Solutions for Outside Plant

3M Telecommunications offers an extensive range of housings and closures for outside plant. They are available in a variety of sizes, made from either plastic or metal. For housings, the preferred connection technologies are SID or QSA/LSA plus. For closures the proven splice methods Scotchlok or MS2 are more appropriate. These give the maximum number of splices in the smallest possible space. With optical fibre cable, fibre management is more important than density. 3M Telecommunications extensive 'know-how' has produced a variety of closure sealing options. Both encapsulated and mechanically-closed closures are available. For example, the BPEO family of closures are re-enterable several times and do not require specialist tools or additional materials such as gaskets or mastic.

2

2.1   Copper splicing
2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

Over 40 years ago, 3M™ introduced the industry's original U element connector, the Scotchlok UR Connector. The latest series of connectors, the Scotchlok UR2, UY2, and UB2A Connectors, feature that same originality in technology advantages, building on the successful Scotchlok Connector's design, shape, color-coded cap concepts, and element technology.

The Series 2 Connectors additionally offer full wire range capability, increased port size to accommodate up to 2.08 mm (0.082") insulation sizes, double elements in all products, and a solvent resistant plastic construction.
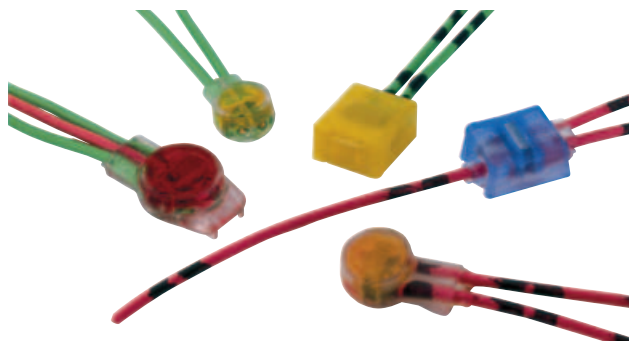
Scotchlok™

UR2/UR2-D Butt Connectors
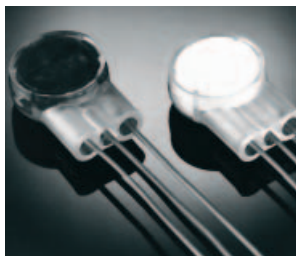
The UR2 Connector accepts two or three solid copper conductors that can be of different wire gauges for butt splicing. The connector is filled with a moisture resistant sealant and the UR2-D Connector is a dry version. **RUS Listed**

UY2/UY2-D Butt Connectors

The size of the UY2 Connector reduces the splicing bundle O.D. to a minimum. The wires joined can be of different wire gauges. Factory inserted sealant seals out moisture. In addition, the UY2 Connector is available in a dry version, UY2-D Connector. **RUS Listed**

UB2A/UB2A-D Tap Connectors

The UB2A Connector has a pre-crimp feature that gives the user a time-saving edge. By positioning the connector on the conductor and pre-crimping, the conductor is prevented from slipping out of the connector before the crimp is completed.

Like the UR2 Connector, a factory sealant insulates against moisture and seals out corrosion. The UB2A Connector permits tapping directly onto an existing conductor without interrupting service. In ready access closures, the UB2A Connector eliminates cutting cable pairs, opening circuits, and piecing out wires. The UB2A-D Connector is a dry version of the UB2A Connector. **RUS Listed**

211 Trim-Out Connector
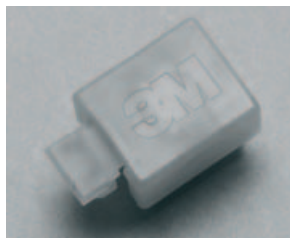
The Scotchlok™ 211 Trim-Out Connector is a polypropylene, moisture-resistant, self-stripping insulation displacement contact device with a built-in cut-off blade and a test port. Wires are positioned in the connector from the sides, allowing the 211 Connector to be used as a maintenance connector for replacing problem connectors without interrupting service. The 211 Connector may also be used for standard two-wire butt type splicing operations.

A pre-crimp feature permits easy, positive connector positioning by gripping the conductors until the crimp is completed. Excess wire is cut off when the connector is crimped. **RUS Listed**

557TG Self-Stripping Dropwire Connector

Use the Scotchlok 557TG aerial connector to electrically connect two dropwire solid copper legs, insulate and provide moisture protection for the connection.

2.1   Copper splicing
2.1.1   3M™ Scotchlok™ Connectors and Tools

Description

UP2 Butt Connector

A dry flame retardant two-wire, UL Listed connector for use on paper, pulp or PIC cable where moisture resistance is not a requirement.

UP3 Butt Connector

The UP3 Butt connector is a dry, flame-retardant two or three-wire connector for paper, pulp or PIC cable where moisture moisture resistance is not a requirement.

UPB Tap Connector

A dry, flame-retardant, two-wire UL Listed connector with a pre-crimp feature for use on pulp, paper or PIC cable where moisture resistance is not a requirement.

U1B Inline Connectors
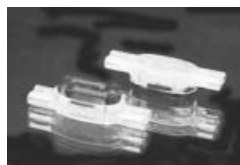
The U1B connector is a sealed moisture-resistant four-wire (1 full pair) inline connector for larger gauge solid copper

U1R Inline Connectors

The U1R connector is a sealed moisture-resistant four-wire (1 full pair) inline connector for larger gauge solid copper.

UDW2 Inline connetor

A sealed moisture-resistant, four-wire (1 full pair) inline aerial connector for copper or copper-coated steel conductors. Not for mid-span splices unless strain-relief is provided. Tape over-wrap is not required.

E-9Y Crimping Tool

Stepped jaws and long nose provide parallel crimping action. Features include a side wire cutter, insulated handles, and a return spring. Not recommended for any 19 gauge, 3 wire application due to fatigue factor.

E-9J Crimping Tool

The E-9J tool is a lightweight, handheld tool featuring a single-stroke, parallel crimping action with a work-saving 10-to-1 mechanical advantage over applied hand force. For use with Scotchlok butt and tap connectors.

E-9BM Crimping Tool

The E-9BM has parallel closing action with adjustable jaws, and features high mechanical advantage. For use with all Scotchlok Connectors.

E-9C Cartridge Tool with Case & Gauge

The E-9C tool holds the connectors (in cartridges) firmly in place, allowing the user the use of the other hand for guiding wires. This time-saving tool holds cartridges of UR2, UR2-D, UR, UY2, UY2-D, UY, UAL, ULG, UCC, UPC, UP2 and UP3 Connectors. Its automatic feed, ratchet, and parallel jaw action assure perfect crimps every time.

2

2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

Specification Chart

Connector	Type Connector	Special Features	Maximum Insulation O.D.		PIC-unfilled and PIC-filled		Pulp or Paper	
			Metric (mm)	Inches	AWG	Metric (mm)	AWG	Metric (mm)
UR2		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
UR2-D		Dry Polypropylene	2,08	0,082	19-26	0,9-0,4	19-26	0,9-0,4
UR		Gel-filled RUS and UL Listed Polycarbonate	1,52	0,060	19-26	0,9-0,4	N/A	N/A
UY2		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
UY2-D		Dry Polypropylene	2,08	0,082	19-26	0,9-0,4	19-26	0,9-0,4
UY		Gel-filled UL Listed Polycarbonate	1,52	0,060	22-26	0,7-0,4	N/A	N/A
*557TG		Gel-filled Flame Retardant Polypropylene	3,0	0,12	16-22	1,3-0,6	N/A	N/A
UYF		Gel-filled UL Listed Polycarbonate	1,52	0,060	20-26	0,8-0,4	N/A	N/A
UP2		Dry Flame Retardant RUS and UL Listed Polycarbonate	1,52	0,060	22-26	0,7-0,4	22-26	0,7-0,4
UP3		Dry Flame Retardant RUS and UL Listed Polycarbonate	1,52	0,060	19-26	0,9-0,4	19-26	0,9-0,4
UAL		Gel-filled For Aluminum Polycarbonate	2,08	0,082	17-20 AL 19-24 CU	1,2-0,8 AL 0,9-0,5 CU	N/A	N/A
211		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A

Butt Splicing

*Inline and drop wire connectors can only be used with E-9BM.
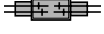
2.1 Copper splicing
2.1.1 3M™ Scotchlok™ Connectors and Tools

Description

Specification Chart

	Connector	Type Connector	Special Features	Maximum Insulation O.D.		PIC-unfilled and PIC-filled		Pulp or Paper	
				Metric (mm)	Inches	AWG	Metric (mm)	AWG	Metric (mm)
Tap Splicing	UB2A		Gel-filled RUS and UL Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
	UB2A-D		Gel-filled RUS Listed Polypropylene	2,08	0,082	19-26	0,9-0,4	N/A	N/A
	UG		Gel-filled RUS Listed Polycarbonate	Butt 1,54 Tap 1,12	0,051 0,044	19-26 22-26	0,9-0,4 0,7-0,4	N/A	N/A
	UPB		Dry UL Listed Flame Retardant Polycarbonate	1,27	0,050	22-26	0,7-0,4	22-26	0,7-0,4
Inline Splicing	*UDW2		Full Pair Drop Pair Polycarbonate	4,4	0,175	16-19	1,3-0,9	N/A	N/A
	*U1B		Gel-filled Full Pair Polycarbonate	3,18	0,125	16-19	1,3-0,9	N/A	N/A
	*U1R		Gel-filled Full Pair Polypropylene	3,18	0,125	19-24	0,9-0,5	N/A	N/A

To reduce fatigue, use tool within each group with highest mechanical advantage indicated in ( ).

E-9BM (10:1) E-9C (7:1) E-9Y* (3:1) E-9Y** (3:1) E-9R (10:1) E-9J (10:1)

*Inline and drop wire connectors can only be used with E-9BM.
**Not recommended for 19 gauge (0,9 mm) conductor and larger.

2.1.1 3M™ Scotchlok™ Connectors and Tools

Type/Order text				Ref.-No.

Ordering Information

Connector	Box Packaging Weight kg (lbs.) Minimum Order	Bulk Packaging Weight kg (lbs.) Minimum Order	Cartridge Packaging Weight kg (lbs.) Minimum Order	
UR2	100/box, 1000/cs. 1,36 (3) Min. Order: 1000 connectors	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,09 (4,6) Min. Order: 1000 connectors	UR2
UR2-D	N/A N/A N/A	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,09 (4,6) Min. Order: 1000 connectors	UR2-D
UR	100/box, 1000/cs. 1,36 (3) Min. Order: 1000 connectors	500/box, 5000/cs. 6,7 (15,2) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs 2,09 (4.6) Min. Order: 1000 connectors	UR
UY2	100/box, 1000/cs. 0,9 (1,3) Min. Order: 1000 connectors	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	12/cart, 120/pak., 1200/cs. 1,4 (3,5) Min. Order: 1200 connectors	UY2
UY2-D	N/A N/A N/A	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	12/cart, 120/pak., 1200/cs. 1,4 (3,5) Min. Order: 1200 connectors	UY2-D
UY	100/box, 1000/cs. 0,9 (1,3) Min. Order: 1000 connectors	1000/box, 5000/cs. 2,8 (6,1) Min. Order: 5000 connectors	16/cart, 160/pak., 1600/cs. 1,4 (3,5) Min. Order: 1600 connectors	UY
557TG	N/A N/A N/A	500/bag, 5000/box 9,09 (20) Min. Order: 5000 connectors	N/A N/A N/A	557TG
UYF	500/box, 2500/cs. 2,15 (4,75) Min. Order: 2500 connectors	N/A N/A N/A	N/A N/A N/A	UYF
UP2	N/A N/A N/A	1000/box, 5000/cs. 2,4 (5,4) Min. Order: 5000 connectors	16/cart, 160/pak., 1600/cs. 1,4 (3,2) Min. Order: 1600 connectors	UP2
UP3	N/A N/A N/A	1000/box, 5000/cs. 7,1 (13,3) Min. Order: 5000 connectors	10/cart, 100/pak., 1000/cs. 2,0 (4,4) Min. Order: 1000 connectors	UP3
UAL	N/A N/A N/A	N/A N/A N/A	10/cart, 100/pak., 1000/cs. 2,1 (4,7) Min. Order: 1000 connectors	UAL

TOOLS	E-9BM CRIMPING TOOL	E-9C CARTRIDGE TOOL	E-9R CRIMPING TOOL	E-9Y CRIMPING TOOL*	E-9J CRIMPING TOOL
Packaging kg (lbs.)/cs.	4,3 (9,5)	1/cs., 0,91 (2)	1/bag, 10/cs., 2,59 (5,7)	1/bag,10/cs., 1,53 (3,3)	1/bag, 10/cs., 4,1 (9,02)
Minimum Order	10 each	1 each	10 each	10 each	10 each

Solutions for Outside Plant

Type/Order text	Ref.-No.

Ordering Information

Connector	Box Packaging Weight kg (lbs.) Minimum Order	Bulk Packaging Weight kg (lbs.) Minimum Order	Cartridge Packaging Weight kg (lbs.) Minimum Order	Ref.-No.
211	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	N/A N/A N/A	N/A N/A N/A	**211**
UB2A	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	500/box, 5000/cs. 5,9 (12,9) Min. Order: 5000 connectors	N/A N/A N/A	**UB2A**
UB2A-D	100/box, 1000/cs. 1,2 (2,6) Min. Order: 1000 connectors	500/box, 5000/cs. 5,9 (12,9) Min. Order: 5000 connectors	N/A N/A N/A	**UB2A-D**
UG	100/box, 1000/cs. 1,1 (2,5) Min. Order: 1000 connectors	1000/box, 5000/cs. 5,2 (11,6) Min. Order: 5000 connectors	N/A N/A N/A	**UG**
UPB	N/A N/A N/A	1000/box, 5000/cs. 3,0 (6,6) Min. Order: 5000 connectors	N/A N/A N/A	**UPB**
UDW2	25/bag, 100/box N/A Min. Order: 1000 connectors	N/A N/A N/A	N/A N/A N/A	**UDW2**
U1B	100/box, 1000/cs. 7,3 (16,0) Min. Order: 5000 connectors	N/A N/A N/A	N/A N/A N/A	**U1B**
U1R	100/box, 1000/cs. 7,4 (16,2) Min. Order: 2500 connectors	N/A N/A N/A	N/A N/A N/A	**U1R**

*Not recommended for 19 AWG and larger.

For more information, please contact your local 3M representative.

2

2.1.2 3M™ MS2™ Splice Modules and Accessories

Description

MS² 25-Pair Super-Mini Splicing Modules

The MS² Super-Mini 25-pair and MS² Super Mate 25-pair Splicing Modules provide the reliability of soldered connections, the efficiency of multi-pair splicing, plus the proven performance of MS² splicing system.

The MS2 4000TR Series Super-Mini and 4005TR Series Super Mate Modules are the basic components of MS² Modular System Splicing from 3M™. The modules are building blocks of a systematized splicing technology that can reduce installation time of outside or inside plant, and in addition can reduce reworking demands, saving both time and effort in your construction and maintenance programs. To make your job easier, all MS² modules are now transparent.

U-shaped contacts enable solder-equivalent connections

The MS² 4000TR 25-pair Series Super-Mini and MS² 4005TR Super Mate Modules feature an array of U-shaped, phosphor-bronze contacts and stainless steel cut-off blades.

As a module is crimped, each contact strips the insulation from the positioned wire and securely grips the conductor. During this crimping operation, the cut-off blades inside each module trim the excess wire.

A single crimp completes a gas-tight connection on all 25-pairs in the module. It's simple and fast, because there's no need to strip or trim any of the individual pairs.

Pair testing is easy

Test entry ports on the front side of all modules provide access for testing individual pairs. All tests can be accomplished without opening the module, stripping insulation, or otherwise interrupting service.

The rugged design and construction of the modules can withstand crimping and reopening to facilitate transfers or cable rearrangements.

MS² 4000-G/TR Super-Mini Splicing Module

The new 4000-G/TR Super-Mini Splicing Module not only meets CAT-5 requirements of the TIA/CIA 568A and the ISO/IEC 11801:1995 for high-speed connectors, but it also delivers in place performance withstanding extended exposure to various conditions of extremely high humidity, including water immersion, while maintaining insulation resistance and circuit integrity.

MS² 4000-DWP/TR Module with Sealant Box
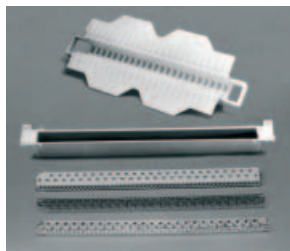
The 4000-DWP/TR 25-pair module combines a 4000-D/TR Super-Mini Module with a 4075-S Sealant Box. This combination offers waterproof splicing of copper in buried, aerial, and under ground applications.

The module also makes re-entry into splices encapsulated with re-enterable gel much easier. Because the sealant box prevents the encapsulants from filling the wire channels and test entry ports, modules may be tested at any time once the sealant box is removed.

The term "waterproof" applies to this system as determined according to 3M™ Test Method No. TP0200-05. Users should write for this method to determine suitability for application.

The MS² 4008D/TR 25-pair Series Super-Mini Modules are similar to the 4000TR Series, except that the cut-off blades have been removed from the bottom of the modules. This allows the run of through wires to be half-tapped without cutting the conductors. The wires in the base are electrically connected, but are not cut off. Both 4000TR and 4008TR Series Modules are available dry, or encapsulated. **RUS Listed**

2.1 Copper splicing
2.1.2 3M™ MS²™ Splice Modules and Accessories

Description

MS² 4075-S Sealant Box
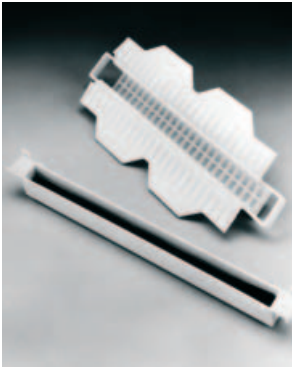
The 4075-S Sealant Box is a molded PBT polyester box designed to be used with the MS² 4000 Series Super-Mini Modules.
One applicator tool is included with every order.
RUS Listed

MS² 4005-DPM/TR Super Mate Pluggable Module
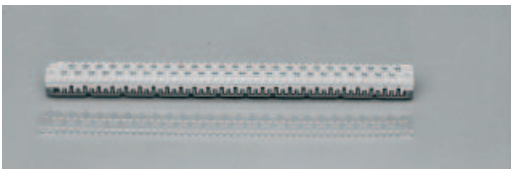
4005-DPM/TR 25-pair Series Super Mate Pluggable Modules increase productivity and reduce expense by avoiding the time and cost-intensive job of cutting and re-splicing conductors for re-arrangement, addition, and removal of apparatus and stubs. The 4005-DPM/TR Series Super Mate Modules plug into other Super Mate Modules and onto the top of the 4000-D/TR Super-Mini Module Series for bridging applications.The 4005-CBM/TR Series Modules is for bridging to encapsulated 4000-C Series Modules, as a bridge only.The UL Listed 4005-DPM/FR is for applications which require a flame-retardant module.

MS² 4077 Series Sealant Boxes

Designed for use with MS² 4005-DPM/TR Super Mate Modules and/or in combination with 4000-D/TR Modules. The Sealant Boxes provide water-proof protection in PIC splicing applications where one or more modules are plugged together.
One applicator tool is included with each box of 12 sealant boxes.
The term "waterproof" applies to this system as determined according to 3M™ Test Method No. TP0200-05. Users should write for this method to determine suitability for application.
RUS Listed

4077-A One	4005-DPM/TR Module	
4077-B One	4000-D/TR and one 4005-DPM Module	
4077-C Two	4005-DPM/TR Modules	
4077-D Three	4005-DPM/TR Modules	

2

Type/Order text | Ref.-No.

Sealant Boxes

Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
12/box, 120/cs & 7,5 (16.6)	120 each	**4000DWP/TR**
12/box, 120/cs & 4,1 (9.1)	120 each	**4075-S**
12/box, 120/cs. & 4,9 (10.8)	120 each	**4077-A**
12/box, 120/cs. & 5,4 (12)	120 each	**4077-B**
12/box, 120/cs. & 6,0 (13.3)	120 each	**4077-C**
12/box, 120/cs. & 7,5 (16.6)	120 each	**4077-D**

2.1.2　3M™ MS²™ Splice Modules and Accessories
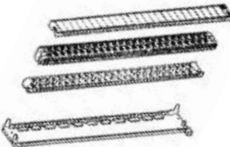
Specifications for all MS² 4000/4005/4008 Series Splicing Modules (Super-Mini and Super Mate)

Maximum Insulation O.D.	
Metric (mm)	1,65 [4000G/TR has maximum insulation O.D. of 1,35 mm (0.053")]
Inches	0.065

Cable Type PIC, Pulp or Paper	
AWG	22-28
Metric (mm)	0,7-0,3

3M MS² 4000 Series Straight Splicing Modules

Splicing Module	4000-D/TR	4000-G/TR	4000-DCO	4000-DT/TR	4000-GT/TR
Modular Type					
	RUS Listed Dry transparent	Gelled transparent	Dry/flame-retardant	Dry/test transparent	Gelled transparent
Colour					
Cover	Transparent	Transparent	Grey	Transparent	Transparent
Body top	Yellow	Yellow	Grey	Yellow	Yellow
Body bottom	Dark gold	Dark gold	Grey	Dark gold	Dark gold
Base	Transparent smoked	Transparent smoked	Grey	Transparent smoked	Transparent smoked
Sealant Boxes for 4000 Modules	4075-S	N/A	N/A	4075-S	N/A

Sealant Boxes

Packaging & kg (lbs.)/cs.	Minimum Order	
12/bag, 120/cs & 2,95 (6.5)	120 each	**4000-D/TR**
12/bag, 120/cs. & 3,7 (8.3)	120 each	**4000-G/TR**
12/bag, 120/cs. & 2,9 (6.4)	120 each	**4000-DCO**
12/bag, 120/cs. & 2,8 (6.3)	120 each	**4000-DT/TR**
12/bag, 120/cs. & 3,7 (8.3)	120 each	**4000-GT/TR**

Note: 4077-A protects one 4005-DPM Module, 4077-B protects one 4000-D and one 4005-DPM Module, 4077-C protects two 4005-DPM Modules, 4077-D protects three 4005-DPM Modules.
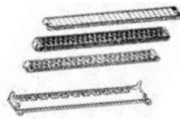
2.1.2 3M™ MS2™ Splice Modules and Accessories

Technical characteristics

MS² 4005 Series Pluggable/Bridge Splicing Modules

Splicing Module	4005-GBM/TR	4005-DPM/FR
Module Type		
	Filled bridge transparent	Dry flame-retardant
Colour		
Cover	Transparent	Grey
Body top	Yellow	Grey
Body bottom	Blue	Dark blue
Insulator	Red	Maroon

MS² 4008 Series Splicing Modules

Splicing Module	4008-D/TR	4008-G/TR	4008-DCO
Module Type	**RUS Listed**		
	Dry transparent	Gelled transparent	Dry flame-retardant
Colour			
Cover	Transparent	Transparent	Grey
Body top	Yellow	Yellow	Grey
Body bottom	Green	Green	Grey
Base	Transparent smoked	Transparent smoked	Grey
Sealant Boxes for 4008 Modules	4075-S after cut out	N/A	N/A

Type/Order text   **3M-ID**

3M Sealant Boxes

Packaging & kg (lbs.)/cs.	Minimum Order	
12/bag, 120/cs. & 5,1 (11.3)	120 each	**4005-GBM/TR**
12/bag, 120/cs. & 3,5 (7.8)	120 each	**4005-DPM/FR**
12/bag, 120/cs. & 2,9 (6.6)	120 each	**4008-D/TR**
12/bag, 120/cs. & 2,9 (6.6)	120 each	**4008-G/TR**
12/bag, 120/cs. & 2,9 (6.3)	120 each	**4008-DCO**

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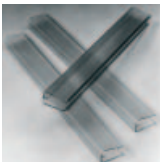
2.1.2 3M™ MS²™ Splice Modules and Accessories

Type/Order text		Ref.-No.

MS² Components and Accessories

		Pkg & kg (lbs.)/cs.	Min. Order	
	Super-Mini Module Cover The 4003-D/TR Super-Mini Module Cover is identical to the 4003-D Cover with the exception that it is clear to allow for the visual inspection of conductors.	12/bag 120/cs. 0,6 (1.4)	120 each	**4003-D/TR**
	Super-Mini Module Base The 4004-D/TR Super-Mini Module Base is identical to the 4004-D Super-Mini Module Base with the exception that it is smoked transparent.	12/bag 1 120/cs. 0,6 (1.4)	20 each	**4004-D/TR**
	Super-Mini Test Base The 4004-DT/TR Super-Mini Test Base is identical to the 4004-DT Super-Mini Test Base with the exception that it is smoked transparent.	12/bag 120/cs. 0,6 (1.3)	120 each	**4004-DT/TR**
	4005-DPM/TR/36PTJ Preterminated Jumper Assemblies The assemblies consist of 24 AWG, PIC, unsheathed 25-pair binder group terminated on each end with a 4005-DPM Module. It enablesquick restoration of cut cable and is available in 91,4 cm (36") and 182,9 cm (72") lengths with transparent covers.	12 assy./kit 12/cs. 36" 2,63 (5.8) 72" 3,8 (8.5)	12 each 12 each	**4005-DPM/TR/36PTJ** **4005-DPM/TR/72PTJ**
	Bottom Test Plug The 4005-DPM/BTP is a test plug assembly consisting of a 4005-DPM module attached by a 60,9 cm (24") jumper to a module designed to plug into the bottom of a Super-Mini module. This assembly enables re-entry into any Super-Mini/Super Mate combination splice without interruption of service.	1/bag 12/cs.	12 each	**4005-DPM/BTP**
	Marking Pen Use the 4039 Marking Pen for permanent marking of MS² modules for easy identification at a later date.	12/box 144/cs. 0,5 (1.1)	144 each	**4039**
	Half-Tap Cover Used to protect wire ends after the half-tap has been cut out of the MS² Super-Mini 4008 Half-Tap Module in pulp/paper and pressurized PIC cable and vault splices.	12/bag 120/cs. 1,4 (3.1)	120 each	**4078-C**

2.1 Copper splicing
2.1.2 3M™ MS²™ Splice Modules and Accessories

Description

MS² 10-Pair Super-Mini Splicing Modules
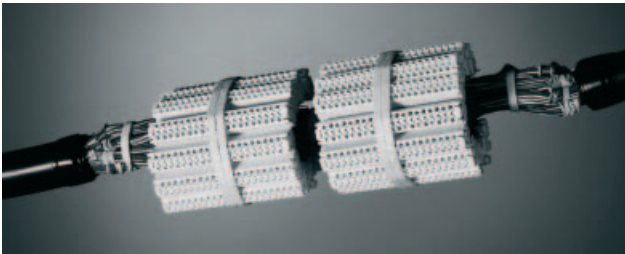
Multi-pair splicing; full wire range

The MS² 10-Pair Super-Mini Splicing Modules provide the reliability of soldered connections, plus the efficiency of multi-pair splicing in 10-pair units. This eliminates the need to strip or trim any of the individual pairs, saving time and simplifying the process.

For added convenience and efficiency, all MS² super-mini modules accept 0.35 mm - 0.9 mm (26-19 AWG) solid copper up to a maximum insulation outside diameter of 1.8 mm (0.70) PIC, pulp and paper-insulated conductors.

Solder-equivalent connections

The MS² 10-pair super-mini modules feature an array of U-shaped, phosphor-bronze contacts and stainless steel cut-off blades. As a module is crimped, each contact strips the insulation from the positioned wire and securely grips the conductor. During this crimping operation, the cut-off blades inside each module trim the excess wire.
A single crimp completes a gas-tight, solder equivalent connection on all pairs in the module.

* The term "water resistant" applies to this system as determined according to 3M™ Test Method Number TPO200-05.

MS² 9700-10/TR Module for two-wire straight splicing

The 9700-10/TR module provides for two-wire straight splicing. Like all super-mini modules, the 9700-10 module is designed so that wire gauges and insulation types may be mixed in the module.

MS² 9700-G/TR Super Mini Module

Encapsulated Super-Mini Module for protection against humidity and condensation.

MS² 9708-10/TR Module for half-tap splicing

The 9708-10 Super-Mini Module is similar to the 9700-10 module, except that the cut-off blades have been eliminated from the bottom of the modules. This allows the through wires to be half-tapped without cutting the conductors. The wires in the base are electrically connected, but are not cut off.

MS² 9700-DWP/TR Module for water resistant* splicing

The 9700-DWP/TR System consists of a 9700-10/TR Module, a 9777-S Sealant Box, and an insertion tool for seating the module.

Designed specifically for buried and underground plant applications where PIC cable is not pressurized, the sealant box protects the splice by filling the module wire channels and test ports with a moisture resistant sealant. This simplifies reentry and reworking when necessary. The 9700-DWP Module is also recommended for use in aerial applications where additional moisture protection is desired.

The 9777-S Sealant Box may be ordered separately. An applicator tool is provided to facilitate installation.

2

Type/Order text			Ref.-No.
Description	**Pkg., kg (lbs.)/ctn.**	**Min. Order**	
10-pair Splicing Module/Sealant Box Combination (10 modules, 1 applicator & 10 sealant boxes/box)	5 boxes/ctn., 0,29 (.63)	50 each	**9700-DWP/TR**
10-pair Super-Mini Splicing Module (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,07 (2.35)	100 each	**9700-10/TR**
Super Mini Module (encapsulated transparent) (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,34 (2.95)	1000 each	**9700-G/TR**
10-pair Super-Mini Half-Tap Module (100 covers, 100 bases & 100 bodies/box)	10 boxes/ctn., 1,06 (2.33)	1000 each	**9708-10/TR**
10-pair Super-Mini Sealant Box (20 sealant boxes & 1 applicator/box)	5 boxes/ctn., 0,28 (.61)	100 each	**9777-S**

International Shipments only, source of supply – 3M Germany. Contact your local 3M Representative for additional ordering information.

Description

MS² 9700 Series 10-Pair Super Mate Pluggable Modules

MS² 9705-10TR Super Mate Pluggable Modules transfer without interupting service

MS2 9705-10TR Super Mate Pluggable Modules increase productivity and reduce expenses by avoiding the time- and cost-intensive job of cutting and resplicing conductors for re-arrangements, additions, and removals of apparatus and stubs.

With super mate pluggable modules you can do it all, 10 pairs at a time, in "make before break" fashion — without interrupting service. Once a splice is in place, you have the flexibility to complete future transfers by simply plugging and unplugging the existing modules. Using simple handtools, super mate modules mate with other super mate modules, allowing multiple counts as necessary.

- Cut apparatus in or out without re-splicing
- Easy pair testing
- Full wire range
- Rugged design
- Ideal for lightweight tooling applications

MS² 9755-10 Lightweight Rig

Type/Order text   Ref.-No.

Description	Pkg., kg (lbs.)/ctn.	Min. Order	Ref.-No.
10-pair Super Mate Pluggable Module (10 covers, 10 bases and 10 bodies/bag)	10 boxes/ctn., 1,18 (2.6)	1000 each	**9705-10/TR**
Pluggable Module Sealant Box (20 sealant boxes and 1 applicator/box)	5 boxes/ctn., 0,37 (.81)	100 each	**9777-B**
Pluggable Module Sealant Box (20 sealant boxes and 1 applicator/box)	5 boxes/ctn., 0,41 (.90)	100 each	**9777-C**
Hand Presser	1/cs., 1,5 (3.4 lbs.)	1 each	**4270-A**
Separator Tool	1/cs., 0,4 (2.0 lbs.)	1 each	**9753-PM**
Lightweight Rig	1/ctn., 3,3 (7.3)	1 each	**9755-10**

International Shipments only, source of supply – 3M Germany. Contact your local 3M Representative for additional ordering information.

2.1   Copper splicing

2.1.3   3M™ MS2™ Modular Splicing Rigs & Equipment

Description

MS² 25-Pair Super-Mini Splicing Modules

3M MS² splicing tools and equipment are easy to use in any kind of splicing operation, regardless of the environment or working conditions. By designing system components and techniques that are interchangeable, 3M simplifies the splicing task and reduces potential inventory headaches. Included in the system are detailed step-by-step instructions for each splicing application, user-friendly parts and components, and testing equipment to optimize splice accuracy.

Systemized splicing technology

MS² splicing simplifies wire joining and terminating operations by allowing many jobs to be performed with the same components, tools, and techniques. Any of five standard splicing rigs with MS² splicing modules could meet all your multi-pair splicing requirements in inside or outside plant — new construction, cable rearrangements or maintenance. Easily learned procedures, designed to assure both splicing accuracy and good housekeeping, make the system's components simple to master.

MS² 4020-M Splicing Rig

The 4020-M Splicing Rig is a splicing rig designed for one-person fold-back or inline splicing. The 4020-M Splicing Rig contains the same components as the 4021-M Splicing Rig, except the crimping unit.

MS² 4021-M Splicing Rig

The 4021-M Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing.

MS² 4021-M/36 Splicing Rig

The 4021-M/36 Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing. This rig contains the 4036-25 Hand Crimper.

MS² 4021-M2/36 Splicing Rig

The 4021-M2/36 Splicing Rig is a complete splicing rig designed for one-person fold-back or inline splicing. This rig contains the 4036-25 Hand Crimper.

MS² 4049 Lite Rig

The MS² 4049 Lite Rig is a complete splicing rig and provides many features and benefits.

MS² 4026-A Module Maintenance Kit

The 4026-A Module Maintenance Kit contains the tools necessary for reentry of Super-Mini and Super Mate Modules

2

2.1 Copper splicing
2.1.3 MS2™ Splicing Kit Components

Description

Complete MS² Splicing Rigs and MS² Maintenance Kits

Product Number For Kits	4020-M	4021-M	4021-M/36	4021-M2/36	4049	
Application	Designed for one-person fold-back or inline splicing.	A complete splicing rig designed for one-person fold-back or inline splicing. Contains 4031 Crimper.	A complete splicing rig designed for one-person fold-back or inline splicing. Contains 4036 Crimper.	A complete splicing rig designed for one-person fold-back or inline splicing Contains 4036 Crimper.	A lightweight, portable splicing rig in a pail. Contains 4036-25. Hand/Hydraulic Tool.	
Kit Components						
(can be ordered separately; see accessories)						
4049 Rig Container/Pail					1	
4036 Tool Holder					1	
4028 Rubbermaid Rig Case	1	1	1	1		
4031 Hand/Hydraulic Crimping Unit		1				
4036-25 Hand Crimper			1	1	1	
4041 SH Splice Head Holder					1	
4040 Splicing Head Assembly Includes:						
4041 Splicing Head	1	1	1	2		
Pedestal	1	1	1	1		
Traverse Clamp Assembly With Long Bar	1	1	1	1		
Head Clamp	1	1	1	1		
4041-P Splicing Head and "T" Bar Pedestal Support					1	
4042 Support Tube Assembly	1	1	1	1		
4047 Pair Test Plug	1	1	1	1		
4051 Wire Insertion Tool	1	1	1	1	1	
4052T Tester Check Comb	2	2	2	2	1	
4053 Cover Removal Tool	1	1	1	1		
Short Traverse Bar	1	1	1	1		
4049 Variable Traverse Brace Assembly					1	

Type/Order text   Ref.-No.

Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
11,3 (25)	1 each	**4049**
20 (44)	1 each	**4020-M**
24,95 (55)	1 each	**4021-M**
25,0 (55)	1 each	**4021-M/36**
25,4 (56)	1 each	**4021-M2**
25,4 (56)	1 each	**4021-M2/36**

3M

Solutions for Outside Plant

Type/Order text			Ref.-No.

MS² Rig Components

		Pkg & kg (lbs.)/cs.	Min. Order	
	Rubbermaid Rig Case 66 x 29.2 x 28.2 cm (26 x 11.5 x 11.1") Cube: 9.8 kg. (21.7 lbs.) Ctn. size:67.1 x 30 x 58.4 cm (26.4 x 11.8 x 23")	2/cs. 9,8 (16.5)	2 each	**4028**
	Air/Hydraulic Crimping Unit The 4030 Air/Hydraulic Crimping Unit is designed for use with an air or nitrogen supply. An air cylinder or compressor with output pressure of 5.37kg/cm 21 (90-100 PSI) must be used. The unit is either hand oroperated.	1/cs. 8,3 (18.2)	1 each	**4030**
	Hand/Hydraulic Crimping Unit The 4031 Hand Crimping Unit is lightweight and-hand-operated. When the correct crimping pressure is reached, a bypass valve opens.	1/cs. 6,3 (13.8)	1 each	**4031**
	Aerial Strand Clamp A 4035-A Aerial Strand Clamp is designed to hold a 4041-P Splicing Head in aerial splicing applications. Anchored to the suspension strand, the aerial strand clamp, clamps behind and belo-wthe splice bundle and can be used with strands from 5mm (3/16") diameter to 10 mm (3/8").	1/cs. 1,7 (3.7)	1 each	**4035-A**
	Hand Crimper The 4036 Hand/Hydraulic Crimper is a self-contained, pistol-gripped crimper designed to crimp MS² Modules in the 4041 Splicing Head.	1/cs. 6,3 (13.8)	1 each	**4036-25**
	Splicing Head Assembly This assembly contains a splicing head, a pedestal, a traverse clamp assembly with a longbar, & a head clamp for use with two manfold-back splicing.	1/cs. 3,2 (7.1)	1 each	**4040**
	Splice Head The 4041 Splicing Head is the standard MS² Splicing Head without any support components.	1/cs. 1,3 (2.9)	1 each	**4041**
	Splicing Head and "T" Bar Additional Splicing Head and "T" Bar support for use with the MS² System.	1/cs. 1,7 (3.7)	1 each	**4041-P**

2

Type/Order text			Ref.-No.

MS² Rig Components

		Pkg & kg (lbs.)/cs.	Min. Order	
	Universal Splicing Head Support Assembly The 4045 Universal Splicing Head Support Assembly is designed to hold an MS² Splicing Head so it can be used in all applications.	1/cs. 3,2 (7)	1 each	**4045**
	Split Support Tube Collapsable for easy transport and set up.	1/cs. 3.2 (7)	1 each	**4046**
	Pair Test Plug This plug is a module probe which permits one pair checking without damaging wire insulation. The prongs fit the test entry port of all MS² modules. The cord permits easy connection to a talk block or test set.	1/box 10/cs. 1,0 (2.3)	10 each	**4047**
	Wire Insertion & Cut-Off Tool The 4051 tool is used on MS² modules to replace conductors back into the module.	1/bag 10/cs. 0,7 (1.5)	10 each	**4051**
	In-Head Tester Check Comb The check comb eliminates wiring errors by double-checking tip and ring placement prior to crimping and to insulate pairs when using the in-head tester without a cover.	1/box 10/cs. 0,6 (1.3)	10 each	**4052-T**
	Cover Removal Tool The 4053 Cover Remote Tool is recommended for removing either the base or cover from 25-pair Super-Mini and Super Mate Modules.	1/box 10/cs. 0,4 (0.8)	10 each	**4053**
	Separation Tool The only recommended tool to separate MS² Super Mate 4005-DPM/TR Modules from any other module. Note: The 4053 Cover Removal Tool cannot be used with DPM Modules.	1/cs. 0,6 (1.3)	1 each	**4053-PM**
	Hand Presser The 4270-A presser is used to plug up to seven Super Mate Modules together.	1/cs. 1,5 (3.4)	1 each	**4270-A**
	Hand Presser* (not pictured)	1/cs. & 1,5 (3.4)	1 each	**4270-10**
	10/25 part splice Head (not pictured)			**9741**
	9753-PM Separator Tool*	1/cs. & 0,4 (2.0)	1 each	**9753-PM**

* International shipments only, source of supply - 3M Germany.
  Contact your local 3M Representative for additional ordering information.

2.2.1 Closures
3M™ OS Closures

Description

OSS and OSL closures are one piece, tool-free, one-hand / one-operation, small size, mechanical, copper cable splice closures. Simply pressing the two shelves of the closure together by hand, closure locks and seals the splice. Closure body is made out of thermoplastic material and the sealing is a patented gel. Splice area in the middle of the closure is non-filled and the sealing material is surrounding the splice cell. Top shelve and bottom shelve of the closure are hinged from the back edge and when the closure is closed, sealing gel on the top and the bottom shelves meet/compress each other by sealing the cable entries automatically. "Cable Tie" and/or "special design build-in strain relief" provide cable retention. The design of the closure allows re-entries by simply unlatching the locking mechanism.

Highlights:

• Mechanical

• Easy to install

• UV resistant and IP 67 protection

• Non-craft sensitive and reliable

• Re-enterable

• Splice area is dry (no gel filing)

• Up to 10 pairs application with Scotchlok TM and MS2TM

• Cylindrical design

• No deformation on the sealing area or splice area after the closure installation

OSS closure is mainly for 2/4 pairs splices (w ScotchlokTM U/U2) protection and OSL closure is mainly for up to10 a pairs splice (w Scotchlok U/U2) protection. OSL can be perfectly used with MS2 10 pairs module, too.
Both closures are, having IP67 protection class, suitable for UG (direct buried) applications as well as the overhead applications, which may require lower protection class.

Type/Order text	Ref.-No.
OSSC One Step Small Closure 1 to 1 Chicane version MOQ: 10 ea Packaging: 10ea in a carton box w installation instructions.	**OSSC 121C**
OSSC One Step Small Closure 1 to 2 Chicane version MOQ: 10 ea Packaging: 10ea in a carton box w installation instructions.	**OSSC 122C**
OSSC One Step Small Closure 1 to 1 Cable Tie version Packaging: 10ea + 20ea cable ties in a carton box w installation instructions.	**OSSC 121T**
OSSC One Step Small Closure 1 to 2 Cable Tie version MOQ: 10 ea Packaging: 10ea + 20ea cable ties in a carton box w installation instructions.	**OSSC 122T**
OSLC One Step Large Closure 2 to 2 MOQ: 10 ea Packaging: 1ea w 4ea cable ties & 4ea spring force s/b connectors in a bag / 10 bags in a carton box w installation instructions.	**OSLC 222**

Solutions for Outside Plant

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2.2 Splice Protection Products
2.2.1 Closures
3M™ BEC

Description

3M BEC closures are suitable for all type of splicing configurations in a twisted pair transmission network.

The sturdy design allows the BEC closures to accommodate any kind of electronic active circuits used in Telecom Networks (HDSL, repeaters, PCM 11).

These watertight, pressurisable closures (up to 1 bar above atmospheric pressure) are suitable for underground network.

Easy to install and to cable up
- Closures are easely opened and re-sealed to allow testing and repairs
- One range of cable glands fits all 5 types of closures
- Can be mounted onto metal inserts

Various configurations are possible
- 5 box sizes
- 5 to 8 ports depending on model

Wide range of accessories
- Cable glands (resin, heat-shrink, combined seals)
- Cable gland kits for repairs
- Sealing resin
- Mounting brackets

Highlights:

- High pressure reinforced polyester for direct burried applications

- IP 67 to NFC 20010

- Standard equipment

- Joint closure for buried applications without cable entry, with dummy plugs

- Service pressure: 500 mb

Technical characteristics

Models	Volume (litres)	Length (mm)	Width (mm)	Depth (mm)	Cable entries
1B	3.60	240	210	72	5
1A	6.90	240	210	137	5
2	10.30	430	210	114	6
3B	9.80	550	280	80	8
3A	25.00	550	280	215	8
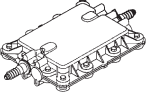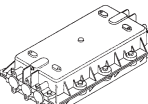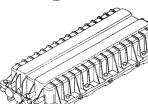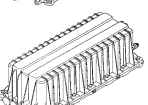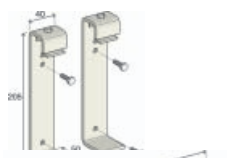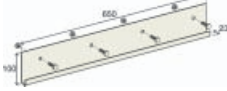
2.2.1 Closures
3M™ BEC

Type/Order text	Ref.-No.

Distribution and protection closures

BEC Closure type 1 B
Equipped with: 5 dummy plugs, 2 earth terminals
NN450214VB00

BEC Closure type 1 A
Equipped with: 5 dummy plugs, 2 earth terminals
NN450213VB00

BEC Closure type 2
Equipped with: 6 dummy plug, 2 earth terminals
NN450212VB00

BEC Closure type 3 B
Equipped with: 8 dummy plugs, 2 earth terminals
NN450209VB00

BEC Closure type 3 A
Equipped with: 8 dummy plugs, 2 earth terminals
NN450208VB00

Kit of 2 cable inlets in 2 part-Heat-shrink
Capacity: cable of ø12 to 26 mm
The kit comes complete with heat-shrink sleeves, fixing accessories and instruction leaflet.
NN3720140000

Kit of 2 cable glands-Heat-shrink
Capacity: Cable of ø18 to 30 mm
The kit comes complete with heat-shrink sleeves, fixing accessories and instruction leaflet.
NN3720130000

Kit of 2 twin cable glands
PVC cable gland to take 2 cables of ø9 mm supplied with heat-shrink sleves.
NN3720190000

Re-opening cable glands
The shells of these glands can be separated to provide access for repairs, testing, etc..., without the need to cut the cable.

Kit of 2 cable glands-Resin and heat-shrink
The kit comes complete with heat-shrink split sleeves, tin of resin, fitting accessories and instruction leaflet.

Capacity: cable of ø12 to 26 mm	NN3720250000
Capacity: cable of ø18 to 30 mm	NN3720260000

Mounting accessories

Mounting brackets
Wall mount brackets are attached to the back of the BPEM closure and hook onto wall rail.
NN3711460000

Manhole mounting rail
L section attached to the wall of the manhole to support the protection closure with mounting brackets.
NN2717531800

3M

Solutions for Outside Plant

2

2.2 Splice Protection Products
2.2.1 Closures
SLiC™

Description

3M Floating Bond, 3M Rigid Bond, 3M Spiral End Seal

The 3M SLiC aerial closure is a single-piece aerial closure, easily installed in construction or maintenance situations. The one piece construction permits complete splice access after placement without removal of the closure or bonding from the cables. The closures are free breathing and suitable for straight, butt and branch splices of non-pressurised communication cables.

Splices are protected by the closure's double-wall moulded polyethylene construction. The durable SLiC closure will not crack or break in even the harshest environment. All components are attached to the closure.

Due to its interlocking ends, the SLiC aerial closure can expand to meet any size sheath opening without special kits, eliminating excess inventory. The 2 x 29, 3 x 33 , 5 x 33, and 7 x 33 closures
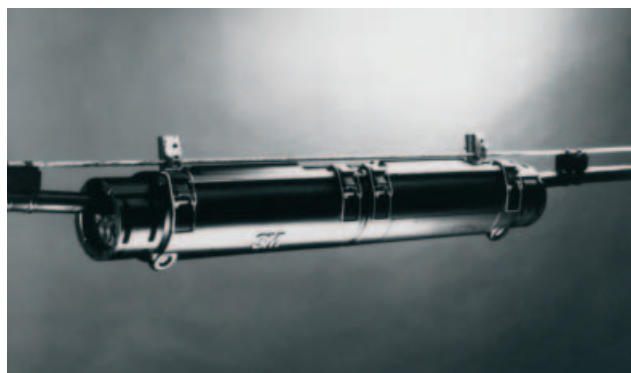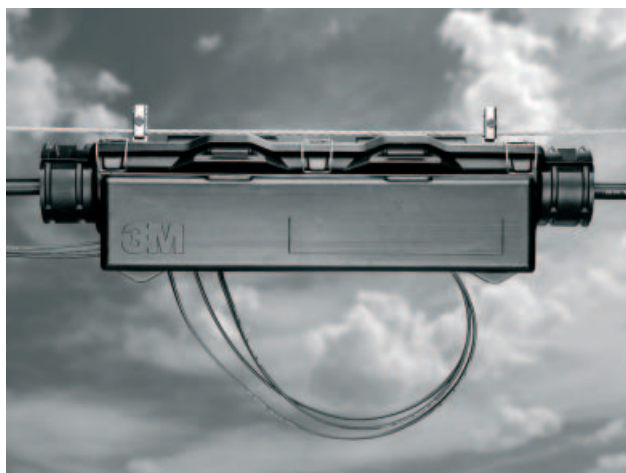
can be extended while maintaining their initial strength. The SLiC aerial closure does not require taping, bricking or any special labour-intensive practices. The end seals assure a snug fit on cables and eliminate the need for a drip collar. Sealing collars or tape are not required when using the SLiC closure.
The two, three, five, seven, and nine-inch diameter closures feature a universal end seal to handle any plant configuration. There are six sizes available, accommodating splice openings from 254 to 635 mm (10 to 25 inches). **RUS listed**

Highlights:

- One piece construction
- Provides easy installation; no loose parts
- Double walled, moulded construction
- Resists breaking or cracking
- Interlocking ends
- Extendible for long sheath openings
- Hanger/bonding system
- No external or additional bonding material required
- Quick release latch
- Easy re-entry
- Attached sheath retention (SR) bracket
- Protects cable sheath pull-out or movement (only for rigid bond)
- Spiral end seal
- One size fits multiple cable configurations

Fewer parts and easier installation with the SLiC Aerial Closure.

- Superior seal
- Easily adaptable
- Single piece design
- Double wall moulded construction
- Made from durable, rugged materials
- Easy to access and re-enter

2.2 Splice Protection Products
2.2.1 Closures
SLiC™

Type/Order text	Ref.-No.

SLiC Aerial Closures with Floating Bond

Contains	Pkg. & kg (lbs.)/cs.	Min. Order	
SLiC Aerial Closure Kit with Spiral End Seal			
Spiral End Seal	1/cs., 1,0 (2.3)	1 kit	**2" x 19"-SES**
Spiral End Seal	1/cs., 1,7 (3.7)	1 kit	**2" x 29"-SES**
Spiral End Seal	1/cs., 2,0 (4.4)	1 kit	**3" x 19"-SES**
Spiral End Seal	1/cs., 2,4 (5.3)	1 kit	**3" x 33"-SES**
Spiral End Seal	1/cs., 3,8 (8.3)	1 kit	**5" x 33"-SES**
Spiral End Seal	1/cs., 5,0 (11.1)	1 kit	**7" x 33"-SES**
Spiral End Seal	1/cs., 7,5 (16.5)	1 kit	**9" x 36"-SES**
SLiC Aerial Closure Kit with Rubber End Seal			
2 Double Port	1/cs., 1,1 (2.4)	1 kit	**2" x 19"**
2 Double Port	1/cs., 1,7 (3.7)	1 kit	**2" x 29"**
2 Triple Port	1/cs., 2,4 (5.6)	1 kit	**3" x 33"**
2 Triple Port	1/cs., 3,6 (8.0)	1 kit	**5" x 33"**
2 Triple Port	1/cs., 4,8 (10.6)	1 kit	**7" x 33"**
2 Triple Port	1/cs., 7,3 (16.0)	1 kit	**9" x 36"**

SLiC Aerial Closures with Rigid Bond/Sheath Retention

Contains	Pkg. & kg (lbs.)/cs.	Min. Order	
Aerial Closure Kit with Spiral End Seal			
Spiral End Seal	1/cs., 1,1 (2.5)	1 kit	**2" x 19"-SR/SES**
Spiral End Seal	1/cs., 1,7 (3.7)	1 kit	**2" x 29"-SR/SES**
Spiral End Seal	1/cs., 2,6 (5.8)	1 kit	**3" x 33"-SR/SES**
Spiral End Seal	1/cs., 3,9 (8.6)	1 kit	**5" x 33"-SR/SES**
Spiral End Seal	1/cs., 5,1 (11.2)	1 kit	**7" x 33"-SR/SES**
Spiral End Seal	1/cs., 7,4 (16.3)	1 kit	**9" x 36"-SR/SES**

SLiC Aerial Closures with Bond Assembley attached (4462-SN)

Contains	Pkg. & kg (lbs.)/cs.	Min. Order	
Aerial Closure Kit with Spiral End Seal			
Spiral End Seal	1/cs., 4,3 (9.4)	4 kits	**2" x 19"-BA/SES**
Spiral End Seal	1/cs., 6,5 (14.4)	4 kits	**2" x 29"-BA/SES**
Spiral End Seal	1/cs., 9,1 (20.0)	4 kits	**3" x 33"-BA/SES**
Spiral End Seal	1/cs., 3,9 (8.6)	1 kit	**5" x 33"-BA/SES**
Spiral End Seal	1/cs., 5,0 (11)	1 kit	**7" x 33"-BA/SES**
Spiral End Seal	1/cs., 7,6 (16.8)	1 kit	**9" x 36"-BA/SES**
Aerial Closure Kit with Rubber End Seal			
2 Double Port	1/cs., 4,3 (9.5)	4 kits	**2" x 19" BA**
2 Double Port	1/cs., 6,6 (14.5)	4 kits	**2" x 29" BA**
2 Double Port	1/cs., 9,1 (20.0)	4 kits	**3" x 33" BA**
2 Double Port	1/cs., 3,8 (8.3)	1 kit	**5" x 33" BA**
2 Double Port	1/cs., 4,8 (10.5)	1 kit	**7" x 33" BA**
2 Double Port	1/cs., 7,4 (16.4)	1 kit	**9" x 36" BA**

2.2.1 Closures
SLiC™

SLiC Aerial Closures with Bond Assembly included (4460-S)

Contains	Pkg. & kg (lbs.)/cs.	Min. Order	
Aerial Closure Kit with Spiral End Seal			
Spiral End Seal	1/cs., 1,1 (2.4)	1 kit	**2" x 19" 4460S/SES**
Spiral End Seal	1/cs., 1,7 (3.8)	1 kit	**2" x 29" 4460S/SES**
Spiral End Seal	1/cs., 2,4 (5.2)	1 kit	**3" x 33" 4460S/SES**
Spiral End Seal	1/cs., 3,7 (8.1)	1 kit	**5" x 33" 4460S/SES**
Spiral End Seal	1/cs., 5,0 (11.1)	1 kit	**7" x 33" 4460S/SES**
Spiral End Seal	1/cs., 7,2 (15.9)	1 kit	**9" x 36" 4460S/SES**
Aerial Closure Kit with Rubber End Seal			
Double Port/Double Port	1/cs., 1,1 (2.5)	1 kit	**2" x 19" 4460S**
Double Port/Double Port	1/cs., 1,8 (3.9)	1 kit	**2" x 29" 4460S**
Double Port/Triple Port	1/cs., 2,4 (5.2)	1 kit	**3" x 33" 4460S**
Double Port/Triple Port	1/cs., 3,5 (7.8)	1 kit	**5" x 33" 4460S**
Double Port/Triple Port	1/cs., 4,8 (10.6)	1 kit	**7" x 33" 4460S**
Double Port/Triple Port	1/cs., 7,0 (15.4)	1 kit	**9" x 36" 4460S**

Technical characteristics

SLiC Aerial Closure Capabilities

	SLiC 2 x 19 mm (in.)	SLiC 2 x 29 mm (in.)	SLiC 3 x 19 mm (in.)	SLiC 3 x 33 mm (in.)	SLiC 5 x 33 mm (in.)	SLiC 7 x 33 mm (in.)	SLiC 9 x 36 mm (in.)
Max. Splice Opening	356 (14)	432 (17)	356 (14)	533 (21)	533 (21)	533 (21)	635 (25)
Max. Bundle Diameter	55,9 (2.2)	66 (2.6)	91,4 (3.6)	91,4 (3.6)	142,2 (5.6)	193,0 (7.6)	244 (9.6)
Approx. Cable Range Pair Count	100-pair (26 or 24 AWG) 0,4 or 0,5	**200-pair (26 or 24 AWG) 0,4 or 0,5	200-pair	*400-pair (26 or 24 AWG) 0,4 or 0,5	*1200-pair (26 AWG) 0,4	*2400-pair (26 AWG) 0,4	*3600-pair (26 AWG) 0,4
Spiral End Seal Port Capacity							
End Seal Dia. Port #1	20-41 (0.8-1.6)	20-41 (0.8-1.6)	20-66 (0.8-2.6)	20-66 (0.8-2.6)	30-76 (1.2-3.0)	38-97 (1.5-3.8)	38-97 (1.5-3.8)
End Seal Dia. Port #2	13-25 (0.5-1.0)	13-25 (0.5-1.0)	13-25 (0.5-1.0)	13-25 (0.5-1.0)	20-36 (0.8-1.4)	30-46 (1.2-1.8)	30-46 (1.2-1.8)
End Seal Dia. Port #3	13-25 (0.5-1.0)	13-25 (0.5-1.0)	13-25 (0.5-1.0)	13-25 (0.5-1.0)	36-51 (1.4-2.0)	13-30 (0.5-1.2)	13-30 (0.5-1.2)
End Seal Dia. Port #4	NA	NA	NA	NA	13-30 (0.5-1.2)	46-61 (1.8-2.4)	46-61 (1.8-2.4)
End Seal Dia. Port #5	NA	NA	NA	NA	NA	13-30 (0.5-1.2)	13-30 (0.5-1.2)
Rubber End Seal Port Capacity							
1 Port End Seal Dia. Port #1	5-41 (0.2-1.6)	5-41 (0.2-1.6)	5-66 (0.2-2.6)	5-66 (0.2-2.6)	NA	NA	NA
2 Port End Seal Dia. Port #1	5-25 (0.2-1.0)	5-25 (0.2-1.0)	5-51 (0.2-2.0)	5-51 (0.2-2.0)	20-56 (0.8-2.2)	41-81 (1.6-3.2)	41-81 (1.6-3.2)
2 Port End Seal Dia. Port #2	5-15 (0.2-0.6)	5-15 (0.2-0.6)	5-15 (0.2-0.6)	5-15 (0.2-0.6)	5-56 (0.2-2.2)	5-81 (0.2-3.2)	5-81 (0.2-3.2)
3 Port End Seal Dia. Port #1	NA	NA	5-41 (0.2-1.6)	5-41 (0.2-1.6)	15-56 (0.6-2.2)	36-97 (1.4-3.8)	36-97 (1.4-3.8)
3 Port End Seal Dia. Port #2	NA	NA	5-25 (0.2-1.0)	5-25 (0.2-1.0)	5-36 (0.2-1.4)	15-46 (0.6-1.8)	15-46 (0.6-1.8)
3 Port End Seal Dia. Port #3	NA	NA	5-25 (0.2-1.0)	5-25 (0.2-1.0)	5-36 (0.2-1.4)	15-46 (0.6-1.8)	15-46 (0.6-1.8)

* Based on 2-Bank Straight Splice using MS² 4000-DWP Module

** Based on more than one cable

Description

SLiC Aerial Terminal and SLiC Aerial Terminal with Spiral End Seal

The 3M SLiC Aerial Terminal and the SLiC Aerial Terminal with Spiral End Seal are distribution terminals and closures contained within a lightweight, double-wall moulded-plastic housing designed for fixed-count termination of aerial drop wires. Special block con-figurations required by the individual customer are also available and may be completed either at the factory or by the customer.

End seals of the SLiC Terminal are designed to assure proper sizing and a snug fit around the cable sheath. This eliminates the need for drip collars to prohibit water from entering the splice chamber. The SLiC Terminal with Rubber End Seal comes packaged with single-port end seals; however, customers may use double-port or triple-port end seals as their applications require. The 7.6 cm SLiC Terminal with spiral end seal comes packaged with three port end seals. And, the 12.7 cm terminal comes packaged with four port end seals.
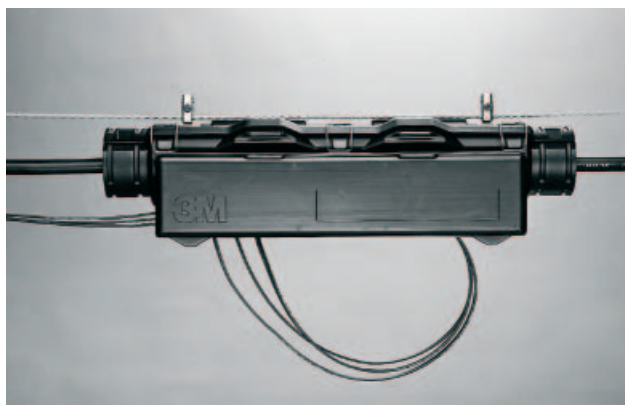
Highlights:

• Two-closure-in-one housing design
  Separates splice and drop chamber

• One piece construction
  Eases installation

• Self-healing drop wire ports
  Minimises weather and insect problems

• Sleeves extend in either or both directions
  Eliminates need for separate rehabilitation
  and distribution splices; accommodates long
  sheath openings

• Accommodates a variety of terminating blocks
  Adaptable to user requirements

• Multiple distribution counts
  Counts range in multiples of 5, from 5 to 25

• Spiral end seal
  One size fits multiple cable configurations

Accessories see

2.2 Splice Protection Products
2.2.1 Closures
SLiC™

Empty SLiC Aerial Terminals

Block Type	Initial Pair Capacity	Packaging & kg (lbs.)/cs.	Minimum Order	
Empty Terminals with Spiral End Seals				
ATS/IDC	5 - 25	11.7 (26.0)	4	**328-MTPI/SES**
ATS/IDC	5 - 25	4.1 (9.1)	1	**530-MTPI/SES**

Empty Housings Available with Rubber End Seals Upon Request 328 & 530 MT Housing
will accommodate other manufacturer's blocks
* Blocks must be purchased from manufacturer or through your distributor.

Filled SLiC Aerial Terminals

Block Type	Initial Pair Capacity	Packaging & kg (lbs.)/cs.	Minimum Order	
Filled Terminals with Spiral End Seals				
ATS/IDC	5, 10, 15, 25	12,0 (26.4)	4	**328-PI-5/SES**
ATS/IDC	5, 10, 15, 25	12,0 (26.4)	4	**328-PI-10/SES**
ATS/IDC	5, 10, 15, 25	12,0 (26.4)	4	**328-PI-20/SES**
ATS/IDC	5, 10, 15, 25	13,8 (30.6)	4	**328-PI-25/SES**
ATS/IDC	5, 10, 15, 25	5,0 (11.0)	1	**530-PI-5/SES**
ATS/IDC	5, 10, 15, 25	5,0 (11.0)	1	**530-PI-10/SES**
ATS/IDC	5, 10, 15, 25	5,0 (11.0)	1	**530-PI-20/SES**
ATS/IDC	5, 10, 15, 25	5,1 (11.22)	1	**530-PI-25/SES**

NOTE: 3" SLiC terminals have an approximate splice bundle capacity of 78,7 mm (3.1").
Based on 24 AWG (0,5 mm) 2 bank straight splices using MS2 4000DWP modules;
splice capacity is approximately 300 pair. 5" SLiC terminals have an approximate splice
bundle capacity of 129,5 mm (5.1"). Based on 26 AWG (.4 mm) 2 bank straight splices
using MS2 4000DWP modules; splice capacity is approximately 900 pair.

Type/Order text	Ref.-No.

SLiC Aerial Closure and Terminal Accessories

	Pkg. & kg (lbs.)/cs.	Min. Order	
Offset Hanger Brackets	1/cs., 2,4 (5.3)	1 set/bag, 10 sets/case	**AC-HB1**
Extended Hanger Brackets	1/cs., 2,4 (5.3)	1 set/bag, 10 sets/case	**AC-HB2**

SLiC Rubber End Seal Kits

Pkg. & kg (lbs.)/cs.	Min. Order	Type
10/cs., 0,6 (1.4)	10 each	**2" Single Port Rubber End Seal**
10/cs., 0,5 (1.2)	10 each	**2" Double Port Rubber End Seal**
10/cs., 1,0 (2.2)	10 each	**3" Single Port Rubber End Seal**
10/cs., 1,0 (2.1)	10 each	**3" Double Port Rubber End Seal**
10/cs., 1,0 (2.2)	10 each	**3" Triple Port Rubber End Seal**
5/cs., 2,51 (5.5)	5 each	**5" Single Port Rubber End Seal**
5/cs., 2,46 (5.4)	5 each	**5" Double Port Rubber End Seal**
5/cs., 1,3 (2.8)	5 each	**5" Triple Port Rubber End Seal**
5/cs., 2,4 (5.2)	5 each	**7" Double Port Rubber End Seal***
5/cs., 2,3 (5.0)	5 each	**7" Triple Port Rubber End Seal***

SLiC Spiral End Seal Kits

Pkg. & kg (lbs.)/cs.	Min. Order	Type
10/cs., 0,5 (1.2)	10 each	**2" Triple Port Spiral End Seal**
10/cs., 1,2 (2.7)	10 each	**3" Triple Port Spiral End Seal**
5/cs., 2,1 (4.7)	5 each	**5" Four Port Spiral End Seal**
5/cs., 3,5 (7.8)	5 each	**7" Five Port Spiral End Seal***

Sheath Retention Kits

	Pkg. & kg (lbs.)/cs.	Min. Order	Ref.-No.
SR-3 adds sheath retention to 3" SLiC Terminals and Closures	10/cs.	10 kits per case 1 kit per bag	**SR-3**
SR-5 adds sheath retention to 5" SLiC Terminals and Closures	10/cs.	10 kits per case 1 kit per bag	**SR-5**

* Also fits in a 9" closure.

2.2.1 Closures
3M™ Dome Closure

Description

Re-enterable 3M Dome Closures with Pull 'N' Shrink Tubing (PST), offer fast and rugged splice protection, with easy re-entry.

An economical method of protecting butt splices for pedestal, hand hole or pole mount applications is provided by the Re-enterable PST Dome Closures. The closure provides protection from the harmful effects of moisture, insects, and ultraviolet light, while providing no cost re-entry.

The dome closure is an easily re-enterable closure that protects the splice–without requiring special tools or heat for installation. The splice is enclosed in a split polypropylene dome which is clamped together with a steel latch and sealed with an O-ring. An expanded ethylene propylene rubber tube (PST) is slipped over the base of the enclosure and onto a gel sealing collar. Pulling a plastic rip cord on the PST allows it to shrink to the minimum outside diameter necessary to form a tight seal. The flexible tubing material conforms to the shape of the collar, sealing out both air and water.

The kit is available in four sizes, which accommodate splices from 25 to 900-pair. For encapsulated plant, three sizes are available which accommodate splices from 25- to 600-pair. **RUS Listed**

Highlights:

• Unique latching system to secure dome to the sealed base

• Easily re-enterable, no re-entry kit, seal
  undisturbed at re-entry, no tools needed to re-enter

• Gel end seal

• Air tight seal over multiple cable diameters
  and configurations

• Retrofits existing PST

• Multiple applications

2.2 Splice Protection Products
2.2.1 Closures
3M™ Dome Closure

Technical characteristics

Specifications for Re-enterable 3M PST Dome Closure Kits

	4604	4606	4608	4608XL
Closure Outside Dimension W x D mm (in.)	97 x 71 (3.8 x 2.8)	142 x 99 (5.6 x 3.9)	178 x 137 (7.0 x 5.4)	178 x 137 (7.0 x 5.4)
Closure Height (H) mm (in.)	572 (22.5)	572 (22.5)	597 (23.5)	851 (33.5)
Approx. Bundle Diameter mm (in.)	64 (2.5)	99 (3.9)	135 (5.3)	135 (5.3)
Minimum Reliable CAD Pedestal	CAD 4	CAD 6	CAD 8	CAD 12/70
Main Cables mm (in.)	13-28 (0.5-1.1)	23-41 (0.9-1.6)	36-64 (1.4-2.5)	36-64 (1.4-2.5)
Terminal Cables mm (in.)	10-15 (0.4-0.6)	10-15 (0.4-0.6)	10-20 (0.4-0.8)	10-20 (0.4-0.8)
Branch Cables mm (in.)	–	18-25 (0.7-1.0)	23-33 (0.9-1.3)	23-33 (0.9-1.3)
Drop Cables mm (in.)	9 max. (0.35 max.) 2 cable max.	9 max. (0.35 max.) 2 cable max.	9 max. (0.35 max.) 2 cable max.	9 max. (0.35 max.) 2 cable max.
*Approx. Splice Range	100 pr.-MS[2] 50 pr.-UR2	300 pr.-MS[2] 100 pr.-UR2	600 pr.-MS[2] 300 pr.-UR2	900 pr.-MS[2] 400 pr.-UR2

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

Re-enterable 3M PST Dome Closure Kits

Packaging & kg (lbs.)	Minimum Order	
15/cs. 17,0 (37.5)	15 kits	**4604**
9/cs. 15,6 (34.4)	9 kits	**4606**
5/cs. 12,2 (26.8)	5 kits	**4608**
5/cs. 15,3 (33.7)	5 kits	**4608XL**

*NOTE: Based on 2 bank MS[2] 4000-DWP Modules and Scotchlok Connectors installed per 3M practices. Examples: 100-pair means 100-pair In and 100-pair Out or 100 pair straight splice.

Kit components included: Closure Assembly, Dome, Base, O-Ring, Latch, Gel End Seal, Ground Wires, P.S.T. Sheath Scuff, Desiccant Bag.

Companion products needed: Scotch 88T 38 mm (1-1/2") Wide Vinyl Tape, 130C LR Rubber Tape, Scotchlok 4460 Series Shield Bond Connectors, Scotchlok UR2 or MS[2] Splice Connectors, 6228 Cable Ties, 381 mm (15").

Dome Closure Accessories

	Size cm (in.)	Pkg. & kg (lbs.)	Min. Order	
Pull N' Shrink Tubing	11,4 x 13,3 (4.8 x 5.25)	5/cs., 2,4 (5.5)	5 each	**4604-PST**
Pull N' Shrink Tubing	14,6 x 15,8 (5.75 x 6.25)	5/cs., 4,0 (8.92)	5 each	**4606-PST**
Pull N' Shrink Tubing	18,4 x 18,4 (7.25 x 7.25)	5/cs., 9,4 (20.78)	5 each	**4608-PST**
Gel Sealant Strip	6,3 x 50,7 (2.5 x 20)	50/cs., 9,4 (20.78)	50 each	**4608-PST**
Non-Indicating Desiccant Bags	–	100/cs., 3,6 (8.0)	100 each	**4600-NID**

2

2.2.1 Closures
3M™ Encapsulated Closures

Description

Encapsulated Closures enclose cable plant splices in direct buried, hand hole, and man hole applications. They also protect cable splices from environmental elements found in these applications and enclose a variety of cable configurations.
The closures are also used to easily accommodate distribution drops from the main cable. The methods used in encapsulated closures have evolved from early gravity filled methods to compound compression methods.

The Better Buried and 89 Series Closures use a gravity fill method of encapsulating and protecting the cable splice. Both kits are simple to install and are offered with a full product offering to cover the complete cable ranges found in the outside plant. In addition, both kits can be ordered with 8882 High Gel re-enterable encapsulant. The 89 Series can also be purchased with 4407 Encapsulant for making a permanent, hard encapsulated closure with maximum water protection.

Better Buried Closures

Foam Sealed Closure
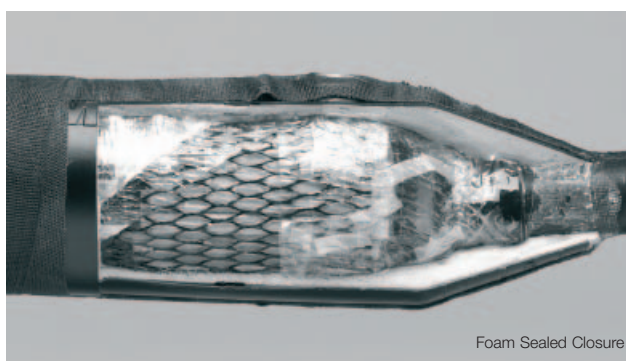
3M Buried Compound Compression

The Better Buried Compound Compression Closure method forces the encapsulant up the cable core to stop water ingress. The product is simple to install, comes with the spacer web and plastic wrap and is used to hold and force the encapsulant. The product is offered in different sizes to cover various cable ranges and can be easily extended and bricked.

Accessories see

Compounds/Encapsulants	pg. 188 - 191
Shield Bonding	pg. 207 - 210
Scotchlok Connectors	pg. 108 - 113
Tapes and Sealing	pg. 194 - 198

3M Foam Sealed Closure

Foam Sealed Closures use the Compound Compression method to apply the pressure to the encapsulant. The polyethylene closure body is over wrapped with the armorcast structural material for physical strength. 3M 4411 expandable sealant is used to fill the void between the closure body and the compound compression splice. The expandable foam adheres to the closure body, E-Z wrap and the cable sheath which in turn provides a water tight barrier around the splice and cables entering the closure.

Highlights:

- Few loose parts
- Easy assembly and improved productivity
- No heat required
- Eliminate safety concerns
- Adjustable closure diameter
- Minimises compound usage and total cost
- Tough outer shell
- Can be used in harsh environments
- Rigid body closure
- Easy re-entry, physical strength
- Rigid bonding assembly

- Increased physical strength, provides more support to the cable
- Solvent resistant
- Gasoline won't erode expandable foam and armorcast
- Can be cut with a zip cord
- Can be extended easily
- No need to stock different sizes
- Total kit
- No need to order individual parts, reduces total cost

2.2 Splice Protection Products

2.2.1 Closures
3M™ Encapsulated Closures

Technical characteristics

3M Foam Sealed Closure with Compound Compression

Product Number	FSC-2x12	FSC-3x12 S	FSC-3x12 L	FSC-3x19	FSC-4x19	FSC-6x19	FSC-8x19	FSC-8x19 L
Splice Bundle Diameter mm (in.)	31 (1.25)	50 (2)	76 (3)	76 (3)	100 (3.9)	145 (5.7)	190 (7.48)	190 (7.48)
Max. Splice Opening mm (in.)	228 (9)	255 (10)	255 (10)	430 (17)	430 (17)	480 (19)	480 (19)	480 (19)
Closure Length End To End mm (in.)	90 (15.25)	546 (21.5)	546 (21.5)	724 (28.5)	724 (28.5)	775 (30.5)	775 (30.5)	775 (30.5)
MS^2 4000 DWP Module Splice Max.	0	100/24	200/24	400/24	600/24	1200/24	2400/26	2700/26
Scotchlok Connector Splice UY2	25/22	75/24	200/24	400/24	600/24	1200/24	2400/26	2700/26
Approx. Compound Required ml (g*)	(150) 165	385 (350)	769 (700)	1648 (1500)	2473 (2250)	5769 (5250)	8242 (7500)	9890 (9000)

*Grams of 4442/8882 High Gel Re-enterable Encapsulant based on the density of 1,1ml (0,9 g). The density of other re-enterable encapsulants will vary.

Type/Order text   Ref.-No.

3M Foam Sealed Closure with Compound Compression

Packaging	Minimum Order	
1 kit	1 kit	**FSC-2x12**
1 kit	1 kit	**FSC-3x12S**
1 kit	1 kit	**FSC-3x12L**
1 kit	1 kit	**FSC-3x19**
1 kit	1 kit	**FSC-4x19**
1 kit	1 kit	**FSC-6x19**
1 kit	1 kit	**FSC-8x19**
1 kit	1 kit	**FSC-8x19L**

Additional products needed to complete this product:
Splicing Connectors and External Bonding Kit (if necessary).

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

3M Better Buried Closures

To order Better Buried Gravity Filled Closures follow 2 easy steps:

Step 1: Determine closure size using pair capacity and maximum opening, (i.e. = BB2 x 12)

Step 2: Using closure size from Step 1, determine splice and cable configuration code. (i.e. = SB/2SC-LHS) (Combine steps 1 and 2 to determine product number (i.e. = BB2 x 12 SB/2SC-LHS))

Product Nomenclature:

BB=Better Buried	SC	= Single Port End Cap
FC=Flat Cap	SB	= Strain Relief Bond Bar
DC=Double Port End Cap	PC	= Puddle Cap
SW=Spaces Web	TC	= Triple Port End Cap
LHS = Locking Harness System	DS	= Double Closure

Closure Capacity for 3M BB2x12 through 3M BB4x12

Step 1	BB2x12	BB2x24	BB3x12	BB3x24	BB4x12
Splice Bundle Diameter mm (in.)	50 (2)	50 (2)	75 (3)	75 (3)	100 (4)
Max. Splice Opening mm (in.)	177 (7)	425 (17)	177 (7)	425 (17)	177 (7)
Closure Length End To End mm (in.)	400 (16)	700 (28)	400 (16)	700 (28)	400 (16)
MS2 4000 DWP Module Splice Maximum Pair Capacity	50-pr.	100-pr.	100-pr.	200-pr.	200-pr.
Scotchlok Connector UR2/UR	25-pr.	50-pr.	75-pr.	100-pr.	150-pr.
Approx. Compound Required ml (g*)	660 (600)	1,320 (1,200)	1,320 (1,200)	3,300 (3,000)	2,500 (2,250)

*Grams of 4442/8882 High Gel Re-enterable Encapsulant based on the density of 1.1ml (0.9g). The density of other re-enterable encapsulants will vary.

Splice & Cable Configurations for 3M BB2x12 through 3M BB4x12

Step 2	BB2x12	BB2x24	BB3x12	BB3x24	BB4x12
In-line Splice With Single End Caps (1 in/1 out)	SB/2SC-LHS	SB/2SC-LHS	–	SB/2SC-LHS	SB/2DC-LHS
In-line Splice With 1 Single & 1 Double End Cap (1 in/2 out)	–	SB/SC, DC-LHS	–	SB/SC, DC-LHS	–
In-line Splice With 1 Single & 1 Double End Cap, (SB/SC, DC-LHS), Plus 4462 Shield Bond Connector And 4442 or 8882 High Gel (1 in/2 out)	4462/High Gel SC, DC-LHS	4462/High Gel SC, DC-LHS	–	4462/High Gel SC, DC-LHS	–
In-line Splice With 2 Double End Caps (2 in/2 out)	–	–	SB/2DC-LHS	–	–
In-line Splice With 1 Double & 1 Triple End Cap (2 in/3 out)	–	–	–	–	–
Butt Splice With End Cap	2BB BUTT-LHS	–	3BB BUTT-LHS	–	4BB BUTT-LHS

3M End Caps & 3M Closure Extension Sleeves

Accessories	BB2x12	BB2x24	BB3x12	BB3x24	BB4x12
Single Entry	2" SC-LHS BB	2" SC-LHS BB	3" SC-LHS BB	3" SC-LHS BB	4" SC-LHS BB
Double Entry	2" DC-LHS BB	2" DC-LHS BB	3" DC-LHS BB	3" DC-LHS BB	4" DC-LHS BB
Triple Entry	–	–	–	–	–
1 Flat Cap, 1 Puddle Cap	–	–	–	–	4" BB FC/PC
Closure Name	2DS-12-BB	2DS-24-BB	3DS-24-BB	3DS-24-BB	4DS-24-BB

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

Description

Ordering Example: 3M BB2x24 SB/SC, 3M DC-LHS

BB	=	A Better Buried Closure
2x24	=	2 inch Diameter, 24 inch Length
SB	=	Strain Relief Bond Bar
SC	=	One Single Port End Cap
DC	=	One Double Port End Cap
LHS	=	Locking Harness System

Closure Capacity 3M BB4x24 through 3M BB9x26

Step 1	BB4x24	BB5x26	BB6x26	BB7x26	BB9x26
Splice Bundle Diameter mm (in.)	(100) 4	(125) 5	(150) 6	(175) 7	(225) 9
Max. Splice Opening mm (in.)	(425) 17	(475) 19	(475) 19	(475) 19	(475) 19
Closure Length End To End mm (in.)	(750) 30	(750) 30	(750) 30	(750) 30	(750) 30
MS2 4000 DWP Module Splice Maximum Pair Capacity	400-pr.	600-pr.	900-pr.	1,200-pr.	2,400-pr.
Scotchlok Connector UR2/UR	200-pr.	300-pr.	400-pr.	600-pr.	900-pr.
Approx. Compound Required ml (g)	4,500 (5,500)	7,200 (8,300)	12,500 (13,750)	15,000 (16,500)	21,000 (23,100)

*Grams of 4442/8882 High Gel Re-enterable Encapsulant based on the density of 1,1ml (0,9 g). The density of other re-enterable encapsulants will vary.

Splice & Cable Configurations 3M BB4x24 through 3M BB9x26

Step 2	BB4x24	BB5x26	BB6x26	BB7x26	BB9x26
In-line Splice With Single End Caps (1 in/1 out)	SB/2SC-LHS	SB/2SC-LHS	–	–	–
In-line Splice With 1 Single & 1 Double End Cap (1 in/2 out)	SB/SC, DC-LHS	SB/SC, DC-LHS	–	–	–
In-line Splice With 1 Single & 1 Double End Cap, (SB/SC, DC-LHS), Plus 4462 Shield Bond Connector And 4442 or 8882 High Gel (1 in/2 out)	4462/High Gel SC, DC-LHS	4462/High Gel SC, DC-LHS	–	–	–
In-line Splice With 2 Double End Caps (2 in/2 out)	–	–	SB/2DC-LHS	SB/2DC-LHS	SB/2DC-LHS
In-line Splice With 1 Double & 1 Triple End Cap (2 in/3 out)	–	–	–	SB /DC,TC-LHS	SB /DC,TC-LHS
Butt Splice With Double End Cap	SW/FC, PC-LHS	SW/FC, PC-LHS	–	SW/FC,PC-LHS	–

3M End Caps & 3M Closure Extension Sleeves

Accessories	BB4x24	BB5x26	BB6x26	BB7x26	BB9x26
Single Entry	4" SC-LHS BB	5" SC-LHS BB	–	–	–
Double Entry	4" DC-LHS BB	5" DC-LHS BB	6" DC-LHS BB	7" DC-LHS BB	9" DC-LHS BB
Triple Entry	–	–	–	7" TC-LHS BB	9" TC-LHS BB
1 Flat Cap, 1 Puddle Cap	4"BB FC/PC	5"BB FC/PC	–	7"BB FC/PC	–
Closure Name	4DS-24-BB	5DS-26-BB	6DS-26-BB	7DS-26-BB	9DS-26-BB

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

Type/Order text		Ref.-No.

Better Buried Closure Kits

Packaging & kg (lbs.)	Minimum Order	
10/cs., 6,3 (13.8)	10 kits	**BB2x12 SB/2SC-LHS**
1/cs., 1,4 (3.0)	1 kit	**BB2x24 SB/2SC-LHS**
1/cs., 1,8 (3.9)	1 kit	**BB3x24 SB/2SC-LHS**
1/cs., 2,3 (5.1)	1 kit	**BB4x24 SB/2SC-LHS**
1/cs., 3,2 (7.1)	1 kit	**BB5x26 SB/2SC-LHS**
1/cs., 1,4 (3.2)	1 kit	**BB2x12/4462/High Gel**
1/cs., 2,6 (5.8)	1 kit	**BB2x24/4462/High Gel**
1/cs., 5,9 (13.0)	1 kit	**BB3x24/4462/High Gel**
1/cs., 8,6 (19.0)	1 kit	**BB4x24/4462/High Gel**
1/cs., 13,1 (28.8)	1 kit	**BB5x26/4462/High Gel**
1/cs., 0,7 (1.5)	1 kit	**BB2x12 SW/FC, DC-LHS**
1/cs., 0,9 (2.0)	1 kit	**BB3x12 SW/FC, DC-LHS**
1/cs., 1,1 (2.5)	1 kit	**BB4x12 SW/FC, DC-LHS**
1/cs., x (4.6)	1 kit	**BB4x24 SW/FC-PC**
1/cs., x (7.0)	1 kit	**BB5x26 SW/FC-PC**
1/cs., x (9.0)	1 kit	**BB7x26 SW/FC-PC**
1/cs., 1,4 (3.0)	1 kit	**BB2x24 SB/SC, DC-LHS**
1/cs.	1 kit	**BB3x12 SB/SC, DC-LHS**
1/cs., 1,7 (3.7)	1 kit	**BB3x24 SB/SC, DC-LHS**
1/cs., 1,7 (3.7)	1 kit	**BB4x24 SB/SC, DC-LHS**
1/cs., 2,3 (5.0)	1 kit	**BB5x26 SB/SC, DC-LHS**
1/cs., 1,8 (3.9)	1 kit	**BB3x24 SB/2SC, DC-LHS**
1/cs., 1,7 (3.7)	1 kit	**BB4x24 SB/2SC, DC-LHS**
1/cs.	1 kit	**BB4x12 SB/2DC-LHS**
1/cs., 3,6 (8.0)	1 kit	**BB6x26 SB/2DC-LHS**
1/cs., 4,2 (9.3)	1 kit	**BB7x26 SB/2DC-LHS**
1/cs., 5,1 (11.3)	1 kit	**BB9x26 SB/2DC-LHS**
1/cs., 4,7 (10.4)	1 kit	**BB7x26 SB/DC, TC-LHS**
1/cs., 5,9 (13.0)	1 kit	**BB9x26 SB/DC, TC-LHS**

3M Better Buried Closure Accessories

2/cs., 1,04 (2.3)	2 each	**4430 Spacer Web 3x20**
1/cs., 0,90 (2.0)	1 each	**4430 Spacer Web 6x 20**

2.2 Splice Protection Products

2.2.1 Closures
3M™ Encapsulated Closures

Type/Order text		Ref.-No.

Better Buried Closure Kit Spare Parts

Packaging & kg (lbs.)	Minimum Order	
10/cs., 0,9 (2.0)	10 each	**2" SC-LHS BB**
10/cs., 1,0 (2.3)	10 each	**2" DC-LHS BB**
10/cs., 7,4 (16.4)	10 each	**2DS-24-BB**
10/cs., 1,4 (3.0)	10 each	**3" SC-LHS BB**
10/cs., 1,4 (3.0)	10 each	**3" DC-LHS BB**
10/cs., 12 (26.5)	10 each	**3DS-24-BB**
10/cs., 1,8 (4.0)	10 each	**4" SC-LHS BB**
10/cs., 2,3 (5.0)	10 each	**4" DC-LHS BB**
10/cs., 2,3 (5.0)	10 kits	**4" BB FC/PC**
10/cs., 16,1 (35.4)	10 each	**4DS-24-BB**
10/cs., 2,7 (6.0)	10 each	**5" SC-LHS BB**
0/cs., 3,2 (7.0)	10 each	**5" DC-LHS BB**
10/cs., 3,2 (7.0)	10 kits	**5" BB FC/PC**
10/cs., 13,6 (30.0)	10 each	**5DS-26-BB**
1/cs., 0,5 (1.0)	1 each	**6" DC-LHS BB**
1/cs., 2,9 (6.5)	1 each	**6DS-26-BB**
1/cs., 0,5 (1.0)	1 each	**7" DC-LHS BB**
1/cs., 0,5 (1.0)	1 each	**7" TC-LHS BB**
5/cs., 2,3 (5.0)	5 kits	**7" BB FC/PC**
1/cs., 3,4 (7.5)	1 each]	**7DS-26-BB**
1/cs., 0,5 (1.0)	1 each	**9" DC-LHS BB**
1/cs.	1 each	**9" TC-LHS BB**
1/cs., 4,9 (9.0)/cs.	1 each	**9DS-26-BB**

3M Compound Compression Kits

10/case, 8,16 (18.0)	10 kits	**BB2x12CC SB/2SC-LHS**
10/case, 1,49 (3.3)	1 kit	**BB2x24CC SB/2SC-LHS**
1/case, 1,36 (3.0)	1 kit	**BB3x12CC SB/2SC-LHS**
1/case, 1,81 (4.0)	1 kit	**BB3x24CC SB/2SC-LHS**
1/case, 2,72 (6.0)	1 kit	**BB4x24CC SB/2SC-LHS**
1/case, 3,62 (8.0)	1 kit	**BB5x26CC SB/2SC-LHS**
1/case, 4,53 (10.0)	1 kit	**BB6x26CC SB/2DC-LHS**
1/case, 5,21 (11.5)	1 kit	**BB7x26CC SB/2DC-LHS**
1/case, 5,57 (12.3)	1 kit	**BB9x26CC SB/2DC-LHS**
1/case, 0,90 (2.0)	1 kit	**BB/CC-R**

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

Maximum Splice Bundle Capacities (In-Line Splice)
for 3M Better Buried Compound Compression Kits

4000-DWP or	UR Connectors		
	25-pair modular connector	(w/3" Pigtails)	
50 pr., 24 AWG (0,5 mm)	25 pr., 22 AWG (0,6 mm)		**BB2x12CC SB/2SC-LHS**
100 pr., 22 AWG (0,6 mm)	75 pr., 22 AWG (0,6 mm)		**BB3x12CC SB/2SC-LHS**
100 pr., 24 AWG (0,5 mm)	50 pr., 22 AWG (0,6 mm)		**BB2x24CC SB/2SC-LHS**
200 pr., 24 AWG (0,5 mm)	100 pr., 22 AWG (0,6 mm)		**BB3x24CC SB/2SC-LHS**
400 pr., 24 AWG (0,5 mm)	200 pr., 22 AWG (0,6 mm)		**BB4x24CC SB/2SC-LHS**
600 pr., 24 AWG (0,5 mm)	300 pr., 22 AWG (0,6 mm)		**BB5x26CC SB/2SC-LHS**
900 pr., 24 AWG (0,5 mm)	400 pr., 22 AWG (0,6 mm)		**BB6x26CC SB/2DC-LHS**
1200 pr., 24 AWG (0,5 mm)	600 pr., 22 AWG (0,6 mm)		**BB7x26CC SB/2DC-LHS**
2400 pr., 24 AWG (0,5 mm)	900 pr., 22 AWG (0,6 mm)		**BB9x26CC SB/2DC-LHS**
–	–		**BB/CC-R Re-entry Kit**

Technical characteristics

Closure Dimension Guide for 3M Better Buried Compound Compression Kits

Product	Closure End Cap Port Diameters			Max. Splice Openings			Approx. Amount of Compound Required (Ave. Splice)
	Single Entry (Max.)	Multiple Entry		Single Sheath	Double Sheath		
		1	2		Outer	Inner	
BB2x12CC SB/2SC-LHS	30 mm (1.2")			127 mm (5")			659 ml (600 grams)
BB3x12CC SB/2SC-LHS	41 mm (1.6")			127 mm (5")			1320 ml (1200 grams)
BB2x24CC SB/2SC-LHS	30 mm (1.2")			423 mm (17")	423 mm (17")	356 mm (14")	1320 ml (1200 grams)
BB3x24CC SB/2SC-LHS	41 mm (1.6")			423 mm (17")	423 mm (17")	356 mm (14")	3300 ml (3000 grams)
BB4x24CC SB/2SC-LHS	51 mm (2.0")			423 mm (17")	423 mm (17")	356 mm (14")	4945 ml (4500 grams)
BB5x26CC SB/2SC-LHS	61 mm (2.4")			483 mm (19")	483 mm (19")	406 mm (16")	7912 ml (7200 grams)
BB6x26CC SB/2DC-LHS		68 mm (2.7")	51 mm (2.0")	483 mm (19")	483 mm (19")	406 mm (16")	13736 ml (12500 grams)
BB7x26CC SB/2DC-LHS		78 mm (3.1")	60 mm (2.4")	483 mm (19")	483 mm (19")	406 mm (16")	16483 ml (15000 grams)
BB9x26CC SB/2DC-LHS		97 mm (3.8")	78 mm (3.1")	483 mm (19")	483 mm (19")	406 mm (16")	23077 ml (21000 grams)

2.2   Splice Protection Products

2.2.1 Closures
3M™ Encapsulated Closures

Description

Scotchcast 89Series Closures
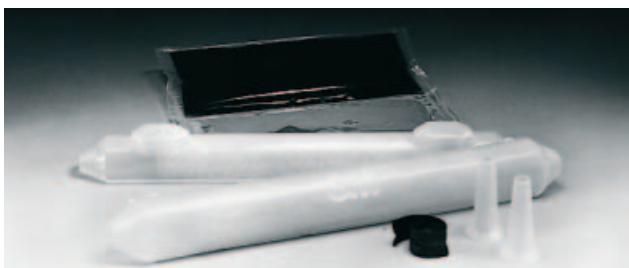
These rigid body closures use a gravity fill method of encapsulating and protecting cables. They are packed with 4442 or 8882 Re-enterable encapsulant for easy re-entry and include:

- Scotchlok 4462-Shield Bond Connectors
- Scotch 130C Tape
- Scotch 88T Tape
- Scotchcast 4435 Sheath Scuff

RUS Listed

Technical characteristics

Information for 3M Scotchcast 89 Series Closures/Re-enterable Encapsulant

Product	8981 High Gel	8982 High Gel	8983 High Gel	8984 High Gel	8985 High Gel	8986 High Gel
Splice Bundle Diameter mm (in.)	13 (0.5)	23 (0.9)	32 (1.25)	57 (2.25)	88 (3.5)	119 (4.75)
Max. Splice Opening mm (in.)	38 (1.5)	132 (5.25)	244 (9.75)	225 (9.0)	425 (17)	425 (17)
Closure Length End To End mm (in.)	182 (7.2)	273 (10.75)	396 (15.6)	400 (15.75)	622 (24.5)	635 (24.5)
Scotchlok Connector UR2/UR	4-pr.	18-pr.	50-pr.	100-pr.	400-pr.	600-pr.
MS² 4000 DWP Module Splice Maximum Pair Capacity	–	–	–	100-pr.	400-pr.	600-pr.
Approx. Compound Included	90 ml (82 grams)	300ml (266 grams)	660 ml (600 grams)	1,320 ml (1,200 grams)	2,640 ml (3,000 grams)	6,600 ml (6,000 grams)

Type/Order text   Ref.-No.

Packaging & kg (lbs.)	Minimum Order	Ref.-No.
1/box 10/cs.	10 kits /2.9 (6.4)	**8981/High Gel**
1/cs. 5,7 (12.5)	10 kits	**8982/High Gel**
1/cs. 10,3 (22.6)	10 kits	**8983/High Gel**
1/cs. 2,1 (4.6)	1 kit	**8984/High Gel**
1/cs. 4,7 (10.3)	1 kit	**8985/High Gel**
1/cs. 9,1 (20.0)	1 kit	**8986/High Gel**

Additional products needed to complete this closure: 4458 Pair Saver, Scotchlok and MS² Connectors.

2.2.1 Closures
3M™ Encapsulated Closures

Description

3M Scotchcast PIC Encapsulating Closure Kits (Non-Re-enterable)

These rigid body closures are made of translucent polypropylene and are packed with 4407 Urethane Compound and rubber tape strips for sealing ends of closure.

Technical characteristics

Information for 3M Scotchcast 89 Series Closures/Hard Encapsulant (non-re-enterable)

Product	8981-07	8982-07	8983-07	8984-07	8985-07	8986-07
Splice Bundle Diameter mm (in.)	13 (0.5)	23 (0.9)	32 (1.25)	57 (2.25)	88 (3.5)	119 (4.75)
Max. Splice Opening mm (in.)	38 (1.5)	132 (5.25)	244 (9.75)	225 (9.0)	425 (17)	425 (17)
Closure Length End To End mm (in.)	182 (7.2)	273 (10.75)	396 (15.6)	400 (15.75)	622 (24.5)	635 (24.5)
Scotchlok Connector UR2/UR	4-pr.	18-pr.	50-pr.	100-pr.	400-pr.	600-pr.
MS² 4000 DWP Module Splice Maximum Pair Capacity	–	–	–	100-pr.	400-pr.	600-pr.
Approx. Compound Included	90 ml (94 grams)	300ml (300 grams)	660 ml (675 grams)	1,320 ml (1,350 grams)	2,640 ml (3,375 grams)	6,600 ml (6,750 grams)

Type/Order text		Ref.-No.
Packaging & kg (lbs.)	**Minimum Order**	
1/box 10/cs. 3,1 (6.8)	10 kits	**8981-07**
1/box 10/cs. 6,2 (13.6)	10 kits	**8982-07**
1/box 10/cs. 11,2 (24.7)	10 kits	**8983-07**
1/cs. 2,1 (4.6)	1 kit	**8984-07**
1/cs. 4,9 (10.7)	1 kit	**8985-07**
1/cs.	1 kit	**8986-07**

Additional products needed to complete this closure: 4458 Pair Saver, Scotchlok and MS² Connectors.

2.2.1 Closures
3M™ Encapsulated Closures

Description

3M SLiC 5-Pair Buried Service Wire Kit

Protecting a buried service wire splice is now easier than ever with the SLiC Buried Service Wire Kit. The BSW kit is a three-part, rigid body closure that self-encapsulates two and five-pair buried service wire. It has a built-in bonding system that bonds the buried service wire shield as the splice is put together and contains a revolutionary new sealant.

The special formulated sealant is a one-part, no-mix, non-urethane product containing no grease. The sealant serves as an electrical insulator and reacts upon moisture contact to prevent water ingression. At the point of water incursion, the sealant hardens and forms a water-resistant barrier.

3M Scotchcast 3817 Buried Service Wire Splicing/Cable Capping Kit
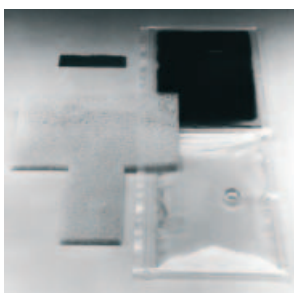
For buried service wire splicing and end capping. Kit contains T foam spacer pad, 17 compound in "J" size bag, 75 g (2.65 oz.) Unipak container. Packaged in poly bag with instructions.

3M Scotchcast 3821 Cable Capping Kit
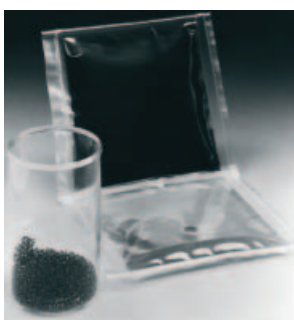
Designed specifically for cable capping, this kit includes a clear plastic cup. The 3821 kit accepts a 300-pair 0.6 mm (22 AWG) or 400-pair 0.5 mm (24 AWG).

Also included in the kit is fast curing 17 compound in the Unipak Container. Instructions are provided. 38 mm (1-1/2") O.D.

3M Scotchcast 3832 Buried Service Wire Splice Kit

The Scotchcast 3832 Buried Service Wire Splice Kit will accommodate inline and butt splices of up to five-pair filled or unfilled service wire. One "A" size bag of 4403 encapsulant and a split bolt are provided with the kit. Once the compound has been poured, an outer tube is rotated over the barrel opening to seal the unit, requiring no waiting for the compound to cure before the kit is buried.

Solutions for Outside Plant

2

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

3M 3838 PST/Gel Buried Service Wire Splice Kit

The 3M 3838 PST/Gel Buried Service Splice Kit is a flexible and "non-compound" splicing system that provides fast, reliable and easy protection. This kit will accommodate inline, butt and extended splices of up to six pair buried service wire. The new kit utilises non-toxic PST and Gel technology and provides an excellent water-proof environment.

It meets tough qualification tests such as impact and pull-out resis-tance, water immersion and freeze / that cycle test in wet sand. The shield bond connector is specially designed to provide good electrical continuity and strain relief at the same time.The 3838 PST/Gel buried service wire kit is simple to use and requires mini-mal training.

Highlights:

- PST/Gel technology
  Proven reliability; waterproof performance saves maintenance costs, keeps lines up and running

- Passes freeze/thaw cycle test in wet sand
  No return dig-ups; saves repair costs

- Used for butt and in-line splicing
  Addresses multiple splicing configurations; reduces inventory hassles and costs

- No encapsulant mixing
  Reduces installation time and reduces waste

- Universal sizing, "push type" strain relief and shield connector

- Fits all needs; inventory savings. No special tools required; no tooling costs

- Fewer piece parts
  Fast assembly; reduced labour

- No compound
  No curing time; can be buried immediately

- Easy installation
  Craft friendly with minimal training

- Applicable in extreme temperatures
  No scheduling or weather constraints

2.2 Splice Protection Products
2.2.1 Closures
3M™ Encapsulated Closures

Type/Order text			Ref.-No.

3M Buried Service Wire and End Capping Kits

	Packaging & kg (lbs.)/cs.	Min. Order	
Buried Service Wire Kit 2,3 (5.0)	1 kit/bag, 12 kits/cs.	12 kits	**SLiC 5-pair**
Buried Service Wire Splicing/ Cable Capping Kit 38,100 mm (1 1/2"), O.D.	1 kit/bag, 12 cs. 1,45 (3.2)	12 kits	**3817**
Buried Service Wire Splice Kit with Split Bolt	1/bag, 12/cs. 1,9 (4.2)	12 kits	**3832**
Cable Capping Kit 22,225 mm + 38,100 mm (7/8"+ 1 1/2") O.D.	1/bag, 12/cs. 1,7 (3.8)	12 kits	**3821**
PST/Gel Buried Service Wire Splice Kit	1 kit/1 box (.625 lbs)	1 kit	**3838**
includes the following:	Gel Blanket (1) 4360 Pull 'N' Shrink Tubing (1) 4463 Shield Bond Assembly (1) 23 Tape Strip (1)		

2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Description

A complete pressure tight re-enterable closure system for enclosing spliced connections of communications cables in a wide variety of applications

The 2-type Closure Series is available in a wide variety of closure lengths and diameters. Lengths range from 470mm (18-1/2") to over 2096mm (82-1/2") and closure diameters range from 77mm (3") to 305mm (12").
The 2-type kit comes complete with all the components needed to install the cover and end plates. The only tool required for installation is a washer cutter tool.

MS² Modules see	pg. 114 - 120
Tapes and Sealing see	pg. 194 - 198
Splicing Rigs & Equipment see	pg. 121 - 124
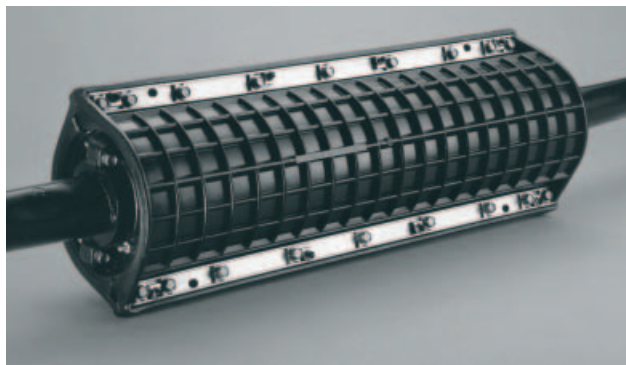
Each complete 2-Type Cover Kit Selection Contains:

- Cover assembly with channel bars and bolts
- Transparent splice wrap with cable ties
- Cover sealing R-Type re-enterablesealing tape
- Endplate sealing R-Type re-enterable sealing tape
- Solvent cleaning wipe and plastic gloves
- Back cover support clips with cable ties
- Pressurisation valve
- Internal shield continuity braid with insulation
- External grounding ribbon
- Vented and solid continuity and ground connectors with hex nuts
- Assembly Instructions

Each complete 2-Type Endplate Kit Selection Contains:

- Endplate assembly with sheath grip clamps
- Cable collar build-up R-Type re-enterable sealing tape material
- Endplate mid-section sealing R-Type re-enterable sealing tape
- Solvent cleaning wipe and plastic gloves
- Cable diameter measuring tape
- Shield connector
- Cable sheath scuff
- Hose clamps for securing sheath grip clamps to cable
- Additional sheath grip clamps
- Universal slotted washers for sealing cable entrances
- Assembly Instructions

Type/Order text   Ref.-No.

Customised complete 3M 2-Type Closure Solutions

Description	Max. Number Cable Pairs	Sheath Opening mm	Cable Opening (Encapsulated)	Max. Ø Cable Opening (mm)	Splice Banks (25 Pair MS)	Min. Order (each)	
2A2AA-4-DTAG	500/0.4	254	2 in & 2 out	41 & 25	1	1	**DKSM 1**
2B2A-4-DTAG	800/0.4	483	2 in & 2 out	56 & 56	2	1	**DKSM 2**
2C2A-4-DTAG	1500/0.4	483	2 in & 2 out	71 & 71	2	1	**DKSM 3**
2D2A-4-DTAG	2000/0.4	500	2 in & 2 out	86 & 86	2	1	**DKSM 4**
2C2B-4-DTAG*	2000/0.4	700	2 in & 2 out	71 & 71	3	1	**DKSM 3L**
2D2B-4-DTAG*	2000/0.4	700	2 in & 2 out	86 & 86	3	1	**DKSM 5**
2D2C-4-DTAG*	2000/0.4	900	2 in & 2 out	86 & 86	4	1	**DKSM 6**
2B2A-4-USSM**	200/0.4-0.8	483	2 in & 2 out	56 & 56 mm	200 SID pairs	1	**USSM**

*   Large closures for exchange transfer and cut over.

** Closure with Lightning protection. Includes SID-C terminal block with gas arrestores. Protects people and equipment in telecommunication towers (UMTS, GSM) and wind power stations against. Bonding and grounding terminal included.

2.2.1 Closures

3M™ 2-Type Series Pressurised Closures

Description

3M 2-Type Closure System Ordering Code

Covers

2 D 2 A

2-Type Series

Inside Diameter

Y = 77 mm (3")
X = 102 mm (4")
A = 134 mm (5-1/4")
B = 178 mm (7")
C = 203 mm (8")
D = 241 mm (9-1/2")
E = 305 mm (12")

Material of Manufacture

2 = Standard
4 = Fire Retardant

Overall Length of Cover

AA = 470 mm (18-1/2")
A = 699 mm (27-1/2")
B = 914 mm (36")
C = 1130 mm (44-1/2")
D* = 1232 mm (48-1/2")
E* = 1340 mm (52-3/4")
F* = 1448 mm (57")
G* = 1563 mm (61-1/2")
H* = 1664 mm (65-1/2")
I* = 1772 mm (69-3/4")
J* = 1880 mm (74")
K* = 1994 mm (78-1/2")
L* = 2096 mm (82-1/2")
* = Custom Sizes

Endplates

2 D 2 -1E

2-Type Series

Inside Diameter

Y = 77 mm (3")
X = 102 mm (4")
A = 134 mm (5-1/4")
B = 178 mm (7")
C = 203 mm (8")
D = 241 mm (9-1/2")
E = 305 mm (12")

Number of Cable Entries in Endplate

1E = 1 Cable
2E = 2 Cables
3E = 3 Cables

Material of Manufacture

2 = Standard
4 = Fire Retardant

Solutions for Outside Plant

2

2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2A2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
134 (5.25)	470 (18.5)	254 (10.0)	400	1	5,0 (11)	1	**2A2AA-510**
134 (5.25)	699 (27.5)	483 (19.0)	600	2	6,8 (15)	1	**2A2A-510**
134 (5.25)	914 (36.0)	699 (27.5)	Custom	3	8,6 (19)	1	**2A2B-510**
134 (5.25)	1130 (44.5)	914 (36.0)	Custom	4	10 (22)	1	**2A2C-510**
134 (5.25)	1448 (57.0)	1232 (48.5)	Custom	–	14 (31)	1	**2A2F-510**
134 (5.25)	1664 (65.5)	1448 (57.0)	Custom	–	16 (35)	1	**2A2H-510**
134 (5.25)	1994 (78.5)	1778 (70.0)	Custom	–	18 (39)	1	**2A2K-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
134 (5.25)	1	56 (2.2)	1,4 (3)	1	**2A2-1E-510**
134 (5.25)	2	41 (1.6) 33 (1.3)	1,4 (3)	1	**2A2-2E-510**
Grommet Selection					
134 (5.25)	6	28 (1.1) up to 33 (1.3)	1,4 (3)	1	**2A4-6E-130**
134 (5.25)	6	28 (1.1) up to 33 (1.3)	0,9 (2)	1	**2A4-6S-130**
134 (5.25)	9	22 (0.88) up to 28 (1.1)	1,4 (3)	1	**2A4-9E**
134 (5.25)	9	22 (0.88) up to 28 (1.1)	1,4 (3)	1	**2A4-9S**
Custom	Custom	Custom	Custom	1	**2A2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products

2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2B2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
178 (7.0)	470 (18.5)	254 (10.0)	600	1	6 (13)	1	**2B2AA-510**
178 (7.0)	699 (27.5)	483 (19.0)	1200	2	8 (17)	1	**2B2A-510**
178 (7.0)	914 (36.0)	699 (27.5)	2100	3	10 (22)	1	**2B2B-510**
178 (7.0)	1130 (44.0)	914 (36.0)	2700	4	12 (27)	1	**2B2C-510**
178 (7.0)	1232 (48.5)	1016 (40.0)	Custom	–	14 (31)	1	**2B2D-510**
178 (7.0)	1340 (52.8)	1124 (44.3)	Custom	–	15 (33)	1	**2B2E-510**
178 (7.0)	1448 (57)	1232 (48.5)	Custom	–	16 (36)	1	**2B2F-510**
178 (7.0)	1772 (69.75)	1556 (61.25)	Custom	–	20 (44)	1	**2B2I-510**
178 (7.0)	1880 (74.0)	1664 (65.5)	Custom	–	21 (46)	1	**2B2J-510**
178 (7.0)	1994 (78.5)	1778 (70.0)	Custom	–	22 (49)	1	**2B2K-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
178 (7.0)	1	86 (3.4)	1,8 (4)	1	**2B2-1E-510**
178 (7.0)	2	56 (2.2) 56 (2.2)	2,3 (5)	1	**2B2-2E-510**
178 (7.0)	3	56 (2.2) 25 (1.0) 25 (1.0)	2,3 (5)	1	**2B2-3E-510**
Grommet Selection					
178 (7.0)	9	28 (1.1) up to 33 (1.3)	2,3 (5)	1	**2B4-9E-130**
178 (7.0)	9	28 (1.1) up to 33 (1.3)	1,8 (4)	1	**2B4-9S-130**
178 (7.0)	12	22 (0.88) up to 28 (1.1)	2,3 (5)	1	**2B4-12E**
178 (7.0)	12	22 (0.88) up to 28 (1.1)	2,3 (5)	1	**2B4-12S**
Custom	Custom	Custom	Custom	Custom	**2B2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products
2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2C2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
203 (8.0)	699 (27.5)	483 (19.0)	1800	2	8,6 (19)	1	**2C2A-510**
203 (8.0)	914 (36.0)	699 (27.5)	3600	3	11 (25)	1	**2C2B-510**
203 (8.0)	1130 (44.5)	914 (36.0)	4200	4	14 (30)	1	**2C2C-510**
203 (8.0)	1232 (48.5)	1016 (40.0)	Custom	–	17 (37)	1	**2C2D-510**
203 (8.0)	1340 (52.75)	1124 (44.25)	Custom	–	18 (39)	1	**2C2E-510**
203 (8.0)	1448 (57.0)	1232 (48.5)	Custom	–	19 (41)	1	**2C2F-510**
203 (8.0)	1563 (61.5)	1346 (53.0)	Custom	–	21 (46)	1	**2C2G-510**
203 (8.0)	1664 (65.5)	1448 (57.0)	Custom	–	21 (47)	1	**2C2H-510**
203 (8.0)	1772 (69.75)	1556 (61.25)	Custom	–	23 (50)	1	**2C2I-510**
203 (8.0)	1880 (74.0)	1664 (65.5)	Custom	–	24 (52)	1	**2C2J-510**
203 (8.0)	1994 (78.5)	1778 (70.0)	Custom	–	25 (55)	1	**2C2K-510**
203 (8.0)	2096 (82.5)	1880 (74.0)	Custom	–	26 (57)	1	**2C2L-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
203 (8.0)	1	86 (3.4)	1,8 (4)	1	**2C2-1E-510**
203 (8.0)	2	71 (2.8) 71 (2.8)	2,7 (6)	1	**2C2-2E-510**
203 (8.0)	3	71 (2.8) 41 (1.6) 41 (1.6)	2,7 (6)	1	**2C2-3E-510**
Grommet Selection					
203 (8.0)	12	28 (1.1) up to 33 (1.3)	2,7 (6)	1	**2C4-12E-130**
203 (8.0)	12	28 (1.1) up to 33 (1.3)	2,7 (6)	1	**2C4-12S-130**
203 (8.0)	18	22 (0.88) up to 28 (1.1)	2,7 (6)	1	**2C4-18E**
203 (8.0)	18	22 (0.88) up to 28 (1.1)	2,7 (6)	1	**2C4-18S**
Custom	Custom	Custom	Custom	Custom	**2C2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products

2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2D2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
241 (9.5)	470 (18.5)	254 (10.0)	Custom	1	8,2 (18)	1	**2D2AA-510**
241 (9.5)	699 (27.5)	483 (19.0)	3300	2	10 (22)	1	**2D2A-510**
241 (9.5)	914 (36.0)	699 (27.5)	4200	3	13 (29)	1	**2D2B-510**
241 (9.5)	1130 (44.5)	914 (36.0)	4800	4	16 (35)	1	**2D2C-510**
241 (9.5)	1232 (48.5)	1016 (40.0)	Custom	–	18 (40)	1	**2D2D-510**
241 (9.5)	1340 (52.75)	1124 (44.25)	Custom	–	20 (43)	1	**2D2E-510**
241 (9.5)	1448 (57.0)	1232 (48.5)	Custom	–	21 (46)	1	**2D2F-510**
241 (9.5)	1563 (61.5)	1346 (53.0)	Custom	–	23 (50)	1	**2D2G-510**
241 (9.5)	1664 (65.5)	1448 (57.0)	Custom	–	24 (53)	1	**2D2H-510**
241 (9.5)	1772 (69.75)	1556 (61.25)	Custom	–	25 (56)	1	**2D2I-510**
241 (9.5)	1880 (74.0)	1664 (65.5)	Custom	–	27 (59)	1	**2D2J-510**
241 (9.5)	1994 (78.5)	1778 (70.0)	Custom	–	28 (62)	1	**2D2K-510**
241 (9.5)	2096 (82.5)	1880 (74.0)	Custom	–	29 (64)	1	**2D2L-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
241 (9.5)	1	86 (3.4)	2,3 (5)	1	**2D2-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	3,2 (7)	1	**2D2-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	3,2 (7)	1	**2D2-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**
Custom	Custom	Custom	Custom	Custom	**2D2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2.1   Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2E2-DD Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	3300	2	12 (26)	1	**2E2A-DD-510**
305 (12.0)	914 (36.0)	699 (27.5)	4200	3	16 (34)	1	**2E2B-DD-510**
305 (12.0)	1130 (44.5)	914 (36.0)	Custom	4	20 (43)	1	**2E2C-DD-510**
305 (12.0)	1232 (48.5)	1016 (40.0)	Custom	–	21 (47)	1	**2E2D-DD-510**
305 (12.0)	1340 (52.75)	1124 (44.25)	Custom	–	23 (50)	1	**2E2E-DD-510**
305 (12.0)	1448 (57.0)	1232 (48.5)	Custom	–	25 (54)	1	**2E2F-DD-510**
305 (12.0)	1563 (61.5)	1346 (53.0)	Custom	–	27 (59)	1	**2E2G-DD-510**
305 (12.0)	1664 (65.5)	1448 (57.0)	Custom	–	28 (62)	1	**2E2H-DD-510**
305 (12.0)	1772 (69.75)	1556 (61.25)	Custom	–	30 (65)	1	**2E2I-DD-510**
305 (12.0)	1880 (74.0)	1664 (65.5)	Custom	–	31 (69)	1	**2E2J-DD-510**
305 (12.0)	1994 (78.5)	1778 (70.0)	Custom	–	32 (71)	1	**2E2K-DD-510**
305 (12.0)	2096 (82.5)	1880 (74.0)	Custom	–	34 (74)	1	**2E2L-DD-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
241 (9.5)	1	86 (3.4)	2,3 (5)	1	**2D2-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	3,2 (7)	1	**2D2-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	3,2 (7)	1	**2D2-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**
Custom	Custom	Custom	Custom	Custom	**2D2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products
2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2E2-EE 12" Endplate Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	3300	2	12 (26)	1	**2E2A-EE-510**
305 (12.0)	914 (36.0)	699 (27.5)	4200	3	16 (34)	1	**2E2B-EE-510**
305 (12.0)	1130 (44.5)	914 (36.0)	Custom	4	20 (43)	1	**2E2C-EE-510**
305 (12.0)	1232 (48.5)	1016 (40.0)	Custom	–	21 (47)	1	**2E2D-EE-510**
305 (12.0)	1340 (52.75)	1124 (44.25)	Custom	–	23 (50)	1	**2E2E-EE-510**
305 (12.0)	1448 (57.0)	1232 (48.5)	Custom	–	25 (54)	1	**2E2F-EE-510**
305 (12.0)	1563 (61.5)	1346 (53.0)	Custom	–	27 (59)	1	**2E2G-EE-510**
305 (12.0)	1664 (65.5)	1448 (57.0)	Custom	–	28 (62)	1	**2E2H-EE-510**
305 (12.0)	1772 (69.75)	1556 (61.25)	Custom	–	30 (65)	1	**2E2I-EE-510**
305 (12.0)	1880 (74.0)	1664 (65.5)	Custom	–	31 (69)	1	**2E2J-EE-510**
305 (12.0)	1994 (78.5)	1778 (70.0)	Custom	–	32 (71)	1	**2E2K-EE-510**
305 (12.0)	2096 (82.5)	1880 (74.0)	Custom	–	34 (74)	1	**2E2L-EE-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
305 (12.0)	2	112 (4.4) 112 (4.4)	4,1 (9)	1	**2E2-2E-510**
305 (12.0)	3	102 (4.0) 86 (3.4) 86 (3.4)	4,1 (9)	1	**2E2-3E-510**
Grommet Selection					
305 (12.0)	27	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-27E**
305 (12.0)	27	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-27S**
305 (12.0)	27	28 (1.1) up to 33 (1.3)	5,5 (12)	1	**2E4-27E-130**
305 (12.0)	27	28 (1.1) up to 33 (1.3)	5,0 (11)	1	**2E4-27S-130**
305 (12.0)	36	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-36E**
305 (12.0)	36	22 (0.88) up to 28 (1.1)	5,5 (12)	1	**2E4-36S**
305 (12.0)	42	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-42E**
305 (12.0)	Custom	To be specified	—	—	**2E2-CG**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.

2. Custom grommet hole configurations are available on a special order basis.

3. Bonding hardware included with solid grommets only.

4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products
2.2.1 Closures
3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2E2-DE Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	4200	2	12 (26)	1	**2E2A-DE-510**
305 (12.0)	914 (36.0)	699 (27.5)	4800	3	16 (34)	1	**2E2B-DE-510**
305 (12.0)	1130 (44.5)	914 (36.0)	Custom	4	20 (43)	1	**2E2C-DE-510**
305 (12.0)	1232 (48.5)	1016 (40.0)	Custom	–	21 (47)	1	**2E2D-DE-510**
305 (12.0)	1340 (52.75)	1124 (44.25)	Custom	–	23 (50)	1	**2E2E-DE-510**
305 (12.0)	1348 (57.0)	1232 (48.5)	Custom	–	25 (54)	1	**2E2F-DE-510**
305 (12.0)	1563 (61.5)	1346 (53.0)	Custom	–	27 (59)	1	**2E2G-DE-510**
305 (12.0)	1664 (65.5)	1448 (57.0)	Custom	–	28 (62)	1	**2E2H-DE-510**
305 (12.0)	1772 (69.75)	1556 (61.25)	Custom	–	30 (65)	1	**2E2I-DE-510**
305 (12.0)	1880 (74.0)	1664 (65.5)	Custom	–	31 (69)	1	**2E2J-DE-510**
305 (12.0)	1994 (78.5)	1778 (70.0)	Custom	–	32 (71)	1	**2E2K-DE-510**
305 (12.0)	2096 (82.5)	1880 (74.0)	Custom	–	34 (74)	1	**2E2L-DE-510**

Note: One end is 229 mm (9"), one end is 305 mm (12").

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection*					
241 (9.5)	1	86 (3.4)	2,3 (5)	1	**2D2-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	3,2 (7)	1	**2D2-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	3,2 (7)	1	**2D2-3E-510**
305 (12.0)	2	112 (4.4) 112 (4.4)	4,1 (9)	1	**2E2-2E-510**
305 (12.0)	3	102 (4.0) 86 (3.4) 86 (3.4)	4,1 (9)	1	**2E2-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits OR
1 cover assembly kit,
1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2.1 Closures

3M™ 2-Type Series Pressurised Closures

Type/Order text	Ref.-No.

3M 2X2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
102 (4.0)	470 (18.5)	254 (10.0)	100	1	4,8 (11)	1	**2X2AA-510**
102 (4.0)	699 (27.5)	483 (19.0)	Custom	2	7,3 (16)	1	**2X2A-510**
102 (4.0)	914 (36.0)	699 (27.5)	Custom	3	8,6 (19)	1	**2X2B-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)		Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection						
102 (4.0)	2	25 (1.0)	25 (1.0)	0,9 (2)	1	**2X2-2E-510**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits.

NOTE: 1.   Custom cover lengths are available on a special order basis.

2.   Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

3M 2Y2 Standard Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
77 (3.0)	470 (18.5)	254 (10.0)	100	1	5,0 (11)	1	**2Y2AA-510**
77 (3.0)	699 (27.5)	483 (19.0)	Custom	2	7,3 (16)	1	**2Y2A-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)		Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection						
77 (3.0)	2	25 (1.0)	25 (1.0)	0,9 (2)	1	**2Y2-2E-510**

A complete 2-type closure system requires:
1 cover assembly kit and 2 endplate kits.

NOTE: 1.   Custom cover lengths are available on a special order basis.

2.   Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

Solutions for Outside Plant

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2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Description

3M 2-Type Closures that can really take the heat.

The 2-Type Fire Retardant Closure is completely self-contained and capable of withstanding a 15 minute horizontal or vertical burn test. In addition, the Fire Retardant Vault/ Building Closure System meets all the performance criteria of the standard 2-Type Closure series so you can use the same tools and installation procedures.

The system has an Oxygen Index of 28% minimum and a UL 94 rating exceeding V.O. The closure self extinguishes when the fuel source is removed. The Fire Retardant Closure can be used for new construction or for retrofitting: cable for entrance facilities, vault or central office, building riser cables or building distribution cables.
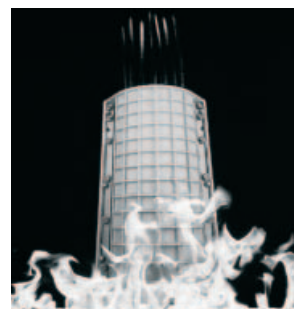
Type/Order text   Ref.-No.

3M 2A4 Fire Retardant Series

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
134 (5.25)	470 (18.5)	254 (10.0)	400	1	5,5 (12)	1	**2A4AA-510**
134 (5.25)	699 (27.5)	483 (19.0)	600	2	7,7 (17)	1	**2A4A-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
134 (5.25)	1	56 (2.2)	1,4 (3)	1	**2A4-1E-510**
134 (5.25)	2	41 (1.6) 33 (1.3)	1,4 (3)	1	**2A4-2E-510**
Grommet Selection					
134 (5.25)	6	28 (1.1) up to 33 (1.3)	1,4 (3)	1	**2A4-6E-130**
134 (5.25)	6	28 (1.1) up to 33 (1.3)	1,4 (3)	1	**2A4-6S-130**
134 (5.25)	9	22 (0.88) up to 28 (1.1)	1,4 (3)	1	**2A4-9E**
134 (5.25)	9	22 (0.88) up to 28 (1.1)	1,4 (3)	1	**2A4-9S**
134 (5.25)	Custom	To be specified			**2A4-GC**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
2. Bonding hardware included with solid grommets only.
3. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

3M 2B4 Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
178 (7.0)	470 (18.5)	254 (10.0)	600	1	7,3 (16)	1	**2B4AA-510**
178 (7.0)	699 (27.5)	483 (19.0)	1200	2	9,6 (21)	1	**2B4A-510**
178 (7.0)	914 (36.0)	699 (27.5)	2100	3	13 (29)	1	**2B4B-510**
178 (7.0)	1130 (44.5)	914 (36.0)	2700	4	16 (35)	1	**2B4C-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
178 (7.0)	1	86 (3.4)	2,3 (5)	1	**2B4-1E-510**
178 (7.0)	2	56 (2.2) 56 (2.2)	2,7 (6)	1	**2B4-2E-510**
178 (7.0)	3	56 (2.2) 25 (1.0) 25 (1.0)	2,3 (5)	1	**2B4-3E-510**
Grommet Selection					
178 (7.0)	9	28 (1.1) up to 33 (1.3)	2,3 (5)	1	**2B4-9E-130**
178 (7.0)	9	28 (1.1) up to 33 (1.3)	2,3 (5)	1	**2B4-9S-130**
178 (7.0)	12	22 (0.88) up to 28 (1.1)	2,3 (5)	1	**2B4-12E**
178 (7.0)	12	22 (0.88) up to 28 (1.1)	2,3 (5)	1	**2B4-12S**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
2. Bonding hardware included with solid grommets only.
3. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

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2.2 Splice Protection Products
2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2C4 Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
203 (8.0)	699 (27.5)	483 (19.0)	1800	2	12 (26)	1	**2C4A-510**
203 (8.0)	914 (36.0)	699 (27.5)	3600	3	16 (34)	1	**2C4B-510**
203 (8.0)	1130 (44.5)	914 (36.0)	4200	4	19 (41)	1	**2C4C-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
203 (8.0)	1	86 (3.4)	2,3 (5)	1	**2C4-1E-510**
203 (8.0)	2	71 (2.8) 71 (2.8)	3,2 (7)	1	**2C4-2E-510**
203 (8.0)	3	71 (2.8) 41 (1.6) 41 (1.6)	3,2 (7)	1	**2C4-3E-510**
Grommet Selection					
203 (8.0)	12	28 (1.1) up to 33 (1.3)	2,7 (6)	1	**2C4-12E-130**
203 (8.0)	12	28 (1.1) up to 33 (1.3)	2,7 (6)	1	**2C4-12S-130**
203 (8.0)	18	22 (0.88) up to 28 (1.1)	2,7 (6)	1	**2C4-18E**
203 (8.0)	18	22 (0.88) up to 28 (1.1)	2,7 (6)	1	**2C4-18S**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
2. Bonding hardware included with solid grommets only.
3. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2.1   Closures

3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2D4 Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
241 (9.5)	699 (27.5)	483 (19.0)	3300	2	14 (30)	1	**2D4A-510**
241 (9.5)	914 (36.0)	699 (27.5)	4200	3	17 (38)	1	**2D4B-510**
241 (9.5)	1130 (44.5)	914 (36.0)	4800	4	22 (47)	1	**2D4C-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
241 (9.5)	1	86 (3.4)	2,7 (6)	1	**2D4-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	3,6 (8)	1	**2D4-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	3,6 (8)	1	**2D4-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**
241 (9.5)	Custom	To be specified	3,6 (8)	1	**2D4-CG**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
2. Bonding hardware included with solid grommets only.
3. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

Solutions for Outside Plant

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2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2E4-DD Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	3300	2	16 (34)	1	**2E4A-DD-510**
305 (12.0)	914 (36.0)	699 (27.5)	4200	3	21 (45)	1	**2E4B-DD-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
241 (9.5)	1	86 (3.4)	2,7 (6)	1	**2D4-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	3,6 (8)	1	**2D4-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	3,6 (8)	1	**2D4-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**
241 (9.5)	Custom	To be specified	3,6 (8)	1	**2D4-CG**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits
OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products

2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2D4-EE Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	4200	2	16 (34)	1	**2E4A-EE-510**
305 (12.0)	914 (36.0)	699 (27.5)	4800	3	20 (44)	1	**2E4B-EE-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
305 (12)	2	112 (4.4) 112 (4.4)	4,5 (10)	1	**2E4-2E-510**
305 (12)	3	102 (4.0) 86 (3.4) 86 (3.4)	4,5 (10)	1	**2E4-3E-510**
Grommet Selection					
305 (12)	27	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-27E**
305 (12)	27	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-27S**
305 (12)	27	28 (1.1) up to 33 (1.3)	5,5 (12)	1	**2E4-27E-130**
305 (12)	27	28 (1.1) up to 33 (1.3)	5,0 (11)	1	**2E4-27S-130**
305 (12)	36	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-36E**
305 (12)	36	22 (0.88) up to 28 (1.1)	5,5 (12)	1	**2E4-36S**
305 (12)	42	22 (0.88) up to 28 (1.1)	5,9 (13)	1	**2E4-42E**
305 (12)	Custom	To be specified	–	1	**2E4-CG**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits
OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

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2.2 Splice Protection Products

2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2E4-DE Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
305 (12.0)	699 (27.5)	483 (19.0)	4200	2	16 (35)	1	**2E4A-DE-510**
305 (12.0)	914 (36.0)	699 (27.5)	4800	3	21 (45)	1	**2E4B-DE-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
241 (9.5)	1	86 (3.4)	14 (30)	1	**2D4-1E-510**
241 (9.5)	2	86 (3.4) 86 (3.4)	17 (38)	1	**2D4-2E-510**
241 (9.5)	3	86 (3.4) 56 (2.2) 56 (2.2)	22 (47)	1	**2D4-3E-510**
Grommet Selection					
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18E**
241 (9.5)	18	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-18S**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,6 (8)	1	**2D4-18E-130**
241 (9.5)	18	28 (1.1) up to 33 (1.3)	3,2 (7)	1	**2D4-18S-130**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27E**
241 (9.5)	27	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-27S**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-36E**
241 (9.5)	36	22 (0.88) up to 28 (1.1)	3,2 (7)	1	**2D4-36S**
241 (9.5)	42	22 (0.88) up to 28 (1.1)	3,6 (8)	1	**2D4-42E**
241 (9.5)	Custom	To be specified	–	1	**2D4-CG**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits OR 1 cover assembly kit, 1 endplate kit and 1 grommet kit.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Custom grommet hole configurations are available on a special order basis. "E" designates solid endplate for new construction and "S" designates split endplate for existing or retrofit applications.
3. Bonding hardware included with solid grommets only.
4. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products

2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

Type/Order text	Ref.-No.

3M 2X4 Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
102 (4.0)	470 (18.5)	254 (10.0)	100	1	5,9 (13)	1	**2X4AA-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)		Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection						
102 (4.0)	2	25 (1.0)	25 (1.0)	1,4 (3)	1	**2X4-2E-510**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2   Splice Protection Products
2.2.1 Closures
3M™ 2-Type Fire Retardant Closures

3M 2Y4 Fire Retardant Series Closures

Inside Diameter mm (in.)	Overall Length mm (in.)	Sheath Opening mm (in.)	Max. Number Cable Pairs	Splice Banks	Pkg. kg (lbs.)	Min. Order (each)	
Cover Halves Assembly Selection							
77 (3.0)	470 (18.5)	254 (10.0)	100	1	5,9 (13)	1	**2Y4AA-510**

Endplate Diameter mm (in.)	Cable Openings	Max. Diameter Each Cable Opening mm (in.)	Pkg. kg (lbs.)	Min. Order (each)	
Endplate Selection					
77 (3.0)	2	25 (1.0)	1,4 (3)	1	**2Y4-2E-510**

A complete 2-type closure system requires: 1 cover assembly kit and 2 endplate kits.

NOTE:
1. Custom cover lengths are available on a special order basis.
2. Maximum number of cable pairs based on 0,51/0,40 mm (24/26") gauge cable using 25 pair modular connectors for straight, in-line splice.

2.2 Splice Protection Products

2.2.1 Closures
Accessories and Replacement Parts

Type/Order text	Ref.-No.

Accessories and Replacement Parts 3M 2-Type Closures
and 3M Fire Retardant 4-Type Vault Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Abrasive Sheath Scuff				
For scuffing cable sheath during cable preparation.				
Cable Sheath Scuff	100	1 pkg.	1,4 (3.0)	**AS10-M100**
25 (1) x 400 (16)				
Aerial Hanger Kit				
For supporting closure assembly to strand wire in aerial applications.				
Aerial Hanger Kit	2	20 kits	3,2 (7)	**AH20K**
Back Cover Clip Kit				
For supporting backing cover to endplates during splicing.				
Also keeps endplates parallel and properly spaced.				
A, B, C, X, Y and Z Covers	2 Clips w/Cable Ties	20 kits	0,9 (2)	**BCC10K**
Kit in bulk	100	1 pkg.	1,4 (3)	**BCC10-M100**
(Cable Ties not Included)				
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**
Bond Connector Kit				
For replacing lost or damaged bond connectors.				
Solid, Vented Bond Conn. Kit	1 Solid & 1 Vented with hex nuts	20 kits	0,9 (2)	**BCHN10K**
Solid Bond Connector	25	4 pkgs.	1,4 (3)	**BBC20K**
Vented Bond Connector	25	4 pkgs.	0,9 (2)	**VBC20K**
Bonding Harness				
For establishing shield continuity on tip cables inside vault closures.				
Standard packaging - 9 Wire Harnesses.				
Bonding Harness Kit (9-wire)	1	1 kit	0,2 (0.4)	**BH9K**
Bonding Harness Kit (18-wire)	2	1 kit	0,3 (0.7)	**BH18K**
Bonding Harness Kit (27-wire)	3	1 kit	0,4 (1)	**BH27K**
Bonding Harness Kit (36-wire)	4	1 kit	0,9 (2)	**BH36K**
Bonding Harness Kit (42-wire)	5	1 kit	0,9 (2)	**BH42K**

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2.2 Splice Protection Products
2.2.1 Closures
Accessories and Replacement Parts

Type/Order text				Ref.-No.

Accessories/Replacement Parts for 3M 2-Type Closures
and 3M Fire Retardant 4-Type Vault Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Channel Bars				
For replacing lost or damaged channel bars in 2-Type and 4-Type cover halves. T = Threaded, U = Unthreaded.				
2-Type and 4-Type Cover - T 470 (18.5)	6	1 kit	2,3 (5)	**CTB9K**
2-Type Cover - T 699 (27.5)	6	1 kit	2,3 (5)	**CTB10K**
2-Type Cover - T 914 (36.0)	6	1 kit	3,2 (7)	**CTB11K**
2-Type Cover - T 1130 (44.5)	6	1 kit	4,1 (9)	**CTB12K**
2-Type Cover - U 470 (18.5)	6	1 kit	2,3 (5)	**CUB9K**
2-Type Cover - U 699 (27.5)	6	1 kit	2,3 (5)	**CUB10K**
2-Type Cover - U 914 (36.0)	6	1 kit	3,2 (7)	**CUB11K**
2-Type Cover - 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 Bar Threaded Inserts	25	4 pkgs.	1,4 (3)	**CBN10K**
Channel Bar Unthreaded Inserts	25	4 pkgs.	1,4 (3)	**CBW10K**
Cleaning Wipes				
For preparing plastic closure halves, endplates and cables before applying sealing tapes.				
Closure Sealing Surface Cleaner	100	1 pkg.	2,3 (5)	**CSSC20-M100**
Continuity/Grounding Pressurisation Kit				
For restoring continuity and external grounding of closure. Also used for flash testing and pressurisation.				
470 (18.5) Length Cover (AA)	1	10 kits	2,7 (6)	**BG9K**
699 (27.5) Length Cover (A)	1	10 kits	4,1 (9)	**BG10K**
914 & 1130 (36 & 44.5) Length Cover (B & C)	1	10 kits	5,0 (11)	**BG12K**
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**
Grommet Sealant and Tip Cable Insertion Shoe				
Insertion shoe for easy insertion of tip cables into grommets and grommet sealant for sealing tip cables into grommet.				
3 oz. Tube of Sealant	1	10 each	1,8 (4)	**GSC10**
Tip Cable Insertion Shoe	1	1 each	0,23 (0.5)	**GCIS20**

2.2 Splice Protection Products
2.2.1 Closures
Accessories and Replacement Parts

Type/Order text				Ref.-No.

Accessories/Replacement Parts for 3M 2-Type Closures and Fire Retardant 3M 4-Type Vault Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
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**
Jaw Tooth Clamps For replacing lost or damaged jaw tooth clamps.				
–	25	4 pkgs.	1,4 (3)	**JT00K**
–	25	4 pkgs.	1,4 (3)	**JT25K**
–	25	4 pkgs.	1,8 (4)	**JT50K**
–	25	4 pkgs.	2,3 (5)	**JT87K**
Pressure Valve Assembly 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 RC45; 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 between 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 RTE46 required for 2 each endplates.				
–	1	108 rolls	20 (43)	**RTE36-8**
–	1	108 rolls	26 (58)	**RTE46-8**
–	1	54 rolls	17 (38)	**RTE62-8**
RTW Re-enterable Sealing Tape For sealing collar build-up around cable. Note: Usage will vary with cable diameter.				
–	1	60 rolls	12 (26)	**RTW36-8**
–	1	60 rolls	21 (47)	**RTW72-8**
Shield Connector For replacing lost or damaged shield connectors.				
BCP1-1, Size #1, up to 20 (0.8) Cable Dia.	25	4 pkgs.	1,8 (4)	**SC10K**
BCP2-1, Size #2, 20 (0.8) to 41 (1.6) Cable Dia.	25	4 pkgs.	2,3 (5)	**SC20K**
BCP3-1, Size #3, over 41 (1.6) Cable Dia.	25	4 pkgs.	2,3 (5)	**SC30K**

2.2.1 Closures
Accessories and Replacement Parts

Type/Order text	Ref.-No.

Accessories/Replacement Parts for 3M 2-Type Closures
and Fire Retardant 3M 4-Type Vault Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Splice Wrap Kit For wrapping and protecting splice bundle and to keep wire out of the cover half sealing groove during assembly.				
2Y2AA, 2X2AA & 2A2AA Closures	1	32 kits	3,6 (8)	**ASW9K**
2B2AA Closures	1	32 kits	-	**BSW9K**
2A2A & 2B2A Closures	1	16 kits	5,0 (11)	**BSW10K**
2B2B Closure	1	16 kits	7,3 (16)	**BSW11K**
2B2C Closure	1	16 kits	10,4 (23)	**BSW12K**
2C2A & 2D2A Closures	1	16 kits	6,8 (15)	**DSW10K**
2C2B & 2D2B Closures	1	16 kits	9,1 (20)	**DSW11K**
2C2C & 2D2C Closures	1	16 kits	11,3 (25)	**DSW12K**
2E2A Closure	1	16 kits	8,2 (18)	**ESW10K**
2E2B Closure	1	16 kits	11,3 (25)	**ESW11K**
Step Washer	2	50 pkgs.	5,0 (11)	**MK-K**

Descriptions / mm (in.)	Pin Size	Packaging	Min. Order	kg (lbs.)	
Tip Cable Opening Plugs For plugging unused tip cable openings for endplate grommets.					
6 - 10 (0.23 - 0.40)	A	1	50 plugs	1,4 (3)	**GP2340**
10 - 15 (0.41 - 0.58)	B	1	50 plugs	0,9 (2)	**GP4158**
15 - 19 (0.59 - 0.76)	C	1	50 plugs	0,5 (1)	**GP5976**
15 - 24 (0.77 - 0.93)	D	1	50 plugs	0,5 (1)	**GP7793**
22 - 28 (0.88 - 1.1)	E	1	50 plugs	1,4 (3)	**GP88100**
28 - 33 (1.1 - 1.3)	F	1	50 plugs	1,8 (4)	**GP110130**
33 - 38 (1.3 - 1.5)	G	1	50 plugs	2,3 (5)	**GP131152**

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Underground Closure Support Kit For supporting closure assembly to racks in vault or manhole applications				
Underground Support Kit	2	10 kits	4,1 (9)	**UCS10K**
Universal Plugging Spools For plugging unused cable openings in endplate openings. Black in colour.				
For 25 (1.0) Cable Openings	25	1 pkg.	0,02 (0.04)	**FX-K**
For 41 (1.6) Cable Openings	25	1 pkg.	0,04 (0.08)	**GX-K**
For 51 (2.0) Cable Openings	25	1 pkg.	0,05 (0.10)	**HX-K**
For 71 (2.8) Cable Openings	25	1 pkg.	0,06 (0.14)	**JX-K**
For 86 (3.4) Cable Openings	25	1 pkg.	0,08 (0.17)	**KX-K**
For 102 (4.0) Cable Openings	1	1 pkg.	0,10 (0.22)	**LX-K**
For 112 (4.4) Cable Openings	10	1 pkg.	0,12 (0.27)	**MX-K**

2.2 Splice Protection Products
2.2.1 Closures
Accessories and Replacement Parts

Type/Order text	Ref.-No.

Accessories/Replacement Parts for 3M 2-Type Closures
and Fire Retardant 3M 4-Type Vault Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Universal Plugging Spools (Fire Retardant) For plugging unused cable openings in endplate openings. Grey in colour.				
For 25 (1.0) Cable Openings	25	1 pkg.	0,02 (0.04)	**FX-4-K**
For 41 (1.6) Cable Openings	1	1 pkg.	0,04 (0.08)	**GX-4-K**
For 51 (2.0) Cable Openings	1	1 pkg.	0,05 (0.10)	**HX-4-K**
For 71 (2.8) Cable Openings	1	1 pkg.	0,06 (0.14)	**JX-4-K**
For 86 (3.4) Cable Openings	1	1 pkg.	0,08 (0.17)	**KX-4-K**
For 102 (4.0) Cable Openings	1	1 pkg.	0,10 (0.22)	**LX-4-K**
For 112 (4.4) Cable Openings	1	1 pkg.	0,12 (0.27)	**MX-4-K**
Universal Slotted Sealing Washers (Bulk Packaging) For sealing cable entrances in endplate openings. Black in colour.				
Cable Range – 10 - 25 (0.4 - 1.0)	200	1 pkg.	0,9 (2)	**FS-B-M200**
Cable Range – 10- 41 (0.4 - 1.6)	200	1 pkg.	2,3 (5)	**GS-B-M200**
Cable Range – 10 - 51 (0.4 - 2.0)	200	1 pkg.	3,2 (7)	**HS-B-M200**
Cable Range – 10 - 71 (0.4 - 2.8)	200	1 pkg.	4,6 (10)	**JS-B-M200**
Cable Range – 10 - 86 (0.4 - 3.4)	200	1 pkg.	6,4 (14)	**KS-B-M200**
Cable Range – 41 - 102 (1.6 - 4.0)	100	1 pkg.	4,1 (9)	**LS-B-M100**
Cable Range – 41 - 112 (1.6 - 4.4)	100	1 pkg.	6,4 (14)	**MS-B-M100**
Universal Slotted Sealing Washers (Fire Retardant - Bulk Packaging) For sealing cable entrances in endplate openings. Grey in colour.				
Cable Range – 10 - 25 (0.4 - 1.0)	200	1 pkg.	0,9 (2)	**FS-4B-M200**
Cable Range – 10 - 41 (0.4 - 1.6)	200	1 pkg.	2,3 (5)	**GS-4-B-M200**
Cable Range – 10 - 51 (0.4 - 2.0)	200	1 pkg.	3,2 (7)	**HS-4-B-M200**
Cable Range – 10 - 71 (0.4 - 2.8)	200	1 pkg.	4,6 (10)	**JS-4-B-M200**
Cable Range – 10 - 86 (0.4 - 3.4)	200	1 pkg.	6,4 (10)	**KS-4-B-M200**
Cable Range – 41 - 102 (1.6 - 4.0)	100	1 pkg.	4,1 (9)	**LS-4-B-M100**
Cable Range – 41 - 112 (1.6 - 4.4)	100	1 pkg.	6,4 (14)	**MS-4-B-M100**

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2.2 Splice Protection Products
2.2.1 Closures
Tools

Type/Order text	Ref.-No.

Tools for Pressurised Standard 3M 2-Type and 3M Fire Retardant 4-Type Closures

Descriptions / mm (in.)	Packaging	Min. Order	kg (lbs.)	
Tools for Closure Assembly				
Tools required for closure assembly but not included with cover or endplate kits.				
Can Wrench 9,5 and 11,1 mm (3/8 and 7/16") Ends	1	1 kit	0,2 (0.4)	**CW10K**
Speed Wrench	1	1 kit	5,9 (13)	**SPW10K** *
Tabbing Shears	1	1 kit	0,4 (1.0)	**TS10K**
Torque Wrench 2,9 kgm (250"/lbs.)	1	1 kit	1,0 (2.3)	**TWS10K** **
China Thaiwan TKTSD Tool Kit	1	1 kit	4,5 (10)	**TK-TSI** ***
Universal Alignment Tool Kit				
For maintaining endplate spacing and alignment.				
Alignment Kit	1	1 kit	5,9 (13)	**UAT20K**
Washer Cutter Tool Kit				
For cutting universal sealing washers.				
Washer Cutter Tool Kit	1	10 kits	5,9 (13)	**WCT11K**
Replacement Blade Kit	2	10 pkgs.	2,3 (5)	**WCB11K**

   * SPW10K does not include sockets.

  ** TWS10K includes 12,7 and 11,1 mm (1/2 and 7/16") sockets and 3 socket extender.

*** WCT11K Washer Cutter Tool not included

2.2 Splice Protection Products

2.2.1 Closures
3M™ Z Watertight Closure System

Description

For Protection of Non pressurised Copper Cable Splice

The Z Watertight Closure is made of an impact-resistant plastic and is corrosion resistant.
The closure can be used for straight or multiple branch splices and there is a fire retardant version available for building applications. It is lightweight, watertight and re-enterable.

Z Watertight Closures may be aerial or wall mounted and accommodate up to 300 pairs of copper conductor splices. The system will also accommodate the entrance of up to four cables, 41mm (1.6") in diameter. All components are supplied in one kit and no special tools are required for assembly

MS² Modules see	pg. 114 - 120
Shield Bonding see	pg. 207 - 210
Scotchlok Connectors see	pg. 108 - 113

Type/Order text

Ref.-No.

3M Z Watertight Closure System

Description	Max. Number Cable Pairs	Length mm (in.)	Width mm (in.)	Max. No. Height mm (in.)	Approx. Weight kg (lbs.)	Min. Order (each)	
Closure Selection							
Standard	300	419 (16.5)	114 (4.5)	165 (6.5)	2,3 (5)	1	**2Z2AAA-510**
Fire Retardant*	300	419 (16.5)	114 (4.5)	165 (6.5)	2,7 (6)	1	**2Z4AAA-510**

Standard Package = Kit, Minimum Order/Ordering Multiple = 1 Kit.
*Grey in colour.

Accessories/Replacement Parts for 3M Z Watertight Series Closures

Descriptions / mm (in.)	Packaging	Min. Order/Multiple	kg (lbs.)	
Two Cable Branch Kit Provides branching adapter spool and internal bonding for two additional cables. Up to 19 mm (0.75") each cable opening.				
Standard	1	1/1 Kit	0,2 (.4)	**BKZ10-2**
Fire retardant*	1	1/1 Kit	0,2 (.4)	**BKZ10-2-4**
Re-entry Kit Provides replacement R-Type re-enterable sealing tapes for each re-entry.				
Re-entry kit, Z-type closure	1	1/1 Kit	0,5 (0.1)	**RKZ10**
Plugging Spool Kit Provides two plugging spools for plugging unused cable openings.				
Standard plugging spools	2	1/1 Kit	0,1 (.2)	**GZX-K**
Fire retardant plugging spools*	2	-/1 Kit	0,1 (.2)	**GZX-4-K**
Back Cover Clip Kit For supporting back cover to cables during splicing. Also keeps endplates parallel and properly spaced.				
Back cover clip kit kor Z-type covers	2 clips w/cable ties	40/20 kit	2 (0.9)	**BCC10K**

*Grey in colour.

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2.2 Splice Protection Products
2.2.1 Closures
3M™ K&B Vault and Riser Closures

Description

3M K&B Vault Closures

K&B Closures are strong, lightweight, and protect a wide variety of vault splice configurations with an air and water tight seal. K&B closures offer a full product line that is simple to install and re-enter. This full product offering provides closures in standard kits to protect the majority of cable configurations and customised and special closures to meet your vault requirements.
All K&B closures are flame retardant. **RUS Listed**

Ordering 3M K&B Vault Closures

The key to ordering the correct K&B Vault Closures Kit is knowing what components suit the splice configuration. The kit can be a solid or split closure and have a collared end cap, multiple end cap, stainless steel hose clamps and cable lubricant.

Because the K&B vault closure is air and water tight, the closures collared and multiple end caps have to be sized precisely to the cables entering them. When ordering K&B closures, three pertinent facts are needed:

Technical characteristics

Chart A / Standard 3M K&B Closure Selection Guide

Maximum Pair Count		Solid Sleeve		Split Sleeve	
MS2*	Scotchlok	Kit Part Number	Diameter Length	Kit Part Number	Diameter Length
100	50	KB2-100-2	2-24		
200	100	KB3-175-1	3-24	KBS3-175-1	3DS-24
400	200	KB4-175-1	4-24		
		KB4-175-2	4-24		
600	300	KB5-100-6	5-26	KBS5-100-6	5DS-26
		KB5-130-6	5-26	KBS5-130-6	5DS-26
		KB5-175-2	5-26	KBS5-175-2	5DS-26
900	400	KB6-100-9	6-26	KBS6-100-9	6DS-26
		KB6-130-9	6-26	KBS6-130-9	6DS-26
		KB6-175-3	6-26	KBS6-175-3	6DS-26
1200	600	KB7-100-15	7-26	KBS7-100-15	7DS-26
		KB7-175-5	7-26	KBS7-175-5	7DS-26
2400	800	KB8-100-24	8-26	KBS8-100-24	8DS-26
		KB8-130-18	8-26	KBS8-130-18	8DS-26
		KB8-175-8	8-26	KBS8-175-8	8DS-26
2700	900	KB9-100-27	9-26	KBS9-100-27	9DS-26
		KB9-130-24	9-26	KBS9-130-24	9DS-26
		KB9-175-9	9-26	KBS9-175-9	9DS-26
3600	–	KB10-100-36	10-26	KBS10-100-36	10DS-26
		KB10-100-36L	10-26	KBS10-100-36L	10DS-24
4800	–	KB12-130-37	12-28		

2.2 Splice Protection Products
2.2.1 Closures
3M™ K&B Vault and Riser Closures

Technical characteristics

- The diameter of all the cables, field and tip, to be spliced. This is needed for hole sizing of the end caps.

- The maximum number of cable pairs to be spliced and the type of connector to be used for splicing, an example is a 2700-pair field cable, spliced to 27-100 pair tip cable is a "2700-pair splice." This determines the size/diameter of the closure.

- The number of tip cables to be enclosed.

NOTE: If the application determines that the closure does not need to be air and water tight, then the use of a K&B riser closure should be considered.

The standard K&B Vault Closure Kit contains the following:
- One closure, solid or split
- One collared end cap
- One multiple end cap
- Hose Clamps:

Solid closure - two closure clamps, one collared clamp

Split closure - three closure clamps, one collared clamp

Steps to Ordering Standard 3M K&B Closures Kits

1. Determine the maximum number of cable pairs, entering into the closure. If a 1200-pair field cable enters the closure, but is only spliced to 6-100 pair tip cables, this is still sized at the 1200 potential pairs.

2. Determine the type of module or connector to be used for splicing. The 25-pair module/connector is recommended because this can make for a more compact splice bundle for a smaller closure diameter.

3. Use "Chart A" to make a selection from the standard kits available. With the standard kits, the Collared Cap opening can be up to 6,35 mm (1/4") larger than the cable diameters. The clamp will tighten it down, and the multiple cap needs to be within the stated diameter range.

4. Fill any vacant multiple holes with the appropriate plug.

(continued)

Collared End Caps**		Multiple End Caps		Clamps	
Part Number	Hole Size mm (in.)	Part Number	Hole Size mm (in.)	Closure***	Collared
C2-2 (two)	6-24,1 (.24-.95) (2 holes & caps)			2SS	
C3-175-1C (two)	44,4 (1.75) (2 caps)			3SS	3-4CC
C4-175-1C (two) C4-175-1C	44,4 (1.75) (2 caps) 44,4 (1.75)	C4-174-2	44,4 (1.75)	4SS	3-4CC
C5-275-1C C5-275-1C C5-275-1C	69,8 (2.75) 69,8 (2.75) 69,8 (2.75)	C5-100-6 C5-130-6 C5-175-2	21,5-26,0 (.85-1.06) 27,4-33 (1.08-1.3) 31,7-41,4 (1.25-1.75)	5SS	5-9CC
C6-275-1C C6-275-1C C6-275-1C	69,8 (2.75) 69,8 (2.75) 69,8 (2.75)	C6-100-9 C6-130-9 C6-175-3	21,5-26,0 (.85-1.06) 27,4-33 (1.08-1.3) 31,7-41,4 (1.25-1.75)	6-7SS	5-9CC
C7-275-1C C7-275-1C	69,8 (2.75) 69,8 (2.75)	C7-100-15 C7-175-5	21,5-26,0 (.85-1.06) 31,7-41,4 (1.25-1.75)	6-7SS	5-9CC
C8-300-1C C8-300-1C C8-300-1C	76,2 (3) 76,2 (3) 76,2 (3)	C8-100-24 C8-130-18 C8-175-8	21,5-26,0 (.85-1.06) 27,4-33 (1.08-1.3) 31,7-41,4 (1.25-1.75)	8SS	5-9CC
C9-300-1C C9-300-1C C9-300-1C	76,2 (3) 76,2 (3) 76,2 (3)	C9-100-27 C9-130-24 C9-175-9	21,5-26,0 (.85-1.06) 27,4-33 (1.08-1.3) 31,7-41,4 (1.25-1.75)	9-10SS	5-9CC
C10-360-1C C10-360-1C	91,4 (3.6) 91,4 (3.6)	C10-100-36 C10-100-27/300	21,5-26,0 (.85-1.06) 21,5-26,0 (.85-1.06)	9-10SS	10-12CC
C12-390-1C C12-390-1C	99 (3.9) 99 (3.9)	C12-100-48 C12-130-37	21,5-26,0 (.85-1.06) 27,4-33 (1.08-1.3)	12SS	10-12CC

*   Based on 2-bank In-line splice using 4000D/TR modules.

** Collared Cap opening can be up to 6,35 mm (1/4") longer than the cable diameter, the clamp will tighten it down.

*** Two clamps are included with solid closure order. Three clamps are included with split closure order. One clamp is included with collared end cap.

**** 254 mm (10") cap with 27- 22 mm to 27 mm (.85" to 1.06") holes around 1- 76 mm (3.0") hole.

2.2.1 Closures
3M™ K&B Vault and Riser Closures

Type/Order text	Ref.-No.

3M K&B Vault Closure Kits

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,91 (2.0)/cs.	1 each	**KB2-100-2**
1/cs., 1,81 (4.0)/cs.	1 each	**KB3-175-1**
1/cs., 2,27 (5.0)/cs.	1 each	**KB4-175-1**
1/cs., 2,27 (5.0)/cs.	1 each	**KB4-175-2**
1/cs., 2,27 (5.0)/cs.	1 each	**KB5-100-6**
1/cs., 2,27 (5.0)/cs.	1 each	**KB5-130-6**
1/cs., 2,27 (5.0)/cs.	1 each	**KB5-175-2**
1/cs., 3,63 (8.0)/cs.	1 each	**KB6-100-9**
1/cs., 3,63 (8.0)/cs.	1 each	**KB6-130-9**
1/cs., 3,63 (8.0)/cs.	1 each	**KB6-175-3**
1/cs., 3,63 (8.0)/cs.	1 each	**KB7-100-15**
1/cs., 5,90 (13.0)/cs.	1 each	**KB7-175-5**
1/cs., 7,26 (16.0)/cs.	1 each	**KB8-100-24**
1/cs., 7,26 (16.0)/cs.	1 each	**KB8-130-18**
1/cs., 7,26 (16.0)/cs.	1 each	**KB8-175-8**
1/cs., 7,26 (16.0)/cs.	1 each	**KB9-100-27**
1/cs., 8,16 (18.0)/cs.	1 each	**KB9-130-24**
1/cs., 8,16 (18.0)/cs.	1 each	**KB9-175-9**
1/cs., 9,07 (20.0)/cs.	1 each	**KB10-100-36**
1/cs., 9,07 (20.0)/cs.	1 each	**KB10-100-36L**
1/cs., 12,70 (28.0)/cs.	1 each	**KB12-130-37**

3M K&B Vault Closure Kits with Split Closure

Packaging & kg (lbs.)	Minimum Order	
1/cs., 1,81 (4.0)/cs.	1 each	**KBS3-175-1**
1/cs., 2,27 (5.0)/cs.	1 each	**KBS5-100-6**
1/cs., 2,27 (5.0)/cs.	1 each	**KBS5-130-6**
1/cs., 2,27 (5.0)/cs.	1 each	**KBS5-175-2**
1/cs., 3,63 (8.0)/cs.	1 each	**KBS6-100-9**
1/cs., 3,63 (8.0)/cs.	1 each	**KBS6-130-9**
1/cs., 3,63 (8.0)/cs.	1 each	**KBS6-175-3**
1/cs., 5,9 (13.0)/cs.	1 each	**KBS7-100-15**
1/cs., 5,9 (13.0)/cs.	1 each	**KBS7-175-5**
1/cs., 7,26 (16.0)/cs.	1 each	**KBS8-100-24**
1/cs., 7,26 (16.0)/cs.	1 each	**KBS8-130-18**
1/cs., 7,26 (16.0)/cs.	1 each	**KBS8-175-8**
1/cs., 8,16 (18.0)/cs.	1 each	**KBS9-100-27**
1/cs., 8,16 (18.0)/cs.	1 each	**KBS9-130-24**
1/cs., 8,16 (18.0)/cs.	1 each	**KBS9-175-9**
1/cs., 9,07 (20.0)/cs.	1 each	**KBS10-100-36 26"**
1/cs., 9,.07 (20.0)/cs.	1 each	**KBS10-100-36L 34"**
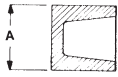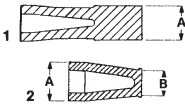
Solutions for Outside Plant

3M

Technical characteristics

3M K&B Plugs

Rubber Bushes	Dimensional Diagram	Part Number	Dimension A	Dimension B
Plugs				
		Collared		
		PC-175	1.75 (44)	
		PC-225	2.25 (57)	
		PC-275	2.75 (70)	
		PC-298	2.98 (76)	
		Tapered		
		PT-100	1.0 (25)	
		PT-120	1.2 (31)	
		PT-125	1.25 (32)	0.75 (19)
		PT-130	1.3 (33)	
		PT-175	1.75 (44)	1.25 (32)
		PT-225	2.25 (57)	1.75 (44)

NOTE: inches (mm) *If inside diameter is less than 6,35 mm (0.25"), use KBS-1 to seal.

Type/Order text   Ref.-No.

3M K&B Collared Plugs

Packaging & kg (oz.)	Minimum Order	
1/cs., 0,06 (2)	1 each	**PC-175**
1/cs., 0,09 (3)	1 each	**PC-225**
1/cs., 0,14 (5)	1 each	**PC-275**
1/cs., 0,17 (6)	1 each	**PC-298**

3M K&B Tapered Plugs

Packaging & kg (oz.)	Minimum Order	
1/cs. 0,03 (1)/cs.	1 each	**PT-100**
1/cs. 0,03 (1)/cs.	1 each	**PT-120**
1/cs. 0,03 (1)/cs.	1 each	**PT-125**
1/cs. 0,06 (2)/cs.	1 each	**PT-130**
1/cs. 0,06 (2)/cs.	1 each	**PT-175**

2

2.2.1 Closures
3M™ K&B Vault and Riser Closures

Description

Steps to Ordering a Customised 3M K&B Closure

If it is determined that a "standard" kit does not fit your cable precisely, a "customised" closure might be used for an air and water tight fit.

1. To customise a closure, use steps 1 through 4 on p. 175 to determine the approximate closure size for your cable's pair count, splice connections and number of tip cables.

2. Once the approximate closure size is determined, then you make it a precisely fit closure by sizing to the cables using K&B Bushes from "Chart B."

As an example:

- You have a 1200-pair splice, with a 1200 pair field cable that has 50,8 mm (2.0") OD and 12-100 pair tip that has 25,4 mm (1.0") OD.
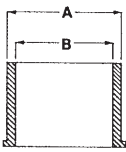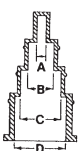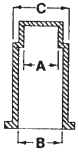
- The approximate closure size is a KB7-100-15. It has a multiple end cap with 15 openings of 25,4 mm (1.0") OD and a collared end cap with an opening of 69,9 mm (2.75") OD.

- The multiple end cap will give the tip cable a precise fit.

- The collared end cap is too big and needs a B275-200 bush to reduce he opening.

The order should be:

- One each KB7-100-15

- One each B-275-200-IC
  (this bush fits into the 69,9 mm (2.75") hole and reduces it down to 50,8 mm (2.0"). The "IC" stands for Insert and Cement)

- Three each PT100

Technical characteristics

Chart B: 3M K&B Bushes

Rubber Bushes	Dimensional	Part Number	Dimension A	Dimension B	Dimension C	Dimension D
		B-100-70	1.0 (28)	0.92 (23,4)	0.62 (15,7)	
		B-125-100	1.25 (32)	1.06 (26,9)	0.85 (21,8)	
		B-175-125	1,75 (44)	1,25 (32)		
		B-175-150	1.75 (44)	1.5 (38)		
		B-225-175	2.25 (57)	1.75 (44)		
		B-225-200	2.25 (57)	2.0 (51)		
		B-275-200	2.75 (70)	2.0 (51)		
		B-275-225	2.75 (70)	2.25 (57)		
		B-275-250	2.75 (70)	2.5 (64)		
		B-300-275	3.0 (76)	2.75 (70)		
		B-360-300	3.6 (91)	3.0 (76)		
		B-360-330	3.6 (91)	3.3 (84)		
		B-390-360	3.9 (99)	3.6 (91)		
Variable Bushes						
		B-1.00-0.25	0.49 (12,4)	0.69 (17,5)	0.79 (20,1)	1.0 (25,4)
		B-2.50-1.00	1.0 (25,4)	1.40 (35,6)	1.90 (48,3)	2.50 (63,5)
		B-1.75-1.50-1.00	1.12 (28,4)	1.50 (38,1)	1.75 (44,5)	

NOTE: inches (mm) *If inside diameter is less than 6,35 mm (0.25"), use KBS-1 to seal.

2.2   Splice Protection Products

2.2.1 Closures
3M™ K&B Vault and Riser Closures

Description

Steps to Ordering a Special 3M K&B Closure

If it is determined that a "standard" or "customised" closure kit will not fit your cable needs, a "special" closure might be used for your air and water tight closure applications. The "special" closure consists of factory built specialty parts, i.e., multiple field cable Collared Caps, split Collared Caps, specific multiple cable Multiple Caps, closure Split Sleeves that are not in a kit form. These "special" closure parts need to be ordered separately and may have to be factory built.

1. For a special closure, use steps 1 through 4 on p. 175 to determine the approximate size of your closure to your cable's pair count, splice connections and number of tip cables. Once the approximate closure size is determined, make it a precise fit by piecing together the closure from "Chart C."

2. The K&B Flat End Caps and Bushes are used in the factory to make the closure fit your requirements. Use the cable O.D. measurements to specify the proper bushes from

"Chart B" and the number of holes to be factory drilled. The "special" end caps will be shipped with holes drilled in the flat cap and bushes inserted and cemented.

3. When the "special" closure is used to cover an existing splice, the field cable collared end cap holes may need to be split so it can be installed. Multiple end caps cannot be split, a split Puddle Cap should be used. (See "Chart C" for the product number.) To seal the split of the end cap, use a KB-S1 Kit.

4. Both split and solid sleeves can also be factory cut to any length. See "Chart C" for the product number.

5. Order two closure clamps for a solid closure or three closure clamps for a split closure.

6. Order one collared clamp for each collared end opening or two collared clamps for a each split collared end opening.

Technical characteristics

Chart C   3M K&B Closure Component Selection Guide

Max. Pair Count		Sleeves		End Caps					Clamps	
MS²	Scotchlok	Solid Diameter length Part number	Split Diameter length Part number	Butt Part number	Flat Part number	Collared Part number	Multiple Part number	Puddle Part number	Closure	Collared
100	50	2-24	2DS-24	C2-2	C2				2SS	
200	100	3-24	3DS-24	C3-3	C3	C3-175-1C			3SS	3-4CC
400	200	4-24	4DS-24		C4	C4-175-1C	C4-175-2		4SS	3-4CC
600	300	5-26	5DS-26		C5	C5-275-1C	C5-100-6 C5-130-6 C5-175-2		5SS	5-9CC
900	400	6-26	6DS-26		C6	C6-275-1C	C6-100-9 C6-100-10 C6-130-9 C6-175-3		6-7SS	5-9CC
1200	600	7-26	7DS-26		C7	C7-275-1C	C7-100-15 C7-175-5	C7-5	6-7SS	5-9CC
2400	800	8-26	8DS-26		C8	C8-300-1C	C8-100-24 C8-130-18 C8-178-8	C8-7	8SS	5-9CC
2700	900	9-26	9DS-26		C9	C9-300-1C	C9-100-27 C9-130-24 C9-175-9 C9-275-3	C9-5 C9-7	9-10SS	5-9CC
3600	–	10-26 10-34	10DS-26 10DS-34		C10	C10-360-1C	C10-100-27 C10-100-36	C10-8	9-10SS	10-12CC
4800	–	12-28	12SS-28		C12	C12-390-1C	C12-100-48 C12-130-37	C12-8/6	12SS	10-12CC

2.2 Splice Protection Products
2.2.1 Closures
3M™ K&B Vault and Riser Closures

Type/Order text	Ref.-No.

To complete the closure kit, include the additional K&B accessories in your order from the following pages once the end seals and closure components are selected.

Customised K&B Closure Components	
Closure Sleeves Lengths Split and Solid	**KB-CSL**
End Cap Hole	**KB-ECH**
End Cap Hole Split	**KB-ECH/SPL**

3M K&B Solid Sleeves

Packaging & kg (lbs.)	Minimum Order	
1/cs, 0,45 (1.0)/cs.	1 each	**3-24**
1/cs., 0,91 (2.0)/cs.	1 each	**4-24**
1/cs., 0,91 (2.0)/cs.	1 each	**5-26**
1/cs., 1,36 (3.0)/cs.	1 each	**6-26**
1/cs., 2,27 (5.0)/cs.	1 each	**7-26**
1/cs., 2,72 (6.0)/cs.	1 each	**8-26**
1/cs., 3,18 (7.0)/cs.	1 each	**9-26**
1/cs., 3,18 (7.0)/cs.	1 each	**10-26**
1/cs., 3,18 (7.0)/cs.	1 each	**10-34**
1/cs., 4,54 (10.0)/cs.	1 each	**12-28**

3M K&B Split Sleeves

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,45 (1.0)/cs.	1 each	**2DS-24**
1/cs., 0,45 (1.0)/cs.	1 each	**3DS-24**
1/cs., 1,36 (3.0)/cs	1 each	**4DS-24**
1/cs., 1,36 (3.0)/cs.	1 each	**5DS-26**
1/cs., 1,81 (4.0)/cs.	1 each	**6DS-26**
1/cs., 2,27 (5.0)/cs.	1 each	**7DS-26**
1/cs., 3,18 (7.0)/cs.	1 each	**8DS-26**
1/cs., 3,63 (8.0)/cs.	1 each	**9DS-26**
1/cs., 3,63 (8.0)/cs.	1 each	**10DS-26**
1/cs., 3,63 (8.0)/cs.	1 each	**10DS-34**
1/cs., 4,99 (11.0)/cs.	1 each	**12SS-28**

3M K&B Multiple Caps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,34 (.75)/cs	1 each	**C4-175-2**
1/cs., 0,68 (1.5)/cs.	1 each	**C5-100-6**
1/cs., 0,68 (1.5)/cs.	1 each	**C5-130-6**
1/cs., 0,45 (1.0)/cs.	1 each	**C5-175-2**
1/cs., 0,79 (1.75)/cs.	1 each	**C6-100-9**
1/cs., 0,79 (1.75)/cs.	1 each	**C6-100-10**
1/cs., 0,9 (2.0)/cs.	1 each	**C6-130-9**
1/cs., 1,1 (2.5)/cs.	1 each	**C6-175-3**
1/cs., 1,2 (2.75)/cs.	1 each	**C7-100-15**
1/cs., 1,1 (2.5)/cs.	1 each	**C7-175-5**
1/cs., 1,7 (3.75)/cs.	1 each	**C8-100-24**
1/cs., 1,6 (3.5)/cs.	1 each	**C8-130-18**
1/cs., 1,6 (3.5)/cs.	1 each	**C8-175-8**
1/cs., 1,7 (3.75)/cs.	1 each	**C9-100-27**
1/cs., 1,6 (3.5)/cs.	1 each	**C9-130-24**

3M™ K&B Vault and Riser Closures

Type/Order text		Ref.-No.

3M K&B Multiple Caps (cont.)

Packaging & kg (lbs.)	Minimum Order	
1/cs., 1,6 (3.5)/cs.	1 each	**C9-175-9**
1/cs., 1,4 (3.0)/cs.	1 each	**C9-275-3**
1/cs., 2,3 (5.0)/cs.	1 each	**C10-100-27/300 ESS**
1/cs., 2,3 (5.0)/cs.	1 each	**C10-100-36**
1/cs., 3,1 (6.75)/cs.	1 each	**C12-130-37**
1/cs., 3,1 (6.75)/cs.	1 each	**C12-100-48**

3M K&B Butt Caps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,06 (0.13)/cs.	1 kit	**C2-2**
1/cs., 0,09 (0.19)/cs.	1 kit	**C3-3**

3M K&B Collared End Caps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,23 (0.5)/cs.	1 each	**C3-175-1C**
1/cs., 0,34 (0.75)/cs.	1 each	**C4-175-1C**
1/cs., 0,91 (2.0)/cs.	1 each	**C5-275-1C**
1/cs., 0,91 (2.0)/cs.	1 each	**C6-275-1C**
1/cs., 1,13 (2.5)/cs.	1 each	**C7-275-1C**
1/cs., 1,36 (3.0)/cs.	1 each	**C8-300-1C**
1/cs., 1,59 (3.5)/cs.	1 each	**C9-300-1C**
1/cs., 1,59 (3.5)/cs.	1 each	**C10-360-1C**
1/cs., 2,49 (5.5)/cs.	1 each	**C12-390-1C**

3M K&B Flat Caps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,09 (0.19)/cs.	1 each	**C2 (2")**
1/cs., 0,09 (0.19)/cs.	1 each	**C3 (3")**
1/cs., 0,23 (0.5)/cs.	1 each	**C4 (4")**
1/cs., 0,45 (1.0)/cs.	1 each	**C5 (5")**
1/cs., 0,45 (1.0)/cs.	1 each	**C6 (6")**
1/cs., 0,45 (1.0)/cs.	1 each	**C7 (7")**
1/cs., 0,9 (2.0)/cs.	1 each	**C8 (8")**
1/cs., 1,4 (3.0)/cs.	1 each	**C9 (9")**
1/cs., 1,4 (3.0)/cs.	1 each	**C10 (10")**
1/cs., 2,3 (5.0)/cs.	1 each	**C12 (12")**

Solutions for Outside Plant

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2.2   Splice Protection Products
2.2.1 Closures
3M™ K&B Vault and Riser Closures

Type/Order text	Ref.-No.

3M K&B Puddle Caps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,91 (2.0)/cs.	1 each	**C7-5**
1/cs., 0,91 (2.0)/cs.	1 each	**C8-7**
1/cs.,1,36 (3.0)/cs.	1 each	**C9-5**
1/cs., 0,91 (2.0)/cs.	1 each	**C9-7**
1/cs., 1,81 (4.0)/cs.	1 each	**C10-8**
1/cs., 1,27 (5.0)/cs.	1 each	**C12-8/6**

3M K&B Bushes

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,09 (3)/cs.	1 each	**B100-50**
1/cs., 0,09 (3)/cs.	1 each	**B100-70**
1/cs., 0,03 (1)/cs.	1 each	**B125-100**
1/cs., 0,06 (2)/cs.	1 each	**B175-125**
1/cs., 0,06 (2)/cs.	1 each	**B175-150**
1/cs., 0,09 (3)/cs.	1 each	**B225-175**
1/cs., 0,17 (6)/cs.	1 each	**B225-200**
1/cs., 0,17 (6)/cs.	1 each	**B275-200**
1/cs., 0,11 (4)/cs.	1 each	**B275-225**
1/cs., 0,06 (2)/cs.	1 each	**B275-250**
1/cs., 0,09 (3)/cs.	1 each	**B300-275**
1/cs., 0,11 (4)/cs.	1 each	**B360-300**
1/cs., 0,11 (4)/cs.	1 each	**B360-330**
1/cs., 0,11 (4)/cs.	1 each	**B390-360**

3M K&B Variable Bushes

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,09 (3)/cs.	1 each	**B-1.0-2.5**
1/cs., 0,09 (3)/cs.	1 each	**B-2.5-1.0**
1/cs., 0,09 (3)/cs.	1 each	**B-1.75-1.50-1.0**

2.2.1 Closures
3M™ K&B Vault and Riser Closures

Type/Order text	Ref.-No.

3M K&B Collared Cap Clamps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,03 (1)/cs.	1 each	3-4CC
1/cs., 0,03 (1)/cs.	1 each	5-9CC

3M K&B Closure Clamps

Packaging & kg (lbs.)	Minimum Order	
1/cs., 0,03 (1)/cs.	1 each	2SS
1/cs., 0,03 (1)/cs.	1 each	3SS
1/cs., 0,03 (1)/cs.	1 each	4SS
1/cs., 0,06 (2)/cs.	1 each	5SS
1/cs., 0,09 (3)/cs.	1 each	6-7SS
1/cs., 0,11 (4)/cs.	1 each	8SS
1/cs., 0,11 (4)/cs.	1 each	9-10SS
1/cs., 0,11 (4)/cs.	1 each	12SS

Solutions for Outside Plant

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2.2.1 Closures
3M™ K&B Vault and Riser Closures Accessories

Description

3M 5925 Fire Barrier Vault Rehabilitation Kit

For use in conjunction with an existing vertically installed K&B Vault Closure when specific fire retardancy requirements such as the Bell System Technical Reference PUB 55006 (Issue 1, Section 5.53) are required.

Kit contents/size:

• Fire Barrier Foil Mat 298 mm x 3,7 m (11 3/4" x 12')

• No. 69 Glass Cloth Tape 25 mm x 23 m (1" x 25 yds.)

3M RC-100 Splice Supports

Designed to reduce closure support costs. The rack clips permit fast, multi-positioning of industry standard manhole racks or uni-struts and hooks to facilitate support of a closure. Two supportsper set.

3M KB-S1 Sealing Kit

Designed for sealing split K&B vault sleeves and split end caps. Each kit contains a "Mini-Semkit" of 38g of urethane adhesive, a 50,8 mm x 76,2 mm x 9,5 mm (2" x 3" x 3/8") ScotchBrite 7H Pad, a wooden spatula, and instructions.

3M Cable Lubricant

Designed to make vault closure installation faster by lubricating tip cables before insertion into multiple end caps, the cable lubricant evaporates after use and does not damage closure elements in any way. Supplied in a 113,2 g (4 oz.) dauber-top bottle.

3M Bonding Harness

For use in closure to ground shields of spliced cable; 14 AWG.

2.2   Splice Protection Products
2.2.1   Closures
3M™ K&B Vault and Riser Closures Accessories

Type/Order text	Ref.-No.

3M K&B Accessories

Description	Packaging & kg (lbs.)	Minimum Order	
5925 Fire BarrierVault Rehabilitation Kit	1/cs., 4,0 (8.9)/cs.	1 kit	**5925**
RC-100 Splice Supports	10 sets/cs., 3,5 (7.8)/cs.	10 sets	**RC-100**
KB-S1 Sealing Kit	1 kit/cs., 0,15 (0.33)/cs.	1 kit	**KB-S1**

3M K&B Bonding Harnesses and Cable Lubricant

Description	Packaging & kg (lbs.)	Minimum Order	
(2,3,4,5,6" closure)	1/cs., 0,23 (0.5)/cs.	1 set	**BH2-6**
(7" closure)	1/cs., 0,45 (1.0)/cs.	1 set	**BH7**
(8-9" closure)	1/cs., 0,68 (1.5)/cs.	1 set	**BH8-9**
(10-12" closure)	1/cs., 0,91 (2.0)/cs.	1 set	**BH10-12**
	1/cs., 0,11 (0.25)/cs.	1 bottle	**Cable Lubricant**

2

2.2.1 Closures
3M™ K&B Building Riser Closures

Description

3M K&B Building Riser Closure

R-6 10 Port/Single Entry Closure

The K&B Riser Closure has the same proven qualities of the K&B Vault Closure but are used in applications that do not require an air or water tight closure. Because of this, the end caps do not need to precisely fit the cable and are more versatile and user friendly. Use "Closure Selection Guide" for determining the proper closure size for your application. All K&B Riser Closures are flame retardant.

NOTE: Single port SRC end caps are optional and must be ordered separately.

Kit contents:
- Split Closure Cover
- Stainless steel hose clamps (2)
- Flex strips (4)
- End caps (2)
  - R3 and R5 – 2 each of double (2) entry conical end caps
  - R6-10 – 1 each of a single (1) entry conical end cap and 1 each of a ten (10) port rubber end cap. Also 1 each of a 4 ounce bottle of cable lubricant.
  - R7 and R9 – 2 each of triple (3) entry conical end caps

R3, R5, R7 and R9 Closures

Closure Selection Guide

Product Number	R-3	R-5	R-6	R-7	R-9
Closure inside dimensions					
Diameter, mm (in.)	76 (3)	127 (5)	152 (6)	178 (7)	228 (9)
Length, mm (in.)	24 (607)	660 (26)	660 (26)	660 (26)	660 (26)
Approx. splice bundle	300-pr.	900-pr.	900-pr.	1800-pr.	3000-pr.
capacity (Super-Mini)	24 AWG or less*	24 AWG*	24 AWG*	24 AWG*	26 AWG*

	Maximum allowable cable diameter				
Multiple entry end caps					
Port 1, mm (in.)	30 (1.2)	51 (2.0)	84 (3.3)	79 (3.1)	96 (3.8)
Port 2, mm (in.)	30 (1.2)	51 (2.0)	Ports 1-10	61 (2.4)	79 (3.1)
Port 3, mm (in.)	—	—	28 (1.1)	51 (2.0)	61 (2.4)
Optional single entry	SRC-3	SRC-5		SRC-7	SRC-9
end caps, mm (in.)	43 (1.7)	61 (2.4)		91 (3.6)	96 (3.8)

*Based on 2-Bank Straight Splice using 4000-D/TR Modules.

2.2 Splice Protection Products
2.2.1 Closures
3M™ K&B Building Riser Closures

Type/Order text	Ref.-No.

3M K&B Building Riser Closure Kits

Description	Packaging & kg (lbs.)	Minimum Order	
R3 (Double Cap/Double Cap)	10/cs., 11,62 (25.6)/cs.	10 kits	R3
R5 (Double Cap/Double Cap)	1/cs., 2,86 (6.3)/cs.	1 each	R5
R7 (Triple Cap/Triple Cap)	1/cs., 4,18 (9.2)/cs.	1 each	R7
R9 (Triple Cap/Triple Cap)	1/cs., 5,08 (11.2)/cs	10 kits	R9
R6 (Multiple Port End Cap)	1/cs., 4,63 (10.2)/cs.	1 each	R6

3M Riser closure end caps —Single entry (optional)

Description	Packaging & kg (lbs.)	Cap Dimension	
Riser Closure End Cap	76 (3)		SRC-3
Riser Closure End Cap	127 (5)		SRC-5
Riser Closure End Cap	178 (7)		SRC-7
Riser Closure End Cap	229 (9)		SRC-9

3M K&B Riser Closure End Caps-Single Entry

Packaging & kg (lbs.)	Minimum Order	
10/cs., 1,22 (2.7)/cs.	10 each	SRC-3
10/cs., 2,8 (6.1)/cs.	10 each	SRC-5
1/cs., 0,63 (1.4)/cs.	1 each	SRC-7
1/cs., 0,77 (1.7)/cs.	1 each	SRC-9

2.2.2 Accessories
Compounds and Sealing Kits

Re-enterable Encapsulant 3M 8882 High Gel

The best all-around buried splice protection

Consider the time and costs of splicing a buried cable. Then consider the time and costs of going back to repair the splice because your encapsulating compound couldn't weather the elements. With these considerations in mind, 3M developed High Gel – a completely re-enterable encapsulant designed for superior performance at a low cost. Using an advanced compound technology, High Gel yields a higher level of adhesion than encapsulants costing much more. This is because High Gel is designed to absorb cable-filling materials, yet remain easily and completely re-enterable. Even when splicing filled cable, little or no cable cleaning is required prior to using High Gel. Application is quick and easy, since High Gel accepts forced-compound techniques as well as gravity-fill. High Gel also provides better penetration of splice bundles at low temperatures due to its lower viscosity and longer gel time. With its

increased hydrolytic stability, High Gel stays firm at high temperatures. You get greater moisture protection and overall performance that's superior – yet High Gel costs no more than most encapsulants of lesser quality. Many encapsulants on the market today contain isocyanate compounds, which can cause allergic reactions in certain persons. High Gel contains no isocyanates, so the risk of an allergic reaction is greatly reduced.

Built-in quality

When you use High Gel for your splicing jobs, you get more than the performance of a superior encapsulant. You get the assurance of quality that's built into every 3M product. As a leader in the tele-communications industry, 3M has built a reputation of reliability at an affordable price. And with High Gel, you can count on getting the job done right-the first time.

Highlights:

Features	Advantages	Benefits
Advanced compound technology	Does not contain isocyanates	Reduces the risk of allergic reaction
High adhesion	Greater moisture protection; no cable cleaning required	Saves time, repair costs and money
High performance	Easy to re-enter; prevents ingress of moisture	Saves man-hours and money
Unipak Packaging	Eliminates worker exposure to vapors during mixing; No unreacted material after mixing	Reduces exposure to chemicals

Eliminates the need for special disposal |

2.2.2 Accessories
Compounds and Sealing Kits

Type/Order text		Ref.-No.

Size	Packaging	
8882 High Gel Re-enterable Encapsulant		
500C (521 ml) Unipak	10 kits per case	**8882 High Gel 500C**
750C (781 ml) Foil Unipak	4 kits per case	**8882 High Gel 750C**
1900C (1979 ml) Foil Unipak	1 kit per case	**8882 High Gel 1900C**
5000C (5203 ml) Pouch in Pail	2 kits per case	**8882 High Gel 5000C**
8000C (8333 ml) Pouch in Pail	1 kit per case	**8882 High Gel 8000C**
Size A (90 ml) Unipak	10 kits per case	8**882 High Gel Size A**
Size C (385 ml) Unipak	10 kits per case	**8882 High Gel Size C**
Size D (659 ml) Unipak	10 kits per case	**8882 High Gel Size D**
Size E (292 ml) Unipak	10 kits per case	**8882 High Gel Size E**
750F (824 ml) Foil Unipak	4 kits per case	**8882 High Gel 750F**
1500F (1648 ml) Foil Unipak	2 kits per case	**8882 High Gel 1500F**
3000F (3297 ml) Foil Unipak	1 kit per case	**8882 High Gel 3000F**
6000 (6593 ml) Pouch in Pail	1 kit per case	**8882 High Gel 6000**

To order, specify the size of packages and number of cases.

Solutions for Outside Plant

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2.2.2   Accessories
Compounds and Sealing Kits

3M Scotchcast 4407 Encapsulating and Blocking Compound

Developed for splice encapsulation and pressure blocking, Scotchcast 4407 compound is a two-part compound. It features excellent wetting properties and low viscosity, which means it flows quickly and freely. Its low temperature cure properties mean that it may be used in almost any type of weather. Cure time is fast; approximately 1 hour at 22°C (72°F) and 20 hours at -4°C (20°F). 4407 is usable to -18°C (0°F). Designed for both splice encapsulation and cable blocking, Scotchcast 4407 eliminates the need to stock more than one compound.

3M 4408 Haplec Blocking Compound

4408 Haplec Blocking Compound is a patented high-performance two-part resin providing high shear adhesion to plastic insulated conductors (PIC), even when the insulation is grease coated (as in filled cable). It was designed to make combination moisture/pressure blocks (especially in filled cable) and pressure dams for transition splices between pressurised and grease filled cable. 4408 Haplec Blocking Compound is conveniently packaged in Unipak Containers.

3M Scotchcast 4411 Pedestal Base Sealant Kit

A two-part expanding sealant used to fill pedestal bases to prevent ground moisture from entering the pedestal. The sealant protects the cables against rodents, insects and moisture.
An "A" size unipak bag will expand to fill about 753,80 cubic cm (46 cubic inches); a "B" size will fill about 56,77 cubic cm (95 cubic inches), and a "D" size will expand to fill about 4096,77 cubic cm (250 cubic inches). **RUS Listed**

3M Scotchcast 4416 Duct Sealing Kit

The 4416 Duct Sealing Kit prevents water and other liquids from running out of a cable duct and entering a manhole or central office.

Kit contents:
• Foam strip
• Spacer web strip
• Scotchcast cleaning pads (4)
• Scotchcast expandable sealant (4)
• Plastic tubes
RUS Listed

3M Pull 'N' Shrink Tubing (Cold Shrink)

Pull 'N' Shrink Tubing is an open-ended tubular rubber sleeve (of high stretch EPDM rubber) which has been factory expanded and assembled into a removable hollow core. To use, the core mounted tubing is correctly positioned over a coaxial cable connector and then shrunk in place by pulling out the specially designed core allowing elastic recovery of the tube. This results in protection of the connector from the ambient environment by the rubber sleeve. The Pull 'N' Shrink Tubing is available in 6 sizes covering coaxial cable diameter range from 6,9 mm (0.27") to a maximum of 45,7 mm (1.80"). Each size is available in two lengths — the long (L) version is designed for splice connector protection and the short (S) is for use with connections to taps, amplifiers and splitters.

3M Scotchcast 4430-F Foam Kit

Open cell polyurethane foam strips used for cable duct sealing or for containing expandable sealants. Kit contents: 8 rolls foam, 25,4 mm x 76,2 mm x 1,8 m (1" x 3" x 72").

2.2   Splice Protection Products
2.2.2 Accessories
Compounds and Sealing Kits

Solutions for Outside Plant

Type/Order text			Ref.-No.
Description	**Packaging & kg (lbs.)/cs.**	**Minimum Order**	
4407 Encapsulating and Blocking Compound			
89 ml (94 g)	1 bag/box, 10/cs., 1,6 (3.5)	10 bags	**Size A**
197 ml (209 g)	1 bag/box. 10/cs., 3,2 (7.0)	10 bags	**Size B**
396 ml (420 g)	1 bag/box, 10/cs., 5,4 (12.0)	10 bags	**Size C**
637 ml (675 g)	1 bag/box, 10/cs., 8,7 (19.1)	10 bags	**Size D**
283 ml (300 g)	1 bag/box, 10/cs., 4,2 (9.3)	10 bags	**Size E**
1415 ml (1500 g)	1 unit/cs., 2,04 (4.5)	1 unit	**Size 1500 F**
2830 ml (3000 g)	1 unit/cs., 3,4 (8.8)	1 unit	**Size 3000 F**
4408 Haplec Blocking Compound			
632 ml (600 g)	1 bag/box, 10/cs., 7,5 (16.5)	10 bags	**Unipak Bag Size D**
316 ml (300 g)	1 bag/box, 10/cs., 4,1 (9.1)	10 bags	**Unipak Bag Size E**
4411 Pedestal Base Sealant Kit			
795 ml (96.3 g)	4/box, 16/cs., 2,7 (6.0)	16 bags	**"A" bag**
1570 ml (190 g)	4/box, 16/cs., 4,3 (9.5)	16 bags	**"B" bag**
4130 ml (500 g)	4/box, 16/cs., 10,3 (22.8)	16 bags	**"D" bag**
6195 ml (750 g)	4 units/cs., 4,7 (10.4)	4 units	**750 F bag**
4416 Duct Sealing Kit	4/cs., 1,5 (3.3)	1 kit	**4416 Duct Sealing Kit**
Pull 'N' Shrink Tubing (Cold Shrink)			
4626L PST Drop Wire	10/cs., 1,5 (3.3)	10 each	**4626L PST Drop Wire**
4627L PST (0.412)	10/cs., 1,8 (4)	10 each	**4627L PST**
4628L PST (0.500)	10/cs., 1,5 (3.3)	10 each	**4628L PST**
4629L PST (0.625)	10/cs., 2,0 (4.5)	10 each	**4629L PST**
4630L PST (0.750)	10/cs., 1,5 (3.3)	10 each	**4630L PST**
4631L PST (1.00)	10/cs., 2,7 (6)	10 each	**4631L PST**
4626S PST Drop Wire	10/cs., 0,3 (0.7)	10 each	**4626S PST Drop Wire**
4627S PST (0.412)	10/cs., 1,0 (2.1)	10 each	**4627S PST**
4628S PST (0.500)	10/cs., 1,1 (2.4)	10 each	**4628S PST**
4629S PST (0.625)	10/cs., 1,2 (2.6)	10 each	**4629S PST**
4630S PST (0.750)	10/cs., 1,3 (2.8)	10 each	**4630S PST**
4631S PST (1.00)	10/cs., 1,5 (3.3)	10 each	**4631S PST**
4430-F Duct Foam Kit	8 rolls/kit, 1 kit/cs. 1,6 (3.6)	1 kit	**4430-F Duct Foam Kit**

Note: Volume in milliliters (ml) is equal to 3,785.4 ml/1 gallon.

2.2.2 Accessories
Pressure and Moisture Blocking Kits

Description

3M Scotchcast 8964 Pedestal Pressure/Moisture Blocking Kit

A system for PIC air core cable blocking. Used to make a pressure block and moisture seal at the pedestal interface. The kit contains a universal closure and the pourable Haplec 4408 compound conveniently packaged in a unipak container. The 8964 kit includes: 1 closure body 254 mm x 355,6 mm (10" x 12"), 1 spacer web 127 mm x 228,6 mm (5" x 9"), 1 mastic strip 254 mm (10"), 1 fiberglas strip roll 38,1 mm x 0.9 mm (1 1/2"x 36"), 1 4408 Haplec blocking compound D bag 600 g (21.2 oz.), 1 Instruction sheet.

3M Scotchcast 4530, 4530-L, 4530-S/NB/4408 Open Sheath Blocking Closures

This system provides full pressure blocking on air core cable (paper or pulp insulated cable that has not been treated with anti-wetting agents and PIC). Compound filling of the cable block can be accomplished by pouring and injecting or, when cable is under air pressure, by injecting alone. Scotchcast 4407 Encapsulating and Blocking Compound is used with the 4530 and 4530-L closure kits. Scotchcast 4407 compound is a two-part polyurethane compound characterised by excellent wetting properties and low viscosity which is ideal for pressure blocking applications. The 4407 compound is sold separately from the closure kit to permit optimisation of the amount of compound used.

3M Scotchcast 4477 and 4477-R Plugging Under Pressure (PUP) Kit (Air Pressure Blocking)

This easy-to-use kit is a system that allows the craftsman to make a pressure block without cable line air pressure shutdown. The Scotchcast 4477 PUP Kit saves time in making a pressure block because it contains all the necessary components in a system package. The 4477-R kit is a replenishment kit that permits use of 4477 kit components that are removed after plug curing for other pressure block applications. The PUP kit's relief valve and bypass tube automatically equalise pressure to 5 p.s.i. on both sides of the injection point. The system's injection valve permits compound injection without loss or mess while the cross fitting permits the addition of an "F" valve for adding buffered air or monitoring. The 4477-R kit includes 60 plungers for SCS usage.

3M Scotchcast 4407/SCS Single Cartridge System for Plugging

The Scotchcast Cable Blocking System features a reusable injection cartridge which can be used for as many as six injections of Scotchcast 4407 compound, or up to 72 oz. (2 kg) of compound, depending on the size of the block. The Single Cartridge System can be used on both open and direct sheath applications, on vertical as well as horizontal blocks, & on plugs made under pressure. The cable blocking system comes with an injection gun. The empty cartridge is screwed onto the injection port of the sheath or 4530 closure. After the compound is poured, a plunger is inserted, the injection gun is placed on the cartridge, and the compound is injected into the sheath or the closure. This is repeated using the same cartridge until the block is completed or six plungers have been used.

Type/Order text

Ref.-No.

3M Pressure Blocking Kits

Descriptions	Packaging & kg (lbs)/cs.	Minimum Order	
Scotchcast 8964	1/cs., 1,1 (2.4)	1 kit	**Scotchcast 8964**
Plugging Under Pressure (PUP) Kits			
	1/cs., 0,58 (1.3)	1 kit	**4477 PUP Kit**
Replenishment Kit	10 petcocks & 60 plungers/kit, 1/cs., 0,49 (1.1)	1 kit	**4477-R PUP**

2.2.2 Accessories
Pressure and Moisture Blocking Kits

3M

Solutions for Outside Plant

Description

Kit Components for the 3M 4530 Series Pressure and 3M Moisture Blocking Kits

Kit contents	Kit Product Numbers		
	4530	4530-L	4530-S/NB/4408
Injection closure	•	•	•
Fill port caps (2)	•	•	•
W9 channeling wedges (12)	•	•	•
4460-S shield bond connectors (2)	•	•	•
25T grounding braid (356 mm (14") strip)	•	•	•
Fibreglass tape (2 strips)	•	•	•
Spacer web	•	•	•
Air vent plugs (2)	•	•	•
Mastic strip	•	•	•
Stainless steel hose clamps (2)	•	•	•
378 mm (1/10 gal.) injection cartridge	•	•	•
Stackable plungers (5)	•	•	•
Injection caps (2)	•	•	•
13 mm (1/2") O.D. tubing 4"	•	•	•
3 mm (1/8") O.D. tubing 6"	•	•	•
Fibreglass strips (2)	•	•	•
Funnel		•	•
"E" size bag of 4408 Haplec Blocking Compound			•

Kit Components for the 3M 4407 Series Single Cartridge System Kits

Kit Contents	Kit Product Numbers		
	4407/SCS Kit with injection gun	4407/SCS-D Single cartridge system	4407/SCS Direct sheath injection kit
Plungers	12	12	1
Cartridge	6	1	1
4478 Flanges	6		1
Petcocks	6	1	1
"B" Bag 4407			1
"D" Bags 4407	6	1	
W9 Channeling wedges	100		6
4470 Injection gun	1		

Type/Order text

Ref.-No.

Packaging & kg (lbs.)	Minimum order	
1/box, 10/cs., 7,4 (16.4)	10 kits	**4530**
1/cs., 1,2 (2.7)	1 kit	**4530-L**
1/box, 10/cs.	10 kits	**4530-S/NB/4408**
1/cs., 6,3 (13.9)	1 kit	**4407/SCS Kit**
1/box, 10/cs., 10,5 (23.1)	10 each	**4407/SCS-D**
10/cs., 5,1 (11.3)	10 kits	**4407/SCS**

2

2.2.2 Accessories
3M™ Specialty Tapes

Description

3M Splicing Tapes

3M 2183 E-Z Wrap Elastic Vinyl

E-Z Wrap is a tough, thin elastic vinyl material which sticks to itself when wrapped in layers. It forms a compact, durable, flexible, moisture-proof covering. Protects wire groups, splice bundles and pulp and paper insulated wire. Recommended for Foam Sealed, and Better Buried, Compound Compression closures.

Size: 3.0 mil thick, 101,6 mm x 30,4 m (4" x 100')

3M Scotch 26-FC Foam Collar Tape
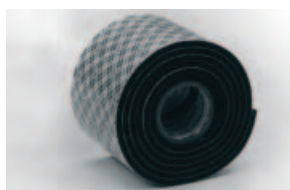
An open-cell (similar to foam rubber), black construction collar with pressure-sensitive adhesive (slight tack) on both sides. Excellent co-adhesion properties and compatibility with encapsulating compounds. For all enclosure collar applications.

Size: 51 mm x 1,01 m (2" x 40")

3M Mastic Sealing Tapes

3M Scotch VM Vinyl Mastic Tape

VM Tape seals out moisture and protects against corrosion without the need for heating tools. Two tapes in one (vinyl and mastic) VM is especially designed for cable sheath repair, splice case and load coil case protection, auxiliary closure and cable reel end sealing, drop wire insulating, conduit repair and protection of CATV components plus many other general taping applications. VM Tape is a rubber based mastic laminated to an all weather 0.18 mm (7 mil) vinyl, which provides double duty protection in one wrap. Four sizes to meet all possible applications are available.

Size: 38,1 mm x 6,1 m (1-1/2" x 20'), 101,6 mm x 3.1 m (4" x 10'), 152 mm x 3,1m (6" x 10'), 559 mm x 13,5 m (22" x 10')

3M Scotch 2900-R Sealing Tape

A non-conductive grey mastic tape with good compression qualities is resistant to solvents and maintains its form in temperatures in excess of 140° C. It can be substituted for B Sealant tape.

Size: 38,1 mm x 1,52 m (1-1/2" x 5')

3M 2178-125 Mastic Tape

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 and is available in rolls.
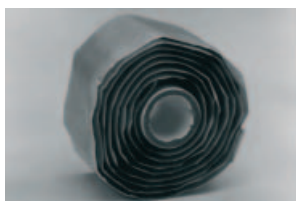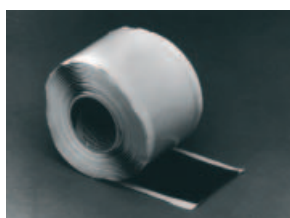
Size: 38,1 mm x 1,1 m (1-1/2" x 45")

3M 2178-281 Cord Re-enterable Mastic

The 2178 Cord Re-enterable Mastic is available in rolls 1,85 m (6') in length with a 8,7 mm (1/3") cord diameter.

3M RM2228 Rubber/Mastic Sealing Tape

2228 Sealing Tape conforms to irregular shapes and is available in 51 mm x 3,1 m (2" x 10') rolls.

2.2.2 Accessories
3M™ Specialty Tapes

Description

3M All Weather Protection Tapes

3M Scotch 88T All Weather Telephone Vinyl Plastic Tape

Taping end caps, wrapping for abrasion protection or temporarily securing—88T Tape will suit your needs for inside or outside plant applications as the handiest tool in your kit. The special formula adhesive and extra-tough backing offer you superior adhesion and excellent conformability over extended temperature ranges, thus reducing your inventory needs to one vinyl tape.
Available in craftsman size rolls to fit your specific in-the-field use, this 0,22 mm (8-1/2 mil) tape releases smoothly from the roll in zero weather and will not ooze adhesive in hot climates. The 38 mm x 13,5 m (1-1/2" x 44') roll is especially suited as the Splicer's roll, for outside plant usage.
88T Tape resists: water, acids, alkalies, and is flame retardant. It is weather resistant and not affected by sunlight.

3M Scotchrap 50 All Weather Corrosion Protection Vinyl Tape

50 All Weather Tape is used for outdoor corrosion applications and is available in rolls 25 mm x 30,4 m (1" x 100') and 51 mm x 30,4 m (2" x 100').

3M Build-up Tapes

3M 26-FC Foam Collar Tape

26-FC Build-up Tape is used for closure sealing end collars for compression type closures and comes in a 51 mm x 1,00 m (2" x 40") roll.

3M 130C Linerless Rubber Splicing Tape

130C Build-up Tape is used for build-up and moisture protection and comes in two sizes: 38 mm x 9,1 m x 0,761 mm (1.5" x 30' [10 yds.] x 0.030") and 50,7 mm x 9,1 m x 0,761 mm (2" x 30' [10 yds.] x 0.030").

3M Scotchfil Build-up Tape

Scotchfil Build-up Tape is used for rapid build-up for sealing collars. It is available in 38 mm x 1,5 m (1-1/2" x 60") rolls.

3M Identification Tapes

3M Scotch 35 Vinyl Identification Tape

35 Identification Tape is used for identifying special applications. It is available in blue, orange, green, brown, grey, red, violet, white and yellow. It is available in two sizes: 12,5 mm x 6,1 m (1/2" x 20') and 19 mm x 20 m (3/4" x 66').

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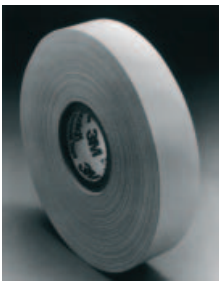
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2.2.2 Accessories
3M™ Specialty Tapes

3M Special Use Tapes

3M 3 Paper Tape

3 Tape is used for repair and identification of pulp/paper insulation. It comes in 12,5 mm x 18,3 m (1/2" x 20 yd.) rolls.

3M 27 Glass Cloth Tape

27 Tape is used for high strength repair requirements. It comes in three sizes: 19 mm x 32.9 m (3/4" x 36 yd.), 25 mm x 32.9 m (1" x 36 yd.), and 51 mm x 54,8 m (2" x 60 yd.).

3M 49 Aluminum Foil Tape

49 Tape is used for EMI and moisture protection. It is available in two sizes: 51 mm x 6,1 m (2" x 20') and 101,6 mm x 6,1 m (4" x 20').

3M 69 Glass Cloth Tape

69 Tape is used for high temperature and high strength requirements. It is available in 25 mm x 22,8 m (1" x 25 yd.) rolls.

3M 77 Fire and Arc Proofing Tape

77 Tape is used for fire and arc protection of cable sheath material. It is available in two sizes: 38 mm x 6,1 m (1-1/2" x 20') and 76,1 mm x 6,1 m. (3" x 20').

3M P-4 Cloth Tape

P-4 Cloth Tape is used for restriction for cable blocking and comes in 25 mm x 9 m (1" x 30') rolls.

2.2 Splice Protection Products

2.2.2 Accessories
3M™ Specialty Tapes

Tape Application Chart

Application	Tape Type	Used For	Sizes
All Weather Protection	88T	General outdoor use	3/4" x 36', 1"x36", 1-1/2" x 44'
	50	For outdoor applications in corrosive environments	1" x 100', 2" x 100'
Sealing	VM	Sealing out moisture and corrosion	1-1/2" x 20', 4" x 10', 6" x 10", 22" x 10'
	2900-R	Closure sealing collars	1-1/2" x 60'
	2228	Conforming to irregular shapes	2" x 10'
	130C	Build-up and moisture protection	3/4" x 30', 2" x 30'
Build-Up	26-FC	Closure sealing end collars (for compression type closures)	2" x 40'
	130C	Build-up and moisture protection	3/4" x 30', 2" x 30'
	Scotchfil	Rapid build-up for sealing collars	1-1/2" x 60'
Identification	35	Identifying special applications	1/2" x 20', 3/4" x 66'
		Available colours: Blue, Orange, Green, Brown, Grey, Red, Violet, White, Yellow	
Special Use	3	Repair and identification of pulp/paper insulation	1/2" x 20 yds.
	27	High strength repair requirements	3/4" x 36 yds., 1" x 36 yds., 2" x 60 yds.
	49	EMI and moisture protection	2" x 20', 4" x 20'
	69	High Temperature/high strength requirements	1" x 25 yds.
	77	Fire and arc protection of cable sheath material	1-1/2" x 20', 3" x 20'
	2183	Wrapping splice bundles prior to closure application	4" x 100'
	P-4	Restriction for cable blocking	1" x 30'
	2176		

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

Tapes and Sealing Products

Product	Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
Splicing Film			
2183 E-Z Wrap Elastic Vinyl (3.0 mils thick), Size: 101,6 mm x 30,4 m (4" x 100')	12/cs., 3,6 (8)	12 rolls	**2183**
Mastic Tapes			
VM Tape Vinyl/Mastic Size: 38 mm x 6,1 m (1-1/2" x 20')	1/box, 10/cs., 2,5 (5.5)	10 rolls	**VM-1.5x20**
101,6 mm x 3,048 m (4" x 10')	1/box, 10/cs., 6,2 (13.7)	10 rolls	**VM-4x10**
152 mm x 3,048 m (6" x 10')	1/box, 1/cs., 0,9 (2)	1 roll	**VM-6x10**
559 mm x 3,048 m (22" x 10')	1/box, 1/cs., 2,9 (6.5)	1 roll	**VM-22x10**
2900-R Sealing Tape Size: 38,1 mm x 1,52 m (1-1/2" x 5')	5 /box, 50/cs., 14,42 (31.8)	50 rolls	**2900-R**
2178-125 Mastic Tape Size: 38,1 mm x 1,1 m (1-1/2" x 45")	1/box, 8/cs., 2,7 (6)	8	**2178-125 Mastic Tape**
2178 Cord Re-enterable Mastic Size: 8,7 mm x 1,85 m (1/3" x 6')	1/box, 14/cs., 2,7 (6)	14 rolls	**2178-CORD**
2228 Sealing Tape Size: 51 mm x 3,048 m (2" x 10')	1/box, 10/cs., 4,23 (9.41)	10 rolls	**2228**
All Weather Protection			
88T All Weather Telephone Vinyl Plastic Tape Size: 19 mm x 11 m (3/4" x 36')	1/bag, 12/ctn., 48/cs., 3,5 (7.8)	48 rolls	**88T-0.75x36**
19 mm x 18 m (3/4" x 60')	1/bag, 10/ctn., 100/cs., 11 (24.2)	100 rolls	**88T-0.75x60**
25 mm x 11 m (1" x 36')	1/bag, 12/ctn., 48/cs., 4,5 (9.9)	48 rolls	**88T-1x36**
38 mm x 13,5 m (1-1/2" x 44')	1/bag, 10/ctn., 100/cs., 16,5 (36.8)	100 rolls	**88T-1.5x44**
50 All Weather Tape Size: 25 mm x 30,4 m (1" x 100')	1/box, 10/cs., 2,7 (6)	10 rolls	**50-1x100**
51mm x 30,4 m (2" x 100')	1/box, 10/cs., 5,4 (12)	10 rolls	**50-2x100**

Type/Order text			Ref.-No.

Tapes and Sealing Products

Product Number	Packaging & kg (lbs.)/cs.	Minimum Order	
Build-up Tapes			
26-FC Build-up Tape			
Size: 51 mm x 1,00 m (2" x 40")	24/cs., 0,8 (1.8)	24 rolls	**26-FC**
130C Linerless Rubber Splicing Tape			
Size: 19 mm x 9 m (3/4" x 30')	10/ctn., 50/cs., 9,9 (22.2)	50 rolls	**130C-0.75x30**
51 mm x 9 m (2" x 30')	50/cs., 25,76 (57.25)	50 rolls	**130C-2x30**
Scotchfil Build-up Tape			
Size: 38 mm x 1,5 m (1-1/2" x 60")	1/box, 10/ctn., 50/cs., 13 (29)	50 rolls	**Scotchfil**
Identification Tapes			
35 Identification Tape			
Size: 12,8 mm x 6 m (1/2" x 20')			
Red	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-RD20**
White	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-WH20**
Blue	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-BL20**
Yellow	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-YL20**
Green	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-GN20**
Orange	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-OR20**
Grey	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-GY20**
Brown	1/box, 10/ctn., 4,5 (10)	10 rolls	**35-BN20**
Size: 19 mm x 20 m (3/4" x 66')			
Red	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-RD66**
White	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-WH66**
Blue	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-BL66**
Yellow	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-YL66**
Green	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-GN66**
Orange	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-OR66**
Grey	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-GY66**
Brown	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-BN66**
Violet	1/box, 10/ctn., 100/cs., 14,5 (32)	10 rolls	**35-VL66**
Special Use Tapes			
3 Tape			
Size: 12,5 mm x 18,2 m (1/2" x 20 yd.)	1/box, 10/ctn., 50/cs., 2,7 (6)	50 rolls	**3 Tape**
27 Tape			
Size: 19 mm x 32,9 m (3/4" x 36 yd.)	48/cs., 7,82 (17.25)	48 rolls	**27Tape-19**
Size: 25 mm x 32,9 m (1" x 36 yd.)	48/cs., 10,32 (22.75)	48 rolls	**27Tape-25**
Size: 51 mm x 54,8 m (2" x 60 yd.)	48/cs., 9,07 (20)	20 rolls	**27Tape-51**
49 Tape			
Size: 51 mm x 6,1 m (2" x 20')	1/box, 10/ctn., 50/cs., 5,7 (13.5)	50 rolls	**49-2x20**
Size: 101,6 mm x 6,1 m (4" x 20')	1/box, 10/ctn., 50/cs., 11,1 (24.4)	50 rolls	**49-4x20**
69 Tape			
Size: 25 mm x 22,8 m (1" x 25 yd.)	10/cs., 1,59 (3.5)	10 rolls	**69**
77 Tape			
Size: 38 mm x 6,1 m (1-1/2" x 20')	1/box, 10/cs., 2,9 (6.4)	10 rolls	**77-1.5x20**
Size: 76,1 mm x 6,1 m (3" x 20')	1/box, 10/cs., 5,5 (12.1)	10 rolls	**77-3x20**
2183 Tape			
Size: 101,6 mm x 30,4 m (4" x 100')	12/cs., 3,6 (8)	12 rolls	**2183 Tape**
P-4 Tape			
Size: 25 mm x 9 m (1" x 30')	1/box, 10/ctn., 50/cs., 4,5 (10)	50 rolls	**P-4 Tpae**

2.2 Splice Protection Products
2.2.2 Accessories
Identification Products and Reflective Tapes

Identification Products

3M Scotchlite Custom Decals

Decals are made to customer requirements from Scotchlite reflective material. 76 mm x 127 mm (3" x 5") size. Three ink and Scotchlite material colours are available. Prices for special sizes and quantities available on request. Minimum order: 5,000 labels.

Scotchlite Material Colours:
- Orange
- Silver
- Yellow

Ink Colours:
- Black
- Blue
- Red

3M Lettering Kits and Replenishment Decals

3M Scotchcal 5003 Non-Reflective Lettering System

For in-plant, interior vault and pedestal cabinet applications. Self-spacing letter blocks are easy to apply for a neat, professional appearance. Highly visible white letters on a black background. Self-sticking adhesive and glossy vinyl base will stand up for years in severe weather and handling conditions. Assortment of 58 characters each: A–Z, 0–9, blank and dash are all provided in a 36-compartment box, with applicator tool. Characters are 19,05 mm x 25,4 mm (3/4" x 1").

3M Scotchlite 5005 Reflective Lettering System

Black characters on a "safety orange" background conform to the American National Standards Institute (ANSI) Z53.l-1979. Convenient and easy to use, letters and numbers are self-spacing, with self-sticking adhesive. Highly visible characters stand out at wide angles and remain visible in wet weather. Using the Scotchlite reflective system proven in millions of highway applications, the 5000 lettering systems offers long-term durability. 25,4mm x 38,1 mm (1"x1-1/2"). Each kit contains 25 each A-Z, 0-9, blank and dash characters, packaged in a clear, 36-compartment box, including an appkication tool. **RUS Listed**
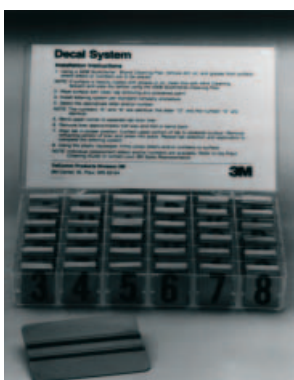
3M Scotchlite 5025 Reflective Lettering System

A complete A–Z lettering and numbering system in black on "safety" orange. Characters are 48 mm x 76 mm (1-7/8" x 3"). Packaged in a clear, 36-compartment box. Contains 25 each of the letters A–Z, numbers 0–9, blank and dash. All characters are self-sticking and self-spacing. Application tool is included. Minimum order, 100 each.

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2.2.2 Accessories
## Identification Products and Reflective Tapes

Description

3M 5012 Decal Strip Holder

Designed for easy attachment to aerial or underground cables, poles and other structural hardware, the 5012 holder holds 4–l8 characters to identify splices, load points, poles, etc. Polyethylene plastic strip can be attached with cable ties or nailed to poles.
RUS Listed

Reflective Tapes
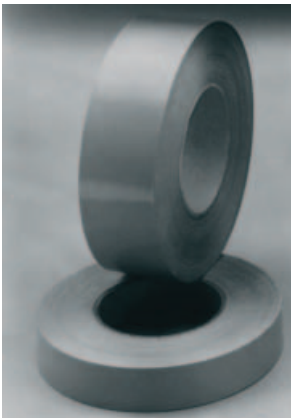
3M 5016-1 and 5016-2 Reflective Tape

This orange, reflective adhesive-backed tape with high-tack adhesive suitable for use at low temperatures provides high visibility at night or during daylight conditions. For marking pedestal cabinets located in right-of-way areas to warn users of cabinet locations. Highly visible markings are designed to prevent injury and reduce property damage. Use only on flat surfaces. Will not adhere well over rivets, nor on vehicular surfaces.

3M 5016-FO Fibre Optic Warning Labels

Orange, reflective adhesive-backed tape with high-tack adhesive is suitable for use at low temperatures. Imprinted "Caution Fibre Optic" on 152 mm (6") spacings. Letters are 19,0 mm (3/4") and 9,5 mm (3/8") high, 288 labels per roll.

2.2.2 Accessories
Identification Products and Reflective Tapes

Type/Order text			Ref.-No.

Identification Products

Product Number	Packaging & kg (lbs.)/cs.	Minimum Order	
Custom Decals			
76 mm x 127 mm (3" x 5")	5000/cs.	5000 each	**054007-17640**
Lettering Kits and Replenishment Decals			
5003 Non-Reflective Lettering System Kit	1000/cs., 1,04 (2.3)	1 kit	**5003**
5005 Reflective Lettering System Kit	1000/cs., 1,09 (2.4)	1 kit	**5005**
5012 Decal Strip Holder	25/cs., 0,86 (1.9)	1 box	**5012**
5025 Reflective Lettering System Kit	100/cs., 2,68 (5.9)	1 kit	**5025**
Reflective Tapes			
5016-1 Reflective Tape	1/box, 0,6 (1.4)	1 roll	**5016-1**
5016-2 Reflective Tape	1/cs., 0,64 (2.6)	1 roll	**5016-2**
5016-FO Fibre Optic Warning Labels	1/cs., 0,6 (1.4)	1 roll	**5016-FO**

Solutions for Outside Plant

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2.2.2 Accessories
Identification Products and Reflective Tapes

Type/Order text	Ref.-No.

3M Scotchcal 5003 Non-Reflective Lettering System Kit

Product Description	Packaging & kg (lbs.)/cs.	Minimum Order	
Non-reflective lettering system	1 kit/cs., 1,0 (2.3)	1000 each	**5003-kit**
Replenishment decal **"A"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "A"**
Replenishment decal **"B"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "B"**
Replenishment decal **"C"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "C"**
Replenishment decal **"D"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "D"**
Replenishment decal **"E"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "E"**
Replenishment decal **"F"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "F"**
Replenishment decal **"G"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "G"**
Replenishment decal **"H"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "H"**
Replenishment decal **"I"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "I"**
Replenishment decal **"J"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "J"**
Replenishment decal **"K"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "K"**
Replenishment decal **"L"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "L"**
Replenishment decal **"M"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "M"**
Replenishment decal **"N"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "N"**
Replenishment decal **"O"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "O"**
Replenishment decal **"P"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "P"**
Replenishment decal **"Q"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "Q"**
Replenishment decal **"R"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "R"**
Replenishment decal **"S"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "S"**
Replenishment decal **"T"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "T"**
Replenishment decal **"U"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "U"**
Replenishment decal **"V"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "V"**
Replenishment decal **"W"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "R"**
Replenishment decal **"X"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "X"**
Replenishment decal **"Y"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "Y"**
Replenishment decal **"Z"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "Z"**
Replenishment decal **"—"**	1000/cs., 2,9 (6.5)	1 kit	**5003 decal "—"**
Replenishment decal **"BLANK"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "BLANK"**
Replenishment decal **"0"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "0"**
Replenishment decal **"1"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "1"**
Replenishment decal **"2"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "2"**
Replenishment decal **"3"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "3"**
Replenishment decal **"4"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "4"**
Replenishment decal **"5"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "5"**
Replenishment decal **"6"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "6"**
Replenishment decal **"7"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "7"**
Replenishment decal **"8"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "8"**
Replenishment decal **"9"**	1000/cs., 2,9 (6.5)	1000 each	**5003 decal "9"**

2.2.2 Accessories
Identification Products and Reflective Tapes

Type/Order text	Ref.-No.

3M Scotchlite 5005 Reflective Lettering System Kit

Product Description	Packaging kg & (lbs.)/cs.	Minimum Order	
Reflective lettering kit (orange and black)	1 kit/cs., 1,0 (2.4)	1 kit	**5005 decal "kit"**
Replenishment decal **"A"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "A"**
Replenishment decal **"B"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "B"**
Replenishment decal **"C"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "C"**
Replenishment decal **"D"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "D"**
Replenishment decal **"E"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "E"**
Replenishment decal **"F"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "F"**
Replenishment decal **"G"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "G"**
Replenishment decal **"H"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "H"**
Replenishment decal **"I"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "I"**
Replenishment decal **"J"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "J"**
Replenishment decal **"K"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "K"**
Replenishment decal **"L"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "L"**
Replenishment decal **"M"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "M"**
Replenishment decal **"N"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "N"**
Replenishment decal **"0"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "O"**
Replenishment decal **"P"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "P"**
Replenishment decal **"Q"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "Q"**
Replenishment decal **"R"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "R"**
Replenishment decal **"S"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "S"**
Replenishment decal **"T"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "T"**
Replenishment decal **"U"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "U"**
Replenishment decal **"V"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "V"**
Replenishment decal **"W"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "W"**
Replenishment decal **"X"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "X"**
Replenishment decal **"Y"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "Y"**
Replenishment decal **"Z"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "Z"**
Replenishment decal **"—"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "—"**
Replenishment decal **"BLANK"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "BLANK"**
Replenishment decal **"0"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "0"**
Replenishment decal **"1"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "1"**
Replenishment decal **"2"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "2"**
Replenishment decal **"3"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "3"**
Replenishment decal **"4"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "4"**
Replenishment decal **"5"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "5"**
Replenishment decal **"6"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "6"**
Replenishment decal **"7"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "7"**
Replenishment decal **"8"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "8"**
Replenishment decal **"9"**	1000/cs., 0,9 (2.0)	1000 each	**5005 decal "9"**

Solutions for Outside Plant

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2.2.2 Accessories
Identification Products and Reflective Tapes

Type/Order text	Ref.-No.

3M Scotchlite 5025 Reflective Lettering System Kit

Product Description	Packaging & kg (lbs.)/cs.	Minimum Order	Ref.-No.
Reflective lettering system kit	1 kit/cs., 2,7 (6.0)	1 kit	**5025 kit**
Replenishment decal **"A"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "A"**
Replenishment decal **"B"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "B"**
Replenishment decal **"C"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "C"**
Replenishment decal **"D"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "D"**
Replenishment decal **"E"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "E"**
Replenishment decal **"F"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "F"**
Replenishment decal **"G"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "G"**
Replenishment decal **"H"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "H"**
Replenishment decal **"I"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "I"**
Replenishment decal **"J"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "J"**
Replenishment decal **"K"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "K"**
Replenishment decal **"L"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "L"**
Replenishment decal **"M"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "M"**
Replenishment decal **"N"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "N"**
Replenishment decal **"O"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "O"**
Replenishment decal **"P"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "P"**
Replenishment decal **"Q"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "Q"**
Replenishment decal **"R"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "R"**
Replenishment decal **"S"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "S"**
Replenishment decal **"T"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "T"**
Replenishment decal **"U"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "U"**
Replenishment decal **"V"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "V"**
Replenishment decal **"W"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "W"**
Replenishment decal **"X"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "X"**
Replenishment decal **"Y"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "Y"**
Replenishment decal **"Z"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "Z"**
Replenishment decal **"—"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "—"**
Replenishment decal **"BLANK"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "BLANK"**
Replenishment decal **"0"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "0"**
Replenishment decal **"1"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "1"**
Replenishment decal **"2"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "2"**
Replenishment decal **"3"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "3"**
Replenishment decal **"4"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "4"**
Replenishment decal **"5"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "5"**
Replenishment decal **"6"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "6"**
Replenishment decal **"7"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "7"**
Replenishment decal **"8"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "8"**
Replenishment decal **"9"**	100/cs., 2,7 (6.0)	100 each	**5025 decal "9"**

2.2 Splice Protection Products
2.2.2 Accessories
Miscellaneous Accessories

Description

3M Scotchcast 4413 Filled Cable Cleaning Kit

A specially formulated cleaning solvent for cleaning grease and Flex-Gel filling compound from filled core cable without damaging connectors, cable or individual conductors. One bag will clean both cable ends at splice point. Comes complete with the right amount of solvent sealed in the bag. No special tools are required. Virtually no personnel contact with the solvent or solvent vapors occurs during cleaning because of the unique packaging concept.

Kit contents:
• Heat-sealed cleaning bag with solvent

• Pair gloves

• Puncture-protection bags (2)

Four different sizes are available to meet a wide range of applications.

3M Scotchcast 4414 Filled Cable Cleaning Kit

The Scotchcast 4414 Filled Cable Cleaning Kit provides all the necessary materials for cleaning the filling compound from filled copper and fibre optic cables in an easy-to-transport kit. This kit includes 15 pads saturated in cleaning solvent, five scraper pads and 10 towels. The specially formulated cleaning solvents are contained in premeasured portions on saturated pads for fast, easy, convenient solvent application to cable core after sheath has been removed. The solvent and wet pads effectively remove cable filling compound from conductors and connectors with no damage to either.

Kit contents:
• Solvent Saturated Pads (15)

• Scraper Pads (5)

• Towels (10)

Additional materials required:
• Scotchcast 4435 Sheath Scuff

• Scotch 88T Vinyl Tape

3M Scotchcast W-9 Channeling Wedge

The Scotchcast W-9 Channeling Wedge is used in separating bundles of conductors when plugging cable. Made of flexible plastic, tapered at one end and grooved, the W-9 wedge separates conductors to ensure maximum penetration of the compound when forming a plug.
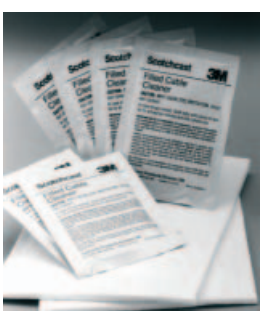
3M Scotchcast 4415 Service Wire Cleaning Kit

Everything needed to clean troublesome filled service wire is included in the 4415 Kit. Solvent saturated pads are individually bagged for convenience. No extra tools are needed, and an instruction sheet is included in each kit.

Kit contents:
• Towels (10)

• Solvent Saturated Pads (10)

2

2.2.2   Accessories
Miscellaneous Accessories

Description

3M Scotchcast 4435 Sheath Scuff

This flexible 80 grit, non-conductive, aluminum oxide strip is used to clean and rough up cable sheath. The clean, scuffed sheath greatly enhances the bond between the compound and sheath. Since the strip is 25.4 mm (1") wide, it encourages the craftsperson to scuff around the sheath rather than along it, thus eliminating moisture paths along the sheath, and also makes it easy to get into tight places.

Size: 25,4 mm x 22,86 m (1" x 75') roll

3M Scotchcast 4458, 4458-W Pair Saver

Protect cable pairs from the sharp edges of the shield and template, while permitting standard bond connector installations.

4458 Size: 21,6 mm x 5,4 m (0.85" x 18') rolls

4458-W Size: 38,0 mm x 5,5 m (1.5" x 18') rolls

Type/Order text   Ref.-No.

Miscellaneous Accessories

Product	Packaging & kg (lbs.)/cs.	Minimum Order	
4413 Filled Cable Cleaning Kit			
for up to 200-pair cables)	8/cs., 5,18 (11.5)	8 kits	**4413-S**
(for up to 600-pair cables)	4/cs., 4,95 (11)	4 kits	**4413-L**
(for 600- to 900-pair)	2/cs., 5,40 (12)	2 kits	**4413-XL**
(for 900-pair and more)	2/cs., 9,54 (21.2)	2 kits	**4413-SXL**
Filled Cable Cleaning Kit	1/cs., 0,63 (1.4)	1 kit	**4414**
Service Wire Cleaning Kit	10/kit, 10 kits/cs., 3,3 (7.3)	10 kits	**4415**
Sheath Scuff	1/box, 10/cs., 5,9 (13)	10 rolls	**4435**
4458, 4458-W Pair Saver			
21,6 mm x 5,4 m (.85" x 18') rolls	1/box, 10/cs., 1,9 (4.0)	10 rolls	**4458**
38 mm x 5,5 m (1.5" x 18') rolls	1/box, 10/cs., 3,7 (7.9)	10 rolls	**4458-W**
Scotchcast W-9 Channeling Wedge	100/box, 1000/cs., 1,8 (4)	1000 each	**W-9**

Accessories
3M™ Shield Bonding Products

Description

3M Scotchlok 4460 Shield Bond Connector (No Tabbing Required)

The 4460 Shield Bond Connector is designed to make a stable, low-resistance electrical connection between the shield of a communications cable and a conductor such as a strap, bar, or wire. The connector consists of four parts: lower member (base), upper member (top), and two securing nuts (lock nuts). The base teeth are set at such an angle as to permit easy insertion under the cable shield. Top and base members are made of tin-plated tempered brass, slightly curved to exert a continuous spring force on sheath and shield after clamping.

3M Scotchlok 4460-S Shield Bond Connector

The 4460-S Shield Bond Connector is designed to make a stable, low-resistance electrical connection between the shield of a communications cable and a conductor such as a strap, bar, or wire. The connector consists of five parts: lower member (base), upper member (top), two securing nuts (lock nuts) and a plastic shoe to aid connector insertion and to protect conductors. The base teeth are set at such an angle as to permit easy insertion under the cable shield. Top and base members are made of tin-plated tempered brass, slightly curved to exert a continuous spring force on sheath and shield after clamping.

3M Scotchlok 4460-D Shield Bond Connector

The 4460-D Shield Bond Connector is a downsized version of the 4460 Shield Bond Connector. Its small size makes it an excellent choice for cables of 100-pair or less. Its current-carrying capacity is equal to or better than aluminum-shielded cables of 100-pair or less and can be used on all cable with 20,3 mm (0.8") or smaller O.D.

3M Scotchlok 4460-D/FO Shield Bond Connector Assembly

The 4460-D/FO Shield Bond Connector is specifically designed to meet the bonding needs of fibre optic cables that contain metallic or fibreglass strength members. The connector is a version of the 4460-D Connector Assembly which utilises two additional plates to capture and secure the strength members. Its current-carrying capacity is equal to or better than aluminum-shielded fibre optic cable and can be used on all cables with 20,3 mm (0.8") or smaller O.D.

Solutions for Outside Plant

2

2.2.2 Accessories
3M™ Shield Bonding Products

Description

3M CCP Shield Bond Connector

Connection Element to give continuity to the shield of
telephone cables. Universal - for cables from 10 to 84 mm diameter.

Features
- Reduced size: 43 x 14 x 15 mm
- Re-usable
- Cable connection independent of the continuity bridges, until 2 continuity bridges istalled
- Instalation without cutting the cable jacket
- Low contact resistance

Electrical:
- Constact resistance: < 5mΩ
- Electrical wave shock: 5 aplications of 20 KA (waveshape 8/20µs)

Mechanical:
- Traction strengh: > 400 N
- Torque strengh of screws: > 5 Nm
- Vibration: > 2 h. 10-55-10 kH² in 20 min max. 1,5 mm

Enviromental
- Temperatures: -40ºC - 80 ºC
- HR related humidity: > 95 %
- Corrosion: > 72 h. Salt fog.

Materials
- Base and Cover: Still zinc bicromated
- Connection plate: Alpaca
- Screws: Still zinc bicromated
- Nuts: Still inoxidable
- Terminal: Copper tinned for cables 6 mm² Section

3M Scotchlok 4462 Shield Bond Connector (Designed Specifically For C.A.C.S.P. Cable)

The 4462 Shield Bond Connector is designed to make a stable,
low resistance electrical connection between the shield of a com-
munications cable and a conductor such as a strap, bar, wire or
braid.

3M Scotchlok 4462-FN Shield Bond Connector

Includes flanged nuts.

3M Scotchlok 4462-SN Shield Bond Connector

The 4462-SN Shield Bond Connector is an improved version of the
popular 4462 Shield Bond Connector, with a longer and stronger
stud to easily accommodate two bond braids (with eyelets). It is
specifically designed to supply greater pullout strength than the
4462 Shield Bond Connector. The nuts have been deepened, too,
making them much easier to hold and tighten. The 4462-SN Shield
Bond Connector is also designed for use with coated cables and
has superior electrical properties for the protection of data circuits.

3M Scotchlok 4462-SNA

The 4462-SNA has a longer stud, deepened nuts and an insulating shoe.

2.2 Splice Protection Products

2.2.2 Accessories
3M™ Shield Bonding Products

Description

Scotchlok 4463 Service Wire Shield Connector

The 4463 Service Wire Shield Connector is designed to make a stable, low resistance electrical connection between the shield of a buried service wire and the ground stud of a house terminal box or other shield connector. The 4463 can be used on service wire with an O.D. up to 11 mm (0.45").

Scotchlok 4464 Shield Bond Connector

The 4464 Shield Bond Connector is a strip of tin-plated brass, punched with mounting holes and two sets of sharp teeth. Each connector can join the shields of up to four two-pair service wires to a stud type shield connector. In addition to providing a stable, low-resistance electrical contact, the connector provides excellent strain relief and occupies a minimum of space. Each connector will accommodate up to four service wires with a shield diameter of up to 5,6 mm (0.21") or two service wires with a shield diameter up to 819 mm (0.35").

Scotch 25T Grounding Braid

This flat, tin-plated copper braid conductor is supplied for use with Scotchlok shield bond connectors. When clamped firmly, 25T Braid provides low electrical resistance connections for dependable shield bonding, and its physical strength contributes to strain relief across spliced cables, 25T Braid is l3 mm (1/2") wide, and is supplied in 7,6 m (25') rolls.
Size: 13 mm x 7,6 m (1/2" x 25')

Scotch 25T Grounding Braid with Eyelets

Provides low electrical resistance connections, contributes to strain relief across cables. Eyelets fit shield connector studs up to 6 mm (1/4") diameter.
Size: 13 mm x 7,6 m (1/2" x 25'), eyelets spaced 76 mm (3")
Size: 13 mm x 7,6 m (1/2" x 25'), eyelets spaced 152 mm (6")

25/4467 Grounding Braid Dispenser Pack

The 25/4467 Grounding Braid Dispenser Pack is a combination of our dependable grounding braid and insulation closure in one convenient package. Equal lengths of each can be dispensed from the 7.6 m (25') roll.
Size: Braid 13 mm x 7,6 m (1/2"x 25') Closure 13 mm x 7,6 m (1/2" x 25') 25/4467 without eyelets

2

2.2 Splice Protection Products
2.2.2 Accessories
3M™ Shield Bonding Products

Type/Order text	Ref.-No.

Shield Bonding Products

Product	Packaging & kg (lbs.)/cs.	Minimum Order	
Shield Bond Connector (No Tabbing Required)	100/cs., 1,8 (4)	100 each	**4460**
Shield Bond Connector	100/cs., 2,1 (4.4)	100 each	**4460-S**
Shield Bond Connector	100/cs., 2,1 (4.6)	100 each	**4460-D**
Shield Bond Connector Assembly	100/cs.	100 each	**4460-D/FO**
CCP Shield Bond Connector	15/bag (kit) 40 kits/cs	800 each	**M004484A**
Shield Bond Connector	100/box, 500/cs., 8,8 (19.4)	500 each	**4462**
Shield Bond Connector	100/box, 500/cs., 10,0 (22.1)	500 each	**4462-FN**
Shield Bond Connector	100/box, 500/cs., 11,0 (24.3)	500 each	**4462-SN**
Shield Bond Connector with Shoe	100/box, 500/cs., 10,9 (24)	500 each	**4462-SNA**
Service Wire Shield Connector	10/bag, 1000/cs., 3,90 (8.6)	1000 each	**4463**
Shield Bond Connector	20/bag, 1000/cs., 7,03 (15.5)	1000 each	**4464**
25T Grounding Braid Size: 13 mm x 7,6 m (1/2" x 25')	1/cs., 1 (2.1)	1 roll	**25T Grounding Braid**
25T Grounding Braid with Eyelets Size: 13 mm x 7,6 m (1/2" x 25')			
Eyelets spaced 78 mm (3")	1/cs., 1,08 (2.3)	1 roll	**25T-BBE3**
Eyelets spaced 156 mm (6")	1/cs., 1,08 (2.3)	1 roll	**25T-BBE6**
25/4467 Grounding Braid Dispenser Pack Size: Braid 13 mm x 7,6 mm (1/2"x 25') Closure 13 mm x 7,6 mm (1/2" x 25')	1/box, 5/cs., 6,7 (14.7)	5 packs	**25/4467**

2.2.2 Accessories
3M™ Sheath Repair Products

Description

3M Armorcast Structural Material

Armorcast Structural Material is a flexible fibreglass knit fabric strip saturated with black resin syrup then dried. No heat is required in the installation process, just water. It forms a tough durable covering that cures in just 20 minutes. For use on pressurised, non-pressurised, polyethylene or lead sheathed cable.

3M Armorcast 4560 Structural Material Bulk

Available in rolls of 1,5 m (5'), 3 m (10') and 4,57 m (15'), each 101,6 mm (4") wide. Each package contains five rolls and five pairs of gloves.

3M Armorcast 4561 Sheath Repair Kit

Armorcast 4561 Sheath Repair Kit contains all products required to repair damaged Cable Sheath. Kit components are designed for use with Armorcast materials.

Kit contents:

- 1 roll Armorcast material, 101,6 mm x 4,57 m (4" x 15')
- 1 roll Scotch VM Tape, 101,6 mm x 3 m (4" x 10')
- 1 roll Scotch 50 Tape, 50 mm x 30 m (2" x 100')
- 1 pair gloves
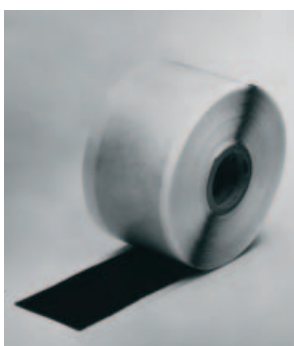
3M Scotch VM Tape Vinyl/Mastic

VM Tape seals out moisture and protects against corrosion without the need for heating tools. Two tapes in one (Vinyl and Mastic)—VM tape is especially designed for cable sheath repair, splice case and load coil case protection, auxiliary closure and cable reel end sealing, drop wire insulating, conduit repair and protection of CATV components plus many other general taping applications.

VM tape is a rubber based mastic laminated to an all weather 0,18 mm (7 mil) vinyl, which provides double duty protection in one wrap. Four sizes to meet all possible applications are available; 38 mm – 559 mm (1-1/2" – 22") width.

Size: 38 mm x 6 m (1-1/2" x 20')

101,6 mm x 3 m (4" x 10')

152 mm x 3 m (6" x 10')

559 mm x 3 m (22" x 10')

2

2.2 Splice Protection Products
2.2.2 Accessories
3M™ Sheath Repair Products

Type/Order text			Ref.-No.

3M Sheath Repair Products

Product	Packaging & kg (lbs.)/cs.	Minimum Order	
4560 Armorcast Structural Material Bulk			
(Bulk, 1,5 m (5')	5 rolls, 0,63 (1.4)	5 rolls	**4560-5**
(Bulk, 3 m (10')	5 rolls, 1,27 (2.8)	5 rolls	**4560-10**
(Bulk, 4,5 m (15')	5 rolls, 1,86 (4.1)	5 rolls	**4560-15**
Armorcast Sheath Repair Kit	1 kit/cs., 1,68 (3.7)	1 kit	**4561**
VM Vinyl/Mastic Tape			
Size: **38 mm x 6 m (1-1/2" x 20')**	1 roll/box, 10/cs., 2,5 (5.7)	10 rolls	**VM-1.5x20**
101,6 mm x 3 m (4" x 10')	1 roll/box, 10/cs., 6,2 (11.6)	10 rolls	**VM-4x10**
52 mm x 3 m (6" x 10')	1 roll/box, 1/cs., 0,9 (2)	1 roll	**VM-6x10**
559 mm x 3 m (22" x 10')	1 roll/box, 1/cs., 2,9 (6.9)	1 roll	**VM-22x10**

Solutions for Outside Plant

Description

Intended for use primarily in cross-connect cabinets in the outside plant, the 3M™ SLIC™ Quick Connecting System is a simple, tool-less copper termination system that provides increased signal integrity, network reliability and improved performance characteristics at higher frequencies for broadband applications. As operators upgrade their access plants for higher bandwidth, the SLIC quick connecting system offers unique features to enable simple and economical broadband deployment. This all-in-one IDC connector is designed with every feature you need in one integrated and simple design.
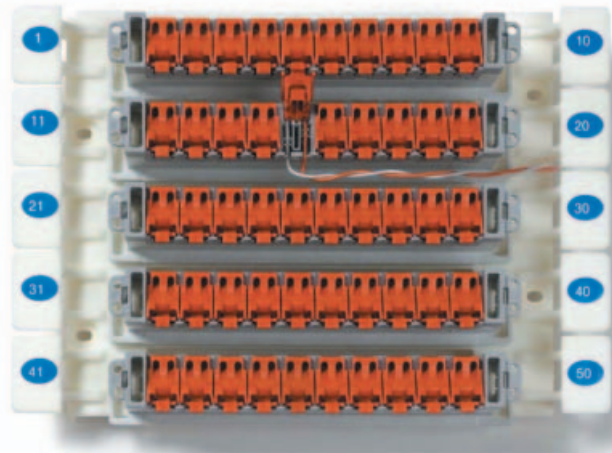
Highlights:

- Integrated wire-cutting facility

- Security of connection and ability to see termination

- Tool-less design

- Low termination force

- Pair-at-once termination

- Gel-filled and moisture-sealed

- Cat.5 performance

- Look-both-ways testing

- Double jumpering ability

Please consult your local representative

2

2.3 Cross connection product range
2.3.1 Connection modules Quante™ SID™-C

Quante SID-C connection and disconnection cable terminal blocks

With the Quante SID-C product family 3M is setting the standards for high density IDC termination combined with improved handling within applications in main telecommunications and data networks.

The SID-C insulation displacement contacts are enclosed by the plastic housing of the module. This improves the insulation performance and helps in providing a safer working practice.

Using SID-C within the InCa cross connection cabinets increases the capacity from 300 to 400 pairs, per vertical. This results in the capacity of the cabinet increasing to 1600 pairs (instead of 1200 pairs), without affecting the well-proved handling of the cabinet.

A wide range of accessories and a comprehensive overvoltage protection solution complete the product family.
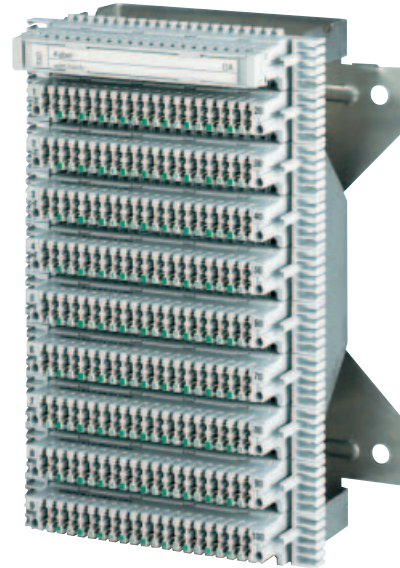
Highlights:

- High density

- One wire per slot 0.32 - 0.80 mm

- Optimised cable conductor guide

- Long-life tools

- Flexible mounting systems

- Removal without the need for special tooling

- Comprehensive overvoltage protection system

2.3   Cross connection product range
2.3.1 Connection modules
Quante™ SID™-C

Type/Order text	Ref.-No.

The compact SID-C connection and disconnection cable terminal blocks provide orderly termination of plastic-coated cable conductors and jumper wires. They are suitable for fitting on distribution frames, in cabinets.

Design:
- SID EVs, fitted with SID connection modules 10 pairs;
- SID TrEVs, fitted with SID disconnection modules;

   10 pairs, each in units of 50 and 100 pairs.

Each block is equipped with:
SID-C EVs back mount frame, for either 5 or 10 connection modules / diconnection modules (10 pairs)
- 1 Label holder;
- 1 Plug-in number set;
- 1 Dust cover;
- 1 Fixing set for mounting between two frame rails.

Quante SID-C-EVs/ 50 pairs
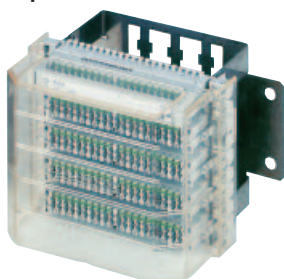
SID-C EVs		**10-050-00400**
with 5 connection modules for 50 pairs		
PU: 1 pc, Weight: 0,45 kg		
SID-C TrEVs		**15-050-00400**
with 5 disconnection modules for 50 pairs		
PU: 1 pc, Weight: 0,45 kg		

Quante SID-C-EVs/ 100 pairs
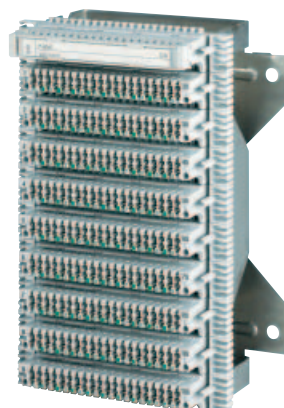
SID-C EVs		**10-100-00400**
with 10 connection modules for 100 pairs		
PU: 1 pc, Weight: 0,8 kg		
SID-C TrEVs		**15-100-00400**
with 10 disconnection modules for 100 pairs		
PU: 1 pc, Weight: 0,8 kg		

2

2.3.1 Connection modules Quante™ SID™-C EXTREME

Description

Quante SID-C EXTREME concept for extreme conditions

The SID-C EXTREME system has been introduced to provide increased environmental protection for cross connection systems located with harsh environments.
The concept allows the operator the opportunity to provide the level of protection suitable for each separate location.

BASIC DUST PROTECTION
Basic protection against dust ingress.

BASIC AMBIENT PROTECTION
For protection against contamination, corrosive atmospheres, and increased atmospheric humidity.
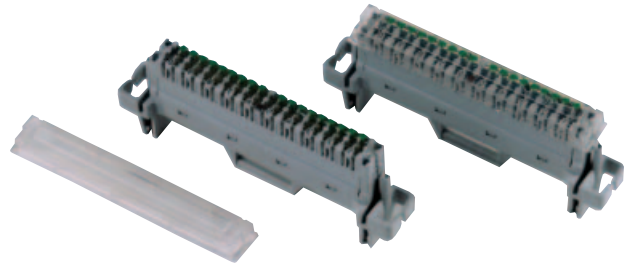
Highlights:

- Improved reliability

- Low cost solution

- High density

- Suitable for all applications

2.3   Cross connection product range

2.3.1 Connection modules
Quante™ SID™-C EXTREME

Type/Order text	Ref.-No.

SID-C EVs / SID-C TrEVs basic dust protection.

Kit containing: SID-C EVs with
connection modules, or SID-C
TrEVs with disconnection modules
complete with dust protection cover.

SID-C EVs	**10-100-00400**
SID-C TrEVs	**15-100-00400**
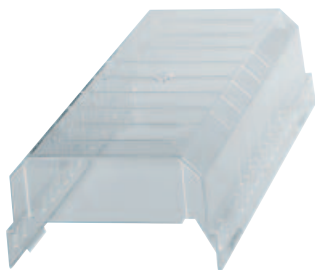
Dust protection cover   **15014-505 004**
100 pairs, grid 17,5
PU: 1 pc
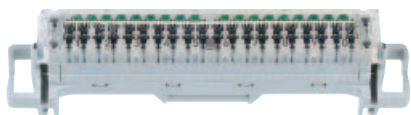
SID-C disconnection modules   **79103-534 35**

10 pairs, gel filled,

with dust protection caps
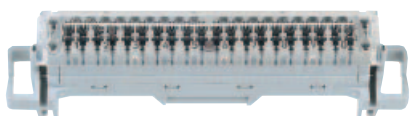
PU: 10 pcs

SID-C connection modules   **79101-553 35**

10 pairs, gel filled,

with dust protection caps

PU: 10 pcs

2.3 Cross connection product range
2.3.1 Connection modules Quante™ SX

The Quante SX module is based upon our years of experience within gel filled, tool free, IDC products coupled with our knowledge in cross connection products.

The module provides a solution for use within cross connection points where high reliability is of the upmost importance.

The SX has been designed to suit all types of cross connection cabinets in our range and is also suitable for mounting on several types of backmount frames. The compact dimensions of the SX allows for upgrades to existing cross connection points as well as providing a durable and more advanced system solution.
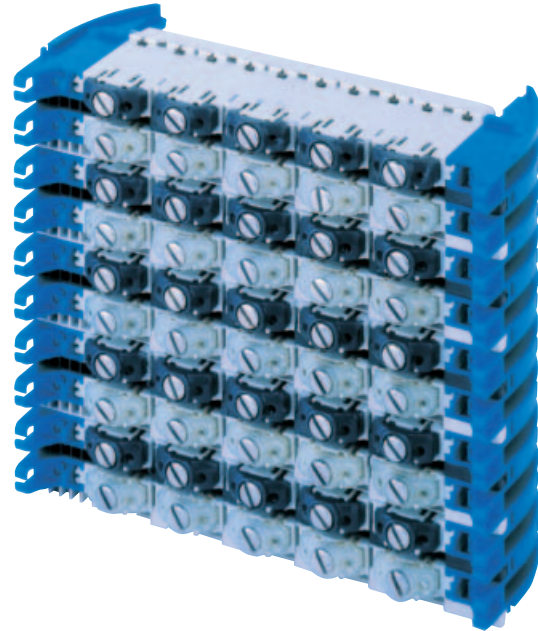
The excellent reliability of the SX is achieved by:

- **reliability by design**

  The fully watertight SX connection point works in full immersion conditions even after multiple re-terminations. The product is designed to avoid any current leakages in between lines by an increased distance between contacts and encapsulation of the wires using gel technology.
  The gel provides a superb corrosion protection.

- **reliability by operation**

  The screw driver operated jumper IDC connects and cuts the unwanted over length of the jumper wire in one simultaneous operation. The hidden cable side protects all incoming cabling from accidental disconnection.

  Incoming cables are quickly terminated using the scissor action termination tool.

  Strain relief devices are included to ensure the correct mooring the cable wires. Once terminated, each connection is encapsulated in a gel-filled cover.

  SX works as a normal cross connection cabinet block with a front facing jumper termination field, the equipment cable (once terminated) is 'hidden' at the rear of the product. SX blocks may be supplied pre-cabled upon request.

  Although SX offers facilities similar to those found in existing terminal block technologies, SX is a modular concept consisting of 5 pair IDC elements. These elements can be bayed together with wire guide channels between to form a terminal block. Even though the internal contact distances are wide to with stand the harshest environmental conditions, SX still offers a 22,5mm pitch per 10 pairs. This Compactness allows the use of SX in cross connected cabinet.

SX is available in two mounting versions:

-     for fixing on E10 Back mount frames
-     for fixing on QSA Back mount frames

2 test points are provided on each pair and are accessible using standard pins of test meters.

Highlights:

- Fully watertight connection module for use in CCC applications
- No specific tool termination (screwdriver operated IDC)
- 0,4 to 0,8 mm conductors diameters
- Automatic cuting of jumper and cable overlengths
- Jumper guide channnels
- 22,5 mm vertical pitch
- Modular solution

2.3 Cross connection product range
2.3.1 Connection modules
Quante™ SX

Type/Order text	Ref.-No.
SX terminal block	
Each block is supplied with:	
connection modues jumper guide channels, gel-filled covers to encapsulate cable termination mounting accessories	
SX for Euro Profile (E10) 50 pairs block PU: 1 pc	**C253800A0000**
SX for QSA backmount frame 50 pairs block PU: 1 pc	**C253802A0000**
SX on Euro Profile (E10) 100 pairs block PU: 1 pc	**C253801A0000**
Termination tool for the cable side	**C234030A0000**

2.4 Drop wire distribution point product range

2.4.1 High reliability drop wire connectors Quante™ MX 2000

Quante MX 2000 high reliability connection module for overhead plant

MX 2000 dropwire connectors are in use world wide to build and upgrade overhead networks with a fully watertight connection technology. When considering the fact that the highest fault rates are measured in overhead networks, it´s indispensable to use a high reliable technology like MX 2000.

MX 2000 is designed to operate under harshest environmental conditions. The user friendly design prevents any possible incorrect installations.

This product is suitable for distribution, protection as well as customer termination in overhead lines. This new generation fits all existing networks and can accommodate all existing dropwire sizes, whatever the core conductor material is (copperweld, steel, bronze, copper cadmium).
No specific tools are required to perform IDC termination, a simple screw driver eases the dropwire termination. Both sides of this connector can be re-terminated multiple times with different conductor sizes.

A central disconnection area offers test facilities for both sides; multipair testing; disconnection and overvoltage protection. The overvoltage protected version is able to drain high currents up to 10kA.

The very flexible built-in protection allows to upgrade unprotected distribution points into protected ones.

The unique MX 2000 design allows to snap this modules on both IEC 715 25mm and 35mm profiles.

Earthing (10kA) is automatically completed through this mounting rail. The MX 2000 one pair module offers a very high flexibility compared to multipair systems.

Highlights:

- Watertight encapsulated contacts

- No specific termination tool needed

- for 0,4 to 1,1 mm dropwire conductors (all kinds of materials)

- Multiple re-terminations possible

- Comprehensive product range

- 10kA drain current capacity

2.4 Drop wire distribution point product range
2.4.1 High reliability drop wire connectors Quante™ MX 2000

Technical characteristics

Dropwire terminations

- Screwdriver operated IDC
- Steel, copperweld, copper cadmium, bronze drop-wires
- From 0,4 to 1,1 mm conductor diameter copper wires
- Overall insulation diameter: 5 mm max.

Cable termination

- Tool free IDC
- Solid copper conductors
- From 0,4 to 0,8 mm conductor gauges
- Overall insulation diameter: 1,8 mm max.
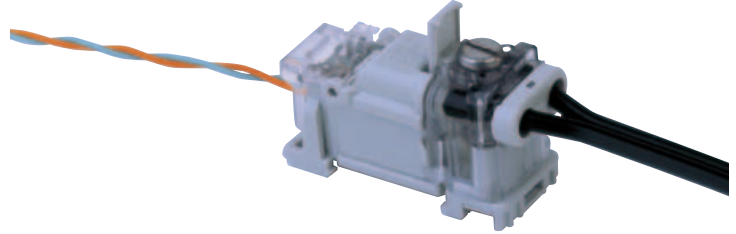
Type/Order text	Ref.-No.
MX 2000 C disconnection module	**C249800A0000**
MX 2000 disconnection module with protection facility (delivered without protection arrester, please consult us)	**C249801A0000**
MX 2000 PP protection module equipped with 250 V surge arrester with fail-safe and PTCR	**C249812A0000**
MX 2000 T disconnection module with protection and test facility without interupting the service	**C249811A0000**
MX 2000 P protection module equipped with 350 V surge arrester with fail-safe	**C249804A0000**
MX 2000 P protection module equipped with 250 V surge arrester with fail-safe	**C249802A0000**
Three-pole surge arrester for MX 2000 **250 V** with fail-safe **350 V** with fail-safe	**C231039A0000** **C231040A0000**

2

2.4.2 Drop wire distribution points
Overview

Description

Quante MX modules for outside plant

	MX 2000 C	MX 2000	MX 2000 P	MX 2000 P 350 V
General product features				
single pair configuration	yes	yes	yes	yes
type of drop wire	all	all	all	all
mounting	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25	clip on both DIN 35 and DIN 25
retermination on dropwire side	yes	yes	yes	yes
retermination on cable side	yes	yes	yes	yes
disconnection	yes	yes	yes	yes
protection	no	upgradable	yes	yes
test	yes	yes	yes	yes
DROP WIRE				
type of termination (operation of IDC)	screwdriver	screwdriver	screwdriver	screwdriver
-> conductor diameters	0,4 -1,1 mm	0,4 -1,1 mm	0,4 -1,1 mm	0,4 -1,1 mm
-> overall insulation diameter	5 mm max	5 mm max	5 mm max	5 mm max
-> overall insulation diameter	copper, bronze, steel	copper, bronze, steel	copper, bronze steel	copper, bronze steel
number of reterminations with same drop wire	30	30	30	30
number of reterminations with different diameters (typical)	10	10	10	10
CABLE				
type of termination (operation of IDC)	tool free or screwdriver	tool free or screwdriver	tool free or screwdriver	tool free or screwdriver
-> conductor diameters	0,4 - 0,8 mm	0,4 - 0,8 mm	0,4 - 0,8 mm	0,4 - 0,8 mm
-> overall insulation diameter	1,8 mm max	1,8 mm max	1,8 mm max	1,8 mm max
-> conductor material	copper	copper	copper	copper
number of reterminations with same cable				
number of reterminations with different diameters (typical)				
Electrical features				
contact resistance	< 3mΩ	< 3mΩ		< 1mΩ
leading through resistance	< 20mΩ	< 10mΩ	< 10mΩ	< 10mΩ
insulation resistance @ 500 V	> 10 GΩ	> 10 GΩ	> 10 GΩ	> 10 GΩ
dielectric strength @ 50 Hz	5 kV RMS-50 Hz	5 kV RMS-50 Hz		
protection				
type of protection	-	upgradable	built-in	built-in
protection when line is disconnected (detent position)	-	yes	yes	yes
replaceable components	-	yes	yes	yes
static breakdown voltage	-	250 V +/-20%	250 V +/-20%	350 V +/-20%
dynamic breakdown voltage	-	< 800 V	< 800 V	< 800 V
impulse discharge current @ 8/20 µs	--	10 kA	10 kA	10 kA
alternative discharge current @ 50 Hz	-	< 10 kA	< 10 kA	< 10 kA
fail safe response time @ 5 A	-	< 10 s	< 10 s	< 10 s
test				
4 points	yes	yes	yes	yes
test probe	crocodile clamps	crocodile clamps	crocodile clamps	crocodile clamps
multipair test (2)	yes	yes	yes	yes
design features				
plastic materials	polycarbonate	polycarbonate	polycarbonate	polycarbonate
contact material	CuSn9P	CuSn9P	CuSn9P	CuSn9P
contact coating	tin/lead 60/40	tin/lead 60/40	tin/lead 60/40	tin/lead 60/40
self-extinguishing plastic material class	UL 94 V0	UL 94 V0	UL 94 V0	UL 94 V0
colour	clear plastic and grey	clear plastic and grey	clear plastic and grey	clear plastic and grey
watertigtness				
self-healing feature	yes	yes	yes	yes
working conditions				
immersion test under 48 V	yes	yes	yes	yes
working temperatures	-30 to + 200°C	-30 to + 200°C	-30 to + 200°C	-30 to + 200°C

2.4.2 Drop wire distribution points Overview

Solutions for Outside Plant

Description

Range of outdoor boxes for outside plant

	3M™ BMX	3M™ BDX3000	3M™ ATS 2000**	3M™ EDB
Applications				
application	dropwire distribution and protection box	multipurpose	dropwire distribution and protection box	Multipair IDC block distribution box
possible internal equipment capacities	MX 2000* or classic 10, 20, 30, 50 pairs	MX*, SID*, STS*, MX2000*, STG2000*	MX 2000* 1, 5, 10, 20, 30 pairs	SID-C, Slic™ QCS, QSA, SID-CT, STG2000K
Product features				
pole mounting	mounting bracket or steel band	mounting bracket	no bracket, screw or steel band	No bracket, with screws
wall mounting	with or without bracket	without bracket	without bracket	No bracket, with screws
type of cover	10 pairs:hinged others:sliding cover	hinged	hinged	hinged
type of box	5 types	6 types	4 types	1 type
type of lock	optional lock with key	optional lock with key	snap lock	screw
cable ties	yes	optional	no	no
cable routing devices	yes	optional	no	no
Technical features				
type of material	10 pairs: PVC 20, 30,50 pairs: polyester re-Inforced fibre glass	PVC	polycarbonate	Fiber reinforced polycarbonate
UV resistance	yes	yes	yes	yes
colour	light grey	light/dark grey	light grey	light grey
standard water tightness (NF EN 50529)	10 pairs hinged IP 44 Other IP 43	IP 55	IP 54	IP 54
mechanical resistance (NFC 20015)	10 pairs: IK 08 others: IK 10	IK 07	IK 07	IK 07
self-extinguishible material (UL 94)	UL94 V0	V0	V0	V0
temperature range	-25°to +70°C	-25°to +70°C	-25° to +70°C	-25° to +70°C
Outside dimensions (w x h x d) in mm				
-> size 1 hinged	240 x 270 x 80	255 x 292 x 86	41 x 95 x 67	116 x 230 x 95
-> size 2	240 x 320 x 73	255 x 292 x 116	204 x 248 x 71	
-> size 3	240 x 511 x 73	255 x 292 x 156	204 x 372 x 71	
-> size 4	240 x 856 x 73	255 x 400 x 86	204 x 422 x 71	
-> size 5 sliding	240 x 213 x 73	255 x 400 x 116		
-> size 6	-	255 x 400 x 156		

** Values should be reconfirmed
* These products are trademarked by Quante.

2.4.2   Drop wire distribution points 3M™ BMX

Description

3M BMX 10-50 pair distribution box

Application

The boxes in the BMX range are used for connecting and protecting subscriber lines and terminals. Developed to accommodate the MX connection modules, they guarantee the operator reliable and consistent connection assemblies.

Numerous configuration are possible:
- 4 box sizes for distribution and secondary cross connection applications
- hinged lid available (10 pair only)
- standard sizes from 10 to 50 pairs
- connection modules can be installed when required.

Easy to assemble:
- rubber 'press-out' cable entries
- equipped with cable routing devices.

Simple to operate and maintain:
- boxes are compatible with all types of supports
- modular connections starting from one pair
- MX module insulation displacement contact reduces cabling time
- total reliability due to watertight connections
- high capacity boxes are aimed to be used as transition point between underground and overhead networks. It is recommended to offer a protection at this point in the network as electronic devices can be installed in the network. For these applications BMX boxes are made of glass fibre reinforced polyester to withstand specific conditions due to the location at the top of the pole.
- In the 10 pair box, multipair cable can 'loop through' the box with only the 10 distributed pairs required taped out. As a result, one 50 pair cable can feed 5 distribution boxes without using any additional overhead joint closure.

Dropwire distribution point

Multipair aerial cable

Cable looping through facility
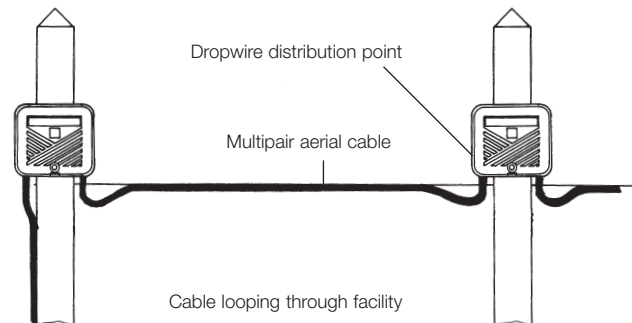
Highlights:

- Comprehensive range

- Enhanced weather-proofing

- Insect proof

- Automatic lid closure

- Swivelling cover (10 pairs)

- Protection of the incoming cables

- Accommodate all types of MX modules

- Glass fibre reinforced polyester for large capacities

Box dimensions overall in mm

Model	10 pairs	10 pairs	20 pairs	30 pairs	50 pairs	100 pairs**
Width	240	240	240	240	240	240
Height	270	213	320	511	856	856
Depth	80	73	73	73	73	73
Cover	swivelling	sliding	sliding	sliding	sliding	sliding

** The 100 pair configurations are achieved by assembling two 50 pair boxes.

2.4.2 Drop wire distribution points 3M™ BMX

Type/Order text	Ref.-No.

Distribution/protection boxes
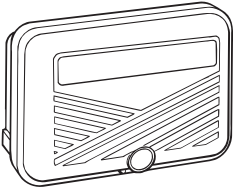
These 2 boxes can not be mounted directly with stanless steel 7/10 bracket

10 pair box with swivelling cover, equipped with 10 MX 2000 P 250 V — N501186A0000

10 pair empty box with swivelling cover, rail and earth post — N501187A0000
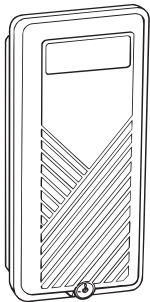
These boxes can be pole mounted directly with stainless steel 7/10 bracket

Simple mounting 2 points bracket
for pole mounting (Mexico type) — C231599A0000

Mounting bracket with 4 fixing
points for pole mounting — N801161A0000

10 pair empty box with sliding cover, rail and earth post
(MX classic) — NN3450600000

Mounting bracket (France Telecom) — NN8809590000

20 pair empty box with sliding cover, rail and earth post
(MX classic) — NN3450610000
(MX 2000) — N451054A0000

Mounting frame
(20 pair) — NN7803400000

30 pair empty box with sliding
(MX classic) — NN3450620000
(MX 2000) — N451055A0000

Mounting frame
(28/30 pair) — NN7803410000

50 pair empty box with sliding cover, rail and earth post
(MX classic) — NN3450630000
(MX 2000) — N451056A0000

Mounting frame
(50/56 pair) — NN7803420000

Treated steel 7/10 bracket, height 20 mm, 50 meters long — NN9019630000

Stainless steel fixing part for treated bracket / (100 pieces) — NN2650540000

Key lock kit — N691009A0000

Solutions for Outside Plant

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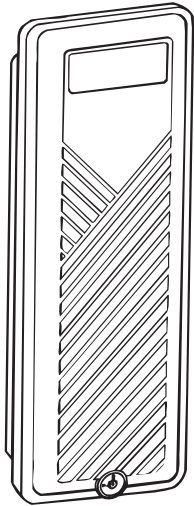
2.4.2 Drop wire distribution points 3M™ ATS 2000, 3M™ EDB

Description

3M ATS2000 boxes are suitable for accommodating the "Pair-at-a time" sealed Insulation Displacement Connector (IDC) service wire and drop wire termination blocks (MX 2000).

ATS2000 boxes are available in 4 standard sizes. 1 pair, 10 pair (both used for 5 pair), 20 pair and 30 pair. The 30 pair box can be used for accommodating 25 pairs IDC modules, too.

ATS boxes are supplied with DIN 35 rails and all the necessary parts to mount the IDC modules. Boxes are supplied without the IDC modules.

Type/Order text   Ref.-No.

Description	Packaging	Minimum Order	
1 pair box w/o module	1 each /box, 100/case	10ea (1 cs)	**ATS 2001**
5 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)	**ATS 2005**
10 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)	**ATS 2010**
20 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)	**ATS 2020**
30 pair box w/o module	1 ea/box, 10ea/cs	10ea (1 cs)	**ATS 2030**

Description

EDB box is made of UV resistant fiber glass reinforced polycarbonate for outdoor/indoor 10/20 pair distribution point applications. Protection class is IP55. Box consists of 2 main injection molded parts, base and lid.

Designed with the necessary depth to accommodate the IDC modules with the protection magazine. Lid is attached to the base with a hinge mechanism at the top. Two main parts are sealed together by means of a rubber gasket fixed at the edge of the lid and locked through a (-) head screw that is supplied on the box. When the lid is open, it is kept in position by the holder attachment part of the lid and base.

One size, compact box for Outside Plant distribution point applications.
Accommodates 1 or 2 each 10 pairs IDC block types SID-C, QSA+, STG2000K and Slic QCS.
Designed to accept modules with protection magazines (where applicable).

Type/Order text   Ref.-No.

Description	Packaging	Minimum Order	
1 box w/o module	1 each/box, 20 each/carton	20 each (1 carton)	**Please consult us**

2.4   Distribution point product range
2.4.2 Drop wire distribution points 3M™ BDX

Description

3M BDX Multipurpose outdoor box

BDX boxes are designed to accommodate different equipment configurations in outside plant. Based on a modular concept, 2 sizes of BDX box are available each with the choice of three different hinged front cover depths..

A slotted internal base allows the mounting equipment whatever the position. The specific grooves are designed to mount the equipment with specific self-tapping screws.

BDX can be equipped with specific strain relief devices for drop wire distribution applications. They are equipped with a gasket and rubber grommets in the cable entry area. The relevant protection class is IP 55.

Suitable for both pole and wall mount applications via a steel strap for pole mount and direct mount without additional mounting bracket for wall mounted applications.

BDX boxes can be secured with either a triangular shaped nut or a standard key type lock. The standard colour is light grey for the cover and dark grey for the base. Additional colours may be ordered upon request.

A specific version with reinforced ventilation is available to accommodate any electronic equipment.

Material
   Thermoplastic

Colours
   Base: dark grey RAL 7037
   Cover: light grey RAL 7035
   (Ivory or black available upon request).

Dielectrical strength
   > 4 kV.

Degree of protection (EN 60 529 standard)
   IP 43 without rubber seal
   IP 55 with rubber.

Mounting
   By 20 mm metal strap
   On a standard RP-type fixing bracket
   By screws (4 x Ø 6 mm).

Highlights:

• 3 depths available

• Free mounting with self tapping screws

• Outstanding weather proofness (IP55)

• Lockable

• Specific version with reinforced ventilation for electronic equipment.

2.4.2 Drop wire distribution points 3M™ BDX

Technical characteristics

External dimensions (mm)

Types	Box	Width	Height	Depth
Size 1 low cover (T1 B)	BDX 3000	255	292	86
Size 1 medium cover (T1 M)	BDX 3000	255	292	116
Size 1 high cover (T1 H)	BDX 3000	255	292	156
Size 2 low cover (T2 B)	BDX 3000	255	400	86
Size 2 medium cover (T2 M)	BDX 3000	255	400	116
Size 2 high cover (T2 H)	BDX 3000	255	400	156

Maximum internal dimensions (mm)

Types	Box	Width	Height	Depth slotted bottom	Depth plain bottom
T1 B	BDX 3000	230	190	60	70
T1 M	BDX 3000	230	190	90	100
T1 H	BDX 3000	230	190	130	140
T2 B	BDX 3000	230	300	60	70
T2 M	BDX 3000	230	300	90	100
T2 H	BDX 3000	230	300	130	140

Type/Order text · Ref.-No.

3M BDX 3000 boxes
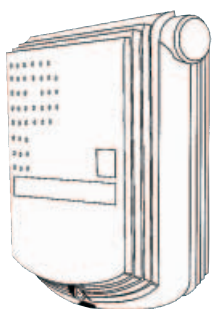
Made up of:

- Body with bottom entirely slotted (FR)
- Hinged cover with built-in locking system
- Strong watertightness
- ETR: Body/cover sealing ring
- Sealing on cable entry
- Ventilation on high side

Colours:

Base: dark grey

Cover: light grey (Ivory and black upon request)

Type/Order text	Ref.-No.
T1 B ETR FR	**N501053A0000**
T1 M ETR FR	**N501054A0000**
T1 H ETR FR	**N501055A0000**
T2 B ETR FR	**N501056A0000**
T2 M ETR FR	**N501057A0000**
T2 H ETR FR	**N501058A0000**

2.4.2 Drop wire distribution boxes 3M™ BDX

Type/Order text	Ref.-No.

Accessories for 3M BDX Multipurpose outdoor box
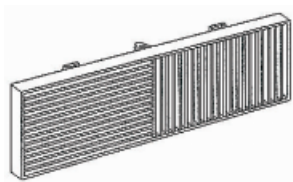
Set of slotted right angles (EQR)
Mounting at 90° on materials in boxes by
self-tapping screws Ø 3 mm
Right angle size: 215 x 70 mm
Compatible with all boxes
Automatically delivered in FL EQR boxes

N711119A0000

Set of 10 quarter turn triangles
Compatible with all covers
Can be mounted on site

N691022A0000

Set of 10 key-locks No 1242 E
Other numbers upon request

NN3690310000

Set of 100 self-tapping screws Ø 3 mm
Fixing on slotted bottoms or on right angles
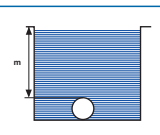
N901038A0000

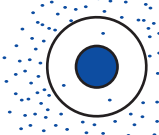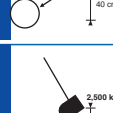**Solutions for Outside Plant**

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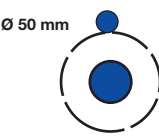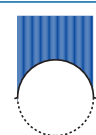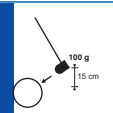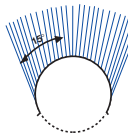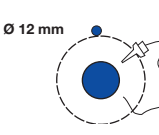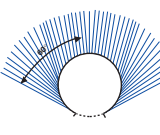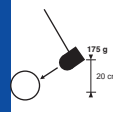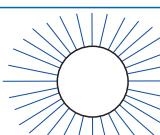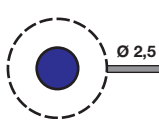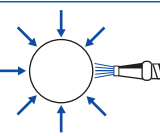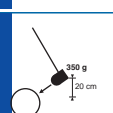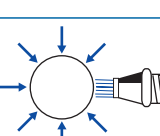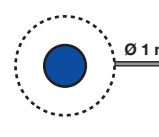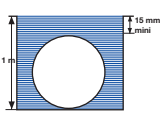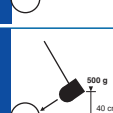
2.4 Distribution point product range
2.4.3 Protection and mechanical resistance for enclosures

Description

IP protection degree for enclosures of electrical equipment according to EN 60 529 standard.

IK shock protection according to EN 50 102 draft standard.

1st digit: Protection against solid bodies			2nd digit: Protection against liquids			Protection against mechanical impacts		
IP		TEST	**IP**		TEST			TEST
0	No protection		**0**	No protection		**00**	No protection	
1	Protection against solid bodies greater than 50 mm (e.g. inadvertent hand contact)	Ø 50 mm	**1**	Protection against dripping water falling vertically (condensation)		**01**	Impact energy 0.150 joule	100 g / 15 cm
2	Protection against solid bodies greater than 12 mm (e.g. fingers)	Ø 12 mm	**2**	Protection against water drops falling up to 15° from the vertical		**02**		100 g / 20 cm
3	Protection against solid bodies greater than 2,5 mm (e.g. tools, wires)	Ø 2,5 mm	**3**	Protection against rainwater falling up to 60° from the vertical		**03**	Impact energy 0.350 joule	175 g / 20 cm
			4	Protection against splashing water from all directions		**04**		250 g / 20 cm
4	Protection against solid bodies greater than 1 mm (e.g. precision tools, small wires)	Ø 1 mm	**5**	Protection against water jets from all directions		**05**	Impact energy 0.700 joule	350 g / 20 cm
			6	Protection against splashing water comparable with large waves		**06**		500 g / 20 cm
5	Protection against dust (no aggressive deposits)		**7**	Protection against the effects of immersion	15 mm mini / 1 m	**07**	Impact energy 2.00 joules	500 g / 40 cm
						08		1,250 kg / 40 cm
6	Total protection against dust		**8**	Protection against the effects of prolonged immersion in specified conditions	m	**09**	Impact energy 10.00 joules	2,500 kg / 40 cm

2.4.4 Cross connection product range
3M™ Quante™ EVz 78

3M

Description

Quante EVz 78 outdoor distribution box

The EVz provides weather-proof termination for up to 20 pair of cable. Additional overvoltage arrester magazines can be added. These must be ordered separately.

Housing: Polyester, reinforced glass-fibre
Colour: RAL 7001, silver-grey
Protection class: IP 64
Contacts: Brass or spring bronze, nickel-coated

EVz 78, 10 pairs, cable inlets
- 1inlet with earth-clamp for screened cables up to Ø14 mm
- 2 inlets with cable restraining facilities for cables up to Ø16 mm
- 2 inlets with cable restraining facilities for cables up to Ø12 mm
- 4 inlets without cable restraining facilities for cables and wires up to Ø9 mm

- 1inlet without cable restraining facilities for earth wire up to Ø 7 mm

The cable openings are sealed by plastic grommets.

EVz 78, 20 pairs, cable inlets:
Inlet seal for synthetic cables:
- 1 inlet for cable up to Ø16 mm
- 2 inlets for cables up to Ø14 mm
- 2 inlets for cables up to Ø12 mm
- 3 inlets for cables up to Ø 9 mm
- 1 inlet for ground conductor up to Ø7 mm.

All inlets without cable restraining facilities.
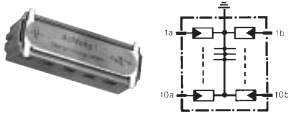
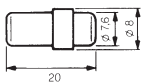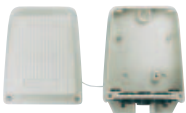| Type/Order text	Ref.-No.
EVz 78 10 pairs PU: 1 pce. Weight: 1.042 kg	**25-510-00000**
M 78 surge arrester magazine Form F (8 x 20) Dimensions (H x W x D) 89 x 34 x 27 mm Circuit for EVz 78, for overvoltage surge arrester PU: 1 pce. Weight: 0.052 kg	**25126-501 00**

To be ordered separately

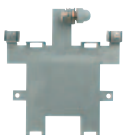|	
F surge arrester 230 V - 20 A/20 kA Form F (8 x 20) Requirements per magazine: max. 10 units Dimensions (H x W x D) 89 x 34 x 37 mm PU: 1 pce. Weight: 0.005 kg	**39081-701 26**
EVz 78 for 20 pairs SID-C with protection magazines, empty box, with high cover PU: 1 pce. Weight: 0.94 kg	**05-769-01900**
Mounting plate for SID-C in EVz 78 Complete with all accessories PU: 5 pcs. Weight: 0.5 kg	**25140-500 00**
SID-C connection module for 10 pairs PU: 5 pcs. Weight: 0.2 kg	**79101-553 00**

Solutions for Outside Plant

2

2.4.4 Cross connection product range 3M™ DDB

Description

3M™ DDB, Durable Distribution Box for copper cable based networks is designed to accommodate Quante™ SID™ -CT or QSA modules. The box is prepared for surge protection. Locking system is optional available.

- Housing with hinged cover (DDB 200 with door)

- Opening of the covers approx. 110° (DDB200 180°)

- Prepared for mounting on wall or pole (wood, metal or concrete)

- No additional pole mounting kit necessary

- Protection class IP 54 / IP 64 with sealing

- Cable sheath grounding clamp

Material

Housing: PC/ABS, UV resistant, UL94 V-0
Cover: glass-fibre reinforced polyester colour RAL 7032
Grommets: polyethylene, UV resistant
Back mount frame: stainless steel
Screws: stainless steel
Cable sheath grounding clamp: steel tin plated

Delivery content

DDB Box with back mount frame for SID™ -CT / QSA modules, with Cable sheath grounding clamp

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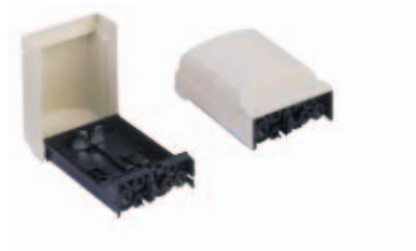
Type/Order text	Ref.-No.
DDB 20 for max. 2 modules	**25-020-01200**
DDB 50 for max. 5 modules	**25-050-01200**
DDB 100 for max. 10 modules	**25-100-01200**
DDB 200 for max. 20 modules	**25-200-01200**
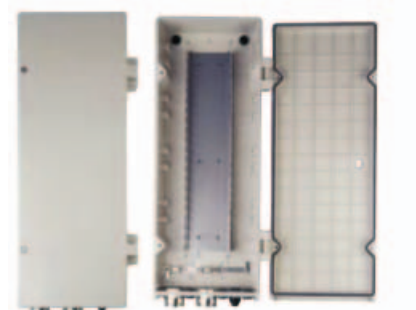
Modules see pg. 36 and 52 - 53

2.4 Distribution point product range
2.4.4 Cross connection product range
3M™ CDS

Description

3M CDS secondary cross connection boxes

CDS range of products are used for cross connection in the secondary network. Made up of 2 verticals, incoming and outgoing cables can be easily identified. The standard boxes are equipped with Europe E10 backmount frame to accomodate the STG range of connection modules or SX high relaibility terminal block. These boxes are designed for pole or wall mount applications with the relevant mounting brackets.

Manufactured in glass fibre reinforced polyester the mechanical resistance is appropriate for use at the base of poles. With an IP44 protection rating the CDS box offers good resistance to weather and insect ingress in external plant application.

The boxes are delivered as standard, with the following: earth post, strain relief devices, jumper routing devices.

CDS 400 / 600 / 800 pair box

- 3 sizes available

- CDS box is delivered without backmount frames

- Locking by triangular shaped nut

- Hinged cover with wind latch

Highlights:

• Comprehensive range

• From 300 to 800 pairs

• Water and insect proof

• Good mechanical resistance

2
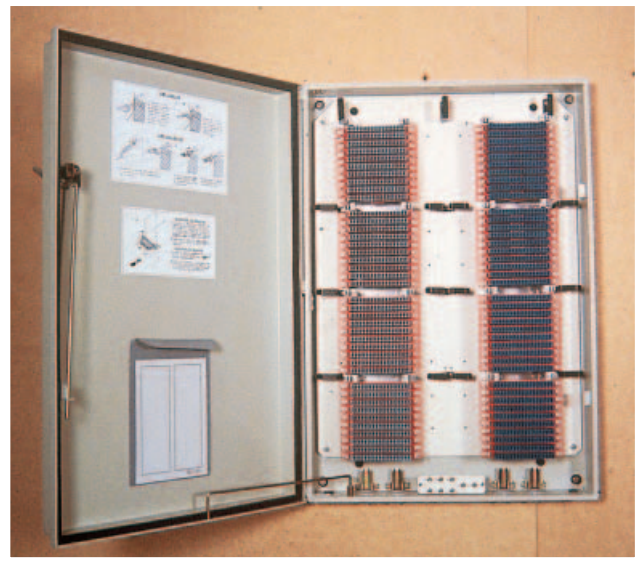
Technical characteristics

Type	Capacity			Overall dimensions (mm)		
	STG	SID	SX	Height	Width	Depth
CDS 400	400	400	200	446	406	117
CDS 600	600	500	400	606	436	117
CDS 800	800	700	600	766	436	117

2.4.4 Cross connection product range 3M™ CDS

Type/Order text	Ref.-No.

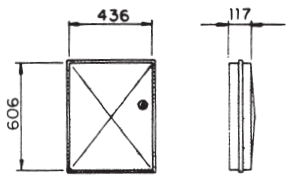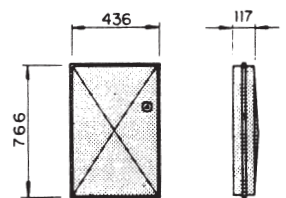**3M CDS boxes**
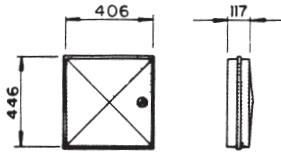
400 pair box
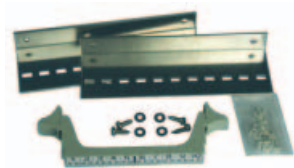with jumper routing devices

M002324A0000

600 pair box
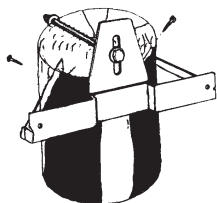with jumper routing devices

M002326A0000

800 pair box
with jumper routing devices

M002327A0000

"L type" profile for mounting of 10 STG modules
(100 pairs)

MPA025KB0000

Accessories for CDS boxes

Pole support

MPA0600A0000

3M™ Dynatel™ 900 Series Subscriber Loop Test Products

Description

Rugged and portable for harsh environments, Dynatel 900 Series test sets offer the right mix of functions, from loop diagnostic routines to fault locating, transmission testing and combination test/terminal capabilities.

Enhanced customer services are in high demand, such as fast Internet and data access and video conferencing. The 3M™ Dynatel™ Qualification Test Sets 949 & 950 ADSL help you make sure such enhanced customer services can be provided.

Dynatel 965DSP/SA Subscriber Loop Analyser

The Dynatel 965DSP/SA Subscriber Loop Analyser is a micropro-cessor controlled integrated test set that provides full-featured POTS, wideband and DSL-specific testing. The functions include fault location and repair verification on twisted-pair and drop cables (utilising capacitance bridge, resistance bridge and Time Domain Reflectometer (TDR) functions).
The Dynatel 965DSP/SA subscriber loop analyser executes a wide range of individual tests, or performs automatic test routines to categorise and sectionalise problems. The hand-held 965DSP/SA test set is housed in a lightweight, ergonomically designed case for portability and ease of handling.
The unit is weather-resistant and weighs only 4.3 pounds (1,95 kg).

Dynatel 965AMS Advanced Modular System

The new rugged, dependable and customizable Dynatel Test Platform will test the latest voice, data and video technologies with just the touch of a single button. Thanks to its knowledge-based auto-test feature and interchangeable test modules and software options, you can bring over a hundred years of Dynatel team experience with you into the field. And share modules with other Dynatel 965AMS users.
This new Dynatel platform can enable you to quickly, easily and accurately analyze and troubleshoot the local loop and services of today as well as the future, and help reduce support costs and increase productivity.

Copper Test Equipment

3M™ Dynatel™ Qualification Test Set 949ADSL

Description

General Specifications

Size:	60 mm high x 100 mm wide x 200 mm long
Weight:	Less than 2.5 lb. with battery
Battery:	NiMH 2.1 Ahr – shrink wrap pack, user replaceable through access door on back of unit
Battery life:	8 hours standby (Backlite Off) + 20 full ADSL qualification tests AC/DC adapter connects to the unit through the RJ-45 test lead jack The unit cannot make measurements while powered by the AC/DC adapter Auto shutoff after 5 minutes with no activity, except during charging
Display:	64 x 128 pixel , 57 mm x 31 mm viewing area with LED backlight
Test leads:	Red, black and green leads. 1.5 meter long. Connected to unit via RJ-45 jack
Breakdown Voltage:	360 Vdc, 250 Vac. (the unit will be damaged if exposed to voltages exceeding these limits)
Operating temperature:	-10°C to 60°C except for ADSL and battery charger functions 0°C to 60°C ADSL functions (temperatures > 50°C performance could degrade) 0°C to 50°C battery charger operation
Humidity:	0 to 80% non-condensing
Rain proof/splash proof:	Conforms to IP42
Shock:	Will survive 3 foot drop to concrete
Regulatory:	CE / FCC
ADSL Test Storage:	200 sets of results identified with an alphanumeric label
Stored results can be viewed in the test set.	
Languages:	English
RS232	Port An RJ45 to DB9 adapter cable is provided to permit connecting the 949 and 950ADSL to a PC The serial connection supports the following: • Upload of test results to the PC • Field software updates

Pots Measurement Specifications

Function	Range	Resolution	Accuracy*	Test Leads
AC voltage:	0 to 250 Vac (input resistance = 1M Ohm ± 5%)	± 1 V ± 2%	R-T, R-G, T-G	
DC voltage	0 to 250 Vdc (input resistance = 1M Ohm ± 5%)	± 1 V ± 2%	R-T, R-G, T-G	
Resistance	0 ohm to 999 ohms 1K ohm to 9.9K ohms 10K ohms to 99.9K ohms 10K ohms to 999K ohms 1M ohm to 9.9M ohms 10M ohms to 30M ohms Active pair: 0 to -60 VDC R-T voltage, 600 ohm to 7K ohms Inactive pair: 0 to -90 VDC R-T voltage, 600 ohms to 1 Megohm	1 ohm 10 ohms 100 ohm 1K ohm 100K ohms 1M ohm ± 10%	± 5 ohm ± 3% ± 3% ± 3% ± 3% ± 3%	R-T, R-G, T-G
Longitudinal Balance	0 – 65 dB	1 dB	±2 dB	TR-G
Precision tone	Frequency 404Hz, 1004Hz, 2804Hz (preset) Source Impedence 600 ohms +/- 5%		Amplitude 0 ± 0.5 dBm	R-T
	Frequency 8000 – 2Mhz (user settable) +/- 10% Source Impedence 100 ohms +/- 5% 577 Hz intermittent trace tone		Amplitude 0 ± 0.5 dBm Amplitude 5V P-P	R-T

*Percent of reading

3M™ Dynatel™ Qualification Test Set 949 & 950ADSL

Description

General Specifications

POTS Test	Storage 10 Sets of results, each identified with a 10 digit numeric identifier Stored results can be viewed in the test set
POTS Autotest	Autotest will run the following tests: V (T, R, G), mA, Ground Resistance, Ohms (T, R, G), Opens (T, R, G), Load Coil Count, Noise, PI, LB and Loss (up to 10 voiceband frequencies)

Additional Pots Measurement Specifications (950ADSL)

Function	Range	Resolution	Accuracy*	Test Leads
Loop Current (DC)	0 to ±110 mA	1 mA	±2mA	R-T (Impedence = 430 Ω)
Loop Resistance	0 ohm to 999 ohms	1 ohm	± 5 ohm ± 3% R-T, R-G, T-G	
Loop Loss	-50 to +10 dBm 200 to 5000 Hz	1 dB	±1 dB	R-T (Impedence = 600 Ω)
Frequency during loss, single frequency only 200 to 5,000 Hz		1 Hz	±3 Hz	R-T
Noise Metallic with C-message weighting** 0 to 60 dBrnc		1 dB	±2 dB	R-T (Impedenct = 600 Ω)
Noise to Ground with C-message weighting** 40 to 100 dBrnc		1 dB	±2 dB	R & T-G(Impedence = 100KW)
Opens	0 to 9,999 ft 10,000 to 99,999 ft (0 to 9,999 m) (10,000 to 30,000 m)	1 ft 100 ft (1 m) (100 m)	± 20 ft ±5% +/- 5% (± 6m, ±5%) (+/- 5%)	Ring, Tip, Mutual
Longitudinal Balance	0 – 65 dB	1 dB	±2 dB	TR-G.
Ground Resistance	0 to 50 Ω	1 Ω	±3 Ω	
Load Coils Count	0,1,2,3,4 or >4 coils Note: First load must be >3000' from the unit and 3000' of cable must extend beyond the last load coil for an accurate count		+/-1 coil	

Notes: * Percent of reading
      ** C-message specification has additional frequency dependent tolerance. Refer to "Subscriber Loop Transmission Test Set Specification",
         Bell System PUB 55020, January 1982.

ADSL Measurement Specifications

ADSL Standards	ANSI T1.413 ITU-T G.992.2 (G.LITE) ITU-T G.992.1 (G.DMT) - Annex A
IP Encapsulation	LLC SNAP or VC MUX
IP Transport Protocols	DHCPoE – IP on Ethernet over ATM DHCPoA - IP over ATM StaticIPoE – IP on Ethernet over ATM StaticIPoA - IP over ATM PPPoE - PPP over Ethernet over ATM PPPoA - PPP over ATM
PPP Authentication	CHAP or PAP
Line Impedance	100 ohms, nominally

Function	Measurement	Accuracy
ADSL Status	Fast Rate Up/Down Interleaved Rate Up/Down Max Rate Up/Down Margin Up/Down Attenuation Up/Down Capacity Up/Down	+/- 1 kbps +/- 1 kbps +/- 1 kbps +/- 1 dB +/- 1 dB +/- 1 %
ADSL Information	FEC Errors Up/Down CRC Errors Up/Down HEC Errors Up/Down Bin Graph	+/- 1 +/- 1 +/- 1
ADSL Alarms	Loss of Signal (LOS) Loss of Frame (LOF) Loss of Power (LOP) Loss of Margin (LOM)	
Ping	Connection Time	+/- 10mS

3M™ Dynatel™ 900 Series Subscriber Loop Test Products

Description

Features for the Dynatel 900 Series Subscriber Loop Test Products

Features	965DSP	965DSP/SA	965DSP/ADSL	945DSP/SA/ADSL
Resistance fault locate	•	•	•	•
Open fault locate	•	•	•	•
Load coil count	•	•	•	•
Longitudinal balance	•	•	•	•
Caller Identification (CID)	•	•	•	•
Split fault locate	•	•	•	•
Voltage measurement	•	•	•	•
Tone source	•	•	•	•
Current measurement	•	•	•	•
Ohms measurement	•	•	•	•
Soak test	•	•	•	•
Ohms-to-distance conversion	•	•	•	•
Loss measurement	•	•	•	•
Noise measurement	•	•	•	•
Ringers count	•	•	•	•
Self-test and self-calibration	•	•	•	•
Wideband noise/loss for ISDN and xDSL		•		•
Line Prequalification tests for basic rate ISDN service	•	•	•	•
TDR	•	•	•	•
IR port (communication port)	•	•	•	•
Stored results internal memory	•	•	•	•
Communications craft set	•	•	•	•
Measurement units	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius	Feet, metres, Fahrenheit, Celsius
Graphic display (backlit)	•	•	•	•
Auto diagnostic DC testing (loop)	•	•	•	•
Auto diagnostic AC testing (transmission)	•	•	•	•
High insulation resistance test	•	•	•	•
Resistance difference and loop resistance	•	•	•	•
Spectrum analyser (includes E, F, G noise filters)	Optional	•	Optional	•
Fast kick test	•	•	•	•
Onboard operating instructions	•	•	•	•
ADSL active modem testing	Optional	Optional	•	•

3M™ Dynatel™ 965DSP Subscriber Loop Analyser

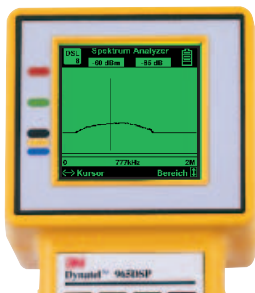## Technical characteristics

Wideband Spectrum Analyser
Sample Screens
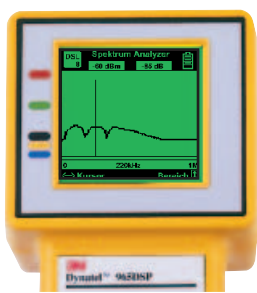
ISDN 2BIQ Crosstalk	T1 Crosstalk	ADSL Downstream Crosstalk
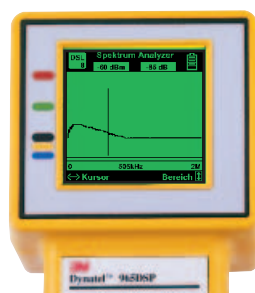
Wideband Autotest
Inactive & Wideband Loss Frequencies

Service Type	Single Frequency (kHz)	Sweep Frequency (kHz)
POTS	1004 (Hz)	404, 804, 1004, 1204,1404, 1604, 1804, 2004, 2804, 3004 (Hz)
56 kB	28	20, 28, 32, 40, 48, 82 64 kB 32 20, 28, 32, 40, 48, 82
ISDN	40	20, 28, 32, 40, 48, 60, 70, 82
HDSL	196	20, 30, 50, 70, 90, 110, 130, 196, 400
T1	772	200, 400, 500, 700, 772, 1024
E1	1024	200, 400, 500, 700, 772, 1024
ADSL	138	20, 30, 50, 69, 90
		1100 110, 138, 276, 400, 600, 800, 1000, 110016

Wideband Test (with FED)

Test	Basic	Full	Pass/Fail
Vdc	Yes	Yes	No
Ohms	Yes	Yes	Yes
Opens	Yes	Yes	Yes
Capacitive balance	Yes	Yes	Yes
Longitudinal balance	Yes	Yes	Yes
Sweep loss	No	Yes	Yes
Single tone loss	Yes	No	Yes
Loop resistance	Yes	No	Yes
Loop ohms	No	Yes	Yes
Resistive balance	No	Yes	Yes
Load coil	Yes	Yes	No

Wideband Autotest Results
Sample Screens
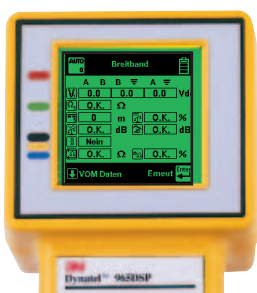
Pass/Fail	Numeric Value	Transmission	Graphic View of Slope
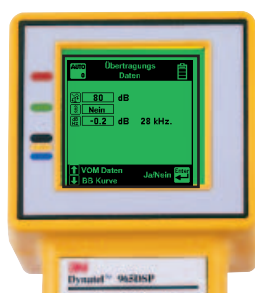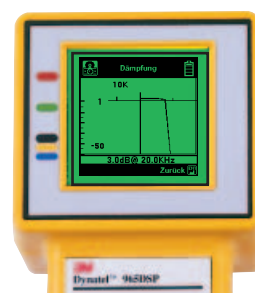
Copper Test Equipment
3M™ Dynatel™ 965DSP Subscriber Loop Analyser

Description

Complete testing of POTS, wideband\par services and digital subscriber lines

The 3M Dynatel 965DSP series subscriber loop analysers are microprocessor-controlled integrated test sets that provide full-featured POTS, wideband and DSL-specific testing.

Test functions include fault location and repair verification on twisted-pair and drop cables (utilising capacitance bridge, resistance bridge and Time Domain Reflectometre). The Dynatel 965DSP subscriber loop analysers execute a wide range of individual tests and perform automatic test routines to categorise and sectionalise problems. Specific tests and measurements performed by the units include:

- Voltage – detects and measures the presence of central office (exchange) or foreign DC or AC voltages.
- Tone – provides test tones for conductor identification and transmission testing with ten default tones, user selectable as ID tone (up to 1,000Hz), voiceband (to 20kHz) or wideband (to 1.2MHz).
- Current – measures DC loop current.
- Resistance – measures conductor and insulation resistance up to 1000 megohms.
- TDR – full-featured Time Domain Reflectometre with user-selectable pulse widths, length, gain zoom, filter and Vp.
  Five modes of operation:
  Single trace – provides graphical representation of events on a pair.
  Dual trace – allows active comparison of two traces.
  Differential – displays difference between two circuits.
  Crosstalk – displays the crosstalk from one pair to another.
  Memory – allows comparison of an active trace with a trace stored in memory.
  Peak – displays a history of maximum and minimum values with the live trace.
- Resistive fault location – displays distance to fault.
- Opens – locates opens at distances up to 100,000 ft. (30 km).
- Load coil count – counts the number of load coils (up to 5) and provides distance to the first load coil.
- Wideband loss and noise – loss and noise measurements to 1.2 MHz for pre-qualifying ISDN/IDSL, HDSL and ADSL.
- Loss – measures voiceband loss.
- Noise – measures noise metallic and noise to ground in dBrnc or dBm0p.
- Longitudinal balance – provides active measurement of line balance.
- Autotest – allows an automatic test of active, inactive and wide band (56K/64K DDS, ISDN/IDSL, HDSL, T1, E1 and ADSL) lines with pass/fail limits.
- Ground resistance – measures protector ground potential compared to central office ground.
- Special resistance – allows the 965DSP to measure the loop resistance and the resistance difference between two conductors on a pair.

- K-Test – allows RFL measurement when both wires in a pair are faulted and there is no separate good pair available.
- Ringers – measures and displays capacitance associated with one or more ringers and the equivalent count.
- Level Trace – measures and displays the AC impedance of the unterminated line as a function of frequency.
- 3M™ Far End Device and CTC's Smartstrap™support for wideband autotest.
- Soak Test – provides a digital display of the resistance between tip/ground and ring/ground prior to stressing the pair; then displays the resistance values while stressing the pair with a DC Voltage.
- Fast kick – provides the technician a fast voltage, length and resistance measurement between tip/ring, tip/ground and ring/ground.

The 3M Dynatel 965DSP/SA Subscriber Loop Analyser offers two additional test features. Wideband noise measurements are made with the E (ISDN/ISDL), F (HDSL) and G (ADSL) filters. The Spectrum Analyser test function enables the operator to view the high-frequency communications spectrum and identify spectral interference such as crosstalk noise generated by other services.

Flexible, practical features

The 965DSP series subscriber loop analysers are designed for functionality and ease of use.
Features of the units include:

- IR port – infrared port for downloading future software programs and uploading test results to a PC or printer.
- Self-calibration – internal instrument calibration and set-up procedures.
- Graphical user interface – user-friendly, icon-based display of test results.
- Replaceable test leads.
- HELP function – an internal help menu provides information as needed during operation.
- Telephone – internal telephone or "talk set."
- Rechargeable nickel metal hydride batteries – with battery charger and alkaline battery holder.
- Backlit high resolution/high contrast LCD display.

Rugged, weather-resistant design

The hand-held 965DSP test sets are housed in lightweight, ergonomically designed cases for portability and ease of handling. The units are weather-resistant and weighs only 4.3 lb. (1.95 kg). The Dynatel brand and its distinctive Dynatel yellow cases are your assurance of rugged dependability.

Copper Test Equipment
3M™ Dynatel™ 965DSP (A, B & SA) Subscriber Loop Analyser

Description

Dynatel™ 965DSP Subscriber Loop Analyser (A, B & SA)

Electrical Specifications

Main Functions	Range	Resolution	Accuracy
Voltage (DC)	0 to 99,9 V	0,1 V	1% ± 0,5 V
	100 to 300 V	1 V	3%
Voltage (AC)	0 to 99,9 V	0,1 V	1% ± 0,5 V
	100 to 250 V	1 V	3%
Current	0 to 59,9 mA	0,1 mA	1% ± 0,3 mA
	60 to 110 mA	0,1 mA	2%
Resistance (DC) and soak test	0 to 9999 Ω	1 Ω	1% ± 5Ω
with CO voltage	0 to 9999 Ω	1 Ω	1% ± 50Ω
	10 k to 99.9 kΩ	0,1 k Ω	1%
	100 k to 999 kΩ	1 k Ω	3%
	1 M to 9,9 MΩ	0,1 M Ω	3%
	10 M to 99 MΩ	1 M Ω	5%
	100 M to 990 MΩ	10 M Ω	10%
Opens (no noise)	0 to 3,000 ft (0 to 1000 m)	1 ft (1 m)	1% ± 3 ft (1 m)
	3000 to 10000 ft (1 km to 3 km)	1 ft (1 m)	3%
	10000 to 50000 ft (3 km to 15 km)	10 ft (10 m)	5%
	50000 to 100000 ft (15 km to 30 km)	100 ft (100 m)	10%
RFL			
Fault range	0 to 20 MΩ	—	—
Resistance to	0 to 99,99 Ω RTS	0,01 Ω	0,1% of RTS ± 0,01 Ω
fault (no noise)	100 to 999,9 Ω RTS	0,1 Ω	0,2% of RTS ± 0,01 Ω
	1 kΩ to 7 k Ω RTS	1,0 Ω	1,0% of RTS ± 0,01 Ω
Loss (& frequency)			
with 600 Ω Zin	-40 to +10 dBm, 200 to 20 kHz	0,1 dB, 1 Hz, 1 kHz	0,5 dB, 1%
with 135 Ω Zin	-50 to +2 dBm, 20 k to 1200 kHz	0,1 dB, kHz	2 dB, 1%
Noise metallic 600 Ω Zin	0 to 50 dBrnc (-90 to -40 dBm0p)	1 dB	2 dB
Noise to ground	40 to 100 dBrnc (-50 to 10 dBm0p)	1 dB	2 dB
Longitudinal balance	0 to 70 dB	1 dB	2 dB
Tone output			
ID	200 to 1000 Hz, fixed level	–	–
Precision - 600 Ω Zout	200 to 9999 Hz, -20 to +1 dBm	1 Hz, 0,1 dB	1% Hz, 0,2 dB
	10 k to 19,99 kHz, -20 to +1 dBm	1 Hz, 0,1 dB	2% Hz, 1 dB
Wideband - 135 Ω Zout	20 k to 1200 kHz, 0 dBm	1 kHz	1 dB
Dial mode	DTMF, Pulse	–	–
TDR			
Under typical conditions a	100, 200, 500, 1000, 2000	1 ft (1 m)	0,6%
range 500 ft bridge tap can be seen	5000, 10000, 20000, 30000 ft		
at 18,000 ft on a 20,000 ft	(30, 60, 150, 300, 600, 1500		
24 AWG cable. (150 m bridge	3000, 6000, 10000 m)		
tap at 5500 m on a 6000 m 0,5 mm cable).			
Pulse width	5 nS, 34 nS, 235 nS, 1600 nS	–	Fixed values
Velocity input	0,50 to 0,99 (150 to 299 m/µs)	0,01 (1 m/µs)	—
Modes	Single trace, dual trace,	—	—
	differential, memory, crosstalk, peak		
Auto tests	Same specifications as full tests	See above	See above
SA Functions (ISDN/IDSL, HDSL, ADSL)			
ISDN (2B1Q)			
Link test	active / inactive	—	—
Error test (US & Canada only)	Near-end & far-end block errors	1 block error	1 block error
DSL			
Loss (& frequency)	-75 to +5 dBm, 20 kHz to 1200 kHz	1 dB	1 dB
with 100 Ω or 135 Ω Zin			
Noise (with E, F, & G filters)			
Metallic with 100 Ω /135 Ω Zin	+10/+20/+30 to +90 dBrn	1 dB	2 dB
Longitudinal with 10 k Ω Zin	+40/+50/+60 to + 120 dBrn	1 dB	2 dB
Wideband Spectrum Analyser			
Range	10 kHz to 1,8 MHz	–	–
5 Spans	from 120kHz to 2 MHz	–	–
Dynamic range	-90 to +10 dBm	–	–
Frequency resolution	1% of span	–	–
Input impedance	135 Ω		

3M™ Dynatel™ 965DSP (A, B & SA) Subscriber Loop Analyser

Description

Dynatel™ 965DSP Subscriber Loop Analyser (A, B & SA)

Specifications

Physical Specifications		Enviromental Specifications	
Size H x W x D in. (cm)	10.3 x 4.7 x 3.2 (26,2 x 12 x 8,1)	Operating temperature	0° to 140°F (-18 to 60°C)
Net weight lbs. (kg)	4.3 (1,95) with battery and soft case	Storage temperature	-40° to 165°F (-40 to 75°C)
Shipping weight lbs. (kg)	7.8 (3,54)	Humidity	0 to 95%, non-condensing
Material	GE Xenoy		

Accessories	Description
Test leads	U.S. – 5 ft (1,5 m) test leads with 2 mm gold-plated banana plugs on one end and chrome-plated alligator clips on other end (black/red, blue/yellow, green) European – 5 ft (1,5 m) test leads with 2 mm gold-plated banana plugs on one end and 4 mm gold-plated banana plugs on other end (black/red, blue/yellow, green)
RFL strap	U.S. – 1.5 ft (0,5 m) with alligator clips on ends European – 1.5 ft (0,5 m) with banana plugs on ends
AC/DC battery charger	100-250 VAC (50/60 Hz) input; 12 VDC (1 A) output. For charging only. Do not operate when using charger.
Soft case	Heavy-duty fabric case for unit and test leads
Battery holder	Plastic holder for 6 AA (LR6) batteries
Battery pack	Custom 1,5 amp-hour nickel metal hydride

Toolbox Functions	Range	Resolution	Accuracy
Load coil count	0 to 5	1	±1
Ohms/distance calculator	0 to 9999 ohms 0 to 99999 ft (0 to 30 km)	0,01 Ω 1 ft (0,1 m)	– –
Caller ID (U.S. & Canada only) Carrier level	Date, time, number, name -4 to -32 dBm	– 1 dBm	— 2 dBm
Self-calibrate	Pass/fail	–	–
Loop resistance	0 to 99,9 Ω 100 to 999,9 Ω 1000 to 7000 Ω	0,01 Ω 0,1 Ω 1 Ω	0,1% ± 0,01 Ω 0,2% ± 0,01 Ω 1,0% ± 0,01 Ω
Resistance difference	0 to 99,99 Ω	0,01 Ω	1% of loop resistance ± 0,01 Ω
Ground resistance	5 to 500 Ω	1 Ω	1% ± 1 Ω

K-Test
    Loop resistance
    Fault ratio
    Resistance to fault
    (no noise)
	
	 0 to 7K Ω
	 (Fault Res1) > twice (Fault Res2)
	 0 to 99 Ω
	 100 to 999 Ω
	 1K to 3,5K Ω
		
		 –
		 –
		 0,01 Ω
		 0,1 Ω
		 1 Ω
			
			 –
			 –
			 5%
			 5%
			 5%

Stored results (Autotest and TDR)	100 results of each, minimum	–	–
Ringers	0,0 to 4,0	0.1	ringer equivalent

General Specifications	
Ruggedness Survives	5 ft (1,5 m) drop in soft case
Water-resistance	Splashproof; may be used in light to moderate rain
Standards	Meets FCC part 15, class A: Digital Devices for the US, and EN55022 (radiated emissions), EN55024-2 (electrostatic discharge), EN55024-3 (radiated immunity) EN55024-4 (transient immunity) and IEC1010 (product safety) for Europe. Built to ISO9001 certification for manufacturing facilities. Built to Bellcore (Telcordia Technologies) TSY000078 manufacturing methods. Meets UL50 Rain Test.
Language	English and multi-languages
Units	Feet or meters, Fahrenheit or Celsius, dBrnC or dBm0p, m/uS or Vp
Battery life	Rechargeable battery pack, 12 hours typical usage (no backlight), 4 hours typical (with backlight); typical usage defined as 30 minutes on, 30 minutes off
Charging time	Minimum 2,5 hours from low to full
Keypad	24-key membrane keypad with tactile feedback
Display in. (cm)	2.5 x 2.5 (74 x 74), 192 by 192 pixel resolution, backlight

Note: Routine calibration is not recommended or required.

3M™ Dynatel™ 965DSP
Subscriber Loop Analyser with ADSL Modem

Description

Dynatel™ 965DSP Subscriber Loop Analyser with ADSL Modem

Specifications

Physical Specifications	
Size H x W x D in. (cm)	10.3 x 4.6 x 3.75 (26,2 x 11,7 x 9,5)
Net weight lbs. (kg) with soft case and test leads	4.5 (2)
Shipping weight lbs. (kg)	8 (3,6)

Environmental Specifications	
Operating temperature	0° to 140° F (-18° to 60° C)
Storage temperature	-40° to 165° F (-40° to 75° C)
Humidity	0 to 95%, non-condensing
Vibration	Random 3-axis vibration for 20 minutes
Water resistance	Meets UL50 Rain Test
Shock	10 drops on corners and sides from 30 in. (without soft case) and 10 drops on corners and sides from 60 in. (with soft case)
Safety	IEC950

General Specifications	
Product will incorporate all the features of the 965DSP and/or 965DSP/SA subscriber loop analyzers at the accuracy currently specified for these products (see 965DSP family product documentation). ADSL datalink capability is limited to link synchronization. No 'PING' or data application capability is provided. Modem will initiate a connection with the far-end under operator command. Status messages indicating link progress will be returned.	
ANSI/ITU standards supported	ITU G.992.2 (G.Lite), ITU G.992.1 (G.DMT), ANSI T1.413 Issue 2
ADSL modes	ANSI, G.DMT, G.Lite, MultiMode
Reach	Designed to synchronize at distances from 0 ft to 18,000 ft
Statistics	Actual and maximum upstream and downstream connect rates Upstream and downstream percent used ADSL line capacity Upstream and downstream noise margin Upstream and downstream signal attenuation Upstream and downstream power levels Modem manufacturer identification (ANSI mode only) Upstream and downstream FEC, CRC, and HEC counts Alarm codes including LOS, LOF, LCD and LOM Graphical display of bits-per-bin count for the DMT signal
Operating modes	Captured – Modem auto-disconnects from the far-end after statistics gathered Continuous – Modem gathers statistics for up to ten minutes

Solutions for Outside Plant

2

3M™ 1342 Far End Device II

3M™ 1342 Far End Device II

Remote controlled far end testing assistance

The perfect companion to the 3M Dynatel 965DSP Subscriber Loop Analyser, the 3M 1342 Far End Device II (FEDII) provides remote controlled far end testing assistance during subscriber loop testing. Designed to enhance technician productivity, the FEDII connects to the far end on a cable pair to enable diagnostic testing to be performed from the near end controlled by the 3M Dynatel 965DSP.

Support of "auto" test function on Dynatel 965DSP, 965DSP-SA and 965DSP-B to facilitate loss measurement:

• Insertion loss to 1.2 MHz
• Slope
• Loop resistance
• Resistance balance

One technician, one test set: Pair Qualification

With a 3M Far End Device II (FEDII), one technician with a 3M™ Dynatel™ 965DSP Subscriber Loop Analyser can perform end-to-end testing of metallic cable pairs. Commanded by the Dynatel 965DSP, the FEDII provides trace tone to verify cable pair connection, supports the 965DSP auto testing feature and qualifies loop performance up to 1.2 MHz (ADSL).Controlled by DTMF signaling from the 965DSP, the FEDII can be commanded to remotely power-up, respond to test signaling, transmit tone on technician-selected conductors,or close relays to short the pairs in any combination. The unit can also be powered-up and commanded manually. The new FEDII may be connected in series with a working pair or bridged on to the test pair. In addition, the FEDII may be connected to two separate pairs allowing the end users to test two pairs.

Pocket accessory

Housed in a rugged, pocket-sized plastic case within a protective Cordura pouch, the 3M Far End Device features a power on/off LED and a test lead. The FED optimises its replaceable 9V-battery life with an automatic power-down feature.

Ordering Information: Model 3M™ 1342

To order, specify the 3M 1342 Far End Device II.
Included with the unit are:

• 1 set test leads with alligator clips (non-insulation-piercing)
• Cordura carrying case
• Operating instructions
• Warranty card

Replacement Parts are available from 3M Service and Repair Department

Ordering Information: Model 3M™ 1343

To order, specify the 3M 1343 Far End Device II.
Included with the unit are:

• 1 set test leads with bed of nails clips
• Cordura carrying case
• Operating instructions
• Warranty card

Replacement Parts are available from 3M Service and Repair Department

Technical characteristics:

Size	4.7"H X 2.6"W X 0.9"D
	(11,9 cm X 6,6 cm X 2,3 cm)
Weight	5.6 oz. (159 g) with battery
Operating temperature	0° to +140°F (-18° to +60°C)
Storage temperature	-40° to +165°F (-40° to +75°C)
Battery life	40 hours typical
Battery shelf life	2 months (installed)
Replacement battery	Recommend: Duracell™ MN1604 9V
	Alkaline or equivalent
Strap resistance	Less than 0.2 ohms
DC input impedance	>100 megohms tip-ring-ground
AC input impedance	~100 kohms in series with
	470 pf tip-ring
Voltage rating	250 Vdc, 150 Vac
ID tone frequency	577 Hz and 1004 Hz
ID tone amplitude	8 volts peak to peak; no load typical
Transmitted tones	0 dBm ± 0.5 dBm
	400 Hz to 100 kHz
	0 dBm ± 1.0 dBm
	100 kHz to 1.2 Mhz