

## Fibre Connector Summary

### Connectors

Style	<b>BICONIC</b>		Modes	SM, MM
Developed by	AT&T/Bell Labs (FOCIS 1)		Cables	3mm
Applications	Military & long haul (Obsolete)		Ferrules	plastic
Features	Good fibre alignment, hard to manufacture		Shapes	
Insertion loss	SM: >0.7dB, MM: ~1dB		Polishes	
Style	<b>D4</b>		Modes	SM, MM
Developed by	NEC		Cables	3, 0.9mm
Applications	(Obsolete)		Ferrules	Zr, 2.5mm
Features	Screw coupling		Shapes	
Insertion loss			Polishes	
Style	<b>DEUTSCH 1000</b>		Modes	
Developed by	Deutsch		Cables	
Applications	(Obsolete)		Ferrules	none
Features			Shapes	
Insertion loss	3dB		Polishes	

Style	<b>DIN</b>		Modes	SM, MM
Developed by			Cables	
Applications			Ferrules	
Features	Spring loaded free floating ferrule, fast polishing		Shapes	
Insertion loss			Polishes	
Style	<b>E2000 (LSH)</b>		Modes	SM, MM
Developed by			Cables	
Applications			Ferrules	
Features	Integrated ferrule endface shutter		Shapes	
Insertion loss			Polishes	PC, APC
Style	<b>ESCON</b> (Enterprise system connection)		Modes	
Developed by	IBM		Cables	
Applications			Ferrules	2.5mm
Features	Duplex		Shapes	
Insertion loss			Polishes	
Style	<b>FC</b> (Ferrule Connector or Face Contact)		Modes	SM, MM
Developed by	NTT (FOCIS 4)		Cables	3, 2, 0.9mm
Applications	Datacom, telecom. See <a href="#">Connector Key Sizes</a> below		Ferrules	SS, Zr, 1.25, 2.5mm
Features	Floating ferrule - good mechanical isolation but screw action can scratch		Shapes	
Insertion loss	SM: 0.50~1.00, Rep: 0.20dB		Polishes	PC, APC

Style	<b>FDDI</b> (Fiber Distributed Data Interface)		Modes	MM
Developed by	ANSI		Cables	
Applications	Computer networks		Ferrules	2.5, 1.25mm
Features	Snap coupling, duplex		Shapes	
Insertion loss	SM: 0.20~0.70, Rep: 0.20dB		Polishes	
Style	<b>LC</b> (Local Connector)		Modes	SM, MM
Developed by	Lucent (FOCIS 10)		Cables	3, 2mm
Applications			Ferrules	Zr, 1.25mm
Features	High density interconnection, snap coupling		Shapes	
Insertion loss	SM:0.15, MM: 0.20, Rep: 0.20dB		Polishes	PC, APC
Style	<b>LX-5</b>		Modes	
Developed by			Cables	
Applications			Ferrules	1.25mm
Features	shuttered		Shapes	
Insertion loss			Polishes	
Style	<b>MPAK</b>		Modes	SM, MM
Developed by	Johnson		Cables	
Applications	Trunk cable, fibre aggregation, patch panels		Ferrules	MT
Features	High density interconnection, keyed connection		Shapes	
Insertion loss	SM:0.15dB, MM:0.35dB		Polishes	

Style	<b>MPX</b>		Modes	
Developed by	AMP & Tyco		Cables	
Applications			Ferrules	
Features	Up to 12 fibre ribbon		Shapes	
Insertion loss			Polishes	
Style	<b>MPO</b> (Multi-fibre Push On / Pull Off)		Modes	
Developed by	NTT / Molex (FOCIS 5)		Cables	
Applications	Multi-fibre ribbon cables (4~72)		Ferrules	MT
Features	Snap coupling		Shapes	
Insertion loss			Polishes	PC, APC
Style	<b>MTP</b> (Mechanical Transfer Push-on / Pull-off)		Modes	SM, MM
Developed by	US Conec		Cables	
Applications	Multi-fibre ribbon cables (4~72)		Ferrules	MT
Features	Snap coupling, MTP is a higher performance version of MPO		Shapes	
Insertion loss	SM: 0.10~0.25dB (typ) MM: 0.20dB (typ)		Polishes	PC, APC
Style	<b>MT-RJ</b> (Mechanical transfer registered jack)		Modes	SM, MM
Developed by	AMP (FOCIS 12)		Cables	1.8, 0.9mm
Applications	Backbone, LANs & telecom (2 fibres)		Ferrules	polymer, MT-RJ
Features	Easy to terminate, high port density, duplex, similar to RJ-45 connectors		Shapes	
Insertion loss	SM: 0.20dB (typ) MM: 0.10dB (typ)		Polishes	PC

Style	<b>MU</b> (Miniature Unit-coupling)		Modes	SM, MM
Developed by	NTT (FOCIS 17)		Cables	3, 2, 0.9mm
Applications			Ferrules	1.25mm
Features	SFF SC		Shapes	
Insertion loss			Polishes	PC, APC
Style	<b>OGI</b> (Optical Gateway Interface)		Modes	SM
Developed by	3M		Cables	
Applications	Multi-fibre feedthroughs		Ferrules	
Features	8~12 fibres		Shapes	
Insertion loss			Polishes	
Style	<b>OPTIMATE</b>		Modes	
Developed by	AMP		Cables	
Applications	(Obsolete)		Ferrules	plastic
Features			Shapes	
IL (SM/MM/Rep)			Polishes	
Style	<b>SC &amp; SC Duplex</b> (Subscriber Connector)		Modes	SM, MM
Developed by	NTT, EIA/TIA (FOCIS 3)		Cables	3, 2, 0.9mm
Applications	Datacom		Ferrules	Zr / 2.5mm
Features	Snap coupling, good packing density, push-pull action reduces scratching		Shapes	
Insertion loss	SM:0.20~0.45, Rep:0.10dB		Polishes	PC, APC

Style	<b>SMA 905 &amp; 906</b> (Subminiature A)		Modes	MM
Developed by	Amphenol		Cables	
Applications	(Obsolete)		Ferrules	SS, Zr / 1, 8in
Features			Shapes	
Insertion loss			Polishes	
Style	<b>SMC</b>		Modes	
Developed by	Infineon		Cables	
Applications			Ferrules	MT
Features	12 fibre ribbon cable		Shapes	
Insertion loss			Polishes	
Style	<b>ST (Straight Tip)</b>		Modes	SM/MM
Developed by	AT&T (FOCIS 2)		Cables	3/2/0.9mm
Applications	Inter-/intra-building, security, Navy		Ferrules	Zr/SS/plastic, 2.5mm
Features	Twist bayonet coupling		Shapes	
Insertion loss	SM: 0.40, MM: 0.50, Rep: 0.30dB		Polishes	PC
Style	<b>TIA FOCIS-6 (Fiber Jack/Opti-Jack)</b>		Modes	
Developed by	Panduit		Cables	
Applications			Ferrules	Zr, 2.5mm
Features			Shapes	
Insertion loss			Polishes	

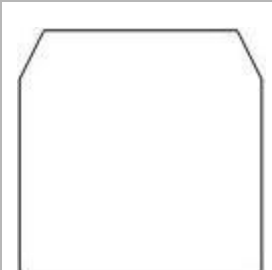
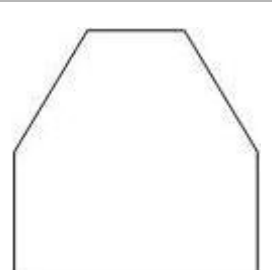
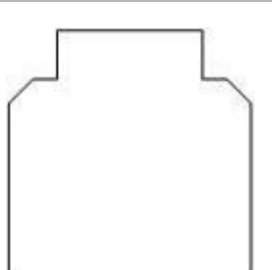
Style	<b>TOSLINK</b> (Toshiba-Link)		Modes	
Developed by	Toshiba		Cables	
Applications	Consumer audio equipment		Ferrules	
Features	limited to 10 meters, snap Connection		Shapes	
Insertion loss			Polishes	
Style	<b>Volition VF-45</b>		Modes	
Developed by	3M		Cables	
Applications			Ferrules	None
Features	No ferrule, fibres aligned in a V-groove		Shapes	
Insertion loss			Polishes	

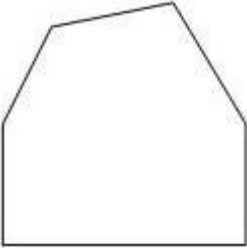
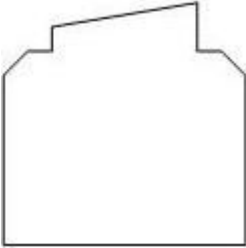
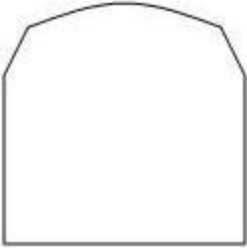
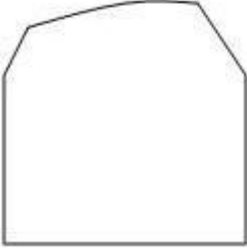
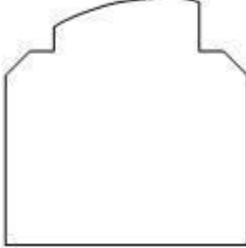
## FC Connector Key Sizes

Connector Type	Key width (mm)	Keyway width (mm)
<b>R (reduced)</b>	1.97 - 2.02	2.03 - 2.08
<b>N (normal)</b>	2.09 - 2.14	2.15 - 2.20

## Ferrule Shapes Before Polishing

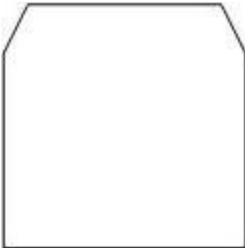
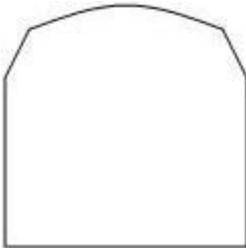
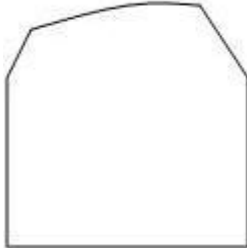
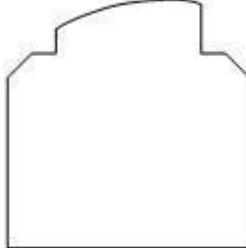
Not to scale

2.5mm	PC	APC Conical	APC Stepped
<b>Plain</b>			

<b>Pre-angled</b>			
<b>Pre-domed</b>			

## Ferrule Shapes After Polishing

Not to scale

<b>2.5mm</b>	<b>Flat</b>	<b>PC/SPC/UPC/HPC</b>	<b>APC Conical</b>	<b>APC Stepped</b>
Polished				

## Polish Types

<b>Name</b>	<b>Abbreviation</b>	<b>SM Return Loss (dB)</b>
<b>Flat</b>	Flat	35
<b>Physical Contact</b>	PC	40
<b>Super Physical Contact</b>	SPC	45
<b>Ultra Physical Contact</b>	UPC	50
<b>Hyper Physical Contact</b>	HPC	55
<b>Angled Physical Contact</b>	APC	60



# PM Fibre Alignment (industry standard)

