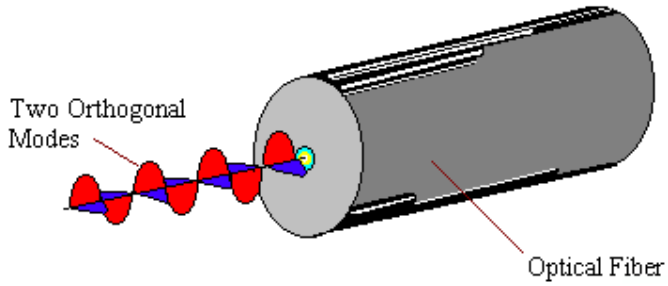
HB 'Bow Tie' PM fiber

First choice for research and product-development

Fibercore's PM fibers dominate the Fiber Sensor Industry and use 'Bow-Tie' stress-applying-parts (SAPs) to create birefringence in the core. The design of these highly efficient SAPs generates very high birefringence without excessive stress, allowing polarization orientation to be controlled effectively across a fiber system - essential for many telecoms and sensor applications.

How it works

Fibercore HB Fibers are special. In standard (non-PM) singlemode fiber the fundamental optical mode propagates as two orthogonal and linearly-polarized (LP) modes.



Since these modes are strongly-coupled, power switches between them at the slightest perturbation of the optical field, induced by (say) variations in temperature, fiber geometry and/or stress. The result of this intrinsic instability is that the power distribution between the two modes, and therefore the output polarization orientation, is both random and time-varying.

With Fibercore HB Polarization Maintaining Fiber, the basic propagation is still singlemoded but the induced birefringence means that the LP modes are now weakly-coupled. The higher the birefringence, the weaker the coupling – so now, optical power launched into either of the two modes cannot switch (cross-couple) to the other, with the result that the polarization state of the transmitted light is preserved.

Polarization Maintaining Fiber

Full range of operating wavelengths

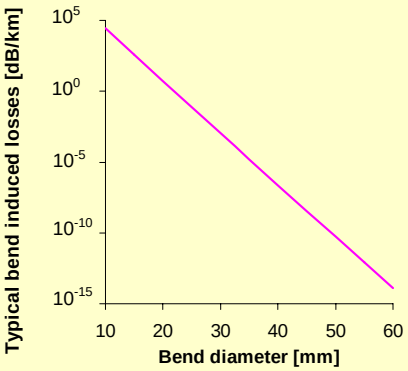
Designed for 488nm - 1550nm

Excellent PM Performance and Handling

'Bow-Tie' SAPs maximize birefringence whilst minimizing internal stress within the fiber by 'focusing' stress efficiently to the core – providing optimum H-parameter with good cleave-quality and fusion-splice yields

High Resistance to Macro and Micro-bend-induced Loss

High NA provides excellent resistance to macro and micro-bending facilitating general handling and enabling deployment in small form-factor packages



Rugged and Easy to Handle

245µm dual-layer acrylate coating provides excellent ruggedness, optical mode stripping and simple mechanical or chemical removal. Other application-specific coating packages are also available.

Excellent Compatibility

Standard, 125 µm glass diameter compatible with a broad range of standard telecoms fibers, tools and components

T: +44 (0) 23 8076 9893 F: +44 (0) 23 8076 9895 E: info@fibercore.com www.fibercore.com

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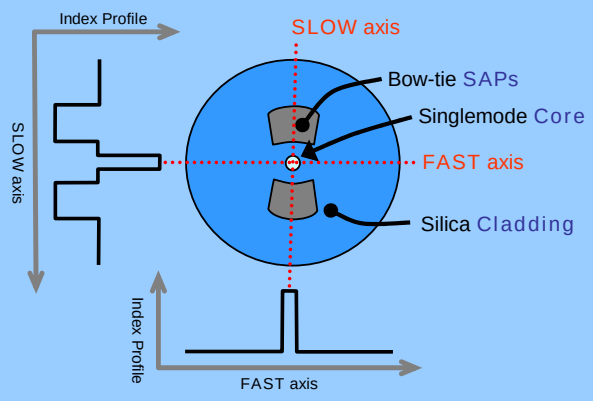
The core is flanked by areas of high-expansion, boron-doped glass that shrink-back more than the surrounding silica as the fiber is drawn and freeze the core in tension. This tension induces birefringence (ie it creates two different indices of refraction: a higher index parallel and a lower index perpendicular to the applied stress). In essence, this phenomenon is very similar to that which creates visible interference fringes when transparent plastics are stressed, except that in silica the effect is highly controlled and its magnitude is at least an order of magnitude lower than may be achieved in a plastic.

Fibercore Limited’s ‘Bow-Tie’ design is capable of creating more birefringence than any other stressed design simply because it is based on two opposing wedges – the simplest and most efficient means of applying stress to a point.



Notes

Specifications

	HB450	HB600	HB750	HB800	HB1000	HB1250	HB1500
Design wavelength (nm)	488 - 514	633 - 688	780	830	1064	1300	1550
Cut-off wavelength (nm)	350 - 470	500 - 600	610 - 750	600 - 800	840 -1020	1030 -1270	1230 -1520
Numerical Aperture	0.10 - 0.13	0.14 - 0.18					
Mode Field Diameter[1] (μm)	3.6	3.2	4.0	4.2	5.4	6.6	7.9
Attenuation @ λ_{op} (dB/km)	<100	<15	<8	<5	<3	<2	
Beat-length [2] (mm)	<2.0						
Proof test (%)	1						
Fiber diameter	125 ± 1 μm						
Core-cladding concentricity	<1.0 μm						
Coating type	Dual layer acrylate						
Coating diameter	245 ± 5%						

Notes:
[1] Nominal MFD at operating wavelength
[2] Measured at 633 nm

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