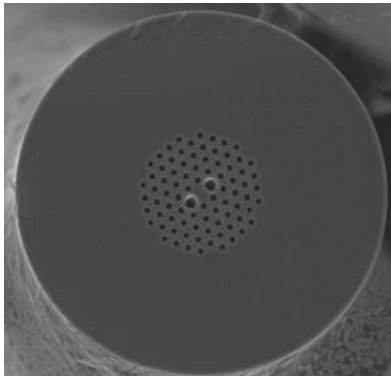


PM – 1550 – 01



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



PM – 1550 – 01



Typical measured near field profile (log scale)

Optical properties at 1550nm²

• Mode field diameter ³	- Polarisation 1	3.6 / 3.1 μm
	- Polarisation 2	3.6 / 3.1 μm
• Attenuation ⁴		< 1 dB/km
• Beat Length (typical)		< 4 mm
• DGD		2.25 ns/km
• PER ⁵ (typical)		> 30 dB/100 m
• Chromatic dispersion	- Polarisation 1	54 ps/nm/km
	- Polarisation 2	59 ps/nm/km

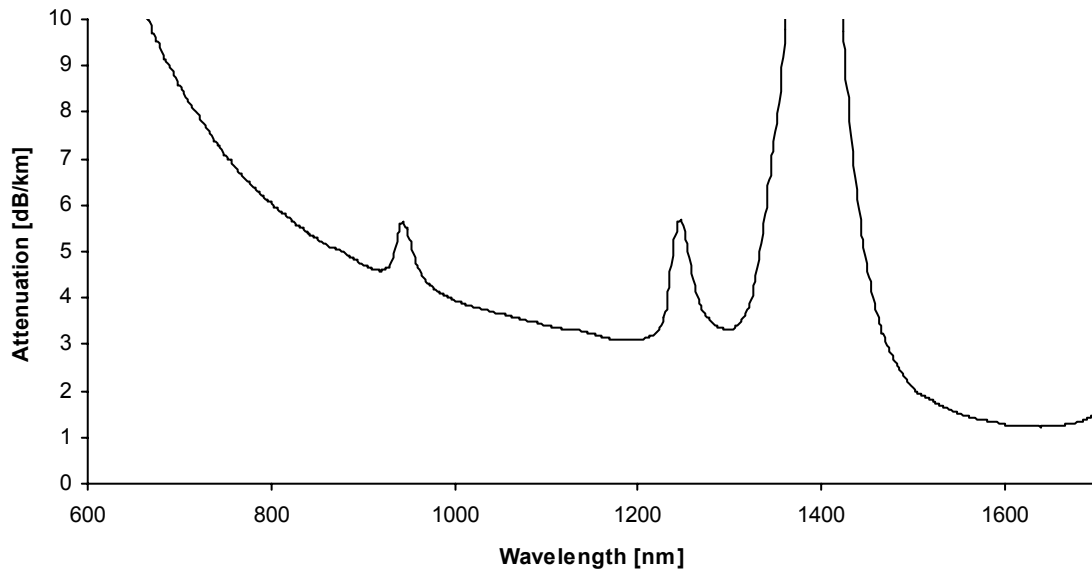
Physical properties

• 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

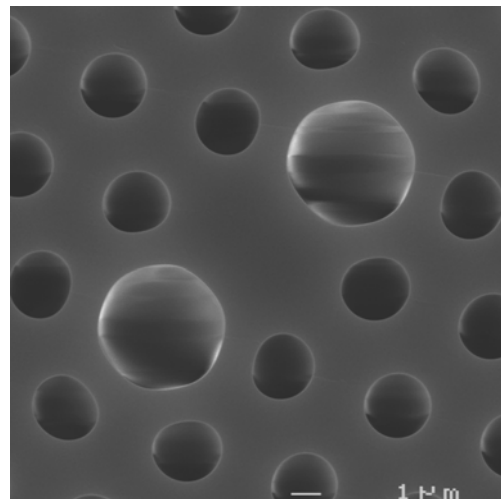
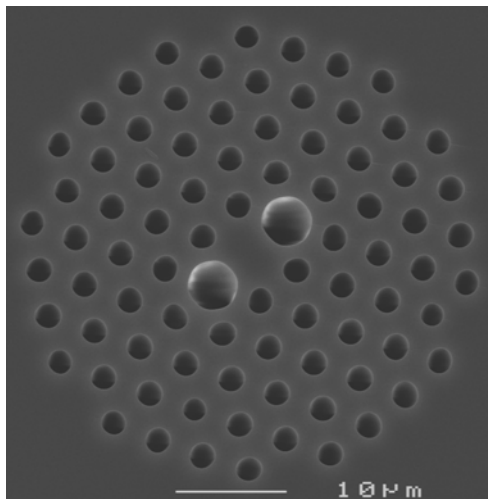


PM – 1550 – 01

Attenuation spectrum



SEM image of PCF region and core



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

