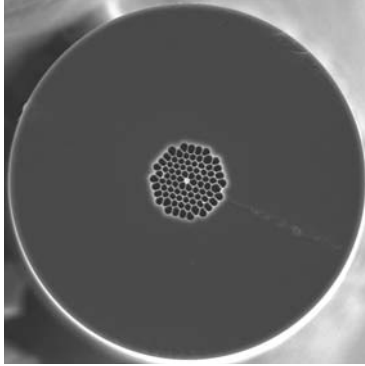


NL – 1.5 – 670



Non-linearity: $168 \text{ W}^{-1} \text{ km}^{-1}$

Zero dispersion $\lambda=670\text{nm}$

Single material

Spliceable

Highly nonlinear PCF

Our highly non-linear 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.

Unique properties of Highly nonlinear PCF

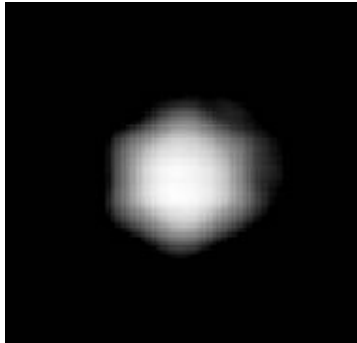
- Zero dispersion wavelengths from 670-880 nm available
- Non-linear coefficients from $34\text{-}215 \text{ W}^{-1}\text{km}^{-1}$ available (cf $1.1 \text{ W}^{-1}\text{km}^{-1}$ for SMF 28 at 1550 nm)
- Near-Gaussian mode profile

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

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Typical measured near field profile (log scale)

Optical properties

• Zero dispersion wavelength (λ_0)		670 ± 5 nm
• Dispersion slope at λ_0		1.00 ps·nm ⁻² ·km ⁻¹
• Attenuation	λ_0	< 320 dB/km
	1550 nm	< 120 dB/km
	1380 nm	< 500 dB/km
	1000 nm	< 200 dB/km
	600 nm	< 380 dB/km
• Mode field diameter ¹ at λ_0		1.0 ± 0.1 μ m
• Numerical aperture ² at λ_0		0.24
• Effective nonlinear area ³		1.1 μ m ²
• Nonlinear coefficient ⁴ at λ_0		214 W ⁻¹ ·km ⁻¹

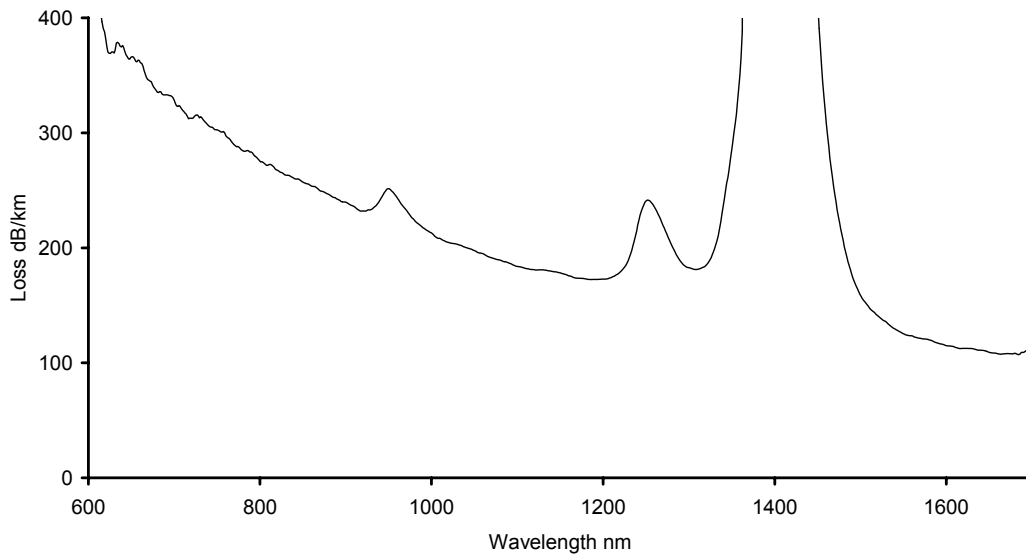
Physical properties

• Core diameter (average)	1.5 ± 0.1 μ m
• Pitch (distance between cladding holes)	2.0 ± 0.1 μ m
• Air Filling Fraction in the holey region	>90%
• Width of struts holding the core	70 ± 10 nm
• Diameter of holey region	22.0 ± 0.5 μ m
• Diameter of outer silica cladding (OD)	104 ± 1 μ m
• Coating diameter (single layer acrylate)	260 ± 5 μ m
• Available length	up to 1 km

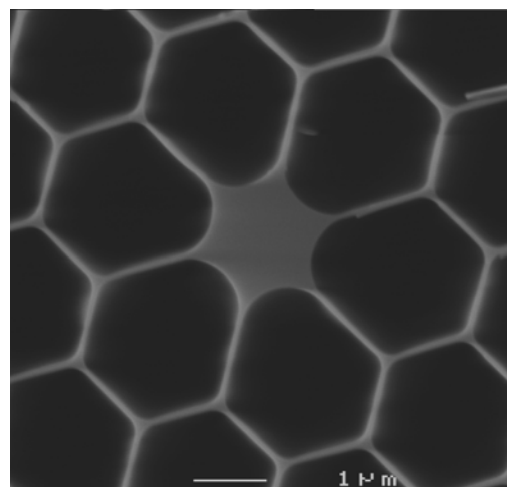
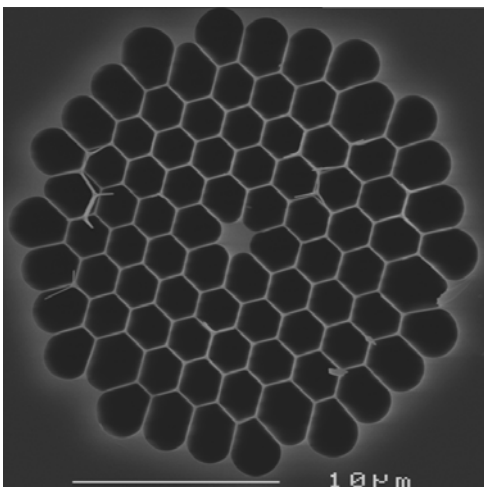
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Measured attenuation spectrum



SEM image of PCF region and core



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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

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

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

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