# What is optical fiber?

**Fiber Optic** This is a cable made of pure glass. Acting as an intermediary to transmit light over long distances. Low signal loss. And can send data in a very large (Bandwidth). No interference with electrical noise. And the data leak

## Type of optical fiber

**1. Multi-Mode Optical Fiber (MM)** Large Core Diameter Core Diameter: 50/125, 62.5 / 125 µm But there is a lot of light loss. Data transfer speeds of up to 100 Mbps at 850 nm wavelength are mainly used for transmitting data within the building, but not exceeding 2 km. And at a data transfer rate of 1000 Mbps, the line distance does not exceed 550 meters. Suitable for indoor use only, but the advantage is cheaper cable and equipment.

**2. Single-mode Optical Fiber (SM)** Core diameter 9/125 micron. Smaller than Multi-Mode Optical Fiber, Less light in the line, Maximum transmission speed of 40 Gbps at 20 km. And 10 Gbps at a distance of 100 km (2018). Mostly used for data communications, telecommunications circuits, mobile phones, cable television, CCTV, etc. The present invention is also used in indoor data transmission.

## Highlights of the optical fiber

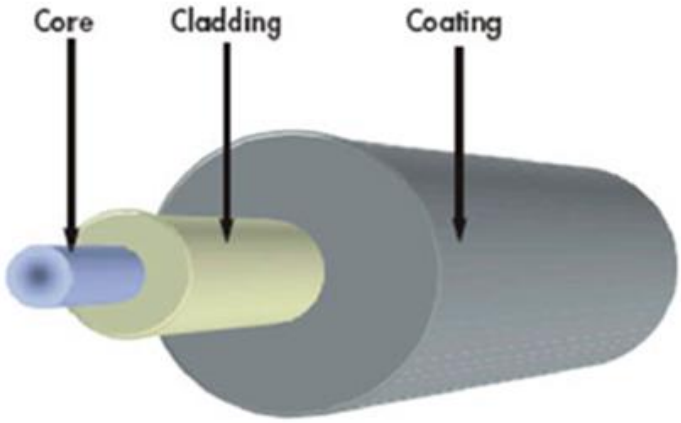
- Ability to send and receive data. Get a lot of data.
- Low loss
- Electromagnetic waves can't be interfered.
- Small, lightweight
- Higher data security.
- Secure life and property.
- Long life
- High reliability.
- Currently cheaper

**Structure of optical fiber**

Fiberglass consists of fiberglass made of high quality glass or plastic called Core. The inner shell is called the cladding. The index of refraction is lower than Core and Coating. Diameter 125 microns. The colors are different in 12 colors. To help determine which fiber optic cable is the sequence number. Because each light conductor is very small. Glass fiber is classified as a set. Up to 12 lines. In the PE pipe called Loose Tube and inject jelly into the pipe to hold the fiber optic cable.

In the case of Loose Tube more than 1 Tube, there are different colors to sort Loose Tube as well as fiber.

**The structure of the optical fiber is shown in Fig.**




| | Diameter |
|---|---|
| Core | 9μm, 50μm, or 62.5μm |
| Cladding | 125μm |
| Coating | 250μm |

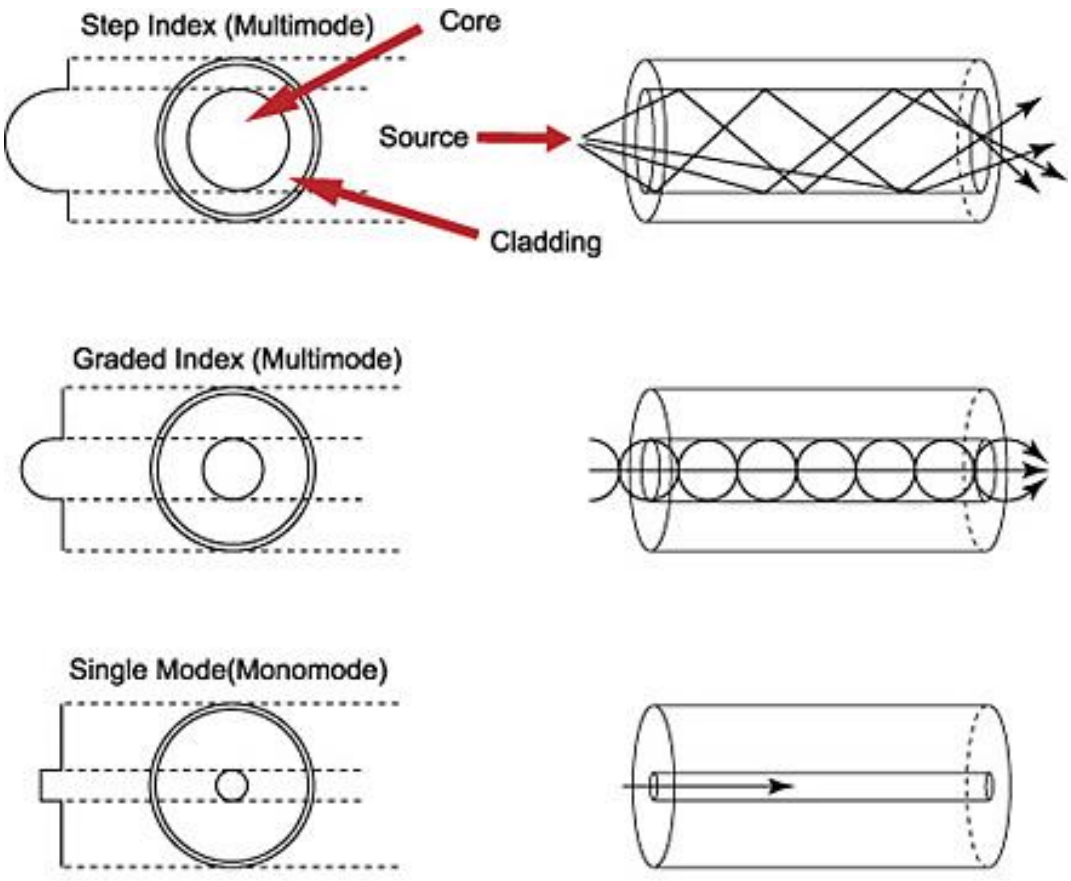
**Multi-Mode Fiber Optic (MM):** Optic fiber diameter 50 microns and 62.5 microns. Core is large. Very lost. Not more than 400 meters. Suitable for indoor use only.

**Single- Mode Fiber Optic (SM):** 9 micron diameter optical fiber. Core is very small. Little loss. Can transmit more than 100 km.

**Transmission through optical fiber.**

**Multi-Mode Optical Fiber Transmission** Both diameters of 50 microns and 62.5 microns are available in two models: Step Index and Graded Index.

**Single-Mode Optical Fiber Transmission** 9 microns in diameter. It is delivered in a straightforward way. It supports Single, Dual Window, Triple Window, Multi Windows.




A Graphic Representation of How Light Rays Travel in Three Fiber Types

## Applications of Fiber Optic cable

Used as an intermediary in telecommunication data transmission. Passive Optical Network. Internet, Cable TV, cell phone Computer Network, Dental Care, Dental Surgery, Microscopic Research Biomedical, Research Lighting, decoration Mechanical inspection, military, space vehicle, automotive industry, such as drag control. And air bags.

## Fiber Optic Standard Color

| NumBer | | Color |
|---|---|---|
| 1 | | Blue |
| 2 | | Ornge |
| 3 | | Green |
| 4 | | Brown |
| 5 | | Slate |
| 6 | | White |
| 7 | | Red |
| 8 | | Black |
| 9 | | Yellow |
| 10 | | Violet |
| 11 | | Rose |
| 12 | | Auqa |