



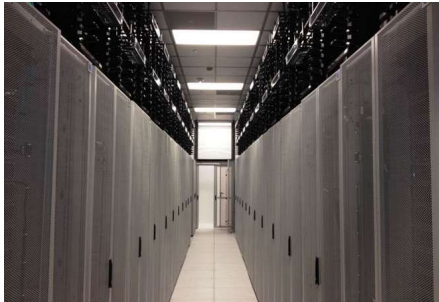
Field Connectivity Solutions

Tim Haigh - Fibre Network Solutions Europe

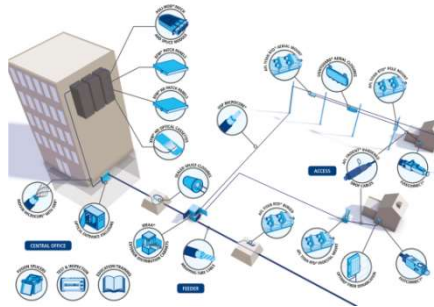


FAST™ Field Fit Connector - applications

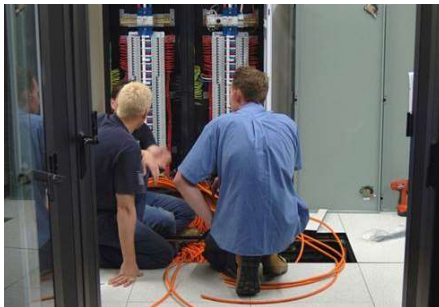
Datacentre
(adds/moves/changes)



FTTH
(subscriber point)



Connector
replacement



Emergency field repairs



CCTV

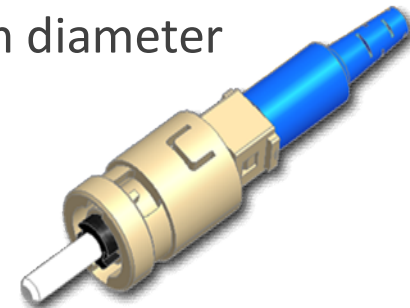
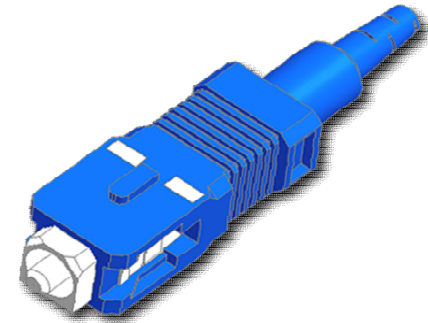


Cable testing

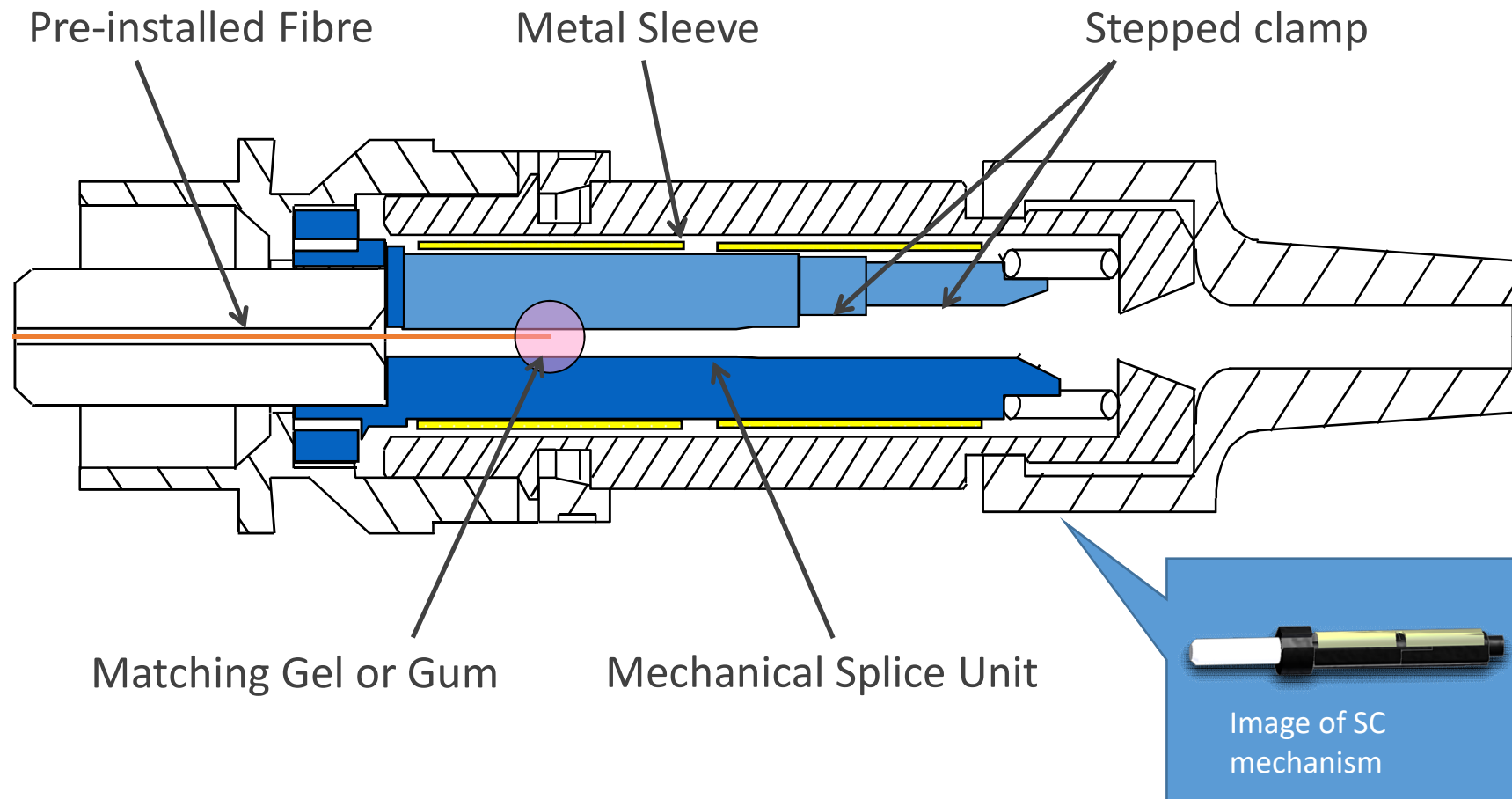
FAST™ Field Fit Connector - Features

Features:

1. No polishing, no epoxy curing
2. Multiple connector types (i.e. SC, ST, LC & Waterproof)
3. Multiple fibre types (i.e. SM, 50/125um, 62.5/125um & OM3 Compliant 50/125um)
4. Can terminate both 0.25mm & 0.9mm diameter fibres
5. Options for multiple cable diameters such as 2mm & 3mm diameter circular premise cable, square drop cables.
(i.e. 3.1mm x 2.0mm & 2.0mm x 1.6mm).
Custom options are also possible for specific cable types/diameters.



FAST™ - internal structure



FAST™ - Field Fit Connector



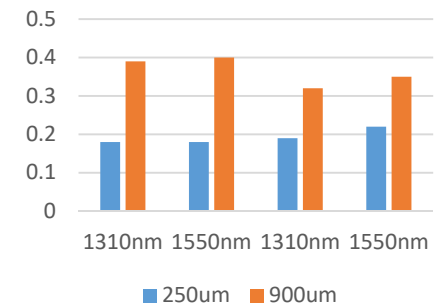
FAST™ Series Connector
Assembly Demonstration
March 2018

FAST™ - Field Fit Connector

	Polish types			Fibre Type				Cable type			
Connector type	UPC	Intermediate APC	APC	SM	50/125	62.5/125	OM3	250 & 900um	2.0 & 3.0mm	Standard Drop (3.1 x 2.0mm)	Low Friction Drop (2.0 x 1.6mm)
SC	•	•	•	•	•	•	•	•	•	•	•
LC	•	•	•	•	•	•	•	•	•	•	•
ST	•			•	•	•	•	•	•		

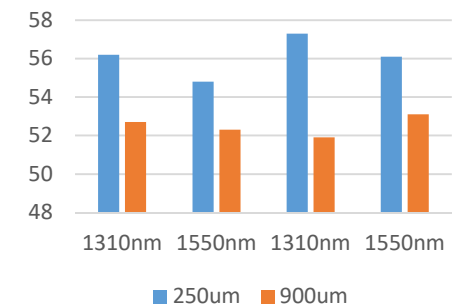
Insertion losses	Fibre Type	Wavelength	Mean Loss (dB)	Max Loss (dB)
IL for 250µm fibre	SM	1310nm	0.18	0.39
		1550nm	0.18	0.4
IL for 900µm fibre	SM	1310nm	0.19	0.32
		1550nm	0.22	0.35

IL for Interface SC/APC

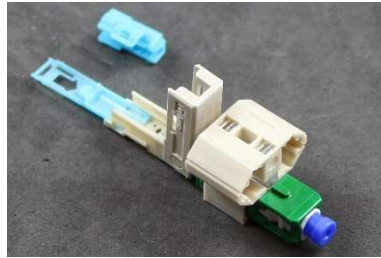


Return losses	Fibre Type	Wavelength	Mean Loss (dB)	Max Loss (dB)
RL for 250µm fibre	SM	1310nm	56.2	52.7
		1550nm	54.8	52.3
RL for 900µm fibre	SM	1310nm	57.3	51.9
		1550nm	56.1	53.1

RL for Interface SC/APC



Developing the concept of “FAST™ Plus Solution”



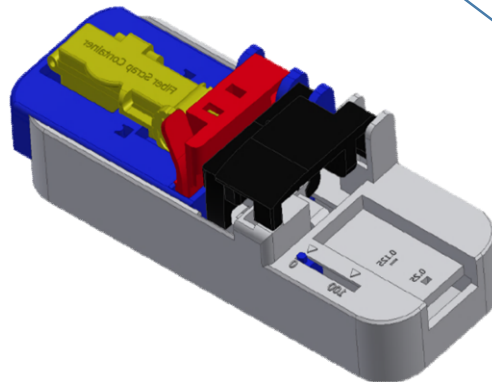
FAST™ Plus
The best field fit solution

Hybrid FAST™

- Acceptable fibre gap level is increased from 0.1μ to 0.5μ
- Good performance for hackled fibre

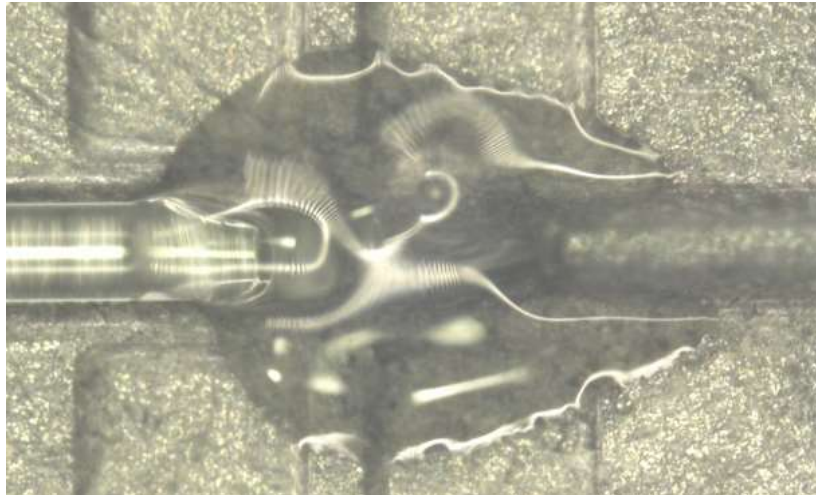
Maintenance Free Cleaver

- Ultra Low frequency of rippled fibre(almost 0ppm)
- Low frequency of hackle

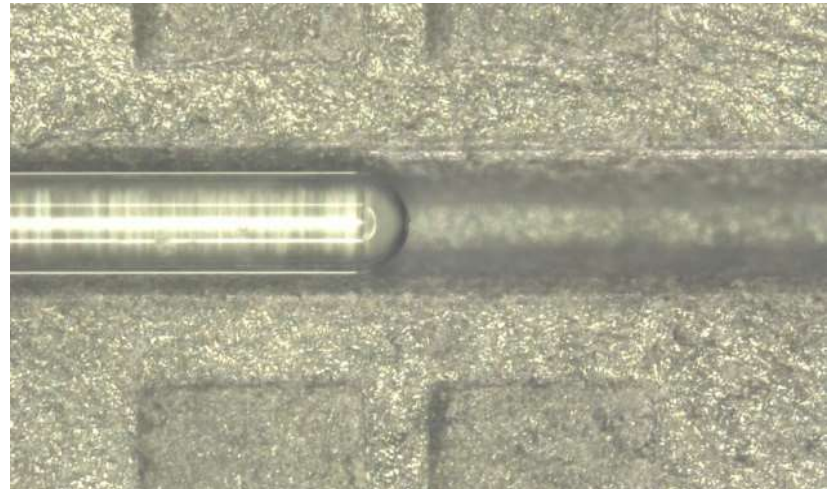


Hybrid FAST™ - Index Matching Material

Conventional Gel



Solid-State Gum

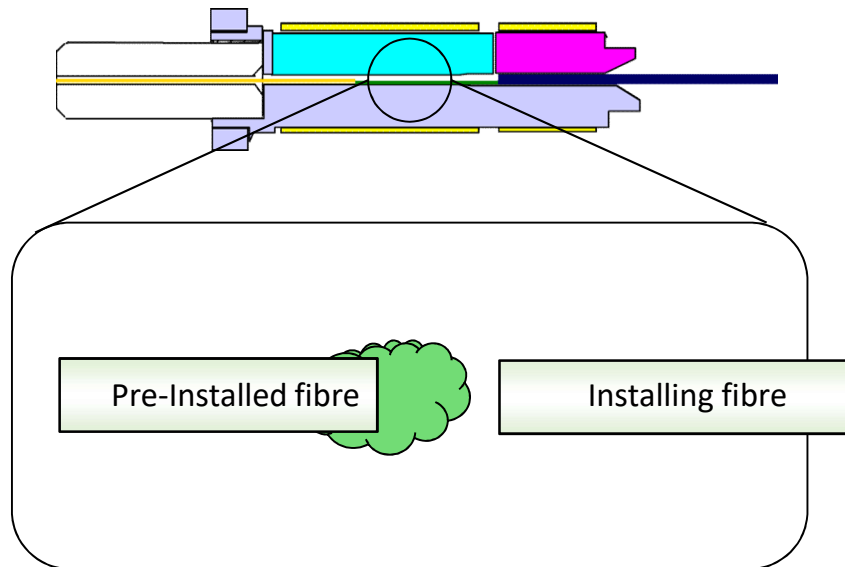


- Easy to fulfill very narrow gap between fibre
- Not effected by air/contamination moving
- Good performance even vs damaged cutting customer's fibre.
- Keep state with high temperature working up to 75°C

What is “Hybrid FAST™”?

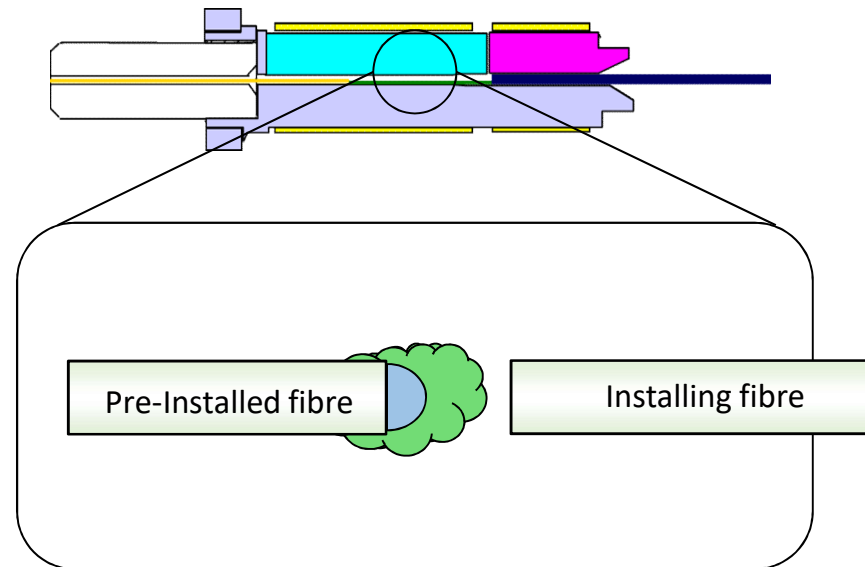
Existing FAST™

- Employed gel-type
- Index-matching material



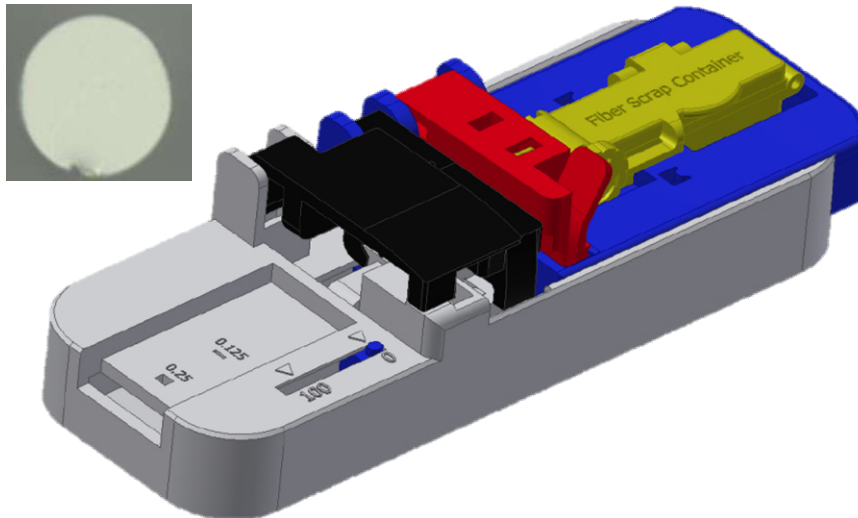
Hybrid FAST™

- Employed gel-type and solid
- Index-matching material



Maintenance Free Cleaver (MFC)

Typical end-face condition

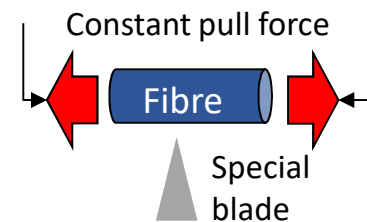


Item		Content
Fibre application	Material	Quartz glass
	Count	Single
	Clad diameter	125µm
Number of Cleaves		>100 times

Ripple NG : Should Never happen



High reliability is realized by special blade structure and tension applied to fibre during cleaving

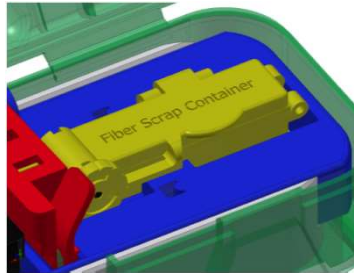


If the blade of the MFC is over its lifetime, the blade stops functioning. When a conventional cleaver blade exceeds its lifetime, it continues to cleave but creates poor cleaves with increasing frequency

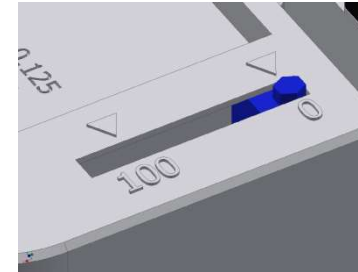
Maintenance Free Cleaver (MFC)



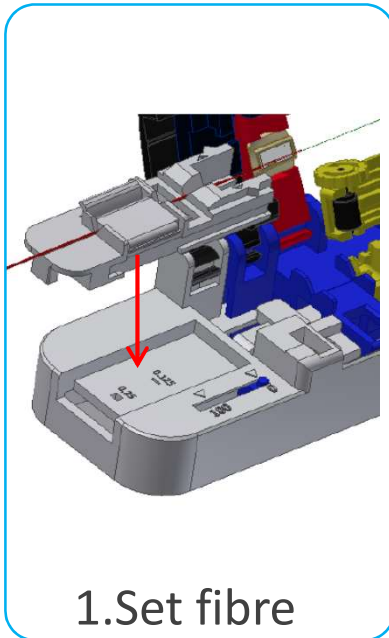
Carrying case



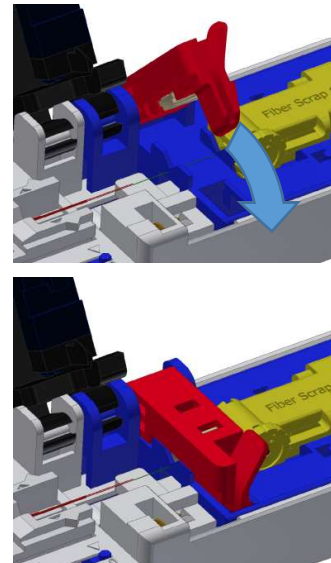
Fibre scrap container



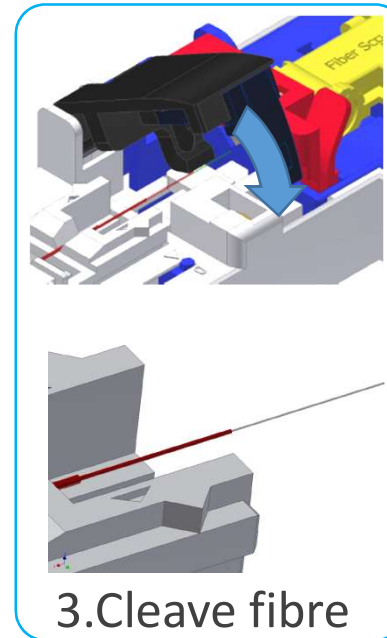
Counter



1. Set fibre



2. Clamp fibre



3. Cleave fibre

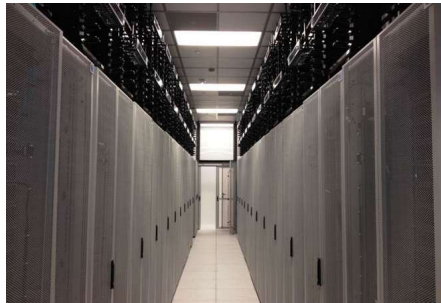
FAST™ Plus Solution (Hybrid FAST™+ MFC)



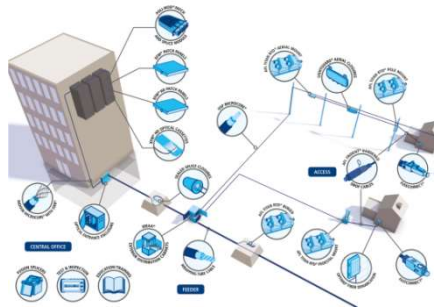
FAST™ Plus Solution
Hybrid FAST™ & Maintenance Free Cleaver
Assembly Demonstration - March 2018

FuseConnect™ - Splice on connector

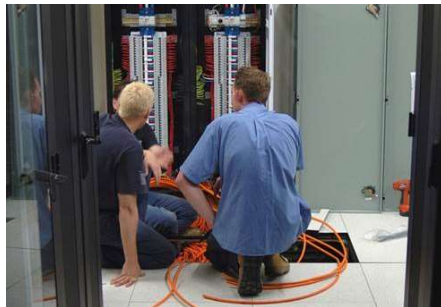
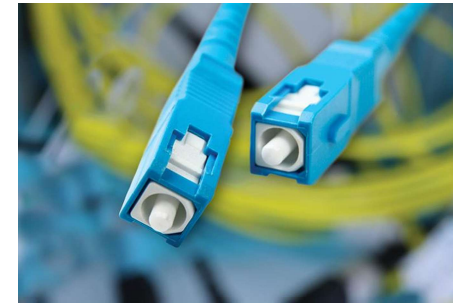
Datacentre
(adds/moves/changes)



FTTH
(Central office & POP)



Connector
replacement



Emergency field repairs



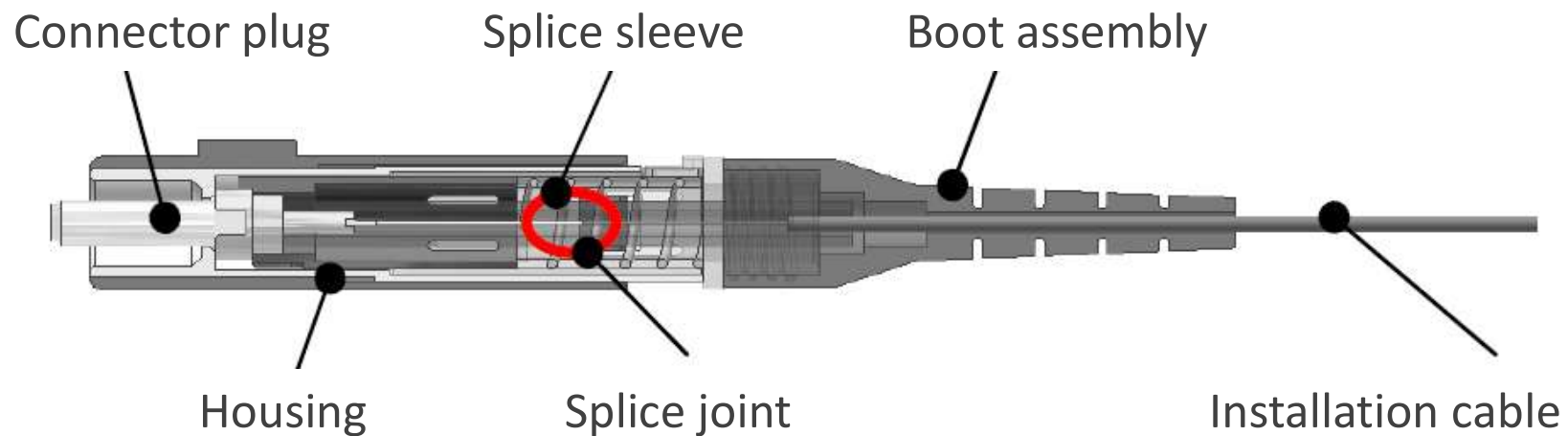
CCTV



Cable testing

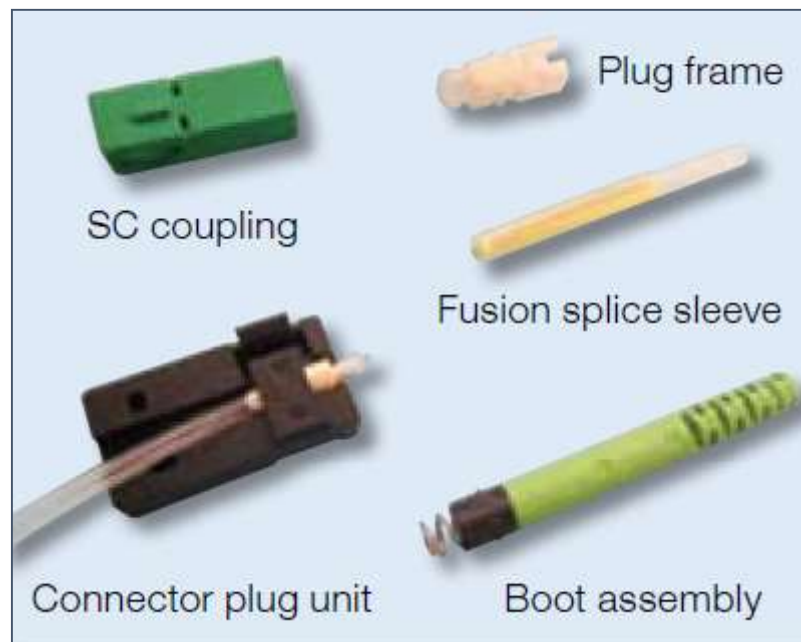
FuseConnect™ - Splice On Connector

General FuseConnect structure:

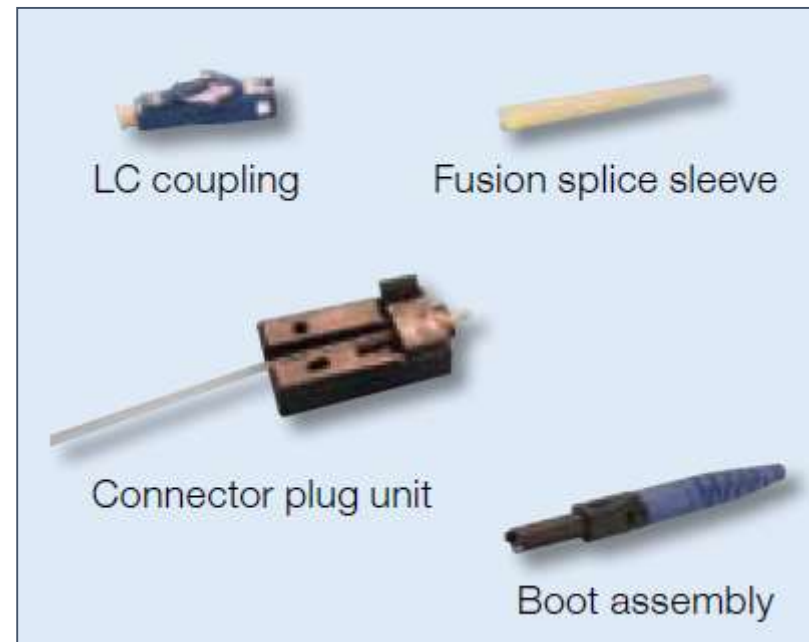


FuseConnect™ - Splice On Connector

QA Type

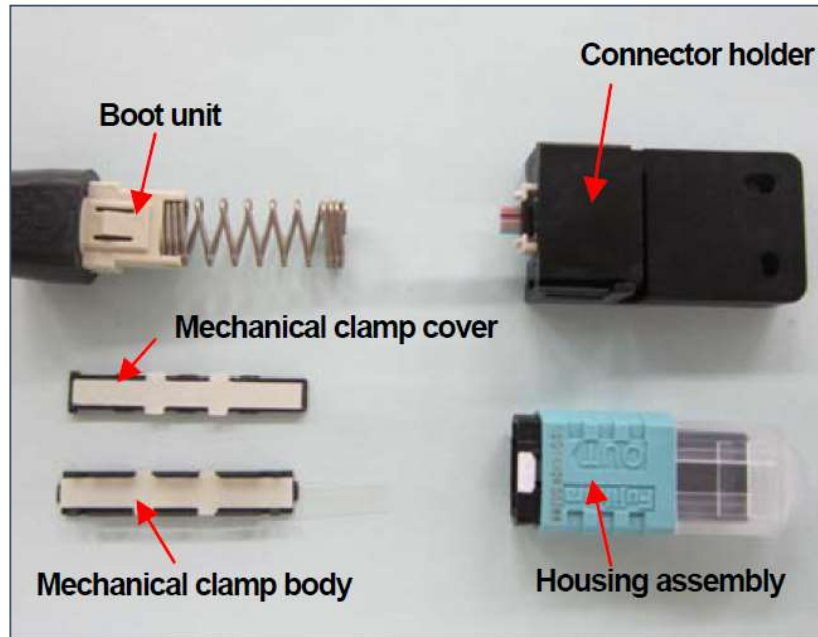


SF Type

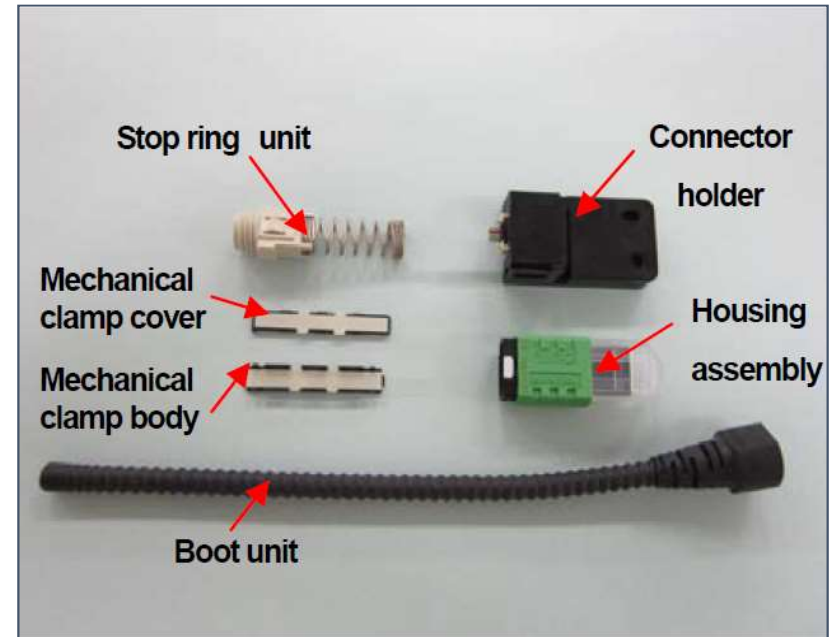


FuseConnect™ - Splice On Connector

MPO – Ribbon type



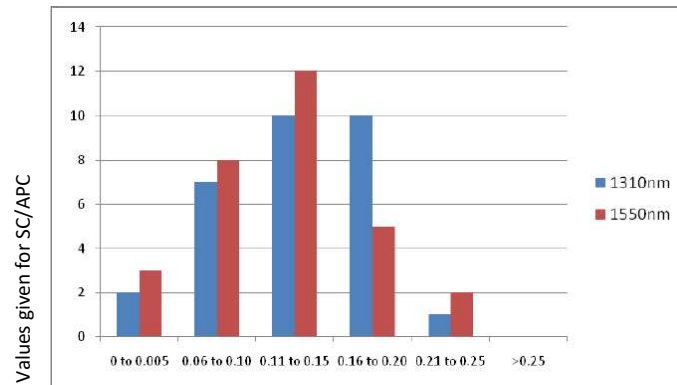
MPO – Cordage type



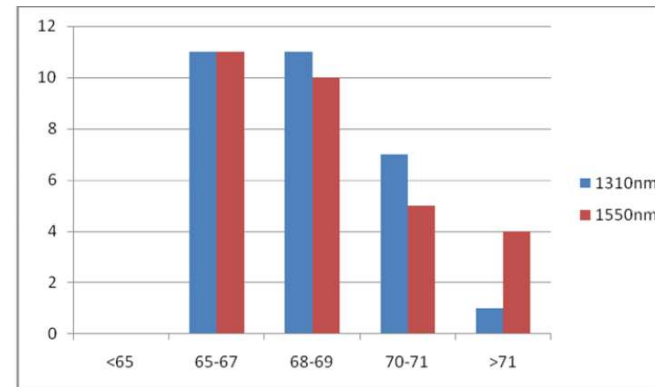
FuseConnect™ - Splice On Connector

Specification

Item	Content
Applicable fiber type	900 μm, 2 mm, 3 mm, 1.6 mm x 2 mm drop cable, 2 mm x 3 mm drop cable
Connector type	SC or LC
Polishing	UPC or APC or PC (MM)
Connection loss (with master)	< 0.3 dB (Singlemode)
	< 0.3 dB (Multimode)
Return loss	> 65 dB (SM fiber APC polish)
	> 55 dB (SM fiber PC polish)
	> 30 dB (MM UPC polish)
Operating temperature	-40°C to 75°C



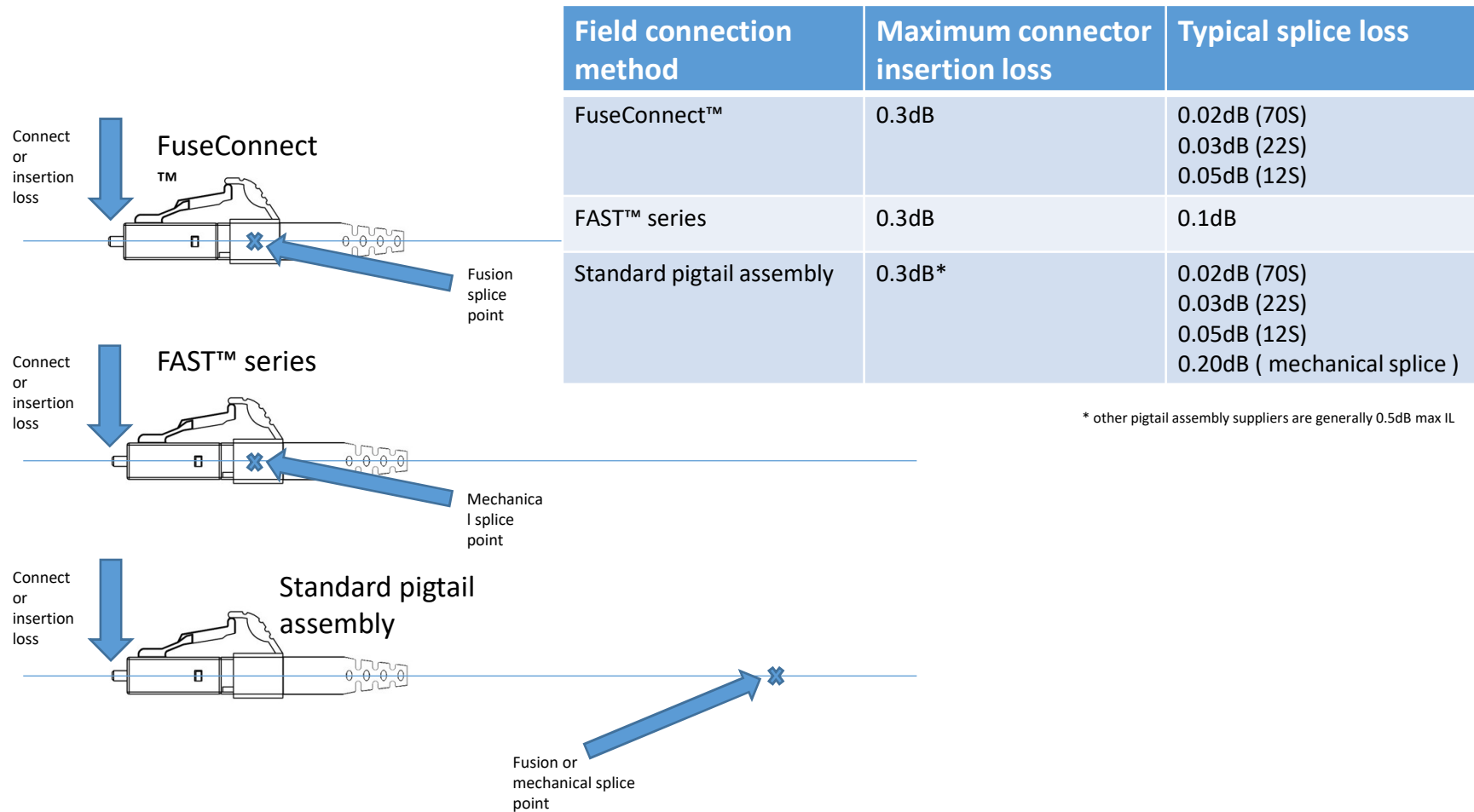
Fiber Type	Wavelength	Mean Loss	Maximum Loss
Single mode	1310nm	0.13dB	0.23dB
	1550nm	0.13dB	0.24dB

































Fiber Type	Wavelength	Mean Return Loss	Minimum Return Loss
Single mode	1310nm	67.9dB	65.8dB
	1550nm	68.2dB	65.2dB



Subscriber Field Fit Connection Comparisons



The 'Pros & Cons' of Field Fit Connectivity

Connectivity type	Cost per termination		CAPEX (tooling costs)	Skill dependency	Installation time	Performance (optical, mechanical, etc.)
	Low splice count	High splice count				
Mechanical splice on connector						
Fusion splice on connector						
Mechanical splice + pigtail						
Fusion splice + pigtail						
Hand polish field connector (anaerobic, etc.)						



= Excellent



= Good



= Poor



= Bad



THANK YOU!



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