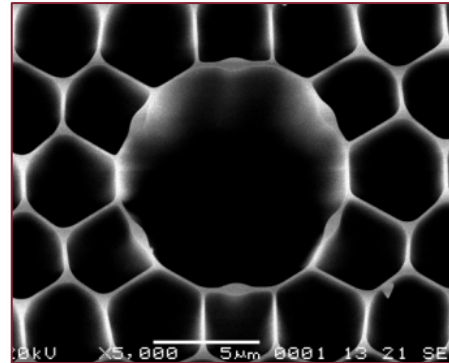


# HC-1550-04

## Hollow Core Photonic Bandgap Fiber



- >95% of optical power located in air
- Quasi-Gaussian fundamental mode
- Can be filled with gas
- Low bend loss: Bending at 3mm radius (20 turns) does not significantly increase loss
- Fresnel reflection to air at the end faces  $<10^{-4}$
- Available spliced or connectorized
- Undoped silica for good temperature stability



Hollow core photonic bandgap fibers guide light in a hollow core surrounded by a microstructured cladding formed by a periodic arrangement of air holes in silica.

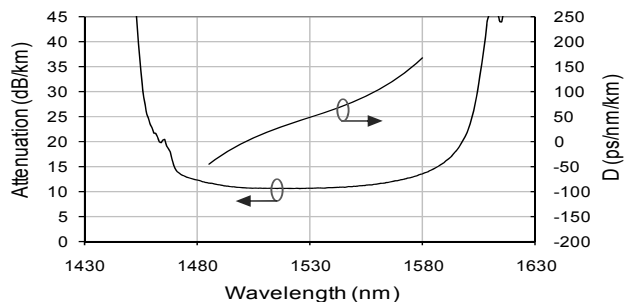
Since only a small fraction of the light propagates in glass, the effect of material nonlinearities is significantly reduced and the fibers do not suffer from the same loss limitations as fibers made from all solid material.

Applications include power delivery, pulse shaping and compression, sensors and non-linear optics.

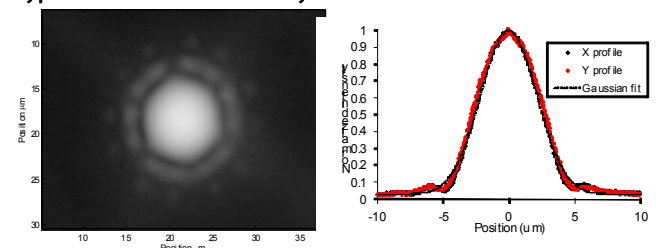
Physical properties	
Core diameter <sup>(1)</sup>	10.6 ± 0.3 μm
Pitch	4.1 ± 0.1 μm
Air filling fraction in the holey region <sup>(2)</sup>	> 90%
Diameter of holey region	76 μm
Cladding diameter	121 ± 2 μm
Coating diameter	220 ± 50 μm
Coating material	Acrylate

Optical properties	
Center wavelength <sup>(3)</sup>	1535 ± 5 nm
Attenuation @ 1550 nm	< 15 dB/km
Dispersion @ 1550 nm	83 ± 10 ps/nm/km
Dispersion slope @ 1550 nm	~2.5 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
NA @ 1550 nm <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 < 20 dB/km
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. MFD's matched to provide best overlap

HC-1550-04-100409