

# LEAD Fiber Optics PRODUCT CATALOGUE

## FIBER PATCH CORD

## Fiber Patch cord



Fiber Patch Cord (Fiber Patch Cable or Fiber jumper) is an fiber cable that has fiber connectors installed on one or both ends. General use of these cable assemblies includes the interconnection of fiber cable systems and optics-to-electronic equipment.

### Fiber pigtail and Fiber patch cord

If the fiber connectors are attached to only one end of a cable, it is known as a fiber pigtail, if the fiber connectors are attached to both ends. it is known as a fiber jumper or fiber patch cord.

### Singlemode and Multimode

Single mode fiber patch cord uses 9/125um glass fiber, Multimode fiber patch cord uses 50/125um or 62.5/125um glass fiber. Single mode and multimode refer to the fiber cable types. Single mode Fiber Patch Cord is used in long distance data transmission. Multimode Fiber Patch Cord is use in short distance transmission. Typical single mode Fiber Patch Cord used yellow fiber cable; Typically multi mode Fiber Patch Cord used orange fiber cable.

### Cable material and cable diameter

There are various kinds of Fiber cable material for different environment and applications, PVC, Riser, Plenum, OFNR, OFNP, LSZH, 10 Gig Aqua. Typical Fiber cable diameter can be 0.25mm, 0.9mm, 2.0mm, 3.0mm.

### Simplex and Duplex

Simplex means this Fiber Patch Cord is with one cord, at each end is only one fiber connector. Duplex can be regarded as two Fiber Patch Cord put side by side. Duplex Fiber Patch Cord usually with Clip on the fiber Connector to combine it.

LFO provide a variety of custom Simplex, Duplex and Mini Zip, single mode (SM) and multi mode (MM) Fiber Patch Cords and Fiber pigtail assemblies that could be built to your specification. Our Fiber Patch Cord and Fiber Pigtail range offers choices of any length, connector types and either PVC or LSZH sheath, All of our cable assemblies are composed of our top quality [Ceramic Ferrules](#) and [Fiber Connector](#) Housings ensuring a stable performance at a high quality level.

## Fiber Patch cord

### Features

- Compliant with JIS C-5973, Bellcore
- Optical performance 100% factory test
- Precision ceramic ferrule with end-face geometry per IEC proposal
- Riser & LSZH cable option
- Low insertion loss
- Low back reflection

### Applications

- Telecommunication
- CATV Networks
- Data Communication Networks
- Active device termination
- Instrumentation
- Local Area Network



## Specifications

ITEM	VALUES
Insertion Loss	$\leq 0.15$ dB Typical (SM) $\leq 0.2$ dB Typical (MM) $\leq 0.3$ dB Typical (MTRJ MM)
Return Loss	$> 40$ dB (PC) $> 45$ dB (SPC) $> 50$ dB (UPC) $> 60$ dB(APC)
Temperature Range	$-40^{\circ}\text{C} \sim 75^{\circ}\text{C}$
Durability	$< 0.2$ dB change after 500 matings

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# Fiber Patch cord Ordering information

**PC**

**XX/XX**

**XX**

**X**

**X**

**XX.X(m)**

**Connector #1 #2**

11-ST  
 21-FC/PC  
 22-FC/APC  
 23-FC/PC Duplex(with clip)  
 31-SC/PC  
 32-SC/APC  
 41-LC/PC  
 42-LC/APC  
 43-LC/PC Duplex(with clip)  
 51-MU/PC  
 53-MU/PC Duplex  
 61- MUJ  
 71-MTRJ Female  
 72-MTRJ Male  
 81-MPO  
 91-FDDI  
 E2-E2000/APC  
 No-None  
 XX-Others, Please specify

**Length**

005-0.5m  
 010-1.0m  
 015-1.5m  
 025-2.5m  
 030-3.0m  
 100-10.0m  
 150-15.0m  
 XXX-Others, 3 digit number ,  
 please specify in **m**

**Cable type**

01-Simplex,bare fiber( 250um)  
 02-Simplex,loose tube cable (0.9mm)  
 03-Simplex,PVC tight buffer cable (0.9mm)  
 04-Simplex,LSZH tight buffer cable (0.9mm)  
 05-Simplex,PVC cable(2.0mm)  
 06-Simplex,LSZH cable(2.0mm)  
 07-Simplex,PVC cable(2.4mm)  
 08-Simplex,LSZH cable(2.4mm)  
 09-Simplex,PVC cable(3.0mm)  
 10-Simplex,LSZH cable(3.0mm)  
 11-Duplex ,PVC cable(2.0mm)  
 12-Duplex,LSZH cable(2.0mm)  
 13-Duplex ,PVC cable(3.0mm)  
 14-Duplex,LSZH cable(3.0mm)  
 15-Duplex Minizip,PVC cable(1.8mm)  
 16-Duplex Minizip,LSZH cable(1.8mm)  
 17-Round cord,PVC calbe(3.0mm)  
 18-Round cord,LSZH calbe(3.0mm)  
 XX-Others, Please specify

**Fiber type**

1-9/125um(Single Mode)  
 2-50/125um(Multi Mode)  
 3-62.5/125um(Multi Mode)

**Cable color**

7-Yellow(SM)  
 8-Orange(MM)  
 X-Other Color

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## **LFO Fiber Patch cord Series**



### **ST Fiber Patch cord**

The ST fiber patch cord uses a long 2.5mm diameter ceramic ferrule (or stainless alloy / plastic ferrule). It mates with an interconnection adapter and is latched into place by twisting to engage a spring-loaded bayonet socket. It is the most popular connector for multimode fiber optic LAN applications.

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### **FC Fiber Patch cord**

The FC fiber patch cord uses a 2.5mm diameter ceramic ferrule (or stainless alloy ferrule). Designed with a threaded coupling for durable connections. It has been the most popular single mode connectors for many years. However it is now gradually being replaced by SC and LC connectors. It is specifically designed for telecommunication applications and provides non-optical disconnect performance.

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### **SC Fiber Patch cord**

The SC fiber patch cord is a non-optical disconnect connector with a 2.5mm pre-radius ceramic (or stainless alloy ferrule). It features a snap-in (push-pull) connection design for quick patching of cables into rack or wall mounts. It is widely used in single mode applications for its excellent performance. Two simplex SC patch cords can be clipped together by a reusable duplex holding clip to create a duplex SC patch cord.

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### **FDDI Fiber Patch cord**

The FDDI fiber patch cord is a duplex connector designed by ANSI and is utilized in FDDI networks. FDDI connector utilizes two 2.5mm ferrules. The ferrules are sheltered from damage because of the fix shroud that has been constructed in the FDDI connector. FDDI connectors are generally used to connect to the equipment from a wall outlet, but the rest of the network will have ST or SC connectors.

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### **LC Fiber Patch cord**

The LC fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule instead of the 2.5mm ferrule. It has a push-and-latch design providing pull-proof stability in system rack mounts. Externally LC patch cord resembles a standard RJ45 telephone jack. Internally they resemble a miniature version of the SC connector. Highly favored for single mode applications.

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### **MU Fiber Patch cord**

The LC fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule. It has push-pull mechanism. They are called "mini SC" and are more popular in Japan. Applications include high-speed data communications, voice networks, telecommunications, and dense wavelength division multiplexing (DWDM). MU connectors are also used in multiple optical connections and as a self-retentive mechanism in backplane applications.



### ***MTRJ Fiber Patch cord***

The MT-RJ fiber patch cord is derived from MT ferrule design. It has a miniature two-fiber ferrule with two guide pins parallel to the fibers on the outside. The guide's pins align ferrules precisely when mating two MT-RJ connectors. MT-RJ connectors are designed with male-female polarity which means male MT-RJ connector has two guide pins and female MT-RJ connector has two holes instead. the MTRJ is designed for backbone and horizontal cabling systems, local area networks and telecommunication systems

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### ***MPO Fiber Patch cord***

The MTP and MPO are compatible ribbon fiber patch cord based on MT ferrule which allow quick and reliable connections for up to 12 fibers. Up to 12 fibers in a ribbon are stripped to 125um cladding and inserted into 250um spaced parallel grooves. MTP and MPO Patch cord feature male and female connector design. Male connectors have two guide pins and female connectors do not. Both connector types need an adapter to mate a pair of male and female connectors.

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### ***E2000 Fiber Patch cord***

The E2000 fiber patch cord uses a 1.25mm ceramic (zirconia) ferrule. E2000's are small form factor connectors with a moulded plastic body similar to that of an LC. The E2000 also exhibits a push-pull latching mechanism, and integrates a protective cap over the ferrule, which acts as a dust shield and shields users from laser emissions. The protective cap is loaded with an integrated spring to ensure proper closing of the cap. Like other small form factor connectors, the E-2000 connector is suited for high-density applications.

## ST Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- Twist-lock bayonet coupling mechanism which ensures quick, highly repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies in standard and custom configurations
- Singlemode and Multimode
- PC finish

### Applications

- Premise installations
- Telecommunication networks
- Metro networks
- Local Area Networks (LANs)
- Data processing networks
- Instrumentation



## Specifications ( Patch cord / Pigtail / Connector)

ITEM	SM / PC	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.3
Return Loss(dB)	> 40	-
Durability:500matings(dB)	< 0.2	< 0.2
Operation temperature(°C)	-40°C ~ 85°C	-40°C ~ 85°C
Ferrule Type	Standard	Standard
Body Material	Zinc die-casting	
Cable Type	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable	
Boot Type	Variety of Color , Design available	

## Specifications ( Adapter)

ITEM	SM / PC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Phosphor bronze
Body Material	Zinc die-casting	

## FC Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- Threaded, key-oriented coupling mechanism which allows repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC or APC finish

### Applications

- CATV
- Metro Applications
- Active device termination
- Test equipment
- Wide Area Networks (WANs)
- Telecommunication networks
- Local Area Networks (LANs)
- Data processing networks
- Premise installations



## Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.2	< 0.3
Return Loss(dB)	> 40	> 60	-
Durability:500matings(dB)	< 0.2	< 0.2	< 0.2
Ferrule Type	Standard	Step / Conical	Standard
Body Material	Nickel plated brass		
Cable	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

## Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Ceramic	Phosphor bronze
Body Material	Nickel plated brass		
Body Type	Square Type / Round Type		



## SC Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- Push-pull, key-oriented coupling mechanism which allows highly repeatable, low-loss connections
- Simplex, duplex, and multi-fiber assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC or APC finish
- UL94V-O compatible resin housing and optional UL94V-O compatible resin boot is available

### Applications

- CATV
- Metro
- Active device termination
- Test equipment
- Telecommunication networks
- Local Area Networks (LANs)
- Data processing networks
- Premise installations
- Wide Area Networks (WANs)



## Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.2	< 0.3
Return Loss(dB)	> 40	> 60	-
Durability:500matings(dB)	< 0.2	< 0.2	< 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / 2.4 / 3.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

## Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic/ Phosphor bronze	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex / Duplex		

## FDDI Fiber Patch cord

### Features

- ANSI FDDI compliant singlemode and multimode versions
- Push-pull installation and removal
- Quick installation with Snap-together housing
- Compatible with all FDDI-compliant connectors and active equipment
- Lowest profile in the industry
- Connector housing quickly and securely snaps together, no screws
- Color coded keying for service identification
- Various brand name connectors are available upon request

### Applications

- Duplex fiber optic system
- Building wiring
- FDDI backbone network



## Specifications (Patch cord / Pigtail / Connector)

ITEM	Multi Mode
Insertion Loss(dB)	< 0.2
Return Loss(dB)	-
Durability:500matings(dB)	< 0.2
Cable Type	Duplex round /Zip Cable
Boot Type	Duplex round cable/ Zip cable

## Specifications (Adapter)

ITEM	Multi Mode
Body Material	Plastic
Housing Color	Beige

## LC Fiber Patch cord

### Features

- Compliance with IEC, Telcordia
- RJ-45 style housing with push-pull coupling mechanism which allows easy disengagement in dense spaces
- Small Form Factor - half the size of standard connectors
- Simplex and duplex assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC Finish

### Applications

- Gigabit Ethernet
- Video
- Active Device Termination
- Premise Installations
- Telecommunication Networks
- Multimedia



## Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.2	< 0.3
Return Loss(dB)	> 40	> 60	-
Durability:500matings(dB)	< 0.2	< 0.2	< 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / Zip Cable		
Boot Type	Variety of Color , Design available		

## Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex / Duplex		

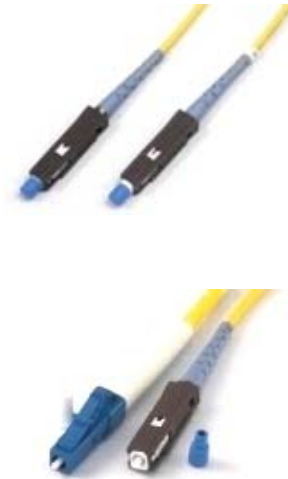
## MU Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- Miniature single-position plug with push-pull coupling mechanism which are used for high density, low profile interconnect applications and back panel connector applications
- Design based on SC connector technology
- Simplex and duplex assemblies available in standard and custom configurations
- Singlemode and Multimode
- PC finish

### Applications

- CATV
- Video
- Active Device Termination
- Premise Installations
- Telecommunication Networks
- Local Area Networks (LANs)
- Data processing networks
- Wide Area Networks (WANs)



## Specifications (Patch cord / Pigtail / Connector)

ITEM	Single Mode	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.3
Return Loss(dB)	> 40	-
Durability:500matings(dB)	< 0.2	< 0.2
Ferrule Type	Standard	Standard
Cable	0.9 / 2.0 / Zip Cable	
Boot Type	Blue, Variety of Color , Design available	

## Specifications (Adapter)

ITEM	Single Mode	Multi Mode
Sleeve	Ceramic	Phosphor bronze
Body Material	Plastic	
Housing Color	Brown	
Housing Type	Simplex / Duplex	

## MTRJ Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- MT style ferrule with RJ-45 style housing with push-pull coupling mechanism which allows easy disengagement in dense spaces
- One ferrule accommodates two fibers
- Small Form Factor - Half the size of duplex SC and ST connectors
- Duplex assemblies available in standard and custom configurations
- Singlemode and Multimode

### Applications

- Asynchronous Transmission Mode (ATM)
- Gigabit Ethernet
- CATV, Video and Multimedia
- Active Device/Transceiver Interface
- Premise Installations
- Telecommunication Networks
- Industrial
- Military
- Parallel optical interconnect between PC Cards and patch panels
- Interconnection for O/E modules
- Optical Switch interframe connections



## Specifications (Patch cord / Pigtail / Connector)

ITEM	Single Mode	Multi Mode
Insertion Loss(dB)	< 0.7	< 0.7
Return Loss(dB)	> 26	-
Durability:500matings(dB)	< 0.3	< 0.3
Cable Type	Simplex round cable / Zip Cable	
Boot Type	Blue, Simplex round cable/Zip cable	

## Specifications (Adapter)

ITEM	Single Mode	Multi Mode
Body Material	Plastic	
Housing Color	Black	

## MPO Fiber Patch cord

### Features

- Compliance with IEC, JIS, Telcordia
- Push-on / Pull-off latching connector
- Available Singlemode (angled) and Multimode (flat) performance
- High fiber density (24 fibers for Multimode)
- Fiber in single connector: 4, 8, 12
- High reflection loss with APC
- Precision molded polymer component

### Applications

- Parallel optical interconnect between PC cards and patch panels
- Interconnection for O/E modules
- Optical Switch inter frame connections
- Gigabit Ethernet
- CATV
- Video
- Active Device / Transceiver Interface
- Premise Installations
- Telecommunication Networks
- Multimedia




### Specifications (Patch cord / Pigtail / Connector)

ITEM	Low Loss /SM	SM	Multi Mode
Insertion Loss(dB)	< 0.35	0.75	< 0.5
Return Loss(dB)	$\geq 50$	$\geq 50$	-
Cable Type	4,8,12,24 Bare fiber ribbon / Ruggedized ribbon		
Boot Type	Variety of Color , Design available		

### Specifications (Patch cord / Pigtail / Connector)

ITEM	Low Loss /SM	SM	Multi Mode
Body Material	Plastic		
Housing Color	Black		

## E2000 Fiber Patch cord

<p><b>Features</b></p> <ul style="list-style-type: none"> <li>● The ferrule is protected by integrated spring-loaded shutter</li> <li>● The connector housing protects the ferrule all round against dust, dirt and scratches</li> <li>● No different expansion coefficients due to Ceramic ferrule</li> <li>● Singlemode and Multimode</li> <li>● PC Finish and APC finish</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>● Telecommunication</li> <li>● CATV</li> <li>● LAN(including FITH,FTTH and FTTD)</li> </ul>	
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## Specifications (Patch cord / Pigtail / Connector)

ITEM	SM / PC	SM / APC	Multi Mode
Insertion Loss(dB)	< 0.2	< 0.2	< 0.3
Return Loss(dB)	> 40	> 60	-
Durability:500matings(dB)	< 0.2	< 0.2	< 0.2
Ferrule Type	Standard	Step / Conical	Standard
Cable	0.9 / 2.0 / 2.4 / 3.0		
Boot Type	Variety of Color , Design available		

## Specifications (Adapter)

ITEM	SM / PC	SM / APC	Multi Mode
Sleeve	Ceramic	Ceramic	Phosphor bronze
Body Material	Plastic		
Housing Color	Blue	Green	Beige
Housing Type	Simplex		