (OD)	127 µm
• Coating diameter (single layer acrylate)	220 µm
• Available length	up to 1 km

To contact Crystal Fibre A/ S, please visit our website www.crystal-fibre.com
or send an email message to contact@crystal-fibre.com

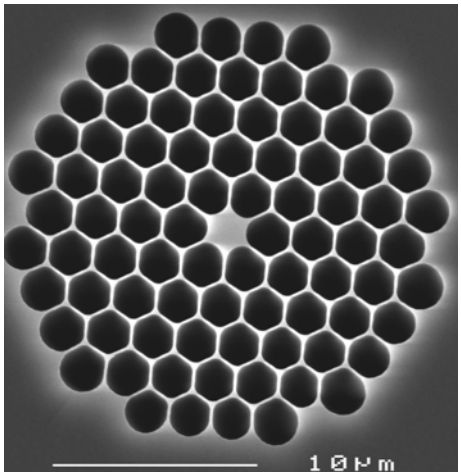
CRYSTAL FIBRE

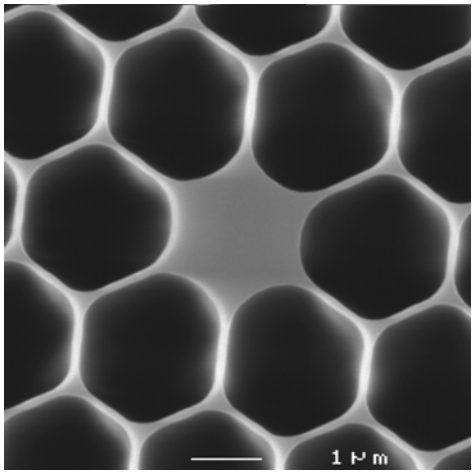
CRYSTAL FIBRE

Typical attenuation spectrum and chromatic dispersion



SEM image of PCF region and core





To contact BlazePhotonics, please visit our website www.blazephotonics.com
or send an email message to info@blazephotonics.com

CRYSTAL FIBRE

CRYSTAL FIBRE

Notes

1 Full 1/e-width of the near field intensity distribution

2 Sine of half angle at which a Gaussian fit to the far field intensity distribution has dropped to 1% of its peak value

3 $$A_{eff} = \frac{\left(\int_{\infty} |\mathbf{E}(\mathbf{r})|^2 d^2\mathbf{r} \right)^2}{\int_{silica} |\mathbf{E}(\mathbf{r})|^4 d^2\mathbf{r}}$$

4 $$\gamma = \frac{2\pi n_2}{A_{eff}\lambda}$$

$n_2 \approx 2.5 \times 10^{-20}$ m^2 W^{-1} for silica