

• Very low intrinsic birefringence

Low birefringence definition

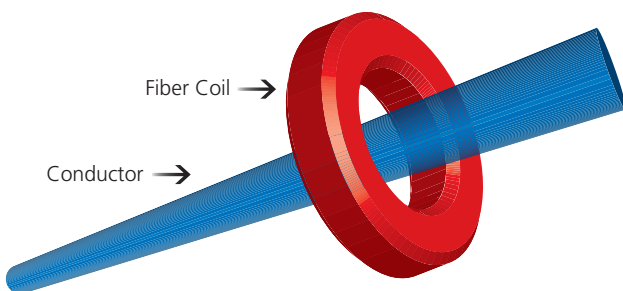
Low birefringence fibers are optical fibers that can propagate optical radiation, preserving the state of polarization for long distances. Ideally this means that the fiber must have perfect geometry and be completely symmetrical along the optical axis. It must also be homogeneous along the axis. Any linear polarization can be represented by two linear polarizing modes orthogonal to each other. An ideal low birefringence fiber will propagate these two modes with identical velocity. In a real fiber there are a number of imperfections such as ellipticity, eccentricity, microbending, bending etc. Such imperfections lead to a difference in velocity between the two polarization modes of the fiber and hence a phase difference (retardance) between them.

Standard telecom type fibers typically have a large retardance that accumulates with length. The LB series fibers have a very low retardance that is not a linear function of length.

Application

These fibers have many uses, one of the most popular is fiber sensors. In a Faraday sensor, the fiber is wound in a coil and a conductor is passed through the coil. Polarized light in the fiber will have its plane of polarization rotated in proportion to the current passing through the conductor.

Faraday effect



The strength of the Faraday effect is determined by the Verdet constant which is about $V = 2.8 \times 10^{-4}$ deg/Oe cm for pure fused silica. It means that an axial magnetic field of 100 Oe acting on a straight 10 m length of fiber will rotate the polarization axis about 30 degrees. Note that such rotation is almost insensitive to temperature changes for pure silica, but if attempts are made to increase the verdet constant by doping silica with paramagnetic ions, there can be a big temperature dependence of retardance. We believe that pure silica low birefringence fibre is the optimal type for magnetic field sensors.

Other applications

In some applications where polarized light must be transmitted, it is not always convenient to align the fiber with the plane of polarization of the input signal that is essential when using HiBi fiber. In these situations LoBi fiber can more conveniently be used.

Coating

The type coating used on low birefringence fiber is important if the properties of the fiber are to be preserved. We use a special low stress coating that maintains the low birefringence properties of the fiber.

LB Series

These fibers are available in 80 μm and 125 μm diameters and for operating wavelengths of 633 nm, 850 nm, 1300 nm and 1550 nm.

	LB600	LB800	LB1300	LB1500
Operating wavelength (nm)	633	850	1300	1550
Attenuation (dB/km)	<12	<5	<2	<2
Cut-off wavelength	<600	<800	<1250	<1400
Mode field diameter	3.5	5	9	10
Numerical aperture (N.A)	0.1	0.1	0.1	0.1

Ordering information

LB 800-125

