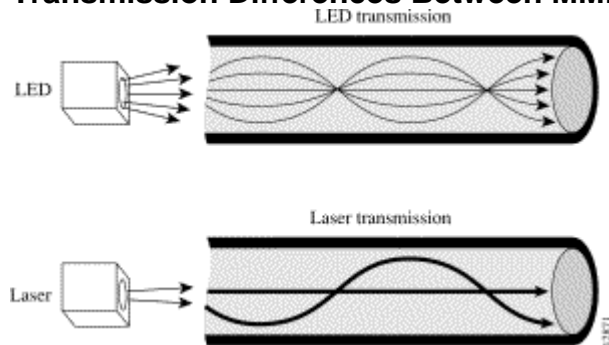


Q. What is the difference between Multi (MM) and Single Mode (SM) fiber?

A. Multimode fiber has a relatively large light carrying core, usually 62.5 microns or larger in diameter (or 50 microns). It is usually used for short distance transmissions with LED based fiber optic equipment. Single-mode fiber has a small light-carrying core of 8 to 10 microns in diameter and a higher bandwidth. It is normally used for long distance transmissions with laser diode based fiber optic transmission equipment. Multi-mode fiber has higher pulse spreading rate (or modal dispersion) than single mode fiber, limiting multi-mode fiber's information transmission capacity.

As shown below, the multi-mode signal is spread over time because the propagation velocity of the optical signal is not the same for all modes. This causes the modes to reach their destination at various times, while single modes are more likely to reach the destination at the same time.

Transmission Differences Between MMF and SMF



Q. How do I know what type of fiber I need?

A. This is based on transmission distance to be covered as well as the overall budget allowed. If the distance is less than a couple of miles, within a building or on a campus, multimode fiber will work well and transmission system costs (transmitter and receiver) will be in the \$500 to \$800 range. Typical transmission speed/distance limits are 100 Mbit/s for distances up to 2 km (100BASE-FX), 1 Gbit/s to 220–550 m (1000BASE-SX), and 10 Gbit/s to 300 m (10GBASE-SR).

If the distance to be covered is more than 3-5 miles, single mode fiber is a better choice. Transmission systems designed for use with this fiber will typically cost more than \$1000 (due to the increased cost of the laser diode). Single-mode fibers are most often used in high-precision scientific research because the allowance of only one propagation mode of the light makes the light easier to focus properly.

Click here for more info on General Cable's fiber optic cable selections:

[Optical Fiber](#)

[Fiber Spec Selection](#)