

Optical Fiber

Written by Administrator
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An **optical fiber** is made up of the core (carrying the light pulses), the cladding (reflecting the light pulses back into the core) and the buffer coating (protecting the core and cladding from moisture, damage, etc). Together, all of this creates a fiber optic which can carry up to 10 million messages at any time using light pulses. **Fiber optics** is the overlap of

[applied science](#)

and

[engineering](#)

concerned with the design and application of optical fibers. Optical fibers are widely used in

[fiber-optic communications](#)

, which permits transmission over longer distances and at higher

[bandwidths](#)

(data rates) than other forms of communications. Fibers are used instead of metal wires

because signals travel along them with less

[loss](#)

and are also immune to

[electromagnetic interference](#)

. Fibers are also used for illumination, and are wrapped in bundles so they can be used to carry images, thus allowing viewing in tight spaces. Specially designed fibers are used for a variety of other applications, including

[sensors](#)

and

[fiber lasers](#)

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Light is kept in the [core](#) of the optical fiber by [total internal reflection](#) . This causes the fiber to act as a [waveguide](#) .

Fibers which support many propagation paths or

[transverse modes](#)

are called

[multi-mode fibers](#)

(MMF), while those which can only support a single mode are called

[single-mode fibers](#)

(SMF). Multi-mode fibers generally have a larger core diameter, and are used for short-distance communication links and for applications where high power must be transmitted. Single-mode fibers are used for most communication links longer than 550 meters (1,800 ft).

Joining lengths of optical fiber is more complex than joining electrical wire or cable. The ends of the fibers must be carefully [cleaved](#) , and then spliced together either [mechanically](#) or by [fusi](#)
[ng](#)

them together with an

[electric arc](#)

. Special

[connectors](#)

are used to make removable connections.

Source: <http://www.wikipedia.org>