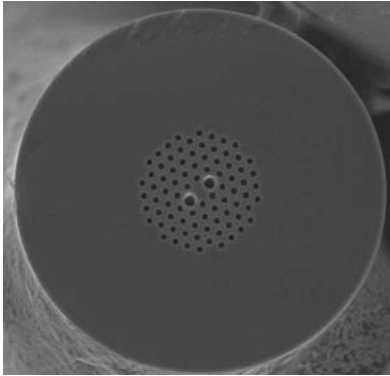


PM – 1550 – 01



Beatlength: < 4 mm
PER >30 dB/100 m (typical)
Temperature insensitive
Single undoped material

Polarisation Maintaining PCF

Birefringence in conventional polarization-maintaining (PM) fibers is created elasto-optically by incorporating materials with different thermal expansion close to the core, which generate stress when the fiber cools down in the drawing process. In contrast, a non-circular core combined with the large air-glass refractive index step in our PCF creates strong *form* birefringence. The result can be a shorter beatlength, reduced bend-induced coupling between polarization states and an improved polarization extinction ratio. Furthermore our PM-PCF is significantly less temperature sensitive than conventional Hi-Bi fiber.

Unique properties of Polarization Maintaining PCF

- Beatlength < 4 mm at $\lambda = 1550$ nm
- Polarization Extinction Ratio (PER) >30 dB over 100 m
- Low loss (<1.5 dB/km at $\lambda = 1550$ nm)
- Temperature coefficient of birefringence measured to be 30 times lower than that of conventional Hi-Bi fiber
- Near-Gaussian mode profile¹: mode field ellipticity 1.5

Applications

- Sensors
- Gyroscopes
- Interferometers

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Typical measured near field profile (log scale)

Optical properties at 1550nm²

- Mode field diameter³ - Polarisation 1 3.6 / 3.1 μm
- Polarisation 2 3.6 / 3.1 μm
- Attenuation⁴ < 1 dB/km
- Beat Length (typical) < 4 mm
- DGD 2.25 ns/km
- PER⁵ (typical) > 30 dB/100 m
- Chromatic dispersion - Polarisation 1 54 ps/nm/km
- Polarisation 2 59 ps/nm/km

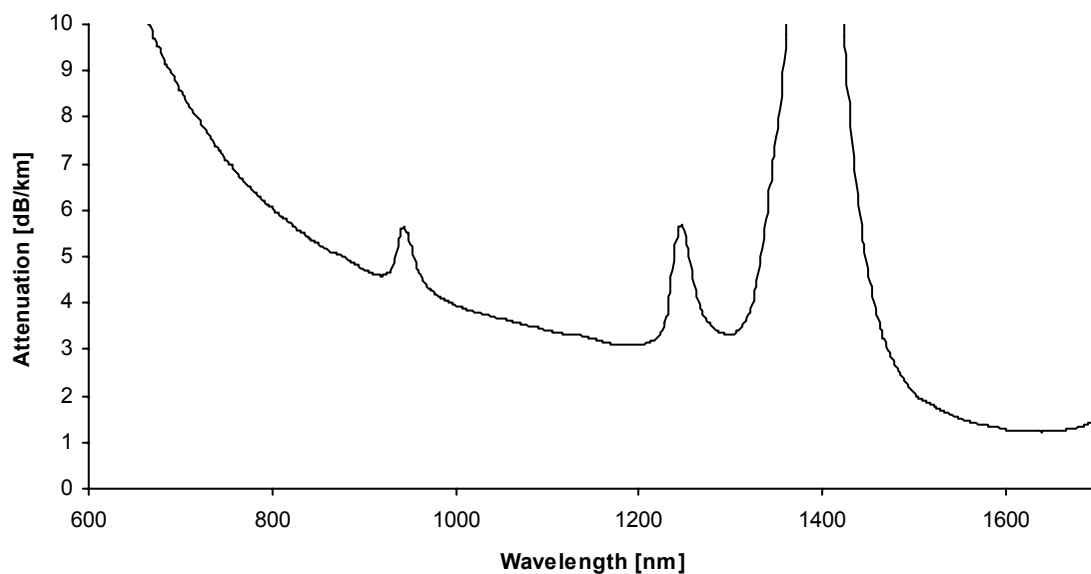
Physical properties

- Pitch, Λ (Spacing between adjacent holes) 4.4 μm
- Large hole diameter 4.5 μm
- Small hole diameter 2.2 μm
- Diameter of holey region 40 μm
- Outside diameter 125 μm
- Coating diameter 230 μm
- Available Length up to 3 km

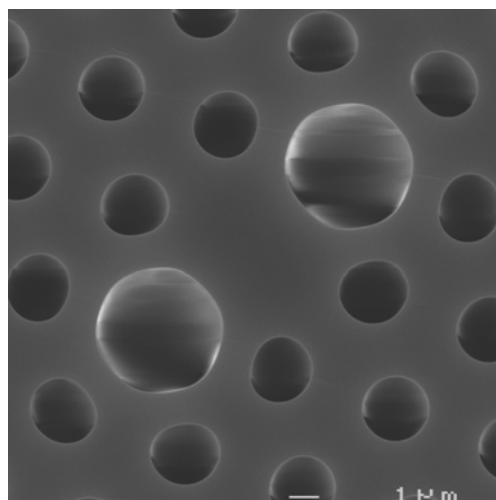
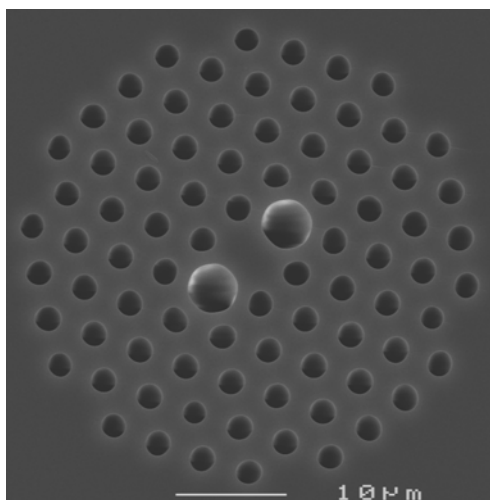
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Attenuation spectrum



SEM image of PCF region and core



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Notes

1. Numerically simulated
2. At 25 °C, $\lambda = 1550$ nm, no strain
3. Full width at points in the near field where intensity has dropped to $1/e$ of the peak value; long/short axis of MF
4. OTDR and spectral cutback measurements
5. Experiment performed on a 155 mm \varnothing spool

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