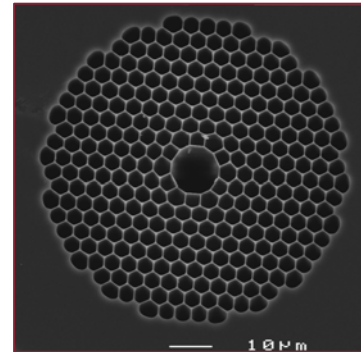


# HC-1550-02

## Hollow Core Photonic Bandgap Fiber



- >95% of optical power located in air
- Quasi-Gaussian fundamental mode
- Can be filled with gas
- Low bend loss down to few mm bend radius
- Fresnel reflection to air at the end faces  $<10^{-4}$
- Up to 75% of fiber cross section composed of solid silica, facilitating fusion splicing to conventional fibers
- Undoped silica for good temperature stability



Photonic Bandgap Fibers guide light in a hollow core, surrounded by a microstructured cladding formed by a periodic arrangement of air holes in silica. Since only a small fraction of the light propagates in glass, the effect of material nonlinearities is significantly reduced and the fibers do not suffer from the same limitations on loss as conventional fibers made from solid material alone.

While hollow core PCF holds the promise to become the next generation ultra-low loss transmission fiber, it already finds important applications in power delivery, pulse shaping and compression, sensors and non-linear optics.

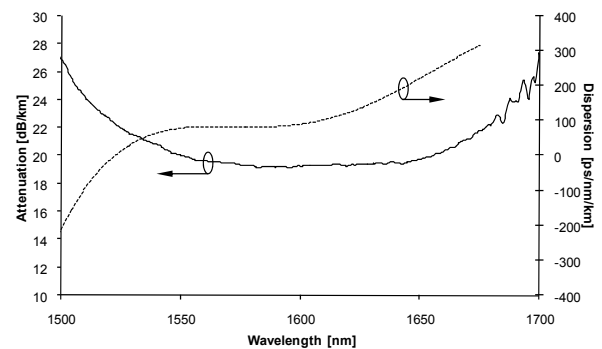
### Physical properties

Core diameter <sup>(1)</sup>	10 μm ± 1 μm
Pitch	3.8 μm
Air filling fraction in the holey region <sup>(2)</sup>	> 90%
Diameter of holey region	70 μm
Cladding diameter	120 μm
Coating diameter (single layer acrylate)	220 μm

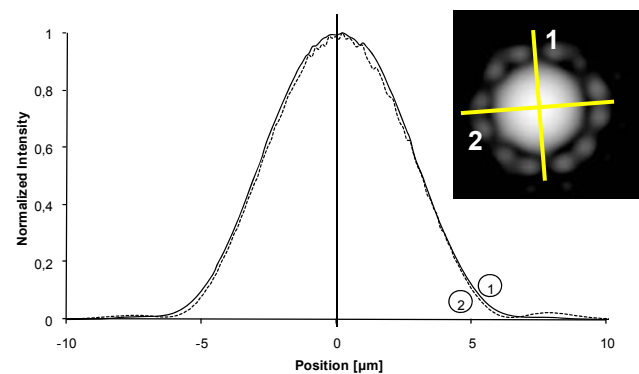
### Optical properties

Center wavelength <sup>(3)</sup>	1550 nm
Attenuation @ 1550 nm	< 0.03 dB/m
Dispersion @ 1550 nm	97 ps/nm <sup>2</sup> /km
Dispersion slope @ 1550 nm	0.5 ps/nm <sup>2</sup> /km
Dispersion slope @ zero disp. wavelength	4.8 ps/nm <sup>2</sup> /km
Width of transmission band <sup>(4)</sup>	> 200 nm
Fraction of light in air <sup>(5)</sup>	> 95%
Mode field diameter <sup>(6)</sup>	7.5 μm
Numerical aperture <sup>(7)</sup>	0.2
Effective mode index <sup>(8)</sup>	~0.99
Mode shape overlap with std. SMF <sup>(9)</sup>	> 85%

### Typical attenuation and dispersion



### Typical near field intensity



1. Core formed by removing 7 hexagonal unit cells of the cladding
2. Excluding core and outermost ring of holes
3. Other wavelengths available on request
4. Bandwidth over which loss < 0.1 dB/m
5. Derived from numerical model
6. Full 1/e-width of the near field intensity distribution
7. Sine of half angle at which a Gaussian fit to the far field intensity distribution has dropped to 1% of its peak value.
8. Derived from numerical model
9. Mode field diameters matched to provide best overlap

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