

Fiber Coils

General Questions on Coils

Q. What types of coils does General Photonics offer? What are the differences?

A. General Photonics has developed the capability to produce several types of specialized custom coils.

These include compact, low-loss coils for delay applications; extremely temperature-stable, low-crosstalk fiber gyro coils; and several other types of specialty coils. Our proprietary winding techniques and equipment, potting adhesives, and characterization techniques and equipment enable us to produce high performance coils optimized for different applications.

Time Delay Coils

Q. What is the fiber length tolerance of the compact time delay coils?

A. Fiber length is typically tested by OTDR. The length tolerance is $\pm 2\text{m}$ for coil length up to about 4000m. Tighter tolerances may be possible for shorter coils. Contact General Photonics for more information.

A. Coils up to about 4km can fit into the standard enclosure. Longer delays can be constructed as multiple coils that can be either spliced together or connected using patchcords. Custom enclosures for nonstandard coils are also possible.

Q. What is the maximum length that can fit in an enclosure?

Q. What are typical fiber coil dimensions?

A. The coil enclosure dimensions are 6x6x1.59 inches. For coils without enclosures, the customer typically specifies any size requests or constraints when ordering.

Fiber Gyro Coils

Q. What fibers and winding patterns are available?

A. Gyro coils can be wound with various types and sizes of SM or PM fiber. Customers can request coils made with standard fibers, or can supply fiber for winding. Most coils are wound using either a simple or quadrupole winding pattern, although other patterns are available on request.

A. For SM coils, test data typically includes fiber length, IL, PMD and PDL, and PMD and PDL variation over temperature. For PM coils, test data typically includes fiber length, IL, PER, and polarization crosstalk vs. position at room temperature. The crosstalk data include a plot of crosstalk vs. position in the fiber, average crosstalk, maximum crosstalk, and a table listing crosstalk peaks > -50 dB.

Additional testing is available as an option. Extended test data for PM coils can include PER vs. temperature, as well as crosstalk data at high and low temperature extremes as well as at room temperature.

Q. What dimensions and lengths are available?

A. Gyro coils are customized to users' needs. Typically, the customer specifies dimensional and length requirements, and General Photonics calculates the closest possible match. Generally, the lengths of simple coils can be very close to requested lengths, while the lengths of quadrupole coils are constrained by the requirements of the winding pattern.

Q. What high performance options are available?

A. Various kinds of process modifications and enhanced testing are available. These include special potting adhesive for enhanced temperature stability, testing at different temperatures, and several levels of Shupe effect mitigation.

Q. What test data is supplied with gyro coils?