TYPES OF CABLES

Glossary

- Interference – in communications and electronics, especially in telecommunications, interference is anything modifies, or disrupts a signal as it travels along a channel between a source and receiver.
- Cable – is one or more wires covering that connects a computer to a power source or other device.
- Coaxial cable – is kind of copper cable used by cable TV companies between the community antenna and user homes and busiinesses.
- Telephone line – is a single-user circuit on a telephone communication system.

- DVI Cable- (Digital Visual Interface) is a video display interface used to connect a video source to a display device, such as a computer monitor.
- Ethernet Cable- a thick cable used to connect a computer to a large network.

- HDMI Cable- (High-Definition Multimedia Interface) a compact audio/video interface for transferring uncompressed digital audio/video data from an HDMI-compliant device to a compatible digital audio device, computer monitor, video projector, and digital television.

What is a CABLE?

- **Cable:** Denotes a bundle of wires
  - e.g: A wire rope is a type of cable
- *Electrical cable is a bundle of electrical conductors used for carrying electricity*
  - Bare conductors
  - Insulated conductors
- In electro-technology, **cable** means an insulated electrical conductor used for transmitting electrical energy

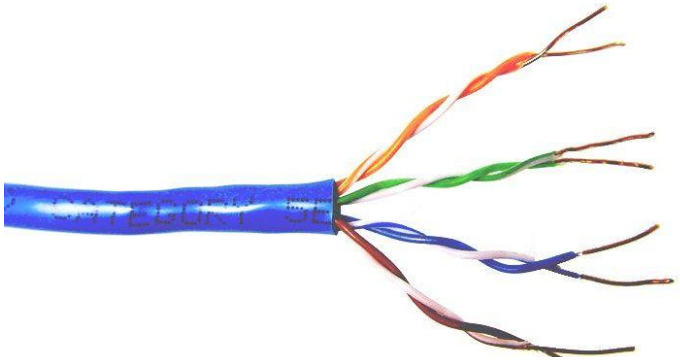
Types of Electrical Lines

- Electrical Cables
  - High Voltage, Low Voltage
  - Supervisory and Signaling Cables
  - Cathodic protection (cabinets, cables, earthing conductors, cable shrouds)
- Communication Cables
  - Phone lines
  - Coaxial cables (e.g. data cables)
  - Broadband cables
  - Tram traction cables and trolley wires
  - Railway supply cables and traction wires

Common network cable types

- Coaxial cable

- Unshielded twisted pair



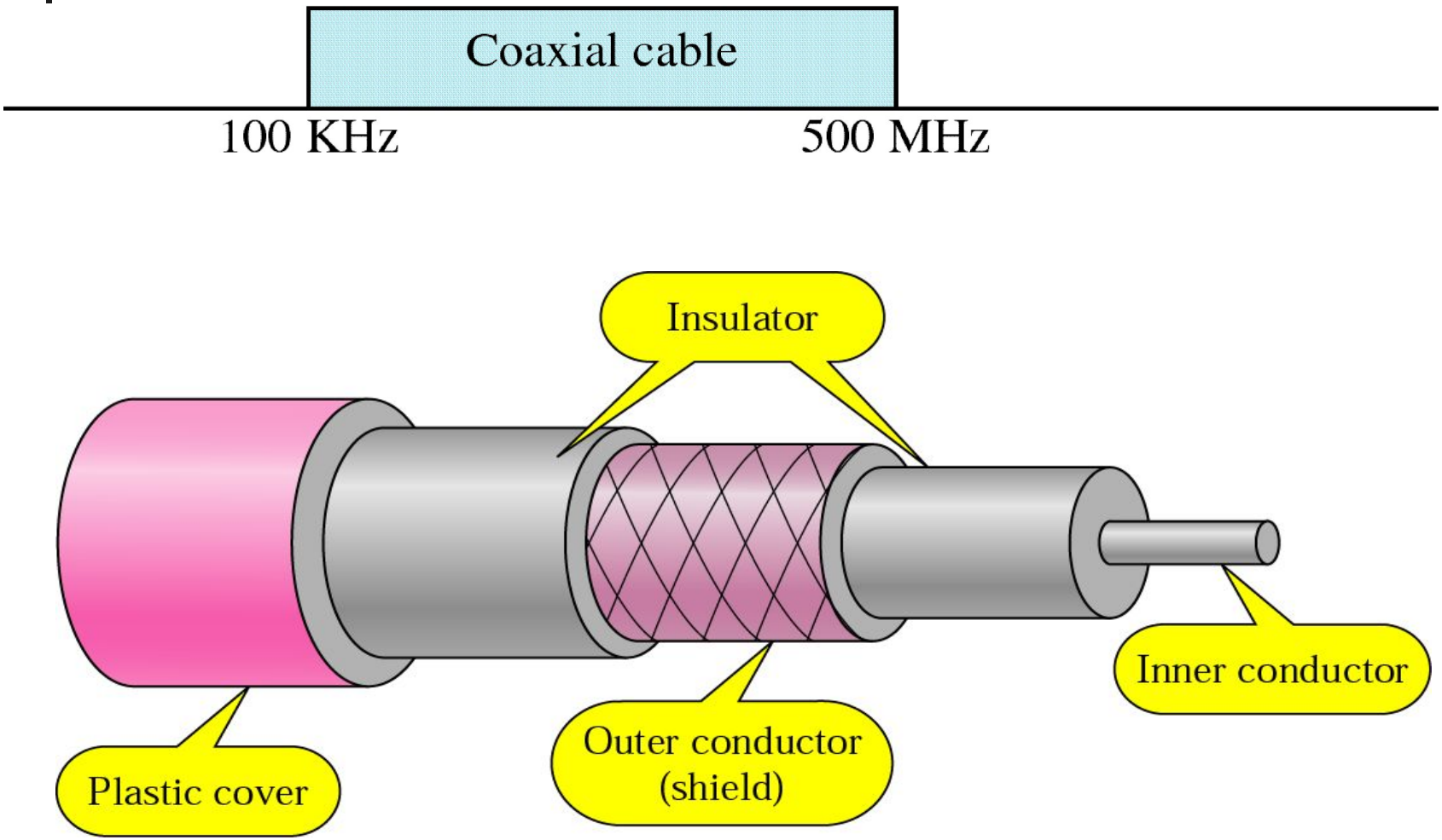
- Fiber optic

Coaxial Cable

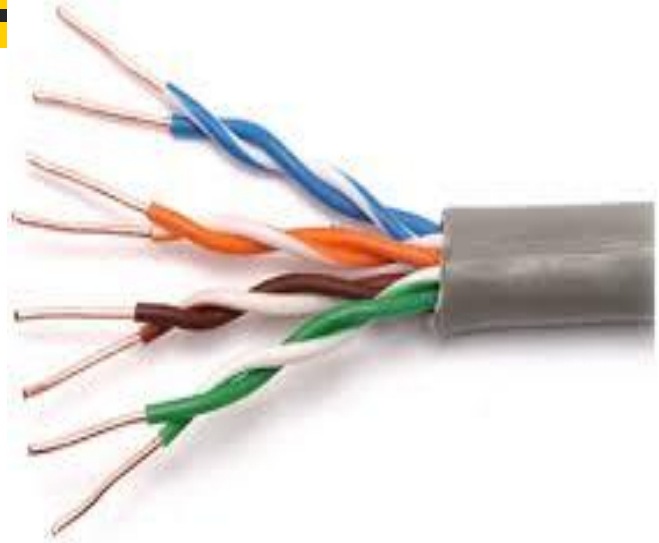
Coaxial Cable- used as a transmission line for radio frequency signals. Its applications include feed lines connecting radio transmitters and receivers with their antennas, computer network (Internet) connections, and distributing cable television signals.

COAXIAL CABLE

Figure 7.7 *Coaxial cable*



UTP Cable

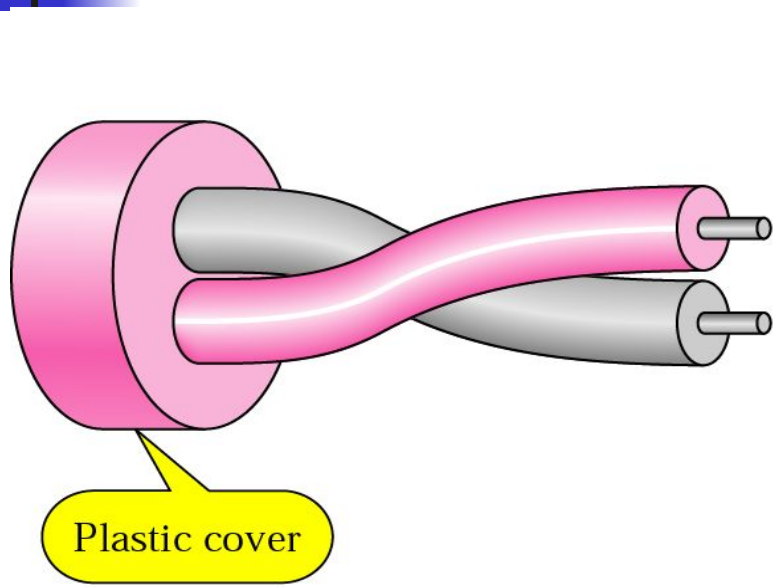


What is UTP Cable?

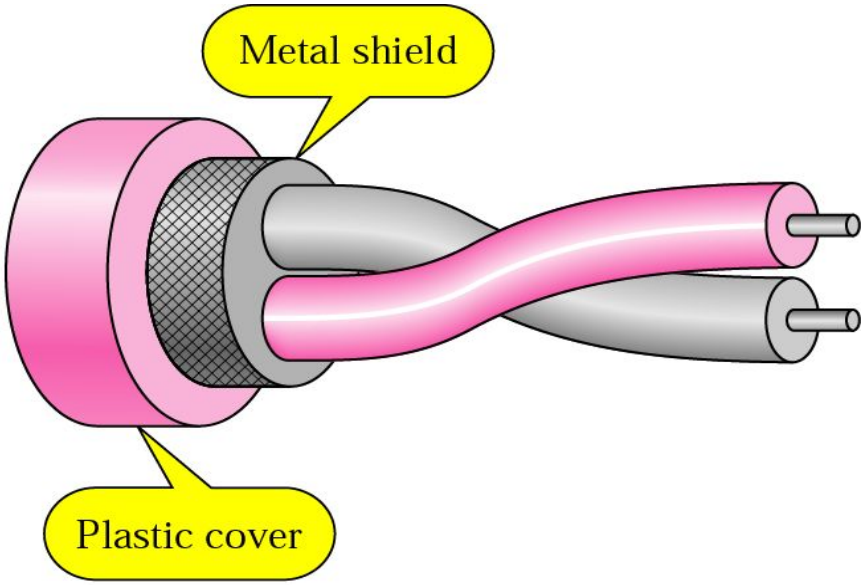
- The most common cable that used in computer networking.
- Can used in networking standard, Modern Ethernet.
- Standard UTP (TIA/EIA-568A and TIA/EIA-568B.)
- Built up by eight color-coded wires.
- Wire in pair is twisted a certain number of times to minimize the interferences with other pairs.
- The rate of data transmission depends by the number of the wire twists in per inch.
- Connect standard is called RJ-45.

Fiber Optic Cable

UTP and STP

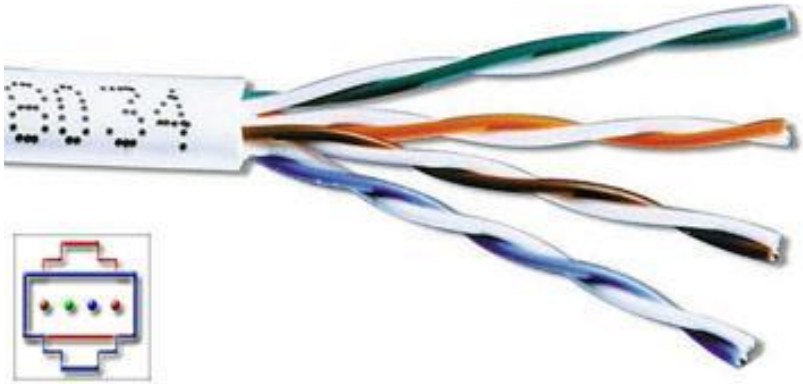


a. UTP



b. STP

Unshielded twisted pair (UTP)



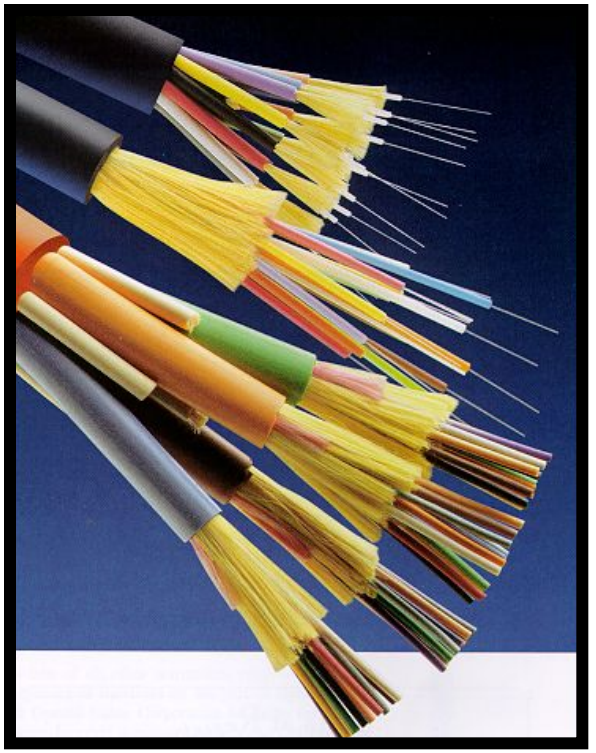
Shielded twisted pair (STP)

What Is Fiber Optics ?

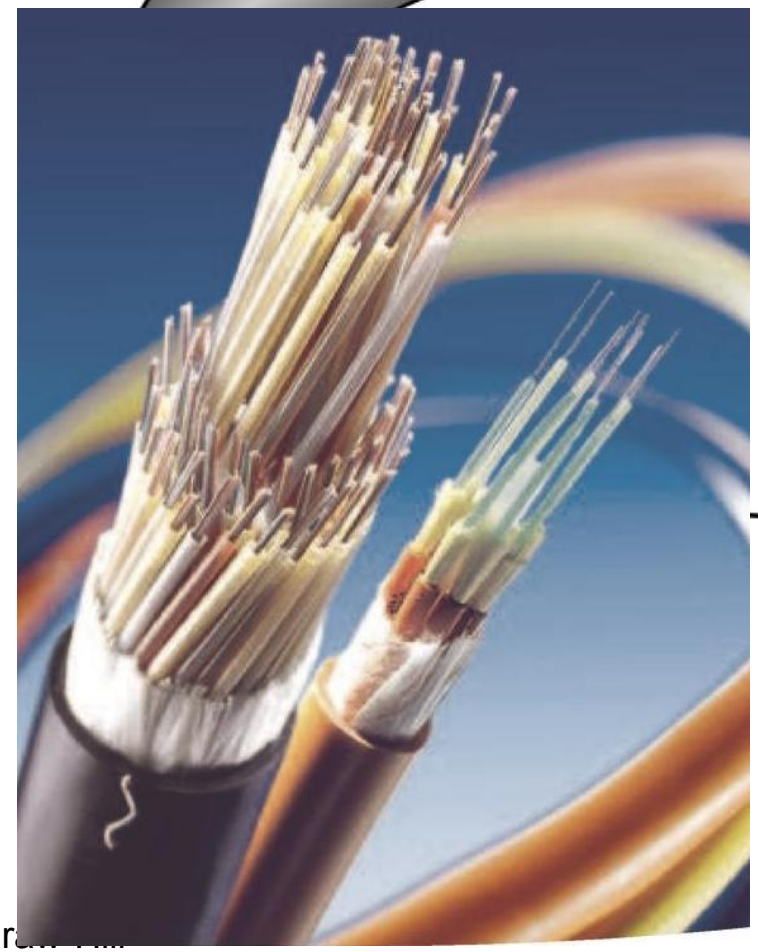
- Transmitting communications signals over hair thin strands of glass or plastic
- Not a "new" technology
- Concept a century old
- Used commercially since 1980

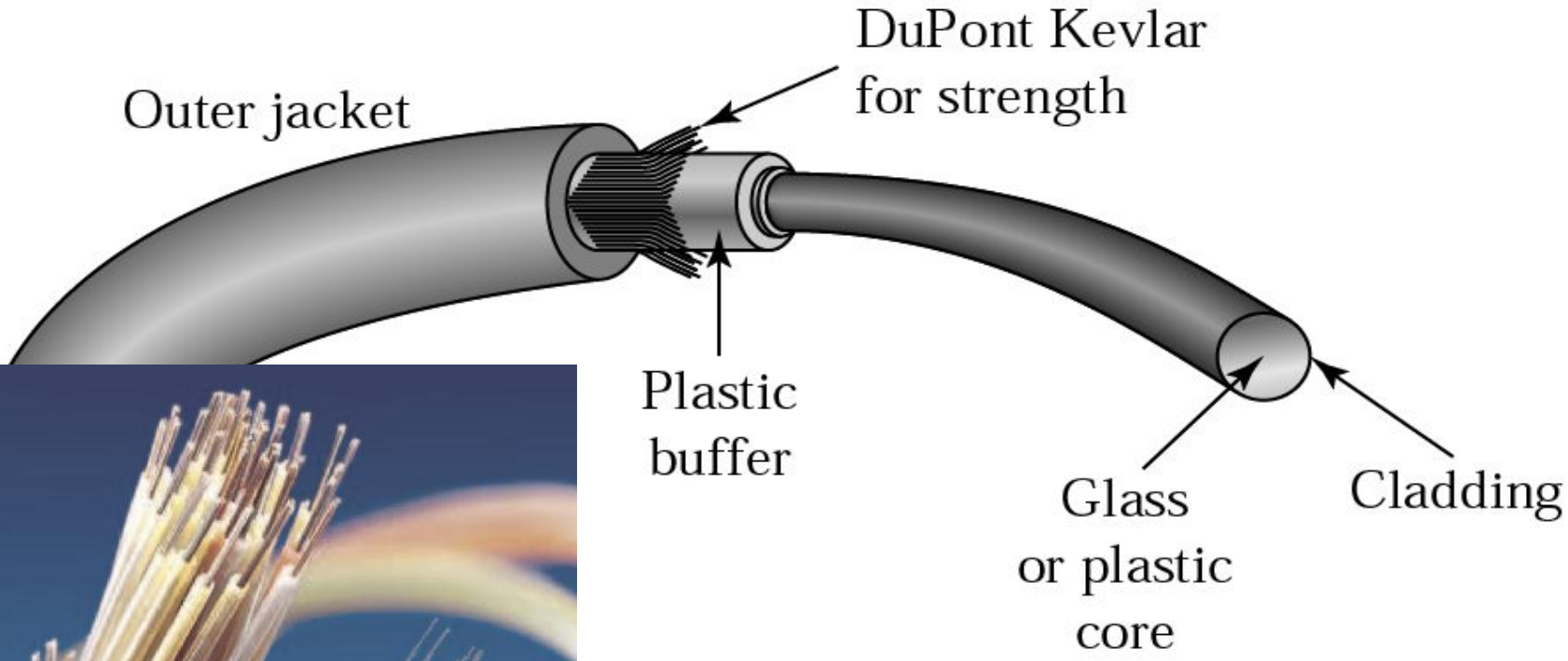
Fiber Optic Cable

- Protects the fibers wherever they are installed
- May have 1 to >1000 fibers



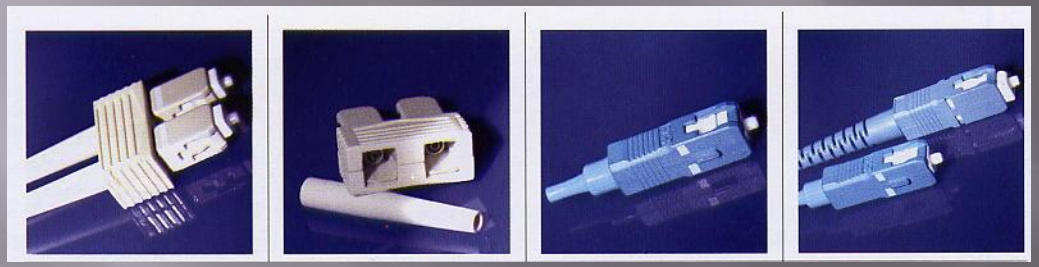
Fiber construction



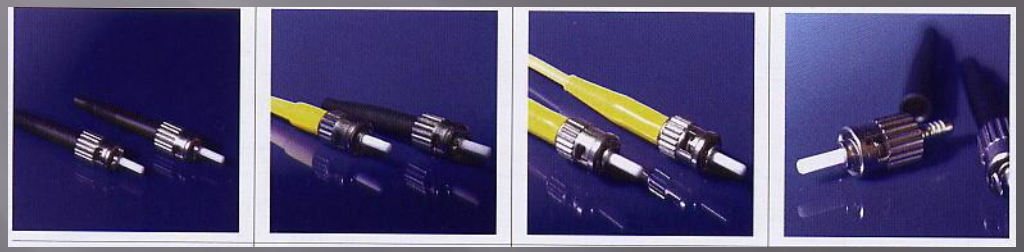


Fiber Optic Connector

FC connector



SC connector



ST connector

POWER CABLES

Power Cables - An assembly of two or more electrical conductors, usually held together with an overall sheath. The assembly is used for transmission of electrical power.

RCA Cables - A type of electrical connector commonly used to carry audio and video signals.

RCA CABLES

VGA CABLE

VGA Cable- a three-row 15-pin connector. VGA connectors and cables carry analog component RGBHV (red, green, blue, horizontal sync, vertical sync) video signals. The 15-pin VGA connector is found on many video cards, computer monitors, and some high definition television sets. On laptop computers or other small devices, a mini-VGA port is sometimes used in place of the full-sized VGA connector.

DVI Cable- (Digital Visual Interface) is a video display interface used to connect a video source to a display device, such as a computer monitor. The interface is designed to transmit uncompressed digital video and can be configured to support multiple modes such as DVI-D (digital only), DVI-A (analog only), or DVI-I (digital and analog).

DVI CABLE

ETHERNET CABLE

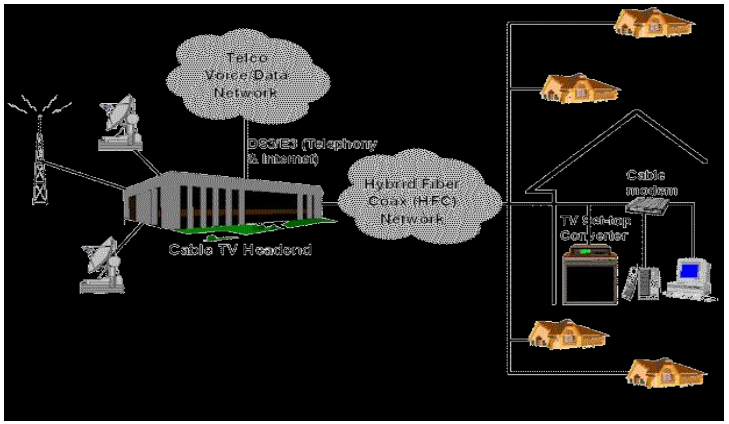
Ethernet Cable- a thick cable used to connect a computer to a large network. An Ethernet cable is often used to connect computers to a college network in a dormitory, for example. Most Ethernet cables are full duplex, meaning they can upload and download information at the same time.

HDMI Cable- (High-Definition Multimedia Interface) a compact audio/video interface for transferring uncompressed digital audio/video data from an HDMI-compliant device to a compatible digital audio device, computer monitor, video projector, and digital television. HDMI is as a digital replacement for existing analog standards such as S-Video, component video, and VGA.

HDMI CABLE

Cable Television

- Cable television is wired communication to the home.
- A cable television system is a communication system that distributes broadcast and satellite delivered programming by means of coaxial and/or fiber optic cable to people's homes.



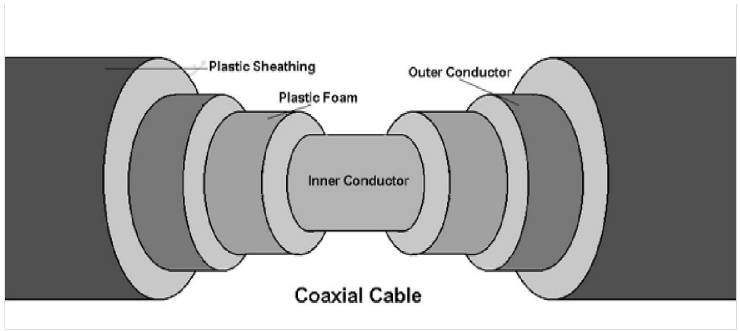
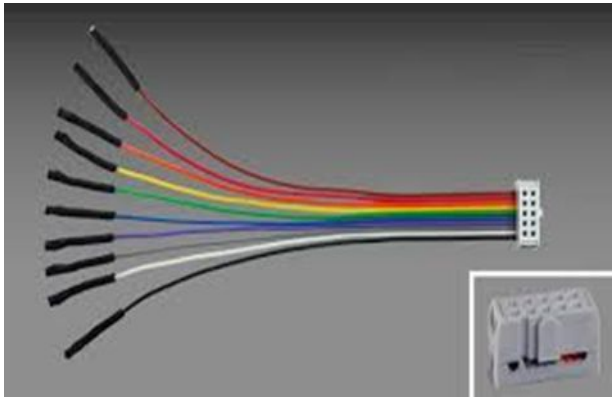


Illustration: Chan, Chin Bong

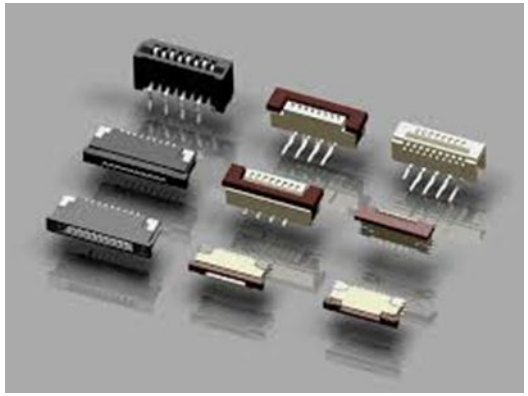
Submarine cable

- A submarine communications cable is a cable laid on the sea bed between land-based stations to carry telecommunication signals across stretches of ocean. The first submarine communications cables, laid in the 1850s, carried telegraphy traffic. Subsequent generations of cables carried telephone traffic, then data communications traffic. Modern cables use optical fiber technology to carry digital data, which includes telephone, Internet and private data traffic.

Submarine Cable



- A **ribbon cable** (also known as multi-wire planar cable) is a cable with many conducting wires running parallel to each other on the same flat plane. As a result the cable is wide and flat. Its name comes from its resemblance to a piece of ribbon.



Overhead cable

- An **overhead cable** is a cable for the transmission of information, laid on utility poles. Overhead telephone and cable TV lines are common in North America. Elsewhere, overhead cables are laid mainly for telephone connections of remote buildings and temporary mechanisms.
- as for example building sites. The same poles sometimes carry overhead power lines for the supply of electric power. Power supply companies may also use them for an in-house communication network.
- Sometimes these cables are integrated in the ground or power conductor. Otherwise an additional line is strung on the masts.

UNDERGROUND CABLES

- Although several types of cables are available, the type of cable to be used will depend upon the working voltage and service requirements. In general, a cable must fulfil the following necessary requirements :

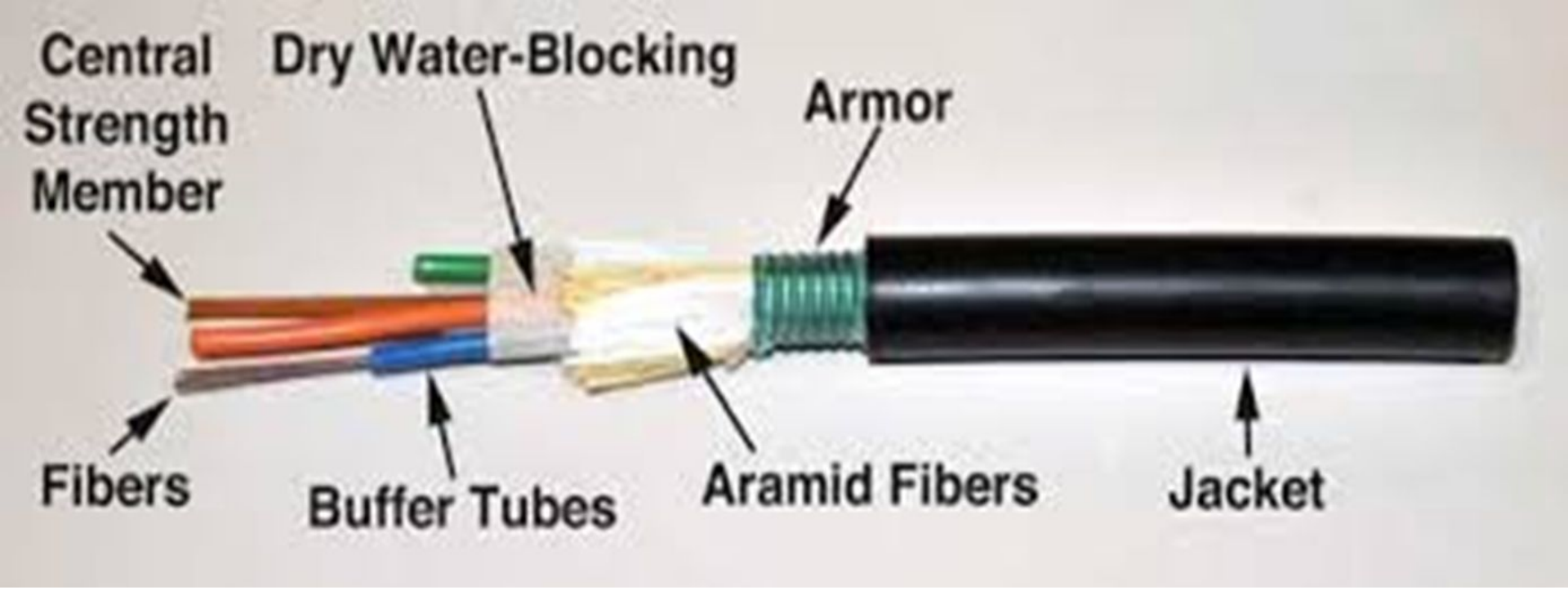
(*i*) The conductor used in cables should be tinned stranded copper or aluminium of high conductivity. Stranding is done so that conductor may become flexible and carry more current.

(*ii*) The conductor size should be such that the cable carries the desired load current without overheating and causes voltage drop within permissible limits.

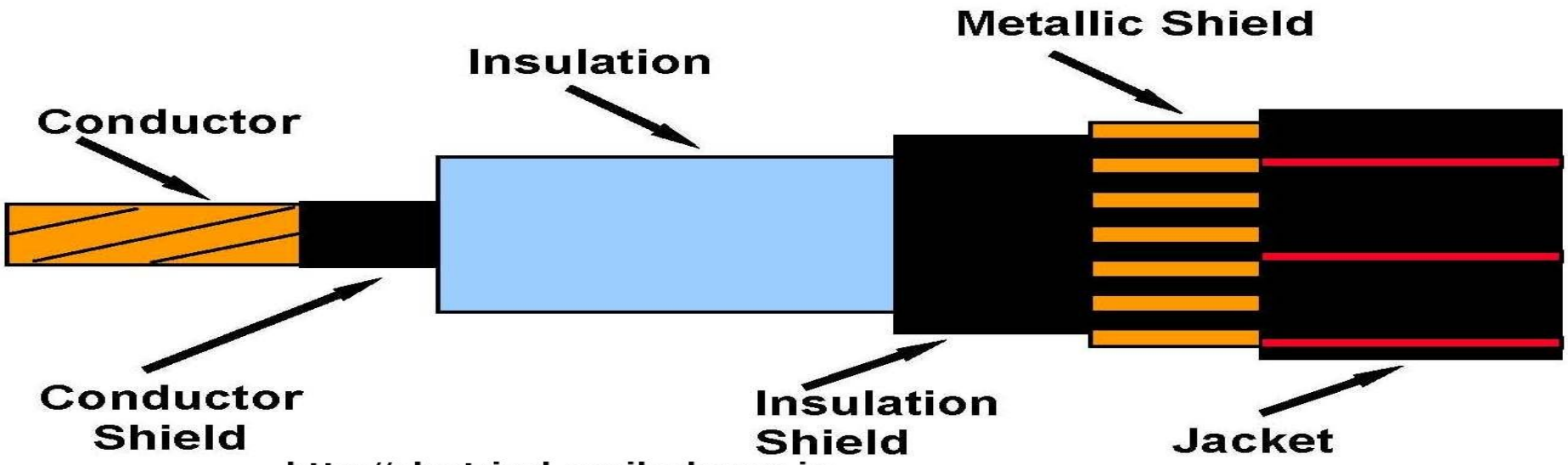
(*iii*) The cable must have proper thickness of insulation in order to give high degree of safety and reliability at the voltage for which it is designed.

(*iv*) The cable must be provided with suitable mechanical protection so that it may withstand the rough use in laying it.

(*v*) The materials used in the manufacture of cables should be such that there is complete chemical and physical stability throughout.



Underground Cable Construction



THE END

Underground vs overhead power cables