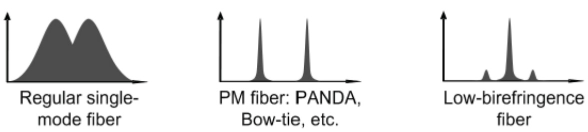
Low-birefringence spun fiber

LB650 | LB1300 | LBE1300 | LBS1300 | LB1500

Rotating glass preform during fiber drawing process produces a waveguide with unique properties: all fiber non-uniformities are averaged along all possible directions, effectively cancelling out total fiber birefringence. With total (but not local) birefringence close to zero, we obtain a fiber that will hold **any** polarization (even when bent or twisted). Unlike conventional PM fibers that can hold only linearly polarized light, or annealed fiber that requires special handling, this low-birefringence fiber preserves both linear and circular polarization and can relay it with minimum error over large distances.
Depending on the type of the preform used in drawing, spun fiber will suit different applications. Highly-birefringent preforms with incorporated stress (LB650, LB1300 and LB1500) or elliptical core (LBE1300) produce spun fibers that can withstand significant bending and twisting and hold polarization over large number of coils with reasonable accuracy (without costly annealing process). Polarization accuracy in this case depends on local (instant) birefringence that introduces a small constant error, independent of fiber length. If regular single-mode preform is used (LBS1300), the fiber will have no local birefringence and hold polarization with very high accuracy over small distances or in a bend-free environment.

PMD in spun fiber

Averaging nature of low-birefringence spun fiber can significantly reduce the effects of polarization mode dispersion in optical sensing and telecommunication systems. As a result, LB1300 fiber offers up to tenfold reduction of fiber PMD compared to conventional single-mode telecom fiber.



Reflection of unpolarized light by fiber Bragg gratings written in different types of optical fiber.

Spun fiber gratings

Bragg gratings written in low-birefringence fibers exhibit polarization insensitivity. Fiber gratings inscribed in regular fibers tend to produce two spectral peaks - one for each polarization, whereas reflections from low-birefringence fiber Bragg gratings feature a spectral peak whose wavelength is independent of input polarization.

Specifications

	LB650	LB1300	LBE1300	LBS1300	LB1500
Operating wavelength	600 - 900 nm	1300 - 1600 nm	1300 - 1600 nm	1300 - 1600 nm	1500 - 1600 nm
Cut-off wavelength	< 580 nm	< 1280 nm	< 1250 nm	< 1280 nm	< 1450 nm
Beatlength	4 mm	13 mm	30 mm	-	11 mm
Spin period	3 mm	3 mm	3 mm	3 mm	3 mm
Attenuation	6 dB/km	4 dB/km	7.5 dB/km	2.5 dB/km	4.5 dB/km
Mode field dimensions	6 um	9 um	8 x 13 um	9 um	9 um
Cladding diameter	125 um	125 um	125 um	125 um	125 um
Coating diameter	250 um	250 um	250 um	250 um	250 um
Core-clad concentricity	< 0.5 um	< 0.5 um	< 0.5 um	< 0.5 um	< 0.5 um
Cladding offset	< 5 um	< 5 um	< 5 um	< 5 um	< 5 um
Coating material	acrylate	acrylate	acrylate	acrylate	acrylate
Proof test	100 kpsi	100 kpsi	100 kpsi	100 kpsi	100 kpsi
Bending radius	> 20 mm	> 20 mm	> 30 mm	> 150 mm	> 20 mm

Major spun fiber parameters can be optimized depending on your application requirements, such as device sensitivity, number and size of fiber coils. To discuss your particular application please contact us at (416) 661 1418 or info@ivgfiber.com

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