

## FIBER OPTICS

### What are the basic differences between copper and fiber transmission systems:

- Copper cabling uses electricity to transmit signals of both analog and digital data.
- Fiber optics uses digital pulses of light to transmit data.

The same result? Not quite. Copper inherently has greater signal loss at higher frequencies resulting in minimal bandwidth or data communication capacity. Fiber can carry very high frequencies with minimal loss offering much greater bandwidth. When the first Trans-Atlantic fiber optic telephone cable was installed in the late 1980's, it carried approximately 38,000 simultaneous voice conversations. In contrast, the best Trans-Atlantic copper system carried only 4,200 conversations-90 percent less than fiber!

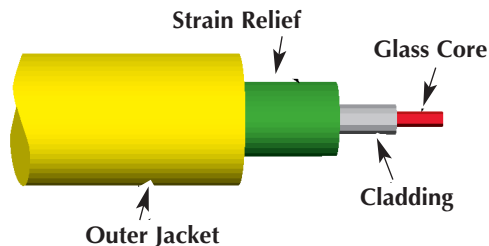
### Specific Customer Base

- 3400 CATV systems.
- Installers and services of LAN systems (Local Area Network).
- Universities and trade schools who offer fiber optic courses and training.
- Hospitals and medical facilities.

### General Customer Base

A significant number of small to medium size corporations will have begun the transition via LAN and WAN (Wide Area Networks). Only fiber optics can support the speed of data transmission that is necessary.

## CONSTRUCTION OF A FIBER OPTIC CABLE



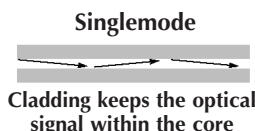
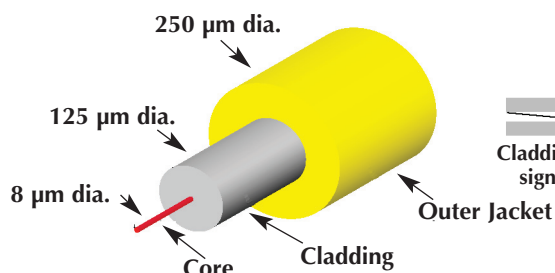
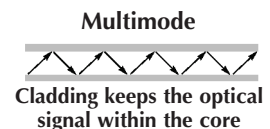
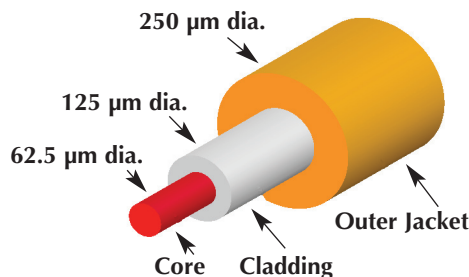
- Glass core carries the light
- Cladding surrounds the core and reflects the light
- Strain relief-kevlar fibers for strength
- Outer jacket

### Cable Types

- **Simplex** cables, a single fiber core allows only one-way data communication.
- **Duplex** cables, contain two fiber cores allows two-way data communication.
- **Multifiber** cables, contain more than two fibers. The fibers are in duplex pairs allowing two-way data transmission. A 30 fiber cable contains 15 duplex pairs.

### Multimode

- Favored in LAN systems.
- Large diameter fiber core, 62.5 micron core typical.
- Short distance applications, having a distance limitation of 2000m (6,560 ft.)
- Is the most common for backbones within buildings and campus environments.
- Generally utilizes a light-emitting diode (LED) light source.
- Cable color-orange.



### Singlemode

- Favored in Telco and CATV applications.
- Small diameter fiber core, 8 micron core is typical.
- Long distance applications may be used for distances up to 3000 m (9,840 ft.)
- Normally uses a laser-light source.
- Cable color-yellow.

### Connector Types

#### Multimode

SC: Push/pull mechanics. Square plastic body latches by pushing into place. Most popular multimode type. Color-beige.  
 ST: Bayonet style, twist to latch in place. Round body early design by AT&T. Color-beige.

#### Singlemode

SC: Differs from SC multimode in color and endface geometry. Most popular singlemode type.  
 FC: Screw on early type. Difficult to attach and remove.

Note: Single mode connectors differ from similar multimode types in that the angle of the contact endface geometry varies. The types are:

- Physical Contact (PC), Color-blue.
- Ultra Physical Contact (UPC), Color-blue.
- Angled Physical Contact (APC), Color-green.

#### SplICES

Two basic types are in wide use.

1. Mechanical. Mechanical splICES attach the two cable ends using a clamp and/or epoxy.
2. Fusion. Melts the two fiber ends together.

## MULTIMODE PATCHCORDS

Preferred in Datacom Applications

### Simplex



Fig. 1

### Duplex



Fig. 3

### Simplex

Retail Part No.	Figure Number	Description
45-6103	1	SC/MM to SC/MM, 10 Meter

### Duplex

Retail Part No.	Figure Number	Description
45-6122	3	SC/MM to SC/MM, 5 Meter