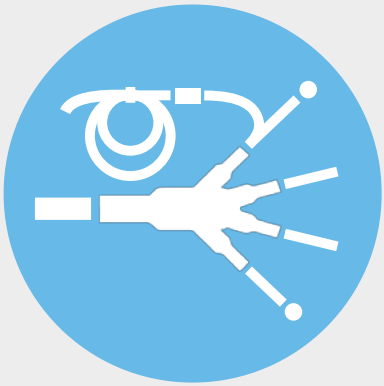

INTRODUCTION

Metal Screening Braids

up to 99% Optical Coverage

Screening braid is a cost effective solution for shielding wire bundles from electromagnetic interference (EMI/EMC). In many applications cable screening is important to either minimise cross-talk within the cable or prevent internal or external sources of interference.

Features & Benefits

- EMI/EMC Protection
- Mechanical protection

Product	Type	Description
Electromagnetic Shielding...		
Raybraid® 90, 101 and 103	Tubular	Tubular metal braid for electrical screening of wire bundles, with up to 99% optical coverage, with minimum of 90%.
InstaLite® 101 and 103	Tubular	Lightweight tubular metal alloy braiding for electrical screening of wire bundles, 50% lighter than traditional copper braid
CSB	Tubular	Commercial grade metal braid for electrical screening, offering a minimum of 90% optical coverage
HBT90 and HBT99	Tubular	Tubular metal braid for electrical screening, offering up to 99% optical coverage HBT99.

Metal Braid EMI/EMC Shielding

Markets	Temp.	Construction	Size
...continued			
Aero, Defence	101 up to +150°C 103 up to +200°C	Series 90 & 101 tinned Cu and series 103 tinned Ni Cu	3.0 to 30.0mm
Aero, Motorsport	101 up to +150°C 103 up to +200°C	Series 101 tinned Cu alloy and series 103 tinned Ni Cu	3.0 to 20.0mm
Commercial/ Industrial	up to 150°C	Tinned copper	3.0 to 30.0mm
Aero, Defence Motorsport	90 up to +150°C 99 up to +260°C	Series 90 tinned Cu and series 99 tinned Ni Cu	3.0 to 30.0mm 3.0 to 40.0mm

RAYBRAID®

Professional Grade, Tin or Nickel plated Copper Electromagnetic Screening Braid

Raybraid® 90 has a minimum of 90% optical coverage and is available in a wide range of sizes to cover 2mm to 36mm diameters.

Raybraid® 101 and 103 have a minimum of 93% and maximum of 100% optical coverage and is available in a wide range of sizes to cover 2.5mm to 38mm diameters.

Standard Raybraid 90 and 101 are tinned copper with Raybraid 103 being nickel plated copper for high temperature applications.

Raybraid is supplied on a round tube former which facilitates assembly and is more robust than braid supplied in flattened form.

Operating Temperature

- Raybraid 90 & 101 up to +150ºC
- Raybraid 103 above +200ºC

Raybraid is fully compatible with Tinel-Lock adaptors for termination of the braid to associated connectors.

Features & Benefits

- Screening military harnesses
- Minimum 90% optical coverage
- 101 and 103 Super flexible
- Good expansion ratio
- Supplied on plastic former to maintain round profile and is more robust than braid supplied in flattened form

CSAmm² and **Resistance** - General guidelines, ratings based on ambient of 20ºC

Size No.	RAY-90			RAY-101			RAY-103	
	CSA mm²	Resistance	Current	CSA mm²	Resistance	Current	CSA mm²	Resistance
-3.0	1.0	28.0 Ω/km	17	1.3	17.00 Ω/km	18	1.3	17.30 Ω/km
-4.0	1.4	18.3 Ω/km	21	2.1	10.30 Ω/km	28	2.1	10.50 Ω/km
-5.0	1.8	13.8 Ω/km	25	-	-	-	-	-
-6.0	2.1	12.2 Ω/km	28	2.7	8.00 Ω/km	34	2.7	8.10 Ω/km
-7.5	-	-	-	4.3	5.20 Ω/km	42	4.3	5.23 Ω/km
-10.0	4.3	6.0 Ω/km	42	5.5	3.96 Ω/km	52	5.5	4.02 Ω/km
-12.5	4.8	6.1 Ω/km	48	6.8	3.23 Ω/km	57	6.8	3.28 Ω/km
-15.0	8.3	3.0 Ω/km	67	-	-	-	-	-
-20.0	12.8	2.2 Ω/km	81	9.7	2.32 Ω/km	69	9.7	2.35 Ω/km
-25.0	16.4	1.6 Ω/km	98	-	-	-	-	-
-30.0	26.0	1.0 Ω/km	125	-	-	-	-	-

Raybraid 90 Tubular Braid - Minimum 90% Optical Coverage

Part Number	Former Ø	Carrier		Strand Size	Cable Bundle		Pack Size	Weight Nom.
	mm	No. of	Ends	AWG/mm	Min. mm	Max. mm	m	kg/km
RAY-90-3.0	3.0 (±0.13)	16	5	36/0.13	2.0	3.5	100	13
RAY-90-4.0	4.0 (±0.25)	16	7	36/0.13	3.0	5.0	100	17
RAY-90-5.0	5.0 (±0.25)	24	6	36/0.13	4.0	6.0	100	21
RAY-90-6.0	6.0 (±0.25)	24	7	36/0.13	5.0	7.0	100	25
RAY-90-10.0	10.0 (±0.25)	24	9	34/0.16	7.0	12.0	100	52
RAY-90-12.5	12.5 (±0.25)	24	10	34/0.16	11.0	13.0	100	65
RAY-90-15.0	15.0 (±0.38)	24	11	32/0.20	13.0	18.0	50	100
RAY-90-20.0	20.0 (±0.38)	36	7	32/0.20	17.0	23.0	50	165
RAY-90-25.0	25.0 (±0.38)	36	9	30/0.25	22.0	28.0	50	207
RAY-90-30.0	30.0 (±0.38)	36	9	28/0.32	27.0	36.0	50	310

Raybraid 101 and **103** Tubular Braid - Minimum 93% Optical Coverage

Part Number	Former Ø	Carrier		Strand Size	Cable Bundle		Pack Size	Weight Nom.
	mm	No. of	Ends	AWG/mm	Min. mm	Max. mm	metres	kg/km
RAY-10X-3.0	3.0 (±0.13)	16	10	38/0.10	2.5	5.0	100	10.3
RAY-10X-4.0	4.0 (±0.25)	24	7	36/0.13	3.5	7.5	100	17.0
RAY-10X-6.0	6.0 (±0.25)	24	9	36/0.13	4.5	9.5	100	25.0
RAY-10X-7.5	7.5 (±0.25)	24	14	36/0.13	7.0	14.0	100	31.0
RAY-10X-10.0	10.0 (±0.25)	36	12	36/0.13	8.0	22.0	100	41.0
RAY-10X-12.5	12.5 (±0.25)	36	15	36/0.13	11.0	24.0	100	51.0
RAY-10X-20.0	20.0 (±0.38)	48	16	36/0.13	16.0	38.0	50	81.0

Notes

For applications that require a limited wire shielding tape which can be wound around a cable for installation and repair, we offer 000W280. Supplied in 4.5m rolls, width 20mm, material tinned copper. For further information on this or other products in our range, or for assistance with your specific requirements, please contact us.

All numeric data shows average or typical values.

LWB INSTALITE®

Super light, Tin or Nickel plated Copper Electromagnetic Screening Braid

INSTALITE offers less weight than in a familiar metal braid technology. Offering up to 50% weight savings over traditional copper braids, INSTALITE lightweight braid has excellent electrical shielding performance over a wide frequency range. Made from high performance nickel plated high strength copper alloy.

Since INSTALITE braid uses well established metal braiding, the transition from traditional braids to INSTALITE is easy. The product can be terminated with standard tooling and installation procedures for existing backshells and band straps, making it easy to introduce it into current applications.

Operating Temperature

- LWB 101 -65ºC to +150ºC Tin plated
- LWB 103 -65ºC to +200ºC Nickel plated

Up to 50% Lighter

Minimum 85% Optical Coverage

InstaLite™ 101 and **103** Lightweight Tubular Braid

Part No.	Former Ø	Optical Coverage		Resistance	Cable Bundle		Pack Size	Weight Nom.
	mm	Min.	Nom.	ohms/km	Min.mm	Max.mm	m	kg/km
LWB-10X-3.0	3.0 (±0.13)	90.0 %	93.7 %	28.0	3.0	4.5	100	8.5
LWB-10X-6.0	6.0 (±0.25)	90.0 %	91.3 %	18.0	4.5	8.0	100	15.5
LWB-10X-10.0	10.0 (±0.25)	90.0 %	96.4 %	9.0	8.0	15.0	100	28.0
LWB-10X-20.0	20.0 (±0.25)	85.0 %	86.0 %	7.0	15.0	25.0	50	45.0

Weight excludes that of the former

Up to 50% lighter than traditional copper braid

Optical Coverage Min. 85% up to Max. 96%

Better low-frequency performance than plated fibres or micro-filaments

INSTALITE-103-10 passes 21kA waveform 5B lightning protection

Environmental Performance

Salt spray:	ASTM B117
Flex endurance:	1000 cycles min., SAE AS4373 method 704 (180º bend)

Comparison	LWB-103	vs RAY-103
Tensile strength [N/mm²]	758	220
Break strength [N]	15.2	11.1
DC Resistance [mΩ/m]	9.0	3.5
Weight [kg/km]	28*	41*
Optical coverage [%]	90	93

Figures for braid with nominal diameter of 10.0mm
* Denotes nominal weight

CSB

Commercial Grade, Tin plated Copper Electromagnetic Screening Braid

Minimum 90% Optical Coverage

CSB is a commercial screening braid providing exceptional protection for wire and cable harnesses from electromagnetic, electrostatic and radio frequency interference. Available in tin plated copper and provides a minimum optical coverage of 90%. It is supplied on a removable PVC former in order to maintain its physical integrity and to aid application. This product is recommended for wire systems demanding high levels of protection from electromagnetic interference EMI.

CSB Screening braid provides a cost effective method of screening wire bundles, harnesses, cables and conduit systems. The product can also be utilised for earth continuity purposes.

Operating Temperature

- -65°C to +150°C Tin plated

CSB Tubular Braid - Minimum 90% Optical Coverage

Part No.	Internal Dia.	No. of Carriers	Strand Size	Expansion Range		Max. Weight*	Reel Size
	mm		mm	Min. mm	Max. mm	Kg/km	m
CSB-030T	3.0	16	0.100	2.5	5.0	14.1	100
CSB-040T	4.0	24	0.127	3.5	7.5	23.2	100
CSB-050T	5.0	24	0.127	3.5	8.5	26.1	100
CSB-060T	6.0	24	0.127	4.5	9.5	29.5	100
CSB-075T	7.5	24	0.127	7.0	14.0	46.3	100
CSB-100T	10.0	36	0.127	8.0	22.0	58.8	100
CSB-125T	12.5	36	0.127	11.0	24.0	75.0	100
CSB-150T	15.0	36	0.127	14.5	30.0	77.2	100
CSB-200T	20.0	48	0.127	16.0	38.0	109.0	50
CSB-250T	25.0	48	0.202	21.0	39.0	218.2	50
CSB-300T	30.0	48	0.202	27.0	40.0	230.0	50
CSB-400T	40.0	48	0.202	36.0	62.0	305.0	50

* Maximum weights are excluding former

HBT90

Standard Grade, Tin plated Copper Electromagnetic Screening Braid

HBT90 screening braid is a quality product providing excellent protection for wire and cable harnesses from electromagnetic, interference. Available in tin plated copper, providing minimum optical coverage of 90%. Offering an effective method of screening wire bundles, harnesses and cables.

Supplied on an internal former to aid installation and maintain the shape and form of braid in transit and prior to installation

Operating Temperature

- -65ºC to +150ºC Tin plated Copper

Minimum 90% Optical Coverage

HBT90 Standard Tubular Braid - Minimal 90% Optical Coverage

Part Number	Internal Dia.	Strand Size	Expansion Range		VG Cross Ref.	Reel Size
	mm	mm	Min. mm	Max. mm		m
HBT90-03.0-2/2-F	3.0	0.127	2.0	3.5	VG 96936 T10 B001A	100
HBT90-04.0-2/2-F	4.0	0.127	3.0	5.0	VG 96936 T10 B002A	100
HBT90-05.0-2/2-F	5.0	0.127	4.0	6.0	VG 96936 T10 B003A	100
HBT90-06.0-2/2-F	6.0	0.127	5.0	7.0	VG 96936 T10 B004A	100
HBT90-10.0-2/2-F	10.0	0.161	7.0	12.0	VG 96936 T10 B005A	100
HBT90-12.5-2/2-F	12.5	0.161	11.0	13.0	VG 96936 T10 B006A	100
HBT90-15.0-2/2-F	15.0	0.202	13.0	18.0	VG 96936 T10 B007A	100
HBT90-20.0-2/2-F	20.0	0.250	17.0	23.0	VG 96936 T10 B008A	50
HBT90-25.0-2/2-F	25.0	0.250	22.0	28.0	VG 96936 T10 B009A	50
HBT90-30.0-2/2-F	30.0	0.320	27.0	36.0	VG 96936 T10 B0010A	50

REG. Nr 8319
Approved to
VG96936-10

HBT99

Premium Grade, Tin or Nickel plated Copper Electromagnetic Screening Braid

HBT99 screening braid provides exceptional protection for wire and cable harnesses from electromagnetic, electrostatic and radio frequency interference. Available in either tin plated or nickel plated copper, providing optical coverage from 93% to 99%.

Supplied on an internal former to aid installation and maintain the shape and form of braid in transit and prior to installation.

Operating Temperature

- -65°C to +150°C Tin plated Copper
- -65°C to +260°C Nickel plated Copper

up to 99% Optical Coverage, with Minimum 93%

*Part Number Construction example

HBT99-10.0-2/0-F Tin plated (-2/)
HBT99-10.0-3/0-F Nickel plated (-3/)

HBT99 Premium Tubular Braid - Maximum 99% to Minimum 93%, Optical Coverage

Part Number	Internal Dia.	Strand Size	Expansion Range		VG Cross Ref.	Reel Size
	mm	mm	Min. mm	Max. mm	-2 Tin plated only	m
HBT99-03.0-X/0-F	3.0	0.100	2.5	5.0	VG 96936 T10 A001A	100
HBT99-04.0-X/0-F	4.0	0.127	3.5	7.5	VG 96936 T10 A002A	100
HBT99-05.0-X/0-F	5.0	0.127	3.5	8.5	-	100
HBT99-06.0-X/0-F	6.0	0.127	4.5	9.5	VG 96936 T10 A003A	100
HBT99-07.5-X/0-F	7.5	0.127	7.0	14.0	VG 96936 T10 A004A	100
HBT99-10.0-X/0-F	10.0	0.127	8.0	22.0	VG 96936 T10 A005A	100
HBT99-12.5-X/0-F	12.5	0.127	11.0	24.0	VG 96936 T10 A006A	100
HBT99-15.0-X/0-F	15.0	0.127	14.5	30.0	-	100
HBT99-20.0-X/0-F	20.0	0.127	16.0	38.0	VG 96936 T10 A007A	50
HBT99-25.0-X/0-F	25.0	0.202	21.0	39.0	-	50
HBT99-30.0-X/0-F	30.0	0.202	27.0	40.0	-	50
HBT99-35.0-X/0-F	35.0	0.202	30.0	52.0	-	50
HBT99-40.0-X/0-F	40.0	0.202	36.0	62.0	-	50

For Nickel plated Copper screening braid use -3/ in the part number or -2/ for Tin plated Copper

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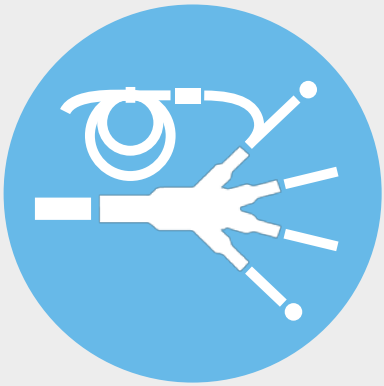
VG96936-10



Heat Shrinkable Boots Transitions and End Caps Glands and Feedthroughs

Based on heat-shrink technology, moulded parts and shapes are available in a vast range of configurations, sizes and materials, from miniature lightweight and space saving straight boots through to large multi-way harness transitions.

Moulded parts can be used to seal and protect harnessing breakouts and terminations from environmental hazards, as well as providing strain relief. Material selection enables full integration and compatibility with other harness components, producing electrical systems that can be used under the most extreme environmental conditions.

Boots

Ideal for providing a high performance environmental seal and mechanical protection between the cable or wire and the connector or connector adaptor.

InstaLite Boots

Offering up to 30% weight savings over similar standard boots, see 202K121 and 222K121 pages in this section. Please note that this range is being expanded, so please contact us for the latest information.

Transitions / Breakouts

Ideal replacement for tapes, mould-in-place epoxies and grease. These moulded parts can be used for cable breakouts, transitions and terminations.

End Caps

Provide optimum waterproofing and environmental protection for sealing cable ends in underwater, underground, or outdoor applications.

Glands and Feedthroughs

Moulded heat shrinkable non screened bulkhead feedthroughs 207Wxxx and CESx available in various configurations for environmentally sealed enclosures.

Also available are a range of screened and non-screened one piece heat shrinkable feedthroughs TCFS and TCFR

Features & Benefits

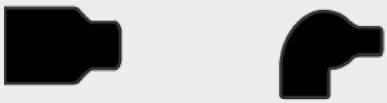
- Mechanical protection
- Chemical resistance
- Electrical insulation
- Electrical screening
- Fluid and solvent resistance
- Moisture protection
- Strain relief
- Flame-retardant, low smoke
- Extreme temperature performance
- Aesthetic enhancement
- Fast & efficient installation
- Wide range of materials
- Pre-installed adhesives
- Modification options

CONTENTS

Selection Guide Overview

Part number and visual identifier
Product Type

BOOTS

Application	Family Description	Typical Shapes
Non-lipped Boots	202A111 to 196 Straight 222A111 to 196 Right Angle	
Lipped Boots	202K121 to 185 Straight 222K121 to 185 Right Angle	
Screened Lipped Boots	202S121 to 174 Straight 222S121 to 174 Right Angle	
Lipped boots, extended tail	202D921 to 963 Straight 222D921 to 963 Right Angle	

MICRO MOULDED Family

Micro Moulded Lipped Boots	202A111-xx-G07 204W221 203W301-xx-G02 204W221-xx-G03 204W511-12 or -25	
	222A111-xx-G07 224W221 223W601-xx 224221-xx-G03 224W511-12 or -25	

Shown here are our more popular products, for further information on the extensive range of moulded parts and shapes available, or for assistance with your specific requirements, please contact us.

A range of heat guns and adhesives are also available for installing moulded parts and shapes, please refer to the relevant sections in this catalogue.

Moulded parts and shapes material performance characteristics can be found later in this section.

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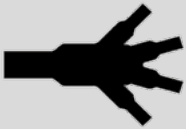
TRANSITIONS

Application	Family Description	Typical Shapes
'T' Transitions	301A011 to 048 322A112 to 158	
45° Transitions	342A012 to 058 342A112 to 138	
30° Transitions	362A014 to 114	
'Y' Transitions	382A012 to 046	
1:3 Transitions	462A011 to 060	
1:4 Transitions	562A011 to 067	

End Caps

Application	Family Description	Typical Shapes
PD and TC End caps	Polyolefin heat shrink Single and dual wall	
End caps	101A011 to 094 SSC-1 to -7	

Part Numbering System

Building your part number

202D121-3-01/42-0

Part Numbering example

Colour:
0 Black

Adhesive Coating (Optional)**:**
/42 General purpose hot melt adhesive
/86 High performance hot melt adhesive
/180 Low fire hazard hot melt adhesive
/225 Pre-coated curing adhesive

Modification (Optional)**:**
-00 Potting ports
-01 One lip removed
-02 Two lips removed
-11 One lip removed with potting ports
-21 Two lips removed with potting ports
-G Special constructions / modifications
Note: Removal of lips will reduce length of boot

Material:
-3 Semi-rigid polyolefin
-4 Flexible polyolefin
-12 Fluoro-elastomer
-25 Fluid resistant elastomer
-100 Low fire hazard

Size of Part in Family:
-11 Smallest through to...
-99 Largest part

Family Member:

Type of Part

-A	Non lipped	-K	Lipped boots
-C	Lipped boot	-S	Screened
-D	Lipped boot	-W,P	Other shapes
-G	Lipped boot		

Angle of Part

Circular		Non circular	
-0	Straight	-0	Straight
-2	90°	-3	90°
-4	45°	-5	45°
-6	30°	-7	30°

Number of Openings in the part

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Seal, Protect and Strain-Relieve with Heat-Shrinkable Moulded Parts in a Range of Shapes and Materials to Help Withstand Harsh Environments.

In addition to the products reviewed in this catalogue on the following pages, there is an extensive range of complimentary shapes and materials also available outlined below, for further details please contact us.

- Uniboots
- Rectangular Boots
- Slimline

202A111 to 196

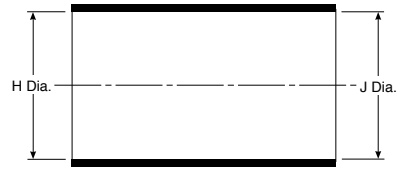
Non-Lipped
Straight, boot

Mechanical protection and strain relief. As the part does not have a lip it can be installed directly onto the connector accessory thread.

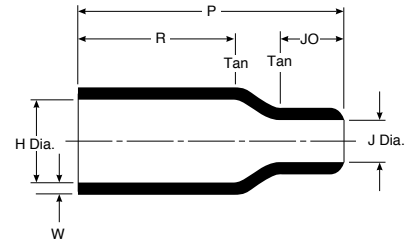
Ordering Information

- Standard colour Black.
- Please specify the product name, size, material, coating and any modifications required, as per Part Numbering System earlier in this section.
- Adhesive lining is optional. If added the entry dimension diameter will be reduced by 1.5mm.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

As supplied



After Recovery



Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery						
Dimension	H		J		H	J	P ±10%	R ±10%	JO ±10%	W ±20%	Weight
Material	3, 4, 25	12, 100	3, 4, 25	12, 100							
Part Number											
202A111	16.5	16.5	16.5	11.9	7.9	3.8	25.0	14.0	6.0	1.3	1.0g
202A121	24.3	22.6	24.6	17.8	9.9	5.3	38.0	22.0	9.0	1.5	3.0g
202A132	28.4	26.2	28.4	20.3	14.2	6.6	51.0	28.0	13.0	1.8	3.6g
202A142	31.0	31.0	31.0	25.4	17.8	7.4	67.0	36.0	18.0	1.8	6.4g
202A153	36.1	36.1	36.1	26.2	21.9	8.6	74.0	41.0	16.0	1.8	11.3g
202A163	42.7	42.7	42.7	27.2	27.4	9.4	99.0	63.0	18.0	2.0	18.0g
202A174	51.8	48.3	51.8	48.3	35.3	16.0	130.0	65.0	42.0	3.3	45.0g
202A185	66.0	66.0	66.0	54.1	43.7	19.6	161.3	90.2	47.8	3.81	-
202A196	86.4	86.4	86.4	71.4	57.2	26.9	212.6	113.0	62.2	4.06	-

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Injection and potting ports also available see part number system earlier in this section

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

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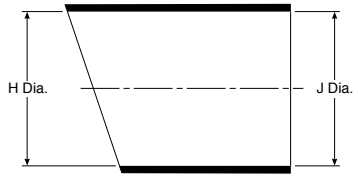
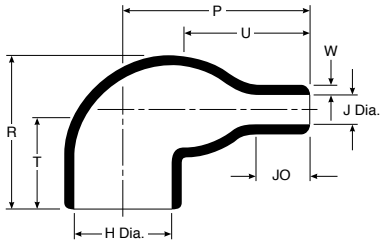
222A111 to 196

Non-Lipped
Right Angle 90°, boot

As supplied



After Recovery



Mechanical protection and strain relief. As the part does not have a lip it can be installed directly onto the connector accessory thread.

Ordering Information

- Standard colour Black.
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimension diameter will be reduced by 1.5mm.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery								
Dimension	H	J			H	J	P ±10%	R ±10%	T ±10%	U ±10%	JO ±10%	W ±10%	Weight
Material	All	3, 4, 25	100	12									
Part Number													
222A111	17.8	17.8	10.9	9.9	7.9	3.8	17.3	20.1	-	11.4	4.3	1.02	0.9g
222A121	24.9	24.9	16.0	18.0	10.2	5.3	21.3	22.6	-	14.7	5.8	1.27	1.4g
222A132	30.0	30.0	21.1	20.6	14.2	6.4	26.9	26.7	19.1	17.8	7.1	1.52	2.9g
222A142	32.5	32.5	22.9	22.9	17.3	6.9	36.6	30.5	19.1	24.9	10.2	1.78	5.4g
222A152	36.1	36.1	27.4	26.4	21.8	8.4	43.7	35.1	19.1	30.0	12.7	1.78	7.7g
222A163	43.9	43.9	28.4	27.4	27.4	9.4	53.6	43.9	19.1	34.0	17.3	2.03	13.0g
222A174	53.1	53.1	48.3	46.7	33.8	15.0	75.7	52.8	25.4	53.2	32.0	3.30	31.0g
222A185	67.6	67.6	58.4	54.4	44.2	20.3	97.5	66.0	25.4	71.1	40.6	3.81	-
222A196	87.6	87.6	68.8	63.0	55.4	23.4	128.0	79.2	25.4	87.6	56.4	4.57	-

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Injection and potting ports also available see part number system earlier in this section

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

202K111 to 185

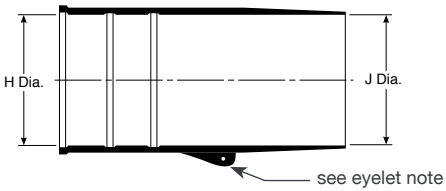
Lipped
Straight, boot

Mechanical protection and strain relief. Part includes a lip or lips as required, can be installed onto circular adaptors of the appropriate shell size.

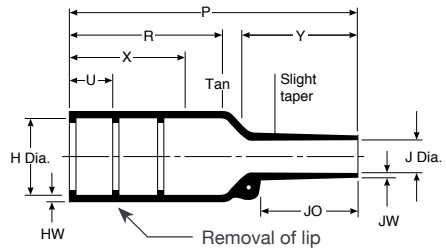
Ordering Information

- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimension diameter will be reduced by 1.5mm.
- -12 material is supplied without eyelet, if required add CS-1863 to part number
- If eyelet clip (000W212) is required with potting ports then add CS-1858 to part number

As supplied



After Recovery



Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery								Nom. Weight
Dimension	H	J			H	J	P ±10%	R ±10%	U ±10%	JO ±10%	HW ±10%	JW min	
Material		3, 4, 25	12	100									
Part Number													
202K111	17.0	17.0	13.0	14.0	6.9	3.0	39.0	24.0	n/a	10.8	1.3	0.7	1.3g
202K121	24.0	24.0	13.0	14.0	10.4	5.6	38.0	21.0	12.0	8.5	1.9	0.41	2.4g
202K132	30.0	30.0	14.0	15.0	14.2	5.9	55.0	32.0	12.0	11.5	1.8	0.81	4.8g
202K142	31.0	31.0	16.0	18.0	18.0	7.1	67.0	35.0	20.0	17.0	1.8	0.81	9.9g
202K153	36.0	36.0	19.0	21.0	22.4	8.4	80.0	42.0	20.0	19.5	2.0	0.81	12.0g
202K163	43.0	43.0	22.0	25.0	28.2	9.9	99.0	61.0	20.0	21.0	2.2	0.81	20.0g
202K174	60.0	60.0	35.0	39.0	35.1	15.7	130.0	72.0	20.0	39.0	3.3	1.02	44.5g
202K185	66.0	66.0	38.0	42.0	44.5	16.8	170.0	90.0	20.0	51.5	3.8	1.63	-

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part. Injection and potting ports also available see part number system earlier in this section.
202K111 only available with single lip and without eyelet. 202K121 thru 202K153 supplied with two lips only.
Removal of lip(s) will reduce length of the boot, see part numbering page.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

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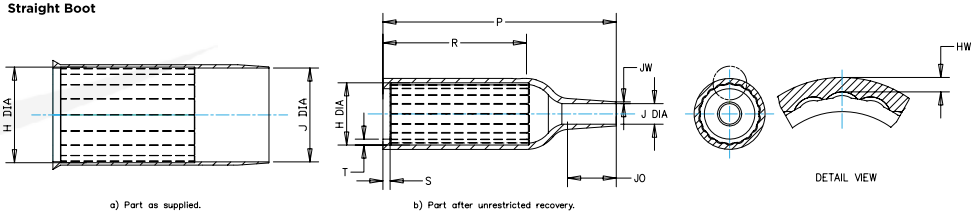
202K121-25L to 185-25L

InstaLite Lipped
Straight, boot

up to 28% LIGHTER

INSTALITE moulded boots advanced materials science drives weight savings and reduces installation time, with high-performance heat shrink shape memory boots.

Straight Boot



a) Part as supplied.

b) Part after unrestricted recovery.

InstaLite **Product Dimensions Selection Table**

	Dim. Supplied		Dimensions After Recovery						Avg. Weight Saving
Dimension	H	J	H	J	P ±10%	R ±10%	HW ±20%	JW min	
Part Number									
202K121-25L	24.0	24.0	10.4	5.6	38.0	21.0	1.3	0.9	20%
202K132-25L	30.0	30.0	14.2	5.9	55.0	32.0	1.3	1.0	20%
202K142-25L	31.0	31.0	18.0	7.1	67.0	35.0	1.2	1.0	20%
202K153-25L	36.0	36.0	22.4	8.4	80.0	42.0	1.5	1.0	23%
202K163-25L	43.0	43.0	28.2	9.9	99.0	61.0	2.0	1.2	28%
202K174-25L	60.0	60.0	35.1	15.7	130.0	72.0	2.3	1.5	22%
202K185-25L	66.0	66.0	44.5	16.8	170.0	90.0	1.8	2.0	21%

All dimensions in mm unless otherwise stated.

INSTALITE boots are a lighter weight alternative to our standard -25 heat shrink boots. Utilising fluid-resistant modified elastomers, the Instalite boots offer semi-rigid, abrasion resistant boots that are up to 28% lighter than standard -25 boots.

The boots offer the same balance of high temperature fluid resistance and long term heat resistance as the standard modified elastomer boots.

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1125

222K121 to 185

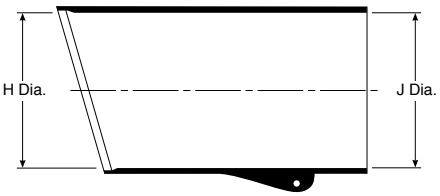
Lipped
Right Angle 90°, boot

Mechanical protection and strain relief. Part includes a lip or lips as required, can be installed onto circular adaptors of the appropriate shell size.

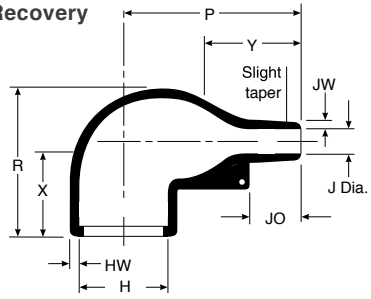
Ordering Information

- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimension diameter will be reduced by 1.5mm.
- Dimensions apply to all available materials unless otherwise stated.
- If eyelet clip (000W212) is required with part then add CS-1858 to part number.

As supplied



After Recovery



Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery							
Dimension	H		J		H	J	P ±10%	R ±10%	JO ±10%	HW ±10%	JW ±10%	Weight
Material	3, 4, 12, 25	100	3, 4, 25	12, 100								
Part Number												
222K121	24.0	24.0	24.0	14.0	10.4	5.6	25.0	25.0	8.5	1.3	0.5	1.7g
222K132	30.0	30.0	30.0	15.0	14.2	5.9	32.0	27.0	8.5	1.5	0.8	3.4g
222K142	31.0	31.0	31.0	18.0	18.0	7.1	39.0	31.0	15.0	1.8	1.0	5.8g
222K152	36.0	36.0	36.0	21.0	22.4	8.4	46.0	38.0	16.0	1.8	1.0	9.0g
222K163	43.0	43.0	43.0	25.0	28.2	9.9	55.0	45.0	17.5	2.0	1.0	14.2g
222K174	60.0	52.0	60.0	39.0	35.1	15.7	80.0	54.0	32.0	3.3	1.8	36.7g
222K185	66.0	66.0	66.0	42.0	44.5	16.8	108.0	68.0	48.0	3.8	2.0	-

All dimension in mm unless otherwise stated. Weight is based on polyolefin part
Injection and potting ports also available see part number system earlier in this section

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

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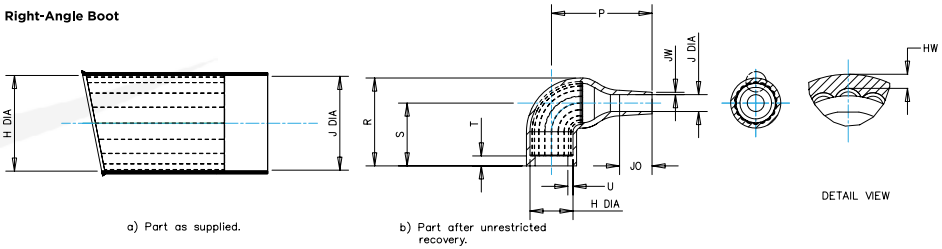
222K111-25L to 185-25L

InstaLite Lipped
Right Angle 90°, boot

up to 30% LIGHTER

INSTALITE moulded boots advanced materials science drives weight savings and reduces installation time, with high-performance heat shrink shape memory boots.

Right-Angle Boot



a) Part as supplied.

b) Part after unrestricted recovery.

InstaLite **Product Dimensions Selection Table**

	Dim. Supplied		Dimensions After Recovery							Avg. Weight Saving
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	HW ±20%	JW min	
Part Number										
202K121-25L	24.0	24.0	10.4	5.6	25.0	25.0	19.0	1.3	0.9	30%
202K132-25L	30.0	30.0	14.2	5.9	32.0	27.0	20.0	1.3	1.0	26%
202K142-25L	31.0	31.0	18.0	7.1	39.0	31.0	21.0	1.2	1.0	21%
202K153-25L	36.0	36.0	22.4	8.4	46.0	38.0	26.0	1.5	1.0	26%
202K163-25L	43.0	43.0	28.2	9.9	55.0	45.0	30.0	2.0	1.2	21%
202K174-25L	60.0	60.0	35.1	15.7	80.0	54.0	35.0	2.3	1.5	23%
202K185-25L	66.0	66.0	44.5	16.8	108.0	68.0	42.0	1.8	2.0	25%

All dimensions in mm unless otherwise stated.

INSTALITE boots are a lighter weight alternative to our standard -25 heat shrink boots. Utilising fluid-resistant modified elastomers, the Instalite boots offer semi-rigid, abrasion resistant boots that are up to 30% lighter than standard -25 boots.

The boots offer the same balance of high temperature fluid resistance and long term heat resistance as the standard modified elastomer boots.

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1125

202S121 to 174

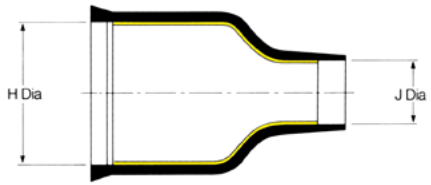
Lipped
Straight, Rayaten® Screened boot

Ideally suited for harness applications where high levels of screening are required between the cable and connector.

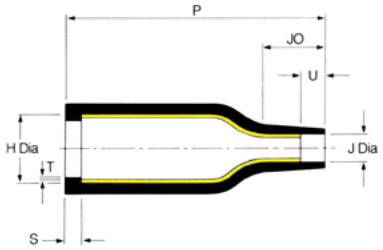
Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- When ordering specify the product name, size, material and modifications required, as per Part Number System.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

As supplied



After Recovery



Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery								
Dimension	H		J		H	J	P ±10%	R ±10%	S ±10%	T ±10%	U ±10%	JO ±10%	Weight
Material	3, 25	100	3, 25	100									
Part Number													
202S121	20.0	14.0	11.0	10.0	10.4	5.0	45.0	17.0	3.0	1.0	10.0	15.0	4.0g
202S132	24.0	20.0	15.0	12.0	14.2	6.0	60.0	28.0	3.0	1.0	10.0	17.0	7.2g
202S142	31.0	26.0	18.0	14.0	18.0	7.2	72.0	32.0	3.0	1.0	10.0	20.0	10.6g
202S152	36.0	32.0	22.0	20.0	22.4	8.5	85.0	31.0	3.0	1.0	15.0	25.0	15.8g
202S163	43.0	38.0	26.0	24.0	28.2	10.0	110.0	50.0	3.0	1.3	20.0	30.0	27.5g
202S174	47.0	41.0	36.0	32.0	35.1	15.8	135.0	70.0	3.0	1.3	20.0	30.0	70.3g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part

Materials Available

Material	Material Description
-3C previously 3S	Semi-rigid polyolefin
-25C previously 25S	Fluid resistant elastomer
-100C previously 100S	Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

Electrically Conductive Adhesive

The recommended conductive adhesive to be used with screened moulded parts is S-1184 (ordered separately) and can be found in the Adhesives and Tapes section of this catalogue. Installation code of Practice guide is available on request.

Environmental Sealing Adhesives

A choice of environmental sealing adhesives are available as either a pre-coat or user applied adhesive, see table above. For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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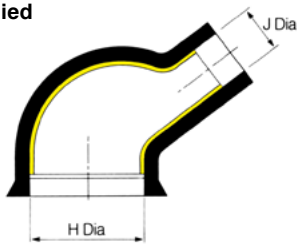
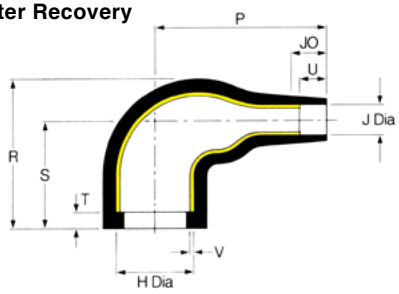
222S121 to 174

Lipped
Right Angle 90°, Rayaten® Screened boot

As supplied



After Recovery



Ideally suited for harness applications where high levels of screening are required between the cable and connector.

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- When ordering specify the product name, size, material and modifications required, as per Part Number System.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

Product Dimensions Selection Table

	Dimensions as Supplied				Dimensions After Recovery								
Dimension	H		J		H	J	P ±10%	R ±10%	S ±10%	T ±10%	U ±10%	JO ±10%	Weight
Material	3, 25	100	3, 25	100									
Part Number													
222S121	20.0	14.0	11.0	10.0	10.4	5.0	30.0	25.0	19.0	3.0	10.0	15.0	4.0g
222S132	24.0	20.0	15.0	12.0	14.2	6.0	38.0	28.0	20.0	3.0	10.0	17.0	4.7g
222S142	31.0	26.0	18.0	14.0	18.0	7.2	42.0	31.0	21.0	3.0	10.0	18.0	9.2g
222S152	36.0	32.0	22.0	20.0	22.4	8.5	51.0	38.0	26.0	3.0	12.0	20.0	15.1g
222S163	43.0	38.0	26.0	24.0	28.2	10.0	67.0	45.0	30.0	3.0	20.0	28.0	27.6g
222S174	47.0	41.0	36.0	32.0	35.1	15.8	80.0	54.0	36.0	3.0	20.0	31.0	41.0g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part

Materials Available

Material	Material Description
-3C previously 3S	Semi-rigid polyolefin
-25C previously 25S	Fluid resistant elastomer
-100C previously 100S	Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

Electrically Conductive Adhesive

The recommended conductive adhesive to be used with screened moulded parts is S-1184 (ordered separately) and can be found in the Adhesives and Tapes section of this catalogue. Installation code of Practice guide is available on request.

Environmental Sealing Adhesives

A choice of environmental sealing adhesives are available as either a pre-coat or user applied adhesive, see table above. For more information on materials and adhesives, please refer to relevant sections of this catalogue.

202D921 to 963

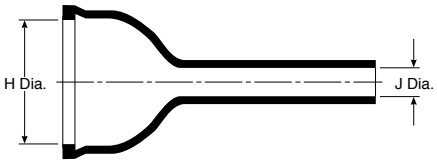
Lipped
Straight, long tail boot

Mechanical protection and cable connector strain relief. Ideal for applications where only a small number of contacts are utilised, resulting in the need for a high ratio boot to match the connector to cable diameter.

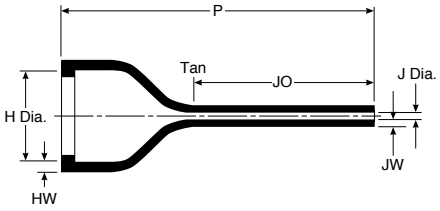
Ordering Information

- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

As supplied



After Recovery



Product Dimensions Selection Table

	Dimensions as Supplied			Dimensions After Recovery						
Dimension	H	J		H	J	P ±10%	JO ±10%	HW ±10%	JW ±20%	Weight
Material	All	3, 4, 25	12, 100							
Part Number										
202D921	19.3	6.3	4.5	13.0	2.1	60.2	37.6	1.52	1.14	1.9g
202D932	26.1	7.6	5.5	19.1	2.6	74.2	45.0	1.78	1.14	3.7g
202D953	34.2	9.6	6.6	26.0	3.1	84.3	51.1	1.78	1.14	6.4g
202D963	43.6	11.4	7.8	34.1	3.6	99.6	57.7	1.78	1.14	13.0g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Injection and potting ports also available see part number system earlier in this section

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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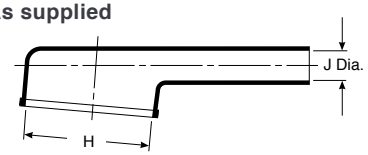
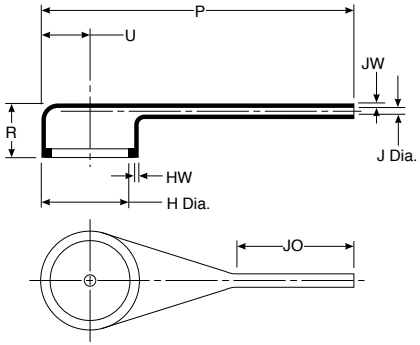
222D921 to 963

Lipped
Right Angle 90°, long tail boot

As supplied



After Recovery



Mechanical protection and cable connector strain relief. Ideal for applications where only a small number of contacts are utilised, resulting in the need for a high ratio boot to match the connector to cable diameter.

Ordering Information

- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.
- Moulded parts are individually packaged.
- Dimensions apply to all available materials unless otherwise stated.

Product Dimensions Selection Table

	Dimensions as Supplied			Dimensions After Recovery								
Dimension	H	J		H	J	P ±10%	R ±10%	U ±10%	JO ±10%	HW ±10%	JW ±10%	Weight
Material	All	3, 4, 25	12, 100									
Part Number												
222D921	19.3	6.3	4.5	13.0	2.1	44.5	16.3	5.6	21.8	1.52	1.14	1.9G
222D932	26.1	7.6	5.6	19.1	2.6	67.3	18.0	8.4	29.2	1.78	1.14	3.7G
222D953	34.2	9.6	6.6	26.0	3.0	81.3	18.8	11.4	36.3	1.78	1.14	6.4G
222D963	43.6	11.4	7.8	34.1	3.6	115.6	21.3	15.5	47.0	1.78	1.14	13.0G

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Injection and potting ports also available see part number system earlier in this section

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

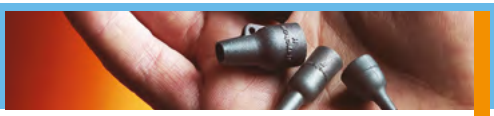
Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

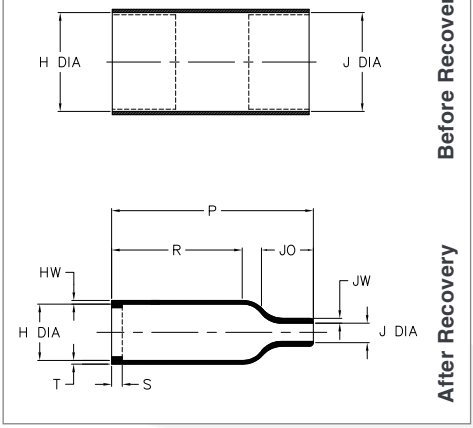
For more information on materials and adhesives, please refer to relevant sections of this catalogue.

Micro Moulded Boots

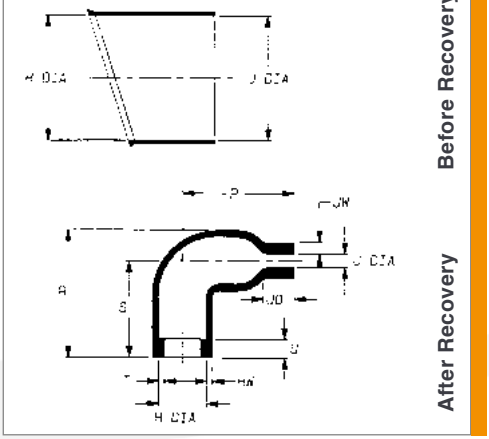
Lipped
Straight and Right Angle 90° boots



202A111-xx-G07



222A111-xx-G07



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery								
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	T ±20%	JO ±20%	JW ±20%	HW ±20%
Material	25,12*										
Part Number											
202A111-xx-G07	17	17	7.9	2.2	25	14	3.0	1.0	6.0	1.7	1.0
222A111-xx-G07	18	18	7.9	2.2	17	20	15.5	1.7	5.0	1.7	1.0

Note * Please check dimensions for -12 material as may differ, as supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-12	Fluoro-elastomer
-25	Fluid resistant elastomer

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1255-04
/225	S-1017 or S-1048 or S-1125

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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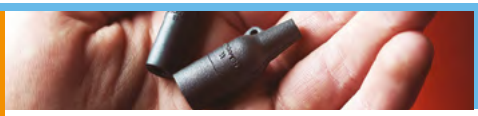
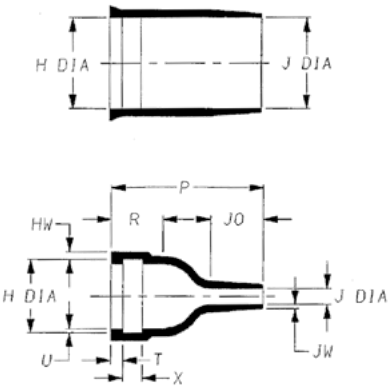


Micro Moulded Boots

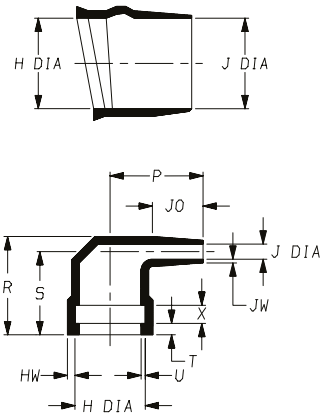
Lipped

Straight and Right Angle 90° boots

204W221-xx



224W221-xx



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery										
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	T ±10%	U ±10%	X ±10%	JO ±10%	HW ±20%	JW ±20%
Material	25,12*												
Part Number													
204W221-xx	11	11	9.3	2.1	19	6.5	-	1.5	0.55	2.4	6.6	1.0	0.5
224W221-xx	11	11	9.3	2.1	12.3	13	11	1.5	0.55	2.4	6.6	1.0	0.5

Note * Please check dimensions for -12 material as may differ, as supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-12	Fluoro-elastomer
-25	Fluid resistant elastomer

Environmental Adhesives Available

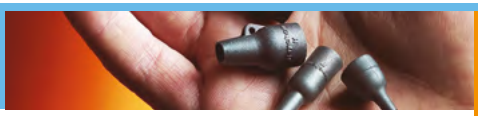
Optional Pre-coat	Optional User Applied
/225	S-1255-04
/225	S-1017 or S-1048 or S-1125

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

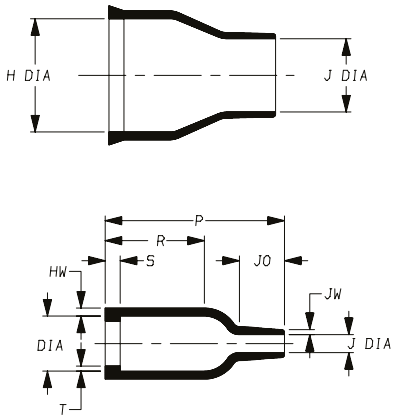
Micro Moulded Boots

Lipped

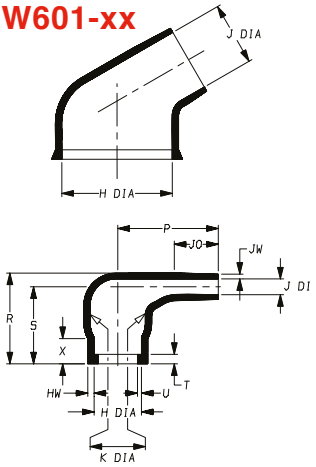
Straight and Right Angle 90° boots



203W301-xx-G02



223W601-xx



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery											
Dimension	H	J	H	J	K	P ±10%	R ±10%	S ±10%	T ±10%	U ±10%	JO ±10%	HW ±20%	JW ±20%	X ±20%
Material	25, 12*													
Part Number														
203W301-xx-G02	10	6.0	5.8	2.2	-	19	11	1.5	0.5	-	4.5	0.8	0.5	-
223W601-xx	10	6.0	6.3	2.0	7.4	12.5	11.5	9.8	1.2	0.5	6.0	1.0	0.6	3.2

Note * Please check dimensions for -12 material as may differ, as supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-12	Fluoro-elastomer
-25	Fluid resistant elastomer

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1255-04
/225	S-1017 or S-1048 or S-1125

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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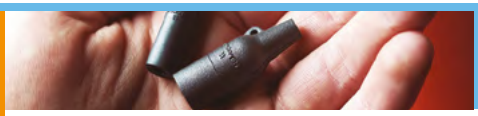
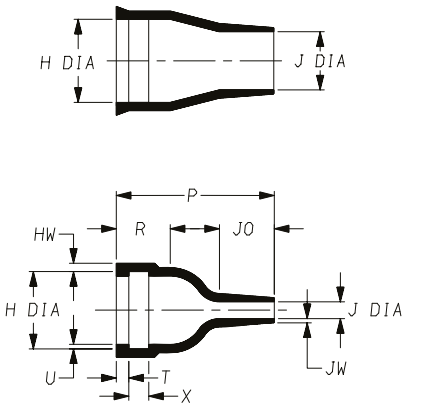


Micro Moulded Boots

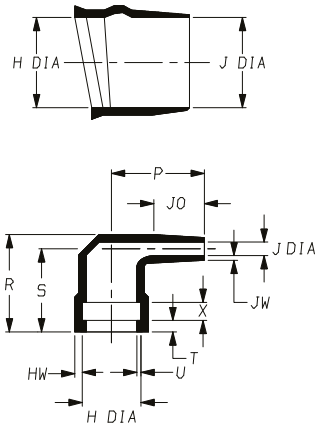
Lipped

Straight and Right Angle 90° boots

204W221-xx-G03



224W221-xx-G03



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery										
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	T ±10%	U ±10%	X ±10%	JO ±10%	HW ±20%	JW ±20%
Material	25,12*												
Part Number													
204W221-xx-G03	11	11	7.8	1.9	19	6.5		1.5	0.55	2.4	6.6	1.1	0.5
224W221-xx-G03	11	11	7.8	1.9	12.3	13	11	1.5	0.55	2.4	6.6	1.0	0.6

Note * Please check dimensions for -12 material as may differ, as supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-12	Fluoro-elastomer
-25	Fluid resistant elastomer

Environmental Adhesives Available

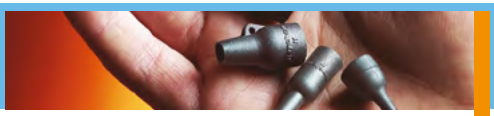
Optional Pre-coat	Optional User Applied
/225	S-1255-04
/225	S-1017 or S-1048 or S-1125

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

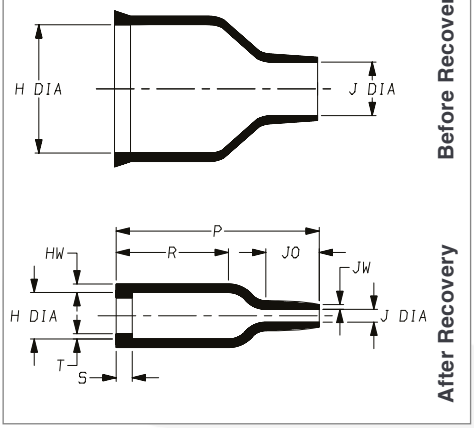
Micro Moulded Boots

Lipped

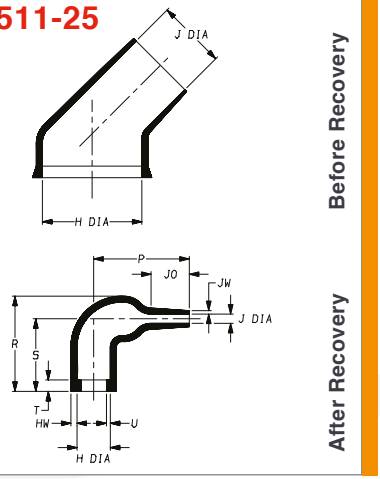
Straight and Right Angle 90° boots



204W511-25



224W511-25



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery									
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	T ±20%	U ±20%	JO ±20%	HW ±20%	JW ±20%
Material	25											
Part Number												
204W511-25	24	16	9.2	2.8	38	21	3.0	1.0	-	10	1.6	0.9
224W511-25	24	16	9.2	2.8	25	25	19	3.0	1.0	10	1.6	0.9

As supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-25	Fluid resistant elastomer

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1017 or S-1048 or S-1125

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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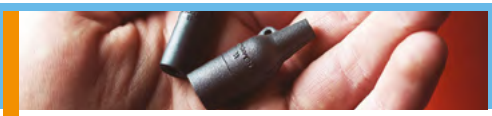
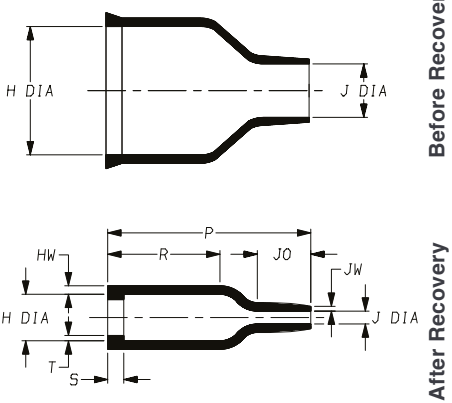


Micro Moulded Boots

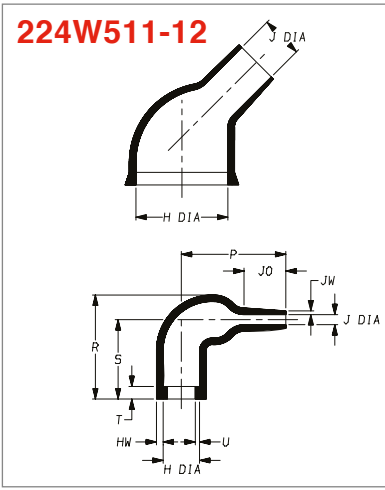
Lipped

Straight and Right Angle 90° boots

204W511-12



224W511-12



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery									
Dimension	H	J	H	J	P ±10%	R ±10%	S ±10%	T ±20%	U ±20%	JO ±20%	HW ±20%	JW ±20%
Material	12											
Part Number												
204W511-12	22	8.0	9.3	2.8	38	21	3.0	1.0	-	10	1.6	0.9
224W511-12	19	8.0	9.3	2.8	25	25	19	3.0	1.0	10	1.6	0.9

As supplied dimensions may be slightly reduced due to the nature of the material. After recovery sizes are not affected.
All dimensions in millimetres unless otherwise stated.

Materials Available

Material	Material Description
-12	Fluoro-elastomer

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/225	S-1255-04

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

301A011 to 048

Transitions

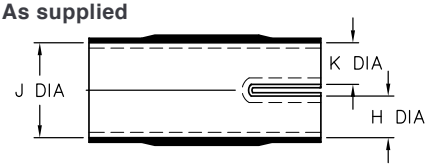
'T' Transition, heat shrink boots

Used for mechanical protection and cable strain relief. Ideal for cable harness applications where cable branches and breakouts are required.

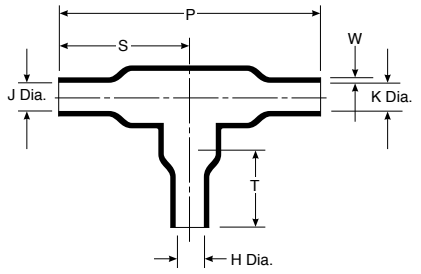
Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

As supplied



After Recovery



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery					
Dimension	J Nom.	H, K	H, J, K	P ±10%	S ±10%	T ±10%	W ±30%	Weight
Part Number								
301A011	12.0	6.6	3.6	29.7	15.1	-	1.0	0.9g
301A022	24.0	13.2	6.9	58.7	29.5	17.5	1.5	4.1g
301A034	48.0	26.9	13.5	120.1	60.2	35.6	2.3	31.3g
301A048	100.0	55.6	30.2	246.4	123.2	70.9	3.0	253.1g

All dimensions are in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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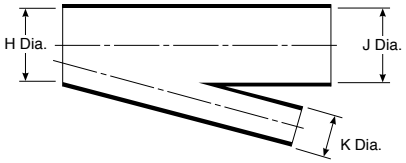
322A112 to 158

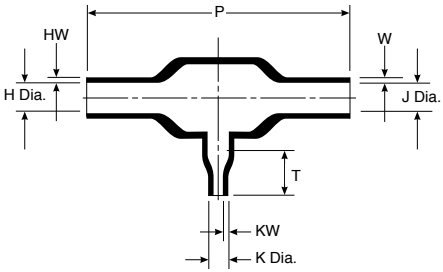
Transitions

'T' Transition, heat shrink boots

As supplied



After Recovery



Used for mechanical protection and cable strain relief. Ideal for cable harness applications where cable branches and breakouts are required.

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery							
Dimension	H, J	K	H, J	K	P ±10%	T ±10%	U ±10%	HW & JW ±20%	KW ±20%	Weight
Part Number										
322A112	13.2	6.6	6.9	3.6	49.3	19.6	19.6	1.52	1.02	2.7g
322A123	26.9	6.6	12.7	3.6	92.5	31.8	39.6	2.54	1.02	15.0g
322A134	26.9	13.2	13.7	6.1	144.8	50.8	50.8	2.54	1.52	20.9g
322A148	55.6	13.2	26.9	6.9	184.9	63.5	63.5	4.57	1.52	115g
322A158	55.6	26.9	26.9	13.7	203.5	66.0	66.0	4.57	2.54	164g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

342A012 to 058

Transitions

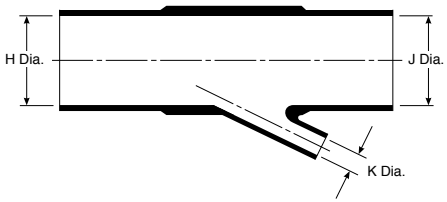
45° Transition, heat shrink boots

Used for mechanical protection and cable strain relief. Ideal for cable harness applications where cable branches and breakouts are required.

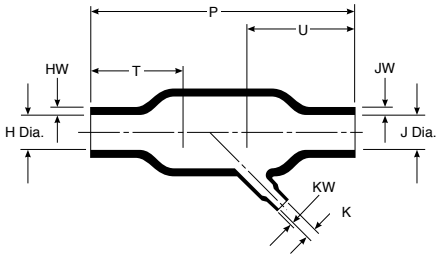
Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

As supplied



After Recovery



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery							
Dimension	H, J	K	H, J	K	P ±10%	T ±10%	U ±10%	HW & JW ±20%	KW ±20%	Weight
Part Number										
342A012	13.2	6.6	6.9	3.6	49.3	19.6	19.6	1.52	1.02	2.6g
342A024	26.9	6.6	12.7	3.6	92.5	31.8	39.6	2.54	1.02	16.1g
342A034	26.9	13.2	13.7	6.1	144.8	50.8	50.8	2.54	1.52	25.0g
342A048	55.6	13.2	26.9	6.9	184.9	63.5	63.5	4.57	1.52	124g
342A058	55.6	26.9	26.9	13.7	203.7	66.0	66.0	4.57	2.54	138g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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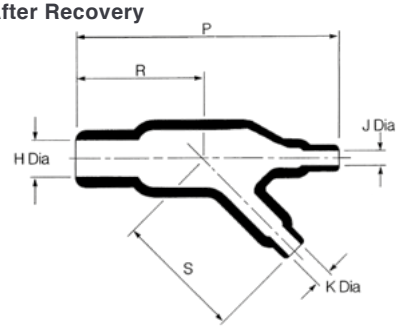
342A112 to 138

Transitions

45° Transition, heat shrink boots

As supplied

After Recovery



Used for mechanical protection and cable strain relief. Ideal for cable harness applications where cable branches and breakouts are required.

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery					
Dimension	H	J, K	H	J,K	P ±10%	R ±10%	S ±10%	Weight
Part Number								
342A112	13.2	6.6	6.1	3.0	45.0	23.0	21.0	2.3g
342A124	26.9	13.2	12.4	6.1	90.0	42.0	43.0	15.9g
342A138	55.6	26.9	25.4	12.4	183.0	96.0	86.0	122g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

362A014 to 114

Transitions

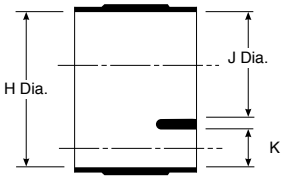
30° Transition, heat shrink boots

Used for mechanical protection and cable strain relief. Ideal for cable harness applications where cable branches and breakouts are required.

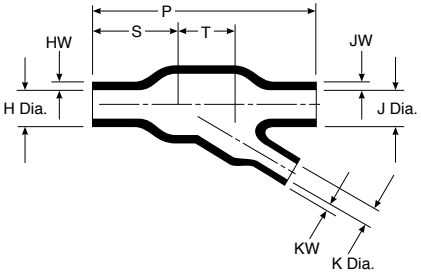
Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

As supplied



After Recovery



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery							
Dimension	H, J	K	H, J	K	P ±10%	S ±10%	T ±10%	HW & JW ±20%	KW ±20%	Weight
Part Number										
362A014	30.5	20.3	15.7	10.7	82.6	31.8	21.1	2.54	1.78	20.4g
362A024	35.6	15.2	18.3	8.6	63.5	19.1	22.4	2.54	1.52	13.3g
362A114	35.6	10.2	18.8	5.3	61.0	19.1	21.3	2.79	1.52	13.2g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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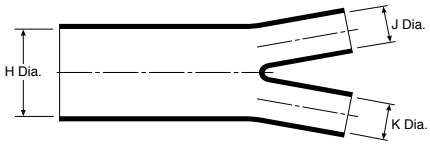
382A012 to 046

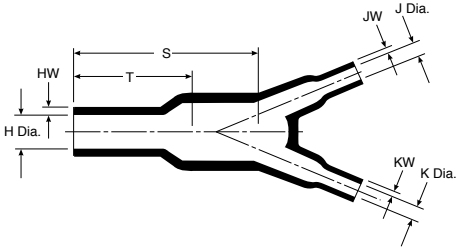
Transitions

'Y' Transition, heat shrink boots

As supplied



After Recovery



Used for mechanical protection and cable strain relief. Ideal for cable harness applications where balanced cable branches and breakouts are required.

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery						
Dimension	H	J, K	H	J,K	S ±10%	T ±10%	HW ±20%	JW & KW ±20%	Weight
Part Number									
382A012	13.2	6.6	6.1	3.3	23.9	15.5	1.52	1.02	1.7g
382A023	26.9	13.2	12.4	6.1	53.3	33.0	2.54	1.52	13.6g
382A034	38.6	26.9	18.0	12.4	78.7	55.9	3.05	2.54	55.5g
382A046	55.6	26.9	25.9	12.7	111.8	71.1	4.57	2.54	93.4g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

462A011 to 060

Transitions

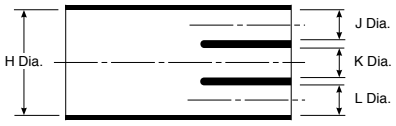
1 to 3 Transition, heat shrink boots

Used for mechanical protection and cable strain relief. Ideal for cable harness applications where multiple cable branches are required.

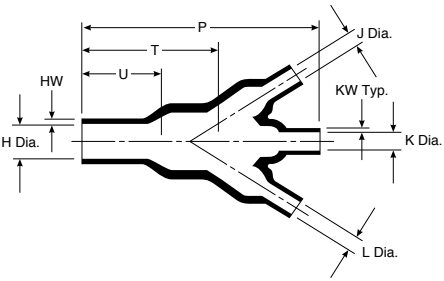
Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

As supplied



After Recovery



Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery							
Dimension	H	J, K, L	H	J, K, L	P ±10%	T ±10%	U ±10%	HW ±20%	KW ±10%	Weight
Part Number										
462A011	13.2	6.6	6.6	3.6	46.2	30.5	15.7	1.52	1.02	2.3g
462A023	26.9	13.2	13.2	6.9	93.2	57.2	33.0	2.54	1.52	16.2g
462A034	38.6	19.3	18.8	9.7	135.1	88.9	45.7	3.05	1.78	38.3g
462A046	55.6	26.9	25.4	12.4	192.0	121.9	71.1	4.57	3.05	143g
462A060	91.4	45.7	54.6	27.4	390.4	254.0	127.0	7.11	4.57	862g

All dimension in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injesction' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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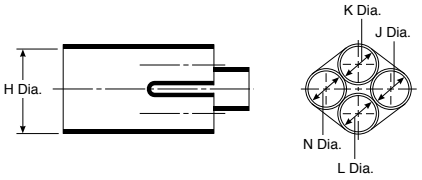
562A011 to 067

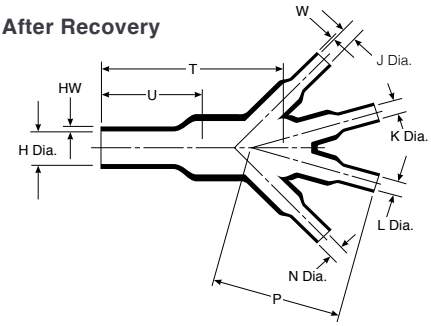
Transitions

1 to 4 Transition, heat shrink boots

As supplied



After Recovery



Used for mechanical protection and cable strain relief. Ideal for cable harness applications where multiple cable branches are required.

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually
- Please specify the product name, size, material, coating and any modifications required, as per Part Number System earlier in this section.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery							
Dimension	H	J, K, L, N	H	J, K, L, N	P ±10%	T ±10%	U ±10%	HW ±20%	W ±20%	Weight
Part Number										
562A011	13.2	6.6	6.9	3.4	24.1	43.9	18.0	1.52	1.02	3.6g
562A022	19.3	9.4	9.7	5.3	35.6	43.2	23.1	1.78	1.02	6.2g
562A032	19.3	13.2	9.7	6.9	49.3	50.5	25.4	1.78	1.52	13.6g
562A043	26.9	13.2	13.0	6.9	49.3	65.8	33.5	2.54	1.52	18.6g
562A054	38.6	19.3	18.5	9.7	71.9	95.3	46.5	3.05	1.78	54.4g
562A067	55.6	26.9	26.7	13.0	101.6	135.1	65.5	4.57	2.54	150g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part
Optional 'Injection' (S) and 'Vent' (T) ports indicated above, see part number system earlier in this section.

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

PD Caps

Polyolefin
Encapsulant lined, semi-rigid

Inexpensive way to encapsulate crimped electrical connections. Encapsulant lining melts and flows to fill surface irregularities of the substrate. These vibration proof caps are used to insulate and terminate dead-end electrical cables, fixtures, connectors and other electrical components.

Features & Benefits
- Rapid and simple installation
- Splash and moisture resistant

Operating Temperature
- From -55°C to +110°C

Installation
- Minimum shrink temperature +125°C
- Minimum full recovery +135°C

Specifications & Approvals
- UL E85381 600v, 125°C

Length Supplied		Inside Diameter		Wall Thickness	Part Number
Nominal Overall	Minimum Open Barrel	Maximum Supplied	Maximum Recovered	Nominal Recovered	
25.4	12.7	3.18	0.58	1.22	PD-CAP-1/8-0
25.4	15.2	4.75	1.52	1.57	PD-CAP-3/16-0
28.4	15.2	6.35	2.03	1.98	PD-CAP-1/4-0
31.8	18.3	9.53	2.29	2.08	PD-CAP-3/8-0
38.1	21.6	12.7	2.29	2.54	PD-CAP-1/2-0

Wall thickness will be less if tubing recovery is restricted during shrinkage.
All dimensions in millimetres unless otherwise stated.

As Supplied

Fully Recovered

Part Number Example; PD-CAP-1/4-0 6.35mm inside diameter, Black end cap.

Ordering Information

Standard colours: 0=Black
Size selection: The largest size that will recover snugly over the component(s).

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TC Caps

Polyolefin
Flame retardant

Widely used for wire terminations because of their light weight, small size and durability. Vibration-proof caps are used to insulate and terminate dead-end electrical cables, fixtures, connectors and other electrical equipment.

Features & Benefits
- 2.5:1 Shrink ratio
- Flame retardant
- Rapid and simple installation

Operating Temperature
- From -55°C to +135°C

Specifications & Approvals
- UL E85381 600v, 125°C

Installation
- Minimum shrink temperature +110°C
- Minimum full recovery +135°C

Length Supplied		Inside Diameter		Wall Thickness	Part Number
Nominal Overall	Minimum Open Barrel	Maximum Supplied	Maximum Recovered	Nominal Recovered	
19.1	10.2	1.6	0.8	0.51	TC-CAPS-4001-9
25.4	14.0	3.2	1.3	0.64	TC-CAPS-4003-2
28.6	14.0	6.4	2.5	0.69	TC-CAPS-4005-8

Wall thickness will be less if tubing recovery is restricted during shrinkage.
All dimensions in millimetres unless otherwise stated.

Part Number Example; TC-CAPS-4003-2 25.4mm inside diameter, Red end cap.

Ordering Information

Standard colour: 9=White, 2=Red, 8=Grey. One colour per size only, as per table
Size selection: The largest size that will recover snugly over the component(s).

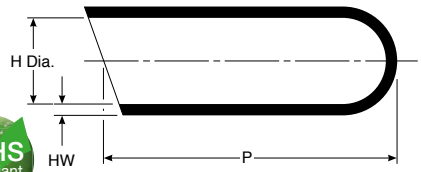
101A011 to 094

End Caps - Standard Wall
Heat shrinkable

Provide optimum water-proofing and environmental protection for underwater, underground, or outdoor applications. Highly resistant to moisture, fungus and weathering. Used for protecting cable and pipes, or capping unused outlets in transitions, providing an environmental seal when used with adhesive.

As supplied

After Recovery



RoHS compliant

Ordering Information

- Size selection please refer to table below.
- When ordering specify the product name, size, material, coating, as per Part Number System.
- Adhesive coating is optional. If added the entry dimensions will be reduced by 1.5mm.

Product Dimensions Selection Table

Dimensions as Supplied		Dimensions After Recovery		
Dimension	H	H	P Nom.	HW ±20%
Part Number				
101A011	5.1	2.00	22.90	1.02
101A021	7.40	3.30	25.40	1.27
101A031	10.20	4.80	30.50	1.52
101A041	15.20	6.40	40.60	1.78
101A062	25.40	11.40	68.80	2.29
101A083	50.80	22.90	101.60	2.79
101A094	83.80	38.10	114.30	3.05

All dimensions in mm unless otherwise stated

Materials Available

Material	Material Description
-3	Semi-rigid polyolefin
-4	Flexible polyolefin
-12	Fluoro-elastomer
-25	Fluid resistant elastomer
-100	Polyolefin, Zerohal

Environmental Adhesives Available

Optional Pre-coat	Optional User Applied
/42 or /86	S-1017 or S-1048
/42 or /86	S-1017 or S-1048
N/A	S-1255-04
/42 or /86 or /225	S-1017 or S-1048 or S-1125
/86 or /180	S-1048 or S-1030

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

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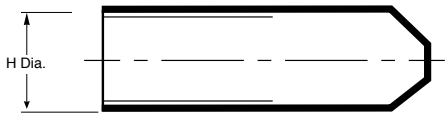
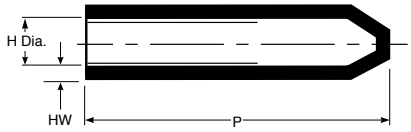
SSC-1 to 7

End Caps - Thick Wall
Heat shrinkable

As supplied



After Recovery



RoHS compliant

These SSC heat shrinkable end caps are made from a thermally stabilised modified polyolefin, which makes them highly resistant to moisture, fungus and weathering

- Electrical insulation to 1000 V
- Temperature rating -40°C to 85°C
- Minimum shrink temperature 121°C

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually

Other styles and derivatives are available to special order, please contact for details.

Product Dimensions Selection Table

Dimensions as Supplied		Dimensions After Recovery		
Dimension	H	H	P Nom.	HW ±20%
Part Number				
SSC-1-xx	10.00	4.00	33.50	2.00
SSC-2-xx	20.00	7.50	55.30	2.30
SSC-3-xx	35.00	15.00	89.90	3.00
SSC-4-xx	55.00	25.00	143.20	3.30
SSC-5-xx	75.00	32.00	150.10	3.30
SSC-6-xx	100.00	45.00	162.50	4.00
SSC-7-xx	120.00	70.00	145.00	3.80

All dimensions in mm unless otherwise stated

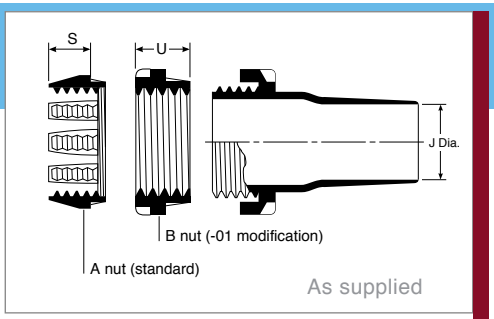
xx - Ordering Information

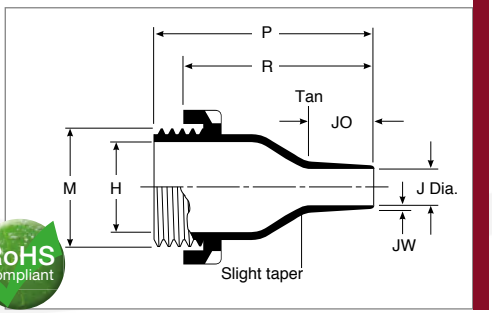
** Material	Material Description
XU	Sealing end cap, uncoated
X	Sealing end cap, with adhesive (standard)
XTV	Sealing end cap, with adhesive, plus c/w pressure valve

For more information on materials and adhesives, please refer to relevant sections of this catalogue.

207W213 to 256

Non-screened
Bulkhead Feedthrough





Feedthroughs provide an effective pressure seal when used with cables passing from pressurised to non-pressurised areas. Also provide excellent strain relief and bulkhead abrasion protection.

Ordering Information

- Standard colour Black (0).
- Packaged individually
- When ordering specify the product name, size, material, coating and modifications required, as per Part Number System.
- Adhesive coating is optional. If added the entry diameter will be reduced by nominal 1.5mm.

Part number example
207W234-25-01/86-0
Fluid resistant elastomer feedthrough (-25), with nut 'B' modification (-01), hot melt thermo-plastic adhesive (/86) and colour black.

Product Dimensions Selection Table

Dimensions as Supplied			Dimensions After Recovery								
Dimension	H	J	H	J	M Thread	P ±10%	R ±10%	S ±20%	U ±10%	JO ±10%	Weight
Part Number											
207W213	13.2	6.6	6.6	3.6	46.2	30.5	15.7	1.52	1.02	1.02	2.3g
207W223	26.9	13.2	13.2	6.9	93.2	57.2	33.0	2.54	1.52	1.52	16.2g
207W234	38.6	19.3	18.8	9.7	135.1	88.9	45.7	3.05	1.78	1.78	38.3g
207W245	55.6	26.9	25.4	12.4	192.0	121.9	71.1	4.57	3.05	3.05	143g
207W256	91.4	45.7	54.6	27.4	390.4	254.0	127.0	7.11	4.57	4.57	862g

All dimensions in mm unless otherwise stated. Weight is based on polyolefin part

Materials and Sealants Available

Material reference & description		Adhesive
-3	Semi-rigid polyolefin	/42 or /86
-4	Flexible polyolefin	/42 or /86
-25	Fluid resistant elastomer	/86 or /225
-100	Polyolefin, Zerohal	/86 or /180

For user applied adhesives please contact us

/42 Hot melt polyamide thermoplastic (60°C)
/180 Hot melt polyolefin (80°C)
/86 Hot melt thermoplastic (120°C)
/225 Curing epoxy/polyamide (+150°C)

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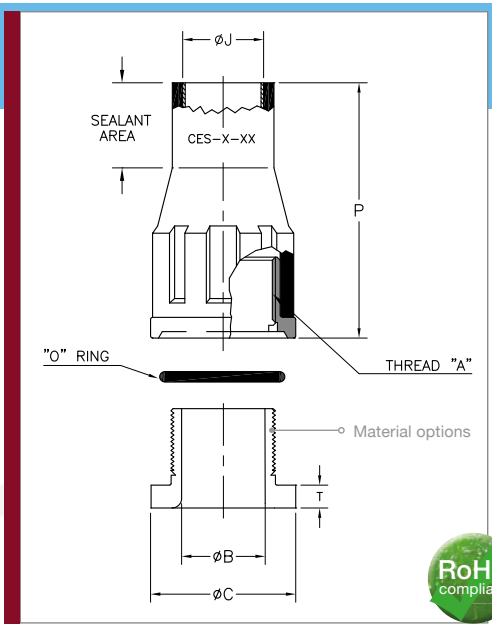
CES 1 to 5
Non-screened Bulkhead Feedthrough



RoHS compliant

Cable Entry Seals provide a watertight, fume tight seal where cables enter connection boxes, bulkheads or enclosures. Threaded single part assembly CES glands are also available.

- SAE-AS81765/1 Type 1
- Temperature rating -55°C to 90°C
- Minimum shrink temperature 121°C

Ordering Information

- Standard colour Black.
- Size selection please refer to table below.
- Packaged individually

Part number example

CES-3

Standard black nylon cable entry seal, with nose internal (J) diameter 30.48mm supplied and 12.7mm fully recovered.

CES-3-SS

Stainless steel cable entry seal version of CES-3 above

Other styles and derivatives, including multi leg variants and single piece male thread glands, are also available to special order, please contact us for details.

Product Dimensions Selection Table

Dimensions as Supplied		Dimensions After Recovery						
Dimension	J	J	"A Thread"	B ±0.5	C Ref.	P Ref.	T Ref.	Max Panel Thickness
Part Number								
CES-1-xx	12.7	4.07	1"-12 UNF	19.05	35.56	62.23	5.34	6.35
CES-2-xx	19.05	6.35	1"-12 UNF	19.05	35.56	62.23	5.34	6.35
CES-3-xx	30.48	12.7	1 3/8"-12 UNF	27.94	48.26	90.17	7.88	9.65
CES-4-xx	40.64	19.05	2"-8 UN	39.62	68.58	97.79	7.88	12.70
CES-5-xx	70.48	35.06	3 3/8"-8 UN	73.66	104.14	190.50	7.88	19.05

All dimensions in mm unless otherwise stated.

xx - Screw Gland Materials Available

Material	Material Description
Leave Blank	Standard black nylon material, omit the last two X's in the part number
AL	Aluminium 6061-T6 with finish of hard anodize per MIL-A-8652F, Type III, Class 2, Dyed black
SS	Stainless Steel type 316, with finish of passivate per ASTM-A967

TCFS and TCFR

Screened and Non-screened Bulkhead Feedthrough

Provides environmental sealing and screen continuity where a cable passes through a bulkhead.

The assembly consists of a specifically designed locknut and O-ring seal, onto the rear of which is pre-installed a heat-shrinkable moulded part.

Feedthrough installation is simply effected by tightening the locknut on the rear of the bulkhead, which compresses the O-ring and ensures that a knife-edge provides electrical contact between the assembly and bulkhead.

TCFS 12 62C - 0 20 100 A H

Part Numbering example

ADHESIVE SYSTEM
- E Epoxy (please contact us)
- H S1030 hot melt
- W S1048 hot melt

MOULDED PART TYPE
- A Straight unscreened
- B 90° unscreened
- C Straight screened
- D 45° screened
- E 90° screened (16 to 36 only)

MOULDED PART MATERIAL
- 25 Semi-rigid elastomer, or 25S if screened
- 100 Low fire hazard, or 100S if screened

THREAD LENGTH
- 20 Standard length (mm)

ASSEMBLY MODIFICATION CODE
- 0 Standard assembly
- 1 Double sided assembly
- 2 Same as 1 but with potting ports
- 3 locknut

MATERIAL and FINISH
See table opposite

SIZE - See product dimensions table

PART
- TCFR Full length moulded part
- TCFS Shortened moulded part (straight only)

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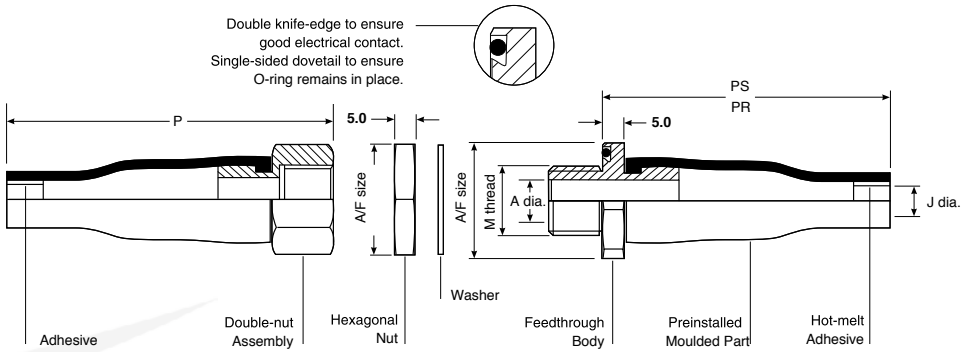


Product Dimensions

Feedthrough Size		J Diameter		M Thread	A Dia.	A/F		P ±10%			Hole Size
Short	Standard	Sup.	Rec.		Max.	Body	Nut	P	PS	PR	
TCFS-12	TCFR-12	6.5	5.0	M12 x 1.5	7.5	24	17	52	50	43	13.0
TCFS-16	TCFR-16	8.5	6.0	M16 x 1.5	10.2	29	22	57	65	48	17.0
TCFS-20	TCFR-20	10.5	7.2	M20 x 1.5	14.0	34	27	61	77	52	21.0
TCFS-24	TCFR-24	16.5	8.5	M24 x 1.5	19.2	38	30	74	90	65	25.0
TCFS-30	TCFR-30	20.5	10.0	M30 x 1.5	24.2	48	36	73	115	64	31.0
TCFS-36	TCFR-36	28.5	15.8	M36 x 1.5	30.2	52	41	104	140	95	37.0
-	TCFR-48	35.5	n/a	M48 x 1.5	40.2	67	55	144	110	135	50.0

PR dimension for shorter TCFR Series | Dimensions in millimetres unless otherwise stated.

S1030 Polyolefin Hot-Melt Adhesive
Operating temperature range -80ºC to +80ºC
Bonding temperature 120ºC
Excellent water blocking and low temperature

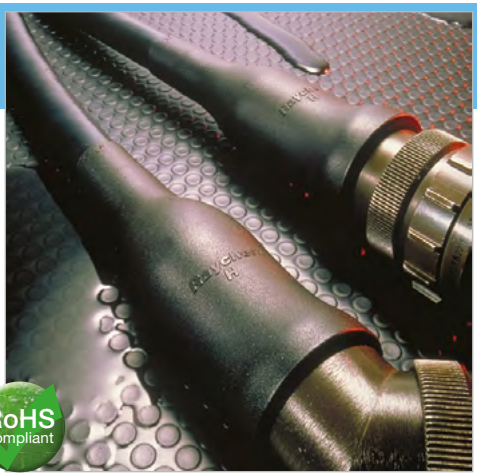
S1048 High Performance Hot-Melt Adhesive
Operating temperature range -55ºC to +120ºC
Bonding temperature 160ºC
Good solvent resistance but requires higher temperature to achieve bonding

Screened Versions
Screened versions provide shielding levels better than 80 dB at 100 MHz.

Material and Finish

Ref	Description
01W	Nickel aluminium bronze, shotblast
19B	Aluminium alloy - plated cadmium, olive drab, over electroless nickel
19C	Aluminium alloy - plated electroless nickel
62C	Stainless steel - plated electroless nickel

Material Selection



Moulded parts and shapes can be manufactured in a wide range of materials, allowing engineers and material specifiers to design electrical harness systems with optimum performance characteristics for any given application. Outlined below are the standard materials available for most moulded parts covered in this section, additional technical details are covered in more detail on the following pages.

Additional specialist materials are also available with details on request. For more information please contact us.

-3 Semi-rigid Polyolefin

A general purpose, heat-shrinkable semi-rigid and flame retardant polyolefin moulding compound.

- Operating temperature -55ºC to 135ºC
- Flame retardant
- Good resistance to fluid and heat
- UL224, E85381 & SAE-AS81765/1 Type I

-4 Flexible Polyolefin

A general purpose, heat-shrinkable flexible and flame retardant polyolefin moulding compound.

- Operating temperature -55ºC to 135ºC
- Flame retardant
- Good resistance to fluid and heat
- UL 224, E85381 & SAE-AS81765/1 Type II

-12 Modified Fluoro-elastomer

A high temperature, heat-shrinkable, flexible, flame-retarded, fluoro-elastomeric moulding compound.

- Operating temperature -55ºC to 200ºC
- Excellent long term fuel immersion resistance
- Fluid resistant and flexible
- Flame retardant

-25 Fluid Resistant Elastomer

A heat-shrinkable, fluid and temperature resistant, elastomeric moulding compound, designed to offer excellent performance in harsh environments.

- Operating temperature -75ºC to 150ºC
- Chemical and abrasion resistant
- Excellent high temperature fluid resistance
- Flame retardant

-100 Low Fire Hazard Material

A heat-shrinkable, semi-flexible, low-fire hazard moulding compound designed to offer excellent fire safety characteristics combined with low smoke and low acid gas emission.

- Operating temperature -30ºC to 105ºC
- Low smoke as defined BS G 198 part 5
- Low-toxicity index as defined by NES 713
- High-temperature index defined by ISO 4589-3
- Flame retardant

-3

Moulded Part Material
Semi-rigid modified Polyolefin

Designed for use in general harnessing applications where toughness is required and systems are occasionally exposed to fluids or heat. The adhesive-lined parts provide excellent sealing and strain relief at connector-cable terminations and transitions. A wide range of shapes are available in this material. The standard colour is black.

Operating Temperature

- From -55°C to 135°C

Installation

- Minimum shrink temperature 125°C
- Recommended shrink temperature 150°C

Specifications & Approvals

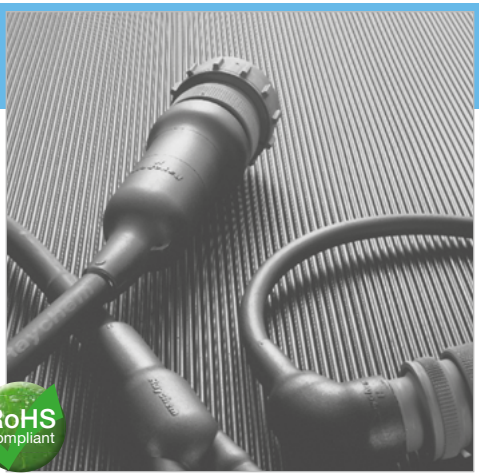
- UL-224, File E85381
- SAE-AS81765/1, Type I
- Def. Stan. 59-97 Issue 3 Type DA (Europe)
- BS-G-198-5-DA (Europe)

Product Characteristics, -3 material

		Specification Requirements	Test Method
Physical	Tensile strength	10.5 MPa (min)	ISO 37; ASTM D 412
	Ultimate elongation	250% (min)	ISO 37; ASTM D 412
	2% secant modulus	80 - 160 MPa	ASTM D 882
	Specific gravity	1.4 (max)	ISO 1183; ASTM D 792
Thermal	Heat aging for 168 hrs @ 175°C	Ultimate elongation 150% (min)	ISO 188, ISO 37
	Heat shock for 4 hrs @ 225°C	No dripping, cracking or flowing	ASTM D 2671
	Low temperature flex @ -55°C	No cracking during mandrel bend	RK-6703, CL 2.7: RT-301
	Flammability	Self-extinguishing	RK-6703, CL 2.8: ASTM D 635
Electrical	Electric strength	8 MV/m (min)	IEC 243
Water absorption	-	0.5% (max)	ISO 62
Fluid resistance	Aviation fuel F40	Tensile strength 8.5 MPa (min) Ultimate elongation 200% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 23°C
	Lubricating oil O-149	Tensile strength 8.5 MPa (min) Ultimate elongation 200% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 23°C
	Phosphate ester hydraulic fluid (DTD 900/4881 A)	Tensile strength 8.5 MPa (min) Ultimate elongation 200% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 23°C

-4

Moulded Part Material
Flexible Polyolefin



Designed for use in general harnessing applications where toughness is required and systems are occasionally exposed to fluids or heat. The adhesive-lined parts provide excellent sealing and strain relief at connector-cable terminations and transitions. A wide range of shapes are available in this material. The standard colour is black.

Operating Temperature

- From -55°C to 135°C

Installation

- Minimum shrink temperature 105°C
- Recommended shrink temperature 150°C

Specifications & Approvals

- UL-224, File E85381
- SAE-AS81765/1, Type II
- SAE-AS85049/ 140, 141, 142

Product Characteristics, -4 material

		Specification Requirements	Test Method
Physical	Tensile strength	1800 psi (min)	ASTM D 412
	Ultimate elongation	400% (min)	ASTM D 412
	Specific gravity	1.3 (max)	ASTM D 792
Thermal	Heat aging for 168 hrs @ 175°C	Ultimate elongation 300% (min)	RT 1304 Sec 4.3.3
	Heat shock for 4 hrs @ 225°C	No dripping, cracking or flowing	RT 1304 Sec 4.3.3
	Low temperature flex @ -55°C	No cracking during mandrel bend	RT 1304 Sec 4.3.3
	Flammability	Average flame time: 120 s (max)	ASTM D 635
Electrical	Dielectric strength	350 V/mil (min)	ASTM D 149
Water absorption	-	0.3% (max)	ASTM D 570
Fluid resistance	JP-4 fuel, aviation gasoline, water, hydraulic fluid	Tensile strength 8.5 MPa psi (min) Ultimate elongation 200% (min)	RT-1304 Sec 4.3.3

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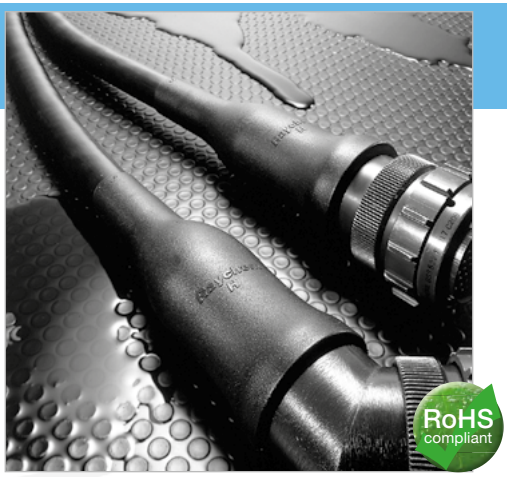
-12
Moulded Part Material
Modified Fluoroelastomer



Moulded parts and shapes with fluoroelastomers are designed to be used in conjunction with tubing made from fluoroelastomers or multi-conductor cable jackets and a suitable adhesive. This system provides excellent resistance to elevated temperatures and continuous fuel immersion. Available in a wide range of configurations, The standard colour is black.

Operating Temperature

- From -55ºC to 200ºC

Installation

- Minimum shrink temperature 175ºC
- Recommended shrink temperature 220ºC

Specifications & Approvals

- Def. Stan. 59-97 Issue 3 Type DD (Europe)
- BS-G-198-5-DD-P (Europe)
- SAE-AS81765/4
- SAE-AS85049/ 140, 141, 142

Product Characteristics, -12 material

		Specification Requirements	Test Method
Physical	Tensile strength	12.4 MPa (min)	ISO 37
	Ultimate elongation	300% (min)	ISO 37
	2% secant modulus	70 MPa (max)	ASTM D 882
	Specific gravity	1.95 (max)	ISO 1183
Thermal	Heat aging for 168 hrs @ 250ºC	Ultimate elongation 250% (min)	ISO 188, ISO 37
	Heat shock for 4 hrs @ 300ºC	No dripping, cracking or flowing	ASTM D 2671
	Low temperature flex @ -55ºC	No cracking during mandrel bend	ASTM D 2671
	Flammability	30 s (max)	ASTM D 635
Electrical	Electric strength	8 MV/m (min)	IEC 243
Water absorption	-	0.5% (max)	ISO 62
Fluid resistance	Aviation fuel F40	Tensile strength 11 MPa (min) Ultimate elongation 200% (min)	ISO 1817 after immersion for 24 hrs @ 23ºC
	Lubricating oil O-149	Tensile strength 11 MPa (min) Ultimate elongation 200% (min)	ISO 1817 after immersion for 24 hrs @ 23ºC
	Hydraulic fluid H515	Tensile strength 11 MPa (min) Ultimate elongation 200% (min)	ISO 1817 after immersion for 24 hrs @ 23ºC

-25 and -25L

Moulded Part Material
Fluid resistant modified Elastomer

Designed to be used in conjunction with components such as DR-25 tubing and S1125 adhesive. Being specifically formulated and designed to provide optimum high-temperature fluid resistance and long term heat resistance. This unique balance of properties makes -25 parts particularly suitable for sealing and strain relief at connector-cable terminations and cable to cable transitions on defence vehicle cables and harnesses. The standard colour is black.

Operating Temperature

- From -75°C to 150°C

Installation

- Minimum shrink temperature 135°C
- Recommended shrink temperature 150°C

Specifications & Approvals

- VG95343 Parts 6, 7, 8 and 9 (Europe)
- Def Stan 59-97, Issue 3, Type DE (Europe)
- BSG-198-5-DE-P
- SAE-AS85049/ 140, 141, 142

Product Characteristics, -25 Material

		Specification Requirements	Test Method
Physical	Tensile strength	15 MPa (min)	ASTM D 412
	Ultimate elongation	350% (min)	ASTM D 412
	Specific gravity	1.5 (max)	ASTM D 792
Thermal	Heat aging for 168 hrs @ 150°C	Ultimate elongation 300% (min)	ASTM D 412
	Heat shock for 4 hrs @ 225°C	No dripping, cracking or flowing	ASTM D 2671
	Low temperature flex @ -70°C	No cracking during mandrel bend	ASTM D 2671
	Flammability	120 s (max)	ASTM D 635
Electrical	Electric strength	8 MV/m (min)	ASTM D 149
Fluid resistance	Aviation fuel JP-4 (MIL-T-5624)	Tensile strength 12 MPa (min) Ultimate elongation 300% (min)	ASTM D 412 after immersion for 24 hrs @ 25°C
	Hydraulic fluid (MIL-H-6083)	Tensile strength 12 MPa (min) Ultimate elongation 300% (min)	ASTM D 412 after immersion for 24 hrs @ 25°C
	Diesel fuel (VV-F-800 No.2)	Tensile strength 12 MPa (min) Ultimate elongation 300% (min)	ASTM D 412 after immersion for 24 hrs @ 50°C
	Automotive gasoline (MIL-G-3056)	Tensile strength 12 MPa (min) Ultimate elongation 300% (min)	ASTM D 412 after immersion for 24 hrs @ 25°C

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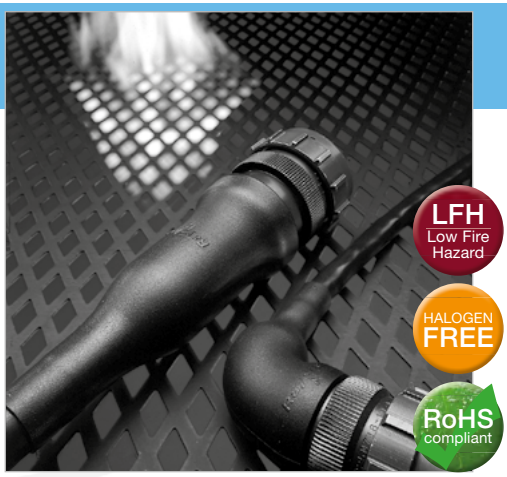
-100

Moulded Part Material
Semi-flexible low fire hazard



Designed for use with Zerohal cable and tubing for applications where hazard reduction in the event of fire is crucial. The material exhibits excellent fire safety characteristics plus low-smoke and low emission while retaining good mechanical and fluid resistant properties. Parts with adhesive lining provide location, sealing and strain relief of cable connector terminations and cable to cable transitions on harnesses used where there is a need to lower the risk. The standard colour is black.

Specifications & Approvals

- Def. Stan 59-97, Issue 3, Type DF (Europe)
- BSG 198 Part 5 Type DF (Europe)
- BR1326 listed Class C
- VG95343 Part 29 & 30

Operating Temperature

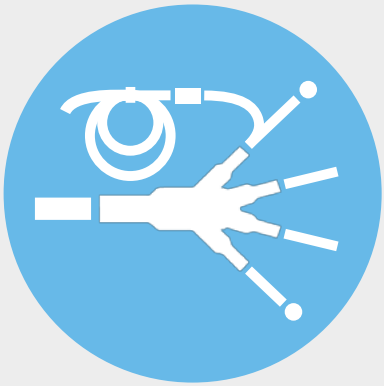
- From -30°C to 105°C

Installation

- Minimum shrink temperature 120°C
- Recommended shrink temperature 150°C

Product Characteristics, -100 material

		Specification Requirements	Test Method
Physical	Tensile strength	8 MPa (min)	ISO 37
	Ultimate elongation	200% (min)	ISO 37
	2% secant modulus	130 MPa (max)	ASTM D 882
	Specific gravity	1.5 (max)	ISO 1183
Thermal	Heat aging for 168 hrs @ 150°C	Ultimate elongation 150% (min)	ISO 188, ISO 37
	Heat shock for 4 hrs @ 225°C	No dripping, cracking or flowing	ASTM D 2671
	Low temperature flex @ -30°C	No cracking during mandrel bend	ASTM D 2671
Fire Safety Properties	Limiting oxygen index	29 min.	ISO 4589-2
	Temperature index	250°C (min)	ISO 4589-3
	Flammability	100 s (max.)	ASTM D 635
	Smoke index	20 (max.)	BSG 198 Part 5
	Toxicity index	5)max.) per 100g	NES 713
Electrical	Electric strength	15 MV/m (min)	IEC 243
Water absorption	-	0.75% (max.) @ 23°C 3.5% (max.) @ 70°C	ISO 62
Fluid resistance	ISO 1817 Gasoline fuel	Tensile strength 5 MPa (min) Ultimate elongation 150% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 23°C
	Lubricating oil O-149	Tensile strength 5 MPa (min) Ultimate elongation 150% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 50°C
	Hydraulic fluid H515	Tensile strength 5 MPa (min) Ultimate elongation 150% (min)	ISO 1817 and ISO 37 after immersion for 24 hrs @ 23°C



Repeatable and Consistent Quality, Inspect-ability, Convenience and Speed. Lower Installed Costs

Termination devices offer an inexpensive, single step, easy to use method of producing high quality wire splicing, solder crimp and sealing in one operation, strain relieving and coaxial shield terminations.

A large range of products are available, providing solutions for commercial to harsh environment applications, through to the high performance demands of the Aerospace and Motorsport markets.

Wire to Wire Splicing
Including single piece solder splice to crimp and heat shrink sleeve.

Terminals and Disconnects
DuraSeal® devices are simple and quick to install using a crimp tool and a heat source.

Wire Terminations to Pins, Posts and Tabs
One step solutions for wire connections to pins, posts, tabs and mass wire terminations.

Braid / Shield Termination
Screen grounding terminators offer sealed, insulated and encapsulated solder connection.

Coaxial Cable terminations
Coaxial cable terminators for coaxial cable applications, including printed circuit boards.

Cable to Cable Splicing Kits
SolderShield® wire splicing and shield continuity solutions in a heat-shrinkable insulation sleeve.

Shielded Connector Contacts
SolderTact® controlled soldering contacts help speed installation and reduce installed costs.

Databus Components
MIL-STD-1553B for multiplexing needs.

CONTENTS

Selection Guide

Overview

Application Type	Conductor: Solder	Conductor: Crimp	Conductor: Coil	Max Temp.	Product Description	Part Series
Wire to Wire Splicing	■			125°C	SolderSleeve wire splices	CWT-9000
	■			125°C	RoHS SolderSleeve wire splices	B-155
	■			150°C	SolderSleeve wire splices	D-1744
	■		■	125°C	SolderGrip closed end connector	SGRS
		■		125°C	DuraSeal crimp splices	D-406
		■		155°C	MiniSeal crimp splices	D-436
		■		200°C	MiniSeal crimp splices	D-200
Terminal Disconnects		■		125°C	DuraSeal crimp terminals & disconnects	B-106
	■		■	150°C	SolderGrip terminals	SGRT
Pin, Post & Tab	■			125°C	SolderSleeve wire terminators	CWT
	■			125°C	RoHS SolderSleeve wire terminators	B-155
	■			150°C	SolderSleeve wire terminators	D-129, D-141
Shield Termination	■			125°C	SolderSleeve shield terminators	CWT
	■				SolderSleeve shield terminators	B-15x
	■				RoHS SolderSleeve shield terminators	B-155
	■				NAS1747 SolderSleeve shield terminators	ST18
	■			150°C	NAS1747 SolderSleeve shield terminators	ST63
	■				SAE-AS83519 SolderSleeve shield terminators	SO63
	■				M83519, SolderSleeve shield terminators	S01, S02 & SO3
	■			175°C	SolderSleeve shield terminators	S096
	■				SolderSleeve shield terminators - Bi-alloy	SO175
	■			200°C	SolderSleeve shield terminators	S200
	■			260°C	SolderSleeve shield terminators	B-023
Coax Cable Termination	■			125°C	SolderSleeve coaxial cable terminators	CWT
	■				RoHS, SolderSleeve coaxial cable terminators	B-155
	■			150°C	SolderSleeve coaxial cable terminators	B-02x & B-04x
	■				SolderSleeve coaxial cable terminators	D-181
	■				SolderSleeve coaxial PCB terminators	D-607 & B-046
Cable to Cable Splicing	■	■		150°C	SolderShield cable splices - Multi-conductor	D-150
	■	■			SolderShield cable splices - Coaxial	D-150, B-202
Connector Contacts	■			150°C	SolderTact for MIL-DTL-26482	D-602
	■				SolderTact for MIL-DTL-28748	D-602, D-610
	■				SolderTact for MIL-DTL-38999 Series I, III, IV	D-602, D-610
	■				SolderTact for MIL-DTL-38999 Series II	D-602
	■				SolderTact for Sub-miniature	D-602
Databus				200°C	Databus micro-couplers - MIL-STD-1553B	D-500

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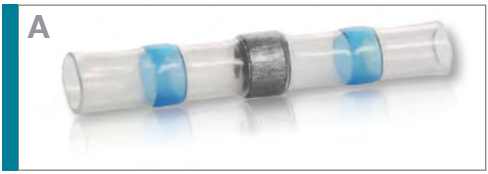
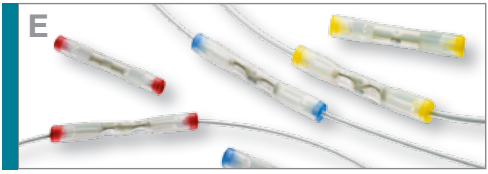


SolderSleeve Splicing Devices
CWT, B-155 and D-1744
For crimp free sealed wire to wire splicing. In a single step process they solder, insulate, encapsulate and strain-relieve wire to wire splices , in a wide range of wire sizes.

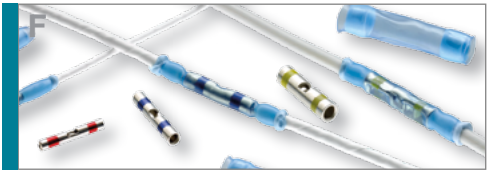
SolderGrip Closed End Connector
SGRS
Closed-end connector utilising a spiral copper coil that grips and compresses the conductors, allows pre-fluxed solder ring to flow to the centre of splicing area, resulting in a high-reliability, repeatable joint.

DuraSeal Heat-Shrinkable Crimp Splices
D-406
Designed for OEM harness fabricators, repair and maintenance, plus accessory installations. DuraSeal Nylon crimp splices provide watertight sealing and protection against corrosion, abrasion, and vibration.

MiniSeal Crimp Splices
D-436
Small, lightweight and low-profile MiniSeal high performance crimp splices, substantially reduce wire bundle size & weight, QPL listed to the MIL-S-81824 specification.



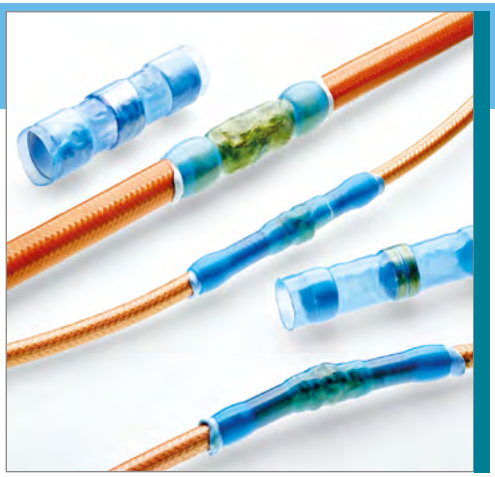
Cold Applied Splice
D-436-COLD
Simple one step immersion-resistant crimped in-line splice, that requires no heat. Ideal for Aerospace and Defence applications where performance and reliability is essential. With MIL-Spec approval.



200°C MiniSeal Crimp Splices
D-200
Small, lightweight, and low-profile MiniSeal high crimp splices, substantially reduce wire bundle size & weight, QPL listed to the MIL-S-81824 specification and are required by the MIL-W-5088 specification.

SolderSleeve®

Wire to Wire Splicing
Single Piece Solder Splice



SolderSleeve splicing devices which can be used to make sealed or unsealed splices in a single step they solder, insulate, encapsulate and strain relieve a wide range of wire sizes.

Features & Benefits

- Transparent PVDF (D-1744 Series) or Polyolefin (B-155 & CWT Series) sleeve provides encapsulation, inspectability, strain relief and insulation solution.
- Pre-fluxed solder preform provides a controlled soldering process.
- One piece design makes installation easy and lowers the installed cost.
- Thermo-chromic temperature indicator in the D1744 splices facilitates termination and inspection.

Specifications & Approvals

- CWT: UL E87681 and D-5023
- D-1744: NAS-1744 and RT-1404

Product Selection

Product Series	Minimum Wire Rating	Minimum Operating Temp'	Maximum Operating Temp'	Application Environment
CWT Series	85°C	-55°C	125°C	Splash-Proof
D-1744 Series	125°C	-55°C	150°C	Immersion Sealed
B-155	85°C	-55°C	125°C	RoHS Splash-Proof

Application 1:
If there is one size of wire per side and no more than two wires on either side:

- Determine wire gauge sizes for both sides of the splice being made.
- Determine number of wires (one or two wires) for each side of splice.
- Select part numbers from the appropriate table on the following two pages.

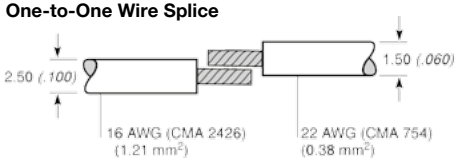
Application 2:
More than two wires on either side (or if you prefer sizes to work with CMA or mm^2 sizes):

- Turn to 'CMA/mm^2 Calculation' chart opposite to calculate the total cross section to be spliced.
- Use Splice Selection Guide to select sleeve recommended for that cross section

Notes:

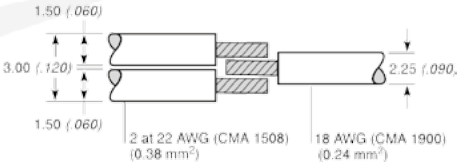
- While all combinations listed will provide satisfactory solder joints, the degree of strain relief obtained depends on the outer diameter of the wires being joined. Refer to Table D for the recommended size ranges for the sleeves.
- Wires 16 AWG (1.2mm^2) and larger, having more than 19 strands should be pre-tinned prior to splicing, to obtain the optimum solder joint quality.
- Part selection for wires 26 AWG (0.15mm^2) and smaller are also available, please contact us for further information or discuss particular needs.
- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector. See Application Equipment Section.

One-to-One Wire Splice



Total CMA = 3180
Total mm² =1.59
Correct part number selection from tables below (based on CMA/mm2 and nominal jacket wire OD) .
= CWT-9002, B-155-9002 or D-1744-02

Multiwire Splice



Total CMA = 3408
Total mm² =1.71
Correct part number selection from tables below (based on CMA/mm2 and nominal jacket wire OD) .
= CWT-9003, B-155-9003 or D-1744-03

CMA/mm² Calculation

To calculate the total circular mil or mm² area of the conductors to be terminated in a single splice, follow these steps:

1. Choose either CMA or mm² as your unit of measure for selection purposes and continue to use it for all your criteria.
2. List the CMA or mm² for each conductor that will go into the same splice (to assist you, refer to 'Size Selection Guide' table, which provides the CMA of typical conductors).
3. Add together the values thus listed, to obtain the total area.
4. From 'Splice Selection Guide' table below, select the part number recommended for the total CMA or mm² you have calculated.
5. Refer to the examples on this page for further clarification

Size Selection Guide

AWG	28	26	24	22	20	18	16	14	12
CMA	177	304	475	754	1216	900	2426	3831	5874
mm²	0.09	0.16	0.24	0.38	0.62	0.96	1.23	1.94	2.97

Splice Selection Guide

Product Series	Wire Jacket OD mm		CMA Combined Total		mm² Combined Total	
	Min.	Max.	Min.	Max.	Min.	Max.
CWT-9001 & B-155-9001	0.4	1.7	450	1500	0.3	0.8
CWT-9002 & B-155-9002	1.3	2.7	1250	3500	0.8	2.0
CWT-9003 & B-155-9003	1.8	4.5	2500	7200	2.0	4.0
CWT-9004 & B-155-9004	2.8	6.0	6100	19000	4.0	6.0
CWT-9005 & B-155-9005	3.2	7.0	12000	25000	6.0	10.0
D-1744-01	0.5	1.9	350	2000	-	-
D-1744-02	0.8	2.8	2000	4000	-	-
D-1744-03	1.3	4.6	4000	10000	-	-
D-1744-04	2.0	7.11	10000	13000	-	-

SolderSleeve®

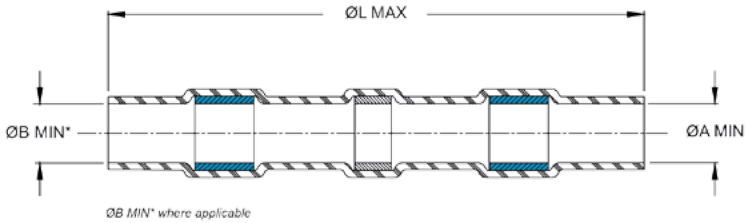
Wire to Wire Splicing
Single Piece Solder Splice

Material

Product Characteristics	Product Performance
Insulation (D-1744)	Radiation cross linked, heat shrinkable polyvinylidene fluoride
Insulation (CWT, B-155)	Radiation cross linked, heat shrinkable polyolefin
Solder and flux (D-1744)	Solder: Sn63 Pb37 Flux: ROL1 per ANSI-J-004
Solder and flux (CWT)	Solder: Sn50 Pb32 Cd18 Flux: ROM1 per ANSI-J-004
Solder and flux (B-155)	Solder: Sn42 Bi58 Flux: ROM1 per ANSI-J-004
Melt-able inserts (B-155, D-1744 & CWT)	Meltable thermoplastic

Typical Performance

Product Characteristics	Product Performance
Voltage drop	2.0 mV
Tensile strength	Exceeds strength of conductor
Dielectric strength	2.0 kV
Temperature rating (B-155, CWT)	-55°C to +125°C
Temperature rating (D-1744)	-55°C to +150°C
Insulation resistance	1000 megohms



Product Selection

Part Number Ref	ØL (mm)	ØA (mm)	ØB (mm)	Colour Code
CWT-9001 & B-155-9001	26.00	1.70	n/a	Clear
CWT-9002 & B-155-9002	42.00	2.70	n/a	Red
CWT-9003 & B-155-9003	42.00	4.50	n/a	Blue
CWT-9004 & B-155-9004	42.00	6.00	n/a	Yellow
CWT-9005 & B-155-9005	42.00	7.00	n/a	Grey
D-1744-01	29.70	1.90	2.40	n/a
D-1744-02	30.15	2.80	3.15	n/a
D-1744-03	29.60	4.60	5.10	n/a
D-1744-04	30.00	7.11	7.62	n/a

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CWT Series Selection Guide - Two Tables

End A Size & No. of Conductors		End B: Size & Number of Conductors							
		26 AWG		24 AWG		22 AWG		20 AWG	
		1	2	1	2	1	2	1	2
26 AWG	1	CWT-9001	CWT-9001	CWT-9001	CWT-9001	CWT-9001	CWT-9002	CWT-9002	CWT-9002
	2	CWT-9001	CWT-9001	CWT-9001	CWT-9002	CWT-9001	CWT-9002	CWT-9002	CWT-9002
24 AWG	1	CWT-9001	CWT-9001	CWT-9001	CWT-9001	CWT-9001	CWT-9002	CWT-9002	CWT-9002
	2	CWT-9001	CWT-9002	CWT-9001	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002
22 AWG	1	CWT-9001	CWT-9001	CWT-9001	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002
	2	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9003
20 AWG	1	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9003
	2	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9003	CWT-9003	CWT-9003
18 AWG	1	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9003
	2	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003
16 AWG	1	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9002	CWT-9003	CWT-9003	CWT-9003
	2	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003
14 AWG	1	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003
	2	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9004
12 AWG	1	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004
	2	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005
10 AWG	1	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005

End A Size & No. of Conductors		End B: Size & Number of Conductors								
		18 AWG		16 AWG		14 AWG		12 AWG		10 AWG
		1	2	1	2	1	2	1	2	1
26 AWG	1	CWT-9002	CWT-9003	CWT-9002	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
	2	CWT-9002	CWT-9003	CWT-9002	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
24 AWG	1	CWT-9002	CWT-9003	CWT-9002	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
	2	CWT-9002	CWT-9003	CWT-9002	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
22 AWG	1	CWT-9002	CWT-9003	CWT-9002	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
	2	CWT-9002	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
20 AWG	1	CWT-9002	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9005	CWT-9005
	2	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9005
18 AWG	1	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9005
	2	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9005
16 AWG	1	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9005
	2	CWT-9003	CWT-9004	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9004	CWT-9005	CWT-9005
14 AWG	1	CWT-9003	CWT-9003	CWT-9003	CWT-9004	CWT-9003	CWT-9004	CWT-9004	CWT-9005	CWT-9005
	2	CWT-9004	CWT-9004	CWT-9004	CWT-9005	CWT-9004	CWT-9005	CWT-9005	CWT-9005	CWT-9005
12 AWG	1	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9004	CWT-9005	CWT-9004	CWT-9005	CWT-9005
	2	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005
10 AWG	1	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005

B-155 Series SolderSleeve®

RoHS Wire to Wire Splicing
Single Piece Solder Splice

B-155 Series Selection Guide

RoHS compliant

End A Size & No. of Conductors		End B: Size & Number of Conductors							
		26 AWG		24 AWG		22 AWG		20 AWG	
		1	2	1	2	1	2	1	2
26 AWG	1	B-155-9001	B-155-9001	B-155-9001	B-155-9001	B-155-9001	B-155-9002	B-155-9002	B-155-9002
	2	B-155-9001	B-155-9001	B-155-9001	B-155-9002	B-155-9001	B-155-9002	B-155-9002	B-155-9002
24 AWG	1	B-155-9001	B-155-9001	B-155-9001	B-155-9001	B-155-9001	B-155-9002	B-155-9002	B-155-9002
	2	B-155-9001	B-155-9002	B-155-9001	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002
22 AWG	1	B-155-9001	B-155-9001	B-155-9001	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002
	2	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9003
20 AWG	1	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9003
	2	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9003	B-155-9003	B-155-9003
18 AWG	1	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9003
	2	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003
16 AWG	1	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9002	B-155-9003	B-155-9003	B-155-9003
	2	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003
14 AWG	1	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003
	2	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9004
12 AWG	1	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9004
	2	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005
10 AWG	1	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005

End A Size & No. of Conductors		End B: Size & Number of Conductors								
		18 AWG		16 AWG		14 AWG		12 AWG		10 AWG
		1	2	1	2	1	2	1	2	1
26 AWG	1	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
	2	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
24 AWG	1	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
	2	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
22 AWG	1	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
	2	B-155-9002	B-155-9003	B-155-9002	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
20 AWG	1	B-155-9002	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9005
	2	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9004	B-155-9005	B-155-9005
18 AWG	1	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9004	B-155-9005	B-155-9005
	2	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9004	B-155-9004	B-155-9005	B-155-9005
16 AWG	1	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9004	B-155-9005	B-155-9005
	2	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9004	B-155-9005	B-155-9004	B-155-9005	B-155-9005
14 AWG	1	B-155-9003	B-155-9003	B-155-9003	B-155-9004	B-155-9003	B-155-9005	B-155-9004	B-155-9005	B-155-9005
	2	B-155-9004	B-155-9004	B-155-9004	B-155-9005	B-155-9004	B-155-9005	B-155-9005	B-155-9005	B-155-9005
12 AWG	1	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9004	B-155-9005	B-155-9004	B-155-9005	B-155-9005
	2	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005
10 AWG	1	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005	B-155-9005

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D-1744 Selection Guide

Side A Size & No. of Conductors		Side B: Size & Number of Conductors							
		26 AWG		24 AWG		22 AWG		20 AWG	
		1	2	1	2	1	2	1	2
26 AWG	1	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-02
	2	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-02	D-1744-01	D-1744-02
24 AWG	1	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-02
	2	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-02	D-1744-02	D-1744-02
22 AWG	1	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-01	D-1744-02	D-1744-01	D-1744-02
	2	D-1744-01	D-1744-02	D-1744-01	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02
20 AWG	1	D-1744-01	D-1744-01	D-1744-01	D-1744-02	D-1744-01	D-1744-02	D-1744-02	D-1744-02
	2	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-03
18 AWG	1	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-03
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03
16 AWG	1	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-02	D-1744-03
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03
14 AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04
12AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-04
	2	D-1744-04	D-1744-04	D-1744-04	-	D-1744-04	-	-	-

Side A Size & No. of Conductors		Side B: Size & Number of Conductors							
		18 AWG		16 AWG		14 AWG		12 AWG	
		1	2	1	2	1	2	1	2
26 AWG	1	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04
	2	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04
24 AWG	1	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04
	2	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	-
22 AWG	1	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04
	2	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	-
20 AWG	1	D-1744-02	D-1744-03	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-04	-
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-04	-
18 AWG	1	D-1744-02	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	-
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-03	-
16 AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-03	-
	2	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-04	-
14 AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-03	-
	2	D-1744-03	D-1744-04	D-1744-04	D-1744-04	D-1744-04	-	-	-
12AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-03	-	D-1744-04	-

SGRS Closed End Connector

SolderGrip®

Self Fixing Solder End

Features & Benefits

- PVDF insulation sleeve provides encapsulation, inspectability & strain relief.
- Spiral copper coil grips and compresses the conductors for the optimum solder connection.
- Pre-fluxed solder preform provides a controlled soldering process.
- The SGRS series has an adhesive insert to provide immersion sealing performance.
- One piece design.
- Accommodates a wide variety of conductor types, quantities and sizes.
- Colour coded for easy identification.

Solder & Flux Characteristics

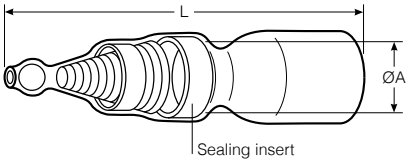
- Sn60 Pb40 with ROM 1flux per ANSI-J-STD-004

Specifications & Approvals

- UL CUL E87681
- RB-109

Part Number	Wire Range mm² (CMA)	Max. Current Rating	Length	Colour Code
SGRS-1	0.7 - 2.4 (1400 - 4800)	17 Amps	34.8mm	Green
SGRS-2	2.0 - 4.0 (4000 - 8000)	28 Amps	34.2mm	Red
SGRS-3	3.5 - 8.0 (7000 - 16000)	56 Amps	42.0mm	Blue
SGRS-4	7.5 - 12.0 (15000 - 24000)	84 Amps	41.5mm	Yellow

This product is also available as 'Ring Terminals', please see SGRT later in this section.



Product Characteristics	Product Performance
Voltage drop	<2.0mV
Tensile strength	Exceeds strength of individual conductors
Dielectric strength	2.0kV
Temperature rating	-55°C to +125°C
Insulation resistance after immersion	100 megaohms
Insulation performance	300 mbar (for specific combinations refer to RB-109)
Voltage rating	600V

Notes:

- To calculate mm² or CMA refer to page earlier in this section
- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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D-406 Series

DuraSeal®

Heat Shrinkable, Crimp Splice

Automotive wiring repair and maintenance
Automotive accessory installations
Marine electronics
Fleet maintenance
Commercial wiring
OEM Harness assembly

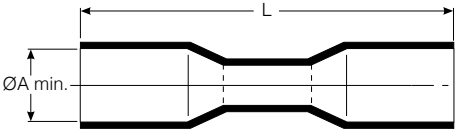
Features & Benefits

- Protects splices from water, condensation, salt and corrosion.
- Provides strain relief
- Protects against vibration in rugged environments
- Completely insulates and protects electrical connections
- Adhesive lining provides protection that is more reliable than conventional splices.

Specifications & Approvals

- UL CUL listed 9134, Fire E87681 (C)
- Lloyds listed, File 65 247 HH 02-93
- RB-107

Part Number		Conductor Size		Splice Dimension		Colour
Bulk	Boxed	AWG	mm²	AØ	L	
D-406-0001	D-406-0001CS100	22 - 18	0.50 - 1.00	3.7	31.5	Red
D-406-0002	D-406-0002CS100	16 - 14	1.50 - 2.50	4.6	31.5	Blue
D-406-0003	D-406-0003CS50	12 - 10	3.00 - 6.00	6.5	37.5	Yellow



Product Characteristics	Product Performance
Operating temperature	-55°C to +125°C
Shrink ratio	Approximately 2:1
Physical properties	Cut through resistance 31 kg
	Wire pull out Red 11.3 kg; Blue 22.7 kg; Yellow 27.2 kg
	No cracking after heat aging for 168h @ 160°C
Chemical Resistance	Solvent resistance: Isopropyl alcohol, trichloroethylene, gasoline, battery acid, diesel fuel, motor oil, antifreeze, brake fluid, 5% salt water
Electrical properties	Dielectric strength: 2500 Vac
	Insulation resistance: 1,000 MΩ at 100VDC

Notes:

- Bulk packs contain 1000 pieces for D-406-0001 & D-406-0002 and 500 pieces for D-406-0003.
- Boxes contain 100 pieces for D-406-0001 & D-406-0002, and 50 pieces for D-406-0003.
- Application tooling: Heat guns with the correct reflector added, together with crimp tools.

D-436 Series MiniSeal®

Wire to Wire Splicing
Heat Shrinkable, Crimp Splice

RoHS compliant

Used for wire splicing where size, weight and environmental sealing are critical. MiniSeal crimp splices consist of a plated copper crimp barrel and a separate sealing sleeve. They can be used on a combination of wires, from 1:1 to 10:10 (sealing inserts may be required).

Features & Benefits

- Immersion-resistant crimp splices
- Splices are smaller and lighter than comparable termination products.
- Transparent heat-shrinkable insulation provides protection & strain relief.
- Splice provides sealing to un-etched wire insulations, including Teflon®.
- Low total installation cost.
- Available as both 'Butt' (in-line) splice or 'Stub' (parallel) splice.

Specifications & Approvals

- SAE-AS-81824/1 for D-436-36/37/38
- MIL spec M8184/1

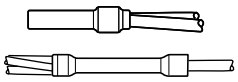
Table A: CMA of Typical Conductors

AWG	28	26	24	22	20	18	16	14	12
CMA	177	304	475	754	1216	1900	2426	3831	5874
mm2	0.09	0.16	0.24	0.38	0.62	0.96	1.23	1.94	2.97

Part Number	MIL Spec Equivalent	mm² Range	Wire Range	Colour Code
D-436-36	M81824/-1-1	0.15 - 0.75	26 - 20 AWG	Red
D-436-37	M81824/-1-2	0.39 - 1.34	20 -16 AWG	Blue
D-436-38	M81824/-1-3	0.95 - 3.37	16 - 12 AWG	Yellow

Product Selection Process

- Determine the type of splice required -
  Stub (parallel) or
  Butt (in-line).



- Which crimp barrel plating is required -
  Tin plating or
  Nickel plating
- Calculate the size of crimp barrel required. Using the table above, calculate the total cross section to be spliced by adding the circular mil area (CMA) or square millimetres (mm^2) of each wire.
- Stub Splice: Add the CMA or mm2 of all the wires together.
- Butt Splice: Calculate each side separately
- Select the colour code for the size crimp barrel required. Using the table above.
- Determine the type of sealing sleeve required, by ensuring wires fit in the holes of the sealing sleeve inserts.
- Select the part number. Turn to the MiniSeal part number selection tables over this page.
- Using the appropriate table, find the crimp barrel size range and the size and number of wires for your application. Then select the part number for the type required.
- Crimp barrels and sealing sleeves are available separately, please contact us for details.

Notes:

- Application tooling: Heat guns HL2010E and CV198X with the correct reflector added are recommended for the installation of these devices, together with crimp tool 1377. See Application Equipment Section.

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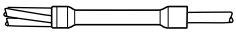
BUTT (in-line) Splice - Selection Guide



Part Number		Colour	Crimp Barrel Size Range		Internal Dimensions			
					End 1		End 2	
Tin Plated	Nickel Plated		CMA	mm²	Sealing Insert mm	Max. No. Wires	Sealing Insert mm	Max. No. Wires
D-436-36	D-436-82	Red	304-1510	0.15-0.75	2.16 Ø	2	2.16 Ø	2
D-436-37	D-436-83	Blue	1058-2680	0.39-1.34	2.79 Ø	2	2.79 Ø	2
D-436-38	D-436-84	Yellow	2375-6755	0.95-3.37	4.32 Ø	2	4.32 Ø	2
D-436-0110	D-436-85	Red	304-1510	0.15-0.75	2.36 Ø	6*	4.06 Ø	2
D-436-52	D-436-86	Blue	1058-2680	0.39-1.34	2.36 Ø	6*	4.06 Ø	2
D-436-53	D-436-87	Yellow	2375-6755	0.95-3.37	2.36 Ø	6*	4.06 Ø	2
D-436-0115	D-436-88	Red	304-1510	0.15-0.75	2.36 Ø	6*	2.36 Ø	6*
D-436-42	D-436-89	Blue	1058-2680	0.39-1.34	2.36 Ø	6*	2.36 Ø	6*
D-436-43	D-436-90	Yellow	2375-6755	0.95-3.37	2.36 Ø	6*	2.36 Ø	6*

* Denotes max 2 wires per hole of insert

STUB (parallel) Splice - Selection Guide

Part Number		Colour	Crimp Barrel Size Range		Internal Ø Dimensions			
					End 1		End 2	
Tin Plated	Nickel Plated		CMA	mm²	Sealing Insert	Max. No. Wires	Sealing Insert mm	Max. No. Wires
D-436-0128	D-436-0119	Red	304-1510	0.15-0.75	2.16	2	1.01	2
D-436-58	D-436-75	Blue	1058-2680	0.39-1.34	4.56	2	2.28	2
D-436-59	D-436-76	Yellow	2375-6755	0.95-3.37	4.56	2	2.28	2
D-436-60	D-436-77	Blue	1058-2680	0.39-1.34	2.03	10*	6.35	2
D-436-61	D-436-78	Yellow	2375-6755	0.95-3.37	2.03	10*	6.35	2

* Denotes max 2 wires per hole of insert

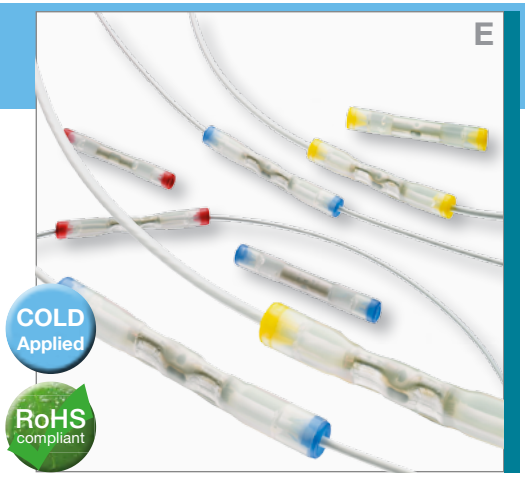
Product Characteristics	Product Performance
Insulation	Radiation crosslinked, heat-shrinkable polyvinylidene fluoride
Operating temperature	-55°C to +150°C
Dielectric strength	2500 V Max
Insulation resistance after immersion	5000 Mega-ohms
Voltage drop	6.9 mV @ 4.5A vs 8.1 mV for an equal length of wire
Physical properties	Tensile strength exceeds strength of spliced wire

Notes:

- The correct crimp tool AD-1377, must be used for proper installation of these devices.
- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

D-436-COLD Series

Cold Applied
Gel Sealed, Crimp Splice



Ideal for Aerospace and Defence applications where performance and reliability is essential. Designed to provide an immersion resistant in-line splice on 1:1 wires.

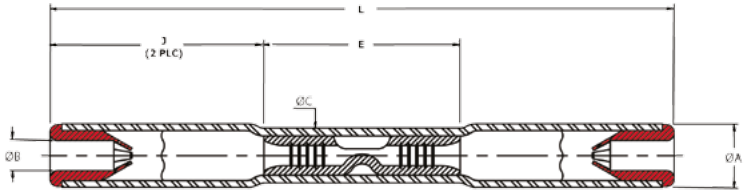
Features & Benefits

- Simple one-step termination and environmental protection.
- No heating required for installation - safe for use on fuelled aircraft.
- Reliability in a wide variety of environmental conditions.
- Prevent water ingress under permanent pressure/weight.
- Achieve environmental performance while maintaining a small profile and electrical performance.

Specifications & Approvals

- SAE-AMS-DTL-23053/8 insulation sleeve
- SAE-AS81824/12

Part Number	Conductor Size		Splice Dimensions (mm)					End Cap Colour Code
	AWG	mm²	AØ	BØ	E	J	L	
D-436-36-COLD	26 - 20	0.16 - 0.62	4.2	2.0	12.1	12.7	36.8	Red
D-436-37-COLD	18 - 16	0.96 - 1.23	5.1	2.9	14.3	11.8	37.7	Blue
D-436-38-COLD	14 - 12	1.94 - 2.97	5.9	3.8	14.3	11.8	37.7	Yellow



Product Characteristics	Product Performance
Operating temperature	-65°C to +150°C
Dielectric strength	2500 V Max
Insulation resistance after immersion	5000 Mega-ohms minimum
Altitude immersion	75,000 ft
Fluid resistance	MIL-L-7808, MIL-L-23699, MIL-PRF-5605 (Hydraulic), MIL-A-8243, MIL-C-25769 and MIL-T-5624 (JP-5)
Physical properties	Tensile strength exceeds strength of spliced wire

Notes:

- Application Tooling: Cold applied crimp tool AD-1381 or approved M22520/44-01 crimp tool, **must be** used for proper installation of these devices.

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D-200 Series

200°C MiniSeal®
Heat Shrinkable, Crimp Splice

Immersion resistant in-line nickel plated sealed crimp splices for 200°C applications. Developed for the growing needs of high temperature applications in the aerospace and defence industry. Provides a small and light, environmental-resistant splice, while meeting SAE-AS81824/1

Provides immersion resistant in-line splice on 1:1 wires for 26 AWG to 12AWG; nickel-plated conductors.

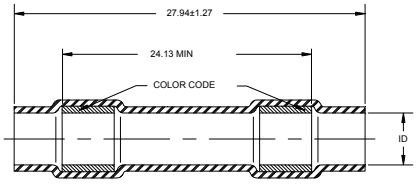
Features & Benefits

- Immersion-resistant crimp splices
- Small size and lightweight
- Provides sealing to unetched wire insulations.
- No need to stagger wire splices.

Specifications & Approvals

- SAE-AS-81824/1 (modified for 200°C applications with heat ageing and thermal shock test temperature of 200°C).

Part Number	MIL Spec Equivalent	Conductor Size		Insulation Sleeve ID Ø		Colour Code
		AWG	mm^2	Supplied	Recovered	
D-200-82	AS81824/1-1	26 - 20	0.16 - 0.62	2.16	0.64	Red
D-200-83	AS81824/1-2	20 - 16	0.62 - 1.23	2.79	0.64	Blue
D-200-84	AS81824/1-3	16 - 12	1.23 - 2.97	4.32	0.64	Yellow



Product Characteristics	Product Performance
Insulation	Radiation crosslinked, heat-shrinkable modified fluoropolymer
Operating temperature	-55°C to +200°C
Dielectric strength	2500 V Max
Insulation resistance after immersion	5000 Mega-ohms
Voltage drop	6.9 mV @ 4.5A vs 8.1 mV for an equal length of wire
Physical properties	Tensile strength exceeds strength of spliced wire

Notes:

- The correct crimp tool AD-1377, must be used for proper installation of these devices.
- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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DuraSeal Crimps

RoHS compliant

Twist-on Soldergrip

DuraSeal Heat Shrinkable Nylon Crimps B-106 Series

DuraSeal terminals and disconnects protect against water, condensation, salt and corrosion. Their tough, heat-shrinkable nylon tubing resists abrasion and cut-through damage, provides strain relief and protects against vibration damage.

DuraSeal products are simple and quick to install using a crimp tool and a heat source. They accommodate a wide range of wire sizes and are colour coded for easy identification, yet are transparent for visual inspection of the finished splice.

SolderGrip Heat Shrinkable Twist-on SGRT

SolderGrip terminals and disconnects utilise a spiral copper coil that grips and compresses the conductors and allows a pre-fluxed solder ring to flow to the centre of the splicing area, resulting in a highly reliable, repeatable joint.

SolderGrip terminals use a durable polyvinylidene fluoride heat-shrinkable tubing that protects the electrical joint and provides insulation and strain relief.

- The SolderGrip technology is a reliable and repeatable means of terminating conductors time after time.
- Can terminate a variety of conductor types (solid and stranded) and platings.
- Multiple conductors can be successfully terminated in a single splice.

B-106 Series

DuraSeal®
Heat Shrinkable, Crimp Terminals

Crimp and Shrink

DuraSeal products insulate and protect electrical connections for numerous applications including;

- OEM wire harness fabrication
- Marine electronics
- Fleet maintenance
- Commercial wiring

Features & Benefits

- Resistance to moisture and abrasion.
- Strain relief.
- Protection from wire pull-out.
- Easy installation.
- Environmental protection.
- Colour coded for identification.
- Transparent for inspection.
- Adhesive lined.

RoHS compliant

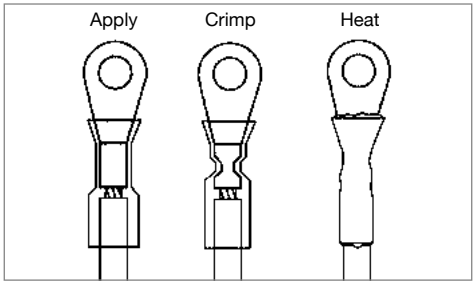
Specifications & Approvals

- UL and CUL 91J4, File E87681
- Lloyds listed, File 65 247 HH 02-93
- UL & CUL E157833 (for B106-3 & B106-4 series only)

Product Characteristics	Product Performance
Operating temperature	-55°C to +125°C
Minimum shrink temperature	180°C
Cut through resistance	31.7kg
Wire pull out after crimping and recovery	Red: 11.3 kg; Blue: 22.7 kg; Yellow: 27.2 kg
Chemical to ASTM D 3032, ESA-603D	Diesel fuel; Brake fluid; Antifreeze; 5% salt water; Motor oil
Chemical resistance	Isopropyl alcohol, trichloroethane, gasoline, battery acid
Dielectric withstand	2500V
Insulation resistance	10 Mega-ohms
Voltage rating	600 Volt max
Physical properties	Tensile strength exceeds strength of spliced wire

Product Installation Process

1 Select appropriate size crimp to suit application. For terminal and disconnect terminations, strip wire insulation to expose 6.5mm conductor.
2 Securely crimp using AD-1522 crimp tool for pre-insulated crimps.
3 Heat terminal or disconnect with appropriate heat gun and reflector until tubing recovers and adhesive flows. Avoid heating ring or fork metallic parts.



Notes:

- The correct crimp tool AD-1522, must be used for proper installation of these devices.
- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector. See Application Equipment Section.

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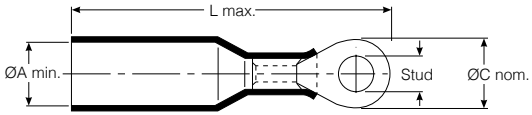
IMPORTANT Ordering Information:
The B-106 Series devices are available in both 'Boxed' and 'Bulk' packaging

- **BOXED** - Boxed packs of 100 pieces for Blue and Red devices are available by adding CS100 to the end of the part number. Whilst boxed packs of 50 pieces for the Yellow size are available by adding CS50 to the end of the part number as illustrated below.

  B-106-1601-CS100
  B-106-1403-CS50

- **BULK** - The part numbers on the following pages refer to devices supplied in bulk packs of 1,000 pieces for the Blue & Red sizes and 500 pieces for Yellow sizes.

Ring Terminals - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Insulation		Stud	Ø 'A' mm	'C' mm	'L' mm
B-106-1401	Red	22-18	3.81	1.40	M4	3.81	7.88	32.0
B-106-1501		22-18	3.81	1.40	M5	3.81	9.91	34.0
B-106-1601		22-18	3.81	1.40	M6	3.81	11.94	36.1
B-106-1801		22-18	3.81	1.40	M8	3.81	13.97	39.0
B-106-1991		22-18	3.81	1.40	M10	3.81	17.78	43.2
B-106-1402	Blue	16-14	4.45	2.00	M4	4.57	7.88	33.0
B-106-1502		16-14	4.45	2.00	M5	4.57	9.91	35.1
B-106-1602		16-14	4.45	2.00	M6	4.57	11.94	36.1
B-106-1802		16-14	4.45	2.00	M8	4.57	13.97	40.1
B-106-1992		16-14	4.45	2.00	M10	4.57	17.78	43.9
B-106-1403	Yellow	12-10	6.35	2.79	M4	6.35	7.88	38.1
B-106-1503		12-10	6.35	2.79	M5	6.35	9.91	40.1
B-106-1603		12-10	6.35	2.79	M6	6.35	11.94	41.2
B-106-1803		12-10	6.35	2.79	M8	6.35	13.97	45.2
B-106-1993		12-10	6.35	2.79	M10	6.35	17.78	47.0

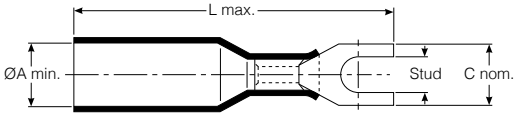
All dimensions in millimetres unless otherwise stated.

B-106 Series

DuraSeal®

Heat Shrinkable, Crimp Terminals

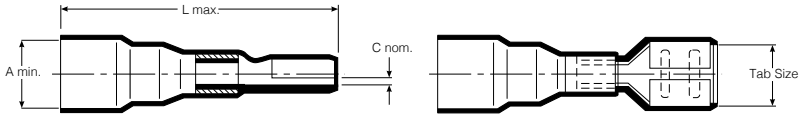
Fork Terminals - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Stud	Ø 'A' mm	'C' mm	'L' mm
B-106-2401	Red	22-18	3.81	1.40	M4	3.81	7.87	32.0
B-106-2402	Blue	16-14	4.45	2.00	M4	4.57	7.87	35.0
B-106-2403	Yellow	12-10	6.35	2.79	M4	6.35	7.87	38.1
B-106-2502	Blue	16-14	4.45	2.00	M5	4.57	9.91	35.0
B-106-2503	Yellow	12-10	6.35	2.79	M5	6.35	9.91	40.2

All dimensions in millimetres unless otherwise stated.

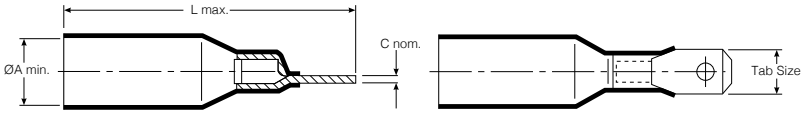
Push-on Terminals - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Tab Size	Ø 'A' mm	'C' mm	'L' mm
B-106-3631	Red	22-18	3.81	1.40	6.35	3.81	0.81	30.5
B-106-3632	Blue	16-14	4.45	2.00	6.35	4.57	0.81	32.0
B-106-3633	Yellow	12-10	6.35	2.79	6.35	6.35	0.81	33.0
B-106-3281	Red	22-18	3.81	1.40	2.79	3.81	0.51	22.9
B-106-3481	Red	22-18	3.81	1.40	4.75	3.81	0.51	30.5

All dimensions in millimetres unless otherwise stated.

Tab Terminals - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Tab Size	Ø 'A' mm	'C' mm	'L' mm
B-106-4631	Red	22-18	3.81	1.40	6.35	3.81	0.81	30.5
B-106-4632	Blue	16-14	4.45	2.00	6.35	4.57	0.81	32.0

All dimensions in millimetres unless otherwise stated.

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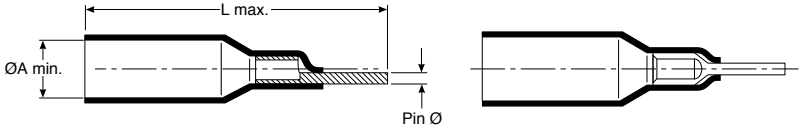
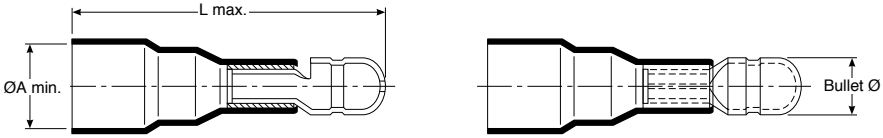
Pin Terminals - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Pin Ø	Ø 'A' mm	-	'L' mm
B-106-6201	Red	22-18	3.81	1.40	2.00	3.81	-	31.0

All dimensions in millimetres unless otherwise stated.

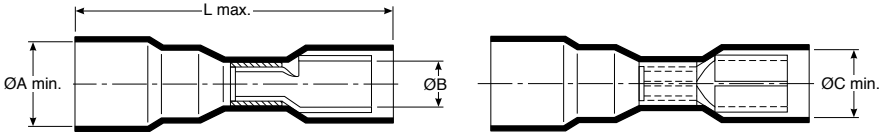
Bullet Terminals (Male) - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Bullet	Ø 'A' mm	-	'L' mm
B-106-7401	Red	22-18	3.81	1.40	3.81	3.81	-	33.5
B-106-7502	Blue	16-14	4.45	2.00	5.08	4.57	-	34.5

All dimensions in millimetres unless otherwise stated.

Bullet Terminals (Female) - Selection Guide



Part Number	Colour	Wire Dimensions			Terminal Dimensions			
		AWG	Max Ø	Min Ø	Bullet	Ø 'A' mm	'C' mm	'L' mm
B-106-8401	Red	22-18	3.81	1.40	3.81	3.81	5.59	30.5
B-106-8502	Blue	16-14	4.45	2.00	5.08	4.57	6.10	32.5

All dimensions in millimetres unless otherwise stated.

SGRT Series

SolderGrip®
Heat Shrinkable, Self-fixing Terminal

Twist and Heat Termination

For terminating multiple wires to terminals.

Features & Benefits

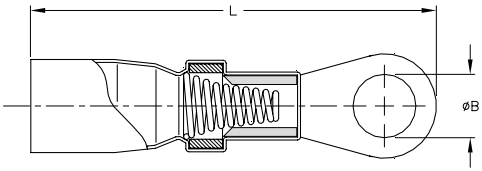
- Transparent insulation sleeve provides encapsulation, inspectability & strain relief.
- Spiral copper coil grips and compresses the conductors for optimum solder connection.
- Pre-fluxed solder preform provides a controlled soldering process.
- One piece design for easy installation.
- Accommodates a wide variety of conductor types, quantities, sizes and plating types unmatched by other termination techniques.

Specifications & Approvals

- MIL-T-7928G
- RB-120

Part Number	Stud Size	Wire Range		Max. Bundle	Max. Rating	Length
	Ø 'B' mm	CMA	mm²	Ø mm	Amps	mm
SGRT-1-02	2.4	1400 - 5000	0.7 - 2.5	4.1	12.5	38.0
SGRT-2-03	3.8	2400 - 6000	1.2 - 3.0	5.0	15.0	38.0
SGRT-2-04	4.3	2400 - 6000	1.2 - 3.0	5.0	15.0	38.0
SGRT-2-05	5.5	2400 - 6000	1.2 - 3.0	5.0	15.0	38.0
SGRT-2-06	6.5	2400 - 6000	1.2 - 3.0	5.0	15.0	38.0
SGRT-3-06	6.5	5000 - 13200	2.5 - 6.6	6.5	33.0	44.5
SGRT-3-08	8.4	5000 - 13200	2.5 - 6.6	6.5	33.0	51.0
SGRT-4-06	6.5	12000 - 22400	6.0 - 11.2	9.0	56.0	44.5
SGRT-4-08	8.5	12000 - 22400	6.0 - 11.2	9.0	56.0	51.0

Product Characteristics	Product Performance
Insulation	Radiation crosslinked, heat-shrinkable polyvinylidene fluoride
Solder and Flux	Sn60 Pb40 with RA flux
Temperature Rating	-55°C to +150°C



Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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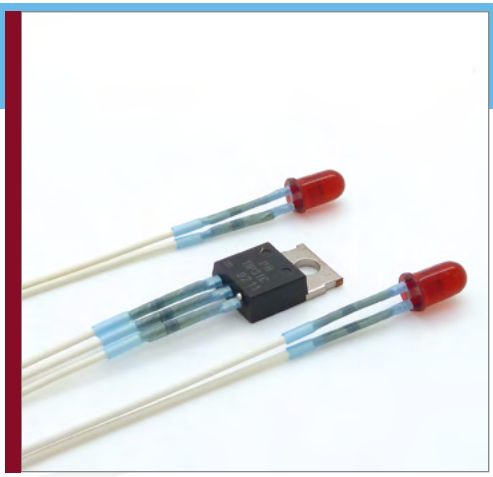
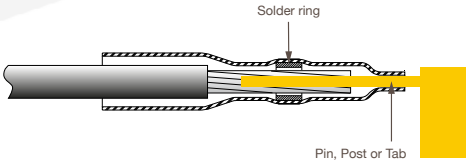




Easy One-Step SolderSleeve® Connecting Wire to Pin, Post or Tab Contacts

Each terminator consists of heat-shrinkable sleeve containing pre-fluxed solder preform. To install simply position over the wire/pin and apply heat. The sleeve will shrink and the solder will melt and flow, resulting in a perfectly soldered, insulated and strain relieved termination.

On connectors where there are several pins to be terminated it is possible to position and recover an entire row of solder sleeves in one go. Recommended for use with most connector pins/posts/tabs applications such as LED's, switches, multiple row/pin connectors

Designed for applications with temperatures up to 150°C. SolderSleeve terminators are also available on carrier tape, spaced precisely to match connector terminal spacing, enabling the termination of an entire row of wires at any one time.

SolderSleeve Terminators
CWT and B155 Series
Offers performance up to +125ºC, utilising cross linked, heat-shrinkable polyolefin insulation.

SolderSleeve Terminators
D-129 and D-141 Series
Offers performance up to +150ºC utilising cross linked, heat-shrinkable polyvinylidene fluoride insulation.

CWT / B155 / D1xx Series

SolderSleeve®

Wire Termination to Pin, Post & Tabs

Only B155-150X RoHS compliant

Used for discrete terminating of wires to component terminals, such as motor tabs, connector pins or switch terminals.

Features & Benefits

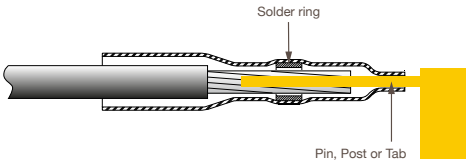
- Transparent insulation sleeve provides encapsulation, strain relief and insulation with inspectability.
- Pre-fluxed solder preform provides controlled soldering process.
- One-piece design provides easy installation and low installed cost.
- A tape carrier option provides convenience and ease of installation.
- UL and CUL recognised.

Specifications & Approvals

- UL and CUL E87681
- D-5023 and RT-1404
- B-155 series RoHS compliant

Material		
Insulation for D-129 and D-141	Radiation crosslinked, heat-shrinkable polyvinylidene fluoride	
Insulation for CWT and B155 Series	Radiation crosslinked, heat-shrinkable polyolefin	
Solder and flux for D-129 and D-141	Sn63 Pb37	Flux: ROM 1 per ANSI-J-004 [RMA flux]
Solder and flux for B155	Sn42Bi58	Flux: ROM 1 per ANSI-J-004 [RA flux]
Solder and flux for CWT-1500 Series	Sn50 Pb32 Cd18	Flux: ROM 1 per ANSI-J-004 [RA flux]

Typical Performance	
Temperature rating for CWT / B155 Series	-55°C to +125°C
Temperature rating for D-129 and D-141	-55°C to +150°C
Voltage drop	2.0 mV
Tensile strength	Exceeds strength of conductor
Dielectric strength	2.0 kV
Insulation resistance	1000 M ohms



Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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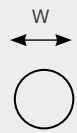
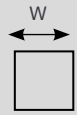
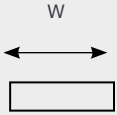
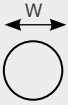
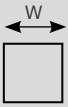
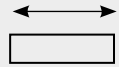
CWT / B155 / D1xx Series

SolderSleeve®

Wire Termination to Pin, Post & Tabs

Part Number		Wire Size	Terminal Characteristics		
		AWG	Dimensions mm	Shape	
CWT-1501	B155-1501	24	W = up to 0.63		Pin
CWT-1502	B155-1502	20			
CWT-1501	B155-1501	24	W = 0.63 to 0.89		
CWT-1502	B155-1502	22			
CWT-1503	B155-1503	20			
CWT-1502	B155-1502	24 - 22	W= 0.89 to 1.14		Post
CWT-1503	B155-1503	20 - 18			
CWT-1503	B155-1503	24 - 22	W = 1.14 to 1.52		
CWT-1504	B155-1504	20 - 18			
CWT-1501	B155-1501	24 - 20	W= up to 1.52		Tab
CWT-1502	B155-1502	24 - 18	W = 1.27 to 2.28		
CWT-1503	B155-1503	24 - 18	W = 1.77 to 2.79		
CWT-1504	B155-1504	24 - 18	W = 2.54 to 3.8		
CWT-1505	B155-1505	22 - 16	W = 2.28 to 4.7		

Part Number	Wire Size	Terminal Characteristics		
	AWG	Dimensions mm	Shape	
D-141-30*	30 - 26	W = up to 0.61		Pin
D-141-07*	24 - 22			
D-141-31*	20	W = 0.63 to 0.81		
D-141-56	24 - 20	W = 0.76 to 1.27		Post
D-129-05*		W = up to 1.52		
D-129-03*	24 - 20	W = 1.27 to 2.28		Tab
D-129-0043		W = 2.28 to 3.55		

* Denotes available on tape carrier version, please contact us for details.

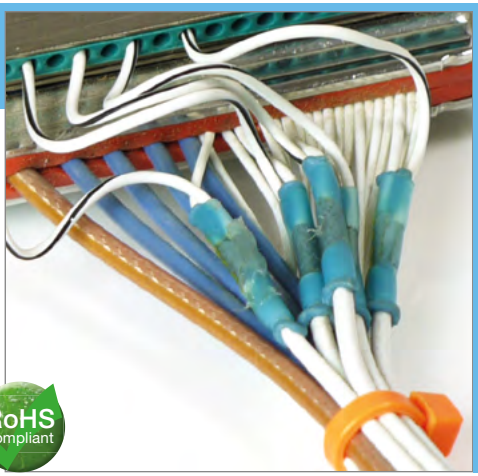
Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

Shield Termination

SolderSleeve®

Heat Shrinkable, Shield termination



RoHS compliant

Only B-155, SO96, SO175 and S200X RoHS compliant

SolderSleeve® shield grounding terminators provide an environmentally sealed, insulated & encapsulated solder connection for a variety of applications. Reliable, versatile and easy to install, resulting in lower installed costs.

SolderSleeve terminators are designed for a wide variety of temperature applications ranging from -65°C to +200°C.

Features & Benefits

- Transparent insulation sleeve provides encapsulation, inspectability & strain relief.
- Pre-fluxed solder preform provides a controlled soldering process.
- One piece design.
- Optional pre-installed ground leads provide convenience & ease installation.
- Quality control temperature indicators.

Specifications & Approvals

- UL and CUL E87681
- NAS 1747
- SAE-AS83519/1 & /2

No Temperature Indicator Versions

CWT Series, entry level version

B-150 and B-151 Series, high performance version of CWT, low fire hazard applications.

B-155 Series, RoHS compliant, lead free low fire hazard and UL compliant.

ST18 and ST63***** offers a high degree of environmental protection and meets NAS-1747

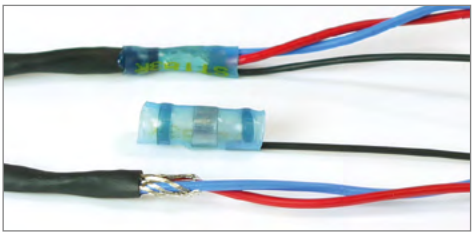
B-023 Series, high temperature terminator.

Thermo-chromic Versions

Contain a temperature indicator that exhibits a colour change when temperature is achieved.

SO1**, SO2** and SO3 Series, terminators with thermal indicator, designed for systems operating up to 150ºC.

SO96*** Series, With grounding lead or braid strap option.



Bi-alloy Versions

Contain a temperature indicator ring, encircling the solder preform that melts to indicate when the wetting temperature is released.

SO63* and SO175*****# Series, With grounding lead or braid strap option.

S200**** Series, with grounding lead or braid strap option, operating up to 200ºC and RoHS compliant.

Notes:

*	Meets performance requirements of SAE-AS83519 and NAS 1747 supplied with Bi Alloy temperature indicator.
**	Qualified to SAE-AS83519, supplied with thermo-chromic temperature indicator.
***	Meets performance requirements of SAE-AS83519 and NAS 1747, supplied with thermo-chromic temperature indicator.
****	Meets performance requirements of SAE-AS83519 and NAS 1747, supplied with Bi-Alloy temperature indicator.
*****	Qualified to NAS 1747.
#	514.1920/99 Aerospatiale Matra.

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Product Series Selection Guide

Product Series	System Operating Temp.		Cable Rating	Pre-installed Lead	Temperature Indicator	Application Environment
	Min	Max.	Min.	Optional	Type	
CWT	-55°C	125°C	85°C	Yes	None	Commercial grade splash proof
B-150	-55°C	125°C	85°C	No	None	Marine/RMT grade, low fire hazard
B-151	-55°C	125°C	85°C	Yes	None	Marine/RMT grade, low fire hazard
B-155	-55°C	125°C	85°C	Yes	None	RoHS compliant version of CWT
ST18	-55°C	125°C	105°C	No	None	Defence grade NAS approved
ST63	-55°C	150°C	125°C	Yes	None	Defence grade NAS approved
SO63	-55°C	150°C	125°C	Yes & Braid	Bi-Alloy	Defence grade, immersion sealing
SO1	-55°C	150°C	125°C	No	Thermo-chromic	Mil-Spec, immersion sealing
SO2	-55°C	150°C	125°C	Yes	Thermo-chromic	Mil-Spec, immersion sealing
SO3	-55°C	150°C	125°C	Braid	Thermo-chromic	Immersion sealing
SO96	-55°C	175°C	150°C	Yes & Braid	Thermo-chromic	Defence grade, immersion sealing
SO175	-55°C	175°C	175°C	Yes & Braid	Bi-Alloy	Defence grade, immersion sealing
S200	-55°C	200°C	150°C	Yes & Braid	Bi-Alloy	Defence grade, immersion sealing
B-023	-65°C	260°C	175°C	No	None	Defence grade

Product Characteristics Selection Guide

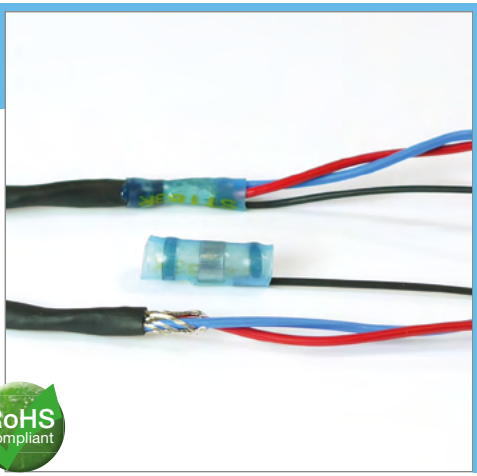
	Product Range	Characteristic
Insulation	S200	Heat-shrinkable, modified fluoropolymer
	SO & ST Series	Heat-shrinkable, polyvinylidene fluoride
	B-150, B-151, CWT	Heat-shrinkable, polyolefin
	BO23	Heat-shrinkable TFE
Solder and Flux	SO63, ST63, SO1/2/3	Solder: Sn63 Pb37 Flux: ROL 1
	S200, SO96, SO175	Solder: Sn96 Ag4 Flux: ROM 1
	B-155	Solder: Sn42 Bi58 Flux: ROM 1
	CWT, B-15X, ST18	Solder: Sn50 Pb32 Cd18 Flux: ROM 1
	BO23	Solder: Pb93 Sn5 Ag2 Flux: ROM 1
Ground Lead	B-155, CWT	XL polyethylene
	B-150, B-151	Zerohal (100G)
	S200 Series	MIL-C-22759/91 or /87
	SO, SO175 Series	MIL-W-22759/32 or /41

Typical Performance	
Voltage drop	2.5 mV
Tensile strength	Exceeds strength of ground lead
Dielectric strength	1.0 kV immersed
Insulation resistance	1000 Mega-ohms

Shield Termination

SolderSleeve®

Heat Shrinkable, Shield termination



Only B-155, SO96, SO175 and S200X RoHS compliant

Product Selection Process

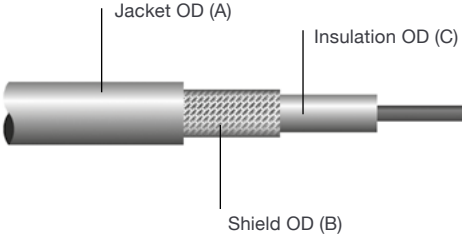
1 Select product series from the Product Series Selection Guide on previous page.
2 Determine cable dimensions for Jacket OD and Shield OD.
3 Optional: Select pre-installed wire lead type from the table below.
4 Select part number from the product selection tables on the following pages.

Pre-installed Lead Description

Product Series	Approval	Type	Plating	AWG	Length Min.	Colour
S200	SAE-AS83519	M22759/91	Silver	22	150mm	White
ST18, ST63	NAS 1747	55A0111	Tin	20-26	150mm	White/Black
SO63	SAE-AS83519	55A0111	Tin	20-26		
S02	M83519	55A0111	Tin	20-26		
SO96, SO175	SAE-AS83519	55A0813	Nickel	22		
B-151	LFH	100G0111	Tin	18	150mm	White
B-155	RoHS	XL polyethylene	Tin	22	150mm	White & Green
CWT	Commercial	XL polyethylene	Tin	22		
SO63, SO96, SO175	SAE-AS83519	Braid Strap	Nickel	22	150mm	Un-insulated
SO3	Commercial	Braid Strap	Tin/Nickel	22		
S200	SAE-AS83519	Braid Strap	Nickel	22		

Product Selection Tables:

Please see the following tables for part number cross reference for given size of cable jacket Ø (A); Shield Ø (B) and Insulation Ø (C). Please contact us for more information or advice on correct product if required.



Note:

- Heat guns are recommended for the installation of all these devices on the following pages: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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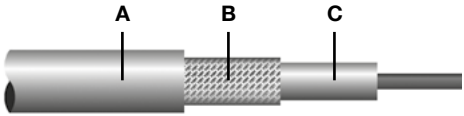


CWT Series Selection Guide - 125°C Rated Commercial Applications

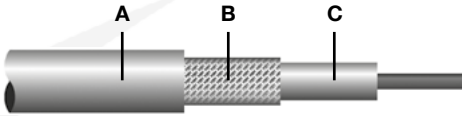
Cable Diameters			Ordering Description		
A	B	C	No Lead	Pre-installed Lead	
mm	mm	mm		22 AWG White	22 AWG Green
1.70	0.9	0.4	CWT-3801	-	-
1.95	1.1	0.6	CWT-3802	-	-
2.70	1.8	1.3	CWT-3803	CWT-3803-W1	CWT-3803-W2
4.50	2.3	1.8	CWT-3805	CWT-3805-W1	CWT-3805-W2
6.00	3.3	2.8	CWT-3806	CWT-3806-W1	CWT-3806-W2
7.00	3.7	3.2	CWT-3807	CWT-3807-W1	CWT-3807-W2
8.70	4.2	3.7	CWT-3809	CWT-3809-W1	CWT-3809-W2
9.70	6.8	6.0	CWT-3810	-	-
10.70	7.1	6.6	CWT-3811	-	-
13.00	8.9	8.4	CWT-3813	-	-

S03 Series Selection Guide - 150°C Rated, Thermo-chromic Indicator, Commercial Applications

Cable Diameters			Ordering Description	
A	B	C	Pre-installed Braid Strap	
mm	mm	mm	Tin Plated	Nickel Plated
1.95	0.90	0.50	S03-01-R	S03-06-R
2.70	1.40	0.75	S03-02-R	S03-07-R
4.30	2.15	1.25	S03-03-R	S03-08-R
6.00	3.30	1.80	S03-04-R	S03-09-R
7.00	4.30	2.50	S03-05-R	S03-10-R

B-155 and B-15X

Shield Termination SolderSleeve®
Heat Shrinkable, Shield termination



B-155 Series - 125°C Rated

RoHS compliant

LFH Low Fire Hazard

Cable Diameters			Ordering Description		
A	B	C	No Lead	Pre-installed Lead	
mm	mm	mm		22 AWG Green	22 AWG White
1.70	0.9	0.4	B-155-3801	-	-
1.95	1.1	0.6	B-155-3802	-	-
2.50	1.50	1.0	B-155-03	B-155-03-35-22-5	B-155-03-35-22-9
4.30	2.00	1.5	B-155-05	B-155-05-35-22-5	B-155-05-35-22-9
6.00	3.30	2.8	B-155-06	B-155-06-35-22-5	B-155-06-35-22-9
6.40	3.30	2.8	B-155-07	B-155-07-35-22-5	B-155-07-35-22-9
8.70	4.50	4.0	B-155-09	B-155-09-35-22-5	B-155-09-35-22-9
10.00	7.50	4.0	B-155-11	B-155-11-35-22-5	B-155-11-35-22-9
13.00	7.00	6.5	B-155-13	B-155-13-35-22-5	B-155-13-35-22-9

B-15X Series - 125°C Rated Low Fire Hazard

LFH Low Fire Hazard

Cable Diameters			Ordering Description	
A	B	C	No Lead	Pre-installed Lead
mm	mm	mm		18 AWG White
3.0	1.5	1.0	B-150-03	-
4.8	2.0	1.5	B-150-05	B-151-05
7.3	3.3	2.8	B-150-07	B-151-07
11.5	4.5	4.0	B-150-11	B-151-11
15.1	7.0	6.5	B-150-13	B-151-13
18.0	9.0	8.0	B-150-17	B-151-17
23.5	12.0	11.0	B-150-23	-
34.0	19.0	17.0	B-150-33	-

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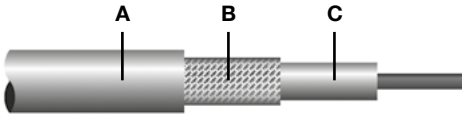


ST18 Series - 125°C Rated, NAS 1747 Approved

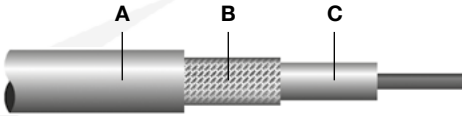
Cable Diameters			Ordering Description				
A	B	C	No Lead	Pre-installed Lead (White/Black)			
mm	mm	mm		20 AWG	22 AWG	24 AWG	26 AWG
2.65	0.90	0.5	ST18-1-00	ST18-1-55-20-90	ST18-1-55-22-90	ST18-1-55-24-90	ST18-1-55-26-90
3.65	1.40	0.75	ST18-2-00	ST18-2-55-20-90	ST18-2-55-22-90	ST18-2-55-24-90	ST18-2-55-26-90
5.08	2.15	1.25	ST18-3-00	ST18-3-55-20-90	ST18-3-55-22-90	ST18-3-55-24-90	ST18-3-55-26-90
6.45	3.30	1.80	ST18-4-00	ST18-4-55-20-90	ST18-4-55-22-90	ST18-4-55-24-90	ST18-4-55-26-90
7.60	4.30	2.50	ST18-5-00	ST18-5-55-20-90	ST18-5-55-22-90	ST18-5-55-24-90	ST18-5-55-26-90

ST63 Series - 150°C Rated NAS 1747 Approved

Cable Diameters			Ordering Description				
A	B	C	No Lead	Pre-installed Lead (White/Black)			
mm	mm	mm		20 AWG	22 AWG	24 AWG	26 AWG
2.65	0.90	0.5	ST63-1-00	ST63-1-55-20-90	ST63-1-55-22-90	ST63-1-55-24-90	ST63-1-55-26-90
3.65	1.40	0.75	ST63-2-00	ST63-2-55-20-90	ST63-2-55-22-90	ST63-2-55-24-90	ST63-2-55-26-90
5.08	2.15	1.25	ST63-3-00	ST63-3-55-20-90	ST63-3-55-22-90	ST63-3-55-24-90	ST63-3-55-26-90
6.45	3.30	1.80	ST63-4-00	ST63-4-55-20-90	ST63-4-55-22-90	ST63-4-55-24-90	ST63-4-55-26-90
7.60	4.30	2.50	ST63-5-00	ST63-5-55-20-90	ST63-5-55-22-90	ST63-5-55-24-90	ST63-5-55-26-90

SO1 and SO2

Shield Termination SolderSleeve®
Heat Shrinkable, Shield termination



S01 & S02 Series - 150ºC Rated, Thermo-chromic Indicator
M83519 Qualified Product Listing Cross Reference

Cable Diameters			Ordering Description					
A	B	C	No Lead		Pre-installed Lead (White/Black)			
mm	mm	mm			20 AWG		22 AWG	
1.95	0.90	0.50	S01-01-R	M83519/1-1	S02-01-R	M83519/2-1	S02-06-R	M83519/2-6
2.70	1.40	0.75	S01-02-R	M83519/1-2	S02-02-R	M83519/2-2	S02-07-R	M83519/2-7
4.30	2.15	1.25	S01-03-R	M83519/1-3	S02-03-R	M83519/2-3	S02-08-R	M83519/2-8
6.00	3.30	1.80	S01-04-R	M83519/1-4	S02-04-R	M83519/2-4	S02-09-R	M83519/2-9
7.00	4.30	2.50	S01-05-R	M83519/1-5	S02-05-R	M83519/2-5	S02-10-R	M83519/2-10

... Continued

Cable Diameters			Ordering Description			
A	B	C	Pre-installed Lead (White/Black)			
mm	mm	mm	24 AWG		26 AWG	
1.95	0.90	0.50	S02-11-R	M83519/2-11	S02-16-R	M83519/2-16
2.70	1.40	0.75	S02-12-R	M83519/2-12	S02-17-R	M83519/2-17
4.30	2.15	1.25	S02-13-R	M83519/2-13	S02-18-R	M83519/2-18
6.00	3.30	1.80	S02-14-R	M83519/2-14	S02-19-R	M83519/2-19
7.00	4.30	2.50	S02-15-R	M83519/2-15	S02-20-R	M83519/2-20

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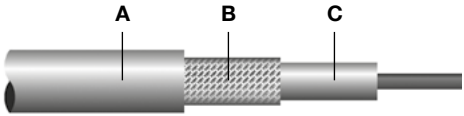


SO63 Series - 150°C Rated, Bi-alloy Indicator SAE-AS83519 Approved

Cable Diameters			Ordering Description					
A	B	C	No Lead	Pre-installed Lead (White/Black)				Braid
mm	mm	mm		20 AWG	22 AWG	24 AWG	26 AWG	Nickel
1.95	0.90	0.50	SO63-1-00	SO63-1-55-20-90	SO63-1-55-22-90	SO63-1-55-24-90	SO63-1-55-26-90	SO63-1-01
2.70	1.40	0.75	SO63-2-00	SO63-2-55-20-90	SO63-2-55-22-90	SO63-2-55-24-90	SO63-2-55-26-90	SO63-2-01
4.30	2.15	1.25	SO63-3-00	SO63-3-55-20-90	SO63-3-55-22-90	SO63-3-55-24-90	SO63-3-55-26-90	SO63-3-01
6.00	3.30	1.80	SO63-4-00	SO63-4-55-20-90	SO63-4-55-22-90	SO63-4-55-24-90	SO63-4-55-26-90	SO63-4-01
7.00	4.30	2.50	SO63-5-00	SO63-5-55-20-90	SO63-5-55-22-90	SO63-5-55-24-90	SO63-5-55-26-90	SO63-5-01

SO96 Series - 175°C Rated, Thermo-chromic Indicator SAE-AS83519 Approved

RoHS compliant

Cable Diameters			Ordering Description		
A	B	C	No Lead	Pre-installed Lead	Braid Strap
mm	mm	mm		22 AWG White/Black	Nickel Plated
1.95	0.90	0.50	SO96-1-00	SO96-1-55-22-90	SO96-1-01
2.70	1.40	0.75	SO96-2-00	SO96-2-55-22-90	SO96-2-01
4.30	2.15	1.25	SO96-3-00	SO96-3-55-22-90	SO96-3-01
6.00	3.30	1.80	SO96-4-00	SO96-4-55-22-90	SO96-4-01
7.00	4.30	2.50	SO96-5-00	SO96-5-55-22-90	SO96-5-01

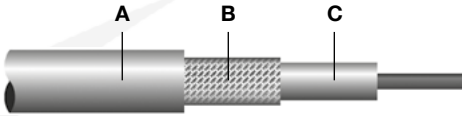
SO175 Series - 175°C Rated, Bi-alloy Indicator SAE-AS83519 Approved

RoHS compliant

Cable Diameters			Ordering Description		
A	B	C	No Lead	Pre-installed Lead	Braid Strap
mm	mm	mm		22 AWG White/Black	Nickel Plated
1.95	0.90	0.6	SO175-1-00	SO175-1-55-22-90	SO175-1-01
2.70	1.40	1.0	SO175-2-00	SO175-2-55-22-90	SO175-2-01
4.50	2.15	1.5	SO175-3-00	SO175-3-55-22-90	SO175-3-01
6.00	3.30	2.8	SO175-4-00	SO175-4-55-22-90	SO175-4-01
7.00	4.30	2.8	SO175-5-00	SO175-5-55-22-90	SO175-5-01

S200 and B-023

Shield Termination SolderSleeve®
Heat Shrinkable, Shield termination



S200 Series - 200ºC Rated, Bi-alloy Indicator, SAE-AS83519 Approved

RoHS compliant

Cable Diameters			Ordering Description		
A	B	C	No Lead	Pre-installed Lead	Braid Strap
mm	mm	mm		22 AWG White	Nickel Plated
1.90	0.90	0.50	S200-1-00	S200-1-WI-22-9	S200-1-01
2.67	1.40	0.75	S200-2-00	S200-2-WI-22-9	S200-2-01
5.00	2.15	1.25	S200-3-00	S200-3-WI-22-9	S200-3-01
6.40	3.30	1.80	S200-4-00	S200-4-WI-22-9	S200-4-01
6.90	4.30	2.50	S200-5-00	S200-5-WI-22-9	S200-5-01

* Pre-installed braid: Nickel plated copper strands in accordance,with AA59569F36N0031

B-023 Series - 260ºC Rated High Temperature Defence Grade Terminator

Cable Diameters		Ordering Description
A	B/C	No Lead
mm	mm	
4.3	3.0	B-023-00
5.5	3.6	B-023-01
7.0	4.5	B-023-02
10.5	6.8	B-023-03
2.4	2.0	B-023-04
3.1	2.4	B-023-07

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Coaxial Cable Termination

SolderSleeve®

Coaxial Terminators

One-Piece PCB Terminators

SolderSleeve coaxial cable terminators allow reliable, easy terminations in a variety of coaxial cable applications, including printed circuit boards. The insulating and strain-relieving capabilities of SolderSleeve terminators provide the ideal solution to centre-conductor breakage problems. Designed for applications with temperatures up to 150ºC.

- Transparent polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, strain relief (eliminates centre conductor breakage) and insulation.
- Pre-fluxed solder pre-form provides a controlled soldering process.
- One-piece design provides easy installation and lower installed costs.
- Pre-installed termination leads provide convenience and ease of installation.

SolderSleeve Coaxial Terminators

B-155 and CWT Series Maximum operating temperature 125ºC, for use on cables rated (min) 85ºC. Please note that the B-155 series terminator is RoHS compliant.

B-02X/B-04X Series Maximum operating temperature 150ºC, for use on cables rated (min) 125ºC.

D-181 Series Maximum operating temperature 150ºC, for use on cables rated (min) 125ºC.

D-184 Series Maximum operating temperature 150ºC, for use on cables rated (min) 85ºC.

One-Piece PCB Terminators

D-607 Series Matched impedance up to 2.3 GHz, metal body.

B-046 Series Effective transmission up to 100 MHz, pin to ground.

Coaxial Cable Termination

SolderSleeve®
Heat Shrinkable, termination

RoHS compliant

Only B155-4XXX-W RoHS compliant

Used for terminating coaxial cable to component terminals, contacts and solder-less wrap terminals.

Features & Benefits

- Polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, inspectability, strain relief and insulation.
- Pre-fluxed solder preform provides controlled soldering process.
- Pre-installed termination leads provide convenience and ease of installation.

Product Options

Product Series	Operating Temp.	Cable Rating	Cable Shield Plating	Part Selection Table	Pieces per Part
	Max.	Min.			
CWT, B-155	125°C	85°C	Tin, bare copper	**A**	2 pc
B-02X & B-04X	150°C	125°C	Tin, silver	**B**	1 pc
D-181	150°C	125°C	Tin, silver	**C**	2 pc
D-184	125°C	85°C	Tin	**D**	2 pc

Product Selection Process

1 Select product series from the product options table above.
2 Select pre-installed lead type from the table illustrated below.
3 Determine cable RG number or dimensions.
4 Select the part number required from the tables on the following pages;
- Table A - CWT & B-155 Series
- Table B - B-02X & B-04X Series
- Table C - D-181 Series
- D-184 Series please contact us

Pre-installed Lead Descriptions

Product Series	Lead Type	Plating	AWG	Length	Colour
CWT, B-155	XL polyethylene	Tin	22	150mm	White (cntr), Green (grnd)
B-021, -041, -043	M81822/13 (solder-less wrap)	Silver	24 - 30	150mm	White (cntr), Blue (grnd)
B-020. -040, -044	55A0111 (MIL-W-22759/32)	Tin	20 - 30	150mm	White (cntr), Blue (grnd)
D-181-12, -22, -32	55A0111 (MIL-W-22759/32)	Tin	20 - 30	150mm	White (cntr), white w/black stripe (grnd)
D-181-18, -28	M81822/13	Silver	26 - 30	150mm	White (cntr), blue (grnd)
D-184	55A0111 (MIL-W-22759/32)	Tin	20 - 26	150mm	White (cntr), white w/black stripe (grnd)

Two part SolderSleeve® for conductor and screen, utilising 55A0111 spec wire. Please note that these two components interlink to form a single component.

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Product Characteristics

Material		
Insulation for B-02X/B-04X, D-181, D-184	Radiation crosslinked, heat-shrinkable polyvinylidene fluoride	
Insulation for CWT, B-155 Series	Radiation crosslinked, heat-shrinkable polyolefin	
Solder and flux for B-02X, B-04X, D-181	Solder Sn63 Pb37	Flux: ROL 1 per ANSI-J-004 (RMA Flux)
Solder and flux for CWT series, D-184	Solder Sn50 Pb32 Cd18	Flux: ROM1 per ANSI-J-004 (RA Flux)
Solder and flux for B-155 series	Solder: Sn42Bi58	Flux: ROM1 per ANSI-J-004 (RA(Flux)

Typical Performance	
Voltage drop	2.0 mV
Tensile strength	Exceeds strength of conductor
Dielectric strength	2.0 kV
Temperature rating for CWT, B-155 & D-184	-55°C to +125°C
Temperature rating for B-02X/B-04X, D-181	-55°C to +150°C
Insulation resistance	1000 M ohms

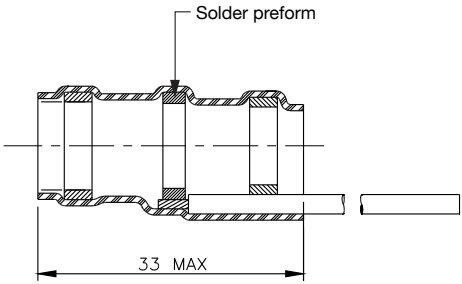
TABLE A - for CWT and B-155 Series

RoHS compliant

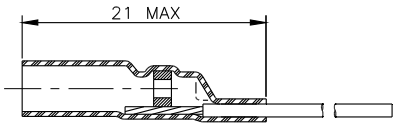
Cable RG No	Dimensions (mm)		Part Number	
	Dielectric OD	Jacket OD	CWT Series	B-155 Series (RoHS)
174	0.80 - 2.30	1.30 - 2.80	CWT-4174-W122-5/9	B-155-4174-W122-5/9
58, 122	2.00 - 2.80	2.50 - 4.40	CWT-4058-W122-5/9	B-155-4058-W122-5/9
59	2.80 - 3.30	3.20 - 6.00	CWT-4059-W122-5/9	B-155-4059-W122-5/9

Note: Only B-155 series is RoHS compliant, CWT is not.

Part A, Ground



Part B, Conductor



B-02X and B-04X Series

150°C SolderSleeve®
Heat Shrinkable, termination

TABLE B for B-02X and B-04X Series

Part 1 - Group Selection

RG Cable Number	Dimension Range				One-Piece Coaxial Product Group
	Jacket OD max	Shield OD	Dielectric OD	Conductor OD	
178, 404	3.40	1.30 - 2.30	0.50 - 1.70	0.30 - 0.80	Group 1
179, 316	4.40	1.50 - 2.80	1.20 - 2.50	0.30 - 0.60	Group 2
180, 302, 303	6.30	2.40 - 4.60	1.40 - 4.30	0.30 - 2.80	Group 3

All dimensions in millimetres

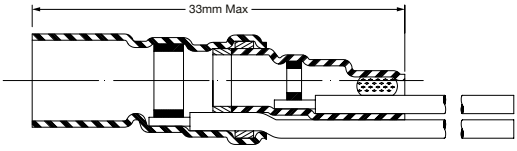
Part 2 - Part Number Selection

One-Piece Coaxial Product Group	Pre-installed Wire Size and Type						
	Type	20 AWG	22 AWG	24 AWG	26 AWG	28 AWG	30 AWG
Group 1	●	-	B-044-22-N	B-044-24-N	B-044-26-N	-	-
	♦	-	-	B-043-24-N	B-043-26-N	B-043-28-N	B-043-30-N
Group 2	●	B-040-20-N	B-040-22-N	B-040-24-N	B-040-26-N	B-040-28-N	B-040-30-N
	♦	-	-	B-041-24-N	B-041-26-N	B-041-28-N	B-041-30-N
Group 3	●	B-020-20-N	B-020-22-N	B-020-24-N	B-020-26-N		--
	♦	-	-	-	B-021-26-N	-	-

Where ● = Stranded (M22759) and ♦ = Solid (M81822) wire

The B-02X and B-04X series uses a one-piece design to terminate coaxial cables rated at 125°C minimum

One Piece Component



Notes:

- Heat guns are recommended for the installation of these devices on both these pages: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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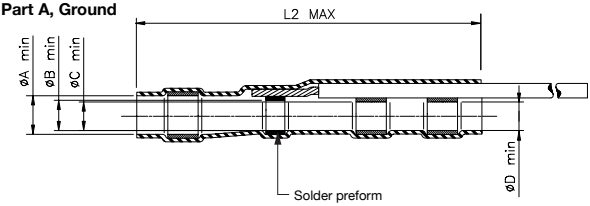
TABLE C for D-181 Series
Part Number Selection

Part Number		Min. Dimensions (mm)						Max. Dim. (mm)	
	AWG	A	B	C	D	E	F	L1	L2
D-181-1220-90/9	20	3.70	3.20	2.70	2.40	0.71	2.30	17.00	21.50
D-181-1222-90/9	22								
D-181-1224-90/9	24								
D-181-1226-90/9	26								
D-181-1226-6/9	26								
D-181-1230-6/9	30								
D-181-2220-90/9	20	4.50	4.00	3.45	2.90	1.10	3.00	17.00	22.70
D-181-2222-90/9	22								
D-181-2224-90/9	24								
D-181-2226-90/9	26								
D-181-2226-6/9	26								
D-181-2230-6/9	30								
D-181-3220-90/9	20	5.20	4.70	4.45	3.95	1.30	4.00	17.00	21.50
D-181-3222-90/9	22								
D-181-3224-90/9	24								
D-181-3226-90/9	26								
D-181-3226-6/9	26								
D-181-3230-6/9	30								

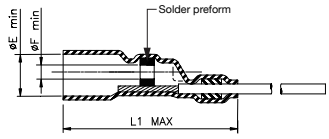
TABLE D for D-184 Series

D-184-1220-90/9	20	3.70	3.20	2.70	2.40	0.71	2.30	17.00	21.50
D-184-1222-90/9	22								
D-184-1224-90/9	24								
D-184-1226-90/9	26								
D-184-2220-90/9	20	4.50	4.00	3.45	2.90	1.10	3.00	17.00	22.70
D-184-2222-90/9	22								
D-184-2224-90/9	24								
D-184-2226-90/9	26								

Part A, Ground



Part B, Conductor



Please note that these two components interlink to form a single component.

PCB Coaxial Termination

SolderSleeve®
Heat Shrinkable, termination

Used for the termination of coaxial cable to printed circuit boards.

Features & Benefits

- Provides a completely shielded, low-resistance, matched-impedance termination with a very low Voltage Standing Wave Ratio (D-607 series).
- Polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, inspectability, strain relief and insulation.
- Pre-fluxed solder preform provides controlled soldering process.
- One piece design provides easy installation and lower installed costs.
- Pre-installed termination body provides convenience and ease of installation.

Specifications & Approvals

- TE Connectivity RT-1404

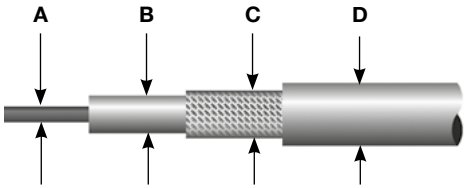
Product Options

Product Series	Typical Application Performance	Shield Method	Part Selection Table
D-607	Matched impedance up to 2.3 GHz	Metal body	A
B-046	Effective transmission up to 100 MHz	Pin to ground	B

Product Selection Process

1 Select product series from the Product Options table above.
2 Determine cable RG number or outside diameter dimensions.
3 Select the appropriate part number from Table A (D-607 series) or Table B (B-046 series).

- For D-607 (matched impedance) series, determine straight or right angle entry to PCB and grid pattern, then select the appropriate part number from Table A on the next page.
- For B-046 (PinPak, or pin to ground) series, determine hole spacing and diameter. Refer to Table B for product selection (see illustration right for cable dimensions).



Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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Product Characteristics

Material		
Insulation	Radiation crosslinked, heat-shrinkable polyvinylidene fluoride	
Solder and flux	Solder Sn63 Pb37	Flux: ROL 1 per ANSI-J-004 (RMA Flux)
Termination body/pin	Copper alloy, solder-plated	
Typical Performance		
Voltage drop	2.0 mV	
Tensile strength	Exceeds strength of conductor	
Dielectric strength	2.0 kV	
Temperature rating	-55°C to +150°C	
Insulation resistance	1000 M ohms	
Electrical Performance (typical) **D-607 Series Only**		
Frequency	VSWR (D-607-09, -40)	VSWR (D-607-10)
350 MHz	1.04 max	1.04 max
700 MHz	1.05 max	1.09 max
2.3 GHz	1.09 max	1.12 max

TABLE A for D-607 Series

RG Cable No.	Cable Dimensions Max. Diameter			Part No. Entry to PCB		
	Jacket	Shield	Dielectric	Straight	Right-Angle	Straight
				Grid 5.08	Grid 5.08	Grid 2.54
174, 178, 179, 316, 404	1.5 - 3.55	1.1 - 3.15	0.60 - 2.25	D-607-09	D-607-10	D-607-40*

All dimensions in millimetres

TABLE B for B-046 Series

RG Cable No.	Cable Dimensions (mm)				Pin Dia.	Part Number		
						Spacing Between Pins		
	A	B	C	D (max)	mm	2.54	5.08	6.35
178, 404	0.3 - 0.8	0.5 - 1.7	1.3 - 2.3	3.4	0.6	B-046-14-N	B-046-10-N	B-046-12-N
					0.8		B-046-11-N	B-046-13-N
179, 316	0.3 - 1.6	1.2 - 2.5	1.5 - 2.8	4.4	0.6	B-046-15-N	B-046-66-N	B-046-16-N
					0.8		B-0466-68-N	B-046-18-N

All dimensions in millimetres

Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

Shielded and Coaxial Splices

SolderShield®

Cable to Cable Splicing

SolderShield cable splices meet the growing performance requirements for shielded cable system fabrication and maintenance while minimising electromagnetic interference (EMI). Being one piece products consisting of a flux coated, solder impregnated copper shield braid encased in a heat shrinkable insulation sleeve, with crimp wire connectors.

Conductor splices are made using MiniSeal crimp products which are recognised by MIL-S-81824 and MIL-W-5088.

SolderShield splice kits, are designed for single-conductor or multi-conductor shielded cables and are ideal for fabrication, repair, re-work while restoring the electrical integrity of the cable. SolderShield devices perform even in demanding environments. They are reliable, versatile and easy to install.

Operating Temperature

- From -55°C to +150°C

Applications

Used for splicing a wide range of cables, including coaxial and multi-conductor cables.

Features & Benefits

- Flux-coated solder-impregnated copper shield braid encased in a transparent heat shrinkable insulation sleeve provides a controlled soldering process, encapsulation, inspectability, strain relief and insulation.
- One-piece design provides easy installation and lower installed cost.
- Circumferential (360°) shielding results in EMI protection and shield continuity to or better than the original cable.
- Conductor splices are made using MiniSeal crimp products, recognised by MIL-S-81824 and MIL-W-5088.

Specifications & Approvals

- US: M81824 (conductor splice only)
- UK: RAF AP 1130-2008-1
- TE RT-1404

Product Selection Process

Multi-conductor Cable Splices

- Determine the number of conductors in the cable to be spliced
- Determine the AWG of each conductor, or the minimum jacket OD.
- Determine the conductor plating
- Select the appropriate part number from table A, over the page.

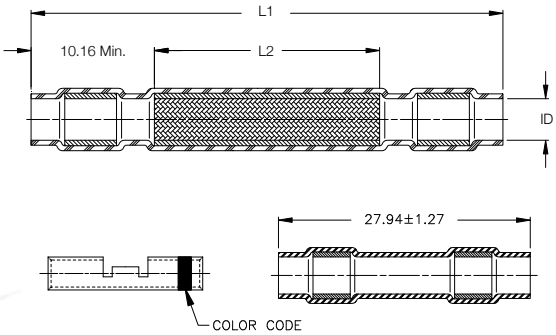
Coaxial Cable Splices

- Determine the cable RG number or cable reference.
- Select appropriate part number from table B, over the page.
- Confirm that dimensional information indicates compatibility with cable being used.

High Temperature Option

D-200 Series

Also available but not detailed here, offering improved operating temperature of -55°C to +200°C, please contact us for more details.



Product Characteristics

Materials	
Insulation sleeve	Radiation crosslinked polyvinylidene fluoride
Melt-able inserts	Fluorocarbon based thermoplastic
MiniSeal crimp splice	Base metal: Copper alloy C10200 per ASTM B75 Plating: Tin per MIL-T-10727 or nickel per QQ-N-290
SolderShield shield splice	Base metal: Tin-plated copper wire braid per ASTM B3 Solder & flux coating: Type Sn63 Pb37. Flux: ROM1 per ANSI-J-STD-004 (RA flux)

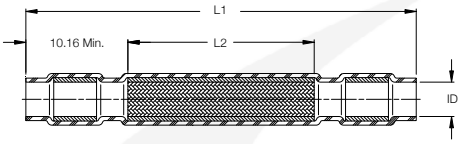
Electromechanical Performance		
Parameter	**Test Method**	**Requirement**
Dielectric strength (shield connection)	-	No breakdown or arcing at 1000 Vac (RMS)
Dielectric strength (conductor connection)	-	2.5 kV
Voltage drop	MIL-S-81824	Less than 2 millivolt increase
Insulation resistance (shield)	-	1000 Mega-ohms
Insulation resistance (conductor)	-	5000 Mega-ohms
Tensile strength for MiniSeal	MIL-S-81824	Exceed yield strength of wire
Tensile strength for SolderShield	MIL-S-81824	75% of strength of un-spliced cable
Temperature rating	-	-55°C to 150°C

Environmental Resistance		
Salt spray	MIL-STD-202 M101	Meets voltage drop requirement
Heat aging	750 hours at 150°C	Meets all electromechanical requirements
Temperature cycling	MIL-STD-202 M107C	Meets all electromechanical requirements
Altitude immersion	Immersion at 22,860m	Meets insulation resistance requirements
Corrosion resistance	-	No evidence of corrosion after testing in accordance with MIL-STD-202, Method 101, Test condition

D-150 Series, Multi-conductor

SolderShield®

Cable to Cable Splicing



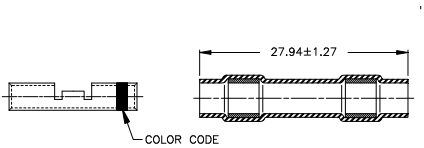


TABLE A: for D-150 Series, Multi-conductor Cable Splices

Part No.		Dimensions			Conductor Splice		
Tin Plated	Nickel Plated	L1	L2	ID	Size Range CMA	Colour Code	Qty per Kit
		Max.	Nom.	Min.	Min Max		
D-150-0168	D-150-0228	80.5	50.0	3.00	304 - 1510	Red	1
D-150-0169	D-150-0229			4.00	779 - 2680	Blue	
D-150-0170	D-150-0230			5.00	1900 - 6755	Yellow	
D-150-0174	D-150-0231	106.0	75.0	4.00	304 - 1510	Red	2
D-150-0175	D-150-0232			5.00	779 - 2680	Blue	
D-150-0176	D-150-0233			6.00	1900 - 6755	Yellow	
D-150-0177	D-150-0234			9.00	304 - 1510	Yellow	
D-150-0178	D-150-0235	106.0	75.0	4.00	304 - 1510	Red	4
D-150-0179	D-150-0236			5.00	779 - 2680	Red	
D-150-0180	D-150-0237			6.00	1900 - 6755	Blue	
D-150-0181	D-150-0238			9.00	1900 - 6755	Yellow	

All dimensions in millimetres

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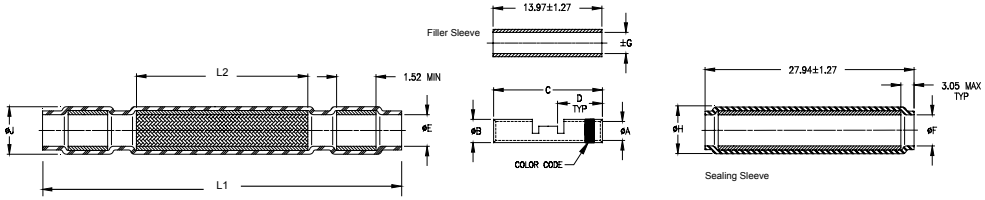


Drawing represent D-150-009X only

TABLE B: for D-150 and B-202 Series, Coaxial Cable Splices

Part No.	RG Cable No.	Cable Ref.	Dimensions			Conductor Splice Qty per Kit
			L1	L2	ID	
		Max	Max.	Nom.	Min.	
D-150-0214	8A, 9B, 11	5012A3311	80.50	50.00	12.00	1
	13, 26, 31	5012E1339				
	115, 144, 149	7518A1311				
	165, 213, 214	-				
	216, 235, 391	-				
	393, 397	-				
D-150-0094	178, 196	5028A1317	80.50	50.00	3.00	1
	179, 187, 188	7528A1317				
	316, 404, M17/138-00001	5030A1317				
	M16/136-00001	7530A1317				
D-150-0095	180, 195	5024A1311	80.50	50.00	4.00	1
	M17/137-00001	7526A1311				
	M17/139-00001	9527A1318				
	-	9530E1014				
D-150-0096	124, 140, 141	5020A1311	80.50	50.00	6.00	1
	159, 302, 303	5022A1311				
	-	7522A1311				
	-	7523D1331				
	-	7542A1311				
B-202-81*	29, 30, 55B	5019D3318	56.00	23.00	7.00	1
	58, 223	5021D1331				
	-	5022A1311				
B-202-82*	59, 62	7523D1331	56.00	23.00	7.00	1
	-	7524A1311				
	-	9524A1311				

All dimensions in millimetres.

* B-202-81/82 kits use solder connectors to terminate the centre conductors. All other kits use crimp connectors

Shielded Connector Contacts

SolderTacts®
Controlled Solder Contacts

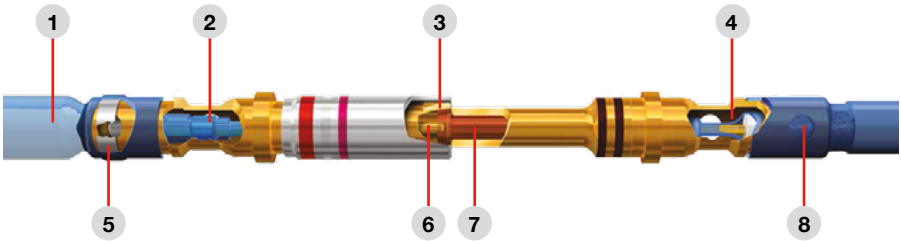
One-piece controlled soldering SolderTacts are designed to facilitate faster and more reliable terminations. SolderTacts eliminate the variables associated with crimping, accelerates production while reducing handling and installed costs.

Features & Benefits

- One-piece contact design with integrated soldering technology
- Controlled re-flow soldering process yields reliable consistent terminations
- 360° shielding reduces crosstalk and improves signal transmission.
- Contact fits multiple cable sizes.
- Compatible with a variety of commercial and military connectors.
- 150°C temperature rating.

Specifications & Approvals

- TE D-6002



1. Outer SolderSleeve
Heat shrinkable insulating sleeve. Cable inserts easily, with no spacers or other parts required.

2. Inner SolderSleeve
Termination is a heat shrinkable sleeve with a precisely pre-fluxed solder preform conforming to QQ-S-571

3. Connector
The precision outer body meets electrical engagement and contact retention requirements of individual connector systems.

4. Inner Heat shrink
In the terminated signal lead, the inner heat shrink tubing forms tightly around the termination to insulate and strain relieve the connection.

5. Outer Solder Pre-form
Contains precise amounts of solder and flux conforming to QQ-S-571.

6. Inner Pin and Socket
Contacts are permanently fixed within the assembly to provide proper setback and concentrically.

7. Dielectric
The dielectric between inner and outer contacts provides concentricity, electrical integrity, precise mating dimensions and closed entry at the inner socket.

8. Inspection
The shield termination can be inspected through the viewing port.

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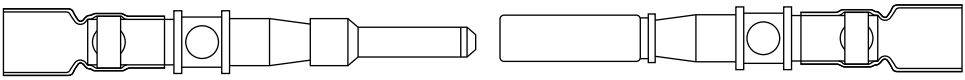


MIL-DTL-26482 Series Contacts

Part Number	Size	Wire (AWG)	Polarity	Cable Type	Military Specification
D-602-16*	12	24-32	Socket	Coaxial	MIS-20067/5-001
D-602-17*	12	24-32	Pin	Coaxial	MIS-20067/5-001
D-602-46	16	24-30	Pin	Coaxial	-
D-602-47	16	26-32	Socket	Coaxial	-
D-602-56	16	24-30	Pin	Twin Pair	-
D-602-57	16	24-30	Socket	Twin Pair	-

* These SolderTacts contacts are on qualified parts list for indicated specification.

Tooling Selection Guide for MIL-DTL-26482 Contacts

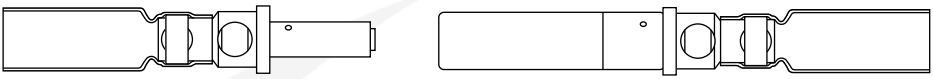
Part Numbers	Eng Standard	Adaptor	Insertion Tool	Removal Tool
D-602-46/47	ES61137	AT-1319-17	AD-1525	AD-1526
D-602-56/57	ES61138	-	(M81969/17-04)	(M81969/19-08)
D-602-16/17	ES61161	-	-	-

Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

Shielded Connector Contacts

MIL-C-28748 Series SolderTacts®
Controlled Solder Contacts



MIL-C-28748 Series Contacts

Part Number	Size	Wire (AWG)	Polarity	Cable Type	Military Specification
D-602-44	16	26-32	Socket	Coaxial	MIS-20067/2-002[a]
D-602-45	16	26-32	Pin	Coaxial	MIS-20067/1-001[a]
D-602-54	16	24-30	Pin	Twin Pair	MIS-20067/4-001[a]
D-602-55	16	24-30	Socket	Twin Pair	MIS-20067/3-001[a]
D-602-72	16	26-32	Pin	Coaxial	M39029/79[b]
D-602-73	16	26-32	Socket	Coaxial	M39029/80[b]
D-602-76	16	26-32	Socket	Coaxial	M39029/40[b]
D-602-77	16	26-32	Socket	Coaxial	M39029/41[b]
D-602-0126	16	24-30	Socket	Twin Pair[c]	-
D-602-0127	16	24-30	Socket	Twin Pair[c]	-
D-602-0172	16	28-32	Socket	Coaxial	-
D-602-0173	16	28-32	Socket	Coaxial	MIS-20067/2-001, 003[a]
D-610-09	16	16-20	Socket	Power	MIS-20067/8-001[a]
D-610-10	16	16-20	Socket	Power	MIS-20067/7-001[a]

a. These SolderTacts contacts are on the qualified parts list for indicated specification.
b. These SolderTacts contacts are inter-mateable and inter-mountable with contacts qualified to the indicated specification; they replace crimp-style termination.
c. These SolderTacts contacts are designed for twisted pair cable per MIL-STD-1553B

Tooling Selection Guide for MIL-C-28748 Contacts

Part Numbers	Eng Standard	Adaptor	Repair Wand	Removal Tool
D-602-44/45	ES61133	AT-1319-14	AT-1480	AD-1447
D-602-0172/0173	ES61240	-	-	
D-602-54/55	ES61132	-	-	
D-602-0126/0127	ES61199	-	-	
D-619-09/10	ES61187	AT-1319-15	AT-1571	
D-602-72/73	ES61135	AT-1319-18	AT-1486	
D-602-76/77	ES61164	AT-1319-20	AT-1554	

Contact insertion tool not applicable

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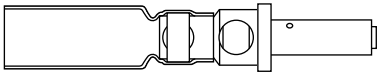


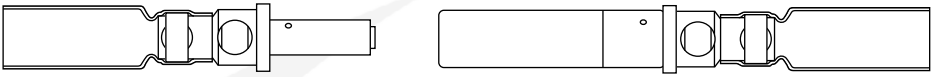
MIL-DTL-38999 Series I, III, IV Contacts

Part Number	Size	Wire (AWG)	Polarity	Cable Type	Military Specification
D-602-0122	8	22-24	Pin	Coaxial	M39029/60[a]
D-602-0123	8	22-24	Socket	Coaxial	M39029/59[a]
D-602-0140	16	26-30	Pin	Coaxial	M39029/76[a]
D-602-0141	16	26-30	Socket	Coaxial	M39029/77[a]
D-602-0142	16	26-30	Pin	Twin Pair	M39029/76[a]
D-602-0143	16	26-30	Socket	Twin Pair	M39029/77[a]
D-602-0144	12	34-32	Pin	Coaxial	M39029/28[a]
D-602-0145	12	24-32	Socket	Coaxial	M39029/75[a]
D-602-0146	12	22-26	Pin	Twin Pair	M39029/28[a]
D-602-0147	12	22-26	Socket	Twin Pair	M39029/75[a]
D-602-0150	12	22-28	Pin	Coaxial	M39029/28[a]
D-602-0151	12	22-28	Socket	Coaxial	M39029/75[a]
D-610-1108	8	24-26	Socket	Twin Pair[b]	-
D-610-1109	8	24-26	Pin	Twin Pair[b]	-
D-602-1110	8	22-26	Socket	Triaxial	-
D-602-1111	8	22-26	Pin	Triaxial	-
D-602-1112	8	24-26	Socket	Twin Pair[b]	-
D-602-1113	8	24-26	Pin	Twin Pair[b]	-
D-602-0156-N-1	8	24-26	Pin	Twinaxial[c]	M39029/90[a]
D-602-0156-N-2	8	24-26	Pin	Twinaxial[c]	M39029/90[a]
D-602-0156-N-3	8	24-26	Pin	Twinaxial[c]	M39029/90[a]
D-602-0157-N-1	8	24-26	Socket	Twinaxial[c]	M39029/91[a]
D-602-0157-N-2	8	24-26	Socket	Twinaxial[c]	M39029/91[a]
D-602-0157-N-3	8	24-26	Socket	Twinaxial[c]	M39029/91[a]
D-602-0169-1	8	20	Pin	Twinaxial[c]	M39029/90[a]
D-602-0170-1	8	20	Socket	Twinaxial[c]	M39029/91[a]

a. These SolderTacts contacts are inter-mateable and inter-mountable with contacts qualified to the indicated specification; they replace crimp-style termination.
b. These SolderTacts contacts are designed for shielded twisted pair cable per MIL-STD-1553B .
c. These SolderTacts contacts are designed for databus contacts per MIL-STD-1553B

Shielded Connector Contacts

MIL-C-38999 Series II SolderTacts®
Controlled Solder Contacts



MIL-C-38999 Series II Contacts

Part Number	Size	Wire (AWG)	Polarity	Cable Type	Military Specification
D-602-0140	16	26-30	Pin	Coaxial	M39029/76[a]
D-602-0171	16	26-30	Socket	Coaxial	M39029/77[a]
D-602-0142	16	26-30	Pin	Twin Pair	M39029/76[a]
D-602-0174	16	26-30	Socket	Twin Pair	M39029/77[a]

a. These SolderTacts contacts are inter-mateable and inter-mountable with contacts qualified to the indicated specification; they replace crimp-style termination.

Tooling Selection Guide for MIL-C-39999 Series I, II, III, IV. Contacts

Size	Part Numbers (D-602-)	Eng Standard	Adaptor	Repair Wand	Insertion Tool	Removal Tool
16	0140/0141	ES61226	AT-1319-78	AD-1565	M81969/8-07 or M81969/14-03	M81969/8-08 or M81969/14-03
	0142/0143	ES61224	-	-		
	0171	ES61226	AT-1319-27	AD-1572		
	0174	ES61224	-	-		
12	0144/0145	ES61206	AT-1319-24	AD-1566	M81969/8-09 or M81969/14-04	M81969/8-10 or M81969/14-04
	0146/0147	ES61218	-	-		
	0150/0151	ES61223	-	-		
8	0122/0123	ES61179	AT-1319-22	AD-1568	-	M81969/14-06 or ATBX-2277
	1108/1109	ES61172	AT-1319-22 and AT-1319-14	AD-1568 and AD-1480		
	1110/1111	ES61172				
	1112/1113	ES61184				
	0156/0157-X	ES61231				
	0169/0170-X	ES61235				

Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

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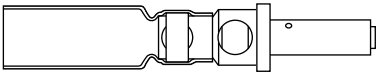


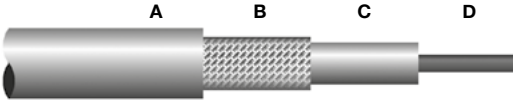
Sub-miniature / Commercial Series Contacts

Part Number	Size	Wire (AWG)	Polarity	Cable Type	A Ø	B Ø	C Ø	D Ø
D-602-0278	16	24-32	Pin	Coaxial	1.52 - 2.92	1.85 - 2.18	0.64 - 1.91	0.23 - 0.74
D-602-0279	16	24-32	Socket	Coaxial	1.52 - 2.92	1.85 - 2.18	0.64 - 1.91	0.23 - 0.74
D-602-0288	16	24-32	Pin	Twin Pair	-	-	0.74 - 1.40	0.23 - 0.74
D-602-0289	16	24-32	Socket	Twin Pair	-	-	0.74 - 1.40	0.23 - 0.74

These SolderTacts contacts belong to the TE “Sub-miniature” series of contacts, which are designed for use in commercial connectors.

Product Selection

Determine which SolderTact is required from the cable dimensions and chart above.



Tooling Selection Guide for Sub-miniature Series Contacts

Part Numbers	Eng Standard	Adapter	Repair Wand	Removal Tool
D-602-0278/0279	ES61170	AT-1319-12	AD-1481	AD-1447
D-602-0288/0289	ES61414	-	-	-

Contact insertion tool not applicable

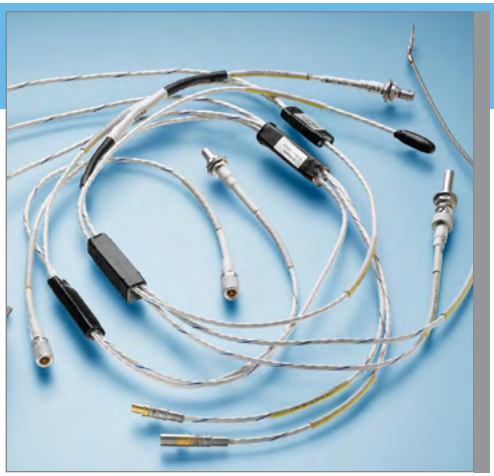
Notes:

- Heat guns are recommended for the installation of these devices: HL2010E and CV198X with the correct reflector added. See Application Equipment Section.

D500 Databus Components

MIL-STD-1553B

In-line micro-couplers: one & two stub.



The low profile configuration enables avionics system designers to plan for optimum coupler locations. Supplied with Spec 55 databus cables, including EMP hardened versions. Also available assembled with other components into a databus harness.

Features & Benefits

- Environmental sealing
- Lightweight -
- 360° continuous low-impedance
- Potted circuit elements for maximum durability.

Product Selection Guide - Single Stub

Part Numbers	
D-500-0455-1-YYY-ZZZ	
D-500-0465-1-YYY-ZZZ	
D-500-0456-1-YYY-ZZZ	
D-500-0466-1-YYY-ZZZ	
D-500-0457-1-YYY-ZZZ	
D-500-0467-1-YYY-ZZZ	
D-500-0458-1-YYY-ZZZ	
D-500-0468-1-YYY-ZZZ	

Product Selection Guide - Double Stub

Part Numbers	
D-500-0455-2-YYY-ZZZ	
D-500-0465-2-YYY-ZZZ	
D-500-0456-2-YYY-ZZZ	
D-500-0466-2-YYY-ZZZ	
D-500-0457-2-YYY-ZZZ	
D-500-0467-2-YYY-ZZZ	
D-500-0458-2-YYY-ZZZ	
D-500-0468-2-YYY-ZZZ	

Notes

YYY Cable Type

612 = 10612 (24 AWG single optimised shield).
613 = 10613 (24 AWG double optimised shield).
614 = 10614 (24 AWG EMP hardened).

- Bus cable 
- Stub cable 

ZZZ Cable Length

012 = 305mm
078 = 1980mm
079 = 2000mm
120 = 3050mm
236 = 6000mm
240 = 6100mm

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Databus Components

MIL-STD-1553B Cables

Spec 55 databus cables meet or exceed the performance requirements of MIL-STD-1553B. Insulation is a high temperature, radiation cross-linked, modified ETFE that can be used in wire constructions rated up to 200°C.

Features & Benefits

- Lightweight
- Highly flexible
- Flame resistant
- Chemical resistant to all aircraft fluids
- Solder iron resistant
- Defined shielding performance.

Product Cable Selection Guide

Cable Type		Part Numbers
24 AWG Single Optimised Shield		10612
24 AWG Double Optimised Shield		10613
24 AWG EMP Hardened		10614

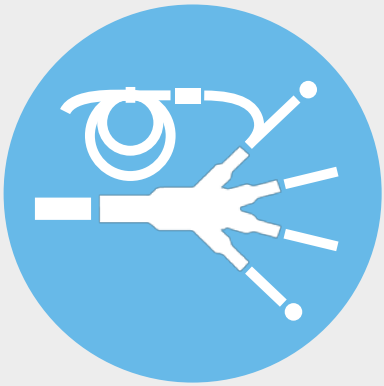
Accessories

We can also supply the accessory components that may be necessary to complete a databus system.
These include:

- Bus and stub terminators (spliced-in and connectorised D-621 series).
- Cable splice kits.
- EMI/environment-resistant connector caps.
- Braid terminators and strain relief tubing.
- Cable marking materials.

Specifications / Approvals

- MIL-AS27500/32 & /35
- MIL-AS27500/41 & /46



INTRODUCTION

Advanced Identification and Labelling Project Solutions

- Heat Shrinkable
- Tie-on Markers
- Adhesive Labels
- Hardware and Software
- Additional Ident Products

Identification and labelling products are increasingly important as the preferred method of identification and traceability, for harness wire and cable, control panel and components.

Our product range covers a multitude of styles and materials including heat-shrinkable markers, tie-on, wrap-around and self-adhesive labels that meet international UL, CSA & Mil-Spec specifications. Products can be marked using a range of state of the art thermal transfer printers.

Applications range from commercial component labelling through to high performance critical systems identification. Typical product performance characteristics include extreme temperature operation, zero halogen, low smoke, low toxicity, chemical resistance, abrasion resistant, electrical insulation, strain relief and UV resistance.

Mechanical Protection
Extreme Temperature Performance
Chemical Resistance
Fluid & Solvent Resistance
Moisture protection
Strain Relief, Flexibility
Flame-Retardant, Low Smoke
High Shrink Ratio
Low shrink Temperature
Aesthetic Enhancement
Fast and Efficient Installation

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CONTENTS

Heat Shrink Selection Chart

Cable Identification Markers

Overview

Our cable identification solutions provide a "marked" difference. Heat-shrinkable cable identification marker sleeves are available in a wide variety of configurations, colours and sizes for high performance applications such as military grade, low-fire hazard, fluid resistant, high temperature and commercial use.

Printable cable markers for large wire bundles, cables, pipes and conduits come in a variety of colours and sizes for military, high temperature, and low-fire hazard applications.

Product	UL Recognised	CSA Approved	SAE AS5942	SAE-AMS DTL-23053	SNCF NF F	EN 50343	Operating Temperature		Shrink Ratio	Thermal Printing	White	Yellow	Black	Clear	Non Standard Colours	Sleeve Pre-scored	Description
							Min.	Max.									
TMS-SCE	•	•	•	•			-55°C	135°C	3:1	•	•	•			•	•	MIL Spec
HT-SCE	•		•				-55°C	225°C	2:1	•	•		•			•	High temp. Low gas
HX-SCE			•		•	•	-30°C	105°C	2:1	•	•	•			•	•	Low fire hazard
D-SCE			•	•	•	•	-55°C	135°C	3:1	•	•	•			•	•	Fluid resistant
ZHD-SCE						•	-55°C	125°C	2:1	•	•	•			•	•	LFH & fluid resistant
UV-SCE	•						-55°C	200°C	2:1	•	•	•				•	UV & fire retardant
RPS	•	•	•				-30°C	105°C	3:1	•	•	•				•	Commercial
TMS-CCUV	•	•		•			-55°C	150°C	2:1					•			UV resistant, clear

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Available on the range of heat shrinkable identification sleeves, in four standard lengths of 50mm, 25mm, 16mm and 12.5mm. Our in-house ability to score sleeves means we can offer a fast order turnaround.

- S1 Scored sleeve for 2 x 25mm sleeves
- S2 Scored sleeve for 3 x 16mm sleeves
- S3 Scored sleeve for 4 x 12.5mm sleeves

For non-standard lengths please contact us.

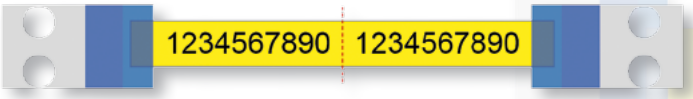
Minimum order quantity is based on the pack size of the particular heat shrinkable sleeve.

Perforated score line is made to produce multiple markers from each sleeve. For part numbering add S1, S2 or S3 to end of the individual part number.

Illustration shows nominal actual size of a 3.2mm Ø marker, using an 11 point Arial font.

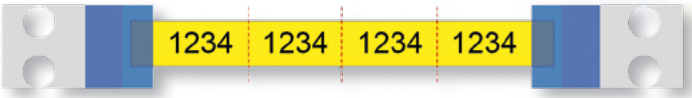
Un-scored sleeve

S1 Perforated sleeve for 2 x sleeves



S2 Perforated sleeve for 3 x sleeves

S3 Perforated sleeve for 4 x sleeves



The above represents the standard choices, other options and variants are available, please contact us for information.

TMS-SCE
Military Grade
Heat Shrink Identification Sleeves

Military grade wire identification sleeve. Offering thin wall, flame retardant radiation cross linked modified heat shrinkable tubing.

Standard colours available are White or Yellow.

Features & Benefits
- Lightweight for aerospace applications.
- CSA certified
- Available as pre-scored marker sleeves

Operating Temperature Range
- -55°C to +135°C

Installation
- Minimum recovery temperature +85°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
TMS-RJS-RIBBON-4RPSCE

Specifications and Approvals
- SAE AS5942 (print adherence)
- MIL-STD-202 method 215 (solvent resistance)
- SAE-AMS-DTL-23053/5 class 1
- EN45545-2 R24 HL2
- UL STD 224 (File 35586)
- CSA Certified (file 31929)
- NSA 937201 Type MR & MT
- BMS 13-69 Grade A & B

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Weight g/10 pcs	Pack Size
TMS-SCE-3/32-2.0-Colour	2.36	0.79	0.81 - 1.90	1.50	250 pcs
TMS-SCE-1/8-2.0-Colour	3.18	1.07	1.11 - 2.66	2.03	250 pcs
TMS-SCE-3/16-2.0-Colour	4.75	1.57	1.75 - 4.06	2.68	250 pcs
TMS-SCE-1/4-2.0-Colour	6.35	2.11	2.31 - 5.46	3.51	250 pcs
TMS-SCE-3/8-2.0-Colour	9.53	3.18	3.47 - 8.12	5.04	250 pcs
TMS-SCE-1/2-2.0-Colour	12.70	4.22	4.64 - 10.79	6.81	250 pcs
TMS-SCE-3/4-2.0-Colour	19.05	6.35	6.99 - 16.25	12.03	250 pcs
TMS-SCE-1-2.0-Colour	25.40	8.46	9.29 - 21.59	15.35	250 pcs
TMS-SCE-1-1/2-2.0-Colour*	38.10	19.05	20.95 - 33.02	27.51	250 pcs
TMS-SCE-2-2.0-Colour*	50.80	25.40	27.94 - 44.95	47.27	250 pcs
TMS-SCE-2-1/4-2.0-Colour	57.15	19.05	22.32 - 50.80	42.06	250 pcs

Alternative packaging sizes also available please ask for details
* Please note that shrink ratio is 2:1

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

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HT-SCE

High Temperature and Low Out-gassing Heat Shrink Identification Sleeves

High temperature low out-gassing heat shrinkable wire identification sleeves. Designed for use in high temperature applications or where extreme resistance to fuels, lubricants and cleaning solvents is required.

Features & Benefits

- High continuous operating temperature.
- Extreme fluid resistance.
- Low vacuum out-gassing.
- Available as pre-scored marker sleeves

Operating Temperature Range

- -55°C to +225°C

Installation

- Minimum recovery temperature +200°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
TMS-RJS-RIBBON-4HT
If black tubing TMS-RJS-RIBBON-WHT-4HT

Specifications and Approvals

- SAE AS5942 (print adherence)
- MIL-STD-202G method 215 (solvent resistance)
- UL-224 VW-1 rated
- Low out-gassing 1% max TML, 0.1% max VCM
- NSA 937201 Type MK & ML
- BMS 13-69 Grade C & D

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Pack Size
HT-SCE-3/32-2.0-Colour	2.36	0.79	0.81 - 1.90	250 pcs
HT-SCE-1/8-2.0-Colour	3.17	1.57	1.75 - 2.66	250 pcs
HT-SCE-3/16-2.0-Colour	4.74	2.36	2.54 - 4.06	250 pcs
HT-SCE-1/4-2.0-Colour	6.35	3.18	3.40 - 6.00	250 pcs
HT-SCE-3/8-2.0-Colour	9.52	4.74	5.30 - 8.10	250 pcs
HT-SCE-1/2-2.0-Colour	12.70	6.35	6.60 - 11.40	250 pcs
HT-SCE-3/4-2.0-Colour	19.05	9.53	9.90 - 15.30	250 pcs
HT-SCE-1-2.0-Colour	25.40	12.70	13.30 - 23.00	250 pcs
HT-SCE-1-1/2-2.0-Colour	38.10	19.05	20.95 - 34.00	250 pcs

Alternative packaging sizes also available please ask for details.

Standard Colours Available

9	0
White	Black

For non standard colours please contact us for details and MOQ's.

HX-SCE

Low Fire Hazard
Heat Shrink Identification Sleeves

Ideal for applications where limited fire hazard characteristics are necessary. The zero halogen material coupled with low smoke and low toxic fume emissions make the product ideal for use in enclosed spaces such as mass transit, marine and industrial installations.

Features & Benefits

- Meets international rail LFH standards.
- High performance print quality.
- Available as pre-scored marker sleeves.

Operating Temperature Range

- -55°C to +105°C

Installation

- Minimum recovery temperature +120°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
1966-RIBBON

Specifications and Approvals

- SAE AS5942 (print adherence)
- MIL-STD-202G method 215 (solvent resistance)
- EN45545-2 R22/R23/R24 HL3
- LUL 1-085 A3 (Fire Safety Performance)
- NF F 16-101 (Class 1A)
- BS 6853 Cat 1A
- EN 50343 H (Diesel immersion removed)

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Pack Size
HX-SCE-2.4-50-Colour	2.36	1.19	1.27 - 1.90	250 pcs
HX-SCE-3.2-50-Colour	3.17	1.58	1.77 - 2.66	250 pcs
HX-SCE-4.8-50-Colour	4.74	2.36	2.54- 4.06	250 pcs
HX-SCE-6.4-50-Colour	6.35	3.18	3.81 - 5.46	250 pcs
HX-SCE-9.5-50-Colour	9.52	4.75	5.59 - 8.12	250 pcs
HX-SCE-12.7-50-Colour	12.70	6.35	6.99- 10.79	250 pcs
HX-SCE-19-50-Colour	19.05	9.53	10.16 - 16.25	250 pcs
HX-SCE-25.4-50-Colour	25.40	12.70	14.29 - 21.59	250 pcs
HX-SCE-38.1-50-Colour	38.10	19.05	20.95 - 33.02	250 pcs

Alternative packaging sizes also available please ask for details

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

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D-SCE

Fluid Resistant Heat Shrink Identification Sleeves

Suitable for applications where exposure to organic fluids, especially oils, is required. Designed to operate in these conditions at elevated temperatures for extended periods, making them ideal for rail and construction industries.

Features & Benefits

- Resistance to organic fluids, common fuels, lubricants and solvents.
- Available as pre-scored marker sleeves.

Operating Temperature Range

- -75°C to +135°C

Installation

- Minimum recovery temperature +135°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
1966-RIBBON

Specifications and Approvals

- AMS AS5942 4.1 (print adherence)
- MIL-STD-202G method 215 (solvent resistance)
- SAE AMS DTL 23053/6 Class 1
- EN50343 appendix H
- SNCF NF F 00608 (cat. A & H)

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Pack Size
D-SCE-2.4-50-Colour	2.36	0.79	0.81 - 1.90	250 pcs
D-SCE-3.2-50-Colour	3.17	1.07	1.11 - 2.66	250 pcs
D-SCE-4.8-50-Colour	4.74	1.57	1.75 - 4.06	250 pcs
D-SCE-6.4-50-Colour	6.35	2.11	2.31- 5.46	250 pcs
D-SCE-9.5-50-Colour	9.52	3.18	3.47 - 8.12	250 pcs
D-SCE-12-50-Colour	12.70	4.22	4.64 - 10.79	250 pcs
D-SCE-18-50-Colour	19.05	6.35	6.99 - 16.25	250 pcs
D-SCE-25-50-Colour	25.40	8.46	9.29 - 12.59	250 pcs
D-SCE-38-50-Colour*	38.10	19.05	20.95 - 33.02	250 pcs

Alternative packaging sizes also available please ask for details
* Please note that shrink ratio is 2:1

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

ZHD-SCE

Halogen Free and Fluid Resistance Heat Shrink Identification Sleeves

Manufactured using a specially developed radiation cross-linked, zero halogen material. Designed specifically to bridge the gap for installations where the highest performance is demanded from an identification sleeve.

Features & Benefits

- Meets international rail LFH standards
- No Halogens, Sulphur and Nitrogen
- Non-flame propagating
- High performance print quality.
- Available as pre-scored marker sleeves.

Operating Temperature Range

- -55°C to +135°C

Installation

- Minimum recovery temperature +120°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
1966-RIBBON

Specifications and Approvals

- SAE AS5942 (print adherence)
- MIL-STD-202G method 215 (solvent resistance)
- EN45545-2 R22 HL2
- BS 6853 Cat II
- EN 50343 (Appendix H)

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Pack Size
ZHD-SCE-2.4-50-Colour	2.4	1.19	1.27 - 1.90	250 pcs
ZHD-SCE-3.2-50-Colour	3.2	1.58	1.77 - 2.66	250 pcs
ZHD-SCE-4.8-50-Colour	4.8	2.36	2.54- 4.06	250 pcs
ZHD-SCE-6.4-50-Colour	6.4	3.18	3.81 - 5.46	250 pcs
ZHD-SCE-9.5-50-Colour	9.5	4.75	5.59 - 8.12	250 pcs
ZHD-SCE-12.7-50-Colour	12.7	6.35	6.99- 10.79	250 pcs
ZHD-SCE-19-50-Colour	19.0	9.53	10.16 - 16.25	250 pcs
ZHD-SCE-25.4-50-Colour	25.4	12.70	14.29 - 21.59	250 pcs
ZHD-SCE-38.1-50-Colour	38.1	19.05	20.95 - 33.02	250 pcs

Alternative packaging sizes also available please ask for details

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

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UV-SCE

UV Resistant, Flame Retardant Heat Shrink Identification Sleeves

The solution to identify wires and cables where extreme resistance to Ultra Violet (UV) and harsh weather conditions are required. UV-SCE offers outstanding physical performance, mark permanence and excellent legibility after 25,000 hours of UV and moisture exposure, without degradation.

Features & Benefits

- UV Resistant
- Flame retardant polymer compound
- Available as pre-scored marker sleeves.

Operating Temperature Range

- -55ºC to +200ºC

Installation

- Minimum recovery temperature +135ºC
- Maximum storage temperature +40ºC

Specifications and Approvals

- SAE AS5942 (print adherence)
- MIL-STD-202G method 215 (solvent resistance)
- EN45545-2 Class 3 R24
- IEC 60068-2, -5, procedure B
- NFT 46-019 method A
- BS EN 60068-2-5 B

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
T300-UV-SCE-RIBBON

Ordering Description	ID Supplied	ID Recovered	Recommended Range	Pack Size
UV-SCE-3/32-2.0-Colour	2.4	0.79	0.81 - 1.90	250 pcs
UV-SCE-1/8-2.0-Colour	3.2	1.58	1.75 - 2.66	250 pcs
UV-SCE-3/16-2.0-Colour	4.8	2.36	2.54 - 4.06	250 pcs
UV-SCE-1/4-2.0-Colour	6.4	3.18	3.40 - 6.00	250 pcs
UV-SCE-3/8-2.0-Colour	9.5	4.75	5.30 - 8.10	250 pcs
UV-SCE-1/2-2.0-Colour	12.7	6.35	6.60 - 11.40	250 pcs
UV-SCE-3/4-2.0-Colour	19.0	9.53	9.90 - 15.30	250 pcs
UV-SCE-1-2.0-Colour	25.4	12.70	13.30 - 23.00	250 pcs
UV-SCE-1-1/2-2.0-Colour	38.1	19.05	20.95 - 34.00	250 pcs

Alternative packaging sizes also available please ask for details

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

RPS

Commercial Grade
Heat Shrink Identification Sleeves

RPS markers are heat-shrinkable marker sleeves for general industrial applications, whilst resistant to abrasion, aggressive cleaning solvents and industrial fluids.

Features & Benefits
- Flame retardant
- Available as pre-scored marker sleeves.

Operating Temperature Range
- -30°C to +105°C

Installation
- Minimum recovery temperature +85°C
- Maximum storage temperature +40°C

Recommended printers:
T200-IDENT-PRINTER and the TE3112.

Approved ribbon:
TMS-RJS-RIBBON-4RPSCE

Specifications and Approvals
- SAE AS 81531 4.6.2 (print adherence)
- MIL-STD-202 method 215J (solvent resistance)
- UL 224 (file E35586)
- CSA Certified (file 31929)

Ordering Description	Supplied Ø mm	Recovered Ø mm	Recommended Range mm	Pack Size
RPS-22-18/2.0-Colour	3.18	1.07	1.17 - 2.66	250 pcs
RPS-18-12/2.0-Colour	4.75	1.57	1.75 - 4.06	250 pcs
RPS-16-10/2.0-Colour	6.35	2.11	2.31 - 5.46	250 pcs
RPS-8-4/2.0-Colour	9.53	3.18	3.47 - 8.12	250 pcs
RPS-10-2/2.0-Colour	12.70	4.22	4.64 - 10.79	250 pcs
RPS-6-250/2.0-Colour	19.05	6.35	6.99 - 16.25	250 pcs
RPS-1-400/2.0-Colour	25.40	8.46	9.29 - 21.59	250 pcs
RPS-400-1000/2.0-Colour*	38.10	19.05	20.95 - 3.02	250 pcs

Alternative packaging sizes also available please ask for details
* Please note that shrink ratio is 2:1

Standard Colours Available

9	4
White	Yellow

For non standard colours please contact us for details and MOQ's.

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TMS-CCUV

Military Grade, UV Protection
Cut Piece Clear Heat Shrink Sleeves

Designed to provide increased protection for identification products in outdoor applications. The clear heat-shrinkable sleeves provide a barrier to the effects of ultraviolet (UV) radiation and tough resistance to abrasion and fluids.

Standard colour Clear only.

Features & Benefits

- Added UV protection
- Resistance to abrasion and fluids

Operating Temperature Range

- -55ºC to +150ºC

Installation

- Minimum recovery temperature +150ºC
- Maximum storage temperature +40ºC

Specifications and Approvals

- UL VW-1 rated
- SAE AMS DTL 23053/18, Class 2

Ordering Description	Supplied Ø mm	Recovered Ø mm	Length mm	Recommended Range mm	Pack Size
TMS-CCUV-SLEEVE-1	3.2	1.6	65	1.80 - 2.80	250 pcs
TMS-CCUV-SLEEVE-2	4.8	2.4	65	2.60 - 3.70	250 pcs
TMS-CCUV-SLEEVE-3	6.4	3.2	65	3.50 - 5.10	250 pcs
TMS-CCUV-SLEEVE-4	9.5	4.8	65	5.00 - 7.00	250 pcs
TMS-CCUV-SLEEVE-5	12.7	6.4	65	6.90 - 10.60	250 pcs
TMS-CCUV-SLEEVE-6	19.0	9.5	65	10.00 - 14.00	250 pcs
TMS-CCUV-SLEEVE-7	25.4	12.7	65	13.30 - 21.00	250 pcs
TMS-CCUV-SLEEVE-8	38.0	19.0	65	21.00 - 33.80	250 pcs

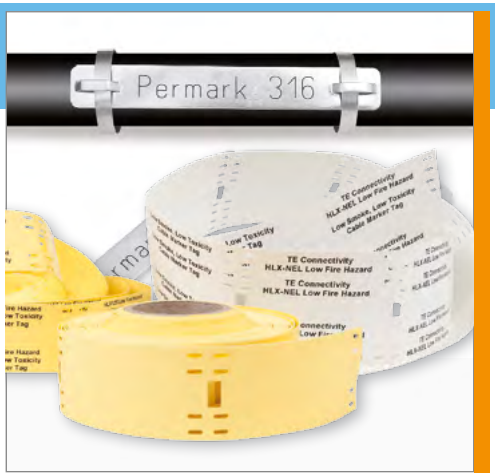
Also available in 32mm and 76mm lengths, in selected sizes, please ask for details

Tie-On Selection Chart

Cable Identification Markers

Overview

Tie-On Cable markers are flat, non-adhesive labels that can be used to identify large cables and wire bundles in particularly aggressive environment.



Product	SAE AS 81531	SAE-AMS DTL-23053	EN45545-2	Operating Temperature	Size (mm)	Thermal Print	Standard Colours			Non Standard Colours.	Description
							Metal	White	Yellow		
CM-SCE-TP	•		•	-55°C to +135°C	10.4 and 51.5	•		•	•	•	Polyolefin
HLX125	•	•		-40°C to +105°C	80 x 12.5	•		•	•	•	Zero halogen
PM316				-80°C to +500°C	95 x 12	n/a	•				Stainless Steel

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CM-SCE-TP

Military Grade Tie-On Cable Marker

These non-adhesive labels can be used to identify large cables and wire bundles in particularly aggressive environments. Can be applied post cable termination using cable ties.

Manufactured using specially developed radiation cross-linked flame retarded polymer. Typical installation include mass transit, military and aerospace.

Colours available are White (9) or Yellow (4).

Features & Benefits

- Highly flame resistant - excellent resistance to burning (Oxygen Index 35%).
- Resistant to key industrial and military grade fluids, as defined by RW-2513.

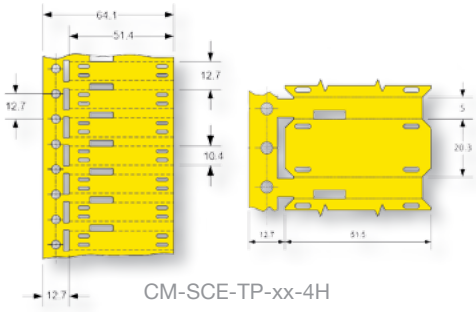
Operating Temperature Range

- -55°C to +135°C

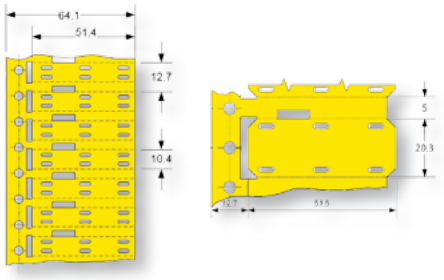
High temperature version HTCM-SCE-TP also available offering 225°C please call us.

Specifications and Approvals

- SAE AS 5942
- MIL-STD-202F Method 215
- EN45545-2 Class 3, R24, HL3
- NFPA130
- UL MH26328 Group PG1S2



CM-SCE-TP-xx-4H



CM-SCE-TP-xx-6H

Ordering Description	Size (inch)	Markable Height mm	Markable Length mm	Recommended Range mm	Pack Size
4 Tie Holes					
CM-SCE-TP-1/4-4H-4 or 9	1/4	6.4	50.80	5.08 to 12.50	250 pcs
CM-SCE-TP-1/2-4H-4 or 9	1/2	12.70	50.80	12.50 and up	250 pcs
6 Tie Holes					
CM-SCE-TP-1/4-6H-4	1/4	6.4	50.80	5.08 to 12.50	250 pcs
CM-SCE-TP-1/2-6H-4 or 9	1/2	12.70	50.80	12.50 and up	250 pcs

Alternative packaging sizes also available please ask for details
Recommended printers: T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon 1966-RIBBON

HLX125-NEL

Halogen free, Low Fire hazard
Tie-On Cable Marker

Low Fire Hazard, UV stabilised, cross-linked polyolefin Cable Markers, assembled in a Narrow Edge Leading 'NEL' format. Consisting of a continuous strip formed into punched tie on Cable Markers. Cable Markers have perforated edges for easy removal

Markers are printed by a computer-based system and are attached using cable ties. Ideal for applications where low fire hazard characteristics (low smoke, low toxicity and low flammability) are critical.

Standard colours available are White or Yellow.

Features & Benefits

- Recommended for use where combustion of products may endanger personnel or delicate electronics.
- Two formats available.
- Ideal for pre or post termination assembly.

Specifications and Approvals

- SAE AS5942
- MIL-STD-202 Method 215
- London Underground 1-085 A3
- EN45545-2 R22/R23/R24 HL3
- BS 6853 Vehicle cat 1a
- NF F 16-101 Class A1

Operating Temperature Range

- -40°C to +105°C

Ordering Description	Marker Dimensions mm	Printable Area mm	No. Markers Across	Pack Size
HLX125-Colour-4NEL60S	80.0 x 12.5	60.0 x 10.5	4	200 pcs per roll
HLX125-Colour-2NEL60S	80.0 x 12.5	60.0 x 10.5	2	200 pcs per roll

Recommended printers: T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon 1966-RIBBON

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PM316 Metal
Stainless Steel Tie-On Cable Marker

For additional information on this product, associated part number and options please contact us direct.

Typical sizes are:
- 95 x 12mm, printable area 55 x 10mm
- 85 x 12mm, printable area 50 x 10mm
- 75 x 7mm, printable area 50 x 5mm

Permark® 316 stainless steel markers are recommended for use in highly demanding applications. Using state of the art technology and no inks, the marking process produces a permanent, deep surface mark with a darkened character in high contrast to the background.

Pre-print service option only.

Offering excellent resistance to a variety of hydrocarbons, organic chemicals, acids, alkali and inorganic salts.

Features & Benefits
- Pre-marked to customer requirements.
- Variety of fixing methods possible.
- Mark will endure the lifetime of a Permark stainless steel marker.
- Excellent resistance to weather extremes and high levels of UV light.
- Resistant to corrosive marine and industrial atmospheres.
- Excellent resistance to a variety of hydrocarbons, organic chemicals, acids, alkalis & inorganic salts.

For resistance to a specific chemicals and substances, please contact us.

Operating Temperature Range
- -80ºC to +500ºC

Ordering Description
As these parts are made to order please contact us for details.

Label Selection Chart

Adhesive Identification Labels

Overview

Range of self-adhesive labels available in various forms and colours for either self printing or using our pre-print service.

Product	UL	ASTM D3330	SAE AD 4952	BMS 13-47	Operating Temperature	Size	Thermal Printing	Standard Colours			Non Standard Colours	Description
								White	Metalised	Clear		
SBP	•	•			-40°C to +80°C	Various	•	•				Self-laminating
PVF				•	-40°C to +107°C		•	•				Self-laminating
MP	•		•		-40°C to +150°C		•		•			Metalised polyester
MV	•				-40°C to +150°C		•		•			Temper evident
WP	•		•		-40°C to +150°C		•	•				Polyester
TTP	•	•			-29°C to +150°C		•	•	•	•	•	Polyester
Raymark A4					-40°C to +105°C	A4		•				Ink-jet printable

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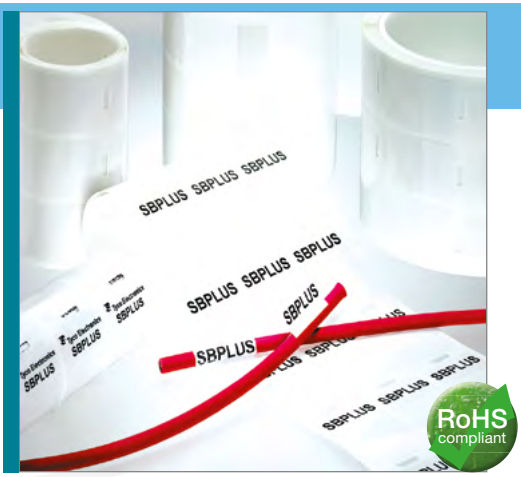
SBPlus

Self-laminating Labels
Thermal Transfer Printable



Clear vinyl film with a permanent acrylic based adhesive, suppled with a white thermal transfer printable area, which is over-laminated upon application with the clear portion of the label.

Can also be 'flagged' around a wire rather than wrapped. This self-laminating feature protects the printed area from exposure to oil, solvents, water and abrasion.

Printable area is equal to the width of the label and the printable height as identified in the table below.

Standard colour is White with a clear tail.

Specifications and Approvals

- ASTM D3330
- ASTM 3611
- MIL-STD-202 Method 215
- UL969 PGJ12 MH17292

Features & Benefits

- Strong adhesive, prevents lift off and seals.
- Base material allows the printing to remain clear after lamination.
- Designed to withstand exposure to oil, solvents and water.

Operating Temperature Range

- -40ºC to +110ºC

Ordering Description	Label Size mm		Printable Height mm	Max. Cable OD mm	No. Labels Across	Pack Size
	Height	Width				
SBP050100WE10	25.4	12.7	8.5	5.1	5	10,000
SBP050143WE10	36.5	12.7	12.7	7.6	5	10,000
SBP075094WE10	23.9	19.1	9.5	7.6	4	10,000
SBP080150WE10	38.1	20.3	12.7	7.6	4	10,000
SBP100143WE5	36.5	25.4	12.7	7.6	3	5,000
SBP100225WE5	57.2	25.4	19.1	12.2	3	5,000
SBP100375WE2.5	95.3	25.4	25.4	22.4	3	2,500
SBP100594WE1	151.0	25.4	38.1	35.6	3	1,000
SBP100743WE1	188.9	25.4	38.1	35.6	3	1,000
SBP190319WE2.5	81.0	48.3	19.1	12.2	2	2,500
SBP190594WE1	151.0	48.3	38.1	35.6	2	1,000
SBP200143WE2.5	6.5	50.8	12.7	7.6	2	2,500
SBP200225WE2.5	57.2	50.8	19.1	12.2	2	2,500
SBP200375WE2.5	95.3	50.8	25.4	22.4	2	2,500
SBP200743WE	188.9	50.8	38.1	48.3	2	11,000

Recommended printers T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon TMS-RJS-RIBBON-4RPSCE

PVF

Self Laminating Labels
Thermal Transfer Printable

Translucent polyvinyl fluoride film with a permanent acrylic adhesive, designed for wire and cable marking applications that require the 'self-extinguishing' properties of polyvinyl fluoride. Supplied with a white printable area, which is over-laminated upon application.

PVF has a low-profile design making it suitable for wrapping onto thin wire gauges as well as excellent conform-ability to round, irregular or flexible surfaces and is ideal for wire & cable identification, including flat ribbon cables that are subject to repeated bending.

Features & Benefits

- Thermal transfer printable
- Excellent UV resistance
- Excellent conform-ability to round, irregular and flexible surfaces.
- High resistance to aging

Operating Temperature Range

- -40°C to +107°C

Specifications and Approvals

- ASTM D1000-76
- AS-81531
- MIL-STD-202 Method 215
- MIL STD 833C
- BMS 13-47
- NGM802AK

Ordering Description	Label Width mm	Label Height mm	Labels Across	Pack Size
PVF050100WE10	12.7	25.4	5	10,000
PVF080150WE10	20.3	38.1	4	10,000
PVF100143WE5	25.4	36.5	3	5,000
PVF200143WE2.5	50.8	36.5	2	2,500
PVF100225WE5	25.4	57.2	3	5,000
PVF190319WE205	48.3	81.0	2	2,500
PVF100375WE2.5	25.4	95.3	3	2,500
PVF200375WE2.5	50.8	65.3	2	2,500
PVF100594WE1	25.4	151.0	3	1,000
PVF100743WE1	25.4	188.9	3	1,000
PVF190594WE1	48.3	151.0	2	1,000
PVF200743WE1	50.8	188.9	2	1,000

Recommended printers: T200-IDENT-PRINTER plus the TE3112 printer
Approved ribbon 1330-3300-10

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MP

Metalised Polyester Labels
Thermal Transfer Printing

MP is a thermal transfer printable metalised polyester film with permanent acrylic adhesive, designed for rating plates and other applications that require a metal look, such as nameplates, equipment labels, detailed product information labels and serial number plates. MP is UL Listed and CSA certified.

Standard colour is Silver, metalised polyester

Features & Benefits

- Thermal transfer printable
- Several die-cut sizes available
- Metalised appearance
- UL listed and CSA certified
- Ideal for rating plate applications

Operating Temperature Range

- -40ºC to +150ºC

Specifications and Approvals

- ASTM AS 4952
- MIL-STD-202 Method 215
- FTM-1
- UL969 PGJ12 MH17292
- UL969 PGJ18 MH17292 (Canadian)

The table below only represents a selection of MP label products available, for a complete list or more detailed information please contact us for details.

Ordering Description	Label Width mm	Label Height mm	Labels Across	Pack Size
MP-080080-10-8A	8.0	8.0	8	10,000
MP-095080-25-8A	9.5	8.0	5	25,000
MP-127111-10-8A	12.7	11.1	5	10,000
MP-165102-10-8A	16.5	10.2	5	10,000
MP-191114-18-8A	19.1	11.4	3	15,000
MP-254045-10-8A	25.4	4.6	3	10,000
MP-254127-10-8A	25.4	12.7	3	10,000
MP-445102-5-8A	44.5	10.2	1	5,000
MP-762508-2.5-8A	76.2	50.8	1	2,500

Recommended printers: T200-IDENT-PRINTER plus the TE3112 printer
Approved ribbon 1330-0607-10

MV

White Polyester Labels
Thermal Transfer Printing

RoHS compliant

MV is a thermal transfer printable metalised polyester film with a permanent acrylic adhesive, designed with a tamper-evident feature which leaves a 'VOID' footprint when removed. It is ideal for applications such as rating plate and serial number labels that require protection against removal.

Standard colour is Silver, metalised polyester.

Features & Benefits

- Thermal transfer printable
- Metalised appearance
- Ideal for security applications
- UL recognised

Operating Temperature Range

- -40°C to +150°C

Specifications

- MIL-STD-202 Method 215
- AS-81531
- UL969 PGJ12 MH17292

The table below only represents a selection of MV label products available, for a complete list or more detailed information please contact us for details.

Ordering Description	Label Width mm	Label Height mm	Labels Across	Pack Size
MV-040040-25-8A	4.0	4.0	20	25,000
MV-089047-10-8A	8.9	4.7	5	10,000
MV-095095-10-8A	9.5	9.5	7	10,000
MV-127127-10-8A	12.7	12.7	5	10,000
MV-191114-15-8A	19.1	11.4	3	15,000
MV-254064-10-8A	25.4	6.4	3	10,000
MV-254097-10-8A	25.4	9.7	3	10,000
MV-381191-5-8A	38.1	19.1	2	5,000
MV-508127-8-8A	50.8	12.7	1	5,000
MV-762508-2.5-8A	76.2	50.8	1	2,500
MV-101508-2.5-8A	101.6	50.8	1	2.500
MV-101101-1.3-8A	101.6	101.6	1	1,300

Recommended printers: T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon 1330-0607-10

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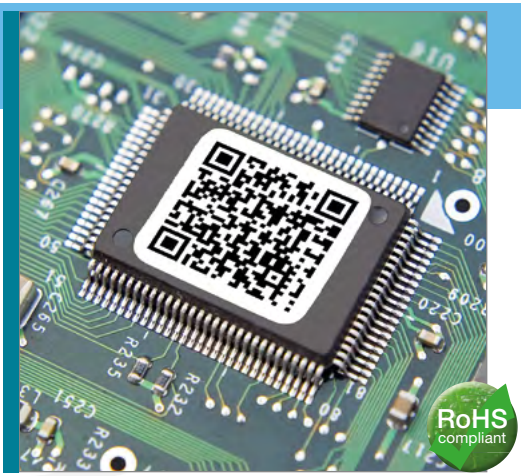
WP

White Polyester Labels
Thermal Transfer Printing



WP is a white polyester film with a permanent acrylic adhesive. It is ideal for bar coding, PCB and component labelling, as well as general purpose labelling applications that require a high durability white label. WP is resistant to a variety of solvents while maintaining print quality. It is UL listed and print performance and durability are reliable when used with specified ribbons.

Standard colour available is White.

Features & Benefits

- Ideal for use on PCB component labelling
- Ink receptive topcoat
- Excellent for bar code applications
- UL listed and CSA certified

Specifications and Approvals

- ASTM AS 4952
- MIL-STD-202 Method 215
- FTM-1
- UL969 PGJ12 MH17292
- UL969 PGJ18 MH17292 (Canadian)

Operating Temperature Range

- -40°C to +150°C

The table below only represents a selection of WP label products available, for a complete list or more detailed information please contact us for details.

Ordering Description	Label Width mm	Label Height mm	Labels Across	Pack Size
WP-127111-10-9	12.7	11.1	5	10,000
WP-165051-25-9	16.5	5.1	4	25,000
WP-171171-10-9	17.1	17.1	5	10,000
WP-191064-10-9	19.1	6.4	4	10,000
WP-229064-10-9	22.9	6.4	3	10,000
WP-254064-10-9	25.4	6.4	3	10,000
WP-254127-10-9	25.4	12.7	3	10,000
WP-318064-10-9	31.8	6.4	1	10,000
WP-381191-5-9	38.1	19.1	2	5,000
WP-508127-5-9	50.8	12.7	1	5,000

Recommended printers: T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon 1330-0607-10

TTP

Continuous Polyester for Decals
Thermal Transfer Printable

This highly durable system offers the features of 'Silk Screened' labels, only without the cost, time and inflexibility involved. The product utilises high performance polyester with permanent adhesive, suitable for panel labels, fascias and decals.

Features & Benefits

- Effective alternative solution for expensive silk-screen printing
- Continuous format
- Several widths and colours available
- Interior and exterior aircraft use including flight entertainment and deck instrumentation.

Operating Temperature Range

- Clear from -40°C to +125°C
- Other from -29°C to +150°C

RoHS compliant

Specifications and Approvals

- A-A-59485
- GAT100BB
- UL MH17292 Group PGJI2 (polywhite)

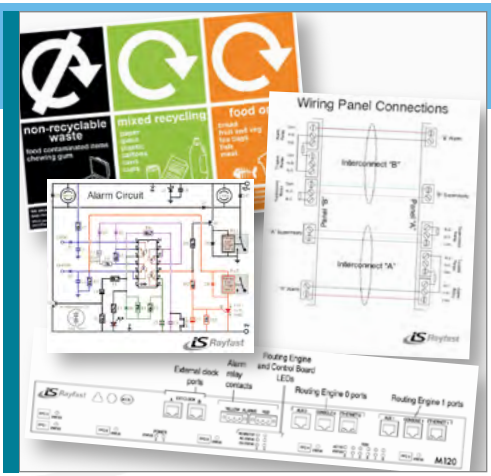
Ordering Description	Label Width mm	Roll Length m	Qty per Pack
Standard adhesive version			
TTP200-Colour-10	50.8	30.48m (100ft)	Continuous Roll
TTP300-Colour-10	73.2	30.48m (100ft)	Continuous Roll
TTP400-Colour-10	101.6	30.48m (100ft)	Continuous Roll
TTP600-Colour-10	152.4	30.48m (100ft)	Continuous Roll
High tack adhesive version			
TTPA200-Colour-10	50.8	30.48m (100ft)	Continuous Roll
TTPA300-Colour-10	73.2	30.48m (100ft)	Continuous Roll
TTPA400-Colour-10	101.6	30.48m (100ft)	Continuous Roll
TTPA600-Colour-10	152.4	30.48m (100ft)	Continuous Roll

Ordering Information: Standard colours: CL = Clear, WE = White and MP = Metalised
Non-Standard: RD = Red, GN = Green, BE = Blue; OE = Orange, BK = Black and YW = Yellow

Recommended printers: T200-IDENT-PRINTER and the TE3112 printer.
Approved ribbon 1330-0607-10

Raymark RMK A4

Epoxy Coated Labels
Computer Printable



Raymark is a computer printer label stock with outstanding fluid and abrasion resistance, for ink-jet printers.

When heat-cured after printing, the heat reactive epoxy surface “locks-in” the printed image. Typical applications are rating plate labels, wiring diagrams, component identification and wraparound markers.

Standard colour available is White

Features & Benefits

- Outstanding adhesion to many surfaces
- Outstanding fluid and abrasion resistance.
- Low fire hazard properties
- Indoor use only

Operating Temperature Range

- Wire marking -40ºC to +85ºC
- Panel marking -40ºC to +105ºC

Specifications and Approvals

- MIL-M-81531 (mark permanence)
- MIL-STD-202F Method 215 (solvent resistance)

Ordering Description	Label Height mm	Label Width mm	No. Labels / reel	Pack Size
RMK-9x25-A4	9	25	132 labels	50 Sheets
RMK-18x35-A4	18	35	48 labels	50 Sheets
RMK-18x50-A4	18	50	36 labels	50 Sheets
RMK-25x50-A4	25	50	27 labels	50 Sheets
RMK-25x75-A4	25	75	18 labels	50 Sheets
RMK-35x75-A4	35	75	12 labels	50 Sheets
RMK-25x100-A4	25	100	10 labels	50 Sheets
RMK-50x100-A4	50	100	5 labels	50 Sheets
RMK-75x150-A4	75	150	3 labels	50 Sheets
RMK-UNCUT-A4	A4	A4	1 label	50 Sheets

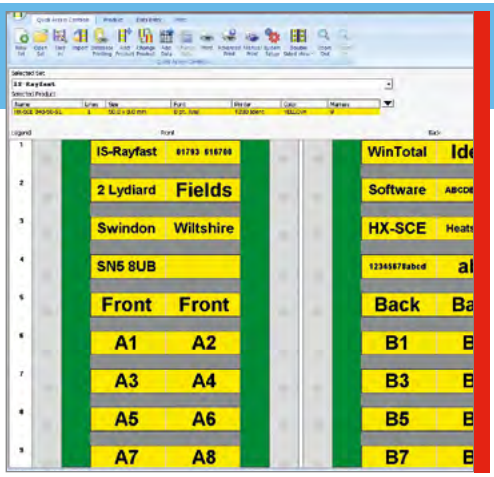
A standard pack contains 50 sheets in environmentally sealed package, if opened the labels should be stored at a temperature no greater than +25ºC @ ,80% humidity and used within 6 months. An un-opened pack can be stored at a temperature no greater then +35ºC and has a recommended shelf life of 12 months.

For full product performance characteristics, refer to product data sheets TH-93269 (UK) and H54584 (USA).

Recommended printers: New Raymark ink jet printer EPSON WF-5190DW.
Also refer to the TE 411-121005 (ribbon/ink matrix)

WinTotal

Software Solution
Design and Print



WinTotal is a label/marker design package that makes wire marker printing simple in an industrial environment. Running in the familiar Windows environment, WinTotal v6 has 2,500 standard TE Connectivity (TE) Identification products pre-installed. This makes the creation and printing of Identification sleeves or labels a quick and simple task. Using the advanced editor, it is also possible to create complex layouts that relate to active data fields, giving a true WYSIWYG representation.

WinTotal v6 now fully supports Unicode. This allows for multilingual text to be printed using any or all of the languages required. If a character has a Unicode equivalent, then WinTotal v6 will display and print that character, if it can be written into a Microsoft application, it can be copied into WinTotal v6.

Key Features & Benefits

- Multi-lingual user interface.
- Pre-loaded WYSIWYG templates.
- Graphical user interface with WYSIWYG display
- Clipart gallery with commonly used symbols, on V6 and above only.
- Incremental alpha and numeric fields.
- Accepts and prints data in any language - UniCode data support (V6 only).
- Multiple Label Design Objects: Text, lines, boxes, circles and images.
- Double sided marker printing complete with WYSIWYG display.
- Extensive Barcode and 2D barcode support.
- Advanced label design elements & tools: Text boxes, rich text formatting, variable font size.
- Image files supported (JPG, WMF, BMP).
- Multiple Printers/Printing: Full MAPP (Multiple Application Port Printing). Able to drive multiple printers simultaneously with automatic selection.

System Requirements

Computer	IBM Compatible PC
Processor	1 GHz or higher
RAM	1GB
Screen Resolution	1024 x 768 pixels
Disk Space Required	100MB of free disk space

Ordering Information	
USB key with licence, once inserted.	WINTOTAL-6-DONGLE

*RAM requirement is less for earlier Windows operating systems please contact for details

Basic Functionalities

- Toolbar design, ‘Keypad’ buttons, ‘Zoom In/Out’.
- ‘Selected Product’ list box
- Simplified user interface configurable for both basic and advanced users
- Single file data format: One file now replaces multiple files used in older versions.
- ‘System Setup’ screen with simplified printer selection: ‘Advanced Printer Setup’ function shows all settings in one location.

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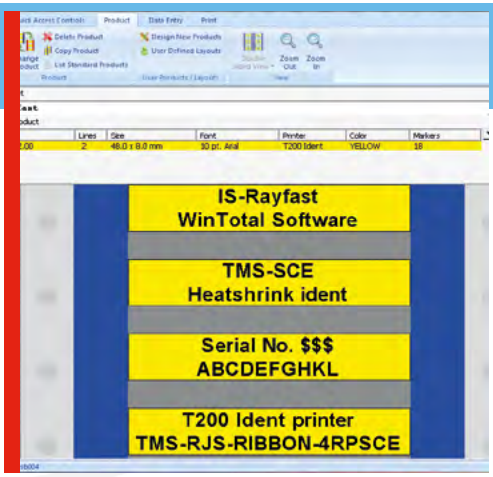
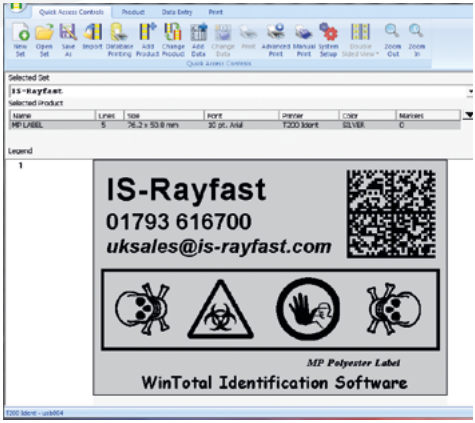
WinTotal
Software Solution
Design and Print





Data Management

- Import data from ASCII or XMT files or from a Windows database
- 'Database printing' function for printing data without importing into WinTotal software
- 'Preview' option to review the import configuration without importing.

Templates

- 'Rotation' option when creating products
- File format supporting importing and exporting of 'User Defined Layouts'.

Supported Languages

Dutch, English, French, German, Italian, Japanese, Korean, Norwegian, Portuguese (Brazil), Russian, Simplified Chinese, Spanish and Turkish.

Note
The WinTotal software package is available to suit a Windows® environment and is constantly being developed in line with operating system updates and technology improvements, please enquire for latest release levels.

Please note that the WINTOTAL-6-DONGLE acts as an authorisation key, the software can be downloaded as a free trial from the TE.com website which this key activates for unrestricted use.

T200-IDENT-PRINTER

Thermal Transfer Printer

Get the most out of your cable identification and labelling. The T200 Ident printer brings together a complete solution for your compact range of thermal transfer printing needs. The increased accuracy and the added flexibility of a movable Media sensor extends the variety of products approved for this printer, while reducing the number of misprints. The T200 is also available as a package with the WINTOTAL Software

Features & Benefits

- Light-weight at 4kg and small footprint
- Automatic calibration
- Simple ribbon and media loading procedure
- Superior print positioning accuracy
- Touch Screen
- Full DHCP and LAN connection

Compact Size

- D322mm x H189mm x W253m

Electrical

- 100 to 240 V | 50/60 Hz | FPC

Operating Conditions

- 5°C to 40°C
- 25 to 85% non-condensing RH

Printing Method

- 300 dpi Thermal Transfer

Printing Speed

- 30, 40, 50, 75, 100 & 125 mm/s (recommended 50 mm/s).

Product Properties

- Print width max: 105.7mm
- Label width 4mm to 105.7mm
- Label height: 5mm to 1,000mm

Approvals & Declarations

- CE, FCC Class A, CB, CCC, UL, GOST

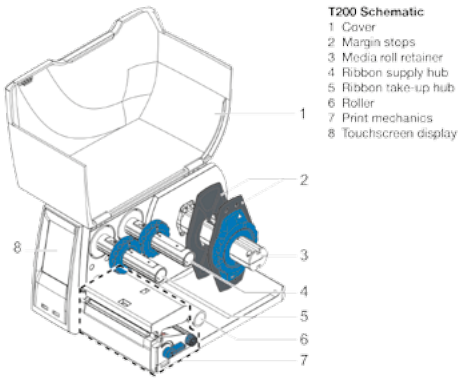
Interfaces

- USB 2.0 (full speed)
- LAN 10/100 Base (Ethernet)

Ordering Information	
Standard printer	T200-IDENT-PRINTER
... with Wintotal	T200-IDENT-SWARE-PRINTER

Spare Parts and Accessories	
Print head	T200-PRINTHEAD
Drive roller	T200-DR4-DRIVEROLLER
Cutter	T200-CUTTER
Perforator	T200-PERFORATOR
Universal Payoff	UNIVERSAL-PAYOFF

For additional information please give us a call



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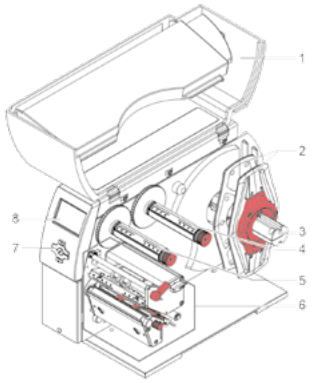
TE3112-PRINTER

Thermal Transfer Printer

Ordering Information	
Standard printer	TE3112-PRINTER

Spare Parts and Accessories	
Print head	TTC-PRINTHEAD-300
Drive roller	TTC-ROLLER
Media Sensor	TTC-3000-MEDIA SENSOR
Cutter	TTC-CUTTER
Perforator	TTC-PERFORATOR
Metal Cover	TE3112-METAL-COVER
Universal Payoff	UNIVERSAL-PAYOFF

For additional information please give us a call



The TE3112 printer is a high performance mid-range identification printer for marking Heat-shrinkable Marker Sleeves, Cable Marker Tags and labels. With a 300 dpi print head, it's capable of marking a broad range of products for use in commercial and industrial environments.

Features & Benefits
- High accuracy printing
- Light-weight at 9kg
- Automatic calibration
- Centre justification of the print media
- Easy to fit accessories
- Prints onto small 2.4mm marker sleeves

Dimensions
- D446mm x H274mm x W242mm

Electrical
- 100 to 240 V | 50/60 Hz
- 250W max, 45W Typical, 9W Power save

Operating Conditions
- 5ºC to 40ºC
- 10 to 85% non-condensing RH

Printing Method
- 300 dpi Thermal Transfer

Printing Speed
- 30, 40, 50, 75, 100 & 125 mm/s (recommended 50 mm/s).

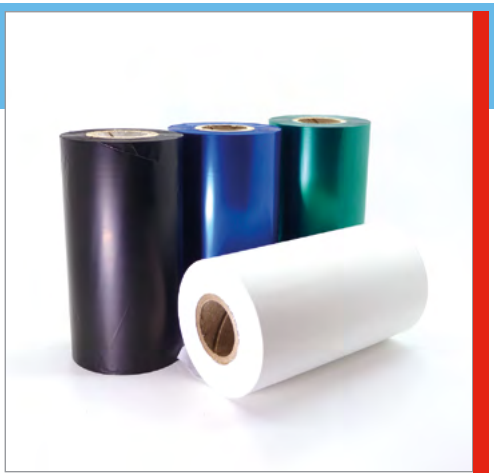
Product Properties
- Print width max: 105.6mm
- Label width 4mm to 105.6mm
- Label height: 5mm to 4,000mm

Approvals & Declarations
- CE, FCC Class A, CB, CCC, UL, GOST

Interfaces
- USB 2.0 High (full speed)
- LAN 10/100 Base (Ethernet)
- Serial RS 232 C 1.200 up to 230.400 Baud/8 Bit

RIBBONS

Thermal Transfer Printer Ribbons Product Cross Ref.



It is essential that the combination of printers, products and ribbons are correct, to ensure the best print quality and mark permanence. Each combination has been evaluated for print quality and tested for mark permanence. The table below illustrates the standard ribbons available for the two printers T200 and TE3112.

Compatible Products	Standard Ribbon
Cable Identification Markers	
CM-SCE-TP	1966-RIBBON
D-SCE	1966 RIBBON or TMS-RJS-RIBBON-4DSCE
HLX125	1966-RIBBON
HT-SCE	TMS-RJS-RIBBON-4HT or T300-RIBBON-WH-4HT
HT-SCE (Black)	T300-RIBBON-WH-4HT or TMS-RJS-RIBBON-4HT
HX-SCE	1966-RIBBON
RPS	TMS-RJS-RIBBON-4RPSCE
TMS-SCE	TMS-RJS-RIBBON-4RPSCE
TMS-SCE (Black)	T300-RIBBON-WH (White) or TMS-RJS-RIBBON-4AG (Silver)
TMS-90-SCE	1966-RIBBON
UV-SCE	T300-UV-SCE-RIBBON
ZHD-SCE	1966-RIBBON
Labels	
SBPlus	TMS-RJS-RIBBON-4RPSCE
TTP	1330-0607-10
MP	1330-0607-10
WP	1330-0607-10
MV	1330-0607-10
PVF	1330-3300-10

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1966-RIBBON

Ultra-high performance black thermal transfer ribbon that produces the ultimate in print performance.

Ink type: Resin

FEATURES AND BENEFITS

- Ideal for use in environments where marker may come into contact with abrasion, solvent or chemical attack

TMS RJS-RIBBON-4DSCE

High performance black thermal transfer ribbon, for use on D-SCE heat shrinkable sleeves.

Ink type: Wax

FEATURES AND BENEFITS

- TMS RJS-RIBBON-4DSCE printed legends have high resistance to fluids, especially diesel.

TMS RJS-RIBBON-4RPSCE

High durability commercial grade black thermal transfer ribbon, for use with TMS-SCE and RPS heat shrinkable sleeves and SBPlus labels.

Ink type: Wax/Resin

FEATURES AND BENEFITS

- TMS RJS-RIBBON-4RPSCE printed legends have high resistance to abrasion, solvents and chemicals

TMS RJS-RIBBON-4HT

High temperature black thermal transfer ribbon, for use with HT-SCE heat shrinkable sleeves.

Ink type: Resin

FEATURES AND BENEFITS

- TMS RJS-RIBBON-4HT printed legends have excellent resistance to high temperatures.

T300-RIBBON-WH-4HT

A white resin based thermal transfer ribbon, for use on HT-SCE product range.

Ink type: Resin

FEATURES AND BENEFITS

- T300-RIBBON-WH-4HT printed legends have high resistance to abrasion, solvents and chemicals.

1330-0607-10

High durability black resin thermal transfer printable ribbon, ideal for use on pressure sensitive labels.

Ink type: Resin

FEATURES AND BENEFITS

- Excellent resistance to abrasion and chemicals.

1330-3300-10

High durability black resin thermal transfer printable ribbon, ideal for use on pressure sensitive labels.

Ink type: Resin

FEATURES AND BENEFITS

- Excellent resistance to chemicals.

T300-UV-SCE-RIBBON

High performance resin based thermal transfer ribbon, for use on UV-SCE product range.

Ink type: Resin

FEATURES AND BENEFITS

- T300-UV-SCE-RIBBON printed legends have high resistance to abrasion, solvents and chemicals.
- T300-UV-SCE-RIBBON has excellent UV resistance properties.

Additional Ident' Products

Printer Universal Payoff and Push-On Markers

EC9926-000 Universal Payoff

The Universal Payoff is a free standing bench top, or wall mounted stand. Designed to dispense all TE Connectivity identification marker sleeves, cable markers and labels.

Key Features and Benefits

- Free standing bench top.
- Wall mountable for space saving.
- Robust, all metal stand.
- Maximum outside roll diameter 400mm
- Size 300 (D) x 232 (H) x 200 (W) mm
- Weight 2.23kg.

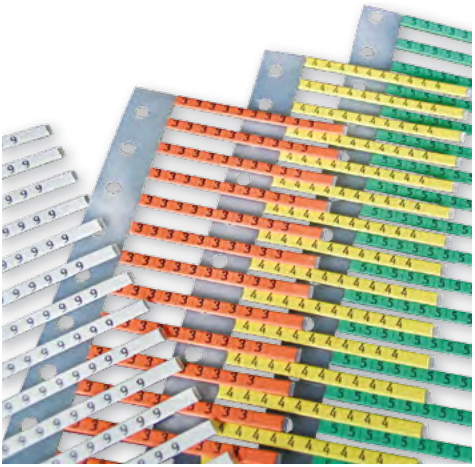
TE Part Number: EC9926-000

Pre-Printed Push-On Markers

A range of cold applied push-on markers are also available for wire and cable marking, including...

- KTMS-501 heat shrinkable bandolier
- Z-Type Marker
- K-Type Marker
- STD-Type Marker

Please contact us for additional information.



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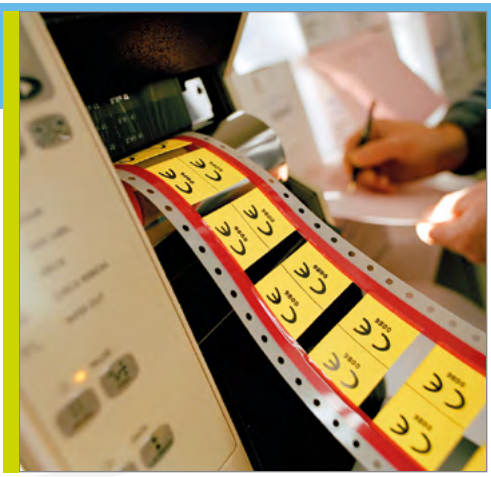
Additional Ident Products

Pre-Print Service
Customised Solutions



We have a full electronic capability, to receive and manipulate customer files for printing. Printing capabilities include logos, barcodes, images and a full range of text fonts.

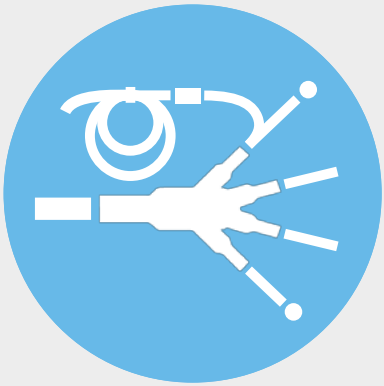
Working closer with our customers providing practical design solutions, full technical support, site visits, system demonstrations and after sales support. Our in-house design and printing capabilities include a full range of text fonts, sequential numbering, logos, barcode, images and personalised graphics.

Heat Shrinkable Sleeves
Metal Photo Labels
Tie-on Cable Markers
Custom Self-adhesive Labels
Pre-printed Markers
Engraved Materials
Complete Sets and Kits
Barcodes and Logos

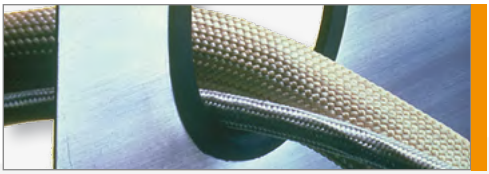
Custom designed solutions is an area of particular interest to our customers for their bespoke identification needs. Where awkward shapes or harsh environments require a particular specialist solution, such as;

- Ruggedised label applied to contoured surface that needs to withstand mechanical abrasion, environmental weathering, plus chemical solvent abuse.
- Metalised permanent adhesive labels for evidence of tampering.
- Control switch panel foil for external application, to withstand UV.
- Etched identification diagrams available on various substrates for use where long term harsh environments require a permanently legible solution is required.

For further information on the Pre-print service capabilities available or to discuss your specific labelling requirements, please contact us.



INTRODUCTION



Everything to Manage, Bundle and Route your Wiring

We offer a vast range of cable management accessories, from a select range of manufacturers. Products include: Cable Glands and Feedthroughs, to Cable Ties and Clips, Lacing Tapes and Cords.

With access to a considerable portfolio of cable management products, a solution can be sourced and matched to your specific requirements.

- **Comprehensive solutions**
- **World class quality and reliability**
- **Innovative products and tools**
- **Unmatched Technical support**

Cable Ties

A wide range of cable tie products are available from Nylon to Stainless Steel, used extensively across a broad range of industries and environments to secure and aesthetically enhance wire and cable systems.

Protective Binding and Edging

For managing wire and cable runs through bulkheads utilising high performance materials for demanding applications and environments.

Lacing Tapes and Cords

Lacing tapes and cords are commonly used to secure cable bundles, typically in the Aerospace industry. Available in a wide range of specifications, colours and sizes to meet specific customer requirements.

Specialist Interest

The range of products portrayed on the following pages represents just the most common types that we supply, for more specialist or alternative solutions please contact us.

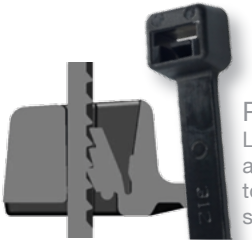
CONTENTS

Cable Tie Selection

Material and Colour Criteria
Selection Table

Characteristic	Test Method	Standard Cable Tie Nylon 6.6	Weather Resistant Nylon 6.6 MIL spec	Heat Stabilised Nylon 6.6	Flame Retardant Nylon 6.6	Weather Resistant Nylon 12
Part No. Suffix	-	-	00	30	60	120
Standard Colour	-	Natural*	Black	Black	Black/Ivory	Black
Mechanical Properties						
Tensile Yield @ 23°C (psi)	ISO 527	12,000	12,000	12,000	11,000	6,700
Water Absorption (24hrs)	ASTM D570	1.2%	1.2%	1.2%	1.1%	0.3%
Radiation Resist' (Rads)	-	1×10^5	1×10^5	1×10^5	1×10^5	3.5×10^6
Weathering (Years)	-	1 - 2	7 - 9	4 - 5	1 - 2	12 - 15
Impact Resistance	-	Good	Good	Good	Low	Good
Chemical Resistance						
Salts Resistance	-	Low	Good	Low	Low	High
Hydrocarbons Resistance	-	Excellent	Excellent	Excellent	Excellent	Excellent
Acids Resistance	-	Low	Low	Low	Low	Low
Thermal Properties						
Max. Continuous Temp.	UL 746B	85°C	85°C	115°C	100°C	90°C
Min. Continuous Temp.	EN 50146	-60°C	-60°C	-60°C	-40°C	-60°C
Flammability Rating	UL 94	V-2	HB	V-2	V-0	HB
Low Smoke	ASTM E662	Pass	Pass	Pass	Pass	-
Oxygen Index	BS ISO 4589	28	-	28	34	-
Halogen Free	IEC 60754-2	Yes	Yes	Yes	Yes	Yes
Burning Fume Toxicity	BSS-7239	Pass	Pass	Pass	Pass	-
Material Availability by Product Family						
Pan-Ty® Cable Ties	PLT	•	•	•	•	•
Dome-Top® Barb Ty	BT	•	•	•	Ivory only	
Contour-Ty® Cable Ties	CBR	•	•	•	Ivory only	

* Available in other colour choices, including Green, Red, Yellow and Blue.



PLT Series
Low threading force and multiple locking tooth design providing strength and reliability

BT Series
Dome top design with stainless steel locking barb

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Cable Ties Selection

Material and Colour Criteria
Selection Table

Polypropylene	Weather Resistant Polypropylene	TEFZEL®	HALAR®	PEEK	Metal Detectable Nylon 6.6	Metal Detectable Polypropylene
109	**100**	**76**	**702Y**	**71**	**86**	**186**
Green	Black	Aqua Blue	Maroon	Brown	Lt Blue	Blue
4,100	4,100	7,500	7,000	15,200	-	-
0.1%	0.1%	<0.03%	<0.05%	0.5%	1.2%	0.1%
1×10^6	1×10^6	2×10^8	2×10^8	1×10^9	-	1×10^6
1	7 - 9	>15	>15	-	-	1
High	High	Excellent	Excellent	Excellent	Good	High
Excellent	Excellent	Excellent	Excellent	Excellent	Low	Excellent
Good	Good	Excellent	Excellent	Excellent	Excellent	Good
Excellent	Excellent	Excellent	Excellent	Good	Low	Excellent
115°C	115°C	170°C	150°C	260°C	85°C	115°C
-60°C	-60°C	-60°C	-60°C	-60°C	-60°C	-60°C
HB	HB	V-0	V-0	V-0	HB	HB
-	-	-	-	Pass	-	-
-	-	30	52	35	-	-
Yes	Yes	No	No	Yes	Yes	Yes
-	-	-	-	-	-	-
•	•	•	•	•	•	•

CBR Series

Unique low profile head design avoids snags and reduces overall bundle size. Outside serrations and smooth round edges protect cable bundle, making them ideal for high vibration applications

Please note that TEFZEL is a registered trademark of E.I. du Pont de Nemours and Company. HALAR is a registered trademark of Ausimont USA, Inc.

PLT Series

Pan-Ty® Locking Nylon Cable Ties
Nylon Locking Barb

These cable ties can be used in countless applications wherever you need to bundle wire, cable, or hoses. Available in standard (Natural) and weather resistant (Black) Nylon, with other colours and materials available to special order. Low threading force and multiple locking tooth design providing strength and reliability.

Conforms to testing requirements of Aerospace standard SAE-A23190A and the dimensional requirements of Aerospace standard SAE-AS33671, see listing later in this section.

EN45545-2 approved material denoted by # see table 2 on opposite page.

1. Sizing Selection

Part Number	Length mm	Width mm	Thick mm	Max Bundle Ø	Min. Tensile
Sub-Miniature Cross Section Ties					
PLT.6SM-C-Colour	71	1.8	0.8	15mm	36N
Miniature Cross Section Ties					
PLT.7M-C-Colour	79	2.3	0.8	17mm	80N
PLT1M-C-Colour	99	2.5	1.1	22mm	80N
PLT1.5M-C-Colour	142	2.5	1.1	32mm	80N
PLT2M-C-Colour	203	2.5	1.1	51mm	80N
Intermediate Cross Section Ties					
PLT1.5I-C-Colour	142	3.6	1.1	35mm	178N
PLT2I-C-Colour	203	3.6	1.1	51mm	178N
PLT2.5I-C-Colour	246	3.7	1.3	64mm	178N
PLT3I-C-Colour	290	3.7	1.3	76mm	178N
PLT4I-C-Colour	368	3.7	1.3	102mm	178N
Standard Cross Section Ties					
PLT1S-C-Colour	122	4.8	1.3	25mm	222N
PLT1.5S-C-Colour	157	4.8	1.3	38mm	222N
PLT2S-C-Colour	188	4.8	1.3	48mm	222N
PLT2.5S-C-Colour	249	4.8	1.3	64mm	222N
PLT3S-C-Colour	292	4.8	1.3	76mm	222N
PLT4S-C-Colour	368	4.8	1.3	102mm	222N
PLT4.5S-C-Colour	394	4.8	1.3	114mm	222N
PLT5S-C-Colour	445	4.8	1.3	127mm	222N

For applicable hand held application tooling please refer to that section of the catalogue.

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Features & Benefits

- One piece construction for consistent performance and reliability.
- Lowest threading force of any one-piece cable tie.
- Curved tip is easy to pick up from flat surfaces and allows faster initial threading to speed installation
- A variety of materials and colours are available for specific applications.
- UL Listed for use in plenum or air handling spaces per NEC (National Electrical Code) specification.

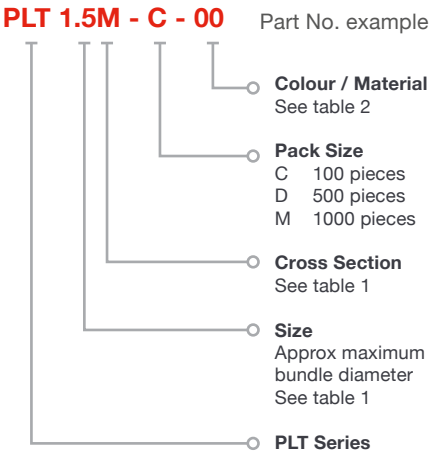
2. Colour / Material Selection

Suffix	Colour	Nylon 6.6
-#	Natural	
0#	Black	Weather resistant
00#	Black	Weather resistant Mil Spec
1#	Brown	
2#	Red	
3#	Orange	
4Y#	Yellow	
5#	Green	
6#	Blue	
7#	Purple	
8#	Grey	
10#	White	
14#	Grey	
20#	Black	
Suffix	**Colour**	**Material**
30#	Black	Heat stabilised Nylon 6.6
300#	Black	Heat stabilised, weather Nylon 6.6
60	Black	Flame retardant Nylon 6.6
69#	Ivory	Flame retardant Nylon 6.6
120	Black	Weather resistant Nylon 12
109	Green	Polypropylene
100	Black	Weather resistant Polypropylene
76	Aqua Blue	TEFZEL
702Y	Maroon	HALAR
71	Brown	PEEK

Part Number System

PLT Series cable ties benefit from being available in all colours and materials as identified on the previous page and listed in table 2 on this page.

To construct your part number please refer to the illustration below



Supplementary Products

Additional products also available in this range:

PRT	Releasable tie
PLC	Clamp tie
PLF	Flag tie
PLM	Marker tie
PLP	Push Mount tie
PLWP	Wing Push Mount tie
PRLWP	Releasable Ladder Wing Push Mount
PRWP	Releasable Wing Push Mount
PLUP	Umbrella Push Mount

BT Series

Dome-Top® Barb-Ty Nylon Cable Ties
Steel Locking Barb

Non-serated cable tie with stainless steel barb for high performance applications where a semi-smooth cable tie binding surface is desired. Features a two piece design incl' a stainless steel locking barb (AISI 316 grade) in a nylon cable tie. Offering a high loop tensile strength that exceeds industry standards.

Conforms to testing requirements of Aerospace standard SAE-A23190A and the dimensional requirements of Aerospace standard SAE-AS33671, see listing later in this section.

EN45545-2 approved for all materials shown in table on the opposite page.

1. Sizing Selection

Part Number	Length mm	Width mm	Thick mm	Max Bundle Ø	Min Tensile
Miniature Cross Section Ties					
BT1M-C-Colour	102	2.4	0.9	23	80N
BT1.5M-C-Colour	160	2.4	1.2	38	80N
BT2M-C-Colour	201	2.4	1.2	51	80N
BT4M-C-Colour	361	2.4	1.2	105	80N
Intermediate Cross Section Ties					
BT1.5I-C-Colour	155	3.6	1.0	38	178N
BT2I-C-Colour	203	3.6	1.0	51	178N
BT3I-C-Colour	287	3.6	1.2	76	178N
BT4I-C-Colour	363	3.6	1.2	102	178N
Standard Cross Section Ties					
BT2S-C-Colour	203	4.7	1.1	51	222N
BT3S-C-Colour	305	4.7	1.3	76	222N
BT4S-C-Colour	384	4.7	1.3	102	222N
Light-Heavy Cross Section (straight tip) Ties					
BT2LH-L-Colour	221	7.0	1.7	51	534N
BT3LH-L-Colour	300	7.0	1.7	76	534N
BT4LH-L-Colour	378	7.0	1.7	102	534N
BT5LH-L-Colour	460	7.0	1.7	127	534N
BT6LH-L-Colour	538	7.0	1.7	152	534N
BT7LH-L-Colour	620	7.0	1.7	178	534N
BT8LH-L-Colour	699	7.0	1.7	203	534N
BT9LH-L-Colour	780	7.0	1.7	229	534N

For applicable hand held application tooling please refer to that section of the catalogue.

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Features & Benefits

- Dome-Top head features unique patented design with round, smooth edges.
- Stainless steel locking barb, provides consistent performance, reliability and infinite adjustability
- Ribbed and stippled strap body helps prevent lateral movement on the bundle.
- Curved tip threads easily and installs faster. Finger grip ensures positive grip during threading of the tie.
- UL Listed for use in plenum or air handling spaces per NEC.

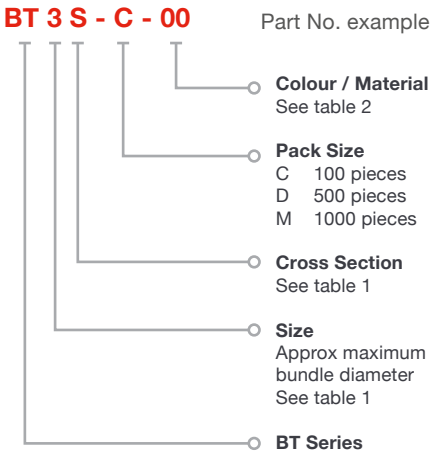
2. Colour / Material Selection

Suffix	Colour	Nylon 6.6
-	Natural	
0	Black	Weather resistant
00	Black	Weather resistant Mil Spec
1	Brown	
2	Red	
3	Orange	
4Y	Yellow	
5	Green	
6	Blue	
7	Purple	
8	Grey	
10	White	
14	Grey	
20	Black	
Suffix	**Colour**	**Material**
30	Black	Heat stabilised Nylon 6.6
300	Black	Heat stabilised, weather Nylon 6.6
69	Ivory	Flame retardant Nylon 6.6

Part Number System

The BT Series of cable ties benefit from being available in numerous colours and materials as identified on earlier in this section and listed in table 2 on this page.

To construct your part number please refer to the illustration below



Supplementary Products

Additional products also available in this range:

BC	Clamp tie
BF	Flag tie
BM	Marker tie
BP	Push Mount tie
BW	Wing Push Mount tie
DT	Locking Tie

CBR Series

Contour-Ty® Nylon Cable Ties
Parallel-Entry

A superior bundling solution for a wide variety of applications. The low profile head and the parallel-entry design along with outside teeth on tie body make it the ideal tie for use in high vibration applications. The product range includes a variety of materials, as well as several sizes and colours to accommodate a range of applications.

Meets testing requirements of Aerospace Standard SAE-AS23190A and dimensional requirements of SAE-AS33671.

EN45545-2 approved for all materials shown in table on the opposite page.

1. Sizing Selection

Part Number	Length mm	Width mm	Thick mm	Max Bundle Ø	Min Tensile
Miniature Cross Section Ties					
CBR1M-M-XX	104	2.5	1.0	25	80N
CBR1.5M-M-XX	142	2.5	1.1	38	80N
CBR2M-M-XX	183	2.5	1.1	51	80N
Intermediate Cross Section Ties					
CBR1.5I-M-XX	150	3.6	1.0	38	178N
CBR3I-M-XX	264	3.6	1.3	76	178N
CBR4I-M-XX	345	3.6	1.3	102	178N
Standard Cross Section Ties					
CBR2S-C-XX	193	4.8	1.1	51	222N
CBR3S-C-XX	274	4.8	1.3	76	222N
CBR4S-C-XX	356	4.8	1.3	102	222N
Heavy-Standard Cross Section					
CBR2HS-D	203	6.4	1.4	51	378N
Light-Heavy Cross Section (straight tip) Ties					
CBR4LH-TL-XX	371	7.6	1.8	102	534N
CBR6LH-C-XX	531	7.6	1.8	152	534N

For applicable hand held application tooling please refer to that section of the catalogue.

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Features & Benefits

- Low profile head, reduces overall bundle size and avoids possible snags.
- Outside teeth, for cable protection, ideal for high vibration applications.
- Parallel entry design, results in lower profile on cable bundles, reduces size of cable tie head.
- Curved tip threads easily and installs faster. Finger grip ensures positive grip during threading of the tie.
- UL Listed for use in plenum or air handling spaces per NEC.

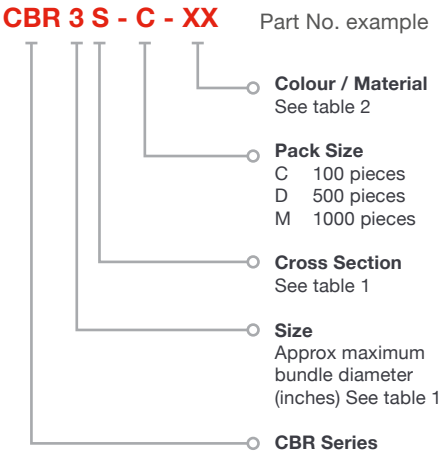
2. Colour / Material Selection

Suffix	Colour	Nylon 6.6
-	Natural	
0	Black	Weather resistant
00	Black	Weather resistant Mil Spec
1	Brown	
2	Red	
3	Orange	
4Y	Yellow	
5	Green	
6	Blue	
7	Purple	
8	Grey	
10	White	
Suffix	**Colour**	**Material**
30	Black	Heat stabilised Nylon 6.6
300	Black	Heat stabilised, weather Nylon 6.6
69	Ivory	Flame retardant Nylon 6.6

Part Number System

The CBR Series of cable ties benefit from being available in numerous colours and materials as identified on earlier in this section and listed in table 2 on this page.

To construct your part number please refer to the illustration below



MS3367 Spec Cross Reference

for PLT, BT and CBR Series Nylon Cable Ties

Cross Reference Guide

MIL Ref	Colour	PLT Series	BT Series	CBR Series
MS3367-1-0	Black*	PLT2S-C00, -M00	-	-
MS3367-1-1	Brown	PLT2S-C1, -M1	BT2S-M1	-
MS3367-1-2	Red	PLT2S-C2, -M2	BT2S-M2	-
MS3367-1-3	Orange	PLT2S-C3, -M3	BT2S-M3	-
MS3367-1-4	Yellow	PLT2S-C4, -M4	BT2S-M4	-
MS3367-1-5	Green	PLT2S-C5, -M5	BT2S-M5	-
MS3367-1-6	Blue	PLT2S-C6, -M6	BT2S-M6	-
MS3367-1-7	Purple	PLT2S-C7, -M7	BT2S-M7	-
MS3367-1-8	Grey	PLT2S-C8, -M8	BT2S-M8	-
MS3367-1-9	Natural	PLT2S-C, -M, -VMR	BT2S-C, -M	-
MS3367-2-0	Black*	PLT4S-C00	-	-
MS3367-2-1	Brown	PLT4S-M1	-	-
MS3367-2-2	Red	PLT4S-C2, -M2	BT4S-M2	-
MS3367-2-3	Orange	PLT4S-C3, -M3	BT4S-M3	-
MS3367-2-4	Yellow	PLT4S-C4Y, -M4Y	BT4S-M4Y	-
MS3367-2-5	Green	PLT4S-C5, -M5	BT4S-M5	-
MS3367-2-6	Blue	PLT4S-C6, -M6	BT4S-M6	-
MS3367-2-7	Purple	PLT4S-C7, -M7	BT4S-M7	-
MS3367-2-8	Grey	PLT4S-C8, -M8	BT4S-M8	-
MS3367-2-9	Natural	PLT4S-C, -M	BT4S-C, -M	-
MS3367-3-0	Black*	PLT4H-L00, -TL00	-	-
MS3367-3-1	Brown	PLT4H-TL1	-	-
MS3367-3-2	Red	PLT4H-TL2	-	-
MS3367-3-3	Orange	PLT4H-TL3	-	-
MS3367-3-4	Yellow	PLT4H-TL4	-	-
MS3367-3-5	Green	PLT4H-TL5	-	-
MS3367-3-6	Blue	PLT4H-TL6	-	-
MS3367-3-9	Natural	PLT4H-L, -C -TL	BT4LH-L, -TL	-
MS3367-4-0	Black*	PLT1M-C00, M00, XMR00	-	-
MS3367-4-0	Black*	PLT1.5M-XMR00	-	-
MS3367-4-1	Brown	PLT1M-C1, M1, -XMR1	BT1M-M1	-
MS3367-4-2	Red	PLT1M-C2, M2, -XMR2	BT1M-M2	-
MS3367-4-3	Orange	PLT1M-C3, -M3, -XMR3	BT1M-M3	-
MS3367-4-4	Yellow	PLT1M-C4Y, -M4Y, -XMR4Y	BT1M-M4Y	-
MS3367-4-5	Green	PLT1M-C5, -M5, -XMR5	BT1M-M5	-
MS3367-4-6	Blue	PLT1M-C6, -M6, -XMR6	BT1M-M6	-
MS3367-4-7	Purple	PLT1M-C7, -M7, -XMR7	BT1M-M7	-
MS3367-4-8	Grey	PLT1M-C8, -M8, -XMR8	BT1M-M8	-
MS3367-4-9	Natural	PLT1M-C, -M, -XMR	BT1M-C, -M, -XMR	-
MS3367-4-9	Natural	PLT7M-C, -M	-	-
MS3367-4-9	Natural	PLT1.5M-XMR	BT1.5M-XMR	-
MS3367-5-0	Black*	PLT1.5I-M00	-	-
MS3367-5-1	Brown	PLT1.5I-C1, -M1	BT1.5I-M1	-
MS3367-5-2	Red	PLT1.5I-C2, -M2	BT1.5I-M2	-
MS3367-5-3	Orange	PLT1.5I-C3, -M3	BT1.5I-M3	-
MS3367-5-4	Yellow	PLT1.5I-C4Y, -M4Y	BT1.5I-M4Y	-
MS3367-5-5	Green	PLT1.5I-C5, -M5	BT1.5I-M5	-

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MS3367 Spec Cross Reference

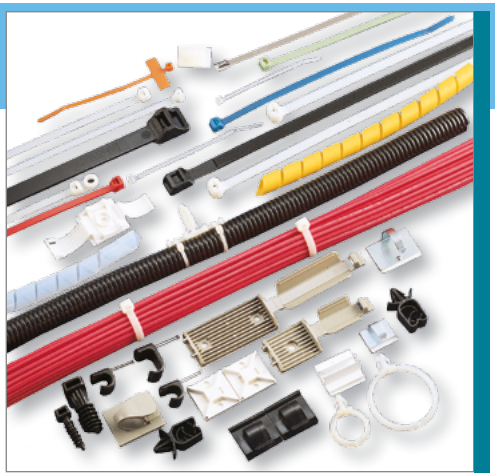
for PLT, BT and CBR Series Nylon Cable Ties
Cross Reference Guide

MIL Ref	Colour	PLT Series	BT Series	CBR Series
MS3367-5-6	Blue	PLT1.5I-C6, -M6	BT1.5I-M6	-
MS3367-5-7	Purple	PLT1.5I-C7, -M7	BT1.5I-M7	-
MS3367-5-8	Grey	PLT1.5I-C8, -M8	BT1.5I-M8	-
MS3367-5-9	Natural	PLT1.5-C, -M	BT1.5-C, -M	-
MS3367-6-9	Natural	PLT8LH-L, -C	BT8LH-L, -C	-
MS3367-6-9	Natural	-	BT9LH-L, -C	-
MS3367-7-0	Black*	PLT1.5I-M00	-	-
MS3367-7-1	Brown	PLT3S-M1	-	-
MS3367-7-2	Red	PLT3S-C2, M2	BT3S-C2	-
MS3367-7-3	Orange	PLT3S-M3	-	-
MS3367-7-4	Yellow	PLT3S-M4Y	-	-
MS3367-7-5	Green	PLT3S-M5	-	-
MS3367-7-6	Blue	PLT3S-M6	-	-
MS3367-7-7	Purple	PLT3S-M7	-	-
MS3367-7-8	Grey	PLT3S-M8	-	-
MS3367-7-9	Natural	PLT3S-C, -M	BT3S-C, -M	-
MS3367-8-9	Natural	PLT5H-L, -C	-	-
MS3367-9-9	Natural	PLT6H-L, -C	-	-
MS3367-11-9	Natural	PLT8H-L, -C	-	-
MS3367-30-9	Natural	-	-	CBR1M-M
MS3367-31-9	Natural	-	-	CBR1.5M-M
MS3367-32-1	Brown	-	-	CBR2M-M1
MS3367-32-2	Red	-	-	CBR2M-M2
MS3367-32-3	Orange	-	-	CBR2M-M3
MS3367-32-4	Yellow	-	-	CBR2M-M4Y
MS3367-32-5	Green	-	-	CBR2M-M5
MS3367-32-6	Blue	-	-	CBR2M-M6
MS3367-32-7	Purple	-	-	CBR2M-M7
MS3367-32-9	Natural	-	-	CBR2M-M
MS3367-33-9	Natural	-	-	CBR1.5I-M
MS3367-34-1	Brown	-	-	CBR3I-M1
MS3367-34-2	Red	-	-	CBR3I-M2
MS3367-34-3	Orange	-	-	CBR3I-M3
MS3367-34-4	Yellow	-	-	CBR3I-M4Y
MS3367-34-5	Green	-	-	CBR3I-M5
MS3367-34-6	Blue	-	-	CBR3I-M6
MS3367-34-7	Purple	-	-	CBR3I-M7
MS3367-34-8	Grey	-	-	CBR3I-M8
MS3367-34-9	Natural	-	-	CBR3I-M
MS3367-35-9	Natural	-	-	CBR4I-M
MS3367-36-9	Natural	-	-	CBR2S-M
MS3367-37-9	Natural	-	-	CBR3S-M
MS3367-38-9	Natural	-	-	CBR4S-M
MS3367-39-9	Natural	-	-	CBR2HS-D
MS3367-40-9	Natural	-	-	CBR4LH-TL
MS3367-41-9	Natural	-	-	CBR6LH-C

* Denotes weather resistant to ASTM D 4066-94B

Cable Tie Design Variations

Complementary Product Options
Product Overview



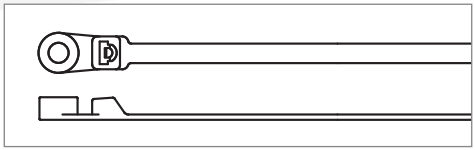
Our range of Nylon cable ties are approved to various application standards, illustrating the quality and commitment to supply a quality product that is fit for purpose in the markets that we serve:

- UL Listed, E56854 and MH29590
- CE EN 50146
- Det Norske Veritas E-6405
- VG 95 387 - 100MS 3367F
- MIL QPL-AS23190-2

For full details please contact us.

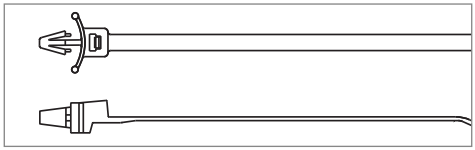
Clamp Ties

Allows for bundling before or after screwing clamp in place. Used to secure a cable bundle to another surface such as a control panel, communication rack, wall or ceiling.



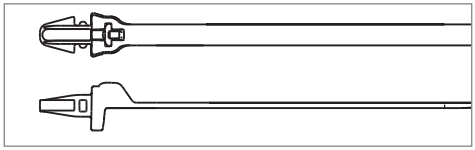
Wing Push Mount Ties

Attached bundles to flat panels, with the wings providing constant tension for a stable, secure and rattle free installation. Single piece moulding for performance and reliability.



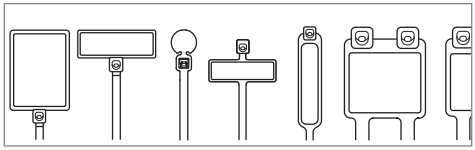
Push Mount Ties

Cable ties, mount and fastener in a single part, used to attach bundles to another surface such as a flat panel. Wingless design allows tie to be used in confined spaces.



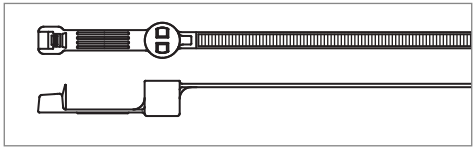
Marker and Flag Ties

Ideal for fastening and identifying bundles at the same time, with a one piece construction for consistent performance and reliability. Various designs available.



Stud Mounted Ties

Integrated mount pushes onto a threaded stud and tie wraps around bundle. Tie can be removed from the stud by turning counterclockwise. Also available as Mid-mount style and Releasable style.



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Super Grip Adhesive Back

Screw Applied

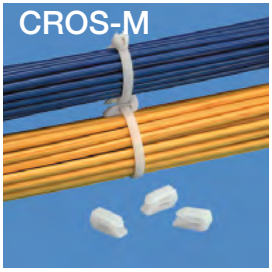
Low Profile Hole Mount

Push Barb

Metal Edge Clip

Swivel Mounts

Stud Applied



Connector Ring Spacers

Vertical Stand-off Post

Harness Push Barb Mount

Combination Mount

Tie Mount Heavy Duty

Harness Board Accessories

Brief Overview of Selected Accessories
Mounts for use Without Cable Ties

An extensive range of cable and wire bundling together with harness routing accessories, that we have outlined here as a brief overview of what can be available.

Wiring accessories are an integral part of our comprehensive selection of wire management products. We are committed to continually provide innovative, high quality products engineered to speed installation and lower your installed costs.

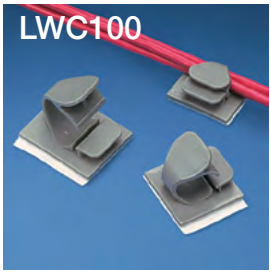
Wire Bundle Strap

Harness Clip

Wire Standoffs

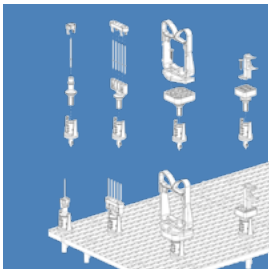
Cable Clamp

Wire Saddles



Latching Cable Clip

P Clips


Quick-Build™ Harness

Harness Edge Clip

Fibre Networks Saddle

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Cable Tie Approvals

Logo (Symbol)	Agency	Spec/Approval	Requirement	Applicable Products
	Underwriters Laboratories, Inc.	File E56854 and MH29590	ZODZ(7), ZODZ(8), ALKW	Most miniature, intermediate, standard, light-heavy and heavy cross section ties are Recognized or Listed in the US and Canada
	Canadian Standards Association	File 031212	C22.2 No. 18.5-02 under the category "Fittings – Positioning Devices"	Most miniature, intermediate, standard, light-heavy and heavy cross section ties are Recognized or Listed in the US and Canada
	Conformity European	Low Voltage Directive 73/23/EEC (amended 93/68/EEC). *Pan-Ty* and *Dome-Top* Barb Ty cable ties also meet the requirements from EN50146	CE Marking is required for products sold within the European Union. CE Marking Directives specify the minimum performance of these products. Applying the CE mark signifies compliance with essential requirements of specific directives.	All cable tie products
	ABS (American Bureau of Shipping)	05-HS463235-PDA	2005 Vessel Rules 1-1-4/7.7, 4-8/421.9.3 2001 MODU Rules 4-3-3/5.9.1	PLT Series, BT Series
	Bureau Veritas	Cert 05968/C0 BV1178B/BVN/04 File ACE 14/601/01	Bureau Veritas Rules for the Classification of Steel Ships	PLT Series, BT Series, PRT Series, CBR Series
	Det Norske Veritas	E-6405	Det Norske Veritas' Rules for Classification of Ships and Mobile Offshore Units	PLT Series, PLC Series, PLM Series, PRT Series, PLWP Series, PRWP Series, PRST Series
	Germany (VG) Military	K17/97165	VG 95 387 – 100 MS 3367F	PLT Series, BT Series, SST Series
	Lloyd's Register of Shipping	89/60111 (E3)	Lloyd's Register Type Approval	PLT Series,BT Series, SST Series
	NRC (Nuclear Regulatory Commission)	NRC 10CFR50	Quality Assurance Criteria for Nuclear Plants and Reprocessing Plants	All cable tie products
	Plenum-Rated	Panduit logo	Panduit symbol indicates that the cable ties represented are suitable for use in plenum or air handling spaces in accordance with Sec. 300.22(C) and (D) of the National Electrical Code and Rules 12-010 (3), (4) and (5) and 12-020 of the Canadian Electrical Code, Part I.	Halar (702Y) and select Nylon 6.6 cable ties as noted throughout catalog
	US Military Aerospace Standard	QPL-AS23190-2	SAE spec AS23190	See Military Cross Reference Page B1.95
	AQA International	ISO/TS16949	AQA registration. Quality management system assessment certificate	Tinley Park, Illinois Manufacturing Operations (Cable Tie Division) Quality Management System.

Correct as of February 2017

MLT Series

Pan-Steel® Steel Cable Ties
Features and Benefits

Perfect for indoor, outdoor, underground, offshore and RMT applications offering excellent resistance to abrasion, radiation, weathering, corrosion and extreme temperatures. Stainless Steel ties are self-locking for fast cabling and can be installed by hand or with tooling.

Manufactured with fully rounded sides and no sharp edges, making them safe to handle during installation. Strap goes through a secondary process which removes the top and bottom corners of the material.

1. Sizing Selection

Part Number	Length mm	Width mm	Thick mm	Max. Bundle Ø	Min. Tensile
MLT - Standard Cross Section Ties - AISI 304 Stainless Steel					
MLT1S-CP	127	4.6	0.25	25	890N
MLT2S-CP	201	4.6	0.25	51	890N
MLT2.7S-CP	259	4.6	0.25	69	890N
MLT4S-CP	362	4.6	0.25	102	890N
MLT6S-CP	521	4.6	0.25	152	890N
MLT8S-CP	679	4.6	0.25	203	890N
MLT10S-CP	838	4.6	0.25	254	890N
MLT12S-Q	998	4.6	0.25	304	890N
MLT14S-Q	1156	4.6	0.25	355	890N
MLT15S-Q	1250	4.6	0.25	380	890N
MLT - Heavy Cross Section Ties - AISI 304 Stainless Steel					
MLT2H-LP	201	7.9	0.25	51	2000N
MLT2.7H-LP	259	7.9	0.25	69	2000N
MLT4H-LP	362	7.9	0.25	102	2000N
MLT6H-LP	521	7.9	0.25	152	2000N
MLT8H-LP	679	7.9	0.25	203	2000N
MLT10H-LP	838	7.9	0.25	254	2000N
MLT12H-Q	998	7.9	0.25	304	2000N
MLT14H-Q	1156	7.9	0.25	355	2000N

Minimum cable bundle diameter for all sizes is 12.7mm
For applicable hand held application tooling please refer to that section of the catalogue.

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Features & Benefits

- Self-locking design can be fastened by hand requiring no fold over or additional installation steps.
- Features fully rounded edges to assure bundle protection and operator safety
- Material options of 304 or 316 grade stainless steel.
- Aggressive locking head provides quicker locking and tighter installation.

2. Colour / Material Selection

Suffix	
-	AISI 304 stainless steel - general purpose
316	AISI 316 stainless steel

Approvals

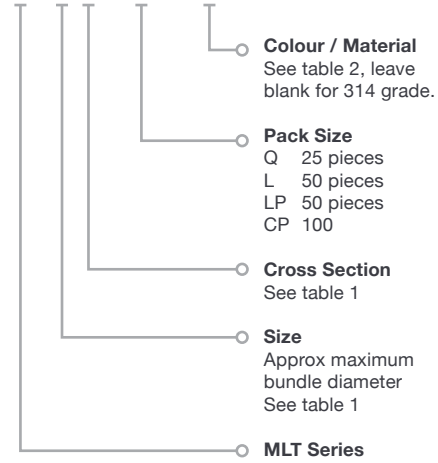
- UL Listed E56854
- SAE AS 23190 (formerly MS23109E)
- Det Norske Cert E-6540, E-6539 (AISI 316)
- Lloyds Cert. # 89/60123
- MIL-STD-202
- MIL-STD-167 and MIL-S-901D for Extra heavy and super heavy cross sections.

Part Number System

The MLT Series of cable ties is available in two grades of stainless steel offering resistance for the most corrosive environments.

To construct your part number please refer to the illustration below

MLT 6 S - CP - 316 Part No. example



Additional Variants Available

- LH. Light Heavy cross section, offering tensile strength up to 1112N.
- EH. Extra Heavy cross section, offering tensile strength up to 3115N.
- SH. Super Heavy cross section, offering tensile strength up to 4005N.

Available in broadly similar sizes as per table opposite. Other lengths are also available to special order.

For enquiries on standard or specials please contact us for further details.

MLTFC and MLTC Series

Pan-Steel® Coated Steel Cable Ties

Features and Benefits

MLTFC Polyester Fully Coated.
Polyester coating provides additional edge protection and prevents corrosion between dissimilar metals.

Heavy cross-section is available in six colour options, providing visual indication for easy identification in colour coding applications

MLTC Nylon 11 Selectively Coated
Coating applied to underside and edges, overlapping outside for protective purposes.
Black only

1. Sizing Selection

Part Number	Colour	Length mm	Width mm	Thick#	Max. Bundle Ø	Min. Tensile
MLTC - Heavy Cross Section Selectively Coated Ties - AISI 316 Stainless Steel						
MLTC2H-LP316	Black	201	7.9	0.25	51	1112
MLTC4H-LP316	Black	362	7.9	0.25	102	1112
MLTC6H-LP316	Black	521	7.9	0.25	152	1112
MLTFC - Heavy Cross Section Coated Ties - AISI 316 Stainless Steel						
MLTFC2H-LP316RD	Red	201	7.9	0.25	51	1112
MLTFC4H-LP316RD	Red	362	7.9	0.25	102	1112
MLTFC6H-LP316RD	Red	521	7.9	0.25	152	1112
MLTFC2H-LP316YL	Yellow	201	7.9	0.25	51	1112
MLTFC4H-LP316YL	Yellow	362	7.9	0.25	102	1112
MLTFC6H-LP316YL	Yellow	521	7.9	0.25	152	1112
MLTFC2H-LP316GR	Green	201	7.9	0.25	51	1112
MLTFC4H-LP316GR	Green	362	7.9	0.25	102	1112
MLTFC6H-LP316GR	Green	521	7.9	0.25	152	1112
MLTFC2H-LP316BU	Blue	201	7.9	0.25	51	1112
MLTFC4H-LP316BU	Blue	362	7.9	0.25	102	1112
MLTFC6H-LP316BU	Blue	521	7.9	0.25	152	1112
MLTFC2H-LP316WH	White	201	7.9	0.25	51	1112
MLTFC4H-LP316WH	White	362	7.9	0.25	102	1112
MLTFC6H-LP316WH	White	521	7.9	0.25	152	1112
MLTFC2H-LP316	Black	201	7.9	0.25	51	1112
MLTFC4H-LP316	Black	362	7.9	0.25	102	1112
MLTFC6H-LP316	Black	521	7.9	0.25	152	1112
MLTFC8H-LP316	Black	679	7.9	0.25	203	1112

For applicable hand held application tooling please refer to that section of the catalogue.

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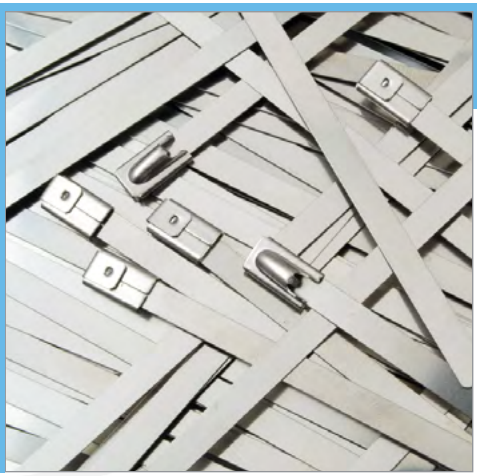
AS23190 Spec
Cross Reference for MLT Series Steel Cable Ties



The products listed in the following table meet the various testing requirements of Aerospace Standard SAE-AS23190A (formerly MIL-S-23190E) and the temperature and shock requirements of MIL-STD-202 for details please contact us.

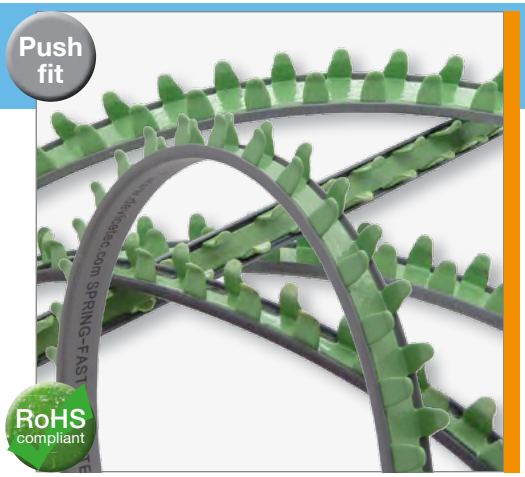
SAE-AS23190A Reference

Mil. Std. Number	MTL Series Pan-Steel®
AS23190/3-1	MLT2S-CP
AS23190/3-1	MLT2S-CP316
AS23190/3-2	MLT4S-CP
AS23190/3-2	MLT4S-CP316
AS23190/3-3	MLT6S-CP
AS23190/3-3	MLT6S-CP316
AS23190/3-4	MLT8S-CP
AS23190/3-4	MLT8S-CP316
AS23190/3-5	MLT2H-LP
AS23190/3-5	MLT2H-LP316
AS23190/3-6	MLT4H-LP
AS23190/3-6	MLT4H-LP316
AS23190/3-7	MLT6H-LP
AS23190/3-7	MLT6H-LP316
AS23190/3-8	MLT8H-LP
AS23190/3-8	MLT8H-LP316
AS23190/3-9	MLT10H-LP
AS23190/3-9	MLT10H-LP316

M22529/2

SPRING-FAST®

Protective grommet edging



Spring-Fast® is a composite grommet edging, that provides a fast, safe and effective method of abrasion protection. Currently used throughout the aerospace market.

- No hazardous adhesives and solvents
- Vibration proof
- Abrasion and Chemical resistant
- Long life expectancy

Constructed from a composite of polymer encapsulated stainless steel, further enhanced by an additional polymer cushion. mechanically locks on to any two axis contour with finger pressure in seconds.

Operating Temperature

- From -40°C to +85°C

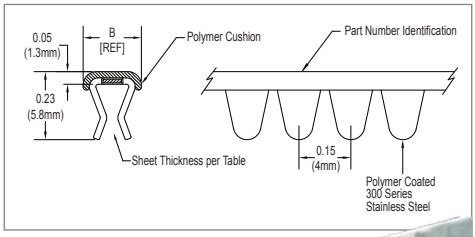
Specifications & Approvals

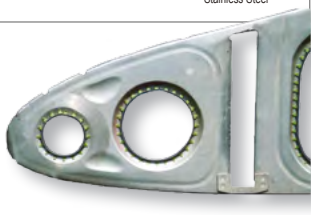
- FAA/CAA Recognised
- UL94 V0 Compliant
- NASM22529 qualified

Sheet Thickness	Spool Size	Cushion Width	Part Number	
(mm)	(feet)	B (mm)	25 ft Spools	100 ft Spools
0.6 - 0.9	25 or 100	5.1	M22529/2-1R-25	M22529/2-1R-100
0.9 - 1.6	25 or 100	5.1	M22529/2-2R-25	M22529/2-2R-100
1.5 - 1.9	25 or 100	5.1	M22529/2-3R-25	M22529/2-3R-100
1.8 - 2.4	25 or 100	6.1	M22529/2-4R-25	M22529/2-4R-100
2.3 - 2.8	25 or 100	6.1	M22529/2-5R-25	M22529/2-5R-100
2.7 - 3.4	25 or 100	6.1	M22529/2-6R-25	M22529/2-6R-100
4.5 - 5.0	25 or 100	8.1	M22529/2-7R-25	M22529/2-7R-100
6.1 - 6.6	25 or 100	9.7	M22529/2-8R-25	M22529/2-8R-100

Standard Colour: Green, with grey polymer

Properties	Test
Voltage breakdown	1500 Volts @ 60Hz
Flammability	FAR 25.601; FAR 25853 MIL-STD-202F (111A)
Vibration & shock	MIL-STD-1344 Method 2005.1 test condition 6, Letter J, Overall rms G 41.7
Salt spray	2000 Hours (minimum) MIL-STD-202F (101D)





For additional variations of the Spring-Fast® product range, please contact us.

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GEPR
Silicone Rubber Protective edging

GEPR protective edging is manufactured from low smoke, low toxicity grade silicone rubber material, making it an ideal product for use in enclosed areas such as marine, defence and rail/mass transit applications.

The tough but very flexible profile is ideally suited to a wide range of applications, offering exceptional reliability in the most demanding of environments. Approved for use on MOD contracts such as Queen Elizabeth class aircraft carriers and Astute class submarines.

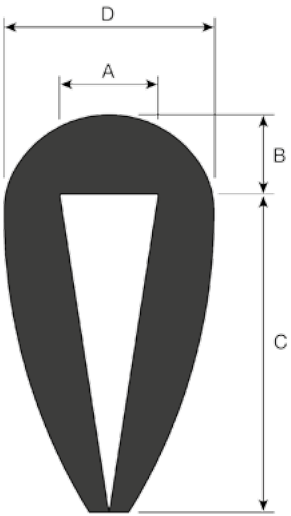
Operating Temperature

- From -40ºC to +200ºC

Specifications & Approvals

- BS6853 Compliant
- BR1326 Approval

Part Number	Measurements (mm) - nominal				BAE Ref. Number	
	A	B	C	D	ACA	CPC
GEPR-02-25	2.00	3.00	9.00	6.00	-	-
GEPR-03-25	3.00	4.00	13.00	10.66	40073362	15424647
GEPR-05-25	5.00	4.00	16.00	10.66	40073524	15424648
GEPR-10-25	10.00	7.00	24.00	16.00	40073525	-
GEPR-12-25	12.00	10.00	32.00	24.00	40073526	-



Material Characteristics

• Hardness	Shore 60
• Smoke density *	0.0049 m^2/g
• Toxic fume emission*	0.05 R
• Flammability temp. index*	354ºC
• Toxicity approval*	BR1326 Class

**BS6853 test method*

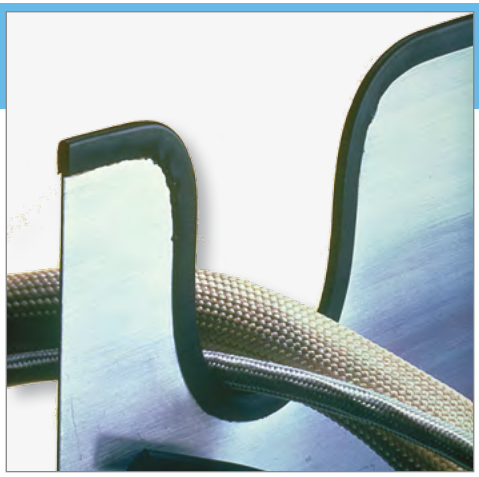
Ordering Information

When ordering, the part can be referenced either by the appropriate BAE number, or the IS-Rayfast product code as identified below, standard pack size is 25m.

GEPR-XX-25-Black

RAYRIM® and TPEM

Polyolefin
Heat Shrinkable Protective Edging



Rayrim® and TPEM are extruded strips internally coated with heat activated adhesive, so that on heating the profile changes from a 'V' to form a 'U' and the adhesive bonds to the substrate profile, typically electrical cabinets and enclosures.

Manufactured from cross-linked Polyolefin, offering a clean and rapid means of covering edges for all round protection. The flexible nature of the product allows application to both internal and external radii, plus straight edges.

Adhesion strength:
RAYRIM 25N/25mm minimum
TPEM 35N/25mm minimum

Operating Temperature

- From -55°C to +80°C

A	B	C	D	E	Std Pack Size		Description	
(mm)	(mm)	(mm)	(mm)	(mm)	(STK)	(SP)	RAYRIM No.	TPEM No.
0.6	0.5	3.5	0.8	1.25	60 pcs	100m	RAYRIM-NR-6-0-*	TPEM-NR-6-0-*
1.0	0.9	4.8	1.6	1.25	60 pcs	100m	RAYRIM-NR-7-0-*	TPEM-NR-7-0-*
2.0	0.9	6.6	2.5	2.25	60 pcs	75m	RAYRIM-NR-8-0-*	TPEM-NR-8-0-*
4.2	0.9	13.5	4.5	2.20	30 pcs	50m	RAYRIM-NR-9-0-*	TPEM-NR-9-0-*

Standard Colour: 0 Black
* Denotes standard pack size required STK (1.2m lengths) or SP for spools/reels.
Packaging: Non-standard pack sizes are available for stocked products, please ask for details.

Application Range Guide

Plate Gauge	Thickness	Bending Radius	Part Number	
SWG	(mm)	Min. (mm)	RAYRIM No.	TPEM No.
30 - 24	0.31 - 0.56	10	RAYRIM-NR-6-0-*	TPEM-NR-6-0-*
23 - 16	0.61 - 1.63	15	RAYRIM-NR-7-0-*	TPEM-NR-7-0-*
15 - 10	1.83 - 3.25	20	RAYRIM-NR-8-0-*	TPEM-NR-8-0-*
9 - 5	3.66 - 5.38	25	RAYRIM-NR-9-0-*	TPEM-NR-9-0-*

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GTB
PTFE
Protective Spiral Binding

PTFE Spiral binding can be used in many environments for:

- Organising wires
- Harness protection
- Abrasion protection
- Eliminate lacing cord and tie-offs

Features & Benefits

- Re-usable
- Flexible and fast installation
- Allows breakouts and re-routing
- Harness multiple cables into a single manageable bundle

Specifications & Approvals

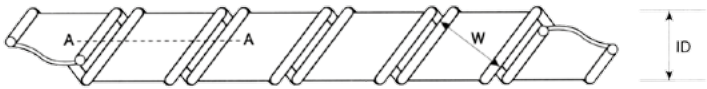
- PAN 6480
- AS41088

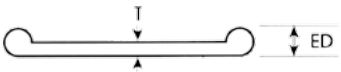
Operating Temperature

- From -70°C to +260°C

ID	Width (W)	Thickness	Ø (D	Weight	Package	Part Number
Nom. (mm)	Max (mm)	Nom g/m	(mm)	(g/m)	Standard	
3.0 (±0.25)	5.0 (±0.25)	0.75 (±0.08)	1.125	20	100m Reel	GTB-30-Colour
5.0 (±0.40)	5.0 (±0.25)	0.75 (±0.08)	1.125	29	50m Reel	GTB-50-Colour
7.5 (±0.50)	8.0 (±0.40)	0.75 (±0.08)	1.125	40	30m Reel	GTB-75-Colour
10.0 (±0.75)	8.0 (±0.40)	0.75 (±0.08)	1.125	50	15m Bag	GTB-100-Colour
12.5 (±0.80)	10.0 (±0.50)	0.75 (±0.08)	1.125	67	15m Bag	GTB-125-Colour
20.0 (±0.80)	12.5 (±0.65)	1.25 (±0.10)	1.660	210	Bag	GTB-200-Colour
25.5 (±0.80)	25.5 (±0.65)	1.25 (±0.10)	1.660	250	Bag	GTB-255-Colour

Standard Colour: Black
Other Colours: Natural, Red and Yellow
Packaging: All reels/bags of spiral binding are supplied in random lengths as standard. The most popular sizes of black spiral binding are held in stock, with low MOQs, plus there is a cut length service available.





ID Internal Diameter
W Strip Width
T Wall Thickness
ED Edge Diameter

This product may become distorted during storage and transit, we would advise gently heating (not exceeding 100°C would sufficient) to return the product to its natural state.

Lacing Tape

Cords and Yarns
General Information

We offer a comprehensive range of high performance lacing tapes, cords and braiding yarns, used throughout the aerospace, electronics, medical and many smaller specialist manufacturing industries. The lacing tapes are manufactured to meet the CID A-A-52080-4 (MIL-T-43435) specification and cover the five materials most commonly used:

- Polyamide (Nylon)
- Polyester (Dacron®)
- Polytetrafluoroethylene (Teflon®)
- Glass-fibre
- Heat Resistant Polyamide (Nomex®)

When specifying a lacing tape, performance parameters such as fibre type (raw materials), size (physical dimensions), form (flat or round), finish, tensile strength and colours should be considered.

Colours

The standard lacing tape colours are Natural and Black, dependent on the type of material used. For further information on additional colours available, please contact us.

Approvals Overview

- Airbus NSA 8420
- Boeing BMS-13-54D
- Eurofighter J96.502 and JN1127
- Locheed
- Panavia 6481
- Raytheon 268-10-11
- Rolls Royce ESW 1900
- Sikorsky SS 7057
- Westland EE 423 (M-T43435T5-3C)

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Finishes

The table below shows the finishes that are available that meet the requirements of CID-A-A-52080 to CID-A-A52084 (MIL-T-43435), as well as demanding industrial and commercial applications. Finishes are generally used to improve a lacing tapes physical properties and performance characteristics. Not all finishes are available on all products, for further information please contact us.

1. Material / Finish Selection

Designation			Description
MIL	Gu	Br	
A	U	-1	No Finish
B	W	-2	Micro-crystaline, Fungicidal Wax
C	H	-3	Synthetic Rubber or Elastomer
C	Z	n/a	Flame Retarded Rubber
C	PTH	n/a	Low Out-gassing Rubber
D	T	-4	Teflon
E	R	-5	Vinyl
F	S	-6	Silicone Resin
G	B/G	-7	Liquid Nylon
#	n/a	-8	Self extinguishing

Meets requirements of Finish C
(Gu = Gudebrod and Br = Breyden)

Part Number System - Example

As a guide to constructing your part number identified below is an example based on...

- Type I - Nylon Tape CID-A-A-52080
- MIL ref for Type 1, Size 3, Finish B

Based on premise that a Gudebrod manufactured part is required...

18 W Black Part No. example

Colour
Standard colours are Natural and Black. For additional colours please contact us

Material Designation
Cross reference with Mil ref...See table 1
Finish B = W (Gu)
-2 (Br)

Part Number
Size 3 = 18 (Gu)
103 (Br)

Specifying Information

Lacing Tapes and Yarns

Fibre Type

NYLON Tape CID-A-A-52080 (formerly MIL-T-43435 Type I)
Flat braid manufactured from high tenacity, continuous filament nylon yarn. Temperature range: -55°C to 121°C, melting point 248°C. Available with a variety of finishes as per table.

- General purpose

POLYESTER Tape CID-A-A-52081 (formerly MIL-T-43435 Type II)
Flat braid manufactured from high tenacity, continuous filament polyester yarn. Temperature range -73°C to 177°C, melting point 250°C. Available with a variety of finishes as per table.

- Superior knot tying properties to Nylon
- High temperature performance, available in a range of finishes
- Suitable for aerospace/NASA applications
- Also available 'Pre-shrunk' to reduce longitudinal shrinkage.

TEFLON Tape CID-A-A-52082 (formerly MIL-T-43435 Type III)
Flat braid manufactured from high tenacity, continuous filament Teflon yarn. Temperature range -73°C to 232°C, melting point 327°C. Available with a variety of finishes as per table.

- High temperature performance, available in a range of finishes
- Good resistance to fluids and solvents
- Suitable for aircraft engine applications
- Also available 'Pre-shrunk' to reduce longitudinal shrinkage.

GLASS Tape CID-A-A-52083 (formerly MIL-T-43435 Type IV)
Flat braid manufactured from high tenacity, continuous filament glass yarn coated with Teflon before braiding. Temperature range to -55°C to 427°C, melting point 1150°C. Available with a variety of finishes as per table.

- Extremely high temperature performance
- Very low elongation
- Minimal fibre to fibre abrasion
- Produced from continuous filament electrical grade glass (E-Glass).

NOMEX® Tape CID-A-A-52084 (formerly MIL-T-43435 Type V)
Flat braid manufactured from high tenacity, continuous filament Nomex yarn. Temperature range -55°C to 260°C, melting point 371°C. Available with a variety of finishes as per table.

- Excellent high temperature performance and Non flammable
- Highly resistant to fluids and lubricants
- Suitable for critical aircraft harness applications, identifiable by a green coloured tracer.

NYLON Cord MIL-T-713 Type P, Class 1
Meets or exceeds MIL-T-713 Type P. Round twisted 3 ply nylon cord manufactured from high tenacity, continuous filament yarn. Temperature range -55°C to 121°C. Available with no finish, or micro-crystalline fungicidal wax finish.

NOMEX® Overbraiding Yarn PAA MIL-C-572
Continuous Filament Nomex yarn twisted to form an essentially round bundle. Available unbonded or bonded with a non-corrosive liquid nylon finish. Temperature range -55°C to 260°C, melting point 371°C. Packaged on cardboard tubes or plastic ratchet bobbins for use on New England Butt #2 braiding machines, other packages are available.

- General purpose
- Superior abrasion and fluid resistance

Polyester overbraiding yarn (MIL-C-572 Type PSTR) is also available, please contact us for further information or to discuss further.

TYPE I · NYLON Tape CID-A-A-52080 Braided Lacing Tape

Part Number		Size	Breaking Strength	Tape Width		Tape Thickness		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	mm (Min.)	mm (Max.)	mm (Min.)	mm (Max.)	Metres
101	26	1	61.23	4.57	5.59	0.33	0.48	228
102	23	2	36.29	2.51	3.07	0.30	0.46	228
103	18	3	22.68	1.96	2.39	0.28	0.43	457
104	22	4	11.34	1.37	1.68	0.23	0.38	457
105	20	5	6.80	1.14	1.40	0.15	0.36	457
n/a	21	n/a	9.07	1.42	1.73	0.13	0.28	457
n/a	15	n/a	3.18	0.74	0.89	0.03	0.23	457

Standard colours are Natural and Black, for additional colour choices please contact us.
Dimension in Metric unless otherwise stated

TYPE II · POLYESTER Tape CID-A-A-52081 Braided Lacing Tape

Part Number		Size	Breaking Strength	Tape Width		Tape Thickness		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	mm (Min.)	mm (Max.)	mm (Min.)	mm (Max.)	Metres
201	26D	1	61.23	4.57	5.59	0.33	0.48	228
202	23D	2	36.29	2.51	3.07	0.30	0.46	228
203	18D	3	22.68	1.96	2.39	0.28	0.43	457
204	22D	4	11.34	1.37	1.68	0.23	0.38	457
205	21D	5	6.80	1.14	1.40	0.15	0.36	457
n/a	20D	n/a	5.44	1.09	1.35	0.10	0.25	457
n/a	15D	n/a	1.81	0.74	0.89	0.05	0.20	457

Standard colours are Natural and Black, for additional colour choices please contact us.
Dimension in Metric unless otherwise stated

TYPE III · TEFLON Tape CID-A-A-52082 Braided Lacing Tape

Part Number		Size	Breaking Strength	Tape Width		Tape Thickness		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	mm (Min.)	mm (Max.)	mm (Min.)	mm (Max.)	Metres
302	256	2	13.61	2.74	3.35	0.23	0.36	228
304	231	4	6.80	1.5	1.83	0.23	0.36	457
305	n/a	5	4.50	0.58	0.71	0.23	0.36	457
n/a	230	n/a	6.35	0.71	0.86	0.64	0.79	457
n/a	302	n/a	1.81	0.25	-	-	-	457

Standard colours: Natural (Dark Brown) only, Teflon fibres cannot be dyed or coloured.
Finishes available: 'unfinished' and 'synthetic' only
Dimension in Metric unless otherwise stated

Glass, Nomex® and Nylon

Braided Lacing Tape and Twisted Cord

Selection Guide

TYPE IV • GLASS Tape CID-A-A-52083 Braided Lacing Tape

Part Number		Size	Breaking Strength	Tape Width		Tape Thickness		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	mm (Min.)	mm (Max.)	mm (Min.)	mm (Max.)	Metres
401	26X	1	90.72	5.16	6.30	0.33	0.48	228
402	23X	2	45.36	2.51	3.07	0.33	0.48	228
403	18X	3	34.02	1.96	2.39	0.33	0.48	457
404	22X	4	22.68	1.37	1.68	0.33	0.48	457
405	n/a	5	22.68	1.14	1.40	0.33	0.48	457
n/a	21X	n/a	31.75	1.73	2.11	0.30	0.46	457

Standard colours are Natural (White) and Black, fibreglass cannot be dyed but finish may be pigmented Black.
Dimension in Metric unless otherwise stated

TYPE V • NOMEX® Tape CID-A-A-52084 Braided Lacing Tape

Part Number		Size	Breaking Strength	Tape Width		Tape Thickness		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	mm (Min.)	mm (Max.)	mm (Min.)	mm (Max.)	Metres
501	726	1	38.56	4.57	5.59	0.33	0.48	228
502	723	2	22.68	2.51	3.07	0.28	0.43	228
503	718	3	15.88	1.73	2.11	0.23	0.38	457
504	722	4	11.34	1.27	1.55	0.18	0.33	457
n/a	1342	n/a	31.75	2.06	2.51	0.43	0.58	228
n/a	946	n/a	2.27	0.30	-	-	-	457

Standard colours are Natural (off White) with a Green tracer. Additional colour choices with or without tracer please contact us.
Dimension in Metric unless otherwise stated

TYPE P • NYLON Cord MIL-T-713 Twisted cord

Part Number		Size	Breaking Strength	Approximate Yield	Diameter		Spool Sizes
Br	Gu	Mil-Spec	Kg (Min.)	Metres per Kg	mm (Min.)	mm (Max.)	Kg
111-2	n/a	1	31.75	273 Wax Finish	0.91	1.12	0.45
111-1	n/a	1	31.75	350 No Finish	0.91	1.12	0.45
112-2	n/a	2	21.77	446 Wax Finish	0.53	0.74	0.45
112-1	n/a	2	21.77	595 No Finish	0.53	0.74	0.45
113-2	n/a	3	14.51	558 Wax Finish	0.48	0.69	0.45
113-1	n/a	3	14.51	744 No Finish	0.48	0.69	0.45

Standard colours are Natural (off White) or Black, no other colours available.
Dimension in Metric unless otherwise stated

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MIL-C-572 Nomex®
Overbraiding Yarn Selection Guide

Continuous Filament Nomex yarn twisted to form an essentially round bundle. Material is available unbonded or bonded with a non-corrosive liquid nylon finish. Temperature range -55°C to 260°C, melting point 371°C.

Material packaged on cardboard tubes or plastic ratchet bobbins for use on New England Butt #2 braiding machines, other packages are available.

Ordering Information

When ordering please specify the denier, finish, colour, number of ply per end x number of ends, material and bobbin requirement, as per example shown below;

200 B Natural 1x4 Nomex® R.

TYPE PAA · NOMEX® MIL-C-572 Overbraiding Yarn

Yarn Size	Number of Filaments	Breaking Strength	Nominal Diameter	Yarn Elongation	Parallel Ends per Bobbin	Spool Sizes
		Kg (Min.)	mm (Min.)			Metres
200 Denier	100	1.24	0.152	35%	1-8	4,572
1200 Denier	600	6.45	0.305	37%	1-4	914.4

Code	Finishes	Comments
U	Untreated	General Purpose
B	Bonded with non-corrosive, flame retardant Polyamide	Superior abrasion resistance. Excellent fluid resistance

Put-Up	Length tube	Length braid	Width	Height	Tube Ø	Taper
T	133.50	120.65	6.35 tube	47.63	20.96	30°
R	155.58	134.94	46.04 bobbin	44.45	7.94	-

Standard colours are Natural (Off White) Olive Drab, Black and Red, other colours are available in bond dyed form or with unbonded yarn in minimum dye lots, for details please contact us.
Dimension in millimetres unless otherwise stated

TYPE PSTR · POLYESTER Mil-C-572 Overbraiding Yarn

Also available please contact us for details

INTRODUCTION

Circular Backshells

For all your wire and cable screen connection requirements, we have the solutions through our partners, offering an extensive range of circular connector backshells, available in various materials and plating specifications.

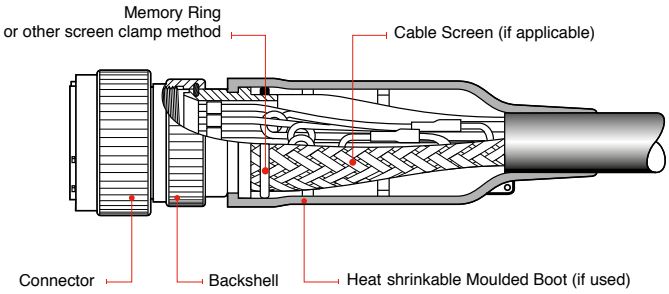
Backshells, or connector adaptors if you prefer, offer high performance sealing and strain relief in demanding applications. We offer a wide range for applications in many industries including Aerospace, Defence, Marine and Mass Transit.

These backshells are available in many configurations to match applications, are easy to install and offer high reliability.

Let us Help you

For your connector adaptors or backshell assemblies, please contact us with the following information where applicable.

- Backshell type.
- Connector part number or specification.
- Connector required or the manufacturer.
- Connector shell size.
- Connector material and plating (this may be in the part number).
- Wire bundle diameter and cable jacket diameter.
- Entry size.
- Angle of backshell, or range required.
- Type of cable screen (e.g. size and number of strands, single or double layer).



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CONTENTS

Selecting Material and Plating

For a backshell or connector design to perform in different demanding environments and applications, the material and plating selected are critical to the optimum performance in any given environment.

To ensure optimum compatibility, select the adaptor material and finish to match those of the connector and or environment, using the 'Material' and 'Plating' tables on these pages.

Of late recent high performance circular connectors and backshells are often manufactured from aluminium with a black zinc nickel Cadmium free plating which are RoHS compliant.

Material Codes

Standard Material Options	Material Part Code		
	Group 1	Group 2	Group 3
Aluminium alloy 6262 / 6082	19	A	1
Nickel Aluminium Bronze DGS 1043 / NES 833 (Marine)	01	B	2
Stainless Steel 303 S31 / 304	62	S	4
Non-Standard Materials	**Group 1**	**Group 2**	**Group 3**
Brass CZ 121	-	-	3
Stainless Steel 316 (Marine)	-	-	46
HDHC Copper CA 104	-	-	5
Black Acetal (cost effective plastic)	-	-	7
PEEK GL30 (30% glass filled) high temperature composite	-	-	73
ULTEM 2300 (30% glass filled) standard composite	-	-	74

Please contact sales office for materials not listed above

Materials

ALUMINIUM (A) - Effective for most applications, as satisfies the majority of environmental and interconnect requirements. Aluminium is strong, lightweight, corrosion resistant and cost effective, with a variety of surface finishes.

NICKEL ALUMINIUM BRONZE (B) - Ideal for marine applications where traditional plating finishes can quickly be eroded revealing weaker base materials, Nickel Aluminium Bronze will remain robust in the harshest of environments.

STAINLESS STEEL (S, 46) - Corrosion resistant steel (CRES) available in 303, 304 and 316 grades, offers excellent corrosion and chemical resistance, plus it is stronger than aluminium and needs no additional plating.

BRASS (3) - Inherently corrosion resistant and being relatively soft, machines easily. It has the added advantage of being non-sparking and does not require additional surface treatment, but it is often nickel and chrome plated for increased hardness, wear resistance .

COMPOSITE (7, 73, 74) - Key advantages include light weight, corrosion resistance and can be lower cost when manufactured in high volumes. Can also be plated for increased surface hardness and conductivity.

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Plating Codes

Standard Plating Options	Colour	RoHS	Plating Part Code	
			Group A	Group B
Cadmium, per SAE AMS-QQ-P-416, Type II, Class 3. Over electroless nickel	Olive Drab	No	B	B
Electroless nickel, per SAE AMS-C-26074, Class 4, Grade B.	Silver	Yes	C	C
Anodised hard per MIL-A-8625, Type III, Class 2	Black	Yes	G	D
Anodised, sulphuric, MIL-A-8625, Type II, Class 2	Black	Yes	-	G
Passivated, per SAE AMS-QQ-P-35 or MIL-S-5002 (stainless steel only).	-	Yes	J	J
Zinc Cobalt over Electroless Nickel	Olive Drab	Yes	U	ZB
Unplated Shot Blast (glass bead), for non reflective finish	-	Yes	W	Z
Zinc Nickel passivate over electroless Nickel, ASTM B841 class 1	Black	Yes	Z	ZN
Non-Standard Plating Material	**Colour**	**RoHS**	**Group A**	**Group B**
Anodise Blue to DEF 03-25	Blue	Yes	-	AB
Anodise Red to DEF 03-25	Red	Yes	-	AR
Electroless Nickel, high Phosphor, BS EN ISO 4527:2003	Silver	Yes	-	CHP
Bright electroless Nickel to MIL-C-26047D, class 4, grade C	Silver	Yes	-	F
Hard anodise Grey	Grey	Yes	-	HA
Iridite conversion of Alocrom 1200, clear/iridescent (aluminium only)	-	Yes	-	
Nickel/PTFE	Black	Yes	-	TN
Unplated clean finish not shot blasted	-	Yes	-	U
Silver plate 5 microns to DEF 03-9	-	Yes	-	V

Plating

CADMIUM (B) - The historical standard finish for military and industrial connectors and backshells, offering excellent salt spray corrosion resistance.

ELECTROLESS NICKEL (C) - Commonly used on industrial and high temperature applications, where a non-reflective finish and high corrosion resistance is not essential.

HARD ANODISED (G) - Used where the need for surface hardness and abrasion resistance is the main criteria. The build up for hard coat anodising is much thicker than your standard anodising.

PASSIVATED (J) - Removes surface contaminants and produces a surface condition which is resistant to corrosive action. Provides a higher degree of corrosion resistance with finished parts retaining the dimension they had prior to treatment.

ZINC COBALT (U) - Offers enhanced corrosion resistance compared to traditional zinc plating of the same thickness. By electroplating zinc and cobalt to the particular metal, the end result is a uniform ductility.

SHOT BLAST (W) - For a non reflective finish.

BLACK ZINC NICKEL (Z) - The latest RoHS compliant solution to environmental plating of connectors and backshells, offering high levels of compatibility with other plating materials.

Determine Entry Size

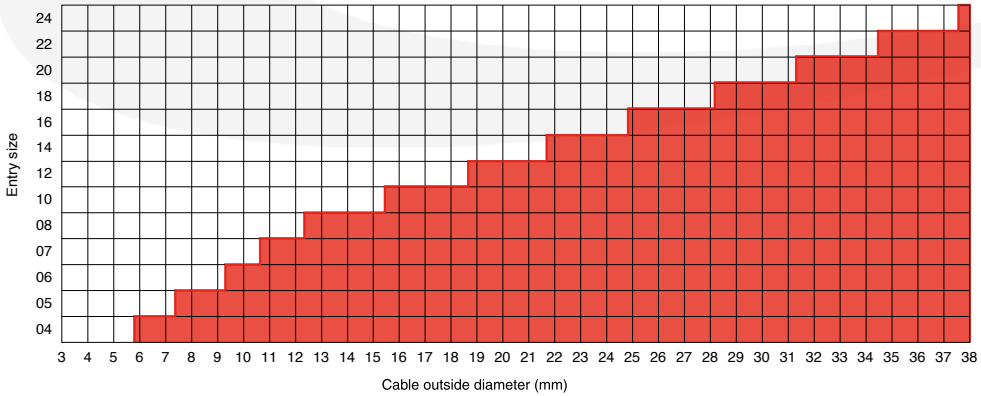
Determining the Entry Size
Once you have the wire bundle size, use the chart below to select entry size. Chart shows the minimum entry sizes for cables from 3 to 38 mm in diameter. In other words, the white spaces on the chart represent all of the cable outside diameters each entry size will fit.

Follow these steps:

- Find the cable diameter on the chart.
- Please note the lowest entry size that will fit the cable diameter.

If the adaptor is shielded or has a Tinel-Lock ring, there are additional considerations, which are noted below.

For further information or assistance on selecting the correct entry size or constructing your required adaptor part number, please contact us.



Braided Tail Backshells
The extreme flexibility of the braid on these backshells accommodates a large range of cable diameters. It is therefore recommended that the standard entry size for any given adaptor part number be specified as indicated on the relevant data sheet. Non standard entry sizes are available to special order. Use the selection chart above to ensure that the standard entry size will pass over the jacketed cable diameter.

Memory Ring Backshells
The cable braid must be opened up to fit onto the outside diameter of the adaptor entry. For optimum performance, select the smallest entry size that will pass over the jacketed cable diameter. Repair of the connector will be easier using the boot and shield rollback if a slightly larger than minimum entry size is used.

The selection chart above shows the minimum entry sizes for cable diameters in the range of 3 mm to 38 mm. This will ensure that the jacketed cable passes through the adaptor. Ensure the braid will open sufficiently to fit the entry size selected and to ensure that the braid and boot can be rolled back.

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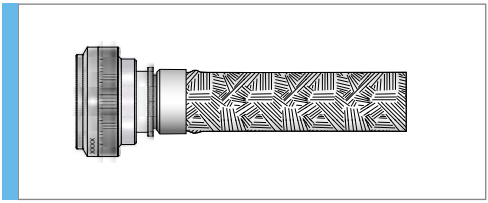
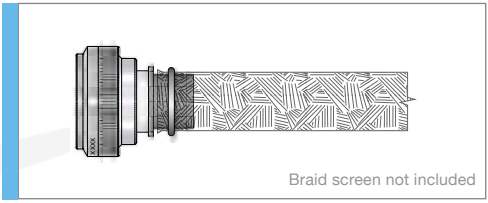
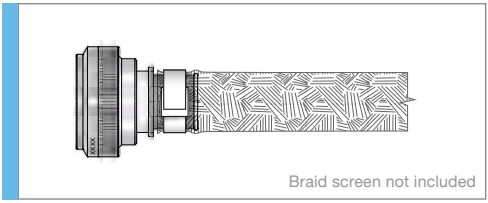
Screened Backshell Types



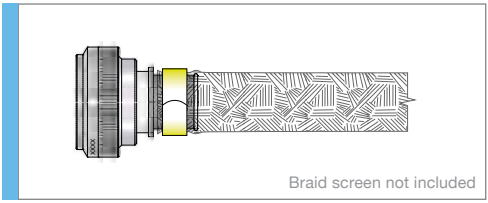
BRAIDED TAIL
Supplied complete with a braided tail that has been secured by a magna-form crimp ring. Braid shield accommodates a range of cable diameters. This allows a standard entry size to be used with most cable sizes and can be terminated using a SolderSleeve® device.



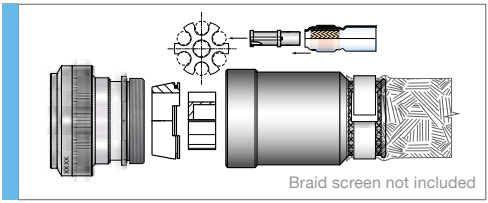
MEMORY RING
Special shape memory metal ring that shrinks uniformly when heated, offering very secure 360° clamp of the screening braid onto the backshell. Withstands shock, vibration and temperature cycling.
Requires specialist tooling.



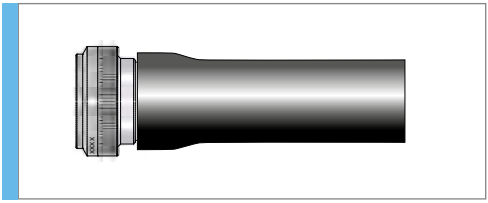
BAND CLAMP
Where the cable screening braid is clamped to the backshell via a mechanical metal strap.
Hand tool required.



CONSTANT FORCE SPRING (CFS)
Cable screening braid is secured to the backshell via constant force spring wrapped around the braid.
Does not need any tooling.



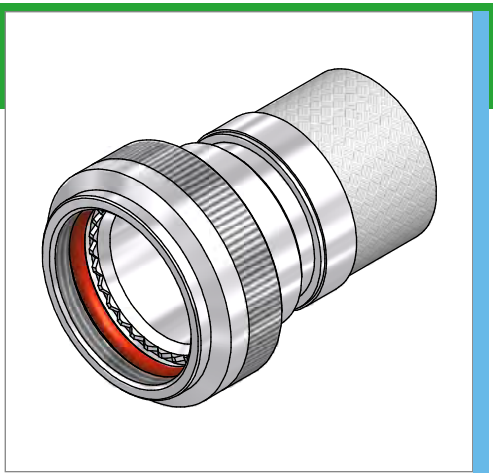
INDIVIDUAL SCREEN
This system offers the greatest EMI/EMC integrity, providing 360° shielding in the termination area of each individual wire/cable plus collective screen cable versions (shown). System offers a significant improvement over pigtail termination methods.



BOOT ASSEMBLY
Supplied as a complete assembly utilising Rayatan® heat shrink screened boot technology that includes an internal lining that offers shielding levels better than 80 dB at 100 MHz. Avoiding the requirement for a separate metal screening braid.

Braided Tail

Pre-terminated Screening Braid Tail Screened Backshells



Shielded spin adaptors include tubular braid attached to the rear of the adaptor, that accommodates a range of cable diameters. This allows a standard entry size to be used with most cable sizes and can be terminated to the cable braid using a SolderSleeve® device.

Standard braid length is 150mm, longer lengths available please ask for details.

Using the part numbering elements on these pages construct your part number, or contact us for details.

208M7 16 - 19 Z 10

Part Numbering example

ENTRY SIZE
See table on opposite page

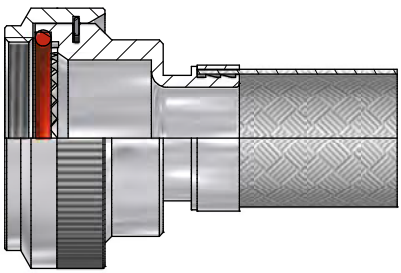
PLATING CODE
See plating code selection table, Group A see page 365

MATERIAL CODE
See material code selection table, Group 1 see page 364

SHELL SIZE
See table on opposite page

FAMILY TYPE DESIGNATION + Angle
See table on opposite page

The above backshell family designations are for the most common applications, for others not listed here please contact us.



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Shell Size Selection Table

Part No.	Ind. Ref.	Mil. Ref.	Max Entry Size
08	9	A	04
10	11	B	07
12	13	C	09
14	15	D	10
16	17	E	12
18	19	F	14
20	21	G	16
22	23	H	18
24	25	J	20

Family Type Designation

MIL-C-5015 (MS3100)
218M7 Straight backshell family
218M8 45° backshell family
218M9 90° backshell family

MIL-C-26482 Series I
206M0 Straight backshell family
206M1 45° backshell family
206M2 90° backshell family

MIL-C-38999 Series III & IV.
208M7 Straight backshell family
208M8 45° backshell family
208M9 90° backshell family

MIL-C-38999 Series I & II.
204M0 Straight backshell family
204M1 45° backshell family
204M2 90° backshell family

MIL-C-26482 Series II and
MIL-C-5015 (MS3400)
203M0 Straight backshell family
203M1 45° backshell family
203M2 90° backshell family

208M* - Entry Size Dimensions Table

Entry Size	Internal Dia
03	4.77 mm
04	6.35 mm
05	7.92 mm
06	9.52 mm
07	11.12 mm
08	12.70 mm
09	14.27 mm
10	15.87 mm
11	17.47 mm
12	19.05 mm
13	20.62 mm
14	22.23 mm
15	23.82 mm
16	25.40 mm
17	26.98 mm
18	28.60 mm
20	31.80 mm
21	33.34 mm
22	35.00 mm
24	38.10 mm
28	44.45 mm

Selection tables shown here are for general indicative purposes only, as they represent the MIL-C-38999 Series III & IV family of 'Braided tail' backshells only. For other family type backshells dimensions and characteristics please contact us for details.

The entry size range shown above indicates the most common combinations only, for further options please contact us.

Tinel-Lock® Series

Memory Ring
Screened Backshells

The Tinel-Lock® ring is made from a special shape memory metal that shrinks uniformly when heated and terminates copper braid directly onto the rear of a backshell.

- Withstands severe shock, vibration and temperature cycling
- Low profile, buckle free termination.
- One piece construction
- Operating Range, -65°C to 200°C

Using the part numbering elements below construct your part number, or contact us for details.

TXR40 A Z 00 - 16 10 AI

Part Numbering example

RING DESIGNATION REF
AI, BI or CI See selection table opposite.
Omit if no ring required

ENTRY SIZE
See table on opposite page

SHELL SIZE
See table on opposite page

ANGLE CONFIGURATION

00	Straight
45	45° angle
90	Right angle

PLATING CODE
See plating code selection table, Group A or B see page 365

MATERIAL CODE
See material code selection table, Group 2 see page 364

FAMILY TYPE

TXR18	MIL-DTL-5015D
TXR21	MIL-DTL-26482 Series I
TXR40	MIL-DTL-38999 Series III & IV
TXR41	MIL-DTL-38999 Series I & II
TXR54	MIL-DTL-26482 Series II and MIL-DTL-5015G (MS3400)

The above backshell family designations are for the most common applications, for others not listed here please contact us.

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TXR40 - Shell Size Selection Table

Part No.	Ind. Ref.	Mil. Ref.	Max Entry Size
08	9	A	04
10	11	B	07
12	13	C	08
14	15	D	10
16	17	E	12
18	19	F	14
20	21	G	16
22	23	H	18
24	25	J	20

Ring Designator Selection Table

Description	Part Ref.
Single Layer	
36 AWG braid	**AI**
34 AWG braid	**AI**
32 AWG braid	**BI**
30 AWG braid	**BI**
Double Layer	
36 AWG braid	**BI**
34 AWG braid	**BI**
32 AWG braid	**CI**

The outside surface of the ring is marked with a dot of thermo-chromic paint which changes colour when appropriate installation temperature is reached.

'AI' Rings are identified by the absence of coloured a dot, whilst 'BI' rings are marked with a **RED** dot and 'CI' rings are marked with a **BLUE** dot.

TXR40 - Entry Size Dimensions Table

Entry Size	Internal Dia
04	6.35 mm
05	7.92 mm
06	9.53 mm
07	11.10 mm
08	12.70 mm
10	15.88 mm
12	19.05 mm
14	22.23 mm
16	25.40 mm
18	28.58 mm
20	31.75 mm
22	34.93 mm
24	38.10 mm

Selection tables shown here are for general indicative purposes only, as they represent the TXR40 MIL-C-38999 Series III & IV family of backshells only. For other family type backshells dimensions and characteristics please contact us for details.

The entry size range shown above indicates the most common combinations only, for further options please contact us for details.

Both Backshells and Tinel-Lock® rings are available separately, please contact us for details.

Band Strap Series

Band Clamp
Screened Backshells

Band Strap adaptors feature a corrosion-resistant steel band to terminate the cable screen. The resulting 360° overall termination creates an effective electrical connection, providing screen continuity between braid and adaptor.

The terminated cable can then be protected and sealed using a heat-shrinkable moulded part, providing strain relief to the cable.

Using the part numbering elements below construct your part number, or contact us for details.

BND40 A Z 00 - 16 12 V

Part Numbering example

BAND CODE
V One step standard band (straight)
U Two step band, contact us for more info

ENTRY SIZE
See table on opposite page

SHELL SIZE
See table on opposite page

ANGLE CONFIGURATION
00 Straight
45 45° angle
90° Right angle

PLATING CODE
See plating code selection table, Group A or B see page 365

MATERIAL CODE
See material code selection table, Group 2 see page 364

FAMILY TYPE
BND18 MIL-DTL-5015 (MS3100)
BND21 MIL-DTL-26482 Series I
BND40 MIL-DTL-38999 Series III & IV
BND41 MIL-DTL-38999 Series I & II
BND54 MIL-DTL-26482 Series II and MIL-DTL-5015 (MS3400)

The above backshell family designations are for the most common applications, for others not listed here please contact us.

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BND40 - Shell Size Selection Table

Part No.	Ind. Ref.	Mil. Ref.	Max Entry Size
08	9	A	04
10	11	B	07
12	13	C	09
14	15	D	10
16	17	E	12
18	19	F	14
20	21	G	16
22	23	H	18
24	25	J	20

Selection tables shown here are for general indicative purposes only, as they represent the BND40 MIL-C-38999 Series III & IV family of backshells only. For other family type backshells dimensions and characteristics please contact the sales department.

The entry size range shown above indicates the most common combinations only, for further options please contact us.

Both Backshells and Band Strap are available separately, please contact us for details.

BND40 - Entry Size Dimensions Table

Entry Size	Nominal Internal Dia
03	4.7 mm
04	6.3 mm
05	7.9 mm
06	9.5 mm
07	11.1 mm
08	12.7 mm
09	14.2 mm
10	15.8 mm
11	17.4 mm
12	19.0 mm
13	20.6 mm
14	22.2 mm
15	23.8 mm
16	25.4 mm
18	28.6 mm
20	31.8 mm
22	35.0 mm
24	38.1 mm

Band straps are constructed from 300 series passivated corrosion resisting steel and offer:

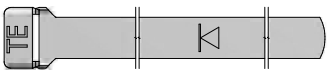
- Low profile design
- Light weight construction
- Space reduction
- Ease of installation

Standard one step band straps ‘V’ have a band slot width of 6.35mm, with a choice of two tools available TIE-DEX-II-TOOL and M81306/1-01

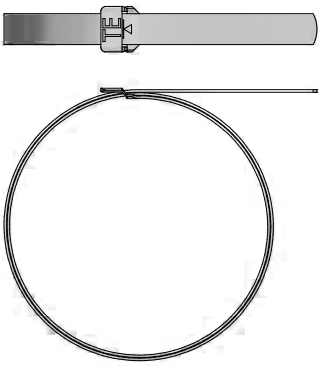
The optional two step band strap has a slot width of 6.65mm, with combination tooling kit TF1700 available.

Please contact us for more information.

Note: The standard 6.35mm slot width band strap was previously denoted by ‘B’ suffix.



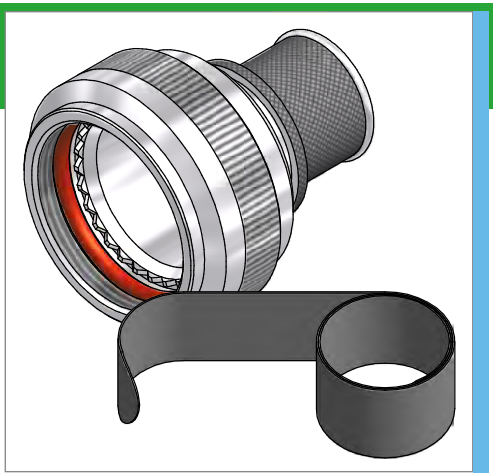
One step band strap - Straight



One step band strap - Pre-coiled

CFS Spring Series

Constant Force Spring
Screened Backshells



Constant Force Spring adaptors feature a fatigue and corrosion-resistant spring steel band to terminate the cable screen. The resulting 360º termination creates an effective electrical connection, providing screen continuity between braid and adaptor.

The terminated cable can then be protected and sealed using a heat-shrinkable moulded part, providing strain relief to the cable.

Using the part numbering elements below construct your part number, or contact us for details.

91H1-17-08-1-C-HE300

Part Numbering example

SPRING REF
HE050 7.5mm unconstrained
HE100 8.0mm unconstrained
HE200 12.8mm unconstrained
HE300 17.9mm unconstrained
HE400 21.8mm unconstrained
Omit if not required

PLATING CODE
See plating code table, Group B on page 365

MATERIAL CODE
See material code table, Group 3 on page 364

ENTRY SIZE
See table 'X' on opposite page

SHELL SIZE
See table 'Y' on opposite page

ANGLE CONFIGURATION
1 Straight
2 45º angle
3 Right angle

INTERFACE
H MIL-DTL-38999 Series III & IV
F MIL-DTL-38999 Series I & II

SERIES TYPE
91 Spring termination series

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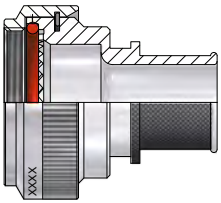
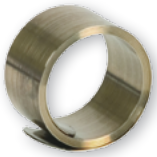
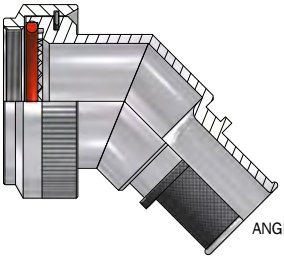
91H - Shell Size Selection Table 'Y'

Part No.	Ind. Ref.	Mil. Ref.	Max Entry Size
09	9	A	04
11	11	B	06
13	13	C	08
15	15	D	10
17	17	E	12
19	19	F	14
21	21	G	16
23	23	H	18
25	25	J	20

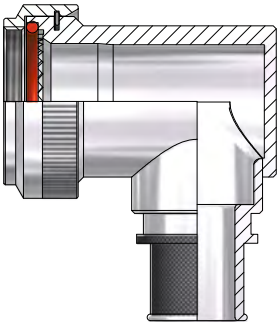
ANGLE 1







ANGLE 2



ANGLE 3

91H - Entry Size Dimensions Table 'X'

Entry Size	Internal Dia	Spring Ref
03	4.7 mm	HE050
04	6.3 mm	HE050
05	7.9 mm	HE100
06	9.5 mm	HE100
07	11.1 mm	HE100
08	12.7 mm	HE200
09	14.2 mm	HE200
10	15.8 mm	HE200
11	17.4 mm	HE200
12	19.0 mm	HE300
13	20.6 mm	HE300
14	22.2 mm	HE300
15	23.8 mm	HE300
16	25.4 mm	HE300
17	27.0 mm	HE400
18	28.6 mm	HE400
19	30.2 mm	HE400
20	31.8 mm	HE400
21	33.3 mm	HE400
22	35.0 mm	HE400
23	36.5 mm	HE400
24	38.1 mm	HE400

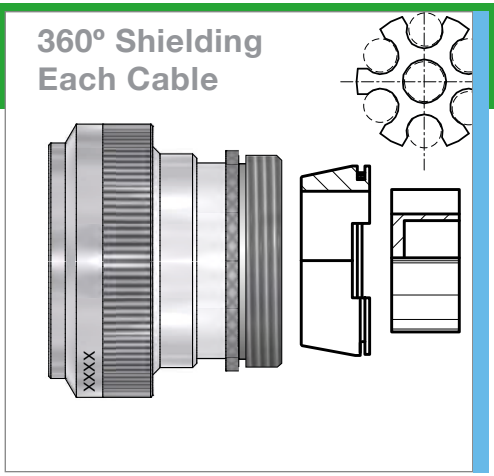
Selection tables shown here are for general indicative purposes only, as they represent the 91H MIL-C-38999 Series III & IV family of backshells only. For other family type backshells dimensions and characteristics please contact the sales department.

The entry size range shown above indicates the most common combinations only, for further options please contact us.

Both Backshells and constant force springs are available separately, please contact us for details.

Hexashield® Series

Individual Screens
Screened Backshells



Superior EMC/EMI Shielding Performance
Hexashield is designed to provide optimum EMC protection solutions for both commercial and military applications, representing a significant improvement over pigtail termination methods. Providing 360° EMC shielding on the termination area of each individual cable, Hexashield backshells provide outstanding shielding effectiveness.

Using the part numbering elements below, construct your part number, or contact us for details.

HEX40 - A C 00 - 17 - A6 - 3

Part Numbering example

BACK NUT TYPE
See illustration opposite

FERRULES
Number of ferrules to be fitted. These need to be ordered separately, see info opposite

SHELL SIZE
See table on opposite page

ANGLE CONFIGURATION

00	Straight
45	45° angle
90°	Right angle

PLATING CODE

B	Cadmium plated
C	Electroless Nickel

MATERIAL CODE

A	Aluminium alloy

FAMILY TYPE

HEX18	MIL-DTL-5015 (MS3100)
HEX21	MIL-DTL-26482 Series I
HEX40	MIL-DTL-38999 Series III & IV
HEX41	MIL-DTL-38999 Series I & II
HEX54	MIL-DTL-26482 Series II and MIL-DTL-5015 (MS3400)

The above backshell family designations are for the most common applications, for others not listed here please contact us.

Additional Options Available
The options below are additional references in the part number, for details please contact us.

- Long body (item 4)
- Swept body (items 6 and 8)

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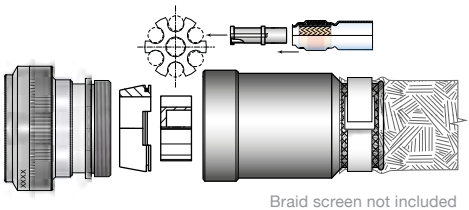


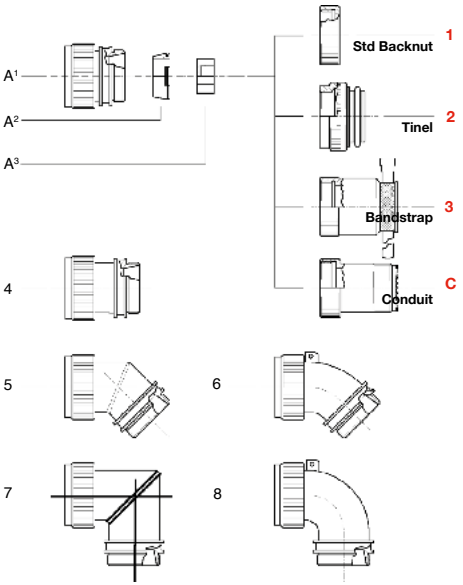
Braid screen not included

Features and benefits

- Simplified maintenance repair
- Excellent mechanical and environmental resistance
- Efficient strain relief
- Flexibility
- Versatility

EMC Performance

- Withstands 10-kA peak current lightning transients of SAE AE4L-87-3.
- Outperforms traditional pigtail termination, especially in HIRF performance.



Ferrule Quantity by Shell Size

Shell Size		Ferrule Quantity	
Ref.	Mil.	Std.	Opt.
09	A	1	-
11	B	2	-
13	C	3	-
15	D	5	-
17	E	6	7
19	F	7	-
21	G	9	11
23	H	10	13
25	J	12	17

Table shown is for indicative purposes only, as represents the MIL-C-38999 Series III & IV family of 'HEX' backshells only. For additional variations please contact us.

Ferrule Kit - Part Numbers

HET-A-02X Shielded cables - for small size cables with heat shrinkable SolderShield terminator.

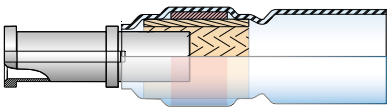
HET-A-03X Unshielded cables - for small size cable with heat shrinkable sealing sleeve.

HET-A-04X Shielded cables - for larger shield diameter cables with heat shrinkable SolderShield terminator.

Type of plating
B = Cadmium plated
C = Electroless nickel

HET07-AX Ferrule - solid blank for use when a HET-A is not needed.

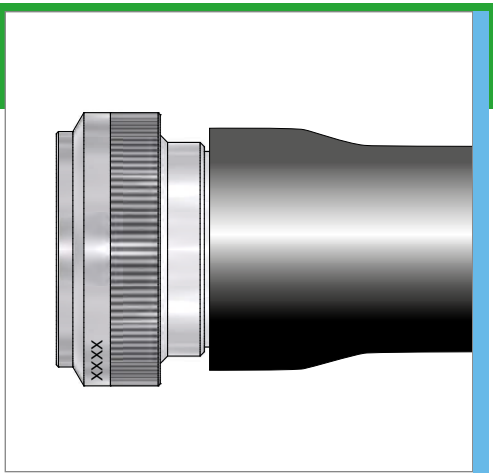
For assistance when ordering this product please contact us for more information.



Ferrule with solder sleeve assembled, before shrinking

KTKK Series

One Piece Heat Shrink Boot Assembly
Heat Shrink Screened Backshells



KTKK boot assemblies are one-part assemblies for screened cables. Constructed from heat-shrinkable screened moulded parts and connector adaptors, the assembly consists of parts already well proven in harsh military environments.

Installation is effected by coupling the adaptor to the connector and shrinking the rear of the moulded part onto the cable with a hot air gun. The moulded part has a hot-melt adhesive pre-installed to provide a bond between the cable jacket and the moulded part.

When used in conjunction with shielded (screened) cables, the assembly provides electrical continuity between the cable shield and the connector with Rayaten® moulded parts. Rayaten moulded parts are shielded, heat shrinkable parts providing shielding levels better than 80 dB at 100 MHz.

The following part number tables are for our most popular ranges that offer screened system 100, low fire hazard, with S1275 conductive adhesive. This selection represents a small selection of what is available in relation to materials and connector types.

Pre-Coated Screening Adhesive Options

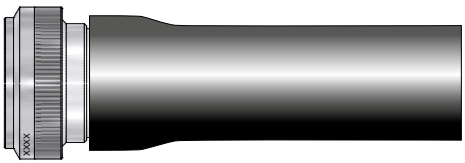
Material	Coatings, shielded
Screened System 25, fluid-resistant modified elastomer	S1030 low fire hazard hot melt adhesive
Screened System 100, low fire hazard material	S1275 conductive adhesive for use with Rayaten moulded parts

Other common variants include...

MIL-DTL-38999 Series III and IV - Aluminium with Cadmium Plate.

MIL-DTL-38999 Series I and II - Aluminium with Cadmium Plate.

Pattern 602 - Aluminium with Cadmium Plate.



For more information please contact us.

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KTKK Series

One Piece Heat Shrink Boot Assembly
Heat Shrink Screened Backshells

MIL-DTL-38999 Series III & IV Connectors - Nickel Aluminium Bronze

RoHS compliant

Shell Size	Straight Assemblies		45° Assemblies		90° Assemblies	
	Part Number	Cable Range	Part Number	Cable Range	Part Number	Cable Range
08	KTKK 2610	5.0 - 7.0	KTKK 3130	5.0 - 7.0	-	-
10	KTKK 2611	6.0 - 9.0	KTKK 3131	6.0 - 9.0	KTKK 2621	6.0 - 9.0
12	KTKK 2612	7.2 - 11.0	KTKK 3132	7.2 - 11.0	KTKK 2622	7.2 - 11.0
14	KTKK 2613	7.2 - 11.0	KTKK 3133	7.2 - 11.0	KTKK 2623	7.2 - 11.0
16	KTKK 2614	8.5 - 17.0	KTKK 3134	8.5 - 17.0	KTKK 2624	8.5 - 17.0
18	KTKK 2615	8.5 - 17.0	KTKK 3135	8.5 - 17.0	KTKK 2625	8.5 - 17.0
20	KTKK 2616	10.0 - 21.0	KTKK 3136	10.0 - 21.0	KTKK 2626	10.0 - 21.0
22	KTKK 2617	10.0 - 21.0	KTKK 3137	10.0 - 21.0	KTKK 2627	10.0 - 21.0
24	KTKK 2618	15.8 - 29.0	KTKK 3138	15.8 - 29.0	KTKK 2628	15.8 - 29.0

Pattern 105 Connectors - Aluminium with Cadmium Plate

Shell Size	Straight Assemblies		45° Assemblies		90° Assemblies	
	Part Number	Cable Range	Part Number	Cable Range	Part Number	Cable Range
08	KTKK 0465	5.0 - 7.0	KTKK 0603	5.0 - 7.0	-	-
10	KTKK 0466	6.0 - 9.0	KTKK 0604	6.0 - 9.0	KTKK 1251	6.0 - 9.0
12	KTKK 0467	7.2 - 11.0	KTKK 0605	7.2 - 11.0	KTKK 1252	7.2 - 11.0
14	KTKK 0468	7.2 - 11.0	KTKK 0606	7.2 - 11.0	KTKK 1253	7.2 - 11.0
16	KTKK 0469	8.5 - 17.0	KTKK 0607	8.5 - 17.0	KTKK 1254	8.5 - 17.0
18	KTKK 0470	8.5 - 17.0	KTKK 0608	8.5 - 17.0	KTKK 1255	8.5 - 17.0
20	KTKK 0471	10.0 - 21.0	KTKK 0609	10.0 - 21.0	KTKK 1256	10.0 - 21.0
22	KTKK 0472	10.0 - 21.0	KTKK 0610	10.0 - 21.0	KTKK 1257	10.0 - 21.0
24	KTKK 0473	15.8 - 29.0	KTKK 0611	15.8 - 29.0	KTKK 1258	15.8 - 29.0

Pattern 608 Connectors - Nickel Aluminium Bronze

RoHS compliant

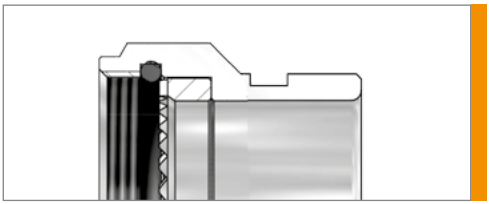
Shell Size	Straight Assemblies		45° Assemblies		90° Assemblies	
	Part Number	Cable Range	Part Number	Cable Range	Part Number	Cable Range
08	KTKK 0444	5.0 - 7.0	KTKK 0580	5.0 - 7.0	-	-
10	KTKK 0445	6.0 - 9.0	KTKK 0581	6.0 - 9.0	KTKK 1021	6.0 - 9.0
12	KTKK 0446	7.2 - 11.0	KTKK 0582	7.2 - 11.0	KTKK 1022	7.2 - 11.0
14	KTKK 0447	7.2 - 11.0	KTKK 0583	7.2 - 11.0	KTKK 1023	7.2 - 11.0
16	KTKK 0448	8.5 - 17.0	KTKK 0584	8.5 - 17.0	KTKK 1024	8.5 - 17.0
18	KTKK 0449	8.5 - 17.0	KTKK 0585	8.5 - 17.0	KTKK 1025	8.5 - 17.0
20	KTKK 0450	10.0 - 21.0	KTKK 0586	10.0 - 21.0	KTKK 1026	10.0 - 21.0
22	KTKK 0451	10.0 - 21.0	KTKK 0587	10.0 - 21.0	KTKK 1027	10.0 - 21.0
24	KTKK 0452	15.8 - 29.0	KTKK 0588	15.8 - 29.0	KTKK 1028	15.8 - 29.0

Non-Screened Backshell Types

Suitable for Heat Shrink Boots

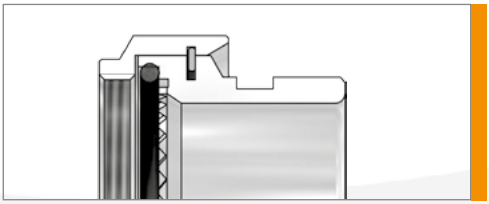
SOLID

Solid adaptors are designed for use where no access is required, for example when potting is necessary or a lower space profile is needed. These adaptors have a groove to accommodate heat-shrinkable moulded parts.



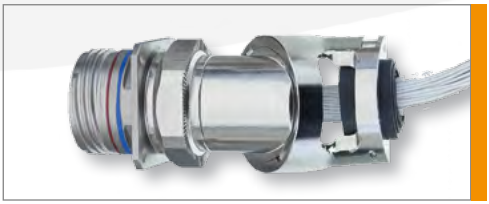
SPIN-COUPLING

Have a rotatable coupling nut and a grooved body to accommodate lipped heat-shrinkable moulded parts. Spin-coupling adaptors combined with heat-shrinkable moulded parts provide environmental protection and strain relief for unscreened cable terminations.



SPIN LOCK

A variable angle backshell that enables straight, 45° and right angle 90 cable terminations with the same part. The connector backshell swivelling body rotates around the axis of the cable bundle and locks in position, minimising stress on the wire bundle.



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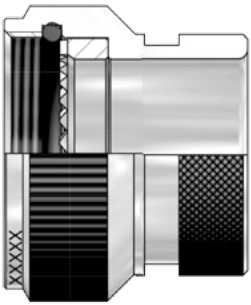
Solid Backshells

2xxMx Series
Non-Screened Backshells



Solid or direct coupling backshells suitable for use with a lipped heat shrinkable boot. The list below represents the family designations for the most common applications, for others not listed here please contact us.

Family Type Designation

MIL-C-5015 (MS3100)
218M5 Straight backshell family

MIL-C-26482 Series I
203M6 Straight backshell family

MIL-C-38999 Series III & IV.
209M3 Straight backshell family

MIL-C-38999 Series I & II.
201M1 Straight backshell family

MIL-C-26482 Series II and
MIL-C-5015 (MS3400)
201M9 Straight backshell family

Patt 603 and BS9522 N0001
225M6 Straight backshell family

Shell Size Selection Table

Part No.	Ind. Ref.	Mil. Ref.	Entry Ø mm
08	9	A	6.35
10	11	B	9.32
12	13	C	12.70
14	15	D	15.88
16	17	E	19.05
18	19	F	20.62
20	21	G	23.80
22	23	H	26.97
24	25	J	30.18

209M3 16 - 19 B

Part Numbering example

PLATING CODE
See plating code selection table, Group A on page 365

MATERIAL CODE
See material code selection table, Group 1 on page 364

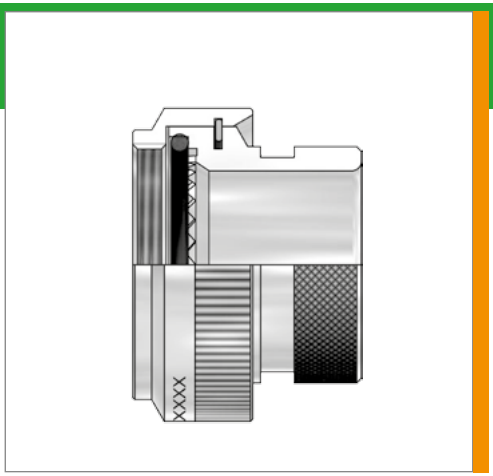
SHELL SIZE
See table above

FAMILY TYPE
See text above

The backshell family designations are for the most common applications, for others not listed here please contact us.

Spin-Coupling Backshells

2xxMx Series
Non-Screened Backshells



Spin-coupling backshells suitable for use with a lipped heat shrinkable boot. The list below represents the family designations for the most common applications, for others not listed here please contact us.

Family Type Designation

MIL-C-5015 (MS3100)
218M6 Straight backshell family

MIL-C-26482 Series I
203M9 Straight backshell family

MIL-C-38999 Series III & IV.
209M4 Straight backshell family

MIL-C-38999 Series I & II.
202M2 Straight backshell family

MIL-C-26482 Series II and
MIL-C-5015 (MS3400)
201M1 Straight backshell family

Patt 603 and BS9522 N0001
225M5 Straight backshell family

Shell Size Selection Table

Part No.	Ind. Ref.	Mil. Ref.	Entry Ø mm
08	9	A	6.35
10	11	B	9.52
12	13	C	12.70
14	15	D	15.75
16	17	E	18.92
18	19	F	20.62
20	21	G	23.80
22	23	H	26.97
24	25	J	29.85

209M4 16 - 19 B

Part Numbering example

PLATING CODE
See plating code selection table, Group A on page 365

MATERIAL CODE
See material code selection table, Group 1 on page 364

SHELL SIZE
See table above

FAMILY TYPE
See text above

The backshell family designations are for the most common applications, for others not listed here please contact us.

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Spin-Lock Backshells

SLC and SLM Variable Angle Non-Screened Backshells

The Spin Lock variable angle backshell enables straight, 45° and right angle 90° cable terminations with the same part.

The connector backshell swivelling body rotates around the axis of the cable bundle and locks in position, minimising stress on the wire bundle.

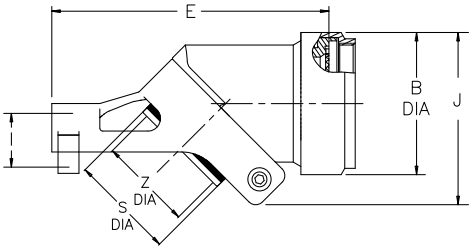
There are many combinations and variants that are possible with numerous part number formats, so for additional information please contact us.

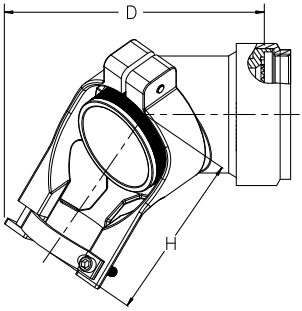
Meets or exceeds SAE-AMS-85049

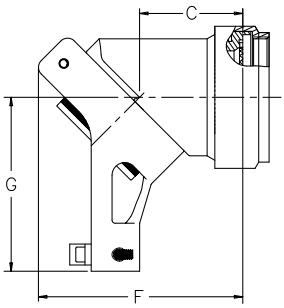
Dimensions - MIL-C-38999 Series III & IV

Shell	D	E	F	G	H	K	J
08	47.8	48.3	34.8	42.2	45.7	5.94	27.7
10	50.8	52.1	37.3	46.5	47.2	5.94	30.5
12	51.8	55.4	39.1	49.5	49.3	8.45	32.0
14	58.4	60.5	45.5	52.6	53.6	11.6	36.3
16	62.0	64.3	49.0	56.9	57.9	15.6	40.1
18	65.8	70.1	56.1	62.7	64.8	16.1	44.5
20	68.6	71.4	55.4	65.0	67.8	17.7	48.0
22	73.4	80.0	58.2	73.7	75.2	20.9	50.5
24	75.2	82.6	60.7	75.2	77.2	21.7	53.3

Measurements are in millimetres and nominal







The dimensional information above is for our most popular backshell application family, others are available upon request. For further details, including entry size options, materials, platings and options please contact us.

Saddle Clamp Version (as shown)

SLC-40-AB-1610 part No. example

- Entry Size
- Shell Size
- Plating
- Material
- Connector family

MATERIALS

- Base: Aluminum or stainless steel
- Plating: Electroless nickel, cadmium, zinc nickel, or passivated

Connector Accessories
MIL-DTL-38999 III
Protective Caps

Outlined on these two pages are protection caps for MIL-DTL-38999 Series III connectors which represents our most popular dust caps.

100P160 Series
Receptacle protection cap

100P237 Series
Plug protection cap

This represents a small proportion of what is available in the complete range, for these variants please contact us for details.

Omit for no attachment

100P160-17-1-B-TC5-17

Part Numbering example

Attachment
See illustrations above for code

LANYARD LENGTH
In inches, with tolerance +1”/-0”

LANYARD TYPE
TC Teflon covered (clear) stainless steel wire rope, available as standard.
For further lanyard options please contact us.

PLATING CODE
See plating code table, Group B on page 365.

MATERIAL CODE
See material code table, Group 3 on page 364.

SHELL SIZE
Range of sizes include
09, 11, 13, 15, 17, 19, 21, 23 and 25

SERIES
100P160 Series receptacle protection cap
100P237 Series plug protection cap
100P757 Series arctic grip receptacle cover
100P756 Series arctic grip plug cover

Other series are available for other connector series, please contact us for details.

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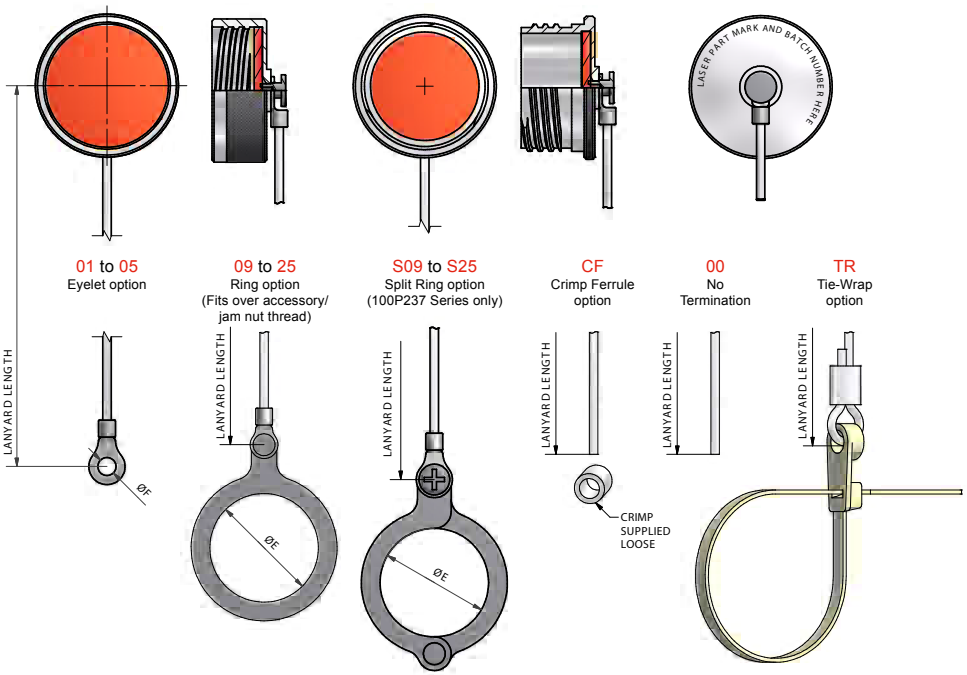
Lanyard Attachments

100P160 Series

100P237 Series



Eyelet

REF.	ØF
01	3.2
02	3.7
03	4.3
04	5.3
05	6.4

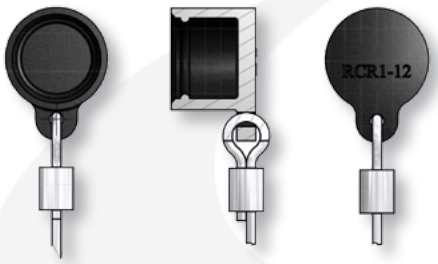
Ring Ref - 160 Series

REF.	ØE
09	18.0
11	21.4
13	25.8
15	28.8
17	32.0
19	35.0
21	38.3
23	41.7
25	44.6

Ring Ref - 237 Series

REF.	SPLIT RING REF	ØE
09	S09	15.1
11	S11	18.0
13	S13	19.4
15	S15	22.6
17	S17	25.8
19	S19	28.8
21	S21	32.0
23	S23	34.1
25	S25	40.1

Elastomer Dust Caps

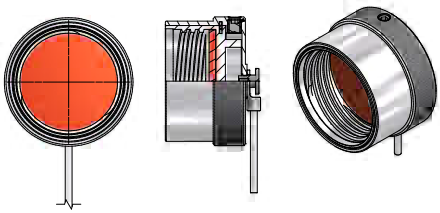


Our caps provide a reliable and durable solution to the protection of connectors whilst in transit or being handled in a wide range of environments. Flexible enough to fit a variety of different sized connectors, they can also be colour coded to greatly increase the ease of identifying corresponding connectors/ connection points.

- Eliminate the potential for damaging other equipment while the cap is not attached to the connector
- Fit to a variety of different connector specifications
- Provide reliable protection while connectors are being transported and handled
- Flexible enough fit different size connectors
- Can be colour coded to identify different connectors and connection points
- Available in Fluorosilicone, Silicone and Neoprene, dependent on application environment, temperature and fluid resistance requirements.

Universal - 100P3188
MIL-DTL-5015 - RCR1
MIL-DTL-26482 - RCR8
VG95234 - RCRQ

Anti Tamper Dust Caps

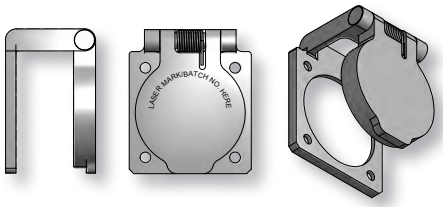


Used on data ports of equipment containing sensitive and confidential data. The design allows the outer shell of the cap to spin without uncoupling until it is locked in position with a small key, allowing it to be removed.

MIL-DTL-38999 Series III - PRC433TL

Other shell sizes and connector series available.

Self Closing Dust Caps



Ensures the protective cap is not removed or lost from equipment, with strong machined construction.

38999 Series III derived square flange receptacle. Other shell sizes and connector series available.

MIL-DTL-38999 Series III - PC4SCC

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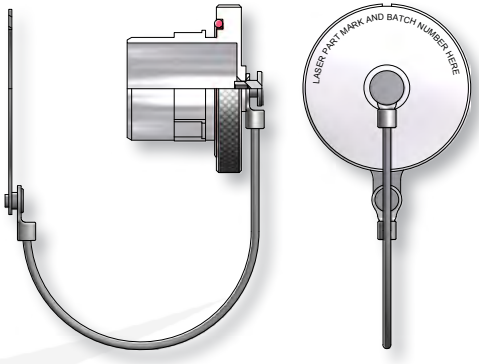

As part of our commitment to offering complete harnessing component solutions we can also supply a vast range of accessories such as those illustrated here. Components are sourced from leading edge companies with industry approvals.

- Many parts machined from solid material for reliable strength and performance
- Compatible with Mil-Spec dimensions and performance
- Wide choice of lanyard options available
- Gasket material options available

Please contact us for more information.

MIL-DTL-26482 Series II
PRC3181 series standard receptacle cover
PPC3180 series standard plug cover

MIL-DTL-38999 Series I
PRC27502 series standard receptacle cover
PPC27501 series standard plug cover

MIL-DTL-38999 Seres II
PRC27511 series standard receptacle cover
PPC27510 series standard plug cover

MIL-DTL-38999 Seres III
See pages 384-385

MIL-DTL-38999 Series IV
100P608 series standard receptacle cover
100P609 series standard plug cover

MIL-DTL-5015H
100P1240 series standard receptacle cover
100P1167 series standard plug cover

MIL-DTL-5015D
100P820S series standard receptacle cover
100P1136S series arctic grip receptacle cover
100P738 series standard plug cover

MIL-DTL-83723 Series III
P83723/60 series standard receptacle cover
P83723/59 series standard plug cover

VG96912
PRC96912 series standard receptacle cover
PPC96912 series standard plug cover

MIL-PRF-39012 BNC/TNC RF Coax
PJCBNC series standard receptacle cover
PJCTNC series standard receptacle cover
PPCBNC series standard plug cover
PPCTNC series standard plug cover