

Fiber Optic Terms:

Absorption: One cause of attenuation where light signal is absorbed into the glass during transmission.

Adapter: A device used to interconnect two different connector types.

Attenuation: Optical loss of power. Attenuation is measured in dB loss per length of cable. Attenuation is usually caused by absorption and scattering.

Attenuator: A device used to reduce the power of an optical signal.

Back Reflection: A measure of the light reflected off the polished end of a fiber connector. Measured in negative dB relative to incident power.

Bandwidth: The range of signal frequencies that a fiber optic cable will transmit.

Buffer: The protective coating over the fiber.

Coupler: A device used to connect two similar connector types.

Fusion Splice: A permanent splice where the two fiber ends are welded together.

Insertion Loss: The attenuation caused by the insertion of a device (such as a splice or connection point) to a cable.

Jack: Female receptacle - usually found on equipment.

Link: The entire span between two optical devices. Includes all cable, connections and splices.

Loss Budget: The maximum amount of power that is allowed to be lost per optical link.

Mandrel: A fiber wrapping device used to cause attenuation within a fiber cable.

Mechanical Splice: A mechanical means of connecting two fibers.

Multimode: A type of fiber optic cable where the core diameter is much larger than the wavelength of light transmitted. Two common multimode fiber types are 50/125 and 62.5/125.

Plug: The male connector - typically found on end of a patch cord.

Return Loss: The ratio of the power launched into a cable and the power of the light returned down the fiber. This measurement is expressed in positive decibel units (dB). A higher number is better. Return Loss = $10 \log \left(\frac{\text{incident power}}{\text{returned power}} \right)$.

Scattering: A second cause of attenuation. Scattering occurs when light collides with individual atoms in the glass.

Singlemode: A type of fiber with a small core that allows only one mode of light to propagate. A common singlemode type is 9/125.

Termination: The process of mechanically installing a connector onto a fiber cable.

Wavelength: A means of measuring light color. Expressed in nanometers (nm).

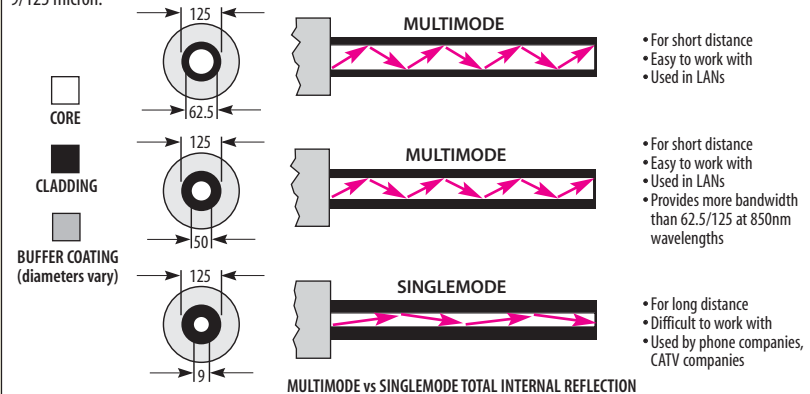
How Do Fiber Optics Work? A Quick Lesson In Optical Transmission

Where copper cabling uses electricity to transmit signals from one end to another, fiber optics use light pulses to accomplish the same purpose. The fiber cable is made of a transparent glass core surrounded by a mirror like covering called cladding. Light passes through the cable, bouncing off the cladding until it reaches the other end of the fiber channel - this is called total internal reflection.

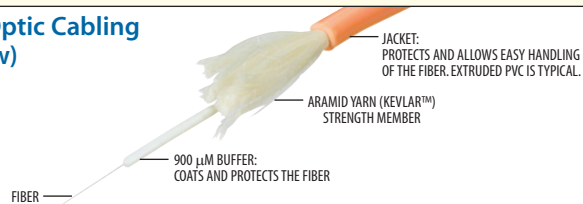
The diameter of the core corresponds directly with the angle of reflection. As this diameter increases, the light requires more reflections (and in turn a greater amount of time) to travel a given distance. Singlemode fiber optic cable has a smaller diameter core which lends itself to long distance, higher bandwidth runs. Multimode fiber has a larger diameter core and is more commonly used in shorter cable runs. Multimode cabling is more economical and easier to work with; it is the choice for most local area networks.

Fiber specifications list the core and cladding diameters as a ratio. The top example shows the ratio of core to cladding as 62.5/125 microns. Below, the ratio is 9/125 microns. Multimode fiber is commonly 62.5/125 or 50/125 micron, singlemode fiber is commonly 9/125 micron.

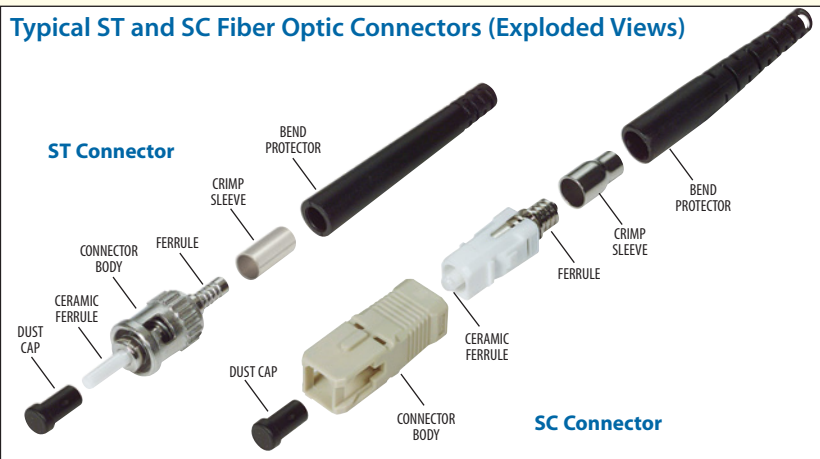
Video clip at www.L-com.com/videos/A15



Typical Fiber Optic Cabling (Exploded View)



Typical ST and SC Fiber Optic Connectors (Exploded Views)



Video clip at www.L-com.com/videos/A21

Commonly Used Fiber Connectors

Connector Type	Coupling Type	Fiber Type	Polish	Number Fibers	Typical Applications	Comment
	Twist On	Singlemode/Multimode	PC, UPC	1	LANs	Keyed
	Screw On	Singlemode/Multimode	PC, UPC, APC	1	Datacom, Telecommunications	Keyed
	Snap On	Singlemode/Multimode	PC, UPC, APC	1	CATV, Test Equipment	Keyed
	Snap On RJ45 Style	Singlemode/Multimode	PC, UPC, APC	1	Gigabit Ethernet, Video Multimedia	Small Form Factor (SFF)
	Push/Pull	Singlemode/Multimode	PC, UPC, APC	1	Medical, Military	Small Form Factor (SFF)
	Snap On RJ45 Style	Singlemode/Multimode	N/A	2	Gigabit Ethernet, Asynchronous Transmission Mode (ATM)	One of Mating Connectors must have Alignment Pins
	Push/Pull	Singlemode/Multimode	N/A	4, 8, 12, 16, 24	Active Device Transceiver, Interconnections for O/E Modules	One of Mating Connectors must have Alignment Pins