



# Fiber Optics

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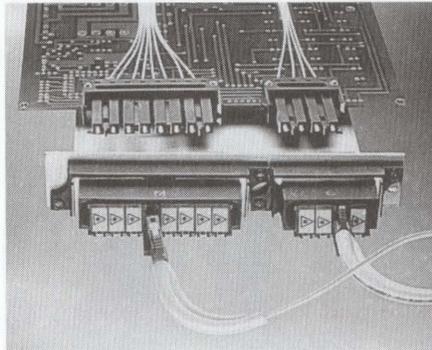
For more information, please see the last page of the catalog for the location nearest you or contact:

**Design and Innovation**

Molex's experience and resources provide customers a wide range of design, manufacturing, and value-added services. Our in-house capabilities include computer-aided design, product modeling and rapid prototyping. These capabilities ensure designed-in reliability and performance in conjunction with faster time-to-market response for customer designed products.

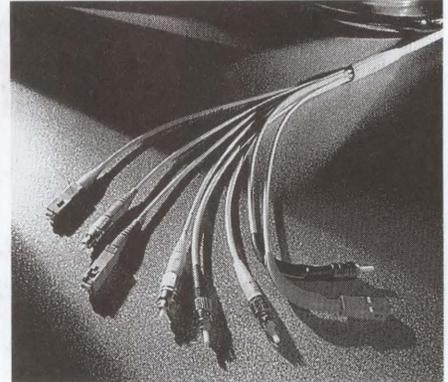
**Product Lines**

Our extensive product offering includes a full range of optoelectronic and passive interconnect solutions, serving the Telecommunication, Data Communication, and CATV markets. Products include optical backplane solutions, flex circuitry, transceivers, custom and standard cable assemblies, and most fiber optic connector standards.



**Backplane Solutions**

To meet the demand for network bandwidth management and DWDM technology, we offer a variety of backplane interconnect solutions. The High Density Backplane MT (HBMT) interconnect system is designed to offer the versatility of a blind mating card edge connector. Based on the NTT-MT\* ferrule and MTP† ribbon fiber connector, the blindmate Backplane MTP (BMTM) is suitable for multimode or singlemode applications. Our blindmate Backplane LC (BLC) systems are designed to provide high density using a small form factor connector and discrete ferrule solution. The widely field deployed Backplane SC and Backplane SC II (BSC and BSCII) systems integrate the NTT standard SC with blind mating PC board mountable connectors through custom Molex backplane adapters.



**Connectors**

Molex connectors provide high performance and reliability. The SC, SC/APC, SC Duplex, LC, MT-RJ, MTP, FC, FC/APC, ST‡, STII‡, SMA, FDDI and ESCON§ connectors are designed to industry standards. These designs utilize the latest engineered polymers, precision ceramics, and the finest metals. Our three small form factor connectors are 50% smaller than standard connectors.

**Small Form Factor Connectors**

Also in our offerings are three small form factor connectors. Each is designed with unique features to address specific applications. The MT-RJ is the ideal small form factor duplex connector for Data Communication applications. The LC connector family offers a high performance connection within its small form factor package. The MTP connector provides a quick and reliable connection for multiple optical fibers.

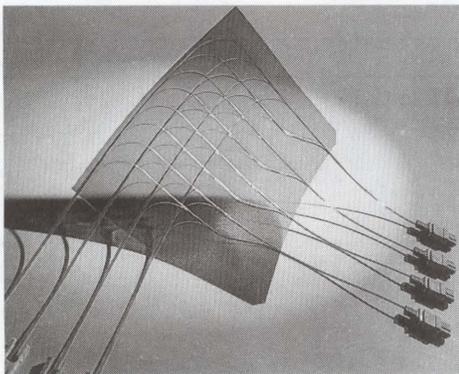
**Cable Assemblies**

Exceptional performance in our cable assemblies is the result of advanced manufacturing processes and demanding specifications employed throughout the termination process. Each cable assembly is serialized for full traceability.

**Contact**

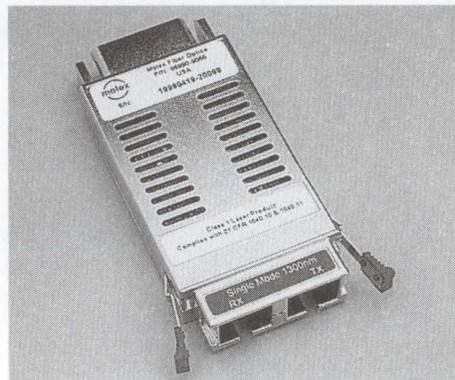
Datasheets, engineering drawings, termination procedures, application notes, etc., are all available for your convenience. View our product information at [www.molex.com/fiber](http://www.molex.com/fiber) or contact us at 1-800-A1-FIBER.

\* NTT-MT is a trademark of NTT Advanced Technology Corporation  
† MTP is a registered trademark of US Conec Ltd.  
‡ ST, ST II are trademarks of Lucent Technologies  
§ ESCON is a registered trademark of International Business Machines Corporation



**Optical Flex Circuitry**

Our FlexPlane™ optical flex circuit provides one of the highest density interconnect systems on the market today. For high fiber count interconnects in backplanes, and cross connect systems, the FlexPlane's high density routing on a flexible, flame resistant substrate provides a manageable means of fiber routing from shelf-to-shelf.



**Optoelectronic Solutions**

Our transceiver offering includes small form factors, parallel optical links, GBIC's and 1 by 9's. Molex's active components pack tremendous power and reliability into small packages. Our optical transceivers offer superior EMI shielding with our fully grounded metal housing and rail systems.

## Optical Flex Circuit and Backplane Solutions

### FLEXPLANE™ OPTICAL FLEX CIRCUIT

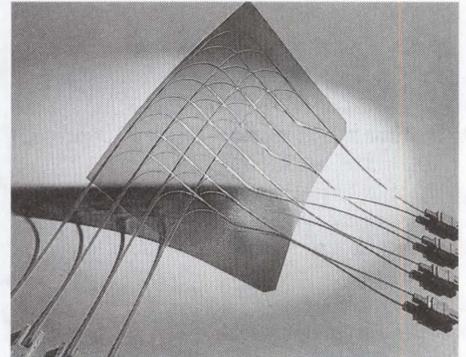
#### Features and Benefits

- Efficient & manageable solution to high fiber count systems
- Compatible with mass and discrete fiber terminations
- Diverse substrate size, shape and packaging
- Meets Telcordia requirements
- Available in any routing scheme
- Direct or fusion splice terminations
- Singlemode, multimode or hybrid

#### Applications

- Computing equipment
- Telecommunication equipment: transmission, switching, multiplexing
- Broadband equipment: amplifiers

Contact Molex Fiber Optics for configuration and part numbers, in the US (800) A1-FIBER or outside the US (630) 512-8787.



### HIGH DENSITY BACKPLANE MT INTERCONNECT SYSTEM (HBMT)

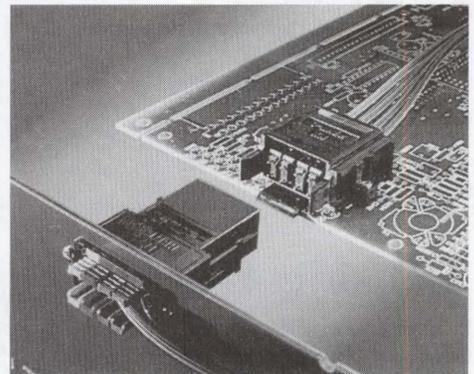
#### Features and Benefits

- Patented dual shutter design for dust and eye safety protection
- Singlemode and multimode compatible
- Telcordia GR-1435-core compliant
- Generous mechanical float in the X, Y, and Z axis
- Compatible with optical flex circuit technology
- Utilizes standard MT ferrule as the optical interface

#### Applications

- High density blind mate interconnect for data and telecommunication systems
- Total optical backplane solution when used with Molex's FlexPlane optical flex circuit

Order No.	Type	Description
86105-0100	HBMT connector	HBMT daughter card connector housing, rivet mount
86105-1100	HBMT connector	HBMT daughter card connector housing, screw mount
86105-2100	HBMT connector	HBMT daughter card connector housing, rivet mount, floating
86105-0000	HBMT adapter	HBMT motherboard adapter housing, rivet mount
86105-1000	HBMT adapter	HBMT motherboard adapter housing, screw mount
86105-2000	HBMT adapter	HBMT motherboard adapter housing, screw mount, fixed



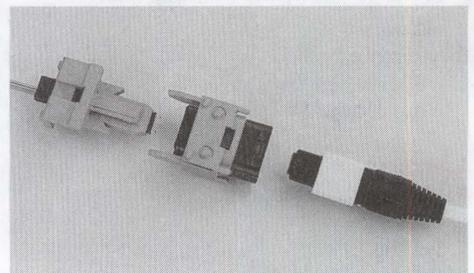
### MTP\* BACKPLANE INTERCONNECT SYSTEM (BMTP)

- Patented dual shutter design for dust and eye safety protection
- Singlemode and multimode compatible
- Integrates with HDM electrical connector system
- Telcordia GR-1435-core compliant
- Generous mechanical float in the X, Y, and Z axis
- Compatible with optical flex circuit technology
- Utilizes standard MTP connector as user interface

#### Applications

- High density blind mate interconnect for data and telecommunication applications
- Integrated optical and HDM electrical systems
- Total optical backplane solution when used with Molex's FlexPlane optical flex circuit

Order No.	Type	Description
86086-5200	BMTP Parts Kit	BMTP backplane daughter card parts kit, single position
86087-5202	MT Ferrule	Pinholder
86186-0000	BMTP Parts Kit	BMTP backplane motherboard parts kit, single position
86186-0020	BMTP Adapter	BMTP backplane, automatic shuttered adapter



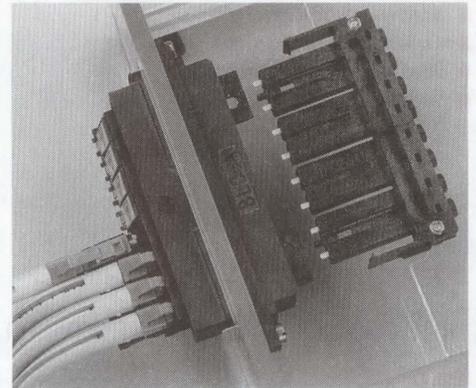
\*MTP is a registered trademark of US Conec Ltd.

**Optical Flex Circuit and Backplane Systems**

**LC BACKPLANE CONNECTOR SYSTEM (BLC)**

- Small form factor LC interface: 1/2 scale of SC connector, RJ-45 latching, uses 1.25mm ferrule
- High performance: 2, 4, and 8 fiber terminations
- Discrete tunable ferrule
- Highly stable interconnect: connection isolated to daughtercard
- Generous axial alignment
- Built-in dust and eye protection
- Low insertion loss:  
 < 0.20 dB typical MM  
 < 0.15 dB typical SM

Order No.	Type	Description
86045-5000	BLC Connector	126µm, 2 position SM, Zirconia PC ferrule, 900µm buffered fiber
86048-5000	BLC/APC Connector	126µm, 2 position SM, Zirconia PC ferrule, 900µm buffered fiber
86046-3000	BLC Connector	128µm, 8 position MM, Zirconia PC ferrule, 900µm buffered fiber
86145-0100	BLC Adapter	2 position backplane assembly, Phosphor Bronze alignment sleeve (adapter mounting plate included), black housing
86146-1500	BLC/APC Adapter	8 position backplane assembly, Zirconia alignment sleeve (adapter mounting plate included), green housing



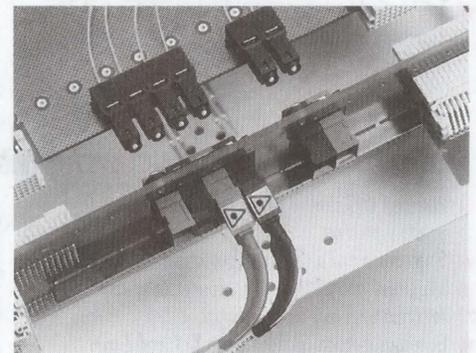
**Applications**

- Computing equipment
- Telecommunications equipment: transmission, switching, multiplexing
- Broadband equipment: amplifiers

**SC BACKPLANE CONNECTOR SYSTEM (BSC/BSCII)**

- System based on NTT-SC\* standard
- System integrates: BSC or BSCII backplane connector, backplane adapter, NTT-SC standard connector
- Backplane connector: PC board mountable, blind mate coupling, removable ferrule assembly, stackable design for multiple channels, floating ferrule design is self-aligning, tunable feature for BSCII
- Backplane adapters: traditional SC style, SC style with shutter
- Low insertion loss:  
 < 0.20 dB typical MM  
 < 0.15 dB typical SM

Order No.	Type	Description
86070-3000	BSC Backplane Connector	128µm, MM, Zirconia PC ferrule, 900µm, buffered fiber
86070-5000	BSC Backplane Connector	126µm, SM, Zirconia PC ferrule, 900µm, buffered fiber
86071-3000	BSCII Backplane Connector	128µm, MM, Zirconia PC ferrule, 900µm, buffered fiber
86075-5000	BSC/APC Backplane Connector	126µm, SM, Zirconia PC ferrule, 900µm, buffered fiber
86076-5000	BSCII/APC Backplane Connector	126µm, SM, Zirconia PC ferrule, 900µm, buffered fiber
86171-0000	BSC Backplane Adapter	Phosphor Bronze alignment sleeve, black housing
86170-0430	BSC Backplane Adapter with Shutter	Zirconia alignment sleeve, red housing
86171-2400	BSCII Backplane Adapter with Shutter	Phosphor Bronze alignment sleeve, black housing



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**Applications**

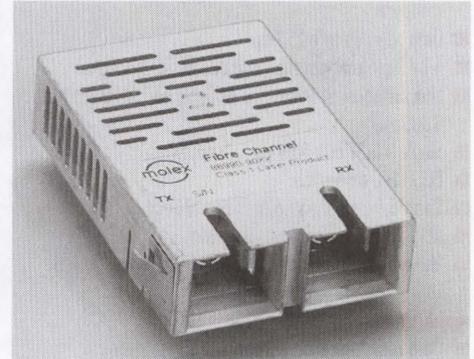
- Telecommunication equipment:  
 Transmission  
 Switching  
 Multiplexing
- Broadband equipment:  
 Amplifiers
- Computing equipment

\* NTT-SC is a trademark of NTT Advanced Technology Corporation

**FIBRE CHANNEL TRANSCEIVER, VCSEL**

- Compliant with Fibre Channel requirements
- Data rates up to 1.0625 Gbps
- 1 by 9 pin configuration and duplex SC connectors
- Link distances ≤ 500m (for 850nm) and ≤ 10 km (for 1300nm)
- Single +3.3V or +5.0V power supply
- ECL/PECL compatible
- Size 25.91mm by 39.62mm by 9.78mm
- TUV certified product
- AC and DC coupled versions available
- Metallized and unmetallized casings available

Order No.	Type	Description
86990-9044	Optical Transceiver	Fibre Channel AC coupled, VCSEL, 3.3V
86990-9048	Optical Transceiver	Fibre Channel AC coupled, VCSEL, 3.3V, low EMI with clip
86990-9052	Optical Transceiver	Fibre Channel AC coupled, VCSEL, 5.0V
86990-9053	Optical Transceiver	Fibre Channel DC coupled, VCSEL, 5.0V
86990-9056	Optical Transceiver	Fibre Channel AC coupled, VCSEL, 5.0V, low EMI with clip
86990-9057	Optical Transceiver	Fibre Channel DC coupled, VCSEL, 5.0V, low EMI with clip
86990-9081	Optical Transceiver	Fibre Channel DC coupled, VCSEL, 5.0V, low EMI with flushmount shield
86990-9097	Optical Transceiver	Fibre Channel AC coupled, VCSEL, 5.0V, TTL signal detect



**Applications**

- Data communication networks
- Telecommunication networks
- Broadband deployments
- Cross-connects
- ATM switches
- Disk array links
- Workstation and mainframe backbones
- Network interface cards

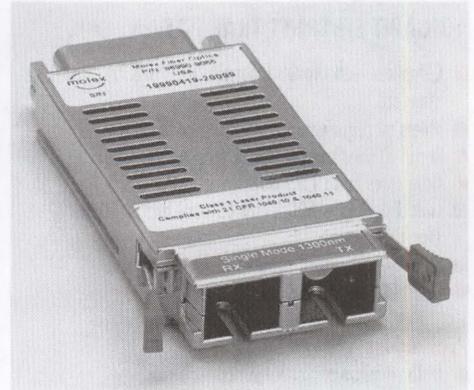
**FIBRE CHANNEL TRANSCEIVER, GBIC**

- Compliant with Fibre Channel requirements
- Meets all requirements of GBIC specifications
- Serial ID interface (Annex D, Mod Definition 4)
- Data rates up to 1.063 Gbps
- Link distances ≤ 500m (for 850nm) and ≤ 10 km (for 1300nm)
- Single +5.0V power supply
- ECL/PECL compatible

**Applications**

- Data communication networks
- Telecommunication networks
- Broadband deployments
- Cross-connects
- ATM switches
- Disk array links
- Workstation and mainframe backbones
- Network interface cards

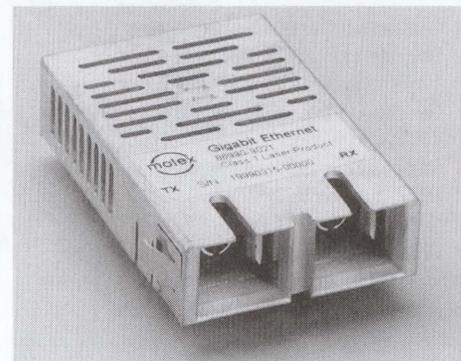
Order No.	Type	Description
86990-9064	Optical Transceiver	Fibre Channel 850nm GBIC
86990-9065	Optical Transceiver	Fibre Channel 1300nm GBIC



**GIGABIT ETHERNET TRANSCEIVER, VCSEL**

- Compliant with Gigabit Ethernet (IEEE 802.3z) standard
- Data rates up to 1.25 Gbps
- 1 by 9 pin configuration and duplex SC connectors
- Link distances ≤ 500m (for 850nm) and ≤ 10 km (for 1300nm)
- Single +3.3V or +5.0V power supply
- ECL/PECL compatible
- Size 25.91mm by 39.62mm by 9.78mm
- AC and DC coupled versions available
- Metallized and unmetallized casings available

Order No.	Type	Description
86990-9054	Optical Transceiver	Gigabit Ethernet AC coupled, VCSEL, 5.0V
86990-9058	Optical Transceiver	Gigabit Ethernet AC coupled, VCSEL, 5.0V, low EMI with clip
86990-9080	Optical Transceiver	Gigabit Ethernet AC coupled, VCSEL, 5.0V, low EMI without clip
86990-9091	Optical Transceiver	Gigabit Ethernet AC coupled, VCSEL, 5.0V, with flushmount shield
86990-9059	Optical Transceiver	Gigabit Ethernet DC coupled, VCSEL, 5.0V, low EMI with clip
86990-9055	Optical Transceiver	Gigabit Ethernet DC coupled, VCSEL, 5.0V



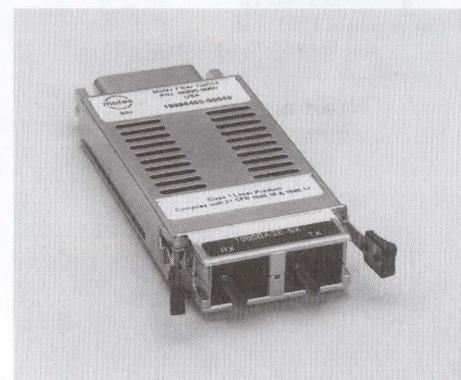
**Applications**

- Data communication networks
- Telecommunication networks
- Broadband deployments
- Cross-connects
- ATM switches
- Disk array links
- Workstation and mainframe backbones
- Network interface cards

**GIGABIT ETHERNET TRANSCEIVER, GBIC**

- Compliant with Gigabit Ethernet (IEEE 802.3z) standard
- Meets all requirements of GBIC specification
- Serial ID interface (Annex D, Mod Definition 4)
- Data rates up to 1.25 Gbps
- Link distances ≤ 500m (for 850nm) and ≤ 10 km (for 1300nm)
- Single +5.0V power supply
- ECL/PECL compatible

Order No.	Type	Description
86990-9060	Optical Transceiver	850nm GBIC
86990-9061	Optical Transceiver	1300nm GBIC singlemode fiber applications
86990-9069	Optical Transceiver	1300nm GBIC SM and MM



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**Applications**

- Data communication networks
- Telecommunication networks
- Broadband deployments
- Cross-connects
- ATM switches
- Disk array links
- Workstation and mainframe backbones
- Network interface cards

**Features and Benefits**

- Standard or custom assemblies
- Precision ferrule endface geometry
- Controlled fiber protrusion
- Factory polished, tested and serialized

**Applications**

- Telecommunication networks
- Data communication networks
- CATV networks

**OVERVIEW**

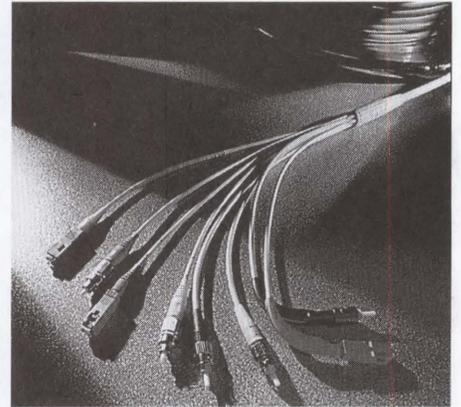
Many years in development and refinement, the advanced Molex termination process delivers exceptional performance for fiber optic terminations and cable assemblies. This process was developed to specifically control one of the most critical elements of fiber optic terminations—the ferrule endface geometry. Physical contact, fiber core alignment and termination reliability are greatly impacted by the radius, apex offset and concentricity of the ferrule. That is why pre-polished and pre-radiused ferrules are always used in Molex connectors.

High precision interferometric measuring equipment is used to control the radius, apex offset and concentricity of the ferrule, before it is assembled into the connector. In doing so, a quality ferrule endface is assumed **before** the expense of a connector and termination labor is added to the assembly. Subsequent termination operations polish the fiber to conform to the radius of the ferrule, thereby eliminating the variability of the polishing process which could alter the ferrule geometry.

Polishing only the fiber, **not** the epoxy and **not** the ceramic, ensures the precise control of the finish and protrusion of the fiber. A high powered interferometer is used to control the length of the fiber projecting above the ferrule surface thereby ensuring physical contact without compromising long-term reliability. Terminations are visually inspected and tested for insertion and return loss. A serial number, fixed to the assemblies, provides traceability to factory measurements.

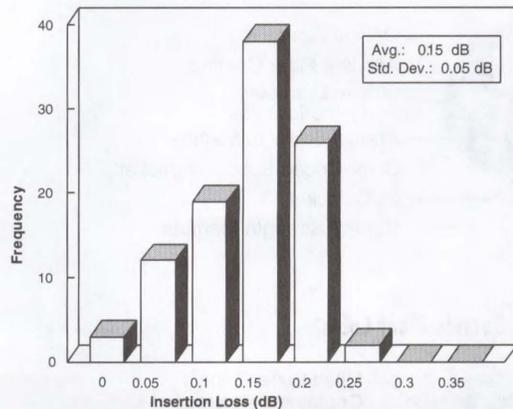
Assemblies suitable for data communication, telecommunication and CATV applications are terminated with connectors that are designed to and are compatible with industry standards (EIA/TIA, IEC, ANSI, NTT and Telcordia Technologies).

Whatever application you have in mind, the Molex production team will make certain your assemblies, whether custom or standard, are delivered on time and to your exact specifications.



**SPECIFICATIONS**

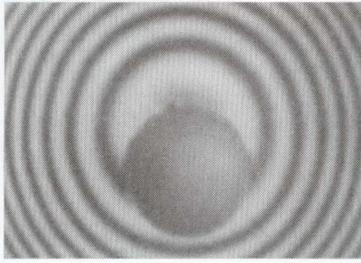
Finish	Units	Insertion Loss		Return Loss
		Mean	Sigma	
Standard Multimode (Ceramic Ferrule)	dB	.34	.10	—
Enhanced Multimode (Ceramic Ferrule)	dB	.17	.06	—
Super PC	dB	.15	.05	≥ 45
Ultra PC	dB	.15	.05	≥ 55
Angled Physical Contact (APC)	dB	.25	.06	≥ 70
Stainless Steel Ferrule	dB	.35	.17	—



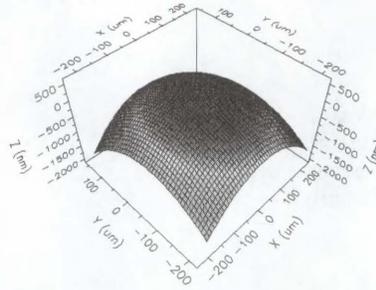
**SC Connector, 9/125µm Fiber  
(Measured at 1550nm)**

**CABLE TYPES**

**Interferometer Image**

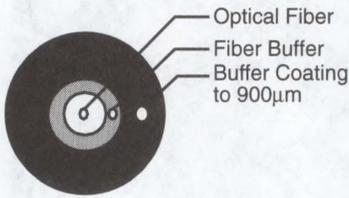


**Polishing Profile**

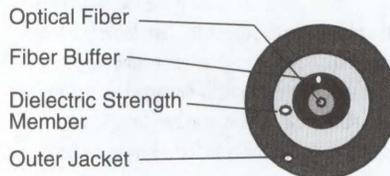


**Simplex Cable**

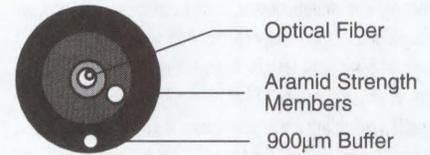
**900µm Buffered Fiber**



**Single Fiber Cable**

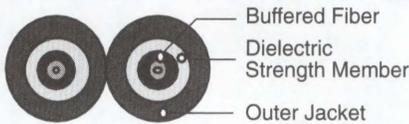


**900µm Buffer and KEVLAR\***

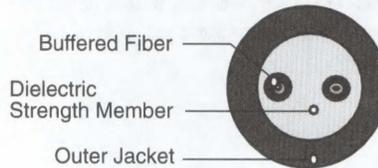


**Duplex Cable**

**2-Fiber Zipcord Cable**

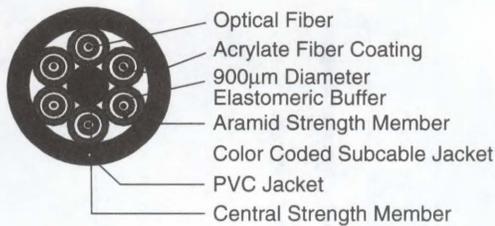


**Round Cable**

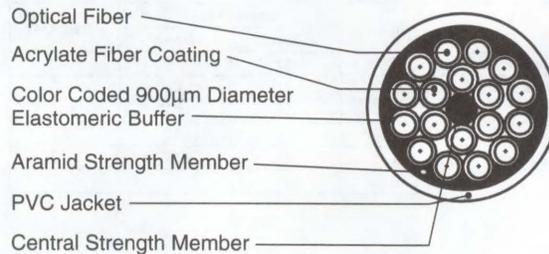


**Breakout, Outside Plant and Distribution Cable**

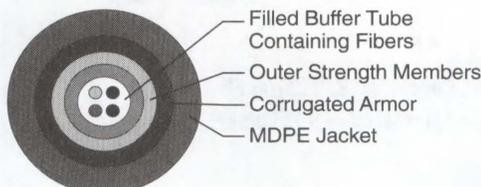
**Breakout Cable†**



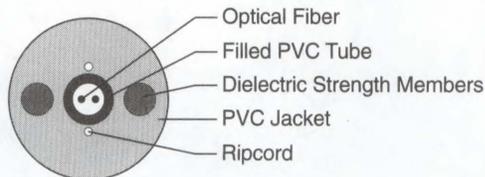
**Distribution Cable†**



**Armored Outside Plant Cable†**



**Dielectric Outside Plant Cable†**



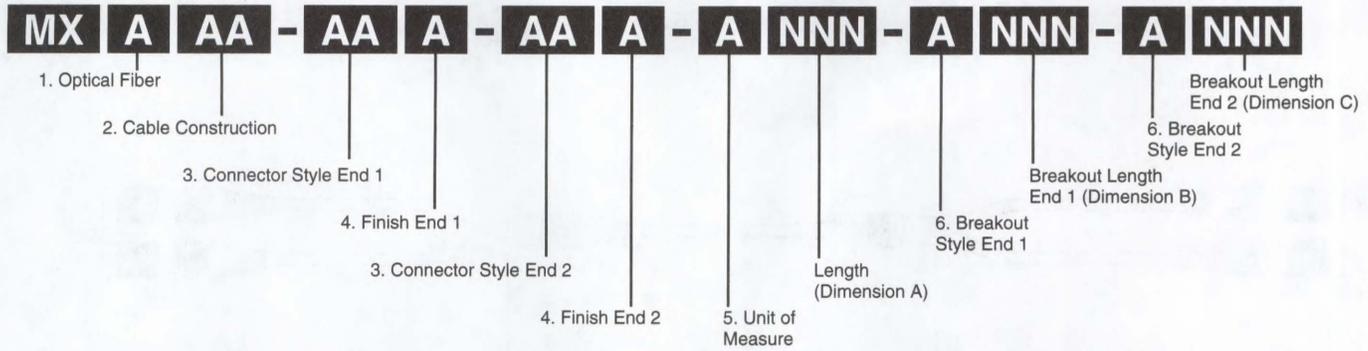
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\* KEVLAR is a registered trademark of E.I. duPont de Nemours & Company, Inc.

† Drawings are for illustration purposes. Please contact Molex Fiber Optics for details and options, in the US (800)-A1-FIBER or outside the US (630) 512-8787.

**Cable Assemblies**



1. Optical Fiber	
A	Multimode, 50/125µm
B	Multimode, 62.5/125µm
C	Multimode, 100/140µm
D	Singlemode, 9/125µm
E	Singlemode, 9/125µm, dispersion shifted

2. Cable Construction	
AA	Simplex, 900µm buffer
AB	Simplex, 900µm buffer & KEVLAR® coating
AC	Simplex, 3.0mm, OFNR
AD	Simplex, 2.4mm, OFNR
AE	Simplex, 3.0mm, halogen free
AF	Simplex 2.0mm OFNR
AG	Simplex 1.6mm OFNR
BA	Duplex, zipcord, 3.0 x 6.5mm, OFNR
BB	Duplex, zipcord, 3.0 x 6.5mm, OFNP
BC	Duplex, zipcord, 2.0 x 4.2mm, OFNR
BD	Duplex, zipcord, 1.6 x 4.0mm jacket, OFNR
CA	Duplex, round 4.8mm, OFNR
CB	Duplex, round 4.8mm, OFNP
CC	Duplex, round 4.8mm, OFNR, ESCON <sup>††</sup>
CD	Duplex, round 3.0mm, OFNR
CE	Ribbon, 2 fiber, 3.0mm
DA	Distribution 4 fiber
DB	Distribution 6 fiber
DC	Distribution 8 fiber
DD	Distribution 12 fiber
DE	Distribution 24 fiber
DF	Distribution 72 fiber
EA	Outside Plant 4 fiber - armored
EB	Outside Plant 6 fiber - armored
EC	Outside Plant 12 fiber - armored
EK	Outside Plant 4 fiber - dielectric
EL	Outside Plant 6 fiber - dielectric
EM	Outside Plant 12 fiber - dielectric
FA	Breakout 4 fiber
FB	Breakout 8 fiber

3. Connector Style End 1 and 2	
AA	ST <sup>†</sup> compatible, polymer coupling nut
AB	ST compatible, metal coupling nut
AC	ST compatible, metal coupling nut, 90° boot
BA	STII <sup>††</sup> compatible
CA	SMA 905, metal coupling nut
DA	FDDI, black housing
DB	ESCON compatible
EA	FC/PC
EB	FC/APC, standard key
EC	FC/APC, tight-fit key
ED	FC/PC, 90° boot
EE	FC/APC, tight-fit standard key, 90° boot
EF	FC/APC, tight-fit key, 90° boot
FA	SC, standard
FB	SC black housing, black boot
FC	SC red housing, red boot
FD	SC, black housing, black 90° boot
FE	SC, red housing, red 90° boot
FF	SC/APC, green housing, green boot
FG	SC Duplex
FH	SC/APC, 90° boot
FI	SC, Standard, 90° boot
FJ	SC Duplex, 90° boot
FK	SC Duplex, black housing
FL	SC/PC, tunable
FM	SC/PC, tunable, black housing, black boot
FN	SC/PC, tunable, red housing, red boot
FO	SC/PC, tunable, black housing, black 90° boot
FP	SC/PC, tunable, red housing, red 90° boot
FQ	SC/APC, tunable
FR	SC/APC, tunable, 90° boot
FS	SC, tunable, 90° boot
FT	SC Duplex, tunable**
FU	SC Duplex, tunable, black housing, black boot**
FV	SC Duplex, tunable, red housing, red boot**
FW	SC/APC Duplex, tunable**
GA	BSC
GB	BSC/APC
GC	BSCII
GD	BSCII/APC
LA	LC, standard
LB	LC, 90° boot
LC	LC/APC, Standard
LD	LC/APC, 90° boot
LE	LC Duplex
LF	LC Duplex, 90° boot
NA	MT-RJ, male
NB	MT-RJ, male, 90° boot
NC	MT-RJ, female
ND	MT-RJ, female, 90° boot
ZZ	No connector (for end 2 only)

4. Finish End 1 and 2	
A	Multimode, ceramic ferrule, standard PC*, or MT-RJ, MM, standard ferrule
B	Multimode, ceramic ferrule, enhanced PC
C	Singlemode RL >45 dB, super PC, or MT-RJ, SM, standard ferrule
D	Singlemode RL >55 dB, ultra PC
E	Singlemode RL >70 dB, APC
F	Multimode, stainless steel
Z	No connector (for end 2 only)

5. Unit of Measure*	
C	Centimeters
F	Feet
I	Inches
M	Meters
<b>A. Length</b>	
Dimension A	

6. Breakout Style End 1 and 2	
A	No breakout
B	Shrink tube at breakout only
C	Fan-out, 900µm to 3mm jacket (Figure 1)
D	Fan-out, 250 to 900µm (Figure 2)
E	Fan-out, 500 to 900µm (Figure 2)
F	Fan-out with Spiral wrap, 250 to 900µm with feed through (Figure 3)
G	Fan-out, 250µm to 3.0mm jacket with feed through (Figure 4)
H	Standard breakout, round duplex to simplex (Figure 5)
I	Standard breakout, zipcord to simplex (Figure 6)

B. Breakout Length End	
Dimension B	

C. Breakout Length End 2	
Dimension C	

Conversion Chart		
To Convert From	To	Multiply By
Meters	Inches	39.37
Meters	Feet	3.281
Centimeters	Inches	.394
Meters	Centimeters	100

\* Numerical values must be kept consistent

† ST and STII are registered trademarks of Lucent Technologies

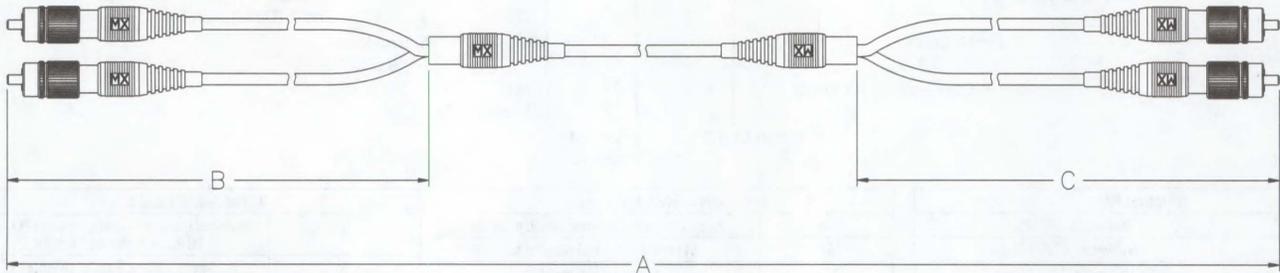
†† ESCON is a registered trademark of IBM Corporation

§ KEVLAR is a registered trademark of E.I. duPont De Nemours and Company, Inc.

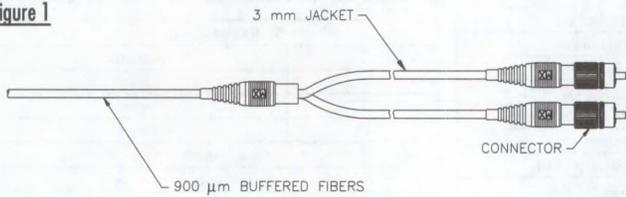
\*\* Fibre Channel compliant housing

Fiber Optics

Q

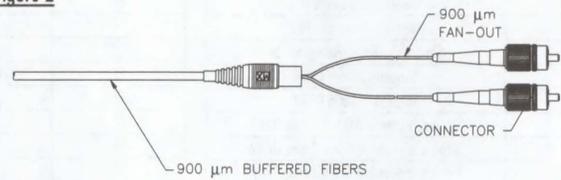


**Figure 1**



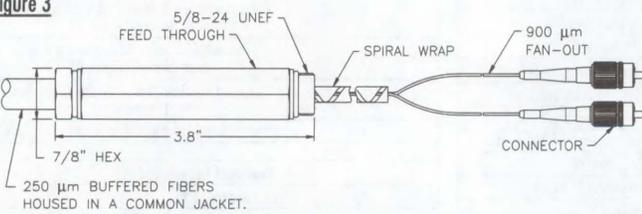
Use with cable type: CA, CB, CC, DA, DB, and DC

**Figure 2**



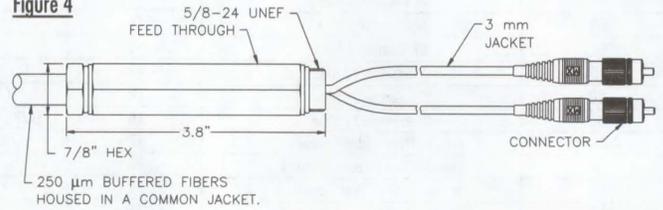
Use with cable type: DA

**Figure 3**



Use with cable type: EA, EB, EC, EK, EL and EM

**Figure 4**

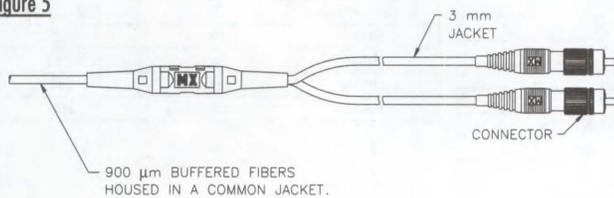


Use with cable type: EA, EB, EC, EK, EL and EM

Fiber Optics

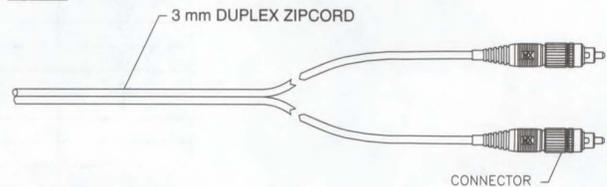
Q

**Figure 5**



Use with cable type: CA, CB and CC

**Figure 6**



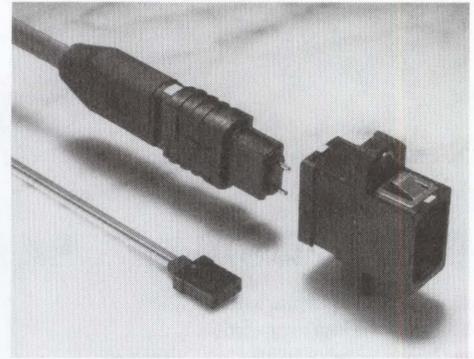
Use with cable type: BA, BB, BC and BD

## MT AND MTP\*/MPO CABLE ASSEMBLIES

- Provides connectorized interface for ribbon or ribbonized fiber
- Connector alignment is made with precision alignment pins
- Fanouts to simplex fiber connectors available
- Low loss interconnect
- Push-pull mating of MTP for quick connections
- NTT compatible
- Consistent and repeatable performance

### Applications

- High density interconnects for: telephone central office, and local loop data communications
- Provides interconnect for parallel optical transmitters and receivers



## ORDERING GUIDE

**MX A AA - AA A - AA A - A NNN - A OOO - A NNN**

1      2      3      4      5      6      7      A      8      C

1. Optical Fiber	
A	Multimode, 50/125µm
B	Multimode, 62.5/125µm
D	Singlemode, 9/125µm

2. Cable Construction	
RA	Bare ribbon fiber, 4 fibers
RB	Bare ribbon fiber, 8 fibers
RC	Bare ribbon fiber, 10 fibers
RD	Bare ribbon fiber, 12 fibers
RE	Ribbon cable, OFNR, 4 fibers
RF	Ribbon cable, OFNR, 8 fibers
RG	Ribbon cable, OFNR, 10 fibers
RH	Ribbon cable, OFNR, 12 fibers

3. Connector Style End 1	
MM	MT compatible, male
MF	MT compatible, female
PM	MTP/MPO compatible, male
PF	MTP/MPO compatible, female

4. Finish End 1	
M	Flat
P	Angle (singlemode)
Q	Enhanced angle (singlemode)

5. Connector Style End 2	
AA	ST <sup>†</sup> compatible, polymer coupling nut
AB	ST compatible, metal coupling nut
AC	ST compatible, 90° boot, metal coupling nut
BA	STII <sup>†</sup> compatible
DA	FDDI, black housing
DB	ESCON <sup>‡</sup> compatible
EA	FC
EB	FC/APC standard key
EC	FC/APC tight-fit key
FA	SC
FB	SC, black housing, black boot
FC	SC, red housing, red boot
FD	SC, black housing, black 90° boot
FE	SC, red housing, red 90° boot
FF	SC/APC, green housing, green boot
FG	SC Duplex
GA	BSC
GB	BSC/APC
GC	BSCII
GD	BSCII/APC
HC	LC connector
MM	MT compatible, male
MF	MT compatible, female
PM	MTP/MPO compatible, male
PF	MTP/MPO compatible, female
ZZ	No connector (for end 2 only)

6. Finish End 2	
A	Multimode, ceramic ferrule, standard PC*
B	Multimode, ceramic ferrule, enhanced PC
C	Singlemode RL >45 dB, super PC
D	Singlemode RL >55 dB, ultra PC
E	Singlemode RL >70 dB, APC
F	Multimode, Stainless Steel
M	Ribbon flat
P	Ribbon angle (singlemode)
Q	Enhanced angle (singlemode)
Z	No connector (for end 2 only)

7. Unit of Measure**	
C	Centimeters
F	Feet
I	Inches
M	Meters

Conversion Chart		
To Convert From	To	Multiply By
Meter	Inch	39.37
Meter	Foot	3.281
Centimeter	Inch	.394
Meter	Centimeter	100

Length	
Dimension A	

8. Breakout Style End 2	
A	No breakout
R	Ribbon to 900µm

Breakout Length End 2	
Dimension C	

Accessories Ordering Guide	
Order No.	Description
86181-0000	MTP adapter
86180-3001	MT spring clip (8 fibers or less)
86180-3201	MT spring clip (greater than 8 fibers)
86780-0010	MT spring fastener tool

\* MTP is a registered trademark of US Conec Ltd.

† ST and STII are registered trademarks of Lucent Technologies

‡ ESCON is a registered trademark of International Business Machines Corporation

\*\* Numerical values must be kept consistent

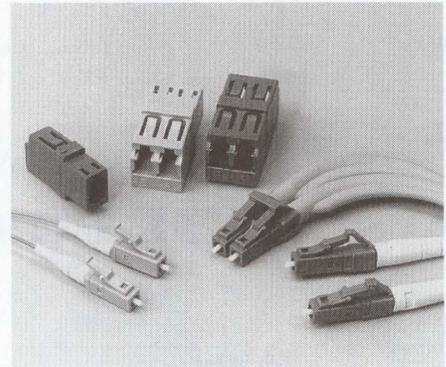
**LC CONNECTORS AND ADAPTERS**

- Versatile RJ-45 latching connector system
- Zirconia 1.25mm ceramic ferrule
- Tunable: optimizes insertion loss performance
- Simplex and duplex styles
- GR 326 and IEC 874 tested

**Applications**

- Telecommunication and data communication equipment
- Local Area Networks (LANs)
- Wide Area Networks (WANs)
- Device terminations
- Premise distribution

Order No.	Type	Description
86024-3000	LC Connector	128µm, MM, Zirconia ferrule, beige housing, white boot, 1.6mm cable
86024-5400	LC Connector	126µm, SM, Zirconia ferrule, blue housing, 90° white boot, 1.6mm cable
86025-3300	LC Duplex Connector	128µm, MM, Zirconia ferrule, beige housing, white boot, 2.0mm cable
86124-0010	LC Adapter	Simplex, Phosphor Bronze sleeve, beige housing
86125-1110	LC Adapter	Duplex, Zirconia sleeve, beige housing
86125-0000	LC Adapter	Duplex low profile, Phosphor Bronze sleeve, blue housing
86125-1200	LC Adapter	Duplex low profile, with retainer, Zirconia sleeve, blue housing



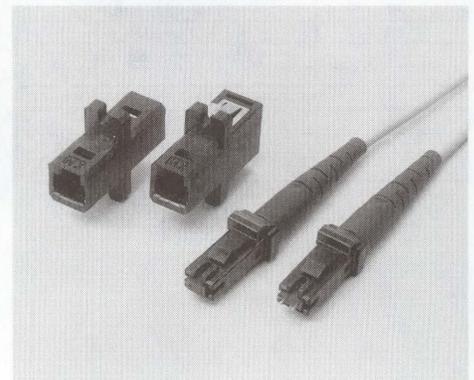
**MT-RJ CONNECTORS AND ADAPTERS**

- Versatile connector system with a RJ-45 form factor
- Duplex ferrule
- Increases port density required on computer and networking related hardware, panels, wall plates, and in closets by 50%
- Meets TIA-568A standards

**Applications**

- Premise infrastructure: backbone, horizontal
- Local Area Networks (LANs)
- Device terminations
- Telecommunication networks

Order No.	Type	Description
86002-3030	MT-RJ Connector	MM, male, black boot
86002-3430	MT-RJ Connector	MM, male, 90° black boot
86003-3030	MT-RJ Connector	MM, female, black boot
86003-3430	MT-RJ Connector	MM, female 90° black boot
86102-0000	MT-RJ Adapter	Standard MT-RJ cut-out
86102-0100	MT-RJ Adapter	Simplex SC cut-out with clip
86702-0000	MT-RJ Tool Kit	Tool kit (includes consumables)



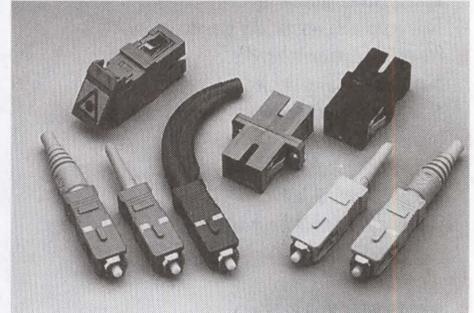
**SC CONNECTORS AND ADAPTERS**

- Pre-assembled or multi-piece body design:  
Reduces termination time  
Field installable
- Pre-polished ceramic ferrules:  
Minimizes polishing time  
Maintains endface geometry, physical contact
- Tunable
- Meets EIA/TIA, IEC and NTT-SC\* standards
- Three adapter styles: industry standard, small flanged and shuttered
- Low insertion loss:  
< 0.15 dB typical SM  
< 0.34 dB typical MM  
< 0.17 dB typical MM enhanced

**Applications**

- Telecommunication networks
- CATV networks
- Data communication networks
- Active device termination

Order No.	Type	Description
86063-5000	SC Connector	126µm, SM, Zirconia PC ferrule, blue housing, yellow boot, 3mm cable
86063-5400	SC Connector	126µm, SM, Zirconia PC ferrule, blue housing, 90° yellow boot, 3mm cable
86063-5500	SC Connector	126µm, SM, Zirconia PC ferrule, blue housing, yellow boot, 900µm buffered fiber
86063-0060	SC Connector	127µm, MM, Zirconia PC+ ferrule, beige housing, beige boot, 3mm cable
86063-0460	SC Connector	127µm, MM, Zirconia PC+ ferrule, beige housing, 90° beige boot, 3mm cable
86032-0000	SC Connector	127µm, MM, tunable, blue housing, blue boot, 3mm cable
86032-5000	SC Connector	126µm, SM, tunable, blue housing, yellow boot, 3mm cable
86160-0000	SC Adapter	Phosphor Bronze alignment sleeve, polymer blue housing
86170-0550	SC Adapter	Zirconia alignment sleeve, blue housing, with shutter



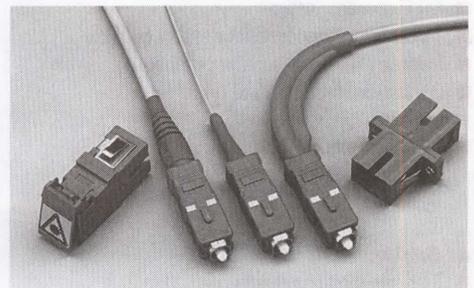
**SC/APC (ANGLED PHYSICAL CONTACT) CONNECTORS AND ADAPTERS**

- 1-piece body design: minimizes termination time, field installable
- Meets NTT-SC standard
- APC ferrule provides superior performance  
Low insertion loss: < 0.25 dB typical  
Low return loss: > 60 dB typical
- Zirconia ceramic and Phosphor Bronze sleeves
- Shuttered adapters: shield against exposure to laser radiation; dust cover for unused ports

**Applications**

- Telecommunication networks
- CATV networks

Order No.	Type	Description
86065-5000	SC/APC Connector	126µm, Zirconia APC ferrule, 3mm cable
86065-5500	SC/APC Connector	126µm, Zirconia APC ferrule, 900µm buffered fiber
86065-5400	SC/APC Connector	126µm, Zirconia APC ferrule, 90° boot, 3mm cable
86161-0000	SC Adapter	Zirconia alignment sleeve, blue housing
86161-3000	SC Adapter	Zirconia alignment sleeve, green housing
86170-0550	SC Adapter	Zirconia alignment sleeve, blue housing with shutter



\* NTT-SC is a trademark of NTT Advanced Technology Corporation

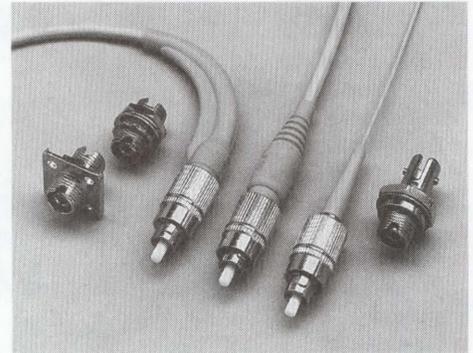
**FC CONNECTORS AND ADAPTERS**

- Designed to NTT-FC\* standards
- 1-piece body design:  
Reduces termination time  
Field installable—essentially pre-assembled
- Pre-polished ceramic ferrules:  
Minimum polishing needed  
Maintains endface geometry, physical contact
- Low insertion loss:  
< 0.15 dB typical SM  
< 0.34 dB typical MM  
< 0.17 dB typical MM enhanced

**Applications**

- Telecommunication networks
- CATV networks
- Active device termination
- Instrumentation

Order No.	Type	Description
86053-0000	FC Connector	127µm, MM, Zirconia PC <sup>+</sup> ferrule, 3mm cable
86053-5000	FC Connector	126µm, SM, Zirconia PC ferrule, 3mm cable
86053-5500	FC Connector	126µm, SM, Zirconia PC ferrule, 900µm buffered fiber
86053-5400	FC Connector	126µm, SM, Zirconia PC ferrule, 90° yellow boot, 3mm cable
86152-0100	FC Adapter	Zirconia alignment sleeve, square mounting flange
86152-1000	FC Adapter	Zirconia alignment sleeve, "D" hole mount
86156-1000	FC Adapter	Phosphor Bronze alignment sleeve, "D" hole mount



**FC/APC (ANGLED PHYSICAL CONTACT) CONNECTORS AND ADAPTERS**

- NTT-FC connector design
- 1-piece body design for quick and easy assembly
- Precision APC ferrule—superior performance
- Low insertion loss: < 0.25 dB typical SM
- Low return loss: < 60 dB
- Compatible with all APC hardware:  
Standard NTT-FC key  
Tight-fit key (compatible with other manufacturers)

**Applications**

- Telecommunication networks
- CATV networks

Order No.	Type	Description
86056-5000	FC/APC Connector	126µm, Zirconia APC ferrule, standard key, 3mm cable
86055-5000	FC/APC Connector	126µm, Zirconia APC ferrule, tight-fit key, 3mm cable
86056-5500	FC/APC Connector	126µm, Zirconia APC ferrule, standard key, 900µm buffered fiber
86055-5400	FC/APC Connector	126µm, Zirconia APC ferrule, tight-fit key, 3mm cable, 90° green boot
86055-5500	FC/APC Connector	126µm, Zirconia APC ferrule, tight-fit key, 900µm buffered fiber
86152-2000	FC/APC Adapter	Zirconia alignment sleeve, square mounting flange, tight-fit key
86152-3000	FC/APC Adapter	Zirconia alignment sleeve, "D" hole mount, tight-fit key



\* NTT-FC is a trademark of NTT Advanced Technology Corporation

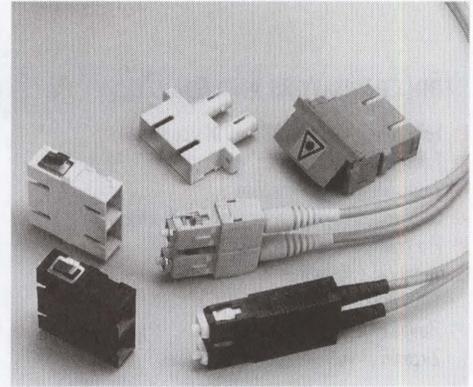
**SC DUPLEX CONNECTORS AND ADAPTERS**

- Utilizes standard NTT-SC\* connectors
- Meets EIA/TIA 568A and IEC 874-19 standards
- Easy to assemble 1-piece SC connector body
- Low insertion loss:
  - < 0.15 dB typical SM
  - < 0.34 dB typical MM
  - < 0.17 dB typical MM enhanced
- Rugged duplex housing provides uniform and smooth mating
- Optional adapter styles: SC to SC and SC to ST† snap mount or flange mount

**Applications**

- Telecommunication networks
- Data communication networks
- Fibre Channel

Order No.	Type	Description
86034-0000	SC Fibre Channel Duplex Connector	127 $\mu$ m, MM, tunable, beige housing, beige boot, 3mm cable
86034-5000	SC Fibre Channel Duplex Connector	126 $\mu$ m, SM, tunable, blue housing, blue boot, 3mm cable
86066-0000	SC Duplex Connector	127 $\mu$ m, MM, beige housing, beige boot, Zirconia PC <sup>+</sup> ferrule, 3mm cable
86066-0070	SC Duplex Connector	127 $\mu$ m, MM, black housing, black boot, Zirconia PC <sup>+</sup> ferrule, 3mm cable
86066-4000	SC Duplex Connector	125 $\mu$ m, SM, blue housing, blue boot, Zirconia PC ferrule, 3mm cable
86167-0110	SC to SC Duplex Adapter	Beige housing, Phosphor Bronze alignment sleeve, snap mount
86166-0100	SC to SC Duplex Adapter	Blue housing, Zirconia alignment sleeve, snap mount
86166-0600	SC to SC Duplex Adapter	Blue housing, Zirconia alignment sleeve, snap mount with shutter
86166-0650	SC to SC Duplex Adapter	APC, green housing, Zirconia alignment sleeve, snap mount
86166-1010	SC to ST Duplex Adapter	Beige housing, Zirconia alignment sleeve, flange mount
86167-1510	SC to ST Duplex Adapter	Beige housing, Phosphor Bronze alignment sleeve, flange mount with shutter

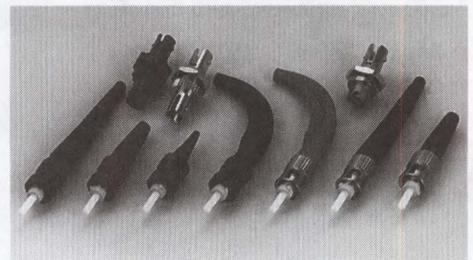

**ST CONNECTORS AND ADAPTERS**

- High performance singlemode and multimode pre-polished ferrules
- ST compatible bayonet coupling
- Field installable
- Standard crimp and crimpless screw type KEVLAR† retention
- Variety of ferrule styles: PC, PC<sup>+</sup> and stainless steel
- Low insertion loss:
  - < 0.34 dB typical MM
  - < 0.17 dB typical MM enhanced
  - < 0.35 dB typical MM stainless steel
  - < 0.15 dB typical SM
- Variety of connector styles: long boot, short boot, 90° boot and 900 $\mu$ m buffered fiber

**Applications**

- Local Area Networks (LANs)
- Data processing networks
- Premise applications
- Instrumentation
- Telecommunications

Order No.	Type	Description
86010-0200	ST Connector	127 $\mu$ m, MM, Zirconia PC <sup>+</sup> ferrule, polymer coupling nut, short boot crimp, 2.4 and 3mm cable
86010-0400	ST Connector	127 $\mu$ m, MM, Zirconia PC <sup>+</sup> ferrule, polymer coupling nut, 90° boot, 3mm cable
86010-8200	ST Connector	127 $\mu$ m, MM, Stainless Steel flat ferrule, polymer coupling nut, short boot crimp, 2.4 and 3mm cable
86012-0200	ST Connector	127 $\mu$ m, MM, Zirconia PC <sup>+</sup> ferrule, metal coupling nut, short boot crimp, 2.4 and 3mm cable
86012-0400	ST Connector	127 $\mu$ m, MM, Zirconia PC <sup>+</sup> ferrule, metal coupling nut, 90° boot, 3mm cable
86112-0000	ST Adapter	Phosphor Bronze alignment sleeve, black polymer housing
86113-0000	ST Adapter	Polymer alignment sleeve, black polymer housing
86110-1000	ST Adapter	Zirconia alignment sleeve, metal housing
86112-1000	ST Adapter	Phosphor Bronze alignment sleeve, metal housing
86172-0000	ST to FC Adapter	Zirconia alignment sleeve, metal housing



\* NTT-SC is a trademark of NTT Advanced Technology Corporation

† ST is a trademark of Lucent Technologies

†† KEVLAR is a registered trademark of E.I. duPont de Nemours & Company, Inc.

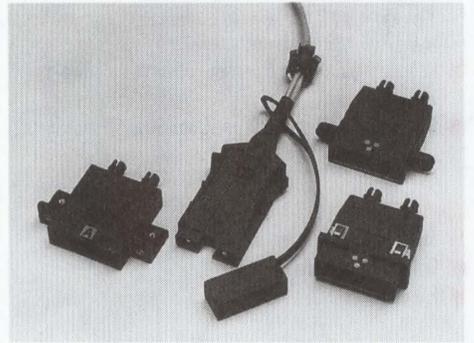
**FDDI CONNECTORS AND ADAPTERS**

- Fully compatible with ANSI FDDI standard
- Floating and self-aligning ferrule design
- Positive latching mechanism
- Color coded keying for service identification
- Pre-polished and pre-radiused ferrules
- Variety of adapters:  
FDDI to ST\*  
Flange mount or snap mount  
Zirconia or polymer alignment sleeves

**Applications**

- Duplex fiber optic systems
- Building wiring
- FDDI backbone network
- IEEE 802.4 token bus

Order No.	Type	Description
86030-0100	FDDI Connector	127 $\mu$ m, MM, Zirconia PC <sup>†</sup> ferrule, 4.8mm cable
86030-0200	FDDI Connector	127 $\mu$ m, MM, Zirconia PC <sup>†</sup> ferrule, zipcord cable
86030-3100	FDDI Connector	128 $\mu$ m, MM enhanced, Zirconia PC <sup>†</sup> ferrule, 4.8mm cable
86030-3300	FDDI Connector	128 $\mu$ m, MM enhanced, Zirconia PC <sup>†</sup> ferrule, 4.2mm plenum cable
86130-3200	FDDI-ST Adapter	Threaded mount, ceramic sleeve, A key
86130-0500	FDDI-ST Adapter	Zirconia alignment sleeve, removable keys, snap-in mount
86130-0600	FDDI-ST Adapter	Zirconia alignment sleeve, removable keys, flange mount

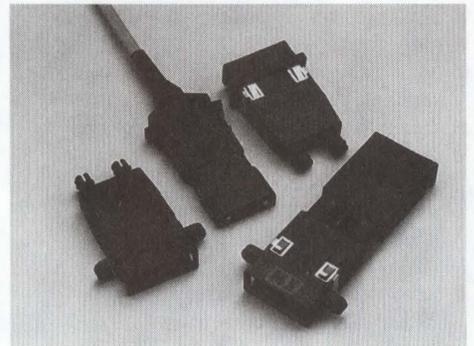

**ESCON<sup>†</sup> CONNECTORS AND ADAPTERS**

- Fully compatible with IBM ESCON architecture
- Positive latching mechanism
- Floating and self-aligning ferrule design
- Zirconia ceramic ferrules, pre-radiused and pre-polished
- Polarized housing with retractable shroud
- Low insertion loss:  
< 0.15 dB typical

**Applications**

- Fiber optic link IBM ESCON networks
- Peripheral control units
- Storage devices
- Processors
- Workstations

Order No.	Type	Description
86040-0100	ESCON Connector	127 $\mu$ m, MM, Zirconia PC <sup>†</sup> ferrule, 4.8mm cable
86040-0200	ESCON Connector	127 $\mu$ m, MM, Zirconia PC <sup>†</sup> ferrule, zipcord cable
86140-0000	ESCON-ST Adapter	Zirconia alignment sleeve, snap-in mount
86140-0300	ESCON-ST Adapter	Zirconia alignment sleeve, flange mount
86140-2300	ESCON-ESCON Adapter	Ceramic sleeve, flange mount
86142-2300	ESCON-ESCON Adapter	Phosphor Bronze sleeve, flange mount



\* ST is a trademark of Lucent Technologies

† ESCON is a registered trademark of International Business Machines Corporation

## INTRODUCTION

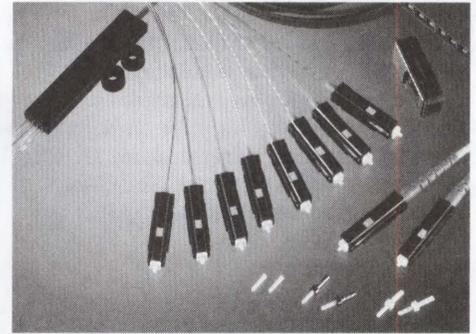
# molex® MU Connector System

### Features and Benefits

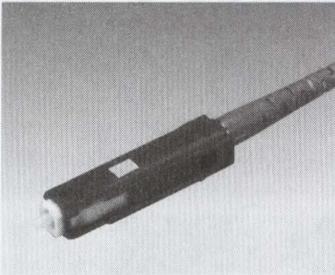
- Complies with JIS-C5983 and IEC 874-14/ IEC 61754-6
- Compact, high density design
- Smaller Form Factor than SC type
- Fully-harnessed with Zirconia ferrule made in-house
- Push-pull friction lock provides secure mating retention

### Performance and Specifications

- Insertion Loss: 0.5dB max. single mode
- Return Attenuation: 40dB min. single mode
- Durability: 0.2dB max.
- Temperature Cycling: 0.2dB max.

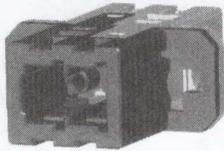


## MU PLUG



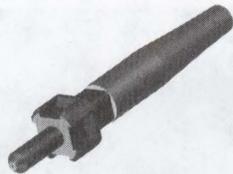
Description	Cable Dia.	Order No.
MU-PH Type Plug Kit	2.00 (.079)	55233-011X
MU-VA Type Plug Kit	2.00 (.079)	55564-011X
MU-CE Type Plug Kit	1.10 (.043)	55589-011X

## MU ADAPTER



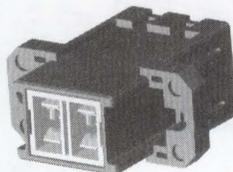
Description	Ports	Order No.
MU-A Type Adapter	Simplex	54748-0117
MU-2A Type Adapter	Duplex	54748-0217
MU-8A Type Adapter	8 port	54748-0817
MU-16A Type Adapter	16 port	54748-1617

## MU SIMPLIFIED PLUG



Description	Buffered Dia.	Order No.
MU Simplified Plug	0.90 (.035)	55590-XXXX

## MU SIMPLIFIED RECEPTACLE



Description	Ports	Order No.
MU-SR Type Receptacle	Simplex	54727-0117
MU-2SR Type Receptacle	Duplex	54727-0217
MU-8SR Type Receptacle	8 port	54727-0817
MU-16SR Type Receptacle	16 port	54727-1617

## INTRODUCTION

### Fully Integrated Zirconia Ferrule Production

Molex is one of the few companies in the world that can produce precision zirconia ceramic ferrules for fiber optic connectors. Our fully-integrated ferrule manufacturing capabilities include blending of the raw materials, production of the precision core pins, high-temperature sintering, injection overmolding and precision grinding and polishing. Key parts of the production process are manufactured in a clean-room environment to avoid dust contamination.

### Drive for Automation

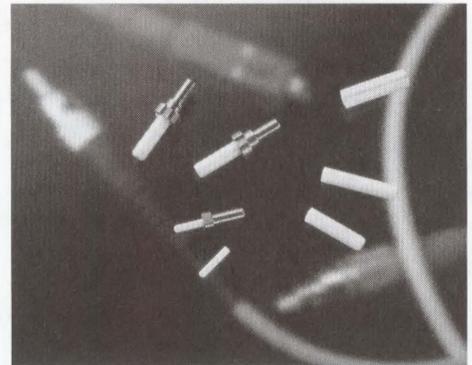
Automation equipment such as vision inspection systems and robotic placement machines are used throughout the production process of Molex's zirconia ferrules. Much of the automation equipment has been designed and built in-house by Molex to further ensure productivity and quality.

### Product Quality Management Based on ISO 9001

All Molex facilities involved in the production of zirconia ferrules and fiber optic housings and cable assemblies are ISO 9001 approved. Combined with our complete in-house production capabilities, our ISO rating provides further quality assurance for components and completed assemblies.

# molex® Zirconia Ferrules

## MU and ST Series



## MU FERRULES AND FLANGES

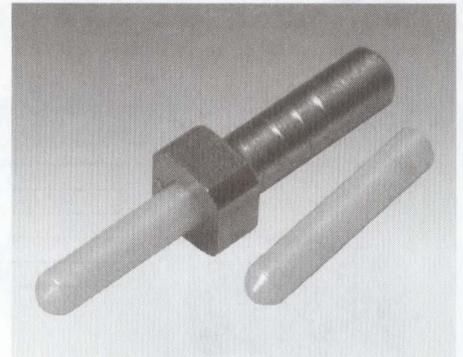
### Features and Benefits

- Available with and without flange
- Various inner diameter choices to meet specific insertion loss requirements
- Smooth funnel lead-in protects fiber during insertion
- High stability even in high temperature and humidity

### Physical

Ferrule: Zirconia  
Flange: SUS303

Order No.		Core Dimension (dia.)
Without Flange	With Flange	
58355-0100	58357-0100	0.1255 (.00494)
58355-0105	58357-0105	0.1250 (.00492)
58355-0106	58357-0106	0.1260 (.00496)
58355-0107	58357-0107	0.1270 (.005)
58355-0108	58357-0108	0.1280 (.00504)



## ST FERRULES

### Features and Benefits

- Various inner diameter choices to meet specific insertion loss requirements
- Smooth funnel lead-in protects fiber during insertion
- High stability even in high temperature and humidity
- Different pre-dome radius options available

### Physical

Ferrule: Zirconia

Order No.	Description	Core Dimension (dia.)
58358-0000	No Groove, With Pre-dome	0.1255 (.00494)
58564-0000	No Groove, No Pre-dome	0.1255 (.00494)
58564-0006	No Groove, No Pre-dome	0.1260 (.00496)
58358-1008	No Groove, With Pre-dome	0.1280 (.00504)
58172-1508	With Groove, With Pre-dome	0.1280 (.00504)



**LC FERRULES**

**Features and Benefits**

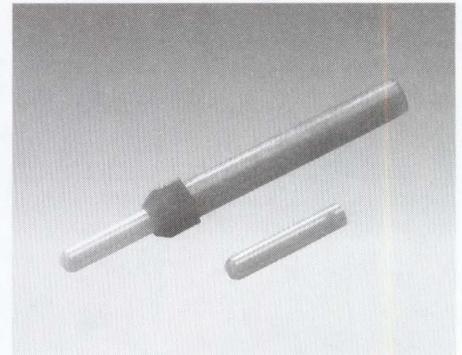
- Available with molded flange
- Various inner diameter choices to meet specific insertion loss requirements
- Smooth funnel lead-in protects fiber during insertion
- High stability even in high temperature and humidity
- Different pre-dome radius options available

**Physical**

Ferrule: Zirconia  
Flange: Brown Polymer, UL 94V-0

Note: All LC ferrules are only single mode

Order No.	Flange Type	Core Dimension (dia.)
55423-0150	Molded Flange	0.1255 (.00494)
55423-0155	Molded Flange	0.1250 (.00492)
55423-0156	Molded Flange	0.1260 (.00496)
58913-0000	None	0.1255 (.00494)
58913-0005	None	0.1250 (.00492)
58913-0006	None	0.1260 (.00496)



**SC FERRULES AND FLANGES**

**Features and Benefits**

- Available with 2-slot or 4-slot flange
- Various inner diameter choices to meet specific insertion loss requirements
- Smooth funnel lead-in protects fiber during insertion
- High stability even in high temperature and humidity
- Different pre-dome radius options available (58379/58380)

**Physical**

Ferrule: Zirconia  
Flange: SUS303

Order No.	Flange Type	Core Dimension (dia.)
58333-X000	None	0.1255 (.00494)
58333-X001	None	0.1265 (.00498)
58333-X005	None	0.1250 (.00492)
58333-X006	None	0.1260 (.00496)
58333-X007	None	0.1270 (.005)
58380-0000	None	0.1255 (.00494)
58380-0005	None	0.1250 (.00492)
58380-0006	None	0.1260 (.00496)
58329-X125	2-slot Flange	0.1250 (.00492)
58329-X120	2-slot Flange	0.1255 (.00494)
58329-X126	2-slot Flange	0.1260 (.00496)
58329-X127	2-slot Flange	0.1270 (.005)
58329-X130	4-slot Flange	0.1255 (.00494)
58329-X135	4-slot Flange	0.1250 (.00492)
58329-X136	4-slot Flange	0.1260 (.00496)
58329-X137	4-slot Flange	0.1270 (.005)
58379-0130	4-slot Flange	0.1255 (.00494)
58379-0135	4-slot Flange	0.1250 (.00492)
58379-0136	4-slot Flange	0.1260 (.00496)



**SC SPLIT SLEEVE**

**Features and Benefits**

- Adapter for SC-SC or SC-ST
- Different lengths available
- Different retention force versions available

**Physical**

Sleeve: Zirconia

Order No.	Retention Force Range	Description
58332-1000	200-450 grams	SC Split Sleeve
58332-2000	200-600 grams	SC Split Sleeve



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