FTTx – Outside Plant

3M Telecommunications offers a wide range of protection products, cable cleaning and visual network marking products suitable for use in FTTx networks.

With 3M's proven mechanical sealing technology, all 3M fibre optic closures are suitable for applications within FTTx networks such as track (backbone), spur (branch) or distribution points. Outdoor fibre optic distribution boxes are also available for the "last mile" applications.

6

6.1 Splice Protection Products
6.1.1 Closures
3M™ 2178-L/S

3M 2178-L/S Fibre Optic Splice Closures

The 2178 Fibre Optic Splice Closure has always given you great protection for fibre optic connections. Now, the addition of 2178-L/S Series more capabilities can be offered.

With the new addition you get all the features of the popular 2178 splice closure. Plus, the 2178-L/S series is made of a tough chemical-resistant material with a new gasket seal which makes this the ideal splice closure for outside plant in underground, aerial, pedestal and direct buried applications.

The 2178-L/S series is designed with larger and smaller interchangeable closure halves so you can select the size case that meets your needs today but with the flexibility to expand for the future. Cable ports and space for trays can be added at reentry with the 2181-L/S Cable Addition Kit.

The ease of installation is unsurpassed, requiring no special tools or complicated training procedures. The closures are easily re-enterable to allow access to the splices.

The 2178-L/S series features a tough, rigid non-filled case, tested under real-world conditions, that stands up to even the most severe conditions of moisture, vibration and extreme temperatures. The closure will withstand up to 90.7 kg (200 lbs.) compression.

Design improvements to the 2178-L/S series include changes to improve the cable strain relief and a movable tray support. The closures hold cables of varying sizes and provide flexibility to add ports on both ends with the cable addition kit.
The 2178-L/S series splice cases can be used with the 2522 or 2523 Fibre Splice Organiser Trays or the Fibrlok™ 2524 Small Fibre Splice Organiser Tray.

Highlights:

- Gasket seal
- Constructed of a highly chemically resistant material
- Unique strength member clamp assembly

- Several sizes with interchangeable parts requirements
- Multiple cable entry options
- No special tools required
- Non-filled closure
- Multiple ground studs
- Pressurisation valve
- Varying cable port sizes cable sizes
- Expandable from two cable entries per end up to eight

- Easy re-entry and reusable seal
- Use in buried applications
- Prevents cable sheath movement with temperature changes
- Expandable system to fit capacity and space
- Butt or in-line configuration for splicing
- Easy installation and re-entry
- No compound required; easy re-entry
- Isolated grounding capability
- Provides ability to flash test
- Accommodates all common trunk and feeder
- Add cable with minimum disturbance; eliminates splice rebuilding when adding lines

6.1 Splice Protection Products
6.1.1 Closures
3M™ 2178-L/S

Description

3M 2178-L/S-FR Flame Retardant Splice Closure

Designed for use in vault and building applications, the 2178-L/S-FR series splice closures are moulded with a flame retardant material that allows them closures to pass Telcordia Technologies (Bellcore), UL and various global specifications which require a flame retardant rating.
This new material also increases the resistance of the closure to the effects of sprays and release agents used for easier re-entry.

Meet your changing network needs

The 2178-L/S-FR series closures are designed with larger and smaller interchangeable closure halves so that you can select the size and case that meets your needs today with the flexibility to expand in the future. Cable ports and space for trays can be added at re-entry with the 3M™ 2181-L/S-FR Cable Addition Kit.

The ultimate protection for fibre optic connections

The 2178-L/S-FR series features tough, rigid non-filled closures, tested under real-world conditions which stand up to even the most severe conditions of moisture, vibration and extreme temeratures.

Design improvements to the 2178-L/S-FR series include changes to improve the cable strain relief and a movable tray support. The closures hold cables of varying sizes and provide flexibility to add ports to both ends with the cable addition kit.
Both the 2178-L/S series and the 2178-L/S-FR series splice closures can be used with the 3M Fibrlok™ 2524 Fibre Splice Organiser Tray and most other commercially available trays.

Highlights:

• Constructed of flame retardant materials	- Increases resistance of closure to effects of sprays and release agents
• Gasket seal	- Easy re-entry and reusable seal
• Unique strength member clamp assembly	- Prevents cable sheath movement with temperature changes
• Several sizes with interchangeable parts	- Expandable system to fit capacity and space requirements
• Multiple cable entry options	- Butt or in-line configuration for splicing
• No special tools required	- Easy installation and re-entry
• Non-filled closure	- No compound required; easy reentry
• Multiple ground studs	- Isolated grounding capabilities
• Pressurisation valve	- Provides ability to flash test
• Expandable from two cable entries per end up to eight	- Add cable with minimum disturbance; eliminates splice rebuilding when adding lines
• Same design and installation practice as 2178-L/S Series	- Use in vault and building applications
• Tested to various global specifications	- Extends capabilities of 2178-L/S series family

6.1 Splice Protection Products
6.1.1 Closures
3M™ 2178-L/S

Description

3M™ 2178-L/S-FR Series Maximum Splice Capacities with Splice Organizer Trays

Configuration	Fibrlok™ Splices	Fibrlok Multi-Fiber Splices	Fusion	Fusion Ribbon	Comments Fusion
2178-S/FR Series					
2178-S/FR w/2 2522	24	16 (193 fibres)	48	20 (240 fibres)	
2178-S/FR w/2 2523	48	24 (288 fibres)	96	24 (288 fibres)	
2178-S/FR w/2 2524	48				
2178-S/FR w/2 2524-A			48	8 (96 fibres)	
2178-S/FR w/2 2524-FT			48		
2178-S/FR w/2 2524-MF	4	6 (72 fibres)			
2178-S/FR w/4 2522	48	32 (384 fibres)	96	40 (480 fibres)	One 2181-LS/FR Cable Addition Kit
2178-S/FR w/4 2523	96	48 (576 fibres)	192	48 (576 fibres)	One 2181-LS/FR Cable Addition Kit
2178-S/FR w/4 2524	96				One 2181-LS/FR Cable Addition Kit
2178-S/FR w/4 2524-A			96	16 (192 fibres)	One 2181-LS/FR Cable Addition Kit
2178-S/FR w/4 2524-FT			96		One 2181-LS/FR Cable Addition Kit
2178-S/FR w/4 2524-MF	8	12 (144 fibres)			One 2181-LS/FR Cable Addition Kit
2178-LS/FR Series					
2178-LS/FR w/5 2522	72	48 (576 fibres)	144	50 (600 fibres)	
2178-LS/FR w/5 2523	144	72 (864 fibres)	288	60 (720 fibres)	
2178-LS/FR w/7 2524	168				
2178-LS/FR w/7 2524-A			168	28 (336 fibres)	
2178-LS/FR w/7 2524-FT			168		
2178-LS/FR w/7 2524-MF	14	21 (252 fibres)			
2178-LS/FR w/8 2522	108	72 (864 fibres)	216	80 (960 fibres)	One 2181-LS/FR Cable Addition Kit
2178-LS/FR w/10 2524-A			240	40 (480 fibres)	One 2181-LS/FR Cable Addition Kit
2178-LS/FR w/10 2524-FT			240		One 2181-LS/FR Cable Addition Kit
2178-LS/FR w/10 2524-MF	20	30 (360 fibres)			One 2181-LS/FR Cable Addition Kit
2178-LS/FR w/10 2522	132	80 (960 fibres)	264	100 (1200 fibres)	Two 2181-LS/FR Cable Addition Kits
2178-LS/FR w/13 2524-A			312	52 (624 fibres)	Two 2181-LS/FR Cable Addition Kits
2178-LS/FR w/13 2524-FT			312		Two 2181-LS/FR Cable Addition Kits
2178-LS/FR w/13 2524-MF	26	39 (468 fibres)			Two 2181-LS/FR Cable Addition Kits

NOTE: 2178-LL/FR has the same splice capacity as 2178-LS/FR with additional space for buffer storage. Capacity may be affected by the cable size and number of cables installed. Please call Customer Service for more information at 1-800-426-8688.
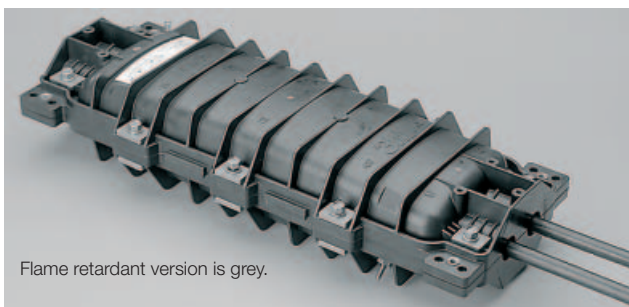
6.1 Splice Protection Products
6.1.1 Closures
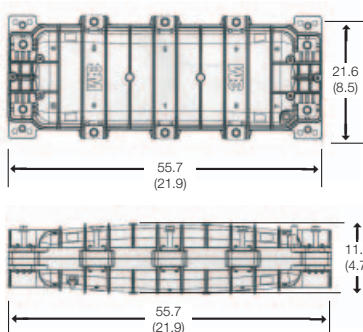## 3M™ 2178-L/S

Description

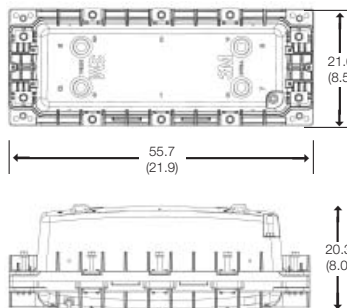### 3M 2178-S Fibre Optic Splice Closure

Dimensions Shown: Centimeters (Inches)
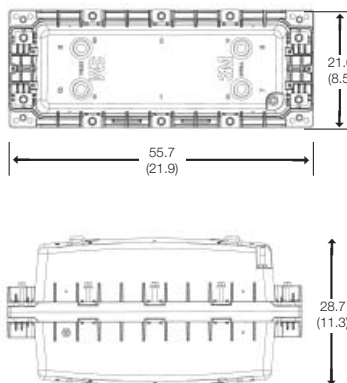
Flame retardant version is grey.

21.6 (8.5)
55.7 (21.9)
11.9 (4.7)
55.7 (21.9)

3M 2178-LS Fibre Optic Splice Closure

Flame retardant version is grey.

21.6 (8.5)
55.7 (21.9)
20.3 (8.0)

3M 2178-LL Fibre Optic Splice Closure

Flame retardant version is grey.

21.6 (8.5)
55.7 (21.9)
28.7 (11.3)

Type/Order text

Ref.-No.

	Packaging	Min. Order	
Small Fibre Optic Splice Closure Contains materials for installation of 3 cables	1 kit/cs.	1 each	**2178-S**
Large Fibre Optic Splice Closure Contains materials for initial installation of 4 cables	1 kit/cs.	1 each	**2178-LS**
Extra-Large Fibre Optic Splice Closure Contains materials for initial installation of 4 cables	1 kit/cs.	1 each	**2178-LL**
Small Fibre Optic Splice Closure Contains material for installation of 3 cables	1 kit/cs.	1 each	**2178-S/FR**
Large Fibre Optic Splice Closure Contains material for initial installation of 4 cables	1 kit/cs.	1 each	**2178-LS/FR**
Extra-Large Fibre Optic Splice Closure Contains material for initial installation of 4 cables	1 kit/cs.	1 each	**2178-LL/FR**

6.1.1   Closures
3M™ 2178-L/S

Description
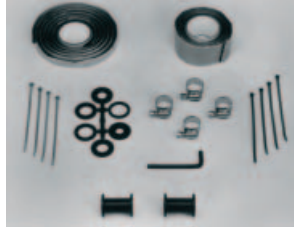
3M 2178-L/S & L/S-FR Series Accessories

3M 2180 Cable Kit

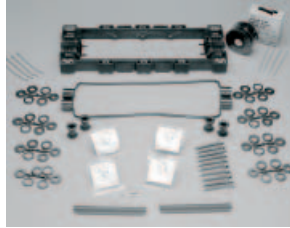All materials required for re-entry into 2178 Splice Closure. Includes plugs, washers and sealing materials.

Kit Includes:
- Two plugs
- Two hose clamps
- Four green cable ties
- Four blue cable ties
- One hex key
- 48 sealing washers
- One box sealing cord
- One box sealing tape

3M 2181-LS

Contains gasket and materials for installing additional cables.

3M 2181 Cable Addition Kit

For use with 2178 and 2178-G Splice Closures. Contains mastic, cable adapter and materials for installing additional cables in 2178 splice case. This kit permits butt splicing of multiple cables from a single and after initial plant construction. Splice re-arranging, branch cables and customer premise drop can be added with minimal disturbance to plant in service.

Kit Includes:
- One cable adapter
- Three plugs
- Four hose clamps
- Four green cable ties
- Four blue cable ties
- One spacer clamp assembly
- One box sealing cord
- One box sealing tape
- Ten bolts
- Eight sealing washer trees

3M 2181-LS/FR Cable Addition Kit

Contains gasket and materials for installing additional cables and is flame retardant.

Type/Order text   Ref.-No.

Type/Order text	Packaging	Min. Order	Ref.-No.
Mastic tape and cord, and other materials to re-enter 2178 splice closure	1 kit/cs.	1 each	**2180**
Cable Addtion Kit Contains mastic, cable adapter and materials for installing additional cables in 2178 splice closure	1 kit/cs.	1 each	**2181**
2181-LS Contains gasket and materials for installing additional cables.	1 kit/cs.	1 each	**2181-LS**
Cable Addition Kit Contains gasket and materials for installing additional cables.	1 kit/cs.	1 each	**2181-LS/FR**
Fire retardant			

Description

3M 2522 and 2523 Fibre Splice Organiser Trays

The 2522 and 2523 Fibre Splice Organiser Trays store and protect discrete and mass, mechanical and fusion fibre optic splices in closures and fibre distribution units. The 2521 Series of splice inserts are easily added to either tray to secure splices into the trays. Fibres are routed into the trays using 2520 FibrTube Transition Tubing that zips over the fibres.
* Splice Inserts must be ordered separately.

Highlights:

- Meets Bellcore requirement for bend diameter
  - Easy maintenance

- Trays allow entry and exit of buffer tubing at
  - Provides flexibility in fibre any of the four corners management

- Extra tray depth
  - Ribbon fibre may be coiled without twisting

- Modular design of the splice holder
  - Accommodates many types of splices

- Stackable hinged tray
  - Easy access without removing other trays

Fibrlok 2524 Splice Organiser Tray

Highlights:

- Single entry point
  - Controls fibre management

- Hinged trays snap together
  - Stackable; individual tray access

- Flame retardant / isopropyl alcohol resistant
  - Meets fire codes and industry standards

- 10,16 cm (4") bend diameter
  - Individual fibre access; allows easy maintenance

The Fibrlok 2524 Splice Organiser Tray holds 24 Fibrlok Splices (2525, 2590, 2599, 2529) and accommodates up to eight buffer tubes holding up to 48 fibres (900 µm or 250 µm). The tubes are secured with channel snaps so that cable ties are not required. The fibres all enter the tray in one corner eliminating the need for figure 8's in the fibre.

An important design feature of these stackable trays is the snap-on hinge cover on each tray. Individual trays may be accessed without disassembly of the trays above or below—and without kinking buffer tubes.

The 2524-FT Fusion Splice Organiser Tray holds up to 24 fusion splices. The 2524 splice organiser tray can be adapted for fusion splice storage using the 2524-F Fusion Insert.

The 2524 and 2524-FT splice trays fit and mount in the 2177 Fibre Optic Splice Closure, the 2178 Fibre Optic Splice Closure and the 2178-S Fibre Optic Splice closure.

FTTx – Outside Plant

6

6.1 Splice Protection Products
6.1.1 Closures
3M™ 2178-L/S

3M 2181-B Double Butt Adapter Kit

Contains fasteners necessary to assemble the 2178-L/S Series Splice Closures when two 2181 or 2181-LS Cable Addition Kits are used.
- Ten bolts
- Two fillister head screws

3M 2181-C Triple Adapter Kit

Contains bolts for installation of three 2181-LS or 2181 Addition Kits.

3M 2178-EGI External Ground Isolation Kit

Provides a means to ground each cable shield with water proof isolation. The 2178-EGI housing can be used with any of the 2178-L/S and 2178-L/S-FR Series LightLinker Fibre Optic Splice Closures, and is placed in the cable port.

Contents of 2178-EGI Kit:
- Two 2178-EGI housing assemblies & caps
- Two ground wire assemblies
- Two O-rings
- Two bolts

3M 2178-125 Mastic Tape

The 2178-125 Mastic Tape is a non-conductive black mastic that provides excellent sealing properties and does not degrade with gasoline or encapsulating compounds. The tape is 3.2 mm (1/8") thick an is available in rolls 3.8 cm (1-1/2") wide x 114 cm (45") long.

3M 2178-CORD Reenterable Mastic

The 2178-CORD Mastic Cord is available in rolls 1.85 m (6') in length with a .87 cm (0.344") cord diameter.

3M 2172 Strength Member Clamp for Fibre Cable

Provides a means to tie the strength member to the cable sheath.

3M 2183 Universal Aerial Hanger Kit and 3M 2197 Aerial Hanger/Hinge Kit

The 2183 Aerial Hanger Kit or the 2197 Aerial Hanger/Hinge Kit can be used with the 2178, 2178-G or 2178-L/S and 2178-L/S-FR series fibre optic splice cases for use in aerial applications. Both kits also accommodate the 2178 Splice Closure with one or two 2181 Cable Addition Kits. The 2197 aerial hanger/hinge kit provides additional hardware to attach the splice closure cover to its base.

Contents of 2183 aerial hanger kit
- Four nylon stop nuts
- Two corner inserts with studs
- Two universal hanger bracket assemblies

Contents of 2197 aerial hanger/hinge kit
- Six corner inserts
- 12 nuts
- Two flexible hinges
- Two "L" brackets
- Two bonding/hanger brackets
- Two bolts with washers

Type/Order text			Ref.-No.

Accessories for 3M 2178-L/S and 2178-L/S-FR Series Splice Closures
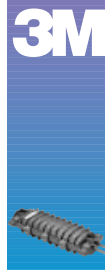
	Packaging	Min. Order	
Strength Member Clamp for fibre cable Clamps strength member to cable sheath	100/cs.	100 each	**2172**
2178-281 CORD Reenterable Mastic	14/cs.	14 rolls	**2178-281 CORD**
External Ground Isolation Kit	5/cs.	5 each	**2178-EGI**
Mastic Tape	1 roll/bx., 8/cs.	8 rolls	**2178-125**
Gasket for 2178-LS/FR Series Fibre Optic Splice Closures	10/cs.	10 each	**2178-LS/GSKT**
Fibre Optic Double Butt Adapter Kit Contains bolts for installation of two 2181-LS Cable Addition Kits	1/cs.	1 kit	**2181-B**
Triple Adapter Kit Contains bolts for installation of three 2181-LS Cable Addition Kits	1/cs.	1 kit	**2181-C**

6.1 Splice Protection Products

6.1.1 Closures
3M™ 2178-L/S

Type/Order text			Ref.-No.

Accessories for 3M 2178-L/S and 2178-L/S-FR Series Splice Closures

	Packaging	Min. Order	
Mounting Hardware Accessories			
Universal Hanger Bracket Hardware for aerial installation	1/cs.	1 each	**2183**
Aerial Hanger/Hinge Kit Contains hardware for aerial installation with hinged cover	1/cs.	1 each	**2197**
Scotchlok™ 4460-D/FO Shield Bond Connector Assembly Provides grounding and strength and member clamp	100/cs.	100 each	**4460-D/FO**
Fibre Management Accessories			
Cable Fanout Kit Transitions cable buffer tubes or single tube to FibrTube	10 kits/cs.	10 kits	**2519**
Cable Fanout Expander Kit Transitions one FibrTube to two FibrTubes 051138-36412	10 kits/cs.	10 kits	**2519-X**
FibrTube Transport Tubing Protects single or ribbon fibre between trays; cut in one-foot lengths	50/cs.	50 ft.	**2520**
Fusion Splice Insert Holds 12 single fusion splices in each insert, used in 2522/2523 trays	2/pkg,12pkg/cs.	12 pkgs.	**2521-F**
Fibrlok™ Splice Insert Holds six splices in each insert, used in 2522/2523 trays	2/pkg,12pkg/cs.	12 pkgs.	**2521-FL**
Fibrlok™ Multi-Fibre Splice Insert Holds four multi-fibre splices in each insert, used in 2522/2523 trays	2/pkg,12pkg/cs.	12 pkgs.	**2521-MF**
Ribbon Fusion Splice Insert Holds five ribbon fusion splices in each insert, used in 2522/2523 trays	2/pkg,12pkg/cs.	12 pkgs.	**2521-RF**
Small Fibre Splice Organiser Tray Holds two 2521 Series Splice Inserts (sold separately)	3/cs.	3 each	**2522**
Large Fibre Splice Organiser Tray Holds four 2521 series splice inserts (sold separately)	3/cs.	3 each	**2523**
Splice Organiser Tray Holds 24 Fibrlok splices and eight buffer tubes	3/cs.	3 each	**2523**
Splice Organiser Tray Holds four mass fusion or 24 single fusion splices, or a combination of 20 single fusion and four mass fusion	3/cs.	3 each	**2524-A**
Fusion Splice Organiser Tray Holds 24 single fusion splices	3/cs.	3 each	**2524-A**
Fibrlok™ Multi-Fibre Splice v Tray Holds three Fibrlok multi-fibre and four single Fibrlok splices	3/cs.	3 each	**2524-MF**
Fusion Splice Insert Adapts the 2524 tray for fusion splices	24/cs.	24 each	**2524-F**
Strap Kit for Organiser Trays Holds 2522 and 2523 trays in place in closure	24 kits/cs.	24 kits	**2526**

6.1.1 Closures
3M™ 2179-CS

Description

3M 2179-CS Fibre Optical Splice Closure

The 2179-CS Fibre Optic Splice Closure is a moulded plastic enclosure used for protecting splices in fibre optic cables. It's suitable for buried, underground, aerial, and pedestal applications. The Splice closure has two cable entrance ports on each end. Port plugs allow the closure to be used for butt or in-line splices. The rigid non-encapsulated closures provide physical and environmental protection. The splice closures are suitable for short-term pressurisation during flash testing.
2179-CS closures are delivered with trays and accessories.
*Only 2179-CS/DIN closure is delivered without DIN trays and accessories. To be ordered separately.
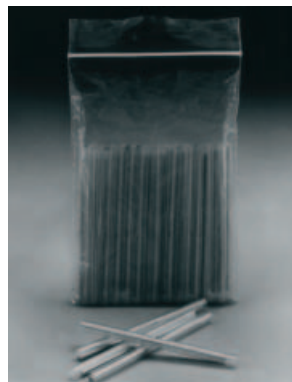
Type/Order text   Ref.-No.

Description	Min. Order/Pkg.	
2179-CS Fibre Optic Closure (w/o tray)	1 each	2179-CS/0
2179-CS Fibre Optic Closure (12C w/1 tray)	1 each	2179-CS/1
2179-CS Fibre Optic Closure (24C w/2 trays)	1 each	2179-CS/2
2179-CS Fibre Optic Closure (36C w/3 trays)	1 each	2179-CS/3
2179-CS Fibre Optic Closure (48C w/4 trays)	1 each	2179-CS/4
Aerial Hanger Kit	1 each	2179-CS/AHK
2180CS Re-entry Accessory Kit	1 each	2180-CS/RAK
2179-CS Port Accessory Kit	1 each	2179-CS/PAK
2179-CS Pole-mount Kit	1 each	2179-CS/PK
2179-CS Fibre Optic Closure (with DIN tray bracket)	1 each	2179-CS/DIN

Description

3M FFSS Heat Shrink Fibre Fusion Splice Sleeves

Transparent plastic tube and stainless steel bar for single fibre protector, ceramic strength bar for ribbon fibre protector designed to prevent stress and protect fusion fibre optic splices in field and factory operations. Sleeves are made ethylene vinyl acetate (EVA) with heat-activated memory which causes them to shrink under exposure to heat. Sleeves shrink tightly to exclude air and hold the bar firmly, preventing abrasion of delicate glass fibres.
Three different versions are available, single fibre sleeve (60 mm in length). 6 fibre ribbon sleeve (40 mm in length) and 12 fibre ribbon sleeve (40 mm in length). Minimum shrink temperature is 90°C, heating time 2-3 min @ 120°C. Minimum diameter after shrink; for single fibre sleeve 3.00-3.20 mm, for 6 fibre ribbon sleeve is 4.25-4.45 mm and for 12 fibre ribbon sleeve 5.35-5.55 mm.

Type/Order text   Ref.-No.

Description	Packaging	Min. Order	
1 single fibre fusion splice sleeve	50 ea/bag	1000 ea.	FFSS-1
6 fibre ribbon fusion splice sleeve	25 ea/ bag	50 ea.	FFSS-6
12 fibre ribbon fusion splice sleeve	25 ea/ bag	50 ea.	FFSS-12

6.1 Splice Protection Products
6.1.1 Closures
3M™ FibrDome

Description

3M FibrDome Fibre Optic Splice Closure

FibrDome Closures protect fibre optic splices from the elements while providing fast and easy no-cost reentry. These closures can be installed in above-ground pedestals, hand-holes, and mounted on poles and strands. The FibrDome closure utilizes proven sealing technology and over 30 years of experience with copper protection. Fibre splices are enclosed in a polypropylene dome that is clamped together with a stainless steel latch and sealed with an O-ring. Pre-stretched tubing is slipped over the base of the closure and onto a gel sealing collar. Pulling the plastic rip cord shrinks the tubing to an air and water tight seal around the collar. No special tools, power supply or torches are required for assembly. To re-enter, simply pull the latch.

Available in two sizes, the FibrDome closure accommodates various cable constructions and splice capacities. Each tray holds two splice inserts. Four types of inserts are available to hold Fibrlo Splices or Fibrlok Multi-Fibre Splices, fusion or mass fusion splices.

For quick installation and field-proven performance specify 3M fibre protection products.

Highlights:

- Proven 3M sealing technology
  - High product reliability; minimised maintenance costs
- Easy installation
  - No special tools, torch or power supply required
- Ready access
  - No-cost re-entry to splices; craft friendly
- Flexible fibre management
  - Accommodates a variety of cable sizes
- Flexible splice capability
  - 1 - 96 fibres in discrete splices; 4 - 432 fibres in ribbon splices
- Minimal training
  - Cost savings
- Gel end seal technology
  - No compounds to mix; air tight seal over multiple cable configurations
- 100 lb. strain relief with shield bond connector assembly
  - Long product life; craft friendly—no exposed metal
- Rugged and versatile design installed in a variety of
  - One system fits all; inventory costs savings environments

Technical characteristics:

3M FibrDome Closure Specifications

Type	FD06	FD08
Dome size	57,15 x 14,2 x 9,4	59,7 x 17,8 x 13,71
cm (in.)	(22.5 x 5.6 x 3.7)	(23.5 x 7.0 x 5.4)
Number of trays	2	4
Number of cables	6	6
Splicing capacity		
Fibrlok™ Universal Splice	24	48
Fibrlok™ Multi-Fibre Splice	16 (192 fibres)	32 (384 fibres)
Fusion	48*	96*
Mass fusion	20 (240 fibres)	36 (432 fibres)
Express capacity		
Single tube discrete	228,6 (90) length	228,6 (90) length
cm (in.)	192 fibres stored in trays	192 fibres stored in trays
Buffer tube	228,6 (90) length	228,6 (90) length
cm (in.)	120 fibres maximum	216 fibres maximum
	(4 buffer tubes or	(8 buffer tubes and
	120 fibres stored in trays)	120 fibres stored in trays)
Ribbon	172,7 (68) length	172,7 (68) length
cm (in.)	288 fibres maximum	288 fibres maximum
	(24 ribbons stored in trays)	(24 ribbons stored in trays)
Cable capacity		
Main port (2)	8,9 - 21,1	12,5 - 33,0
mm (in.)	(0.35-0.83)	(0.49-1.30)
Drop port (4)	8,9 - 17,5	8,9 - 20,1
mm (in.)	(0.35-0.69)	(0.35-0.79)

Protects and organises fibre optic cables and splices with easy access–shown mounted in a 4220 Series Cabinet

6

* Double stacked fusion sleeves

6.1.1 Closures
3M™ FibrDome

Type/Order text	Ref.-No.

Follow 5 Easy Steps for Ordering

1. FD06 FibrDome Closure with splice tray

2. FD08 FibrDome closure

3. FD06 FibrDome closure with transition tray and 2 splice trays

4. FD08 FibrDome closure with 4 splice trays

5. Scotchlok™ 4460-D/FO Shield Bond Connector Assembly

1 For complete installation select one of the following:

	Pkg.	Min. Order	Ref.-No.
FD06 FibrDome Closure			FD06
Contains transition tray and one splice tray; capacity for one more splice tray	1 kit/cs.	1 each	
FD08 FibrDome Closure			FD08
Contains transition tray and one splice tray; capacity for three more splice trays	1 kit/cs.	1 each	
FD06-D FibrDome Closure			FD06-D
Contains transition tray, one splice tray, two 4460-D/F0 Shield Bond Connectors, two 2521-F Splice Inserts for fusion splices, and two 2521-FL Splice Inserts for Fibrlok™ splices	1 kit/cs.	1 each	
FD08-D FibrDome Closure			FD08-D
Contains transition tray, one splice tray, two 4460-D/F0 shield bond connectors, two 2521-F splice inserts for fusion splices, and two 2521-FL Splice Inserts for Fibrlok™ splices	1 kit/cs.	1 each	

2 Choose one package for each splice tray:

	Pkg.	Min. Order	Ref.-No.
2521-FL Fibrlok™ Splice Insert			2521-FL
Holds six single mechanical splices in each insert	2/pkg. 12 pkg./cs.	12 pkg.	
2521-MF Fibrlok™ Multi-Fibre Splice Insert			2521-MF
Holds four multi-fibre splices in each insert	2/pkg. 12 pkg./cs.	12 pkg.	
2521-F Fusion Splice Insert			2521-F
Holds twelve discrete fusion splices in each insert	2/pkg. 12 pkg./cs.	12 pkg.	
2521-RF Ribbon Fusion Splice Insert			2521-RF
Holds five ribbon fusion splices in each insert	2/pkg. 12 pkg./cs.	12 pkg.	

3 Choose one shield bond connector or strength member clamp for each cable:

	Pkg.	Min. Order	Ref.-No.
Scotchlok™ 4460-D/FO Shield Bond Connector Assembly 4460-D/FO			
Provides grounding and central strength member clamp	100/cs.	100 each	
FD110 Ground Kit			FD110
Includes two Scotchlok™ 4460-D/FO Shield Bond Connector Assemblies and two ground straps	12 kit/cs.	12 each	
2172 Strength Member Clamp for Fibre Cable			2172
Clamps strength member to cable sheath	100/cs.	100 each	

6.1.1 Closures
3M™ FibrDome

Type/Order text	Ref.-No.

Ordering Information (continued)

1. FibrDome Closure Splice Tray Kit

2. FibrDome Cable Addition Kit

3. 2520 FibrTube Transition Tubing

4 Choose additional trays as necessary :

	Pkg.	Min. Order	
FD100 FibrDome Closure Splice Tray Kit Contains splice tray, cover, cable ties and FibrTube transition tubing	3 kits/cs.	3 each	**FD100**

5 Choose additional accessories as necessary :

	Pkg.	Min. Order	
FD106 Cable Addition Kit Contains PST, gel strip, cable ties, sheath scuff, FibrTube transition tubing; for re-entry into FD06 Closure	1 kit/cs.	1 each	**FD106**
FD108 Cable Addition Kit Contains PST, gel strips, cable ties, sheath scuff, FibrTube transition tubing; for re-entry into FD08 Closure	1 kit/cs.	1 each	**FD108**
2520 FibrTube Transition Tubing Protects fibres between trays; accommodates ribbon fibres; cut in one-foot lengths	50/cs.	50 each	**2520**
2520-3FT FibrTube Transition Tubing Protects fibres outside trays; accommodates ribbon fibres; cut in three-foot lengths	24/cs.	24 each	**2520-3FT**
4600-GSS Gel Sealant Strip Gel strip seals cables and gel core in FD06 or FD08 FibrDome Closures	50/cs.	50 each	**4600-GSS**
FD120 Mounting Bracket Mounting bracket for FD06/FD08 closures	1 kit/cs.	1 each	**FD120**
FD130 Strand Mount Bracket Strand mounting bracket for FD06/FD08 closures with three clamps	1 kit/cs.	1 each	**FD130**
FD130-S Strand Mount Bracket, single clamp Strand mounting bracket for FD06/FD08 closures with one clamp around closure base	1 kit	1 each	**FD130-S**
FD06 Pull 'N' Shrink Tubing	5/cs.	5 each 36402	**FD06-PST**
FD08 Pull 'N' Shrink Tubing	5/cs.	5 each 36403	**FD08-PST**

6.1 Splice Protection Products
6.1.1 Closures
LightLinker™

The LightLinker System

The LightLinker system is a full series of splice closures and trays used for housing, organising and protecting single or mass fusion fibre splices. Completely modular in design, the system offers total flexibility to meet the evolving requirements of worldwide fibre optic networks.

A full range of closure sizes, diameters from 76 - 241 mm (3- 9-1/2") in combination with lengths up to 914 mm (36"), gives systems designers multiple options when considering splice location options. And while smaller size closures would normally be considered optimal, larger LightLinker closures can be used in many cases to provide extra storage space for ribbon or buffer tubed fibre.

LightLinker closures may be used with all types of fibre optic cable and for cut, uncut and taut sheath applications.

| **Type/Order text** | | | | | **Ref.-No.** |

LL2 Series: Models 4, 5, 7, 8, 9 and 12

Descriptions/ Dimensions mm (in.)	Max. Tray Stacked/ Hinged	Quantity in Standard Package	Min. Order/ Ordering Multiple	Weight per Min. Order kg (lbs.)	
LL2 LightLinker™ Fibre Closures Universal Inline and Butt (LL-FOT001 trays are not included) Models 4 and 5.					
Fibre Closure/Butt	4/4	1 pkg. or 2 x 2 Cables	1	6,3 (14.0)	**LL2-418**
Fibre Closure/Butt	6/4	1 pkg. or 2 x 2 Cables	1	6,3 (14.0)	**LL2-518**
LL2 LightLinker Fibre Closures Butt only with Slack Tray For in-line applications, purchase one (1) LBI 10K conversion kit. (LL-FST2000 trays are not included) Models 7, 8 and 9.					
Fibre Closure/Butt x 4 Cables	8/8	1	1	9,07 (20)	**LL2-718**
Fibre Closure/Butt x 4 Cables	8/8	1	1	10,9 (24)	**LL2-727**
Fibre Closure/Butt x 4 Cables	8/8	1	1	12,,7 (28)	**LL2-736**
Fibre Closure/Butt x 4 Cables	8/8	1	1	14,5 (32)	**LL2-744**
Fibre Closure/Butt x 4 Cables	8/8	1	1	12,0 (26.5)	**LL2-827**
Fibre Closure/Butt x 4 Cables	8/8	1	1	14,5 (32)	**LL2-836**
Fibre Closure/Butt x 4 Cables	10/8	1	1	17,0 (37.5)	**LL2-844**
Fibre Closure/Butt x 4 Cables	10/8	1	1	14,1 (31)	**LL2-927**
Fibre Closure/Butt x 4 Cables	10/8	1	1	16,3 (36)	**LL2-936**
Fibre Closure/Butt x 4 Cables	12/8	1	1	19,0 (42)	**LL2-944**
Fibre Closure/Butt x 4 Cables	24/8	1	1	18,6 (41)	**LL2-1227**
Fibre Closure/Butt x 4 Cables	46/8	1	1	21,8 (48)	**LL2-1236**
LL4 LightLinker Fibre Closures Fire Retardant-Butt only with Slack Tray					
Fibre Closure/Butt x 4	8/8	1	1	10,0 (22)	**LL4-718**
Fibre Closure/Butt x 4	8/8	1	1	13,6 (30)	**LL4-727**
Fibre Closure/Butt x 4	8/8	1	1	17,7 (39)	**LL4-736**
Fibre Closure/Butt x 4	8/8	1	1	21,3 (47)	**LL4-744**
Fibre Closure/Butt x 4	8/8	1	1	14,5 (32)	**LL4-827**
Fibre Closure/Butt x 4	8/8	1	1	18,6 (41)	**LL4-836**
Fibre Closure/Butt x 4	10/8	1	1	22,2 (49)	**LL4-844**
Fibre Closure/Butt x 4	10/8	1	1	17,7 (39)	**LL4-927**
Fibre Closure/Butt x 4	10/8	1	1	21,7 (48)	**LL4-936**
Fibre Closure/Butt x 4	12/8	1	1	24,5 (55)	**LL4-944**

6.1 Splice Protection Products

6.1.1 Closures LightLinker™

Type/Order text	Ref.-No.

LL"Z" Series

Descriptions/ Dimensions mm (in.)	Max. Tray Stacked/ Hinged	Quantity in Standard Package	Min. Order/ Ordering Multiple	Weight per Min. Order kg (lbs.)	

LL"Z" LightLinker Fibre Closures Universal Inline and Butt
(LL-FOT001 trays are not included)

Fibre Closure/Butt	4/4	1	1	2,7 (6.0)	**LLZ-416**
		or 2 x 2 Cables			
Fibre Closure/Butt	4/4	1	1	3,1 (7.0)	**LLZ-416-FR**
		or 2 x 2 Cables/Fire Retardant			

Conversion Kits and Trays

Descriptions/ Dimensions mm (in.)	Quantity in Standard Package	Min. Order/ Ordering Multiple	Weight per Min. Order kg (lbs.)	

Conversion Kits
Converts standard 2-Type closures to LightLinker Fibre Optic Closure.

Conversion kits for LightLinker	**1 kit**	1	2,4 (5.3)	**L-CLK10**
Conversion kits for LightLinker	**1 kit**	1	2,5 (5.5)	**L-CLK11**
Conversion kits for LightLinker	**1 kit**	1	2,9 (6.5)	**L-CLK12**

FF-FST 2000 Tray Kits/Hinged

Universal (Loose or Ribbon)	**10**	1 pkg.	1,8 (3.9)	**LL-FST2000-U**
Loose Tube	**10**	1 pkg.	1,8 (3.9)	**LL-FST2000-L**
Ribbon	**10**	1 pkg.	1,8 (3.9)	**LL-FST2000-R**

Trays/Stacked
Single Fusion 12-Fibre mini tray	4	1	0,5 (1.1)	**LL-FOT001**

Trays/Hinged
Single Fusion 12-Fibre mini tray	4	1	0,5 (1.1)	**LL-FOT001H**

6.1 Splice Protection Products
6.1.1 Closures
LightLinker™

Type/Order text	Ref.-No.

LL2, LL4 and LL"Z" Accessories

Descriptions/ Dimensions mm (in.)	Quantity in Standard Package	Min. Order/ Ordering Multiple	Weight per Min. Order kg (lbs.)	
Anti-rotate stops	25	1 pkg.	0,9 (2.0)	**ARS-M25**
Endplate LL2-228.6 (9) 8-cable	1	1 pkg.	4,3 (9.5)	**L2D28EK**
Endplate LL2-228.6 (9) 8-cable-fire retardant	1	1 pkg.	4,3 (9.5)	**L2D48EK**
Fibre adapter in-line kit	1	1 pkg.	1,8 (4.0)	**LBI10K**
Fibre add-cable kit	1	1 pkg.	1,4 (3.2)	**LCA10K**
Spool: endplate adapt for fibre cables 4-HO	1	1 pkg.	0,9 (2.0)	**LKWSP04-100**
Spool: endplate adapt for fibre cables - 4100, fire retardant	1	1 pkg.	0,9 (2.0)	**LKWSP04-100-FR**
Fibre re-entry kit	1	1 pkg.	0,7 (1.5)	**LRE10K**
Hinged kit 4-tray	1	1 pkg.	0,5 (1.0)	**LHTM4K**
Hinged kit 8-tray	1	1 pkg.	0,5 (1.0)	**LHTM8K**
Plugging spools: fibre cables	25	1 pkg.	0,9 (2.0)	**LFPS-M25**
Plugging spools: KX endplate	10	1 pkg.	0,7 (1.5)	**LKX-M10**
Sheath retension for 8-fibre cables	8	1 pkg.	0,7 (1.5)	**LSRK10**
Straps: velcro tray locking	25	1 pkg.	0,5 (1.0)	**LVST-M25**
Tape: neoprene 3048.0 (120)	10	1 pkg.	2,7 (6.0)	**LNPT-M10**
Tape: RTF 2438.4 (96)	10	1 pkg.	1,8 (4.0)	**LRTF96-M10**

Aerial Hanger Kits

For supporting closure assembly to strand wire in aerial applications.

Aerial Hanger Kit	2	20 kits	3,2 (7)	**AH20K**
Aerial Offset Hanger Kit	2	10 kits	6,3 (14.0)	**AOH40K**

Back Cover Clip Kit

For supporting backing cover to endplates during splicing. Also keeps endplates parallel and properly spaced.

A, B, C, D, E and Z Covers	2	20 kits	0,9 (2)	**BCC10K**

Bolts

For replacing lost or damaged bolts in endplates and covers.

7.9 x 47.6 (5/16 x 1-7/8) - Short	25	4 pkgs.	2,7 (6)	**SB1875K**
7.9 x 60.3 (5/16 x 2-3/8) - Long	25	4 pkgs.	3,2 (7)	**SB2375K**

6.1 Splice Protection Products

6.1.1 Closures LightLinker™

Type/Order text	Ref.-No.

Accessories/Replacement Parts for LightLinker Fibre Optic Closures

Descriptions/ Dimensions mm (in.)	Quantity in Standard Package	Min. Order/ Ordering Multiple	Weight per Min. Order	
Channel Bars				
For replacing lost or damaged channel bars in LightLinker. T = Threaded, U = Unthreaded.				
2-LightLinker - T 470 (18.5)	6	1 kit	(5)	**CTB9K**
2-LightLinker - T 699 (27.5)	6	1 kit	(5)	**CTB10K**
2-LightLinker - T 914 (36.0)	6	1 kit	3,2 (7)	**CTB11K**
2-LightLinker - T 1130 (44.5)	6	1 kit	4,1 (9)	**CTB12K**
2-LightLinker - U 470 (18.5)	6	1 kit	2,3 (5)	**CUB9K**
2-LightLinker - U 699 (27.5)	6	1 kit	2,3 (5)	**CUB10K**
2-LightLinker - U 914 (36.0)	6	1 kit	3,2 (7)	**CUB11K**
2-LightLinker - U 1130 (44.5)	6	1 kit	4,1 (9)	**CUB12K**
Channel Bar Inserts for 2-Type Closure				
For replacing lost or damaged channel bar inserts.				
Channel Bars Threaded Inserts	25	4 pkgs.	1,4 (3)	**CBN10K**
Channel Bars Unthreaded Inserts	25	4 pkgs.	1,4 (3)	**CBW10K**
Endplate Inserts				
For replacing lost or damaged endplate inserts.				
Threaded Endplate Inserts	25	4 pkgs.	1,8 (4)	**SNI300K**
Unthreaded Endplate Inserts	25	4 pkgs.	1,8 (4)	**SWI300K**
Jacking Plates				
For replacing lost or damaged jacking plates.				
Threaded Jacking Plate	25	4 pkgs.	1,4 (3)	**CIT68K**
Unthreaded Jacking Plates	25	4 pkgs.	1,4 (3)	**CIU68K**
Pressure Valve				
For replacing lost or damaged pressure valves.				
Pressure Valve Assembly	10	10 pkgs.	2,3 (5)	**FVA11K**
RC Re-enterable Sealing Cord				
For sealing the groove along the length of cover halves.				
AA Length Cover = 1 roll RC 45; A Length Cover = 1 roll RC62; B and C Length Covers = 1 roll RC96, Z-Closure - 1 roll RC36				
	1	96 rolls	8,6 (19)	**RC36-8**
	1	96 rolls	10 (21)	**RC45-8**
	1	96 rolls	13 (29)	**RC62-8**
	1	96 rolls	21 (46)	**RC96-8**
RTE Re-enterable Sealing Tape				
For sealing cover halves and endplates.				
2Y2, 2X2 & 2A2 series = 1 roll RTE36 required for 2 each endplates; 2B2 series = 1 roll RTE46 required for 2 each endplates.				
2C2 & 2D2 series = 1 roll RTE62 required for 2 each endplates; 2E2 series = 2 rolls RTE 46 required for 2 each endplates.				
	1	108 rolls	20 (43)	**RTE36-8**
	1	108 rolls	26 (58)	**RTE46-8**
	1	108 rolls	17 (38)	**RTE62-8**
Solvent Cleaning Wipes and Plastic Gloves				
For preparing plastic closure halves, endplates and cables before applying sealing tapes.				
Solvent Cleaning Wipes	100	1 pkg. and Plastic Gloves	2,3 (5)	**CSSC20-M100**

Description

Pressure-resistant optical fibre closure for heavy duty applications

The Gf-DKSM is a modified 2-Type Closure to protect splices in fibre optic cables. Suitable for pressurised and unpressurised access and distribution networks.

Gf-DKSM can accommodate 180 single fibre splices in 15 splice trays and is suitable for all outdoor optical fibre cables. The closure consists of two half-shells and two endplates. The closure parts are sealed against each another and the cable with a permanent elastic sealant.

The closure has a fully wrap around design for the installation of uncut, no-slack, mid-span applications. Unused cable ports are sealed with dummy plugs. The Gf-DKSM is designed for installation of DIN splice trays.

Alignment bars are available to keep closure endplates in place, during the installation. Additionally, the Gf-DKSM is equipped with a valve and a compression-resistant valve cap.

The closure can be used either as a butt closure or, using an additional closure adapter spool, as an in-line closure.

Highlights:

- Complete kit, suitable for DIN splice trays
- capacity of up to 180 splices
- up to four cable entries per side
- suited for in-ground, cable shaft and building installation
- pressure and water resistant
- easy reopening and closing
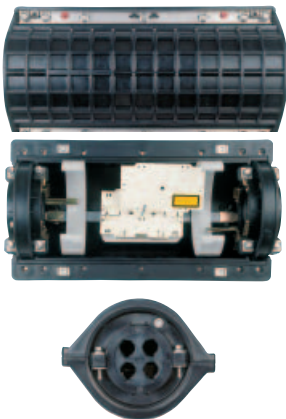- no heat source (open flame, gas) required

Delivery:

- 1 set closure body with upper and lower half-shell
- 1 endplate with spool adapter for four cable entries and cable strain relief
- 1 endplate with dummy plugs
- 1 tray support for 15 trays
- 1 attachment rail for tray tray
- 1 set of sealing tapes
- 1 set of washers
- installation instructions

Type/Order text	Ref.-No.

Gf-DKSM
for 12 to 180 single fibre splices

Suitable for up to 15 DIN splice trays. (Splice tray not included).

Dimensions (HxWxD): 470 x 206 x 258 mm
Colour: black, Weight: approx. 6,7 kg, Packaging: 1 unit

Cable spool adapter, left side:
4 round inlets for cables, 5 mm to 25 mm

Cable spool adapter, right side: optional
4 round inlets for cables, 5 mm to 25 mm

N501294A0000

3M Gf-DKSM-L

Fiber Closure for uncut and taut sheath applications

Gf-DKSM-L closure is based on the 2A2C closure and provides 915 mm sheath opening and is suitable for branching out of taut sheath (no slack in-line) cables. 1 or 2 trays inside the closure can accommodate one bundle or up to 12 fiber splices for branching.

Technical characteristics

Dimensiones (WxHxD):	1130 x 165 x 215 mm
Colour: Black	
Weight appr.:	12,8 kg
Cable openings both sides:	41 mm and 25 mm

Type/Order text	Ref.-No.

Gf-DKSM-L

N501296A0000

6.1 Splice Protection Products
6.1.1 Closures
3M™ Gf-DKSM

Type/Order text		Ref.-No.

3M Gf-DKSM sealing kits

LRE-10K
Re-entry kit for re-entery and closure
without cable addition
Packaging: 1 set

N501330A0000

LCA-10K
Cable addition kit for adding cable
including opening and re-closing
Packaging: 1 set

N501331A0000

LBI-10K
Fibre adapter in-line kit for using the Gf-DKSM as in-line closure
for up to 4 x 25 mm diameter
Packaging: 1 set

N501332A0000

3M Gf-DKSM assembly tools

WCT 11K
Cutting tool for washers to cable diameter
Packaging: 1 unit

WCT 11K

TK-TSD
Tool kit for closure installation
For closing and re-opening
of DKSM closures

Delivery:
• Torque wrench 3/8"
• Measuring tape 3 m
• Scissors
• Speed wrench 3/8"
• Socket driver with grip 1/4"
• Socket extender 60 mm, 3/8"
• Hexagon sockets 3/8", 1/2" and 7/16"
• Hexagon sockets 1/4", 3/8" and 7/16"
• Hexagon sockets top SW 12 and 13 mm
• Installation instruction DKSM

TK-TSD

3M Gf-DKSM splice tray

FO Splice tray
Splicing tray conforming to DIN 47662 and Telecom standards for
up to 12 single fibre splices, strain relief components included
Packaging: 10 units

29026-500 30

Splice insert for crimp splice protector
for 12 single fibre splices; Packaging: 10 units

05-760-08000

Splice insert for shrink splice protector
for 6 single fibre splices, two per splicing tray possible
Packaging: 10 units

05-760-11900

Splice insert for Fibrlok
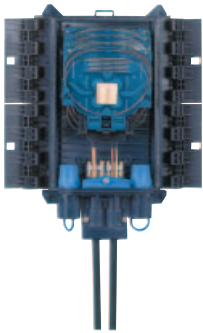for 6 single fibre splices, two per splicing tray possible
Packaging: 10 units

SH-FF

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEO

Fibre Optic Closure System for Access Networks

BPEO 1

BPEO 2

BPEO 3

BPEO: Fully Mechanical, Easy to Install, No Specific Tools BPEO is the newest generation of watertight splice-protection closures for FTTx networks. The BPEO range of product is designed for all types of networks from 12 to 432 optical fibres. These fully mechanical, watertight/sealed closures are designed for installations in the outside plant, in manholes or in directly buried, pole or wall applications. The design allows multiple re-entries.

Each closure is composed IP68 Protection class of:
- body
- cable seals
- tray support
- splicing trays

The range is comprised of three sizes for different capacities and applications. The closure features small outer dimensions. The design of the full range is based on a low depth in order to fit in existing manholes or premises. Primary use is in butt configuration.

BPEO Value
- Fully mechanical
- Unique latch mechanism for body seals and re-entry
- No resin, no power supply, no chemicals required
- No specific tools required
- Multiple re-entry
- Closure re-entry without breaking cable seals
- Fully mechanical cable seals

BPEO: The Closure
The closure is made up of two parts designed as a fast locking system with captivated clamps.
- No specific tools for the re-entries
- Watertightness is ensured by a half-shell gasket (resilient sealing)

ECAM: The Mechanical Cable Entries
Two types are available:
- Single entry for cables up to 18 mm (0.71 in.)
- Double entry for midspan access application.

The ECAM entries have two main functions:
- Watertightness and anchoring
- The watertightness is fully mechanical
- The anchoring is done on the sheath, the central strength member and the strain-relieves

The installation of the cable entry is done completely outside the closure. The cable entry is fixed on the closure simply by clipping.

ECAM, the fully mechanical cable entry, will be very useful for connections and the local loop because of its simplicity.

The BPEO is designed for all the locations in the FTTx network:
- Installation in manholes
- Directly buried
- Pole or wall mounting
- Aerial mounting
- Continuous pressure: 80 mbar

Features	Advantages	Benefits
Accepts a range of fibre optic cables	Will handle a fibre optic cable range of 12 to 432 fibres	Suitable for use in optical fibre backbones in existing premises
Watertight/sealed	Can be used in aerial, buried or underground applications	Will keep water out of the splice in typical environmental conditions
Unique latch mechanism	Easy to use, tool free opening and closing of the closure	No special tools are needed to close or re-enter the BPEO
ECAM Mechanical Single Port ports Cable Seal	Suitable for use on a wide range of cable diameters	Easy to use method of sealing the cable entry from the ingress of water, dirt, dust and bugs. Also provides superior cable strain relief.
Grounding kit	Facilitates grounding continuity	A reliable, safe, durable bonding and ground feature without using a cable port

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEO

3M BPEO 1 Closure

BPEO 1 Butt Closure (N501198A0000) - Example

Butt closure for protection of straight splices. For 48 single fibre splices.
Dimensions (HxWxD):
349 x 204 x 92 mm
Colour: black; Packaging: 1 unit
Weight: approx. 1,8 kg

Cable ports, bottom:
4 round ports for cables,
5 - 18 mm

Delivery**:**
- 1kit wall or pole mount bracket
- 2 round dummy plugs
- 2 single ECAM cable seal
- 4 splice trays 10 mm for 12 single fibre splices, splice insert for shrink splice protector included
- BPEO closure body
- installation instructions

BPEO 1 Branch closure (N501199A0000) - Example

Branch closure for cut or uncut cables.
For 48 single fibre splices
Dimensions (HxWxD):
349 x 204 x 92 mm
Colour: black; Packaging: 1 unit
Weight: approx. 1,8 kg

Cable ports, bottom:
2 round ports for cables,
5 - 18 mm
1 oval port for 2 cables 5 mm to 20 mm

Delivery:
- 1kit wall or pole mount bracket
- 2 round dummy plugs
- 1 set double ECAM cable seal for cut or uncut cables
- 4 splice trays, 10 mm for 12 single fibre splices, insert for shrink splice protection included
- BPEO closure body
- installation instructions

BPEO 1 Fibre Distribution Closure (N501272A0000) - Example

Distribution closure both cut and uncut cables having the possibility of installing 6 drop cables.
For 48 single fibre splices
Dimensions (HxWxD):
349 x 204 x 92 mm
Colour: black; Packaging: 1 unit
Weight: approx. 1,8 kg

Cable ports, bottom:
6 round cable ports, 4-8 mm
1 oval cable port for 2 cables, 5-20 mm

Delivery
- 1kit wall or pole mount bracket
- 6 each 8 mm cable seals
- 1 double ECAM for oval port
- 4 trays, 10 mm. Heat shrink splice protector insert included
- BPEO closure body
- installation instructions

Typical closure configurations. Different configurations are available upon request.

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEO

3M BPEO 2 Closure

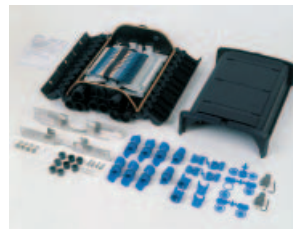**BPEO 2 Butt closure (N501240A0000) - Example**

For 144 single fibre splices.
Dimensions (HxWxD):
510 x 320 x 148 mm
Colour: black
Packaging: 1 unit
Weight: approx. 4,9 kg

Cable ports, bottom:
6 round ports for cables,
5 - 18 mm
1 oval port for 2 cables 5 mm
to 27 mm

Delivery:
• 1kit wall or pole mount bracket
• 4 round dummy plugs
• 1 dummy plug for oval port
• 2 single ECAM seal
• 12 splice trays 10 mm for 12 single fibre splices,
  including splice insert for shrink splice protector
• BPEO closure body
• installation insturctions

BPEO 2 In-Line (N501240A0000) - Example

In-line closure for 144 single
fibre splices.
Dimensions (HxWxD):
510 x 320 x 148 mm
Colour: black; Packaging: 1 unit
Weight: approx. 4,9 kg

Cable ports, bottom:
6 round ports for cables,
5 - 18 mm
1 oval port for 2 cables 5 mm
to 27 mm

Cable ports top:
6 round ports for cables,
5 - 18 mm

Delivery:
• 1kit wall or pole mount bracket
• 10 round dummy plugs
• 1 dummy plug for oval port
• 2 single ECAM cable seals
• 12 splice trays 10 mm for 12 single fibre splices,
  splice insert for shrink splice protector included
• BPEO closure body
• installation instruction

Typical closure configurations. Different configurations are available upon request.

6.1   Splice Protection Products

6.1.1 Closures
3M™ BPEO

Description

3M BPEO 3 Closure

BPEO 3 Butt closure (N501284A0000) - Example

Cable ports, bottom:
6 round ports for cables,
5 - 18 mm
1 oval port for 2 cables 5 mm
to 27 mm

For 288 single fibre splices.
Dimensions (HxWxD):
680 x 320 x 148 mm
Colour: black
Packaging: 1 unit
Weight: approx. 6.7 kg

Delivery:
• 1kit wall or pole mount bracket
• 4 round dummy plugs
• 1 dummy plug for oval port
• 2 single ECAM cable seal
• 24 splice trays 10 mm for 12 single fibre splices,
  splice insert for shrink splice protector included
• BPEO closure body
• installation instruction

Typical closure configurations. Different configurations are available upon request.

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEO

Description

3M BPEO Size I

Butt Closure/Straight Splice	Branch Closure	Fibre Distribution Closure
4 Round Ports for Cables: 5 – 18 mm (0.20 – 0.71 inches)	**2 Round Ports for Cables:** 5 – 18 mm (0.20 – 0.71 inches)	**6 Round Ports for Cables:** 4 – 8 mm (0.16 – 0.31 inches)
	1 Oval Port for two cables: 5 – 20 mm (0.20 – 0.79 inches)	**1 Oval Port for two cables:** 5 – 20 mm (0.20 – 0.79 inches)

Type/Order text   Ref.-No.

Application	No. of Fibres	No. of Trays	Type of Fibre	No. of Supplied Cable Seals	
Butt Closure	48	4	- Bare Fibre S.F.* - Bare Ribbon M.F.* - Microstructure S.F.	2 Single	**N501198A0000**
Butt Closure	64	8	- Buffer Tubes S.F.	2 Single	**N501219A0000**
Butt Closure	96	8	- Bare Fibre S.F. - Microstructure S.F.	2 Single	**N501279A0000**
Butt Closure	96	12	- Bare Fibre S.F. - Microstructure S.F.	2 Single	**N501233A0000**
Branch Closure	48	4	- Bare Fibre S.F. - Bare Ribbon M.F. - Microstructure S.F.	1 Double	**N501199A0000**
Branch Closure	64	8	- Bare Fibre S.F. - Microstructure S.F.	1 Double	**N501260A0000**
Branch Closure	96	8	- Buffer Tubes S.F.	1 Double	**N501256A0000**
Branch Closure	96	12	- Bare Fibre S.F. - Microstructure S.F.	1 Double	**N501234A0000**
FD Closure	48	4	- Bare Fibre S.F. - Microstructure S.F. - Bare Ribbon M.F.	1 Double 6 Single	**N501272A0000**
FD Closure	64	8	- Bare Fibre S.F. - Microstructure S.F.	1 Double 6 Single	**N501259A0000**
FD Closure	96	8	- Buffer Tubes S.F.	1 Double 6 Single	**N501296A0000**
FD Closure	96	12	- Bare Fibre S.F. - Microstructure S.F.	1 Double 6 Single	**N501227A0000**

Typical closure configurations. Different configurations are available upon request.

* S.F. = Single Fusion
  M.F. = Mass Fusion

6.1   Splice Protection Products
6.1.1   Closures
3M™ BPEO

Description

3M BPEO Size II/III

Application	Front Side	Rear Side
BPEO II **Butt Closure**	**6 Round Ports for Cables:** 5 – 18 mm (0.20 – 0.71 inches) **1 Oval Port for two cables:** 5 – 27 mm (0.20 – 0.79 inches)	**Empty**
BPEO II **Inline Closure**	**6 Round Ports for Cables:** 5 – 18 mm (0.20 – 0.71 inches) **1 Oval Port for two cables:** 5 – 27 mm (0.20 – 0.79 inches)	**6 Round Ports for Cables:** 5 – 18 mm (0.20 – 0.71 inches)
BPEO III **Butt Closure**	**6 Round Ports for Cables:** 5 – 18 mm (0.20 – 0.71 inches) **1 Oval Port for two cables:** 5 – 27 mm (0.20 – 0.79 inches)	**Empty**

Type/Order text   Ref.-No.

Application	No. of Fibres Trays	No. of Splicing	Type of Fibre	No. of Supplied Cable Seals	
BPEO II Butt Closure	144	12, 10 mm tray	- Bare Fibre S.F.* - Bare Ribbon M.F.* - Microstructure S.F.	2 Single	**N501240A0000**
BPEO II Butt Closure	192	16, 5 mm tray	- Buffer Tubes S.F.	1 Double	**N501257A0000**
BPEO II Butt Closure	216	18, 5 mm tray	- Bare Fibre S.F. - Microstructure S.F.	1 Double	**N501273A0000**
BPEO II In-line	144	12, 5 mm tray	- Buffer Tubes S.F.	2 Single	**N501245A0000**
BPEO III Butt Closure	288	24, 10 mm tray	- Bare Fibre S.F.* - Bare Ribbon M.F.* - Microstructure S.F.	2 Single	**N501284A0000**
BPEO III Butt Closure	360	30, 5 mm tray	- Buffer Tubes S.F.	1 Double	**N501283A0000**

*   S.F. = Single Fusion
    M.F. = Mass Fusion

Typical closure configurations. Different configurations are available upon request.

6.1.1 Closures
       3M™ BPEO

Type/Order text	Ref.-No.

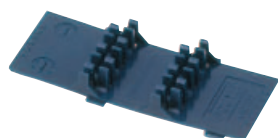### 3M BPEO Accessories
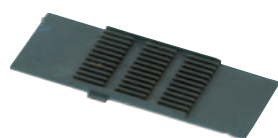
BPEO Splice insert – crimp splice protector for up to 12 single fibre splices per tray Packaging: 30 units		**N801388B0000**
FO crimp splice protector Packaging: 150 units		**05-760-08100**
BPEO Splice insert – shrink splice protector for up to 6 single fibre splices per tray Packaging: 30 units		**N801332B0000**
FO shrink splice protector, 60 mm Packaging: 100 units		**05-760-12000**
FO shrink splice protector, 45 mm Packaging: 100 units		**05-760-12100**

BPEO ECAM cable entry seal

|	
single ECAM cable seal **for cables from 5 mm to 18 mm diameter** for BPEO 1, 2 and 3, Packaging: 1 unit	**N721059A0000**
double ECAM cable seal **for cables from 5 mm to 27 mm diameter** for BPEO 2 and 3, Packaging: 1 unit	**N721069A0000**
double ECAM cable seal **for cables from 5 mm to 20 mm diameter** for BPEO 1, Packaging: 1 unit	**N721063A0000**
BPEO round dummy plug plug for unused 18mm ports for BPEO 1, 2 and 3 Packaging: 1 unit	**N641028A0000**

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEO

Description

Breakout adapter
Available in several variations, they guarantee the safe guidance and breakout of FO fibres to the splice trays.
Simply plug the adapter onto the incoming bundled fibre and lengthen with the bundled fibre tube.
Suitable for all bundled fibres with 2.4 mm to 3.2 mm OD.
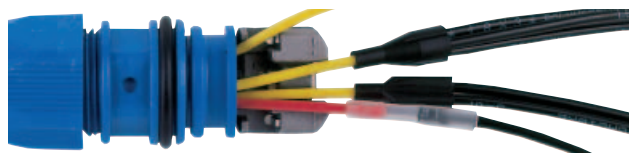
Type/Order text	Ref.-No.

3M BPEO Accessories

Breakout adapter 1/1 — N581078A0000
Consists of breakout adapter 1/1 and bundled fibre tube.
For the flexible guidance of incoming/outgoing fibres to the splice trays.
Packaging: 16 units, bundled fibre tube, 3.2 m

Breakout adapter 1/1 — N581124A0000
for the extension of bundled fibres with the bundled fibre tube.
Packaging: 10 units

Breakout adapter 2/1 — N581121A0000
To split one bundled fibre into two bundled fibre tubes.
Packaging: 10 units

Breakout adapter 1/4 — N581122A0000
To split one bundled fibre into four bundled fibre tubes.
Packaging: 10 units

Breakout adapter 1/6 — N581123A0000
To split one bundled fibre into six bundled fibre tubes.
Packaging: 10 units

Bundled fibre tube — N581125A0000
for lengthening/breaking out of bundled fibres.
Simply plug onto the breakout adapter.

ID: 1.8 mm; OD: 3.0 mm
Colour: black, Packaging: 25 m spool

BPEO earthing kit — N151064A0000
for a conductive connection and earthing
of all metallic cable components
Packaging: 4 units

BPEO number indentification kit — N621020A0000
for numerical identification of all splice trays
Packaging: 0 - 9 with 30 numbers each

6

Description
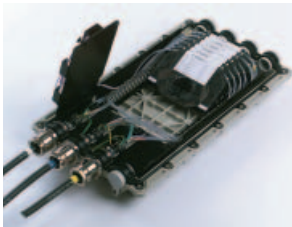
A range adapted to all network configurations
- In line applications
- Distribution applications
- Branching
- Butt configurations

Multi-purpose splice protection
A proved robustness adapted to all installation environments:
- Assembly in manholes
- Outside on a support
- Directly into the ground
- With no special protection.

Watertightness
- Shells made of high-pressure polyester
- Thick-section seals
- Stainless steel screws and nuts
- Continuous pressurisation possible up to 500 mb (boxes supplied pressurised).

Fibre management
Optimised working space:
- Cabling laid flat in the box.
- Fibre routing simplified
- No need to install overtubes to protect the fibres*
- Large-capacity trays
- New splice support enabling 24 fibres to be installed per tray for high-density applications
- New organiser with between 144 and 288 splices in the 3B model. The trays come in different colours for easier identification.

* Where necessary, overtubing kits are available as an accessory upon request.

Materials
Protective body: high-pressure polyester
Organiser: Thermoplastic material
Screws and nuts: Stainless steel
Protection rating:
Watertightness: 0.5 bar continuous
(IP 68 in compliance with NF EN 60 529)
Impact strength: 20 joules
(IK 10 in compliance with EN 50 102)
Cable traction resistance: 100 daN
Operational temperature
- 30° C to + 70 ° C

Technical characteristics:

Capacities

Box	Length in mm	Width in mm	Depth in mm
T1B	344	290	126
T1A	344	290	180
T2	538	276	164
T3B	654	360	127

Organiser	Tray number	Fibre capacity	Very High Density*
1C	1	12	24
2C2	24	48	
3C3	36	72	
1C PAS	1	12	24
2C PAS	2	24	48
3C PAS	3	36	72
6C 6	72	144	
10C	10	120	240
12C	12	144	288

For standard use, we advise to use the tray for 12 single splices (fusion). In our opinion, this is the configuration in which you bene-fit the most from the optimum conditions for cabling and maintenance.

*Very High Density: The internal volume and the tray splicing support make it possible to increase the density densify up to 24 single splices. This density is an advantage when cables with micro-structures are used. (Consult us)

Cable glands (to be ordered separately from the boxes)
Number of cable inlet ports in the boxes

Box	Model	Number of ports
T1B	Size 1 lower	5
T1B PAS	T1B midspan	3
T1A	Size1 upper	5
T2 Size 2	6	
T3B	Size 3 lower	4

Inlet kits (inlet port equipment)

Type	Model	Capacity in numbers of cables	Acceptable diametres in mm
			Ø 7 to 25
N 72 1044	Th	1	Ø 17 to 30
N 72 1045	Th	2	Ø 6 to 14
N 72 1043	Th/R	1	Ø 8 to 18
N 72 1040	Th/R	1	Ø 17 to 25

Th : Watertightness ensured by heat-shrinkable sheath
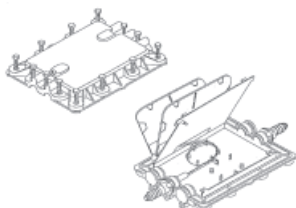Th/R : Special in-line cable (Resin + Thermoplast)

6.1.1 Closures
3M™ BPEM II

Type/Order text	Ref.-No.

FTTx – Outside Plant

BPEM II SCOOP Size1 B
Splice and distribution Organiser with 1 to 3 trays
5 cable mooring devices for cables of Ø 17 mm max.
Wall fastening device
Model T1B/1C for 12 fibres — N501138A0000
Model T1B/2C for 24 fibres — N501137A0000
Model T1B/3C for 36 fibres — N501143A0000

BPEM II SCOOP Size 1 B
Splice, distribution and pass throu cable Organiser with 1 to 3 trays
Receptacle for coiling 15 metres of in-line tube 4 cable mooring
devices for cables of Ø 17 mm max.
Wall fastening device
Model T1B/1C PAS, 12 fibres — N501144A0000
Model T1B/2C PAS, 24 fibres — N501139A0000
Model T1B/3C PAS, 36 fibres — N501145A0000
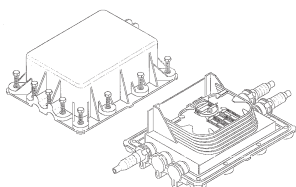
BPEM II SCOOP Size 1 A
Splice and distribution Organiser with 6 trays
4 cable mooring devices for cables of Ø 13 mm max.
(For other models of mooring: see accessories section)
Wall fastening device
Model T1A/6C for 72 fibres — N501140A0000
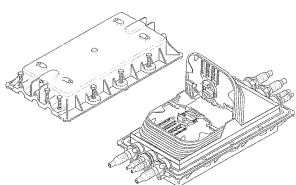
BPEM II SCOOP Size 2
Splice and distribution Organiser with 10 trays.
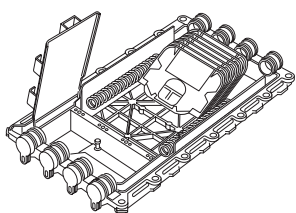4 cable mooring devices for 2 cables of Ø 13 mm max.
and 2 cables of Ø 25 mm max.
(For other models of mooring: see accessories section)
Wall fastening device
Model T2/10C, 120 fibres — N501141A0000

Equipped splice protection boxes

BPEM II SCOOP Size 3 A
Splice, distribution and pass throu cable Angled organiser for 12 trays
(assembled with 6 trays)
Receptacle for coiling 18 metres of in-line tube.
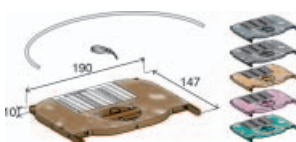4 cable mooring devices for cables of Ø 25 mm max.
Wall fastening device
(For other models of mooring: see accessories section)

Model T3/12C, assembled — N501114C0000
with 6 trays for 72 fibres

6-tray extension kit
Allows the capacity of the N 50 1114 C box to be increased
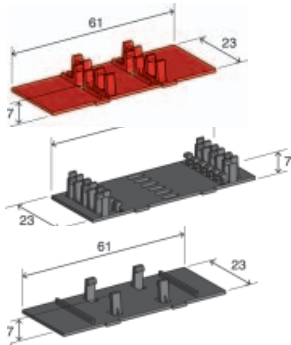from 72 to 144 fibres
Extension kit of 6 trays — N541046C0000

6

6.1 Splice Protection Products
6.1.1 Closures
3M™ BPEM II

| Type/Order text	Ref.-No.

Accessories for trays
Additional accessories for SCOOP trays
In the box kits, each tray comes with two supports enabling a total
of 24 fusion type single splices to be stored.
These two supports can be replaced by other models:

|	
Set of 30 ground splice supports, fusion type, Ø 5 mm (3 splices per support)	N801125B0000
Set of 30 FIBRLOK® mechanical single splice supports (6 splices per support)	N801016C0000
Set of 30 FIBRLOK® mechanical ground splice supports (1 splice per support)	N801127B0000
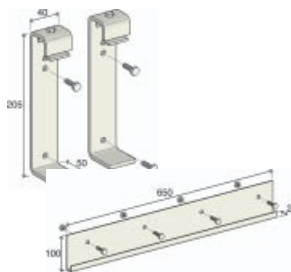
Mounting accessories
The BPEM II boxes are delivered as standard with two bars for
wall fastening.
These bars can be replaced by the old kits which are also usable:

Set of 2 brackets to be fixed on the rear of the box	371146000000
Wall-mounting rail (compatible with kit 3 71 146 00)	271753180000
Adjustable bracket For installing the boxes on supports equipped with plates	271835000000
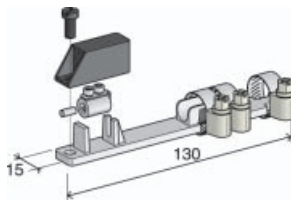
Additional securing devices (more than 2 cables)

Kit of 2 securing plates

For 1 cable, max. dia. 13 mm	NN 4 71 024 0000
For 1 cable, max. dia. 25 mm	N711010A0000
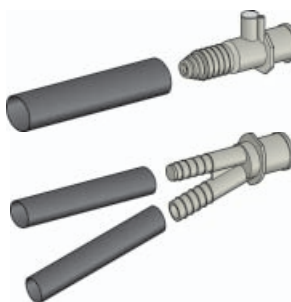
Cable glands
Watertightness ensured by a heat-shrinkable sheath
Set of 2 cable inlets

For a cable of Ø 7 to 25 mm	N721039A0000
For a cable of Ø 17 to 30 mm	N721044A0000

Set of 1 double cable inlet **For two cables of Ø 6 to14 mm**	N721045A0000

Watertightness ensured by a heat-shrinkable sheath and resin **Set of 2 cable inlets For a cable of Ø 17 to 25 mm** Maximum safety for buried cables	N721038A0000

Cable glands kits
Watertightness ensured by a heat-shrinkable sheath and resin
Cable inlets in 2 parts
Kits can also be used for repairing an inlet without
the cable needing to be cut.

Set of 2 cable inlets For a cable of Ø 8 to18 mm	N721043A0000
Set of 2 cable inlets For a cable of Ø 17 to 25 mm	N721040A0000