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Spun HiBi and Spun LoBi Fiber

For Faraday Effect Current Sensors

Fibercore offer two ranges of spun fiber, SHB Spun High Birefringence (HiBi) fibers and SLB Spun Low Birefringence (LoBi) fibers. Both of these products are optimized for use in polarimetric sensors, including the AC and DC fiber optic Current Transformers (CT) that are now replacing conventional current transformers across a broad range of applications in electrical power generation and distribution.

Spun HiBi fibers are designed to allow long lengths of fiber to be used in small diameter coils for Faraday effect current sensors. SHB fibers are fabricated by spinning a 'Bow-Tie' polarization maintaining preform during the fiber drawing process. They preserve circular polarization by design and are therefore insensitive to the thermal and/or vibration-induced signal fade/drift caused by stress-birefringence. This gives the SHB fibers superior performance over SLB fibers when used in sensor coils with a large number of loops.

Spun LoBi fibers are designed for short length, large coil diameter Faraday effect current sensors where cost is more critical than performance. The fiber gives higher sensitivity to the Faraday effect than SHB fiber but does not resist the optical effects induced by thermal fluctuations and vibrations. Subsequently SLB fibers are generally considered to be less suitable for high precision sensors. Nevertheless, they are highly suited to low accuracy/low cost applications.

Advantages:

- Optimized for current sensing
- Spun HiBi designed for high accuracy sensors
- Spun LoBi designed for cost reduced sensors
- Highly temperature stable variants available
- Reduced sensitivity to vibration

Typical applications:

- Current sensing
- Current transformers
- Faraday effect sensors

Related Products:

- Zing™ Polarizing Fiber (HB-Z)
- Telecoms PM Fiber (HB-T)
- PM Gyro Fiber (HB-G)
- Erbium Doped Fiber IsoGain™
- Erbium Doped Fiber MetroGain™

Product Variants:

• **SHB1250(7.3/80)**	Spun HiBi fiber with an 80µm cladding diameter, designed for use around 1310nm
• **SHB1250(7.3/125)**	Spun HiBi fiber with an 125µm cladding diameter, designed for use around 1310nm
• **SHB1500(8.9/125)**	Spun HiBi fiber with an 125µm cladding diameter, designed for use around 1550nm
• **SLB1250(8.9/80)-5**	Spun LoBi fiber with an 80µm cladding diameter, 5mm spin pitch and designed for use around 1310nm
• **SLB1250(8.9/80)-30**	Spun LoBi fiber with an 80µm cladding diameter, 30mm spin pitch and designed for use around 1310nm
• **SLB1250(8.9/125)-5**	Spun LoBi fiber with an 125µm cladding diameter, 5mm spin pitch and designed for use around 1310nm
• **SLB1250(8.9/125)-10**	Spun LoBi fiber with an 125µm cladding diameter, 10mm spin pitch and designed for use around 1310nm
• **SLB1250(8.9/125)-30**	Spun LoBi fiber with an 125µm cladding diameter, 30mm spin pitch and designed for use around 1310nm

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Specifications

Spun HiBi

	SHB1250(7.3/80)	SHB1250(7.3/125)	SHB1500(8.9/125)
Operating Wavelength(nm)	1310		1550
Cut-Off Wavelength (nm)	≤1250		≤1500
Numerical Aperture	0.13 – 0.17		0.13 – 0.16
Mode Field Diameter (µm)	6.2 – 8.4 @1310nm		7.9 – 9.9 @1550nm
Attenuation (dB/km)	≤5 @1310nm		≤3 @1550nm
Circular Beat-Length (mm)	63 – 125 @1310nm		72 – 144 @1550nm
Spin Pitch (mm) Nominal	4.8		
Twist Test (Turns/m)	≤1.0		
Proof Test (%)	1 (100 kpsi)		
Cladding Diameter (µm)	80 ± 1.5	125 ± 1	
Core-Cladding Concentricity (µm)	1.0		
Coating Diameter (µm)	170 ± 10	245 ± 15	
Coating Type	Dual Acrylate		

Spun LoBi

	SLB1250(8.9/80)-5	SLB1250(8.9/80)-30	SLB1250(8.9/125)-5	SLB1250(8.9/125)-10	SLB1250(8.9/125)-30
Design Wavelength (nm)	1310				
Cut-Off Wavelength (nm)	≤1250				
Numerical Aperture	0.11 – 0.13				
Mode Field Diameter (µm)	8.2 – 9.9 @1310nm				
Attenuation (dB/km)	≤5 @1310nm				
Spin Pitch (mm) Nominal	5.0	30.0	5.0	10.0	30.0
Twist Test (Turns/m)	≤1.0				
Proof Test (%)	1 (100 kpsi)				
Cladding Diameter (µm)	80 ± 1.5		125 ± 1		
Core-Cladding Concentricity (µm)	≤1				
Coating Diameter (µm)	170 ± 10		245 ± 15		
Coating Type	Dual Acrylate				

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