

# The History of Connectors

Fiber Connectors, there are many types - but what do they do, and what are they for?

Originally fiber to fiber connections were permanent and connected together by fusion splicing. Fusion splicing is the art of precisely aligning two fibers, then using an incredible amount of heat to melt the glass fiber and fuse the two fibers together. This process is carried out using a fusion splicer - a piece of kit that can quickly and easily fuses one set of fibers (or 12 using the Fujikura 70R), at the same time.

Splicing fibers together in this way, means creating a permanent link. A permanent link limits the flexibility of a network but ensures the highest possible network performance. This practice is well suited to long-haul telecommunication networks, where long cable runs and minimal network losses are essential.

In comparison, fiber connectors are used to terminate the end of an optical fiber. They allow optical fibers to be connected and disconnected quickly and safely, but most importantly, they align fiber cores for light to pass from one connector, to another. Using connectors also allows you to introduce maintenance, testing, repairs, and the possibility of easily reconfiguring, connecting and disconnecting your network, and also give you the advantage of:

Easy installation: Connectors can connect and disconnect with minimal fuss

Low cost: Fiber connectors are generally made of plastic, metal and ceramics

Reliability: Connectors can be used, and re-used a number of times, and are often used in assemblies that form part of 25 year network warranties

Easy to use: Inspect, Clean, Reinspect, Connect!

Low Insertion Loss: Insertion Loss (IL) is the measure of the amount of light that is lost between two fixed points of a cable link.

High Return Loss: Return loss is the amount of light signal that bounces back in the direction it transmitted from. Light can return for a number of reasons, including broken fiber, dirty connectors, poor fiber core to fiber core alignment, or the fiber cable was bent too much

Different fiber connectors have different mechanical and performance properties - lets take a look back at some of the connectors that have graced the market over the years:



## 1980's

The first widely used fiber connectors include the NEC D4 and the AMP Optimate. Popular in the early to mid-80s in telecommunication networks.

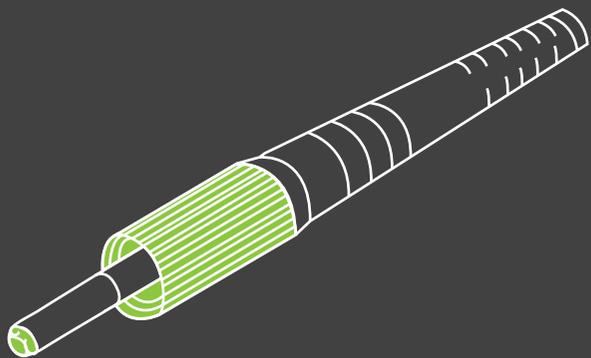
## 1990

### LSA (DIN) CONNECTOR

IEC 61754-3

LSA connector also known as DIN connector

Often used in industrial applications because of its small diameter and screwed locking mechanism



Screw



2.5mm



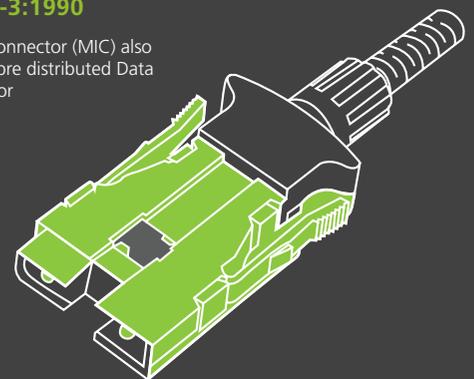
Legacy Networks

## 1990

### FDDI CONNECTOR

ISO/IEC 9314-3:1990

Media Interface Connector (MIC) also known as FDDI (Fibre distributed Data Interface) connector



Latch System



Push & Pull



2.5mm



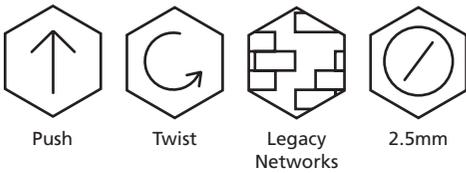
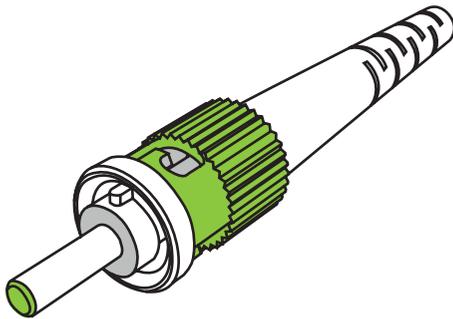
Legacy Networks

# The History of Connectors

1992

## BFOC (ST) CONNECTOR IEC 61754-2 / FOCIS-2

Bayonet Fibre optic connector (BFOC) also known as Stick and Twist (ST) connector. Commonly used in security and industrial applications.

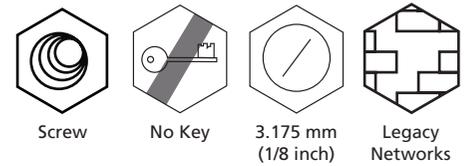


1993

## SMA905 CONNECTOR IEC 61754-22

F-SMA / SMA 905 (SubMiniature A)

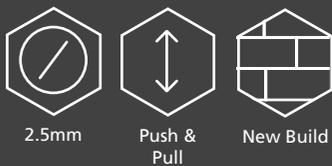
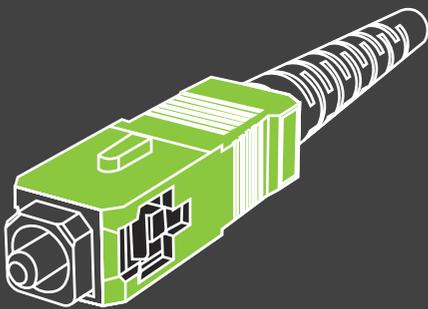
SMA is often used in industrial applications because of its water tightness and resistance to scratches.



1993

## SC CONNECTOR IEC 61754-4/ FOCIS-3

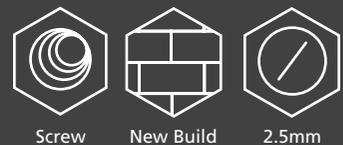
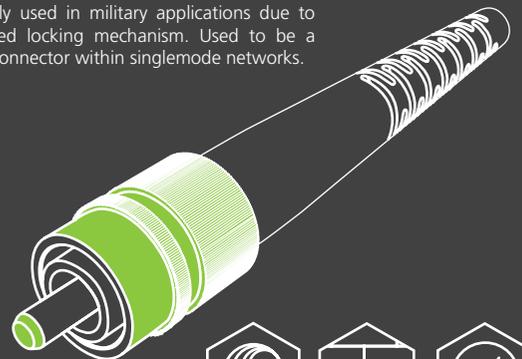
25 years old and still one of the most popular connectors on the market. Easy to use push and pull mechanism, and offers excellent performance.



1993

## FC CONNECTOR IEC 61754-13 / FOCIS-4

Commonly used in military applications due to its screwed locking mechanism. Used to be a popular connector within singlemode networks.



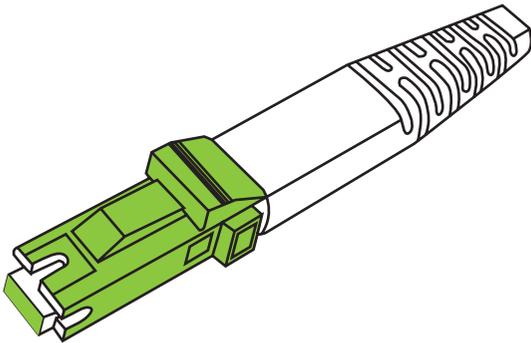
# The History of Connectors

1994

## MT (MTRJ) CONNECTOR

IEC 61754-5 / FOCIS-12

Available pinned or unpinned, the MTRJ houses two fibers in one ferrule.



4.4mm x  
2.5mm



Male & Female  
versions



Housing fits  
RJ45 footprint



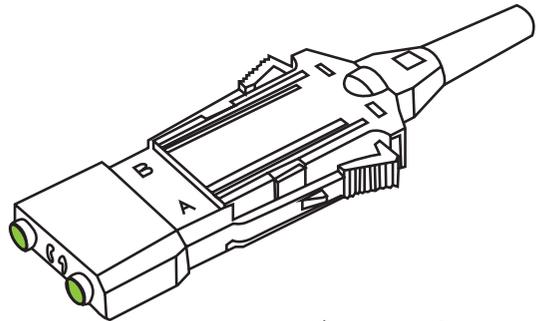
Legacy  
Networks

1996

## ESCON CONNECTOR

ANS X3.296-199 X 3.296

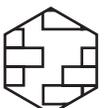
Duplex connector for IBM ESCON system



Latch System



2.5mm



Legacy  
Networks

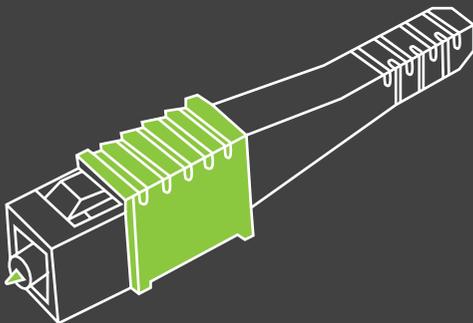
1996

## CF08 (EC) CONNECTOR

IEC 61754-8

CF08 otherwise known as EC connector

CF08 otherwise known as the EC connector - often used in military networks



Push &  
Pull



Angled Polish  
(12 degrees)



Low Loss  
Return



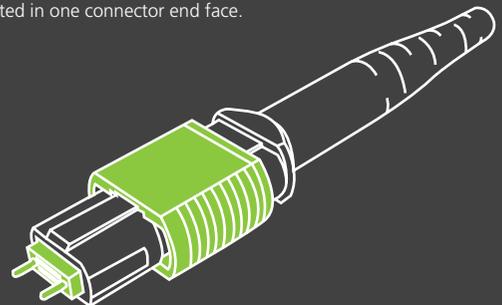
Obsolete

1996

## MPO CONNECTOR

IEC 61754-7 / FOCIS-5

Used in high density networks. MPO allow 12 or 24 fibers to be presented in one connector end face.



Push &  
Pull



4-24 fibre  
counts



6.4mm x  
2.5mm



Male & Female  
versions



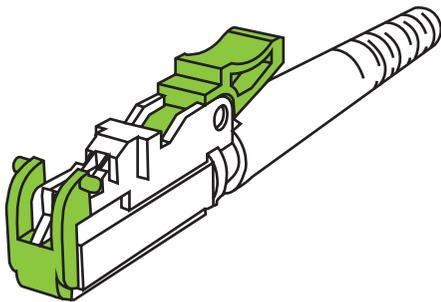
New Build

# The History of Connectors

1997

## LSH (E2000) CONNECTOR IEC 61754-15 / FOCIS-16

Designed as an improvement to the SC connector - it has a push-pull latch in place, and a shuttered dust cap, for contamination, laser and end-face protection



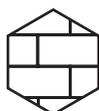
Latch System



Shuttered



2.5mm

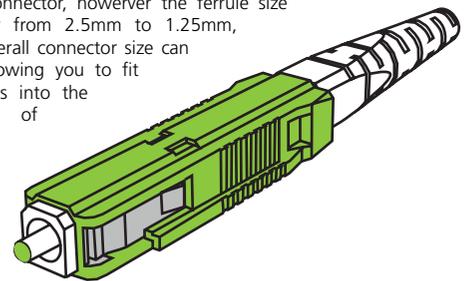


New Build

1997

## MU CONNECTOR IEC 61754-6 / FOCIS-17

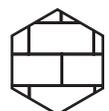
Hugely popular in the Japanese market, the MU is like a miniature SC connector, however the ferrule size is 50% smaller from 2.5mm to 1.25mm, meaning the overall connector size can be reduced, allowing you to fit more connectors into the same amount of space



Push & Pull



1.25mm



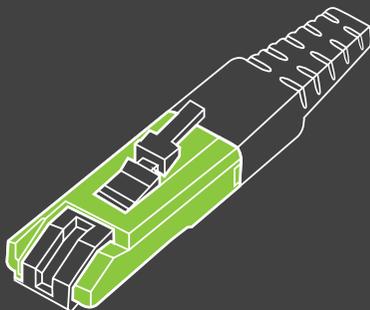
New Build

2001

## SG (VF45) CONNECTOR IEC 61754-19 / FOCIS-7

Volition or VF45

VF45 were duplex fiber connectors primarily used in fiber-to-the-desk LAN applications



Latch System



Bare Fibre



Fits RJ45 footprint



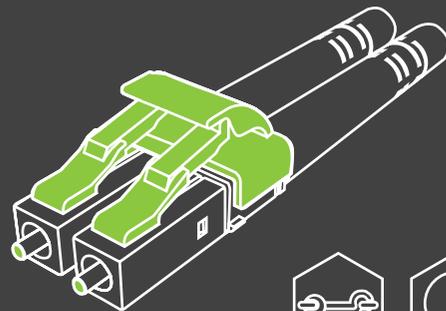
Obsolete

2002

## LC CONNECTOR IEC 61754-20 / FOCIS-10

Most likely the most popular and widely used connector in the world. The LC connector is well established because of its compact size, high performance, and connector reliability.

AFL Hyperscale have a range of unique innovations around this connector including reversible uni boots, short boots, splice on connectors, and connector performance aimed at data center and service provider networks.



Latch System



1.25mm



New Build