

IMRAN FAROOQ

1169



01. CO-AXIAL CABLE

02. UNTWISTED PAIR CABLE

03. TWISTED PAIR CABLE

04. FIBER OPTIC CABLE



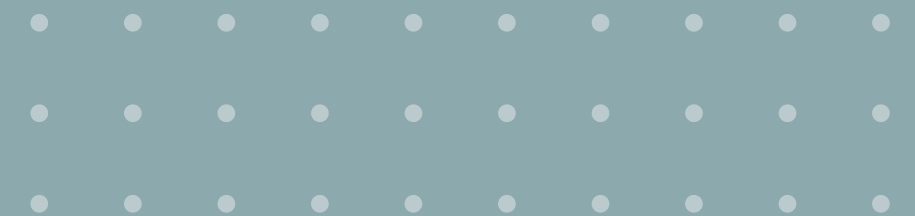
TABLE OF CONTENT





CO-AXIAL CABLE

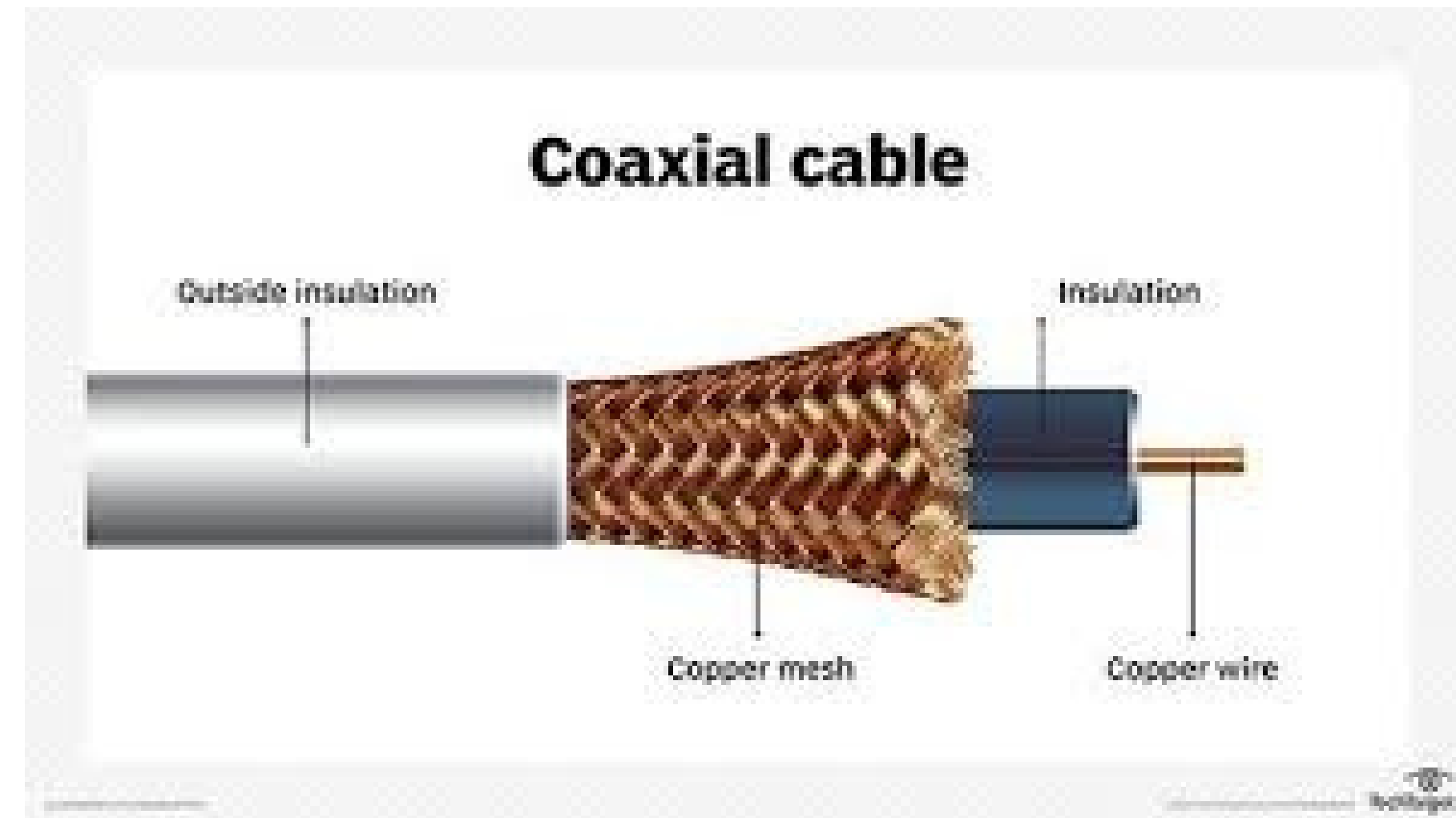
A co-axial cable consists of a central conductor surrounded by insulation, a conductive shielding layer, and an outer insulating layer. The name "co-axial" comes from the fact that the central conductor and shielding share the same geometric axis.



USES:

- Used for cable television networks.
- Used in computer networks like Ethernet (though less common now).
- Used in broadband internet connections.
- Used for long-distance transmission in telecommunication systems.

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ADVANTAGES:

- High resistance to electromagnetic interference (EMI).
- Good for long-distance data transmission.
- Higher bandwidth compared to twisted pair cables.
- More durable and better signal quality.

DISADVANTAGES:

- Bulky and harder to install.
- More expensive than twisted pair cables.
- Limited flexibility due to shielding.
- Can suffer from signal leakage if the cable is damaged.



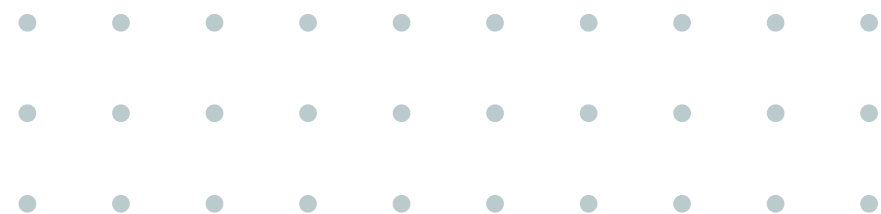
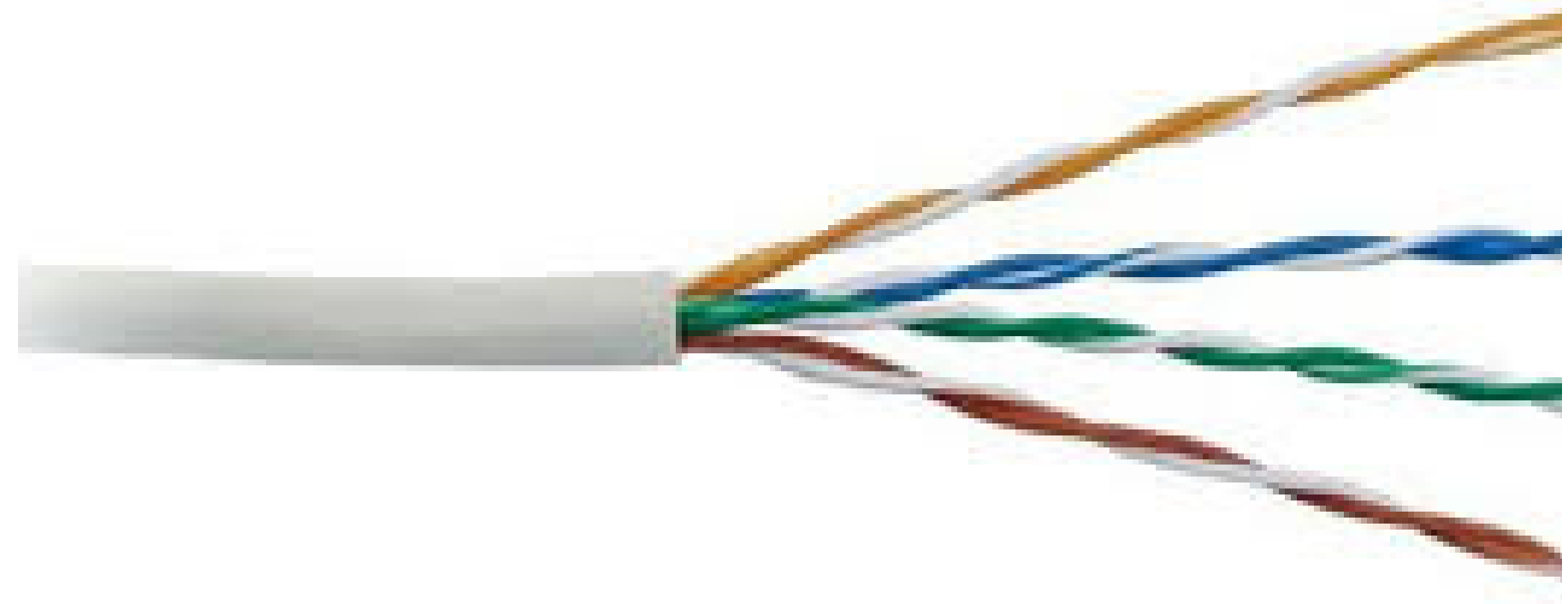
UNTWISTED PAIR CABLE

Untwisted pair cables consist of two or more insulated wires running in parallel without any twisting. These are less commonly used in networking and are mostly used for specific short-distance communication.



USES:

- Used in low-speed, low-cost data transmission.
- Common in some telephone and security systems.
- Used in low-frequency analog signal transmission.



ADVANTAGES:

- Simple and cheap.
- Easy to manufacture and install.
- Suitable for short distances where signal interference is minimal.

DISADVANTAGES:

- Highly susceptible to electromagnetic interference (EMI).
- Poor signal quality over longer distances.
- Limited data transmission speed and bandwidth.



TWISTED PAIR CABLE

A twisted pair cable consists of pairs of insulated copper wires twisted together. The twisting reduces interference from external sources and between the pairs themselves

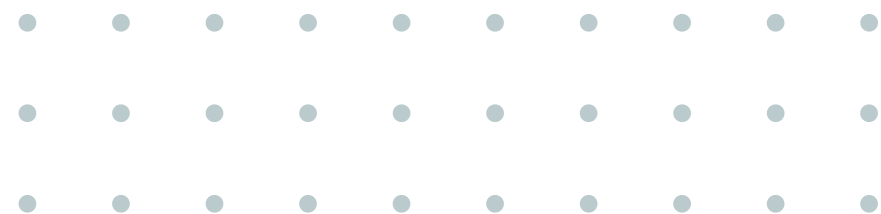
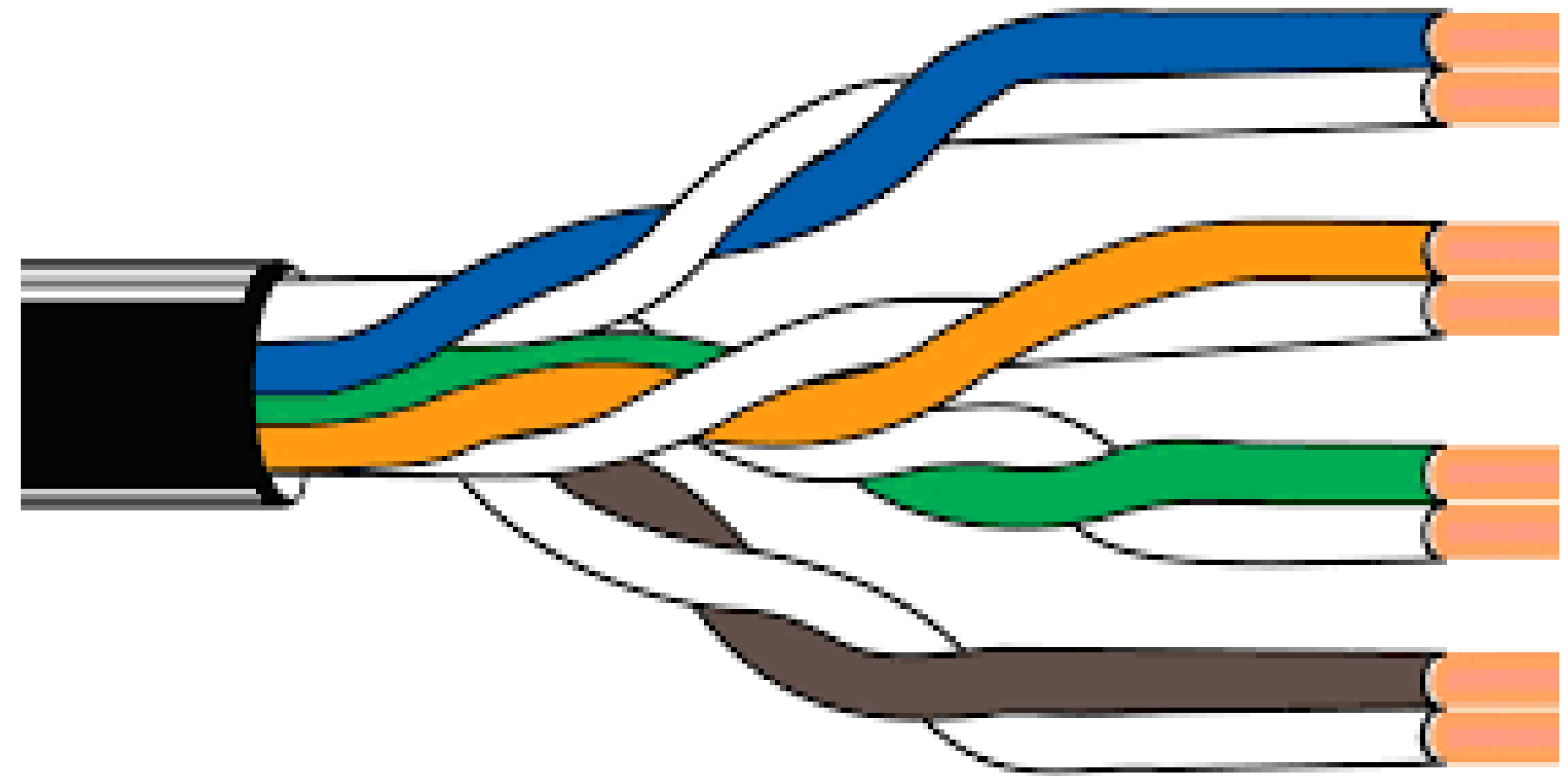
Types:

- Unshielded Twisted Pair (UTP): No extra shielding.
- Shielded Twisted Pair (STP): Has additional shielding to protect against interference.



USES:

- Most commonly used in Ethernet networks (Cat5, Cat6 cables).
- Used in telephone lines.
- Used in Local Area Networks (LANs).




ADVANTAGES:

- Relatively cheap and easy to install.
- Twisting helps reduce electromagnetic interference (EMI).
- Flexible and light.
- Supports moderate data transfer rates.

DISADVANTAGES:

- Limited distance without a repeater or signal booster.
- Lower bandwidth compared to coaxial and fiber optic cables.
- Susceptible to EMI (especially UTP without shielding).
- Not suitable for very high-speed data transmission over long distances.



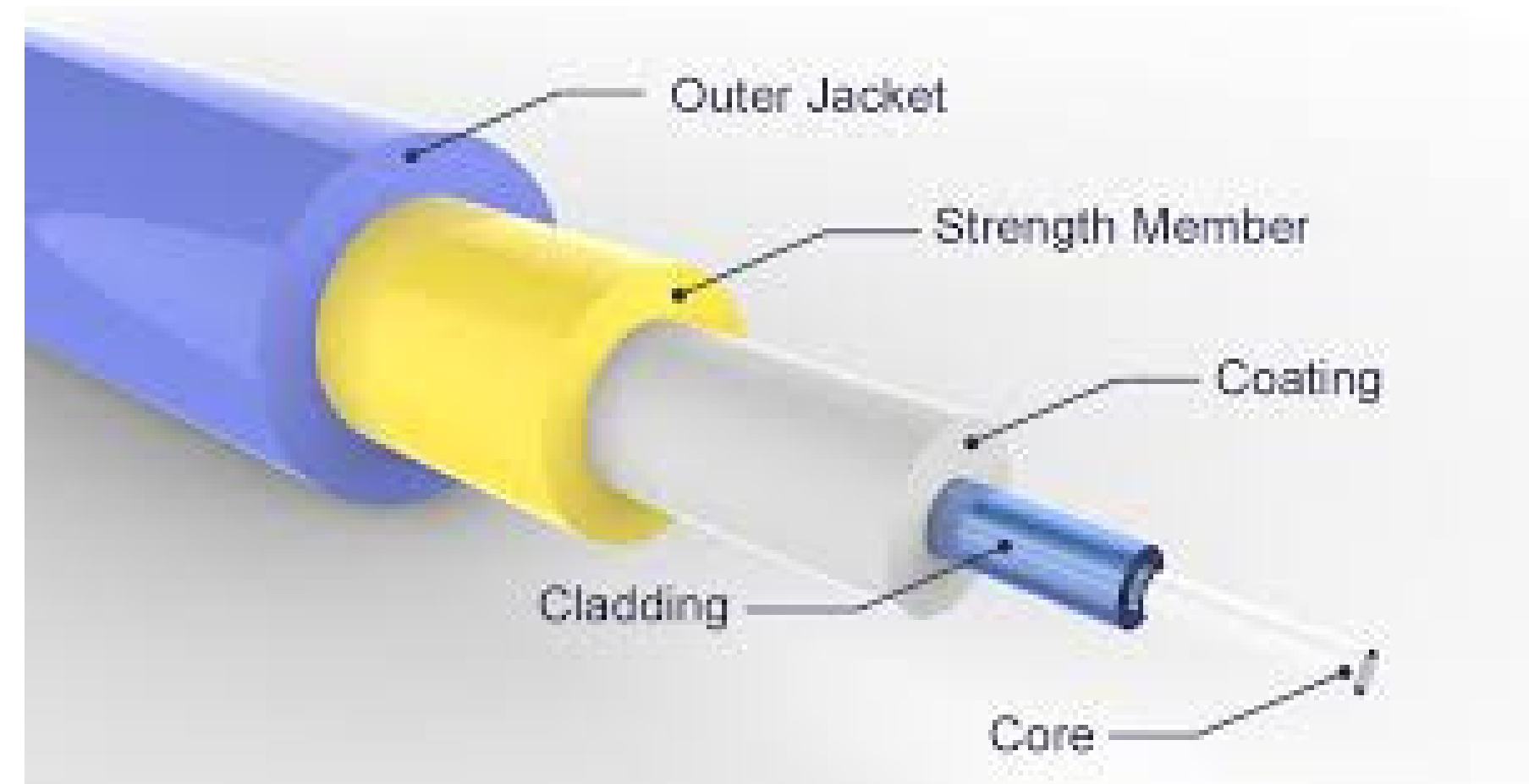
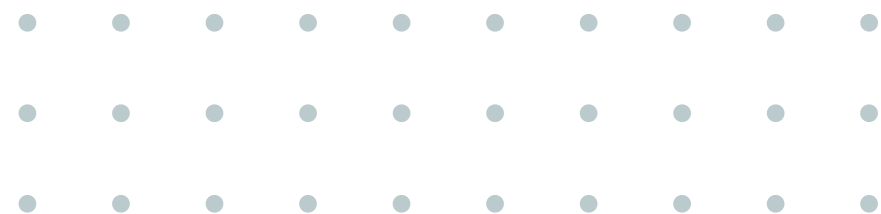
FIBER OPTIC CABLE

Fiber optic cables use light to transmit data. They consist of glass or plastic fibers through which light pulses carry information. The cables are encased in protective layers that shield them from environmental damage.



USES:

- High-speed internet connections.
- Long-distance telecommunication.
- Cable television.
- Medical equipment (endoscopy).
- Networking in large organizations or data centers.



ADVANTAGES:

- Very high bandwidth (supports faster data transmission).
- Immune to electromagnetic interference (EMI).
- Can transmit data over long distances without significant loss.
- More secure as it's difficult to tap into.

DISADVANTAGES:

- Expensive to install and maintain.
- Fragile and more prone to damage compared to copper cables.
- Difficult to splice and requires specialized equipment.
- Installation requires skilled technicians.