



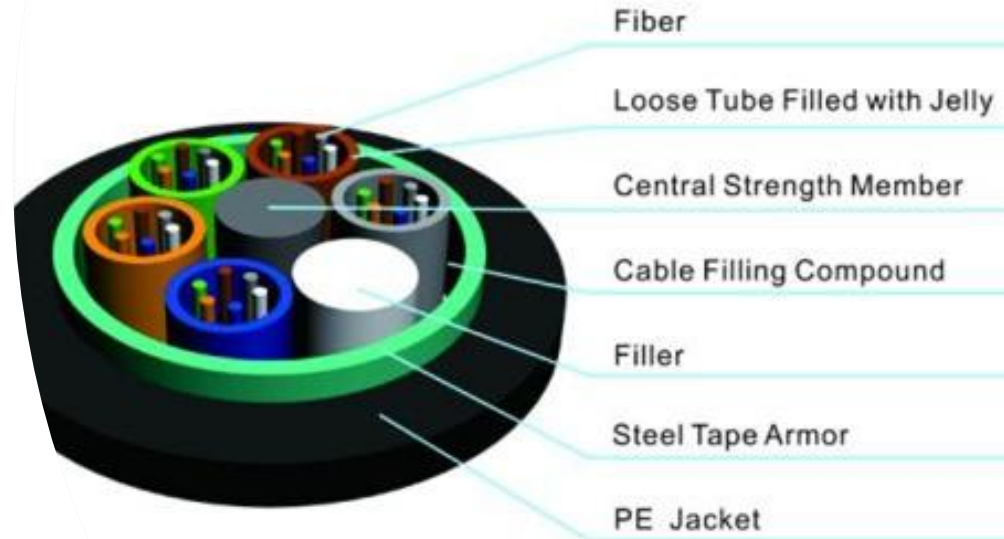
# OPTIC FIBER

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# INTRODUCTION :

- networks operate at high speeds - up into the gigabits.
- made up of incredibly thin strands of glass or plastic.
- large carrying capacity bandwidth.
- Fiber optic cables costs much less to maintain.

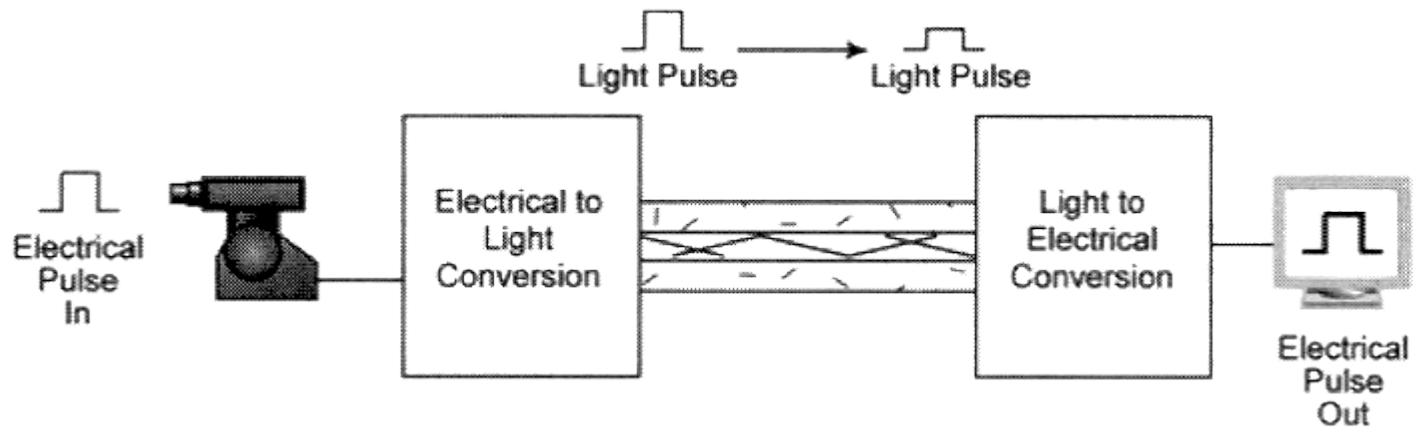
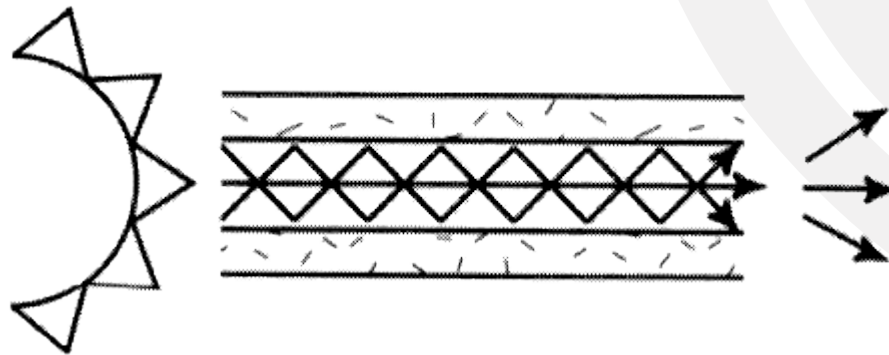


# HISTORY OF CABLE:

- 1840s: Swiss physicist [Daniel Colladon](#) (1802–1893) discovered he could shine light along a water pipe.
- 1930s: **Heinrich Lamm** and **Walter Gerlach**, two German students, tried to use light pipes to make a gastroscope.
- 1957: Three American scientists at the University of Michigan, **Lawrence Curtiss**, **Basil Hirschowitz**, and **Wilbur Peters**, successfully used fiber-optic technology to make the world's first gastroscope.

# WORKING :

- use light pulses to transmit information.
- Light travels down a fiber-optic cable by bouncing repeatedly off the walls.
- Each tiny **photon** (particle of light) bounces down the pipe like a bobsleigh going down an ice run.
- if light hits glass at a really shallow angle (less than 42 degrees), it reflects back in again.

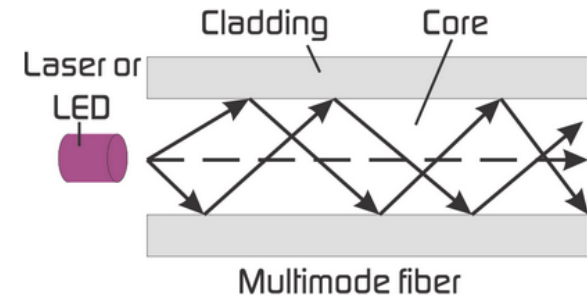
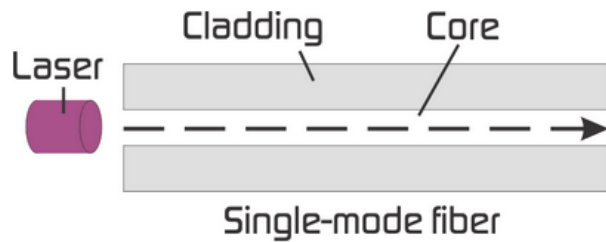


# CABLE OF:

- Light is guided through the materials by using the principle of refraction, which makes this possible.
- The light source can either be a light-emitting diode (LED) or a laser.
- Fiber optics has three components Fiber Core, The Cladding and The insulating Jacket.
- The Fiber core is the Fiber cable that carries light Signals.
- The cladding is a material that surrounds the core - it reflects light back into the core.
- The insulating jacket acts as a sheath that protects the other parts from damage or water getting through.

# TYPES OF CABLES :

## SINGLE-MODE



## MULTI-MODE

# SINGLE MODE CABLE:

- of glass fiber with a diameter of 8.3 to 10 microns that has one mode of transmission.
- Single Mode Fiber with a relatively narrow diameter, through which only one mode will propagate typically 1310 or 1550nm.
- Carries higher bandwidth than multimode fiber.
- Higher transmission rate and up to 50 times more distance than multimode.
- Single Mode fiber is used in many applications where data is sent at multi-frequency



# MULTI MODE CABLE:

- Little bit bigger diameter, with a common diameters in the 50-to-100 micron range.
- Multimode fiber gives you high bandwidth at high speeds over medium distances.
- Light waves are dispersed into numerous paths, or modes.
- multiple paths of light can cause signal distortion at the receiving end.

## USES:

- Computer networking systems.
- Broadcasting.
- Medical field for surgery.
- **Fiber-optic sensors** can be used e.g. for distributed **temperature** and **strain** measurements in buildings, oil pipelines, and wings of airplanes.



**THANK  
YOU**

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