







Raychem Electrical Interconnect Products

SAE AS81824 & SAE AS83519 Series II Qualified Products Offer Robust and Highly Reliable Wire Termination in Demanding Environments

Electrical Interconnect Products

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TE Connectivity's (TE) dependable, economical wire and cable termination products provide solutions for hundreds of wire and cable interconnect requirements. All wire termination products are housed inside transparent heat-shrinkable insulation sleeves, which provide inspectability and can provide various levels of environmental protection. Most Raychem brand termination products incorporate a fluxed solder preform, which is essential for a highly controlled soldering process. Other products incorporate controlled crimping or a unique process of combining a twist-on coil with controlled soldering to provide high-reliability joints on the widest variety of conductor types and platings.

SolderSleeve technology ensures high-quality electrical and mechanical performance time after time. Premeasured solder and flux create repeatable, reliable terminations, reducing rejects and field failures. When the SolderSleeve device is heated, the tubing shrinks and the solder preform melts to make a fully insulated, strain-relieved, protected solder connection. Heat-shrinkable tubing provides the benefits of insulation, strain relief, and protection for our controlled crimp products. Many Raychem brand interconnect products have earned UL recognition or SAE AS83159 Mil-Spec approval.

Many SolderSleeve and related devices are made from polyvinylidene fluoride tubings that meet the requirements of AMS-DTL-23053/8 (formerly MIL-DTL-23053/8).

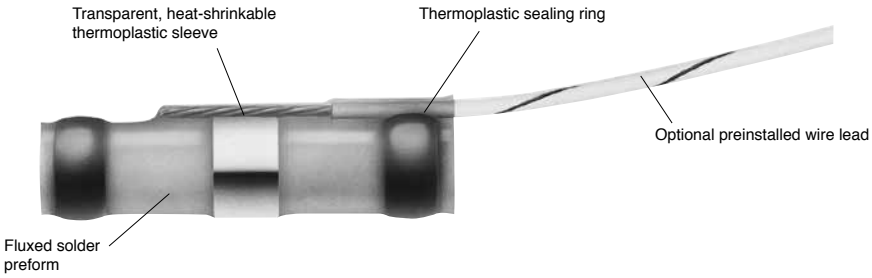
Raychem brand interconnect devices combine high-strength materials with innovative design for consistent, long-life performance. And because the insulation sleeve is transparent, operators can easily inspect the connection.

TE shrink-to-fit technology even helps reduce inventory, because one device size will fit a wide range of wire gauges, cable diameters, and component shapes.

TE interconnect products are designed for many applications, from simple splices to terminators for sophisticated electronic systems, either sealed or unsealed, and for high- or low-temperature environments.

Product Selection

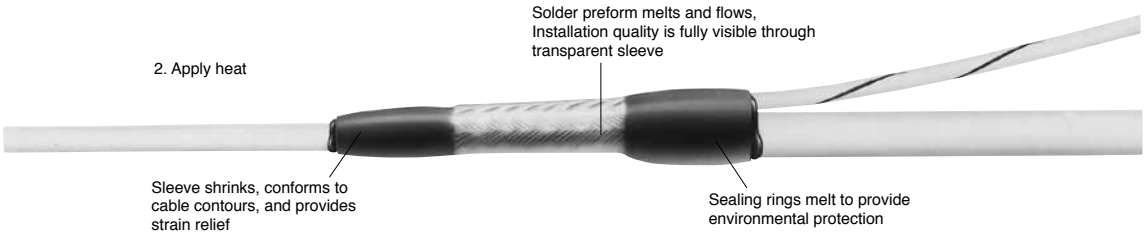
Typical SolderSleeve Device (illustration of shield terminator concept)



Typical Installation

1. Insert prepared cable







Product Selection

Application Type	Max. Operating Temp.	Connection Type	Product Description	Series	Page Number
Wire-to-wire splicing	125°C [257°F]	Solder	SolderSleeve wire splices CWT	B-155-900X	7
	150°C [302°F]	Solder	SolderSleeve wire splices	D-110, D-1744	7
	125°C [257°F]	Coil and solder	SolderGrip closed end connector splices (stub)	SGRP Series X-58, SGRS	13
	125°C [257°F]	Crimp	DuraSeal crimp splices	D-406	19
	125°C [257°F]	Crimp	Cold applied splices	D-436	22
	150°C [302°F]	Crimp	MiniSeal crimp splices	D-436 (M81824)	24
	200°C [392°F]	Crimp	MiniSeal crimp splices	D-200	28
Terminals and disconnects	125°C [257°F]	Crimp	DuraSeal crimp terminals and disconnects	B-106	31
	150°C [302°F]	Coil and solder	SolderGrip terminals	SGRT	36
Wire termination to pin/post/tab	125°C [257°F]	Solder	SolderSleeve wire terminators	B-155-15XX	43
	150°C [302°F]	Solder	SolderSleeve wire terminators	D-129, D-141, D-71X	43
Shield termination	125°C [257°F]	Solder	SolderSleeve shield terminators	B-155-X	47
	150°C [302°F]	Solder	SolderSleeve shield terminators	S01, S02, M83519, SO63	47
	175°C [347°F]	Solder	SolderSleeve shield terminators	SO96, SO175	47
	200°C [392°F]	Solder	SolderSleeve shield terminators	S200	47
Coaxial cable termination	125°C [257°F]	Solder	SolderSleeve coaxial cable terminators	B-155, D-184	57
	150°C [302°F]	Solder	SolderSleeve coaxial cable terminators	B-02X, B-04X, D-181	57
	150°C [302°F]	Solder	SolderSleeve PCB/coaxial cable terminators	D-607, B-046	59
	135°C [275°F]	Solder	RF one-step BNC/TNC connectors	RBD, RTD	61
Cable-to-cable splicing	150°C [302°F]	Solder/Crimp	SolderShield cable splices	D-150	68
	150°C [302°F]	Solder/Crimp	C-Wrap repair sleeve	D-150	71
	260°C [500°F]	Solder/Crimp	Rayseal repair sleeve	D-260	73
	200°C [392°F]	Solder/Crimp	D-200 flexible splice	D-200	75
Shielded contacts	150°C [302°F]	Solder	SolderTacts shielded contacts	D-602	80

Wire-to-Wire Splicing



Introduction

TE offers many products for wire-to-wire splicing: SolderSleeve splicing devices; SolderGrip splices; and DuraSeal and MiniSeal crimp splices.

Like all TE interconnect products, the wire-to-wire splicing devices are rugged and reliable, yet easy to install.

Designed for applications with temperatures up to 200°C [302°F], products in this section include:

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.

DuraSeal heat-shrinkable nylon crimp splices are easy to use in factory or repair applications. DuraSeal crimp splices provide watertight sealing and superior protection against corrosion, abrasion, and vibration.

Small, lightweight, and low-profile **MiniSeal** high-performance crimp splices, which substantially reduce wire bundle size and weight, are QPL-listed to the SAE AS81824 specification, and are required by the MIL-W-5088 specification.

SolderGrip splices, which are closed-end connectors utilizing a spiral copper coil that grips and compresses the conductors and allows a prefluxed solder ring to flow to the center of the splicing area, resulting in a high-reliability, repeatable solder joint.



RUGGED

- Transparent polyvinylidene fluoride or polyolefin sleeve provides encapsulation, inspectability, strain relief, and insulation
- With one or two wires per end, the NAS 1744 splices meet 75,000 ft [22,000 m] altitude immersion requirement

CAPABLE

- Prefluxed solder preform provides a controlled soldering process
- UL and CUL recognized (CWT + D-110) See page 12 specifications and approvals

EASY TO USE

- One-piece design makes installation easy and lowers the installed cost
- Thermochromic temperature indicator in the NAS splices facilitates termination and inspection

SolderSleeve Wire Splices

Product Selection Process

From the Product Options table below, select the product series appropriate for your application based on the temperature rating and sealing performance required.

If the application has only one size of wire per side and no more than two wires on either side:

1. Determine wire gauge sizes for both sides of splice.
2. Determine number of wires (one or two wires) for each side of splice.
3. Select part numbers from the appropriate table:
   - For B-155 and CWT series (low temperature): Use Table A on page 8.
   - For D-110 series (splashproof): Use Table B on page 9.
   - For D-1744 series (immersion sealed): Use Table C on page 10.

If the application has more than one size of wire per side or more than two wires on either side (or if you prefer to work with CMA or mm^2 sizes):

1. Turn to "CMA/mm^2 Calculation" on page 11 and use the workspace there to calculate the total cross section to be spliced.
2. Use Table E on page 12 to select the 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 E for the recommended size ranges for the sleeves.

Wires 16 AWG (1.21 mm^2) and larger, and wires having more than 19 strands, should be pretinned prior to splicing, to obtain the optimum solder joint quality.

Part selection for wires 26 AWG (0.15 mm^2) and smaller is covered on page 11.

Product Options

Product Series	Minimum Wire Temperature Rating	Maximum Operating Temperature	Intended Application Environment
B-155	85°C [185°F]	125°C [257°F]	(RoHS) Splashproof
CWT	85°C [185°F]	125°C [257°F]	Splashproof
D-110	125°C [257°F]	150°C [302°F]	Splashproof
D-1744 (NAS 1744)	125°C [257°F]	150°C [302°F]	Immersion sealed

Note: Cadmium-free option (B-152 series) is available for operating temperature of 125˚C [257˚F]. Consult TE for details.

Table A: B-155 Series Selection

Side A: Size and Number of Conductors		Side B: Size and 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-1559001	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-1559003	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-1559005
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

Side A: Size and Number of Conductors		Side B: Size and 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-155-9003	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-155-9004	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-155-9004	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

Table A: CWT Series Selection

Side A: Size and Number of Conductors		Side B: Size and 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	CWT9001	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	CWT9003	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	CWT9005
10 AWG	1	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005	CWT-9005

Side A: Size and Number of Conductors		Side B: Size and 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	B-155-9005

Table B: D-110 Series Selection

Side A: Size and Number of Conductors		Side B: Size and Number of Conductors							
		26 AWG		24 AWG		22 AWG		20 AWG	
		1	2	1	2	1	2	1	2
26 AWG	1	D-110-35	D-110-35	D-110-35	D-110-35	D-110-35	D-110-41	D-110-41	D-110-41
	2	D-110-35	D-110-35	D-110-35	D-110-41	D-110-35	D-110-41	D-110-41	D-110-41
24 AWG	1	D-110-35	D-110-35	D-110-35	D-110-35	D-110-35	D-110-41	D-110-41	D-110-41
	2	D-110-35	D-110-41	D-110-35	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41
22 AWG	1	D-110-35	D-110-35	D-110-35	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41
	2	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-0181
20 AWG	1	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-0181
	2	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-0181	D-110-0181	D-110-0181
18 AWG	1	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-0181
	2	D-110-0181	D-110-0181	D-110-0181	D-110-0181	D-110-0181	D-110-0101	D-110-0101	D-110-0101
16 AWG	1	D-110-41	D-110-41	D-110-41	D-110-41	D-110-41	D-110-0181	D-110-0181	D-110-0181
	2	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0101
14 AWG	1	D-110-0181	D-110-0181	D-110-0181	D-110-0181	D-110-0181	D-110-0101	D-110-0101	D-110-0101
	2	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090
12 AWG	1	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101
	2	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090
10 AWG	1	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0083	D-110-0083	D-110-0083

Side A: Size and Number of Conductors		Side B: Size and 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	D-110-41	D-110-0181	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0090
	2	D-110-41	D-110-0181	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0090
24 AWG	1	D-110-41	D-110-0181	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0090
	2	D-110-41	D-110-0181	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0090
22 AWG	1	D-110-41	D-110-0181	D-110-41	D-110-0181	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0090
	2	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090
20 AWG	1	D-110-41	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0090	D-110-0090
	2	D-110-0181	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090
18 AWG	1	D-110-0181	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090
	2	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0090	D-110-0090	D-110-0090	D-110-0083
16 AWG	1	D-110-0181	D-110-0101	D-110-0181	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090
	2	D-110-0101	D-110-0101	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090	D-110-0083	D-110-0083
14 AWG	1	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0101	D-110-0090	D-110-0090	D-110-0090	D-110-0083
	2	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0083	D-110-0083
12 AWG	1	D-110-0101	D-110-0090	D-110-0101	D-110-0090	D-110-0090	D-110-0090	D-110-0090	D-110-0083	D-110-0083
	2	D-110-0090	D-110-0090	D-110-0090	D-110-0083	D-110-0090	D-110-0083	D-110-0083	D-110-0083	D-110-0083
10 AWG	1	D-110-0083	D-110-0083	D-110-0083	D-110-0083	D-110-0083	D-110-0083	D-110-0083	D-110-0083	D-110-0083

Fine Wire Splices 26 AWG (0.15 mm²) and Smaller

Part No.	Inside Diameter		
	As Supplied*	Fully Recovered**	Length***
D-110-0071	0.9 [0.035]	0.6 [0.025]	4.7 [0.185]
D-110-0213	0.9 [0.035]	0.6 [0.025]	4.2 [0.165]
D-110-0214	0.6 [0.025]	0.3 [0.013]	6.3 [0.250]
D-110-0217	1.0 [0.040]	0.6 [0.025)	9.1 [0.360]
D-110-40	0.6 [0.025]	0.5 [0.021]	5.1 [0.200]

Note: Micro SolderSleeve terminations are used for splicing wires smaller than 26 AWG [0.15 mm²].
*Minimum. Wire insulation must be smaller than this.
**Maximum. Wire insulation and combined conductor diameters must be greater than this.
***Nominal. Wire strip length must be approximately one-half of this.



Table C: D-1744 Series Selection

Side A: Size and Number of Conductors		Side B: 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
12 AWG	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 and Number of Conductors		Side B: 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	—	—	—
12 AWG	1	D-1744-03	D-1744-03	D-1744-03	D-1744-04	D-1744-03	—	D-1744-04	—

CMA/mm² Calculation

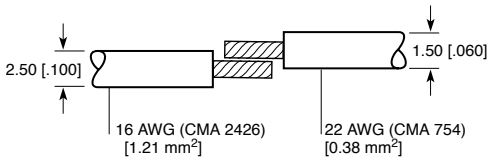
To calculate the total circular mil or mm² area of the conductors to be terminated in a single splice, follow these steps:

1. Choose either CMA or mm² as your unit of measure for selection purposes and continue to use it for all your selection criteria.
2. In the workspace below, list the CMA or mm² for each conductor that will go into the same splice. (To assist you, Table D on this page provides the CMA of typical conductors.)
3. Add together the values listed in the workspace below to obtain the total area.
4. From Table E on the next page, 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.

Wire Number	CMA	mm²	
1			
2			
3			
4			
5			**Part Number:**
Total			

CMA/mm² Examples

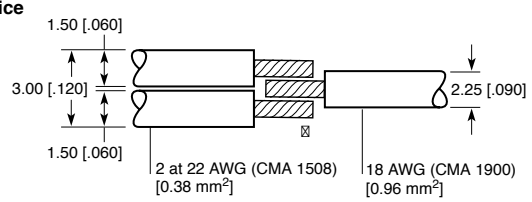
One-to-One Wire Splice



Total CMA = 3180
Total mm² = 1.59

Correct part number selection from Table E (based on CMA/mm² and nominal jacket wire OD) = B-155-9002, CWT-9002, D-110-41 or D-1744-02.

Multiwire Splice



Total CMA = 3408
Total mm² = 1.71

Correct part number selection from Table E (based on CMA/mm² and nominal jacket wire OD) = B-155-9003, CWT-9003, D-110-0181 or D-1744-03.

Table D.

CMA of Typical AWG Conductors

AWG	28	26	24	22	20	18	16	14	12
CMA	177	304	475	754	1216	1900	2426	3831	5874
mm²	0.09	0.15	0.23	0.38	0.62	0.96	1.23	1.44	2.97

Installation Requirements

For proper installation of these devices the correct heating tool and reflector attachment must be used. Any one of the following TE heating tools is recommended:

- HL1920E/HL2020E
- IR-1759 MiniRay
- AA-400 Super Heater
- CV-1981

Refer to TE installation procedure RPIP-850-00 for D-1744 Series and RPIP- 824-00 for B-155 Series.

Table E: Multiwire Splice Selection

Product Series	Wire Jacket OD		CMA Combined Total		mm² Combined Total	
	Min.	Max.	Min.	Max.	Min.	Max.
B-155-9001	0.4 [0.015]	1.7 [0.066]	450	1500	0.3	0.8
B-155-9002	1.3 [0.05]	2.7 [0.106]	1500	4000	0.8	2.0
B-155-9003	1.8 [0.07]	4.5 [0.18]	4000	7800	2.0	4.0
B-155-9004	2.8 [0.11]	6.0 [0.236]	7800	12000	4.0	6.0
B-155-9005	3.2 [0.125]	7.0 [0.275]	12000	19000	6.0	10.0
D-1744-01	0.50 [0.020]	1.90 [0.075]	350	2000	–	–
D-1744-02	0.80 [0.031]	2.80 [0.110]	2000	4000	–	–
D-1744-03	1.30 [0.050]	4.57 [0.180]	4000	10000	–	–
D-1744-04	2.00 [0.080]	7.11 [0.280]	10000	13000	–	–
D-110-35	0.51 [0.020]	1.78 [0.070]	500	1500	–	–
D-110-41	1.27 [0.050]	2.54 [1.00]	1200	3500	–	–
D-110-0181	1.9 [0.075]	4.5 [0.177]	3600	6000	–	–
D-110-0101	2.41 [0.095]	4.32 [0.17]	4800	9000	–	–
D-110-0090	3.56 [0.140]	7.11 [0.28]	8500	16200	–	–
D-110-0083	4.0 [0.160]	8.76 [0.345]	16200	25000	–	–

Product Characteristics

Material		
Insulation (D-110, D-1744)	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride	
Insulation (B-155)	Radiation-crosslinked, heat-shrinkable polyolefin	
Solder and flux (D-110, D-1744)	Solder: Sn63 Pb37	Flux: ROL1 per ANSI-J-004 (RMA flux)
Solder and flux (B-155)	Solder: Sn42Bi58	Flux: ROM1 per ANSI-J-004 (RA Flux)
Solder and flux (CWT)	Solder: Sn50 Pb32 Cd18	Flux: ROM1 per ASNI-J-004 (RA flux)
Meltable inserts (B-155, D-1744)	Meltable thermoplastic	
Typical Performance		
Voltage drop	2.0 mV	
Tensile strength	Exceeds strength of conductor	
Dielectric strength	2.0 kV	
Temperature rating (B-155)	-55°C to +125°C [-67°F to +257°F]	
Temperature rating (D-110, D-1744)	-55°C to +150°C [-67°F to +302°F]	
Insulation resistance	1000 megohms	

Specifications/ Approvals

Series	Agency	TE
B-155	n/a	RT-1404
CWT	UL E87681	D-5023
D-110	UL E87681	RT-1404
D-1744	NAS-1744	RT-1404



RUGGED

- Sealed for immersion (SGRS-X-58, SGRS)
- Excellent strain relief

EASY TO USE

- Simple installation

CAPABLE

- Soldered connection
- Electrical insulation

SolderGrip Closed End Connector Splices

Applications

SolderGrip heat-shrinkable solder-type closed-end connectors are designed for electrical termination of multiple-wire combinations. They provide a reliable alternative to crimping, welding, or conventional twist-on-style closed-end connectors.

Their unique combination of wire fixturing and controlled-soldering technology provides dependable electrical termination of multiple wire combinations.

SolderGrip terminators consist of a heat-shrinkable thermoplastic sleeve containing a spiral-wound copper insert. The insert is fitted with a prefluxed solder band.

This innovation design allows SolderGrip products to reliably terminate as many as 10 wires of different sizes and types in a single device.

The capability of SolderGrip terminators encompasses single or multi-stranded, bare or tinned copper wires with low- or high-temperature insulation.

The termination is environmentally protected and strain relieved.

SolderGrip splice terminators are color-coded for easy identification.

Product Options

Product Series	Environmental Protection	Max. Operating Temp.
SGRP	Splashproof	125°C [257°F]
SGRS-X-58	Sealed	125˚C [257˚F]
SGRS	Sealed	125°C [257°F]

Product Selection Process

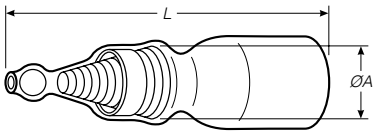
1. From the Product Options table on the previous page, select the product series appropriate for your application.
2. Determine the wire combination (number of wires and size) of the wire bundle you wish to splice.
3. Use Table C (page 16) to select the correct connector for AWG wire combinations.* For mm² wire combinations use Table A to select a SolderGrip part number.

Example: For connecting a bundle with one 12 AWG wire (1 #12) and two 14 AWG wires (+2 #14), you need an SGRP-3 connector. For sealed parts, select the SGRS series.

*If the wire combination is not listed in Table C, use the CMA (mm²) method of determining wire bundle size (see "CMA/mm² Calculation" on page 15). Using Table B (page 15, select the smallest size connector that will fit your total wire CMA (mm²) value.

4. Verify that the wire bundle (with wire insulation) does not exceed the maximum diameter allowed for the connector you selected. Simply check the bundle's diameter against the maximum diameter that Table A (below) lists for that part.
5. Verify that the total amperage to be applied does not exceed the maximum amp rating for the part.

Insulated Closed-End Connectors (SGRP series)



Insulated and Sealed Closed-End Connectors (SGRS series)

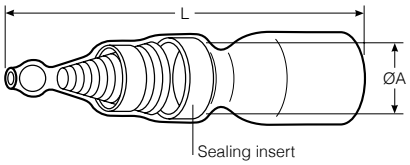


Table A - Product Dimensions and Part Number Descriptions

Part No.	Color Code	Product Dimensions (Min.) L	ØA	Wire Range (Min.-Max.) CMA/mm²
SGRP-1	Green	1.370 [34.8]	.120 [2.9]	1400 - 4800 [0.7 - 2.4]
SGRP-2	Red	1.350 [34.2]	.150 [3.7]	4000 - 8000 [2.0 - 4.0]
SGRP-3	Blue	1.610 [41.0]	.200 [5.1]	7000 - 16000 [3.5 - 8.0]
SGRP-4	Yellow	1.650 [42.0]	.270 [6.8]	15000 - 24000 [7.5 - 12.0]

Part No.	Color Code	Product Dimensions (Min.) L	ØA	Wire Range (Min.-Max.) CMA/mm²
SGRS-1	Green	1.370 [34.8]	0.130 [3.4]	1400 - 4800 [0.7 - 2.4]
SGRS-2	Red	1.350 [34.2]	0.190 [4.8]	4000 - 8000 [2.0 - 4.0]
SGRS-3	Blue	1.650 [42.0]	0.290 [7.3]	7000 - 16000 [3.5 - 8.0]
SGRS-4	Yellow	1.630 [41.5]	0.360 [9.1]	15000 - 24000 [7.5 - 12.0]

Part No.	Color Code	Product Dimensions (Min.) L	ØA	Wire Range (Min.-Max.) CMA/mm²
SGRS-1-58	Green	1.370 [34.8]	0.130 [3.4]	1400 - 4800 [0.7 - 2.4]
SGRS-2-58	Red	1.350 [34.2]	0.190 [4.8]	4000 - 8000 [2.0 - 4.0]
SGRS-3-58	Blue	1.650 [42.0]	0.290 [7.3]	7000 - 16000 [3.5 - 8.0]
SGRS-4-58	Yellow	1.630 [41.5]	0.360 [9.1]	15000 - 24000 [7.5 - 12.0]

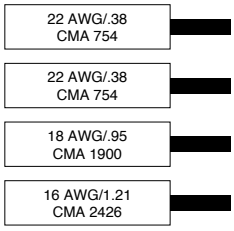
CMA/mm² Calculation

To calculate the total circular mil or mm² area of the wire bundle to be terminated, follow these steps:

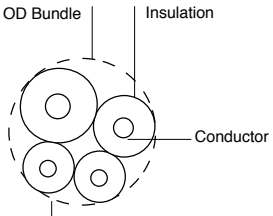
1. Choose either CMA or mm² as your unit of measure for selection purposes and continue to use it for all your selection criteria. (Both measures provide the same results.)
2. In the workspace below, list the CMA or mm² for each conductor in the bundle. (Table B provides the CMA of typical conductors.)
3. Add together the values listed in the workspace below to obtain the total area.
4. Use Table A to select the smallest terminator that will fit the total CMA (mm²).

Wire Number	CMA	mm_2	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			**Solder Grip Part No.**
Total			

CMA/mm² Example



Total CMA = 5834
Total mm2 = 2.92
Correct part number (based on CMA of 5834 or mm² of 2.92): SGRP-2, SGRS-2 or SGRS-2-58



Bundle diameter must not exceed 6.0 mm (0.24 in) for SGRP-2 or 0.18 mm (4.5 in) for SGRS-2 or SGRS-2-58

Table B. CMA of Typical Copper Conductors

AWG	30	28	26	24	22	20	18	16	14	12	10	8
CMA	112	177	304	475	754	1216	1900	2426	3831	5874	9354	16983
mm²	0.05	0.09	0.15	0.24	0.38	0.61	0.95	1.21	1.92	2.94	4.74	8.61



Table C. SolderGrip Wire Combinations

Wire Combinations	Splash-proof	Sealed
1 # 8 + 1 # 12	SGRP-4	SGRS-4-58
1 # 8 + 1 # 16	SGRP-4	SGRS-4-58
2 # 8 + 2 # 16	SGRP-4	SGRS-4-58
1 # 8 + 1 # 14	SGRP-4	SGRS-4-58
1 # 8 + 1 # 14 + 1 # 16	SGRP-4	SGRS-4-58
1 # 10 + 1 # 18	SGRP-3	SGRS-3-58
1 # 10 + 2 # 18	SGRP-3	SGRS-3-58
1 # 10 + 3 # 18	SGRP-3	SGRS-3-58
1 # 10 + 1 # 16	SGRP-3	SGRS-3-58
1 # 10 + 1 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 10 + 1 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 10 + 2 # 16	SGRP-3	SGRS-3-58
1 # 10 + 3 # 16	SGRP-4	SGRS-4-58
1 # 10 + 4 # 16	SGRP-4	SGRS-4-58
1 # 10 + 5 # 16	SGRP-4	SGRS-4-58
1 # 10 + 1 # 14	SGRP-3	SGRS-3-58
1 # 10 + 1 # 14 + 1 # 18	SGRP-3	SGRS-3-58
1 # 10 + 1 # 14 + 1 # 16	SGRP-3	SGRS-3-58
1 # 10 + 1 # 14 + 2 # 16	SGRP-3	SGRS-3-58
1 # 10 + 1 # 14 + 3 # 16	SGRP-4	SGRS-4-58
1 # 10 + 2 # 14	SGRP-4	SGRS-4-58
1 # 10 + 3 # 14	SGRP-4	SGRS-4-58
1 # 10 + 1 # 12	SGRP-3	SGRS-3-58
1 # 10 + 1 # 12 + 1 # 14	SGRP-4	SGRS-4-58
1 # 10 + 2 # 12	SGRP-4	SGRS-4-58
2 # 10	SGRP-4	SGRS-4-58
2 # 10 + 1 # 16	SGRP-4	SGRS-4-58
1 # 12 + 1 # 18	SGRP-2	SGRS-2-58
1 # 12 + 2 # 18	SGRP-3	SGRS-3-58
1 # 12 + 3 # 18	SGRP-3	SGRS-3-58
1 # 12 + 4 # 18	SGRP-3	SGRS-3-58
1 # 12 + 5 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 16	SGRP-3	SGRS-3-58
1 # 12 + 1 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 16 + 3 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 16 + 4 # 18	SGRP-4	SGRS-4-58
1 # 12 + 2 # 16	SGRP-3	SGRS-3-58
1 # 14 + 3 # 20	SGRP-2	SGRS-2-58
1 # 14 + 4 # 20	SGRP-3	SGRS-3-58
1 # 14 + 1 # 18	SGRP-2	SGRS-2-58
1 # 14 + 1 # 18 + 1 # 20	SGRP-2	SGRS-2-58
1 # 14 + 2 # 18	SGRP-2	SGRS-2-58
1 # 14 + 3 # 18	SGRP-3	SGRS-3-58
1 # 14 + 4 # 18	SGRP-3	SGRS-3-58
1 # 14 + 5 # 18	SGRP-3	SGRS-3-58
1 # 14 + 1 # 16	SGRP-2	SGRS-3-58
1 # 14 + 1 # 16 + 1 # 20	SGRP-2	SGRS-2-58
1 # 14 + 1 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 14 + 1 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 14 + 1 # 16 + 3 # 18	SGRP-3	SGRS-3-58
1 # 14 + 1 # 16 + 4 # 18	SGRP-3	SGRS-3-58
1 # 14 + 2 # 16	SGRP-3	SGRS-3-58
1 # 14 + 2 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 14 + 2 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 14 + 2 # 16 + 3 # 18	SGRP-3	SGRS-3-58
1 # 14 + 3 # 16	SGRP-3	SGRS-3-58
1 # 14 + 3 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 14 + 3 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 14 + 4 # 16	SGRP-3	SGRS-3-58
1 # 14 + 4 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 14 + 5 # 16	SGRP-3	SGRS-3-58
2 # 14	SGRP-2	SGRS-2 -58
2 # 14 + 1 # 16	SGRP-3	SGRS-3-58
2 # 14 + 1 # 16	SGRP-3	SGRS-3-58
2 # 14 + 1 # 16	SGRP-3	SGRS-3-58
2 # 14 + 1 # 16	SGRP-3	SGRS-3-58
2 # 14 + 2 # 16	SGRP-3	SGRS-3-58
2 # 14 + 2 # 16	SGRP-3	SGRS-3-58
2 # 14 + 3 # 16	SGRP-3	SGRS-3-58
2 # 14 + 4 # 16	SGRP-4	SGRS-4-58
3 # 14	SGRP-3	SGRS-3-58
3 # 14 + 1 # 16	SGRP-3	SGRS-3-58
3 # 14 + 2 # 16	SGRP-4	SGRS-4-58
3 # 14 + 3 # 16	SGRP-4	SGRS-4-58
4 # 14	SGRP-3	SGRS-3-58
2 # 16 + 1 # 18 + 3 # 20	SGRP-3	SGRS-3-58
2 # 16 + 1 # 18 + 2 # 20	SGRP-3	SGRS-3-58
2 # 16 + 1 # 18 + 1 # 20	SGRP-2	SGRS-2-58
2 # 16 + 1 # 18	SGRP-2	SGRS-2-58
2 # 16 + 4 # 20	SGRP-3	SGRS-3-58
2 # 16 + 3 # 20	SGRP-3	SGRS-3-58
2 # 16 + 2 # 20	SGRP-2	SGRS-2-58
2 # 16 + 1 # 20	SGRP-2	SGRS-2-58
2 # 16	SGRP-2	SGRS-2-58
1 # 16 + 5 # 18	SGRP-3	SGRS-3-58
1 # 16 + 4 # 18 + 1 # 20	SGRP-3	SGRS-3-58
1 # 16 + 4 # 18	SGRP-3	SGRS-3-58
1 # 16 + 3 # 18 + 2 # 20	SGRP-3	SGRS-3-58
1 # 16 + 3 # 18 + 1 # 20	SGRP-3	SGRS-3-58
1 # 16 + 2 # 18 + 3 # 20	SGRP-3	SGRS-3-58
1 # 16 + 2 # 18 + 1 # 20	SGRP-2	SGRS-2 -58
1 # 16 + 2 # 18	SGRP-2	SGRS-2-58
1 # 16 + 1 # 18 + 4 # 20	SGRP-3	SGRS-3-58
1 # 16 + 1 # 18 + 3 # 20	SGRP-2	SGRS-2-58
1 # 16 + 1 # 18 + 2 # 20	SGRP-2	SGRS-2 -58
1 # 16 + 1 # 18 + 1 # 20	SGRP-2	SGRS-2-58
1 # 16 + 1 # 18	SGRP-1	SGRS-1-58
1 # 16 + 4 # 20	SGRP-2	SGRS-2-58
1 # 16 + 3 # 20	SGRP-2	SGRS-2-58
1 # 16 + 1 # 20 + 1 # 22	SGRP-1	SGRS-1-58
1 # 16 + 1 # 20	SGRP-1	SGRS-1-58
1 # 16 + 3 # 22	SGRP-1	SGRS-1-58
1 # 16 + 2 # 22	SGRP-1	SGRS-1-58
1 # 16 + 1 # 22	SGRP-1	SGRS-1-58
1 # 18 + 1 # 22	SGRP-1	SGRS-1-58
1 # 18 + 2 # 22	SGRP-1	SGRS-1-58
1 # 18 + 3 # 22	SGRP-1	SGRS-1-58
1 # 18 + 1 # 20	SGRP-1	SGRS-1-58
1 # 18 + 1 # 20 + 1 # 22	SGRP-1	SGRS-1-58
1 # 18 + 1 # 20 + 2 # 22	SGRP-1	SGRS-1-58
1 # 18 + 2 # 20	SGRP-1	SGRS-1-58
1 # 18 + 3 # 20	SGRP-2	SGRS-2-58
1 # 18 + 4 # 20	SGRP-2	SGRS-2-58



Table C. SolderGrip Wire Combinations (Continued)

Wire Combinations	Splash-proof	Sealed
1 # 12 + 2 # 16 + 1 # 18	SGRP-3	SGRS-3-58
1 # 12 + 2 # 16 + 2 # 18	SGRP-3	SGRS-3-58
1 # 12 + 3 # 16	SGRP-3	SGRS-3-58
1 # 12 + 4 # 16	SGRP-3	SGRS-3-58
1 # 12 + 5 # 16	SGRP-4	SGRS-4-58
1 # 12 + 1 # 14 + 1 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 14 + 2 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 14 + 3 # 18	SGRP-3	SGRS-3-58
1 # 12 + 1 # 14 + 1 # 16	SGRP-3	SGRS-3-58
1 # 12 + 1 # 14 + 2 # 16	SGRP-3	SGRS-3-58
1 # 12 + 1 # 14 + 3 # 16	SGRP-4	SGRS-4-58
1 # 12 + 1 # 14 + 4 # 16	SGRP-4	SGRS-4-58
1 # 12 + 2 # 14	SGRP-3	SGRS-3-58
1 # 12 + 2 # 14 + 1 # 18	SGRP-3	SGRS-3-58
1 # 12 + 2 # 14 + 1 # 16	SGRP-4	SGRS-4-58
1 # 12 + 2 # 14 + 2 # 16	SGRP-4	SGRS-4-58
1 # 12 + 2 # 14 + 3 # 16	SGRP-4	SGRS-4-58
1 # 12 + 3 # 14	SGRP-4	SGRS-4-58
1 # 12 + 3 # 14 + 1 # 16	SGRP-4	SGRS-4-58
1 # 12 + 4 # 14	SGRP-4	SGRS-4-58
2 # 12	SGRP-4	SGRS-4-58
2 # 12 + 1 # 18	SGRP-3	SGRS-3-58
2 # 12 + 1 # 18	SGRP-3	SGRS-3-58
2 # 12 + 1 # 16	SGRP-3	SGRS-3-58
2 # 12 + 2 # 16 + 1 # 18	SGRP-4	SGRS-4-58
2 # 12 + 3 # 16	SGRP-4	SGRS-4-58
2 # 12 + 1 # 14 + 1 # 18	SGRP-4	SGRS-4-58
2 # 12 + 1 # 14 + 1 # 16	SGRP-4	SGRS-4-58
3 # 12 + 1 # 14	SGRP-4	SGRS-4-58
2 # 12 + 2 # 14	SGRP-4	SGRS-4-58
3 # 12 + 1 # 18	SGRP-4	SGRS-4-58
3 # 12 + 1 # 16	SGRP-4	SGRS-4-58
1 # 14 + 1 # 22	SGRP-1	SGRS-1-58
1 # 14 + 1 # 20	SGRP-2	SGRS-2-58
1 # 14 + 2 # 20	SGRP-2	SGRS-2-58

Wire Combinations	Splash-proof	Sealed
4 # 14 + 1 # 16	SGRP-4	SGRS-4-58
4 # 14 + 2 # 16	SGRP-4	SGRS-4-58
5 # 14	SGRP-4	SGRS-4-58
5 # 14 + 1 # 16	SGRP-4	SGRS-4-58
1 # 16 + 3 # 18	SGRP-3	SGRS-3-58
# 16 + 2 # 18 + 2 # 20	SGRP-3	SGRS-3-58
1 # 16 + 5 # 20	SGRP-3	SGRS-3-58
1 # 16 + 2 # 20	SGRP-2	SGRS-2-58
6 # 16	SGRP-3	SGRS-3-58
5 # 16 + 1 # 18	SGRP-3	SGRS-3-58
5 # 16 + 1 # 20	SGRP-3	SGRS-3-58
5 # 16	SGRP-3	SGRS-3-58
4 # 16 + 2 # 18	SGRP-3	SGRS-3-58
# 16 + 1 # 18 + 1 # 20	SGRP-3	SGRS-3-58
4 # 16 + 1 # 18	SGRP-3	SGRS-3-58
4 # 16 + 2 # 20	SGRP-3	SGRS-3-58
4 # 16 + 1 # 20	SGRP-3	SGRS-3-58
4 # 16	SGRP-3	SGRS-3-58
3 # 16 + 3 # 18	SGRP-3	SGRS-3-58
# 16 + 2 # 18 + 1 # 20	SGRP-3	SGRS-3-58
3 # 16 + 2 # 18	SGRP-3	SGRS-3-58
# 16 + 1 # 18 + 2 # 20	SGRP-3	SGRS-3-58
# 16 + 1 # 18 + 1 # 20	SGRP-3	SGRS-3-58
3 # 16 + 1 # 18	SGRP-3	SGRS-3-58
3 # 16 + 3 # 20	SGRP-3	SGRS-3-58
3 # 16 + 2 # 20	SGRP-3	SGRS-3-58
3 # 16 + 1 # 20	SGRP-3	SGRS-3-58
3 # 16	SGRP-2	SGRS-2-58
2 # 16 + 4 # 18	SGRP-3	SGRS-3-58
# 16 + 3 # 18 + 1 # 20	SGRP-3	SGRS-3-58
2 # 16 + 3 # 18	SGRP-3	SGRS-3-58
# 16 + 2 # 18 + 2 # 20	SGRP-3	SGRS-3-58
# 16 + 2 # 18 + 1 # 20	SGRP-3	SGRS-3-58
2 # 16 + 2 # 18	SGRP-3	SGRS-3-58
—	—	—

Wire Combinations	Splash-proof	Sealed
1 # 18 + 5 # 20	SGRP-2	SGRS-2-58
2 # 18	SGRP-1	SGRS-1-58
2 # 18 + 1 # 22	SGRP-1	SGRS-1-58
2 # 18 + 1 # 20	SGRP-2	SGRS-2-58
2 # 18 + 2 # 20	SGRP-2	SGRS-2-58
2 # 18 + 3 # 20	SGRP-2	SGRS-2-58
2 # 18 + 4 # 20	SGRP-3	SGRS-3-58
3 # 18	SGRP-2	SGRS-2-58
3 # 18 + 1 # 20	SGRP-2	SGRS-2-58
3 # 18 + 2 # 20	SGRP-3	SGRS-3-58
3 # 18 + 3 # 20	SGRP-3	SGRS-3-58
4 # 18	SGRP-2	SGRS-2-58
4 # 18 + 1 # 20	SGRP-3	SGRS-3-58
4 # 18 + 2 # 20	SGRP-3	SGRS-3-58
5 # 18	SGRP-3	SGRS-3-58
5 # 18 + 1 # 20	SGRP-3	SGRS-3-58
6 # 18	SGRP-3	SGRS-3-58
1 # 20 + 1 # 22	SGRP-1	SGRS-1-58
1 # 20 + 2 # 22	SGRP-1	SGRS-1-58
1 # 20 + 3 # 22	SGRP-1	SGRS-1-58
1 # 20 + 4 # 22	SGRP-1	SGRS-1-58
2 # 20	SGRP-1	SGRS-1-58
2 # 20 + 1 # 22	SGRP-1	SGRS-1-58
2 # 20 + 2 # 22	SGRP-1	SGRS-1-58
2 # 20 + 3 # 22	SGRP-1	SGRS-1-58
3 # 20	SGRP-1	SGRS-1-58
3 # 20 + 1 # 22	SGRP-1	SGRS-1-58
4 # 20	SGRP-2	SGRS-2-58
5 # 20	SGRP-2	SGRS-2-58
6 # 20	SGRP-2	SGRS-2-58
3 # 22	SGRP-1	SGRS-1-58
4 # 22	SGRP-1	SGRS-1-58
5 # 22	SGRP-1	SGRS-1-58
6 # 22	SGRP-1	SGRS-1-58
—	—	—

Product Characteristics

Material			
Insulation	Radiation-crosslinked, transparent heat-shrinkable polyvinylidene fluoride		
Solder preform with flux (SGRS-X-58)	SN42Bi58, ROM1 flux per ANSI-J-STD-004 (RA flux).		
Solder preform with flux (SGRP, SGRS)	Sn 60 Pb 40, ROM1 flux per ANSI-J-STD-004 (RA flux).		
Sealing insert (SGRS-X-58, SGRS)	Hot melt adhesive		
Spiral wound insert	Copper alloy		
Physical	**Unit**	**Method of test**	**Requirement**
Dimensions	inches	RB-109	See product dimensions.
Electromechanical	**Unit**	**Method of test**	**Typical values**
Dielectric withstand voltage	kilovolts	RB-109	2.0
Static heating	degrees	RB-109	Less than 50°C rise
Environmental*	**Unit**	**Method of test**	**Requirement**
Insulation resistance after water immersion (SGRS only)	megohms	RB-109	100
Contact resistance after testing	milliohms	RB-109	Less than 6 milliohms
Operating condition	**Unit**	**Method of test**	**Value**
Temperature rating	—	—	-55°C to 125°C [-67°F to 257°F]
Voltage rating	volts	—	600

*Immersion resistance sealing is dependent on the wire combinations used. The user should test specific wire combinations. Refer to RB-109 TE specification for procedures.

Approvals and Reference Documents

Agency Approvals	UL, CUL E87681
Reference documents	TE Specification RB-109 for splices Specification Control Drawings Splices—Non Sealed (SGRP-X), Splices—Sealed (SGRS-X)

Note: SGRS-X-58 is not UL approved.

Installation Requirements

The SolderGrip product is pushed onto the conductors with a twisting motion. With the product in place, installation can be completed with the proper selection and use of heating tools and reflectors.

Either of the following TE heating tools is recommended:

- HL1920E/HL2020E
- CV-1981

Refer to TE installation procedure RPIP-820-00 for detailed instructions and recommended reflector attachments.



DuraSeal Heat-Shrinkable, Environmentally Sealed, Nylon-Insulated Crimp Splices

RUGGED

- Protects splices from water, condensation, salt, and corrosion
- Provides strain relief
- Protects against vibration in rugged environments

CAPABLE

- Completely insulates and protects electrical connections
- Has adhesive lining for protection that is more reliable than conventional splices
- UL, CUL, and Lloyd's listed

APPLICATIONS

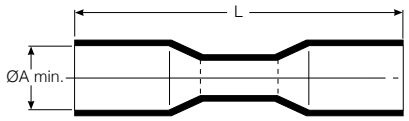
- Automotive/truck wiring repair and maintenance
- Automotive accessory installations.
- OEM automotive/truck/RV wire harness fabrication
- Marine electronics
- Fleet maintenance
- Commercial wiring (pumps/pools/spas)
- Appliances

Specifications/Approvals

Series	Agency	TE
D-406	UL and CUL listed 91J4, File E87681	RB-107

Note: D406-0034 is not UL approved.

Product Dimensions
Butt Splices



Part No.	Butt Splice Dimensions		Color	Conductor	Wire Dimensions	
	A Min.	L Nom.			Insulation O.D. (Max.)	Insulation O.D. (Min.)
D-406-0034	3.00 [.118]	31.5 [1.24]	Yellow	26-24	3.00 [.118]	1.40 [.055]
D-406-0001	3.70 [.146]	31.5 [1.24]	Red	22–18	3.70 [.146]	1.40 [.055]
D-406-0002	4.60 [.181]	31.5 [1.24]	Blue	16–14	4.60 [.181]	2.00 [.080]
D-406-0003	6.50 [.255]	37.5 [1.48]	Yellow	12–10	6.50 [.255]	2.80 [.110]

Product Selection Process

1. Determine wire size.
2. Select part number.

Wire Size AWG	mm_2	Part No.	Color
26-24	0.15-0.25	D-406-0034	Yellow
22–18	0.5-1.0	D-406-0001	Red
16–14	1.2–2.5	D-406-0002	Blue
12–10	3–6	D-406-0003	Yellow

Product Characteristics (Typical)

Operating temperature	-55°C to 125°C [-67°F to 257°F]
Shrink ratio	Approximately 2:1
Physical properties	Cut-through resistance: 31 kg [70 lb] Wire pullout after crimping and recovery: red: 11.3 kg [25 lb]; blue: 22.7 kg [50 lb]; yellow: 27.2 kg [60 lb] Not flame-retardant No cracking after heat aging for 168 h at 160°C [320°F]
Chemical properties	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: 1000 megohms at 100 Vdc

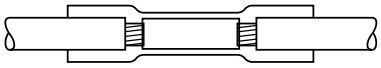
Installation Requirements

For proper installation of these devices, the correct crimp tool and a heating tool with a reflector attachment must be used. The AD-1522 crimp tool and HL1920E/HL2020E heating tool are recommended.

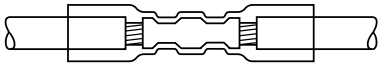
Refer to TE installation procedure RPIP-821-00 for detailed instructions.

Installation

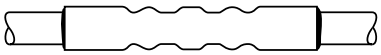
1. Select splice of appropriate size. Strip wire 7.5 mm (5/16 in). Insert into crimp barrel.

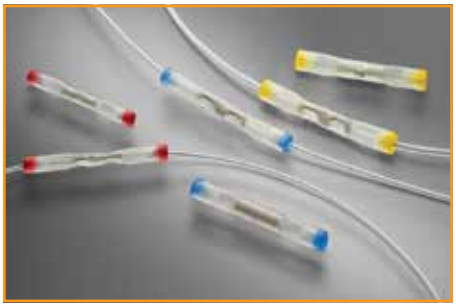


2. Crimp using AD-1522 crimp tool for preinsulated crimps.



3. Heat crimped splice with heat gun until tubing recovers and adhesive flows.





VERSATILE

- Easy installation and application flexibility
- One-step termination and environmental protection
- No heating required for installation — safe for use on fueled aircraft

PROVEN TECHNOLOGY

- Reliable in a wide variety of environmental conditions
- Prevents water ingress under permanent pressure/weight
- Achieves environmental performance while maintaining:
  - Small profile
  - Electrical performance

Raychem Cold Applied Splices and Ring Terminals

TE Connectivity's (TE) cold applied splice and terminals product line is designed as a single-component in-line splice that requires no heat to install. It seals the termination and prevents the ingress of moisture which can lead to insulation failure and breakdown of the electrical connection.

In this product, sealing is achieved by replacing traditional methods, such as grommets, greases, and tapes with a novel gel technology. A polymer outer layer provides electrical isolation.

MECHANICAL/ENVIRONMENTAL

- **Tensile Strength:** Exceeds that of spliced wire
- **Temperature Range:** -65°C to 150°C
- **Dielectric Strength:** 2500 V maximum
- **Insulation Resistance:** 5000 megohms minimum
- **Altitude Immersion:** 75,000 feet
- **Fluid Resistance:** MIL-L-7808, MIL-L-3699, MIL-H-5605 (Hydraulic), MIL-A-8243, MIL-C-59769, and MIL-T-5624 (JP-5)
- **Current Rating:** Defined by the size of the crimp, gauge of wire, and specification

PHYSICAL

- **Cross-Linked Gel Technology:**
  - Well-established gel sealing system
  - Versatile gel closure
  - Non-flowing gel
- Protects and seals on all conventional Mil Spec and commercial wire insulation systems

MATERIALS

- **Insulation Sleeve:** Transparent polyvinylidene fluoride
- **Metal Crimp Splice or Terminal:** Tin-plated copper
- **End Caps:** Thermoplastic, color coded
- **Gel:** Clear, flame-retardant silicone-based gel

STANDARDS

- **SAE AMS-DTL-23053/8** (Insulation sleeve)
- **SAE AS81824/12 for Splices**
  SAE AS7928/14 for Terminals



AD-1381 Hand Crimping Tool
Tool is used to crimp cold-applied gel-filled splices with wires ranging from 26 to 12 AWG.

Specifications

DIMENSION

- **Overall Length:** 230 mm (9") approx.

WEIGHT

- 350 g (12.3 oz.)

COLD-APPLIED SPLICE PRODUCT RANGE

- **D-436-36-COLD:** 26 to 20 AWG wire range
- **D-436-37-COLD:** 18 to 16 AWG wire range
- **D-436-38-COLD:** 14 to 12 AWG wire range

Ordering Information

AD-1381 Hand Crimping Tool

Model	Description	Part No.
AD-1381 Hand Crimping Tool	AD-1381	CS1660-000
Calibration Gauge	AD-1382	992013-000

ROHS Information can be found at the following website: http://www.te.com/customersupport/productcompliance/

This product must not be disposed of as municipal waste.

RoHS Compliant

ORDERING INFORMATION

Mini-Seal Crimp Wire Splices – Cold Applied (Gel Filled)

TE Description	TE RPN	QPL P/N	Specification
D-436-36-COLD	CN1020-000	M81824/12-1	SAE AS81824
D-436-37-COLD	CN1021-000	M81824/12-2	SAE AS81824
D-436-38-COLD	CN1022-000	M81824/12-3	SAE AS81824



Ring Tongue Terminal – Cold Applied (Gel Filled)

TE Description	TE RPN	QPL P/N	Specification
D-436-1101-COLD	CW8662-000	M7928/14-004	SAE AS7928
D-436-1102-COLD	CW0419-000	M7928/14-008	SAE AS7928
D-436-1103-COLD	CW0421-000	M7928/14-016	SAE AS7928
D-436-1122-COLD	TBD	M7928/14-012	SAE AS7928
D-436-1123-COLD	TBD	M7928/14-020	SAE AS7928
D-436-1142-COLD	TBD	M7928/14-009	SAE AS7928
D-436-1143-COLD	TBD	M7928/14-017	SAE AS7928
D-436-1162-COLD	TBD	M7928/14-010	SAE AS7928
D-436-1163-COLD	TBD	M7928/14-018	SAE AS7928
D-436-1382-COLD	TBD	M7928/14-011	SAE AS7928
D-436-1383-COLD	TBD	M7928/14-019	SAE AS7928
D-436-1401-COLD	TBD	M7928/14-001	SAE AS7928
D-436-1402-COLD	TBD	M7928/14-005	SAE AS7928
D-436-1403-COLD	TBD	M7928/14-013	SAE AS7928
D-436-1601-COLD	TBD	M7928/14-002	SAE AS7928
D-436-1602-COLD	TBD	M7928/14-006	SAE AS7928
D-436-1603-COLD	TBD	M7928/14-014	SAE AS7928
D-436-1801-COLD	CW8661-000	M7928/14-003	SAE AS7928
D-436-1802-COLD	CW0418-000	M7928/14-007	SAE AS7928
D-436-1803-COLD	CW0420-000	M7928/14-015	SAE AS7928





RUGGED

- Insulation and strain relief

CAPABLE

- MIL-Spec approval
- Small size
- Light weight

EASY TO USE

- Immersion-resistant crimp splices are on QPL for SAE-AS81824
- Easy installation

MiniSeal High-Performance, Immersion-Resistant Crimp Splices

Applications

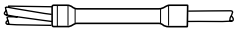
MiniSeal wire-to-wire splicing products offer solutions for hundreds of aerospace and defense applications. These environment-resistant splices provide excellent reliability, long term performance, MIL-S-81824/1 qualification, and a low installed cost.

MiniSeal crimp splices consist of a plated copper crimp barrel and a separate, heat-shrinkable, transparent sealing sleeve. They can be used on a combination of wires, from 1:1 to 10:10. MiniSeal splices are one of the smallest, lightest, and most environment-resistant splices available. They preserve the electrical integrity of the splice by preventing the penetration of liquids and the resulting chemical and galvanic corrosion.

Product Selection Process

1. Determine the type of splice required.
   - Stub (parallel) splice:

     
   - Butt (in-line) splice:

     
2. Determine which crimp barrel plating is required:
   - Tin plating, recommended for tin or silverplated wire
   - Nickel plating, recommended for nickel-plated wire, or silver-plated wire in applications above 150°C [302°F].
3. Calculate the size of crimp barrel required.

   Using the CMA/mm² worksheet on the next page, calculate the total cross section to be spliced by adding the circular mil area (CMA) or square millimeters (mm²) of each wire.

   Stub splice: Add the CMA or mm² of all wires together.

   Butt splice: Calculate each side separately (see example on the worksheet).

   Table A provides the CMA of typical conductors. (Both CMA and mm² give the same results, so choose either CMA or mm² as your unit of measure for selection purposes and continue to use it for all your selection criteria.)
4. Select the color code for the size crimp barrel required. Using Table B (page 24), select the crimp barrel—color-coded red, blue, or yellow—for the CMA or mm² you calculated.

   Stub splice: Select the barrel that will accommodate the total cross section.

   Butt splice: Select the smallest barrel that will accommodate the largest CMA/mm² required. (Refer to the example in the worksheet for a more specific description.) If the CMA/mm² of the smaller side of a butt splice is too small for the size barrel required to fit the larger side, increase the CMA/mm² — either by doubling back one wire (stripping the conductor twice the length you would ordinarily strip it and then folding it back) or by adding a filler wire.
5. Determine the type of sealing sleeve required. Some wire insulations will not fit in the holes of the sealing sleeve inserts, so be sure to compare the internal diameter of each hole with the outer diameter of the wire(s) you intend to insert in that hole. To create a reliable seal, place a maximum of two wires in any hole of the sealing sleeve.
6. Select the part number. Turn to the MiniSeal part number selection tables (Tables C and D, page 24 and 25) and find the table for the type of splice (stub or butt) required.

   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 of plating required. The color code accompanying that part number should match the color code you arrived at in Table B, confirming that the part number you have selected is correct.

Table A. CMA of Typical Conductors

Strands	7	19	19	19	19	19	19	19	37
AWG	28	26	24	22	20	18	16	14	12
CMA	177	304	475	754	1216	1900	2426	3831	5874
mm^2	0.09	0.15	0.24	0.38	0.61	0.95	1.21	1.92	2.94

Table B. Crimp Barrel Color Code Selection

CMA Range	1:1 Splice (AWG Size)	Color Code
304–1510	26–20	Red
1058–2680	20–16	Blue
2375–6755	16–12	Yellow

CMA/mm^2 Worksheet

Example:

Application: A butt splice with three AWG 22 wires in one side and one AWG 18 wire in the other side:

The CMA for AWG 22 wire in Table A is 754.

Side one is therefore calculated as follows:

CMA = 3 x 754 = 2262

The other side, where the CMA for AWG 18 is 1900, is calculated as:

CMA = 1 x 1900 = 1900

Using Table B to select the smallest crimp barrel that will easily fit 2262 CMA, the blue barrel is the correct choice.

Wire Number	CMA	mm^2	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			**Part Number:**
Total			

Table C. Stub (Parallel) Splices

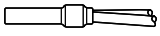


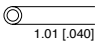
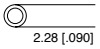
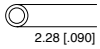
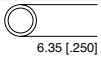
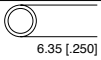
Illustration	Part No.		Crimp Barrel Size Range CMA Min.–Max.	I.D.dimensions			
				Side 1		Side 2	
	Tin Plated	Nickel Plated		Sealing Insert	Max. No. of Wires	Sealing Insert	Max. No. of Wires
	D-436-0128 Red	D-436-0119 Red	304–1510	 2.16 [.085]	2	 1.01 [.040]	2
	D-436-58 Blue	D-436-75 Blue	1058–2680	 4.56 [.180]	2	 2.28 [.090]	2
	D-436-59 Yellow	D-436-76 Yellow	2375—6755	 4.56 [.180]	2	 2.28 [.090]	2
	D-436-60 Blue	D-436-77 Blue	1058–2680	 2.03 [.080]	10 (2 per hole)	 6.35 [.250]	2
	D-436-61 Yellow	D-436-78 Yellow	2375–6755	 2.03 [.080]	10 (2 per hole)	 6.35 [.250]	2

Table D. Butt (in-line) splices

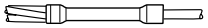
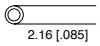
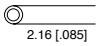
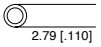
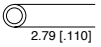
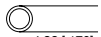
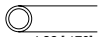
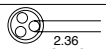
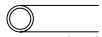
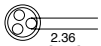
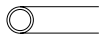
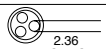
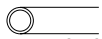
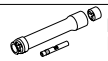
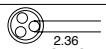
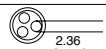
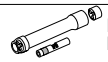
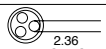
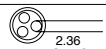
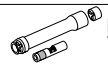
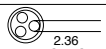
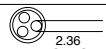


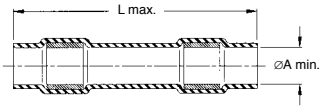
Illustration	Part No.		Crimp Barrel Size Range CMA Min.–Max.	I.D.dimensions			
				Side 1		Side 2	
	Tin Plated	Nickel Plated		Sealing Insert	Max. No. of Wires	Sealing Insert	Max. No. of Wires
	D-436-36* Red	D-436-82 D-200-82 Red	304–1510	 2.16 [.085]	2	 2.16 [.085]	2
	D-436-37* Blue	D-436-83 D-200-83 Blue	1058–2680	 2.79 [.110]	2	 2.79 [.110]	2
	D-436-38* Yellow	D-436-84 D-200-84 Yellow	2375–6755	 4.32 [.170]	2	 4.32 [.170]	2
	D-436-0110 Red	D-436-85 Red	304–1510	 2.36 [.093]	6	 4.06 [.160]	2
	D-436-52 Blue	D-436-86 Blue	1058–2680	 2.36 [.093]	6 (2 per hole)	 4.06 [.160]	2
	D-436-53 Yellow	D-436-87 Yellow	2375–6755	 2.36 [.093]	6 (2 per hole)	 4.06 [.160]	2
	D-436-0115 Red	D-436-88 Red	304–1510	 2.36 [.093]	6 (2 per hole)	 2.36 [.093]	6 (2 per hole)
	D-436-42 Blue	D-436-89 Blue	1058–2680	 2.36 [.093]	6 (2 per hole)	 2.36 [.093]	6 (2 per hole)
	D-436-43 Yellow	D-436-90 Yellow	2375–6755	 2.36 [.093]	6 (2 per hole)	 2.36 [.093]	6 (2 per hole)

*Qualified to MIL-S-81824/1.

Table E. Crimp Barrel Only

Type	Color Code	Tin-Plated	Nickel Plated	Crimp Barrel Size Range CMA Min. - Max.
Butt (in-line)	Red	D-609-06	D-609-09	304-1510
Butt (in-line)	Blue	D-609-07	D-609-10	1058-2680
Butt (in-line)	Yellow	D-609-08	D-609-11	2350-6755
Stub (Parrel)	Red	D-609-03	D-609-12	304-1510
Stub (Parrel)	Blue	D-609-04	D-609-13	1058-2680
Stub (Parrel)	Yellow	D-609-05	D-609-14	2350-6755

Table F. Sealing Sleeve Only



Part No.	Color Code	L Max.	A Min.
D-436-0096	Red	29.2 [1.15]	2.16 [0.085]
D-436-0097	Blue	29.2 [1.15]	2.8 [0.110]
D-436-0098	Yellow	29.2 [1.15]	4.32 [0.170]

Product Characteristics

Material	
Insulation	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride (D-436)
Crimp barrel	Tin- or nickel-plated copper
Meltable inserts	Meltable thermoplastic (D-436)
Typical Performance	
Voltage drop	6.9 mV at 4.5 A vs 8.1 mV for an equal length of wire
Tensile strength	Exceeds strength of conductor
Dielectric strength	2.5 kV
Temperature rating	-55°C to 150°C [-67°F to 302°F] (D-436 Series)
Insulation resistance	5000 megohms

Specifications/ Approvals

Series	Military
D-436	SAE-AS-81824/1 for D-436-36/37/38

Installation Requirements

For proper installation of these devices, the correct crimp tool (TE part number AD-1377) and a heating tool and reflector attachment must be used.

Any one of the following TE heating tools is recommended:

- HL1920E/HL2020E
- AA-400 Super Heater

Refer to TE installation procedure RCPS-200-20 for detailed instructions and recommended reflector attachments.



AD-1377 Hand Crimping Tool
Tool is used for crimping wire terminations with MiniSeal splices.

Specifications

DIMENSION

- **Overall Length:** 230 mm (9”) approx.

WEIGHT

- 350 g (12.3 oz.)

Ordering Information

AD-1377 Crimp Tool for MiniSeal Splices

Model	Description	Part No.
AD-1377 Crimp Tool	AD-1377-CRIMP-TOOL-3-CVTY	992008-000
Commercial Crimp Tool	AD-1377-S-SPEC-CRIMP-TOOL	959025-000
Calibration Gauge	AD-1386-CALIBRATION-GAUGE	992013-000

Accessories and Replacement Parts

Parts	Description	Part No.
Crimp Locator	AD-1377-103-CRIMP-LOCATOR	994855-000
Spring	AD-1377-P-E118-TOR-SPRNG	994123-000

ROHS Information can be found at the following website: http://www.te.com/customersupport/productcompliance/

This product must not be disposed of as municipal waste.

RoHS Compliant



RUGGED

- Transparent heat-shrinkable insulation sleeve provides environmental protection and strain relief

EASY TO USE

- No need to staffer wire splices

VERSATILE

- Small size
- Light weight
- Immersion-resistant crimp splices while meeting all requirements of SAE AS81824/11
- Splices provide sealing to unetched wire insulations

200˚ MiniSeal High-Performance, Immersion-Resistant Crimp Splices

In-line nickel plated sealed crimp splices for 200˚C applications were developed for the growing needs of high temperature applications in the aerospace and defense industry.

200˚C MiniSeal crimp splices provides the smallest, lightest, and the most environmental-resistant splices available, while meeting all requirements of SAEAS81812/11.

Applications

MiniSeal wire-to-wire splicing products are ideal for aerospace and defense applications where performance, reliability or size reduction is essential.

Designed to provide an immersion resistant in-line splice on 1:1 wires for the following: wire range from 26 AWG to 12 AWG; nickel-plated conductors and insulation rated for at least 135˚C.

Product Characteristics

Material	
Insulation	Heat-shrinkable, transparent blue, radiation cross-linked modified fluoropolymer
Crimp splicer	Base Metal: Copper alloy 101 or 102 per ASTM B75 Plating: Nickel per SAE AMS-QQ-N-290 Color Code: see table below
Meltable rings	Environment resistant modified thermoplastic fluoroelastomer Color: Light blue
Typical Performance	
Voltage drop	6.9 mV at 4.5 A vs 8.1 mV for an equal length of wire
Tensile strength	Exceeds strength of conductor
Dielectric strength	2.5 kV
Temperature rating	-55˚C to 200°C [-67°F to 392°F]
Insulation resistance	5000 megohms

Specifications/ Approvals

Series	Military
D-200	Meets the requirements of SAE AS81824/11

Part Numbers

Part No.	Color Code	Part Number
D-200-82	Red	D17660-000
D-200-83	Blue	A36675-000
D-200-84	Yellow	C60253-000

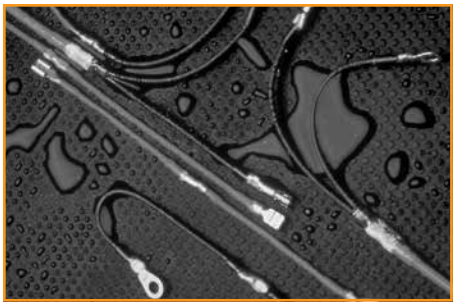
Product Dimensions

Product Name	Product Rev.	I.D.* a. min b. max	Crimp Splicer øA	øB	C	D	E max.	Color Code
D-200-82	A	2.16 (0.085) 0.64 (0.025)	1.27 (0.050) 1.14 (0.045)	2.03 (0.080) 1.91 (0.075)	12.95 (0.510) 12.45 (0.490)	6.22 (0.245) 5.72 (0225)	0.38 (0.015)	Red
D-200-83	A	2.79 (0.110) 0.64(0.025)	1.75 (0.069) 1.63 (0.064)	2.70 (0.106) 2.57 (0.101)	14.86 (0.585) 14.35 (0.565)	7.11 (0.280) 6.60 (0.260)	0.51 (0.020)	Blue
D-200-84	A	4.32 (0.170) 0.64 (0.025)	2.60 (0.102) 2.46 (0.097)	3.89 (0.153) 3.73 (0.147)	14.86 (0.585) 14.35 (0.565)	7.11 (0.280) 6.60 (0.260)	1.27 (0.050)	Yellow

*I.D.: a- As received; b- After unrestricted recovery thru meltable insert.

Product Name	MIL Spec Equivalent Size	Wire Range	Wgt. Lbs/Mpc max.
D-200-82	M81824/11-1	26-20	1.02
D-200-83	M81824/11-2	20-16	1.61
D-200-84	M81824/11-3	16-12	2.72

Insulated Terminals and Disconnects





Introduction

TE insulated electrical terminal products provide reliable, repeatable, and rugged examples of terminals available. We start on the front end with terminal sizes and configurations that meet or exceed industry standards in terms of material selection, surface treatment, and electrical performance.

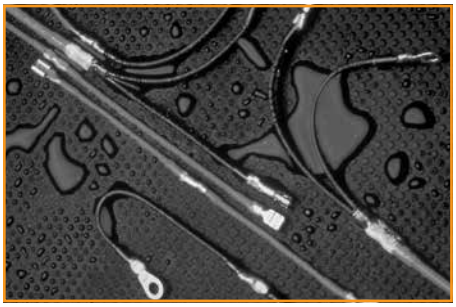
Here the comparison stops. What separates Raychem brand products from the rest of the industry are the materials and termination techniques used on the back end of the products, which provide unparalleled value.

Products include:

DuraSeal heat-shrinkable nylon crimp products, which 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 color-coded for easy identification, yet are transparent for visual inspection of the finished splice.

SolderGrip heat-shrinkable twist-on products, which utilize a spiral copper coil that grips and compresses the conductors and allows a prefluxed solder ring to flow to the center 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 means of terminating more than two conductors time after time. SolderGrip terminals can terminate a variety of conductor types (solid and stranded) and platings. Terminations on more than eight individual conductors in a single joint have been successfully demonstrated using this product.

DuraSeal product delivers protected electrical joints on industry standard terminals and is suitable for harsh environments.



DURABLE
- Resistance to moisture and abrasion
- Strain relief

CAPABLE
- Protection from wire pull-out
- UL and CUL listed

EASY TO USE
- Easy installation

DuraSeal Heat-Shrinkable Environmentally Sealed, Nylon Insulated Crimp Terminals and Disconnects

Applications

DuraSeal products insulate and protect electrical connections from mechanical abuse, wire pull-out, and abrasion while resisting water, salt, and other contaminant's.

DuraSeal devices provide a tough, environmentally sealed wire connection. Their crimp barrel or terminal, encased in rugged, heat-shrinkable nylon tubing lined with a special hot-melt adhesive, resists damage from abrasions and cuts.

DuraSeal devices retain flexibility and impact-resistance long after similar products have become brittle.

DuraSeal devices accommodate wire gauge sizes 22 to 10. They are color-coded for easy identification of gauge sizes, yet transparent for inspection of the finished splice.

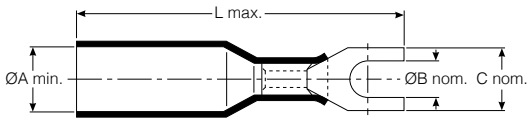
Approvals and Reference Documents

Agency approvals	UL listed component, file E87681, terminals except quick connect terminals; file E157833, quick connect terminals
Reference documents	TE specifications RB-108, Specification DuraSeal crimp terminals DuraSeal selection guide (H54153) DuraSeal installation guidelines (H54154)

Product Characteristics

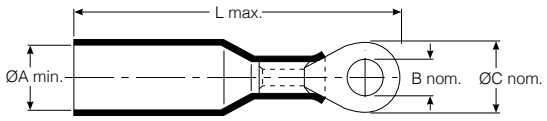
	Property	Unit	Requirement	Method of Test
Physical	Dimensions Tensile strength	Inches Pounds	None 8 to 40 lbs depending on AWG	See product dimensions UL486C, IEC512-8
	Property	**Unit**	**Typical value**	**Method of Test**
Electrical	Voltage drop Insulation resistance Dielectric withstand voltage	Millivolts Megohms Kilovolts	Less than equal length of wire 103 min. 2.5	MIL-S-81824, IEC512-2 MIL-STD-202 method 302 MIL-STD-202F method 301, IEC512-2
	Property	**Unit**	**Requirement**	**Method of Test**
Chemical	Diesel fuel Brake fluid Antifreeze 5% salt water Motor oil	—	Meet electrical test listed above after conditioning.	ASTM D 3032, ESA-603D
Environmental (Fluid)	Humidity Immersion Vibration Bending Thermal shock Heat aging (168h @ 85°C [185°F) Salt spray	—	Meet electrical test listed above after conditioning.	MIL-STD-202F method 106, IEC68-2-30 MIL-STD-202F condition C, IEC68-2-14 test NC MIL-STD-202F method 201, IEC68-2-6 UL486C, IEC512-8 MIL-STD-202F method 107, IEC68-2-14 test N MIL-STD-202F, IEC68-2-2 MIL-STD-202F method 101, IEC68-2-11
Operating conditions	Temperature rating Minimum shrink temperature Voltage rating	—	-55°C to +125°C [-67°F to -257°F] 180°C [356°F] 600 Volt max	None None None

Fork Terminals



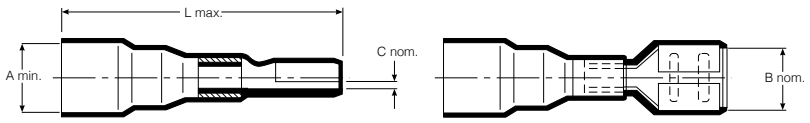
Part No.	Fork Terminal Dimensions					Color	Insulation Conductor (AWG)	Wire Dimensions	
	A Min.	Stud Size		C Nom.	L Max.			Insulation O.D. (Max.)	O.D. (Min.)
		Metric	Imperial						
B-106-2401	3.81 [.15]	M4	8	7.87 [.31]	32.00 [1.26]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-2402	4.57 [.18]	M4	8	7.87 [.31]	35.05 [1.38]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-2403	6.35 [.25]	M4	8	7.87 [.31]	38.10 [1.50]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-2502	4.57 [.18]	M5	10	9.91 [.39]	35.05 [1.38]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-2503	6.35 [.25]	M5	10	9.91 [.39]	40.15 [1.58]	Yellow	12–10	6.35 [.250]	2.79 [.110]

Ring Terminals



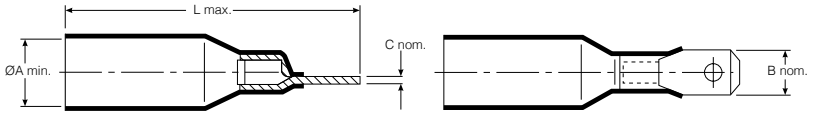
Part No.	Ring Terminal Dimensions					Color	Wire Dimensions		
	A Min.	Stud Size		C Nom.	L Max.		Insulation Conductor (AWG)	Insulation O.D. (Max.)	O.D. (Min.)
		Metric	Imperial						
B-106-1401	3.81 [.15]	M4	8	7.88 [.31]	32.00 [1.26]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-1501	3.81 [.15]	M5	10	9.91 [.39]	34.04 [1.34]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-1601	3.81 [.15]	M6	1/4	11.94 [.47]	36.07 [1.42]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-1801	3.81 [.15]	M8	5/16	13.97 [.55]	39.12 [1.54]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-1991	3.81 [.15]	M10	3/8	17.78 [.70]	43.18 [1.70]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-1402	4.57 [.18]	M4	8	7.88 [.31]	33.02 [1.30]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-1502	4.57 [.18]	M5	10	9.91 [.39]	35.05 [1.38]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-1602	4.57 [.18]	M6	1/4	11.94 [.47]	36.58 [1.44]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-1802	4.57 [.18]	M8	5/16	13.97 [.55]	40.13 [1.58]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-1992	4.57 [.18]	M10	3/8	17.78 [.70]	43.94 [1.73]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-1403	6.35 [.25]	M4	8	7.88 [.31]	38.10 [1.50]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-1503	6.35 [.25]	M5	10	9.91 [.39]	40.13 [1.58]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-1603	6.35 [.25]	M6	1/4	11.94 [.47]	41.66 [1.64]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-1803	6.35 [.25]	M8	5/16	13.97 [.55]	45.21 [1.78]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-1993	6.35 [.25]	M10	3/8	17.78 [.70]	46.99 [1.85]	Yellow	12–10	6.35 [.250]	2.79 [.110]

Push-on Terminals



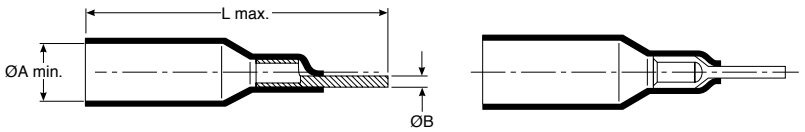
Part No.	Tab Size (inches)	Push-on Terminal Dimensions				Color	Insulation Conductor (AWG)	Wire Dimensions	
		A Min.	B Nom.	C Nom.	L Max.			Insulation O.D. (Max.)	O.D. (Min.)
B-106-3631	.250 x .032	3.81 [.150]	6.35 [.250]	.81 [.032]	30.48 [1.200]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-3632	.250 x .032	4.57 [.180]	6.35 [.250]	.81 [.032]	32.00 [1.260]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-3633	.250 x .032	6.35 [.250]	6.35 [.250]	.81 [.032]	33.02 [1.300]	Yellow	12–10	6.35 [.250]	2.79 [.110]
B-106-3281	.110 x .020	3.81 [.150]	2.79 [.110]	.51 [.020]	22.86 [.900]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-3481	.187 x .020	3.81 [.150]	4.75 [.187]	.51 [.020]	30.48 [1.200]	Red	22–18	3.81 [.150]	1.40 [.055]

Tab Terminals



Part No.	Tab Size (inches)	Tab Terminal Dimensions				Color	Insulation Conductor (AWG)	Wire Dimensions	
		A Min.	B Nom.	C Nom.	L Max.			Insulation O.D. (Max.)	O.D. (Min.)
B-106-4631	.250 x .032	3.81 [.150]	6.35 [.250]	.81 [.032]	30.48 [1.20]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-4632	.250 x .032	4.57 [.180]	6.35 [.250]	.81 [.032]	32.00 [1.26]	Blue	16–14	4.45 [.175]	2.00 [.080]

Pin Terminals



Part No.	Pin Terminal Dimensions			Color	Wire Dimensions		
	A Min.	B Nom.	L Max.		Conductor (AWG)	Insulation O.D. (Max.)	Insulation O.D. (Min.)
B-106-6201	3.81 [.150]	2.00 [.080]	30.99 [1.220]	Red	22–18	3.81 [.150]	1.40 [.055]

Bullet Terminals

Fig. 1

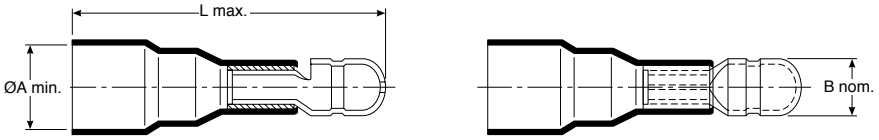
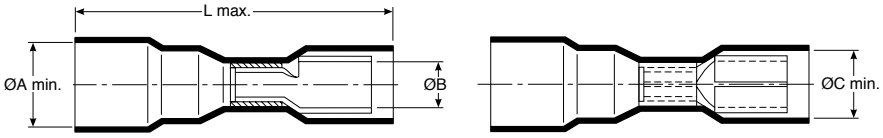


Fig. 2



Part No.	Fig.	Type	Bullet Terminal Dimensions				Color	Conductor (AWG)	Wire Dimensions	
			A Min.	B Nom.	C Min.	L Max.			Insulation O.D. (Max.)	Insulation O.D. (Min.)
B-106-7401	1	M	3.81 [.150]	3.81 [.150]	—	33.53 [1.32]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-7502	1	M	4.57 [.180]	5.08 [.200]	—	34.54 [1.36]	Blue	16–14	4.45 [.175]	2.00 [.080]
B-106-8401	2	F	3.81 [.150]	3.81 [.150]	5.59 [.220]	30.48 [1.20]	Red	22–18	3.81 [.150]	1.40 [.055]
B-106-8502	2	F	4.57 [.180]	5.08 [.200]	6.10 [.240]	32.51 [1.28]	Blue	16–14	4.45 [.175]	2.00 [.080]

Product Characteristics (Typical)

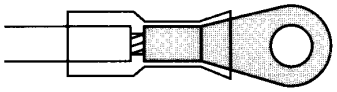
Operating temperature	-55°C to 125°C [-67°F to 257°F]
Shrink ratio	Approximately 2:1
Physical properties	Cut-through resistance: 31.7 kg [70 lb] Wire pullout after crimping and recovery: red: 11.3 kg [25 lb]; blue: 22.7 kg [50 lb]; yellow: 27.2 kg [60 lb] Not flame-retardant No cracking after heat aging for 168 hr at 160°C [320°F]
Chemical properties	Solvent resistance: isopropyl alcohol, trichloroethylene, gasoline, battery acid, diesel fuel, motor oil, antifreeze, brake fluid, 5% salt water
Electrical properties	Dielectric strength: 1000 V Insulation resistance: 10 megohms

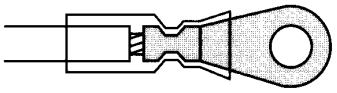
Specifications/ Approvals

Series	Agency	TE
B-106	UL and CUL 91J4, File E87681 Lloyd's listed, File 65 247 HH 02-93 UL and CUL E157833 (B-106-3XXX/B-106-4XXX)	RB-108

Installation Requirements

1. Select appropriate size. For terminal and disconnect terminations, strip wire 6.5 mm (1/4 inch).
2. Crimp using AD-1522 crimp tool for preinsulated crimps.
3. Heat terminal or disconnect with heat gun until tubing recovers and adhesive flows. Avoid heating ring or fork metallic parts.







For proper installation of these devices, the correct crimp tool and heating tool with reflector attachment must be used. The AD-1522 crimp tool and HL1920E/ HL2020E heating tools are recommended. Refer to TE installation procedure RPIP-684-00 for detailed instructions.



AD-1522-1 Hand Crimping Tool
Tool is used for completing wire terminations using DuraSeal splices.

Specifications

DIMENSION

- **Overall Length:** 230 mm (9") approx.

WEIGHT

- 350 g (12.3 oz.)

PRODUCT RANGE

- DuraSeal Crimp Splices and Terminals

Ordering Information

AD-1522-1 Crimp Tool for DuraSeal Splices

Product	Description	Part No.
Crimp Tool	AD-1522-1	047011-000
Calibration Gauge	AE-2245	020435-000

ROHS Information can be found at the following website: http://www.te.com/customersupport/productcompliance/

This product must not be disposed of as municipal waste.



RUGGED

- Transparent insulation sleeve provides encapsulation, inspectability, strain relief, and insulation

VERSATILE

- Spiral copper coil grips and compresses the conductors for optimum solder connection
- Prefluxed solder preform provides a controlled soldering process
- Accommodates a wide variety of conductor types, quantities, sizes, and plating types unmatched by any other termination technique

HIGH PERFORMANCE

- Parts meet the performance requirements of MIL-T-7928G

EASY TO USE

- One-piece design for easy installation

APPLICATIONS

- Used for terminating multiple wires to terminals

SolderGrip Self-Fixturing Insulated Terminals

Product Selection Process

1. Determine the wire combination (number of wires and size) of the wire bundle you wish to terminate.
2. Use Table C to select the correct terminal for AWG wire combination.* Example: For connecting a bundle with one 12 AWG wire (1 #12) and two 18 AWG wires (+ 2 #18) to a terminal, you need an SGRT-4-XX terminal.
3. Determine the correct stud size.
4. Select the correct part number from Table A for that stud size in the terminal series and size you selected in Step 2. Example: If the stud size is 1/4, select part number SGRT-4-06.
5. Verify that the wire bundle (with wire insulation) does not exceed the maximum diameter allowed for the part you selected. Simply check the bundle's diameter against the maximum diameter that Table A lists for that part.
6. Verify that the total amperage to be applied does not exceed the maximum amp rating for the part as specified in Table A.

*If the wire combination is not listed in Table B, use the CMA (mm^2) method of determining wire bundle size (see "CMA/mm^2 Calculation" on page 37).

Using Table B, select the smallest size part that will fit your total wire CMA (mm^2) value.

Product Option

Product Series	Environmental Protection
SGRT	Splashproof (not RoHS compliant)

Table A. Part Number Selection

SolderGrip Part No.	Stud Size	Maximum Bundle Diameter†	Maximum Amp Rating	Wire Range (Min.–Max.) CMA [mm^2]	Typical Length
SGRT-1-02	2 [2]	4.1 [.161]	12.5 A	1400–5000 [0.7–2.5]	38 [1 1/2]
SGRT-2-03	3 [6]	5.0 [.195]	15 A	2400–6000 [1.2–3.0]	38 [1 1/2]
SGRT-2-04	4 [8]	—	15 A	2400–6000 [1.2–3.0]	38 [1 1/2]
SGRT-2-05	5 [10]	—	15 A	2400–6000 [1.2–3.0]	38 [1 1/2]
SGRT-2-06	6 [1/4]	—	15 A	2400–6000 [1.2–3.0]	38 [1 1/2]
SGRT-3-06	6 [1/4]	6.5 [.255]	33 A	5000–13,200 [2.5–6.6]	44.5 [1 3/4]
SGRT-3-08	8 [5/16]	—	33 A	5000–13,200 [2.5–6.6]	51.0 [2]
SGRT-4-06	6 [1/4]	9.0 [.355]	56 A	12,000–22,400 [6.0–11.2]	44.5 [1 3/4]
SGRT-4-08	8 [5/16]	—	56 A	12,000–22,400 [6.0–11.2]	51 [2]

†Maximum bundle diameter is measured over wire insulation.

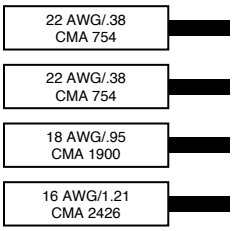
CMA/mm² Calculation

To calculate the total circular mil or mm² area of the wire bundle to be terminated, 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 selection criteria. (Both measures provide the same results.)
2. In the workspace below, list the CMA or mm² for each conductor in the bundle. (Table B provides the CMA of typical conductors.)
3. Add together the values listed in the workspace below to obtain the total area.
4. Use Table A to select the smallest terminator that will fit the total CMA (mm²).

Wire Number	CMA	mm²	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			Solder Grip Part No.
Total			

CMA/mm² Example



Total CMA = 5834
Total mm² = 2.92
Correct part number (based on CMA of 5834 or mm² of 2.92):
SGRT-2-XX if bundle OD is less than 5.0 mm (0.195 in).

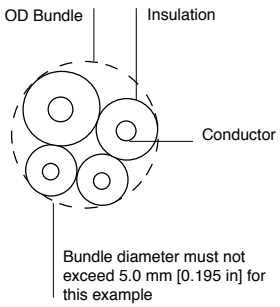


Table B. CMA of Typical Copper Conductors

Strands	7	19	19	19	19	19	19	19	37
AWG	28	26	24	22	20	18	16	14	12
CMA	177	304	475	754	1216	1900	2426	3831	5874
mm^2	0.09	0.15	0.24	0.38	0.61	0.95	1.21	1.92	2.94

Table C. SolderGrip Wire Combinations (see Table A for Terminal Size [-XX])

Wire Combinations	Part No.	Wire Combinations	Part No.	Wire Combinations	Part No.
1 # 8	SGRT-4-XX	1 # 12 + 1 # 16 + 4 # 18	SGRT-4-XX	1 # 14 + 4 # 20	SGRT-3-XX
1 # 8 + 1 # 16	SGRT-4-XX	1 # 12 + 2 # 16	SGRT-3-XX	1 # 14 + 1 # 18	SGRT-2-XX
2 # 8 + 2 # 16	SGRT-4-XX	1 # 12 + 2 # 16 + 1 # 18	SGRT-3-XX	1 # 14 + 1 # 18 + 1 # 20	SGRT-3-XX
1 # 8 + 1 # 14	SGRT-4-XX	1 # 12 + 2 # 16 + 2 # 18	SGRT-4-XX	1 # 14 + 2 # 18	SGRT-3-XX
1 # 10	SGRT-3-XX	1 # 12 + 3 # 16	SGRT-4-XX	1 # 14 + 3 # 18	SGRT-3-XX
1 # 10 + 1 to 3 # 18	SGRT-3-XX	1 # 12 + 4 # 16	SGRT-4-XX	1 # 14 + 4 # 18	SGRT-3-XX
1 # 10 + 2 # 18	SGRT-3-XX	1 # 12 + 5 # 16	SGRT-4-XX	1 # 14 + 5 # 18	SGRT-4-XX
1 # 10 + 3 # 18	SGRT-4-XX	1 # 12 + 1 # 14 + 1 # 18	SGRT-3-XX	1 # 14 + 1 # 16	SGRT-3-XX
1 # 10 + 1 # 16	SGRT-3-XX	1 # 12 + 1 # 14 + 2 # 18	SGRT-4-XX	1 # 14 + 1 # 16 + 1 # 20	SGRT-3-XX
1 # 10 + 1 # 16 + 1 # 18	SGRT-4-XX	1 # 12 + 1 # 14 + 3 # 18	SGRT-4-XX	1 # 14 + 1 # 16 + 1 # 18	SGRT-3-XX
1 # 10 + 1 # 16 + 2 # 18	SGRT-4-XX	1 # 12 + 1 # 14 + 1 # 16	SGRT-3-XX	1 # 14 + 1 # 16 + 2 # 18	SGRT-3-XX
1 # 10 + 2 # 16	SGRT-4-XX	1 # 12 + 1 # 14 + 2 # 16	SGRT-4-XX	1 # 14 + 1 # 16 + 3 # 18	SGRT-3-XX
1 # 10 + 3 # 16	SGRT-4-XX	1 # 12 + 1 # 14 + 3 # 16	SGRT-4-XX	1 # 14 + 1 # 16 + 4 # 18	SGRT-4-XX
1 # 10 + 4 # 16	SGRT-4-XX	1 # 12 + 1 # 14 + 4 # 16	SGRT-4-XX	1 # 14 + 2 # 16	SGRT-3-XX
1 # 10 + 5 # 16	SGRT-4-XX	1 # 12 + 2 # 14	SGRT-4-XX	1 # 14 + 2 # 16 + 1 # 18	SGRT-3-XX
1 # 10 + 1 # 14	SGRT-3-XX	1 # 12 + 2 # 14 + 1 # 18	SGRT-4-XX	1 # 14 + 2 # 16 + 2 # 18	SGRT-3-XX
1 # 10 + 1 # 14 + 1 # 18	SGRT-4-XX	1 # 12 + 2 # 14 + 1 # 16	SGRT-4-XX	1 # 14 + 2 # 16 + 3 # 18	SGRT-4-XX
1 # 10 + 1 # 14 + 1 # 16	SGRT-4-XX	1 # 12 + 2 # 14 + 2 # 16	SGRT-4-XX	1 # 14 + 3 # 16	SGRT-3-XX
1 # 10 + 1 # 14 + 2 # 16	SGRT-3-XX	1 # 12 + 2 # 14 + 3 # 16	SGRT-4-XX	1 # 14 + 3 # 16 + 1 # 18	SGRT-3-XX
1 # 10 + 1 # 14 + 3 # 16	SGRT-4-XX	1 # 12 + 3 # 14	SGRT-4-XX	1 # 14 + 3 # 16 + 2 # 18	SGRT-4-XX
1 # 10 + 2 # 14	SGRT-4-XX	1 # 12 + 3 # 14 + 1 # 16	SGRT-4-XX	1 # 14 + 4 # 16	SGRT-4-XX
1 # 10 + 3 # 14	SGRT-4-XX	1 # 12 + 4 # 14	SGRT-4-XX	1 # 14 + 4 # 16 + 1 # 18	SGRT-4-XX
1 # 10 + 1 # 12	SGRT-4-XX	2 # 12 + 1 # 18	SGRT-4-XX	1 # 14 + 5 # 16	SGRT-4-XX
1 # 10 + 1 # 12 + 1 # 14	SGRT-4-XX	2 # 12 + 1 # 16	SGRT-4-XX	2 # 14	SGRT-3-XX
1 # 10 + 2 # 12	SGRT-4-XX	2 # 12 + 2 # 16 + 1 # 18	SGRT-4-XX	2 # 14	SGRT-3-XX
2 # 10	SGRT-4-XX	2 # 12 + 3 # 16	SGRT-4-XX	2 # 14	SGRT-3-XX
2 # 10 + 1 # 16	SGRT-4-XX	2 # 12 + 1 # 14 + 1 # 18	SGRT-4-XX	2 # 14	SGRT-3-XX
1 # 12	SGRT-3-XX	2 # 12 + 1 # 14 + 1 # 16	SGRT-4-XX	2 # 14	SGRT-3-XX
1 # 12 + 1 # 18	SGRT-3-XX	2 # 12 + 2 # 14	SGRT-4-XX	2 # 14 + 1 # 16	SGRT-3-XX
1 # 12 + 2 # 18	SGRT-3-XX	3 # 12 + 1 # 18	SGRT-4-XX	2 # 14 + 1 # 16	SGRT-3-XX
1 # 12 + 3 # 18	SGRT-3-XX	3 # 12 + 1 # 16	SGRT-4-XX	2 # 14 + 1 # 16	SGRT-3-XX
1 # 12 + 4 # 18	SGRT-4-XX	3 # 12 + 1 # 14	SGRT-4-XX	2 # 14 + 1 # 16	SGRT-3-XX
1 # 12 + 5 # 18	SGRT-4-XX	1 # 14	SGRT-2-XX	2 # 14 + 2 # 16	SGRT-3-XX
1 # 12 + 1 # 16	SGRT-3-XX	1 # 14 + 1 # 22	SGRT-2-XX	2 # 14 + 2 # 16	SGRT-3-XX
1 # 12 + 1 # 16 + 1 # 18	SGRT-3-XX	1 # 14 + 1 # 20	SGRT-2-XX	2 # 14 + 3 # 16	SGRT-4-XX
1 # 12 + 1 # 16 + 2 # 18	SGRT-3-XX	1 # 14 + 2 # 20	SGRT-3-XX	2 # 14 + 4 # 16	SGRT-4-XX
1 # 12 + 1 # 16 + 3 # 18	SGRT-4-XX	1 # 14 + 3 # 20	SGRT-3-XX	3 # 14	SGRT-3-XX



Table C. SolderGrip Wire Combinations (see Table A for Terminal Size [-XX]) (Continued)

Wire Combinations	Part No.	Wire Combinations	Part No.	Wire Combinations	Part No.
3 # 14 + 1 # 16	SGRT-4-XX	2 # 16 + 4 # 20	SGRT-3-XX	1 # 18 + 1 # 20 + 2 # 22	SGRT-2-XX
3 # 14 + 2 # 16	SGRT-4-XX	2 # 16 + 1 # 18	SGRT-3-XX	1 # 18 + 2 # 20	SGRT-2-XX
3 # 14 + 3 # 16	SGRT-4-XX	2 # 16 + 1 # 18 + 1 # 20	SGRT-3-XX	1 # 18 + 3 # 20	SGRT-2-XX
4 # 14	SGRT-4-XX	2 # 16 + 1 # 18 + 2 # 20	SGRT-3-XX	1 # 18 + 4 # 20	SGRT-3-XX
4 # 14 + 1 # 16	SGRT-4-XX	2 # 16 + 1 # 18 + 3 # 20	SGRT-3-XX	1 # 18 + 5 # 20	SGRT-3-XX
4 # 14 + 2 # 16	SGRT-4-XX	2 # 16 + 2 # 18	SGRT-3-XX	2 # 18	SGRT-2-XX
5 # 14	SGRT-4-XX	2 # 16 + 2 # 18 + 1 # 20	SGRT-3-XX	2 # 18 + 1 # 22	SGRT-2-XX
5 # 14 + 1 # 16	SGRT-4-XX	2 # 16 + 2 # 18 + 2 # 20	SGRT-3-XX	2 # 18 + 1 # 20	SGRT-2-XX
1 # 16	SGRT-2-XX	2 # 16 + 3 # 18	SGRT-3-XX	2 # 18 + 2 # 20	SGRT-3-XX
1 # 16 + 1 # 22	SGRT-2-XX	2 # 16 + 3 # 18 + 1 # 20	SGRT-3-XX	2 # 18 + 3 # 20	SGRT-3-XX
1 # 16 + 2 # 22	SGRT-2-XX	2 # 16 + 4 # 18	SGRT-3-XX	2 # 18 + 4 # 20	SGRT-3-XX
1 # 16 + 3 # 22	SGRT-2-XX	3 # 16	SGRT-3-XX	3 # 18	SGRT-2-XX
1 # 16 + 1 # 20	SGRT-2-XX	3 # 16 + 1 # 20	SGRT-3-XX	3 # 18 + 1 # 20	SGRT-3-XX
1 # 16 + 1 # 20 + 1 # 22	SGRT-2-XX	3 # 16 + 2 # 20	SGRT-3-XX	3 # 18 + 2 # 20	SGRT-3-XX
1 # 16 + 2 # 20	SGRT-2-XX	3 # 16 + 3 # 20	SGRT-3-XX	3 # 18 + 3 # 20	SGRT-3-XX
1 # 16 + 3 # 20	SGRT-3-XX	3 # 16 + 1 # 18	SGRT-3-XX	4 # 18	SGRT-3-XX
1 # 16 + 4 # 20	SGRT-3-XX	3 # 16 + 1 # 18 + 1 # 20	SGRT-3-XX	4 # 18 + 1 # 20	SGRT-3-XX
1 # 16 + 5 # 20	SGRT-3-XX	3 # 16 + 1 # 18 + 2 # 20	SGRT-3-XX	4 # 18 + 2 # 20	SGRT-3-XX
1 # 16 + 1 # 18	SGRT-2-XX	3 # 16 + 2 # 18	SGRT-3-XX	5 # 18	SGRT-3-XX
1 # 16 + 1 # 18 + 1 # 20	SGRT-2-XX	3 # 16 + 2 # 18 + 1 # 20	SGRT-3-XX	5 # 18 + 1 # 20	SGRT-3-XX
1 # 16 + 1 # 18 + 2 # 20	SGRT-3-XX	3 # 16 + 3 # 18	SGRT-3-XX	6 # 18	SGRT-3-XX
1 # 16 + 1 # 18 + 3 # 20	SGRT-3-XX	4 # 16	SGRT-3-XX	1 # 20 + 2 # 22	SGRT-2-XX
1 # 16 + 1 # 18 + 4 # 20	SGRT-3-XX	4 # 16 + 1 # 20	SGRT-3-XX	1 # 20 + 3 # 22	SGRT-2-XX
1 # 16 + 2 # 18	SGRT-3-XX	4 # 16 + 2 # 20	SGRT-3-XX	1 # 20 + 4 # 22	SGRT-2-XX
1 # 16 + 2 # 18 + 1 # 20	SGRT-3-XX	4 # 16 + 1 # 18	SGRT-3-XX	2 # 20	SGRT-2-XX
1 # 16 + 2 # 18 + 2 # 20	SGRT-3-XX	4 # 16 + 1 # 18 + 1 # 20	SGRT-3-XX	2 # 20 + 1 # 22	SGRT-2-XX
1 # 16 + 2 # 18 + 3 # 20	SGRT-3-XX	4 # 16 + 2 # 18	SGRT-4-XX	2 # 20 + 2 # 22	SGRT-2-XX
1 # 16 + 3 # 18	SGRT-3-XX	5 # 16	SGRT-3-XX	2 # 20 + 3 # 22	SGRT-2-XX
1 # 16 + 3 # 18 + 1 # 20	SGRT-3-XX	5 # 16 + 1 # 20	SGRT-4-XX	3 # 20	SGRT-2-XX
1 # 16 + 3 # 18 + 2 # 20	SGRT-3-XX	5 # 16 + 1 # 18	SGRT-4-XX	3 # 20 + 1 # 22	SGRT-2-XX
1 # 16 + 4 # 18	SGRT-3-XX	6 # 16	SGRT-4-XX	4 # 20	SGRT-2-XX
1 # 16 + 4 # 18 + 1 # 20	SGRT-3-XX	1 # 18 + 1 # 22	SGRT-2-XX	5 # 20	SGRT-3-XX
1 # 16 + 5 # 18	SGRT-3-XX	1 # 18 + 2 # 22	SGRT-2-XX	6 # 20	SGRT-3-XX
2 # 16	SGRT-2-XX	1 # 18 + 3 # 22	SGRT-2-XX	4 # 22	SGRT-2-XX
2 # 16 + 1 # 20	SGRT-3-XX	1 # 18 + 1 # 20	SGRT-2-XX	5 # 22	SGRT-2-XX
2 # 16 + 2 # 20	SGRT-3-XX	1 # 18 + 1 # 20 + 1 # 22	SGRT-2-XX	6 # 22	SGRT-2-XX
2 # 16 + 3 # 20	SGRT-3-XX	—	—	—	—

Installation Requirements

The SolderGrip product is pushed onto the conductors with a twisting motion. With the product in place, installation can be completed with the proper selection and use of heating tools and reflectors.

Either of the following TE heating tools is recommended:

- HL1920E/HL2020E
- CV-1981

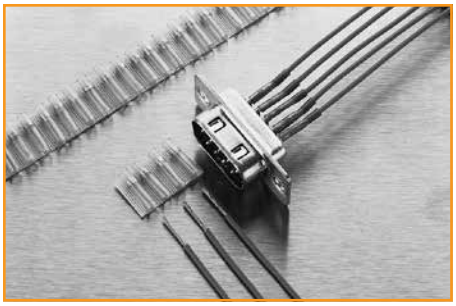
Refer to TE installation procedure RPIP-820-01 for detailed instructions and recommended reflector attachments.

Product Characteristics

Material	
Insulation	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride (Kynar®)
Solder and flux	Sn60 Pb40 with RA flux
Typical Performance	
Tensile strength	Exceeds strength of individual wires
Temperature rating	-55°C to +150°C [-67°F to +302°F]
Voltage Drop	Not to exceed that of equivalent length of wire by more than 1 mV
Dielectric Withstanding Voltage	Current leakage less than 2 mA (1.5 kV)

Kynar is a trademark of Arkema, Inc.

Wire Termination to Pin/Post/Tab



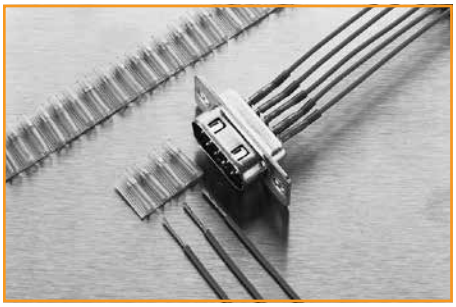
Introduction

TE SolderSleeve terminators offer easy, one-step solutions for wire connections to pins, posts, and tabs and for mass wire terminations.

Designed for applications with temperatures up to 150°C [302°F], the products in this section include SolderSleeve discrete wire terminators, which are heat-shrinkable thermoplastic sleeves containing a precisely engineered fluxed solder preform.

SolderSleeve terminators are also available on carrier tape, spaced precisely to match connector terminal spacing, enabling termination of an entire row of wires at one time.

SolderSleeve wire-to-pin, wire-to-post, and wire-to-tab terminators, like all TE termination products, provide reliability and economical installation for greater productivity. They can be supplied either in bulk or on carrier tape.



DURABLE

- Transparent polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, inspectability, strain relief, and insulation

CAPABLE

- Prefluxed solder preform offers a controlled soldering process

HIGH PERFORMANCE

- UL and CUL Recognized

EASY TO USE

- One-piece design means easy installation and low installed cost
- Optional tape carrier provides convenience and ease of installation

APPLICATIONS

- Used for terminating wires to component terminals, such as motor tabs, connector pins, and switch terminals

SolderSleeve Discrete Wire Terminators

Product Selection Process

1. Determine the application operating temperature.
2. From the Product Options table on the next page, select the product series appropriate for the application, based on the temperature required.
3. Determine your component connection point type (pin, post, or tab) and dimensions.
4. Determine your wire gauge.
5. Optional: Select tape carrier center-to-center spacing (D-71X series only). This should match center spacing of component terminals.
6. Select part number from the appropriate table:
   - For B-155 and CWT series (applications with low-temperature wires—below 125°C [257°F]), use Table A.
   - For D-129/141/71X series (applications with wires rated higher than 125°C [257°F]), use Table B.

Installation Requirements

For proper installation of these devices, the correct heating tool and reflector attachment must be used. Either of the following TE heating tools is recommended:

- HL1920E/HL2020E
- AA-400 Super Heater

Refer to TE installation procedure RCPS-200-12 (for D-129, D-141, D-71X) or RPIP-824-00 (for B-155 and CWT) for detailed instructions and recommended reflector attachment.

Product Options

Product Series	Max. Operating Temperature	Min. Wire Temperature Rating
B-155, CWT	125°C [257°F]	85°C [185°F]
D-129, D-141, D-71X	150°C [302°F]	125°C [257°F]

Note: Cadmium-free option (B-152 series) is available for operating temperature of 125˚C [257˚F]. Consult TE for details.

Table A. B-155 Series (125°C [257°F] rated)

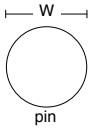
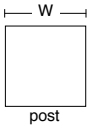
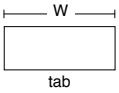
Connection-point Type and Size	Terminal Dimensions	Wire AWG/mm²	Part No.
	W = up to 0.63 [.025]	24 [0.24] 20 [0.61]	B-155-1501 B-155-1502
	W = 0.63 [.025] to 0.89 [0.035]	24 [0.24] 22 [0.38] 20 [0.61]	B-155-1501 B-155-1502 B-155-1503
	W = 0.89 [0.035] to 1.14 [.045]	24–22 [0.24–0.38] 20–18 [0.61–0.95]	B-155-1502 B-155-1503
	W = 1.14 [.045] to 1.52 [.060]	24–22 [0.24–0.38] 20–18 [0.61–0.95]	B-155-1503 B-155-1504
	W = up to1.52 [.060]	24–20 [0.24–0.61]	B-155-1501
	W = 1.27 [.050] to 2.28 [.090]	24-18 [0.24–0.95]	B-155-1502
	W = 1.77 [.070] to 2.79 [.110]	24-18 [0.24–0.95]	B-155-1503
	W = 2.54 [.100] to 3.80 [.150]	24-18 [0.24–0.95]	B-155-1504
	W = 2.28 [.090] to 4.70 [.187]	22-16 [0.38–1.21]	B-155-1505

Table B. D-129/141/71X Series (up to 150°C [302°F] rated)

Connection-point Type and Size

Terminal Dimensions		Wire AWG	Wire mm^2	Tape Carrier Spacing of Sleeves (Center-to-Center) None	1.27 [0.050]	2.54 [0.100]	3.17 [0.125]	4.0 [0.156]
W pin	W = up to 0.61 [.024]	30–26	[0.05–0.15]	D-141-30	D-713-03	—	—	—
		24–22	[0.24–0.38]	D-141-07	—	D-711-00	—	—
	W = 0.63 [.025] to 0.81 [.032]	20	[0.61]	D-141-31	—	D-711-04	D-711-07	D-711-08
W post	W = 0.76 [.030] to 1.27 [.050]	24–20	[0.24–0.61]	D-141-56	—	—	—	—
	W = up to 1.52 [.060]	24–20	[0.24–0.61]	D-129-05	—	D-714-01	—	—
W tab	W = 1.27 [.050] to 2.28 [.090]	24–20	[0.24–0.61]	D-129-03	—	—	—	D-714-00
	W = 2.28 [.090] to 3.55 [.140]	24–20	[0.24–0.61]	D-129-0043	—	—	—	—

For Fine Wire Terminations 0.15 mm^2 (26 AWG) and Smaller*

Part No.*	Inside Diameter As Supplied**	Fully Recovered†	Length††
D-110-0062	1.0 [0.040]	0.6 [0.025]	16.0 [0.630]
D-110-0217	1.0 [0.040]	0.6 [0.025]	9.0 [0.360]
D-141-13	0.75 x 1.65 [0.030 X 0.065]	0.75 [0.030]	4.7 [0.185]
D-141-22	0.75 x 1.65 [0.030 X 0.065]	0.75 [0.030]	6.0 [0.240]
D-141-30	0.75 x 1.65 [0.030 X 0.065]	0.75 [0.030]	9.5 [0.375]

Note: Micro SolderSleeve terminators are used for attaching leads smaller than 26 AWG (0.15 mm^2) to terminals less than 0.6 [.025] wide.

*The D-110 series sleeves are primarily for single wire terminations and do not have a wire stop. The D-141 series will accept either one or two wires; the parts have a built-in wire stop that will locate the wire approximately 0.76 [0.03] from bottom of terminal.

**Minimum. Wire insulation must be smaller than this. When using the D-141 parts for two-wire terminations, the combined wire insulation diameters must be less than 1.5 [.060].

†Maximum. The combination of conductor diameter and terminal width and the wire insulation must be greater than this.

††The terminal length should be at least 1.2 [0.05] shorter than this. The wire strip length must be adjusted so that, when terminated, the exposed conductor is covered by the sleeve.

Product Characteristics

Material		
Insulation [D-129, D-141, D-71X]	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride	
Insulation [B-155, CWT]	Radiation-crosslinked, heat-shrinkable polyolefin	
Solder and flux [D-129, D-141, D-71X]	Solder: Sn63 Pb37	Flux: ROL1 per ANSI-J-004 [RMA flux]
Solder and flux [B-155]	Solder: Sn42Bi58	Flux: ROM1 per ANSI-J-004 [RA flux]
Solder and flux [CWT]	Solder: Sn50 Pb32 Cd 18	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 [B-155, CWT]	-55°C to 125°C [-67°F to 257°F]	
Temperature rating [D-129, D-141, D-71X]	-55°C to 150°C [-67°F to 302°F]	
Insulation resistance	1000 megohms	

Specifications/ Approvals

Series	Agency	TE
B-155	RoHS	RT-1404
CWT	UL and CUL E87681	D-5023
D-129, D-141	UL and CUL E87681	RT-1404

Shield Termination



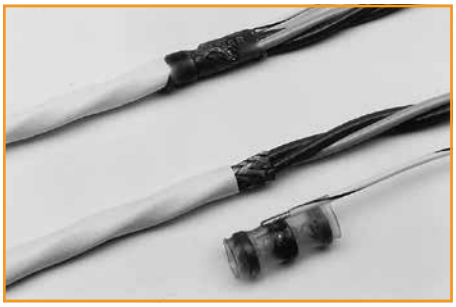
Introduction

TE SolderSleeve shield grounding terminators provide an environmentally sealed, insulated, and encapsulated solder connection for a variety of applications. SolderSleeve terminators are available in many styles.

Designed for a wide variety of temperature applications ranging from -65°C to 200°C [-85°F to 392°F], the products in this section include:

- B-155-X and CWT-X SolderSleeve terminators, designed for low-temperature cables with operating temperatures up to 125°C [257°F] and suitable for most commercial environments.
- MIL-S-83519 SolderSleeve terminators, which are immersion resistant and available with or without a preinstalled ground lead.
- SO Series SolderSleeve terminators, which also are immersion resistant and feature the TE BiAlloy temperature indication system.
- S200 Shield terminators are offered in various sizes and ground lead configurations.

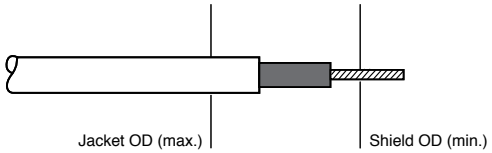
All SolderSleeve products are reliable, versatile, and easy to install, resulting in lower installed costs.



SolderSleeve Shield Terminators

Product Selection Process

1. Select product series from the Product Options table below.
2. Determine cable dimensions.
3. Optional: Select preinstalled wire lead type (see Table G on page 53 for type descriptions).
4. Select part number (use the selection table indicated for your product series in the Product Options table below).
5. Refer to Table H on page 53 for cross-reference information.



RUGGED

- Transparent insulation sleeve provides encapsulation, inspectability, strain relief, and insulation

VERSATILE

- Prefluxed solder preform provides a controlled soldering process

EASY TO USE

- One-piece design means easy installation and lower installed cost
- Optional preinstalled ground leads provide convenience and ease of installation

APPLICATIONS

- Used for shield-to-ground termination

Product Options (Refer to Table G on Page 53 for Additional Information)

Product Series	System Oper. Temperature (Max.)	Used on Cables Rated (Min.)	Environmental Protection	Solder Alloy	Flux Type	Insulation Material	Part No. Selection Table
B-155	125°C [257°F]	85°C [185°F]	Splash resistant	Bi58	PA	Polyolefin	A
CWT	125°C [257°F]	85°C [185°F]	Splash resistant	Cd18	RA	Polyolefin	A
SO63*	150°C [302°F]	125°C [257°F]	Immersion resistant	Sn63	RMA	Polyvinylidene fluoride	B
S01/S02**, S03	150°C [302°F]	125°C [257°F]	Immersion resistant	Sn63	RMA	Polyvinylidene fluoride	C, D
SO96***	175°C [347°F]	150°C [302°F]	Immersion resistant	Sn96	RA	Polyvinylidene fluoride	E
SO175****	175˚C [347°F]	150˚C [302°F]	Immersion resistant	Sn96	RA	Polyvinylidene fluoride	F
S200****	200°C [392°F]	150˚C [302°F]	Immersion resistant	Sn96	RA	Fluoropolymer	G

*Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519) and NAS 1747, supplied with BiAlloy temperature indicator.
**Qualified to SAE-AS83519 (formerly MIL-S-83519), supplied with thermochromic temperature indicator.
***Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519) and NAS 1747, supplied with thermochromic temperature indicator.
****Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519), supplied with BiAlloy temperature indicator.
Note: Cadmium-free option (B-152 series) is available for operating temperature of 125˚C [257˚F]. Consult TE for details.



ECONOMICAL

- One-piece design allows for a single-step, simplified installation and a low total installed cost
- Bi-alloy or thermochromic temperature indicator works as a process control aid and simplifies operator training
- Offered in various sizes and ground lead configurations

CAPABLE

- Provides a completely soldered, strain-relieved termination
- Heat-shrinkable sleeve helps provide insulation, inspectability, and strain relief
- Designed for high-temperature applications up to 200°C
- Sealing inserts helps ensure reliable, environmental protection

APPLICATIONS

- Shield termination of cables subjected to a minimum temperature rating of 150°C and maximum operating temperature of 200°C
- Protecting and sealing for BMS 13-60 PTFE wrapped cables and M27500 cables with PTFE/polyimide jackets

Raychem S200 Shield Terminators

HIgh-Performance, High-Temperature Cable Terminators
An important extension of the Raychem SolderSleeve family, S200 shield termination devices were developed specifically to address the need for high-temperature connecting, insulating, and sealing for applications in the aerospace and defense industry.

Wide Selection
Offered in various sizes and ground lead configurations, our S200 shield termination devices provide environmentally protected shield termination on cables with a minimum temperature rating of 150°C, and silver or nickel-plated shields. They are also available with bi-alloy or thermochromic indicators

Fast Installation and Lower Costs
Convenient to use, the one-piece design of S200 shield termination devices help ensure reliable environmental protection and greatly simplified installation for a lower total installed cost.

MATERIALS

- **Solder**: Tin 96%/Silver 4% bi-alloy solder
- **Tubing**: Heat-shrinkable modified fluoropolymer
- **Inserts**: Thermoplastic fluoropolymer

STANDARDS AND SPECIFICATIONS

- **Industry Standards**:
  SAE-AMS-DTL-23053/13 (applies to heat-shrinkable insulation sleeve only)
  SAE-AS83519 (modified for 200°C applications)
  EU RoHS/ELV compliant
- **TE Instruction Sheet**: RCPS-100-71
- **TE Qualification and Test Report**: Available on request

MECHANICAL/ENVIRONMENTAL

- **Operating Temperature**: 150°C to 200°C
- **Durability**: Heat-shrinkable sleeve adheres and seals to provide a completely soldered, strain-relieved termination



ORDERING INFORMATION (TC indicates that this part has a thermochromic indicator)

Without ground lead

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-00	F92583-000	
1.90	0.90	S200-1-00-TC	CN5417-000	
2.67	1.40	S200-2-00	F94898-000	
2.67	1.40	S200-2-00-TC	CN5418-000	
4.32	2.15	S200-3-00	A65903-000	
4.32	2.15	S200-3-00-TC	CN5419-000	
5.97	3.30	S200-4-00	E32454-000	
5.97	3.30	S200-4-00-TC	CN5420-000	
6.98	4.30	S200-5-00	D12074-000	
6.98	4.30	S200-5-00-TC	CN5421-000	

With pre-installed braid: Nickel-plated copper strands in accordance to AA59569F36N0031. (6 Inches)

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-01	CS5526-000	M83519/5-1
2.67	1.40	S200-2-01	D08259-000	M83519/5-2
4.32	2.15	S200-3-01	A77145-000	M83519/5-3
5.97	3.30	S200-4-01	F26506-000	M83519/5-4
6.98	4.30	S200-5-01	A18826-000	M83519/5-5

With pre-installed braid: Ni-plated copper strands per ASTM B355, Class 4. CMA = 1200. (6 Inches)

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-9020	CJ1037-000	M83519/5-11
1.90	0.90	S200-1-9020-TC	CP7589-000	M83519/5-16
2.67	1.40	S200-2-9020	CJ1039-000	M83519/5-12
2.67	1.40	S200-2-9020-TC	CP4262-000	M83519/5-17
4.32	2.15	S200-3-9020	CJ1041-000	M83519/5-13
4.32	2.15	S200-3-9020-TC	CP6063-000	M83519/5-18
5.97	3.30	S200-4-9020	CJ1042-000	M83519/5-14
5.97	3.30	S200-4-9020-TC	CP6893-000	M83519/5-19
6.98	4.30	S200-5-9020	CJ1043-000	M83519/5-15
6.98	4.30	S200-5-9020-TC	CP7313-000	M83519/5-20

With pre-installed braid: Ni-plated copper strands per ASTM B355, Class 4. CMA = 1800. (6 Inches)

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-9030	CA7639-000	
2.67	1.40	S200-2-9030	CA7640-000	
4.32	2.15	S200-3-9030	CA7641-000	
5.97	3.30	S200-4-9030	CA7642-000	
6.98	4.30	S200-5-9030	CA7643-000	
6.98	4.30	S200-5-9030-TC	CP7417-000	



With pre-installed braid: High nickel-plated copper strands per ASTM-B355 Class 7. CMA = 640. (10 Inches)

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-01-100HN	D89883-000	
2.67	1.40	S200-2-01-100HN	A87947-000	
4.30	2.15	S200-3-01-100HN	A59779-000	
5.95	3.30	S200-4-01-100HN	C69495-000	
6.90	4.30	S200-5-01-100HN	D92195-000	

With pre-installed braid: Stranded nickel-plated copper wire in accordance with SAE-AS22759/41.

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-55-22-9	EH1934-000	
2.67	1.40	S200-2-55-22-9	EH1935-000	
4.30	2.15	S200-3-55-22-9	EH1936-000	
5.95	3.30	S200-4-55-22-9	EH1938-000	
6.90	4.30	S200-5-55-22-9	EH1939-000	

With pre-installed braid: Stranded nickel-plated copper wire in accordance with SAE-AS22759/41.

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-55-20-9	EH1940-000	
2.67	1.40	S200-2-55-20-9	EH1941-000	
4.30	2.15	S200-3-55-20-9	EH1942-000	
5.95	3.30	S200-4-55-20-9	EH1943-000	
6.90	4.30	S200-5-55-20-9	EH1944-000	

With pre-installed braid: Stranded nickel-plated copper wire in accordance with SAE-AS22759/41.

Jacket OD (mm)	Shield (mm)	Product Description	Raychem Part Number	SAE AS83519
1.90	0.90	S200-1-55-18-9	EH1945-000	
2.67	1.40	S200-2-55-18-9	EH1946-000	
4.30	2.15	S200-3-55-18-9	EH1948-000	
5.95	3.30	S200-4-55-18-9	EH1949-000	
6.90	4.30	S200-5-55-18-9	EH1950-000	

Table A. B-155 Series (125°C [257°F] rated)

Cable OD		Part Nos.	
Jacket OD Max.	Shield OD Min.	No Preinstalled Lead	With Preinstalled Lead (22AWG/0.38 mm² green)
1.7 [.065]	0.9 [.035]	B-155-3801	—
1.95 [.075]	1.1 [.043]	B-155-3802	—
2.7 [.105]	1.5 [.059]	B-155-3	B-155-03-35-22-5
4.5 [.180]	2.0 [.079]	B-155-5	B-155-05-35-22-5
6.0 [.235]	3.3 [.130]	B-155-6	B-155-06-35-22-5
7.0 [.275]	3.3 [.130]	B-155-7	B-155-07-35-22-5
8.7 [.340]	4.5 [.177]	B-155-9	B-155-09-35-22-5
10.7 [.420]	4.5 [.177]	B-155-11	B-155-11-35-22-5
13.0 [.510]	7.0 [.276]	B-155-13	B-155-13-35-22-5

*See Table G on page 53 for lead description.
Note: The B-155 series is suitable for applications using low-temperature wires (typically rated at 85°C [185°F] to 125°C [257°F]) with bare copper or tin plating.

Table B. SO63 Series

BiAlloy Temperature Indication System

This system greatly enhances the reliability and repeatability of SO63 series terminators while reducing installed cost. The heat-shrinkable thermoplastic sleeve contains a precisely engineered, fluxed solder band that is visible through the sleeve. The band provides exactly the amount of solder and flux required to terminate the ground lead to the cable shield. Encircling the band is a small temperature indicator ring. This ring melts only when the surfaces to be joined have reached the correct soldering temperature, thus ensuring a properly soldered connection. Process control is built into each sleeve.

Cable OD			Part Nos.					
			Preinstalled Lead Option*				Braid Strap	
Jacket OD Max.	Shield OD Min.	No Preinstalled Lead	20 AWG	22 AWG	24 AWG	26 AWG	Nickel Plated	Tin Plated
1.95 [0.075]	0.90 [.035]	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	SO63-1-9030
2.7 [0.105]	1.40 [.055]	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	SO63-2-9030
4.3 [0.170]	2.15 [.085]	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	SO63-3-9030
6.0 [0.235]	3.30 [.130]	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	SO63-4-9030
7.0 [0.275]	4.30 [.170]	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	SO63-5-9030

*See Table G on page 53 for lead description. Color of wire lead is denoted by the last two digits of the part number as follows:
90 = White with a black stripe 9 = White 0 = Black 6 = Blue (24 AWG only) 5 = Green (20, 22, 24 AWG)
The SO63 series is immersion resistant, features the TE BiAlloy temperature indication system, and meets the performance requirements of SAE-AS83519 (formerly MIL-S-83519) .

Table C. S01/S02 M83519 Series

Thermochromic Temperature Indicator

The M83519 (S01 and S02) series terminators contain a colored thermochromic temperature indicator that exhibits a distinct color change when surfaces have reached wetting temperature. This color change gives both manufacturing and Quality Control an aid in the inspection of the completed termination.

Cable OD		Part No. (MIL Part Number and TE Part No.) by Lead Option					
				Preinstalled Lead Option*			
		No Preinstalled Lead		20 AWG		22 AWG	
Jacket OD Max	Shield OD Min	MIL	TE	MIL	TE	MIL	TE
1.95 [0.075]	0.9 [.035]	M83519/1-1	S01-01-R	M83519/2-1	S02-01-R	M83519/2-6	S02-06-R
2.7[0.105]	1.40 [.055]	M83519/1-2	S01-02-R	M83519/2-2	S02-02-R	M83519/2-7	S02-07-R
4.3 [0.170]	2.15 [.085]	M83519/1-3	S01-03-R	M83519/2-3	S02-03-R	M83519/2-8	S02-08-R
6.0 [0.235]	3.30 [.130]	M83519/1-4	S01-04-R	M83519/2-4	S02-04-R	M83519/2-9	S02-09-R
7.0 [0.275]	4.30 [.170]	M83519/1-5	S01-05-R	M83519/2-5	S02-05-R	M83519/2-10	S02-10-R
Jacket OD Max.	Shield OD Min.			Preinstalled Lead Option*			
				24 AWG		26 AWG	
1.95 [0.075]	0.9 [.035]			M83519/2-11	S02-11-R	M83519/2-16	S02-16-R
2.7 [0.105]	1.40 [.055]			M83519/2-12	S02-12-R	M83519/2-17	S02-17-R
4.3[0.170]	2.15 [.085]			M83519/2-13	S02-13-R	M83519/2-18	S02-18-R
6.0 [0.235]	3.30 [.130]			M83519/2-14	S02-14-R	M83519/2-19	S02-19-R
7.0 [0.275]	4.30 [.170]			M83519/2-15	S02-15-R	M83519/2-20	S02-20-R

*See Table G for lead description.

M83519 is the qualified product listed in SAE-AS83519 (formerly MIL-S-83519) . The series features a thermochromic temperature indicator to assist in termination and inspection. The part number is permanently marked on the sleeve.

Table D. S03 Series

Thermochromic Temperature Indicator

The S03 series terminators contain a colored thermochromic temperature indicator that exhibits a distinct color change when surfaces have reached wetting temperature. This color change gives both Manufacturing and Quality Control an aid in the inspection of the completed termination.

These parts now have qualification to /3
SOLDER SLEEVE SHIELD TERMINATORS
S03-01-R 257305-000 M83519/3-1 SAE AS83519
S03-02-R 065762-000 M83519/3-2 SAE AS83519
S03-03-R 676516-000 M83519/3-3 SAE AS83519
S03-04-R 689088-000 M83519/3-4 SAE AS83519
S03-05-R 531872-000 M83519/3-5 SAE AS83519
S03-06-R 022926-000 M83519/3-6 SAE AS83519
S03-07-R 101273-000 M83519/3-7 SAE AS83519
S03-08-R 587725-000 M83519/3-8 SAE AS83519
S03-09-R 751586-000 M83519/3-9 SAE AS83519
S03-10-R 621833-000 M83519/3-10 SAE AS83519

Cable OD		Part No.	
		Preinstalled Lead Option*	
Jacket OD Max.	Shield OD Min.	Tin plated Braid Strap	Nickel plated Braid Strap
1.95 [0.075]	0.9 [.035]	S03-01-R	S03-06-R
2.7 [0.105]	1.40 [.055]	S03-02-R	S03-07-R
4.3 [0.170]	2.15 [.085]	S03-03-R	S03-08-R
6.0 [0.235]	3.30 [.130]	S03-04-R	S03-09-R
7.0 [0.275]	4.30 [.170]	S03-05-R	S03-10-R

*See Table G for lead description.

Table E. SO96 Series (175°C [347°F] rated)

Thermochromic Temperature Indicator

The SO96 series terminators contain a colored thermochromic temperature indicator that exhibits a distinct color change when surfaces have reached wetting temperature. This color change gives both manufacturing and Quality Control an aid in the inspection of the completed termination.

Cable OD		Part No.		
Jacket OD Max.	Shield OD Min.	No Preinstalled Lead	Preinstalled Lead Option*	
			22 AWG	Braid Strap
1.95 [0.075]	0.9 [.035]	SO96-1-00	SO96-1-55-22-90	SO96-1-01
2.7 [0.105]	1.40 [.055]	SO96-2-00	SO96-2-55-22-90	SO96-2-01
4.3 [0.170]	2.15 [.085]	SO96-3-00	SO96-3-55-22-90	SO96-3-01
6.0 [0.235]	3.30 [.130]	SO96-4-00	SO96-4-55-22-90	SO96-4-01
7.0 [0.275]	4.30 [.170]	SO96-5-00	SO96-5-55-22-90	SO96-5-01

*See Table G for lead description.
The SO96 series is designed for high-temperature applications with operating temperature requirements up to 200°C [392°F]. This series features a thermochromic temperature indicator and meets performance requirements of SAE-AS83519 (formerly MIL-S-83519) . The solder is Sn96 with RA flux compatible with nickel-plated shields.

Table F. SO175 Series (175°C [347°F] rated)

BiAlloy Temperature Indication System

This system greatly enhances the reliability and repeatability of SO175 series terminators while reducing installed cost. The temperature indicator ring, encircling the solder preform, melts to indicate the very minimum amount of heat.

Cable OD		Part No.		
Jacket OD Max.	Shield OD Min.	No Preinstalled Lead	Preinstalled Lead Option*	
			22 AWG	Braid Strap
1.95 [0.075]	0.90 [0.035]	SO175-1-00	SO175-1-55-22-90	SO175-1-01
2.7 [0.105]	1.40 [0.055]	SO175-2-00	SO175-2-55-22-90	SO175-2-01
4.3 [0.170]	2.15 [0.085]	SO175-3-00	SO175-3-55-22-90	SO175-3-01
6.0 [0.235]	3.30 [0.130]	SO175-4-00	SO175-4-55-22-90	SO175-4-01
7.0 [0.275]	4.30 [0.170]	SO175-5-00	SO175-5-55-22-90	SO175-5-01

*See Table H for lead description.

Table G. S200 Series (200°C [392°F] rated)

BiAlloy Temperature Indication System

This system greatly enhances the reliability and repeatability of S200 series terminators while reducing installed cost. The temperature indicator ring, encircling the solder preform, melts to indicate the very minimum amount of heat.

Cable OD		Part No.		
Jacket OD Max.	Shield OD Min.	No Preinstalled Lead	Preinstalled Lead Option*	
			22 AWG	Braid Strap
1.95 [0.075]	0.90 [0.035]	S200-1-00	S200-1-55-22-9	S200-1-01
2.7 [0.105]	1.40 [0.055]	S200-2-00	S200-2-55-22-9	S200-2-01
4.3 [0.170]	2.15 [0.085]	S200-3-00	S200-3-55-22-9	S200-3-01
6.0 [0.235]	3.30 [0.130]	S200-4-00	S200-4-55-22-9	S200-4-01
7.0 [0.275]	4.30 [0.170]	S200-5-00	S200-5-55-22-9	S200-5-01

*See Table H for lead description.

Table H. Preinstalled Lead Description

Series	Lead Type	Remarks	Plating	Stranding	Min. Length
S200	M22759/91	MIL-W-22759/91	Silver	Stranded	150 (6.00)
M83519, SO63	55A0111	MIL-W-22759/32	Tin	Stranded	150 [6.00]
SO96, SO175	55A0813	MIL-W-22759/41	Nickel	Stranded	150 [6.00]
SO63, SO96, S03	Braid strap	Uninsulated	Nickel	40 x 38 AWG	150 [6.00]
B-155	XL polyethylene	RoHS	Tin	Stranded (W2)	150 [6.00]
CWT	XL polyethylene	UL Listed	Tin	Stranded (W1)	150 [6.00]
SO63, S03	Braid Strap	Uninsulated	Tin	Stranded	150 [6.00]

Product Characteristics

Material		
Insulation		
S200	Radiation-crosslinked, heat-shrinkable, modified fluoropolymer	
SO, M83519	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride	
B-155	Radiation-crosslinked, heat-shrinkable polyolefin	
Solder and flux		
SO63, M83519, S03	Solder: Sn63 Pb37	Flux: ROL1 per ANSI - J - 004 (RMA Flux)
S200, SO96, SO175 series	Solder: Sn96 Ag4	Flux: ROM1 per ANSI - J - 004 (RA Flux)
B-155	Solder: SN42Bi58	Flux: ROM1 per ANSI - J - 004 (RA Flux)
Ground lead		
B-155 series	XL polyethylene	
S200 series	MIL-C-22759/91 or /87	
SO, M83519, SO175	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	
Temperature rating		
B-155	-55°C to 125°C [-67°F to 257°F]	
SO63/M83519/S03	-55°C to 150°C [-67°F to 302°F]	
SO96/SO175 series	-55°C to 175°C [-67°F to 347°F]	
S200	-55°C to 200°C [-67°F to 392°F]	
Insulation resistance	1000 megohms	

Specifications/ Approvals

Series	Agency	TE
B-155	—	RT-1404
SO63*	NAS 1747	RT-1404
M83519**	MIL-S-83519/1&/2	RT-1404
SO96***	NAS 1747	RT-1404
SO175		RT-1404
S200**	—	RT-1404

* Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519) and NAS 1747, supplied with BiAlloy temperature indicator.
** Qualified to SAE-AS83519 (formerly MIL-S-83519), supplied with thermochromic temperature indicator.
***Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519) and NAS 1747, supplied with thermochromic temperature indicator.

Installation Requirements

For proper installation of these devices, the correct heating tool and reflector attachment must be used. Any one of the following TE heating tools is recommended:

- HL1920E/HL2020E
- AA-400 Super Heater
- CV-1981
- MiniRay
- IR-1759

For detailed instructions and recommended reflector attachments, refer to the appropriate TE installation procedure:

Series	Procedure
B-155	**RPIP-824-000**
CWT	**RPIP-655-00-D**
SO63	**RCPS-100-70**
M83519 (S01/S02)	**RCPS-100-70**
SO96	**RCPS-100-70**
S03	**RCPS-100-70**
SO175	**RCPS-100-70**
S200	**RCPS-100-71**

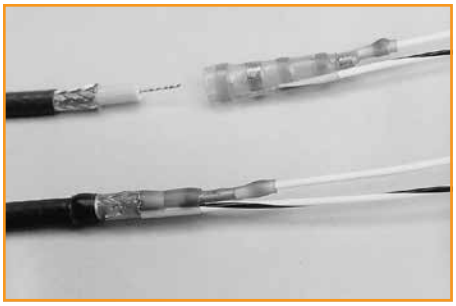
Table H. NAS, M83519, and TE Cross-Reference

NAS Part No.	TE D Series Part No.	NAS Comment
1744-1	D-1744-01	
1744-2	D-1744-02	
1744-3	D-1744-03	
1744-4	D-1744-04	
1744-5	D-1744-05	
1744-6	D-1744-06	
1744-7	D-1744-07	
1744-8	D-1744-08	
1745-1	D-144-25	Inactive, Use SAE-AS83519/1-1 (formerly MIL-S-83519)
1745-2	D-100-00	Inactive, Use SAE-AS83519/1-2 (formerly MIL-S-83519)
1745-3	D-101-00	Inactive, Use SAE-AS83519/1-3 (formerly MIL-S-83519)
1745-4	D-103-00	Inactive, Use SAE-AS83519/1-5 (formerly MIL-S-83519)
1745-5	D-144-26	
1745-6	D-100-31	
1745-7	D-101-31	
1745-8	D-103-31	
1745-9		Obsolete - Use NAS1745-13
1745-10		Obsolete - Use NAS1745-14
1745-11		Obsolete - Use NAS1745-15
1745-12		Obsolete - Use NAS1745-16
1745-13	D-142-83	Inactive, Use SAE-AS83519/1-1 (formerly MIL-S-83519)
1745-14	D-142-50	Inactive, Use SAE-AS83519/1-2(formerly MIL-S-83519)
1745-15	D-142-51	Inactive, Use SAE-AS83519/1-3 (formerly MIL-S-83519)
1745-16	D-142-52	Inactive, Use SAE-AS83519/1-5 (formerly MIL-S-83519)
1745-17	D-107-00	Inactive, Use SAE-AS83519/1-4 (formerly MIL-S-83519)
1745-18	D-104-00	
1745-19	D-105-00	
1745-20	D-107-31	
1745-21	D-104-31	
1745-22	D-105-31	
1745-23	D-142-56	Inactive, Use SAE-AS83519/1-4 (formerly MIL-S-83519)
1745-24	D-142-65	
1745-25	D-142-66	
1746-1	D-144-25	Inactive, Use SAE-AS83519/1-1 (formerly MIL-S-83519)
1746-2	D-144-00	Inactive, Use SAE-AS83519/1-2 (formerly MIL-S-83519)
1746-3	D-144-01	Inactive, Use SAE-AS83519/1-3 (formerly MIL-S-83519)
1746-4	D-144-02	Inactive, Use SAE-AS83519/1-5 (formerly MIL-S-83519)
1746-5	D-144-26	
1746-6	D-144-03	
1746-7	D-144-04	
1746-8	D-144-05	
1746-9	D-144-46	Inactive, Use SAE-AS83519/1-4 (formerly MIL-S-83519)
1746-10	D-144-37	

Military Part No.	TE S01/S02 Series* Part No.	TE SO63 Series** Part No.
M83519/1-1	S01-01-R	SO63-1-00
M83519/1-2	S01-02-R	SO63-2-00
M83519/1-3	S01-03-R	SO63-3-00
M83519/1-4	S01-04-R	SO63-4-00
M83519/1-5	S01-05-R	SO63-5-00
M83519/2-1	S02-01-R	SO63-1-55-20-90
M83519/2-2	S02-02-R	SO63-2-55-20-90
M83519/2-3	S02-03-R	SO63-3-55-20-90
M83519/2-4	S02-04-R	SO63-4-55-20-90
M83519/2-5	S02-05-R	SO63-5-55-20-90
M83519/2-6	S02-06-R	SO63-1-55-22-90
M83519/2-7	S02-07-R	SO63-2-55-22-90
M83519/2-8	S02-08-R	SO63-3-55-22-90
M83519/2-9	S02-09-R	SO63-4-55-22-90
M83519/2-10	S02-10-R	SO63-5-55-22-90
M83519/2-11	S02-11-R	SO63-1-55-24-90
M83519/2-12	S02-12-R	SO63-2-55-24-90
M83519/2-13	S02-13-R	SO63-3-55-24-90
M83519/2-14	S02-14-R	SO63-4-55-24-90
M83519/2-15	S02-15-R	SO63-5-55-24-90
M83519/2-16	S02-16-R	SO63-1-55-26-90
M83519/2-17	S02-17-R	SO63-2-55-26-90
M83519/2-18	S02-18-R	SO63-3-55-26-90
M83519/2-19	S02-19-R	SO63-4-55-26-90
M83519/2-20	S02-20-R	SO63-5-55-26-90

* QPL listed to SAE-AS83519 (formerly MIL-S-83519)
** Meets performance requirements of SAE-AS83519 (formerly MIL-S-83519)

Coaxial Cable Termination



Introduction

TE SolderSleeve coaxial cable terminators allow reliable, easy terminations in a variety of coaxial cable applications, including printed circuit boards (PCBs). The insulating and strain-relieving capabilities of SolderSleeve terminators provide the ideal solution to center-conductor breakage problems.

Designed for applications with temperatures up to 150°C [302°F], the products in this section include:

- SolderSleeve coaxial cable terminators, which allow reliable, economical attachment of coaxial cable to connector terminals, printed wiring assemblies, or solderless wrap terminals.
- One-piece SolderSleeve PCB coaxial cable terminators, which permit quick, easy, and cost-effective terminations of coaxial cable to printed circuit boards.
- RF one-step BNC/TNC connectors, which are single-piece assemblies for terminating the center conductor and the braid of a broad range of coaxial cables. They are fully intermateable with MIL-C-39012C connectors and are available in 50-ohm and 75-ohm versions).

With precisely measured solder and flux, SolderSleeve products provide exact process control of terminations. The SolderSleeve method means strong connections with the lowest possible voltage drop. Small, lightweight SolderSleeve terminators are also the ideal solution for high-density packaging problems.



SolderSleeve Coaxial Cable Terminators

Product Selection Process

1. Select product series from the product options table below.
2. Select preinstalled lead type from the table below.
3. Determine cable RG number or dimensions.
4. Select part number from Table A (B-155, CWT series) or Table B (B-02X/B-04X series) on the next page.

VERSATILE

- Transparent polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, inspectability, strain relief (eliminates center conductor breakage), and insulation.
- Prefluxed solder preform provides a controlled soldering process

EASY TO USE

- One-piece design means easy installation and lower installed cost
- Optional preinstalled ground leads provide convenience and ease of installation

APPLICATIONS

- Used for terminating coaxial cable to component terminals, contacts, printed circuit boards, and solderless wrap terminals.

Product Characteristics

Material		
Insulation (B-02X/B-04X, D-181, D-184)	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride	
Insulation (B-155, CWT series)	Radiation-crosslinked, heat-shrinkable polyolefin	
Solder and flux (B-02X/B-04X, D-181)	Solder: Sn63 Pb37	Flux: ROL1 per ANSI-J-004 (RMA Flux)
Solder and flux (CWT series, D-184)	Solder: Sn50 Pb32 Cd18	Flux: ROM1 per ANSI-J-004 (RA Flux)
Solder and flux (B-155)	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 (B-155, CWT, D-184)	-55°C to 125°C [-67°F to 257°F]	
Temperature rating (B-02X/B-04X, D-181)	-55°C to 150°C [-67°F to 302°F]	
Insulation resistance	1000 megohms	

Product Options

Product Series	Max. Operating Temp.	Use on Cables Rated (Min)	Cable Shield Plating	Part No. Selection Table	Design
B-155, CWT	125°C [257°F]	85°C [185°F]	Tin, copper	A	2-pc.
B-02X/B-04X	150°C [302°F]	125°C [257°F]	Tin, silver	B	1-pc.
D-181	150°C [302°F]	125°C [257°F]	Tin, silver	C	2-pc.
D-184	125°C [257°F]	85°C [185°F]	Tin	D	2-pc.

Preinstalled Lead Descriptions

Series	Lead Type	Plating	Stranding	AWG	Length	Color
B-155, CWT	XL polyethelene	Tin	Stranded (W1)	22	150 [6.000]	White (cntr), green (grnd)
B-021	M81822/13 (solderless wrap)	Silver	Solid-OFHC	24—30	150 [6.000]	White (cntr), blue (grnd)
B-041	M81822/13 (solderless wrap)	Silver	Solid-OFHC	24—30	150 [6.000]	White (cntr), blue (grnd)
B-043	M81822/13 (solderless wrap)	Silver	Solid-OFHC	24—30	150 [6.000]	White (cntr), blue (grnd)
B-020	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), blue (grnd)
B-040	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), blue (grnd)
B-044	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), blue (grnd)
D-181-12XX	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), white w/black stripe (grnd)
D-181-22XX	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), white w/black stripe (grnd)
D-181-32XX	55A0111 (MIL-W-22759/32)	Tin	Stranded	20—30	150 [6.000]	White (cntr), white w/black stripe (grnd)
D-181-18XX	M81822/13	Silver	Solid	26 – 30	150 [6.000]	White (cntr), blue (grnd)
D-181-28XX	M81822/13	Silver	Solid	26 – 30	150 [6.000]	White (cntr), blue (grnd)
D-184	55A0111 (MIL-W-22759/32)	Tin	Stranded	20 – 26	150 [6.000]	White (cntr), white w/black stripe (grnd)

Table A. B-155 Series Part Numbers

Cable RG Number	Dimensions		Part No. With Preinstalled Lead AWG/0.38 mm² Green/White)
	Dielectric OD	Jacket OD	
174	0.80–2.30 [.032–.091]	1.30–2.80 [.051–.110]	CWT-4174-W122-5/9
58, 122	2.00–2.80 [.079–.110]	2.50–4.40 [.100–.173]	CWT-4058-W122-5/9
59	2.80–3.30 [.110–.130]	3.20–6.00 [.125–.235]	CWT-4059-W122-5/9

Table B. B-02X/B-04X Series Part Numbers

Part 1: Coaxial Product Group Selection

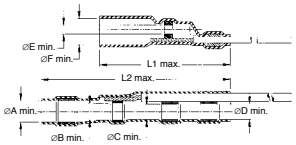
Typical Compatible Part No.		Dimension Range				
RG Cable Number	TE Cable Description	Jacket OD (Max.)	Shield OD	Dielectric OD	Conductor OD	One-Piece Coaxial Product Group
RG178, RG404	5030A13XX 5028A13XX	3.40 [.134]	1.30–2.30 [.051–.091]	0.50–1.70 [.019–.067]	0.30–0.80 [.011–.032]	Group 1
RG179, RG316	5024A13XX 7530A13XX 7526A13XX 9530A13XX	4.40 [.173]	1.50–2.80 [.060–.110]	1.20–2.50 [.047–.100]	0.30–1.60 [.011–.063]	Group 2
RG180, RG302, RG303	9527A13XX 9528A13XX	6.30 [.248]	2.40–4.60 [.094–.181]	1.40–4.30 [.055–.169]	0.30–2.80 [.011–.110]	Group 3

Part 2: Product Part Number Selection

One-Piece Coaxial Product Group	Preinstalled Wire Type	Preinstalled Wire Size					
		20 AWG	22 AWG	24 AWG	26 AWG	28 AWG	30 AWG
Group 1	Stranded (M22759)	—	B-044-22-N	B-044-24-N	B-044-26-N	—	—
	Solid (M81822)	—	—	B-043-24-N	B-043-26-N	B-043-28-N	B-043-30-N
Group 2	Stranded (M22759)	B-040-20-N	B-040-22-N	B-040-24-N	B-040-26-N	B-040-28-N	B-040-30-N
	Solid (M81822)	—	—	B-041-24-N	B-041-26-N	B-041-28-N	B-041-30-N
Group 3	Stranded (M22759)	B-020-20-N	B-020-22-N	B-020-24-N	B-020-26-N	—	—
	Solid (M81822)	—	—	—	B-021-26-N	—	—

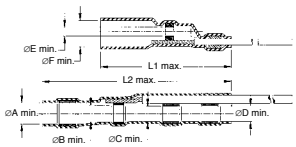
1. The B-02X/B-04X series uses a one-piece design to terminate coaxial cables rated at 125°C minimum.
2. Using Part 1 of this table, select the appropriate coaxial product group (1, 2, or 3) based on your RG cable number, TE cable description, or cable dimensions.
3. Using Part 2 of this table, select the product part number based on the coaxial product group you selected in Part 1 and the appropriate preinstalled lead type you selected on the previous page.

Table C. D-181 Series Part Numbers

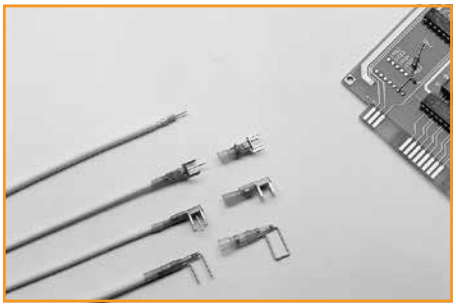


Product Name	Product Dimensions								Wire AWG
	A min.	B min.	C min.	D min.	E min.	F min.	L1 max.	L2 max.	
D-181-1220-90/9									20
D-181-1222-90/9									22
D-181-1224-90/9	3.7 [0.145]	3.2 [0.125]	2.7 [0.105]	2.4 [0.095]	0.71 [0.028]	2.3 [0.09]	17 [0.67]	21.5 [0.85]	24
D-181-1226-90/9									26
D-181-1826-6/9									26
D-181-1830-6/9									30
D-181-2220-90/9									20
D-181-2222-90/9									22
D-181-2224-90/9	4.5 [0.18]	4 [0.16]	3.45 [0.135]	2.9 [0.115]	1.1 [0.045]	3 [0.12]	17 [0.67]	22.7 [0.895]	24
D-181-2226-90/9									26
D-181-2826-6/9									26
D-181-2830-6/9									30
D-181-3220-90/9									20
D-181-3222-90/9								]	22
D-181-3224-90/9	5.2 [0.205]	4.7 [0.185]	4.45 [0.175]	3.95 [0.155]	1.3 [0.055]	4 [0.16]	17 [0.67]	21.5 [0.85]	24
D-181-3226-90/9									26
D-181-3826-6/9									26
D-181-3830-6/9									30

Table D. D-184 Series Part Numbers



Product Name	Product Dimensions								Wire AWG
	ØA min.	ØB min.	ØC min.	ØD min.	ØE min.	ØF min.	L1 max.	L2 max.	
D-184-1220-90/9									20
D-184-1222-90/9	3.7 [0.145]	3.2 [0.125]	2.7 [0.105]	2.4 [0.095]	0.71 [0.028]	2.3 [0.09]	17 [0.67]	21.5 [0.85]	22
D-184-1224-90/9									24
D-184-1226-90/9									26
D-184-2220-90/9									20
D-184-2222-90/9	4.5 [0.18]	4 [0.16]	3.45 [0.135]	2.9 [0.115]	1.1 [0.045]	3 [0.12]	17 [0.67]	22.7 [0.895]	22
D-184-2224-90/9									24
D-184-2226-90/9									26



SolderSleeve PCB/Coaxial Cable Terminators

VERSATILE

- Transparent polyvinylidene fluoride or polyolefin insulation sleeve provides encapsulation, inspectability, strain relief (eliminates center conductor breakage), and insulation.
- Prefluxed solder preform provides a controlled soldering process

EASY TO USE

- One-piece design means easy installation and lower installed cost
- Optional preinstalled ground leads provide convenience and ease of installation

APPLICATIONS

- Used for terminating coaxial cable to component terminals, contacts, printed circuit boards, and solderless wrap terminals.

Installation Requirements

For proper installation of these devices, the correct heating tool and reflector attachment must be used. Any one of the following TE heating tools is recommended:

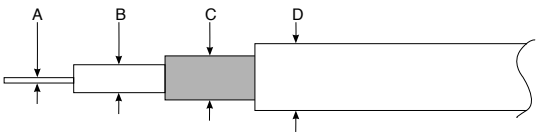
- HL1920E/HL2020E
- AA-400 Super Heater
- IR-1759 MiniRay
- CV-1981

Refer to TE installation procedure ES-61139 for detailed instructions and recommended reflector attachments.

Product Selection Process

1. Select product series from the Product Options table below.
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 below for cable dimensions).



Product Options

Product Series	Typical Application Performance	Shield Method	Part No. 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

Specifications/Approvals

Series	TE
D-607	RT-1404
B-046	RT-1404

Table A. D-607 Series Part Numbers

RG Cable No.	Cable Dimensions (mm/in) Max. Outside Diameter			Part No. Entry to PCB		
	Jacket	Shield	Dielectric	Straight grid 5.08 [.200]	Right-Angle Grid 5.08 [.200]	Straight Grid 2.54 [.100]
174, 178, 179, 316, 404	1.5–3.55 [.060–.140]	1.1–3.15 [.045–.125]	0.60–2.25 [.025–.090]	D-607-09	D-607-10	D-607-40*

Table B. B-046 Series Part Numbers

RG Cable No.	Cable Dimensions				Pin Diameter	Part No.		
	A	B	C	D Max.		Spacing Between Pins 2.54 [.100]	5.08 [.200]	6.35 [.250]
178, 404	0.30–0.80 [.011–.032]	0.5–1.7 [.019–.067]	1.3–2.3 [.050–.091]	3.4 [.134]	0.6 [.023] 0.8 [.031]	B-046-14-N	B-046-10-N	B-046-12-N
							B-046-11-N	B-046-13-N
179, 316	0.3–1.6 [.011–.063]	1.2–2.5 [.047–.100]	.1.5–2.8 [.060–.110]	4.4 [.173]	0.6 [.023] 0.8 [.031]	B-046-15-N	B-046-66-N	B-046-16-N
							B-046-68-N	B-046-18-N

Product Characteristics

Material		
Insulation	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride	
Solder and flux	Solder: Sn63 Pb37	Flux: ROL1 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 [-67°F to 302°F]	
Insulation resistance	1000 megohms	
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.

RF One Step BNC/TNC Connectors

DURABLE

- Outstanding cable-retention force
- Exceptional cable retention force to withstand high vibration and frequent mates and unmates
- Excellent built-in strain relief against vibration and excessive handling

CAPABLE

- Long-term reliability
- Meets performance requirements of MIL-C-39012 up to 2.8 GHz
- Solder-solder connection type (center conductor and braid)
- Fully soldered center conductor and braid

VERSATILE

- Three product sizes to accommodate a wide range of cables
- Use with standard RG/U cables and TE Cheminax cables

EASY TO USE

- One-step termination for easy, quick installation and lower installed cost

Applications

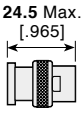
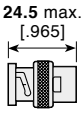
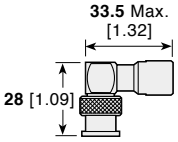
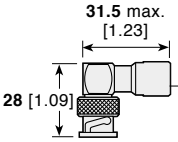
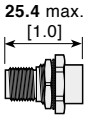
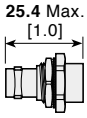
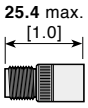
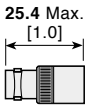
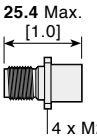
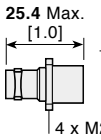
One-Step BNC/TNC connectors are single-piece assemblies for terminating the center conductor and the braid of a broad range of coaxial cables.

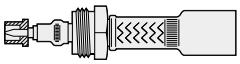
The connectors are fully intermateable with MIL-C-39012 connectors and are available in 50-ohm and 75-ohm versions.



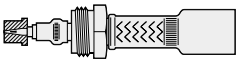
Specifications	Installation	
TE RB-115	For proper installation of these devices, the correct heating tool and reflector attachment must be used. Any one of the following TE heating tools is recommended: • Steinel® Model HL-2010E-230V • CV-1981	Refer to TE installation procedure RPIP-683-00 for detailed instructions.

Product Options and Part Numbering System

RXX - XX - X - XX	Connector Style Dash No. -XX	Style	Connector Type TNC	Connector Type BNC
	-00	Straight plug		
	-01	Right-angle plug		
	-02	Straight bulkhead jack		
	-03	Straight jack		
	-04	Straight panel jack		



Male



Female

Connector size

L = Large
M = Medium
S = Small

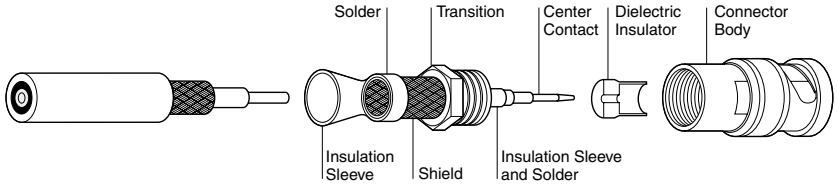
50 = 50 ohms
75 = 75 ohms

D = Nickel-plated brass body, gold-plated brass pin

B = BNC
T = TNC

Example: RBD-50-L-00 is a BNC connector, 50 ohms, large size, with straight plug body.

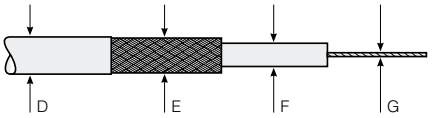
Product Characteristics



Material	
Center contact	Gold-plated beryllium copper (female)
	Gold-plated brass (male)
Dielectric insulator	PTFE
Transition	Silver-plated brass
Connector body	Nickel-plated brass
Solder and flux	Sn63Pb37, RMA flux
Braided shield	Tin-plated copper wire per ASTM B3
Insulation sleeve	Radiation-crosslinked, heat-shrinkable polyvinylidene fluoride, transparent blue
Strain relief/sealing sleeve	Radiation-crosslinked, heat-shrinkable modified polyolefin with adhesive, black
Typical Performance	
Dielectric withstand voltage	1500 V
Insulation resistance	5000 megohms
Temperature rating	-55˚C to 150˚C [-67˚F to 302˚F]
Contact resistance-straight	Inner = 1.5 milliohms, outer = 1.0 milliohm
Contact resistance — right-angle	Inner = 2.5 milliohms, outer = 1.5 milliohms
Cable retention force	295N (66 lb) to 822N (196 lb)
Voltage rating	500 V RMS
Connector durability	500 mating cycles minimum
Electrical Performance	
Nominal impedance	50 and 75 ohms
Frequency range	Up to 2.8 GHz

Part Selection Process

1. From Product Options and Part Numbering System, select the connector style you need (BNC or TNC, plug or jack, male or female contacts).
2. From the tables that follow, find the appropriate table for the connector style you selected.
3. From the appropriate table, select the connector part number based on the RG cable type or cable part number. For cable types not shown use the cable dimensions.
   Note: The cable dimensions in each table are keyed to the diagram below.



Impedance (ohms)	Cable Type RG Cables	Cables	Cable Dimensions D (Min.–Max.)	E (Min.–Max.)	F (Max.)	G (Max.)	Part No.
BNC Straight Plugs, Male Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-50-S-00
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RBD-50-M-00
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-50-L-00
75	RG-179, RG-187	7530A1317	1.50–5.00 [.060–.217]	5 0.90-3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-75-S-00
75	—	7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.126]	1.25 [.050]	RBD-75-M-00
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00–.12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.3 [.287]	2.45 [.100]	RBD-75-L-00
BNC Right-Angle Plugs, Male Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-50-S-01
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RBD-50-M-01
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.1–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-50-L-01
75	RG-179, RG-187	7530A1317	1.50–5.50 [.060–.217]	0.9-3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-75-S-01
75	—	524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.1–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RBD-75-M-01
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00–12.50 [.197–.500]	4.1–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-75-L-01
BNC Straight Bulkhead Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-50-S-02
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RBD-50-M-02
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-50-L-02
75	RG-179, RG-187	7530A1317	1.50–5.00 [.060–.217]	5 0.90-3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-75-S-02
75	—	75 7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RBD-75-M-02
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00-12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-75-L-02
BNC Straight Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-50-S-03
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RBD-50-M-03
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-50-L-03
75	RG-179, RG-187	7530A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-75-S-03
75	—	75 7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RBD-75-M-03
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-75-L-03
BNC Straight Panel Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-50-S-04
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RBD-50-M-04
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-50-L-04
75	RG-179, RG-187	7530A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RBD-75-S-04
75	—	7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RBD-75-M-04
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00–12.50 [.197–.500]	4.10–9.5o [.161–.375]	7.30 [.287]	2.45 [.100]	RBD-75-L-04

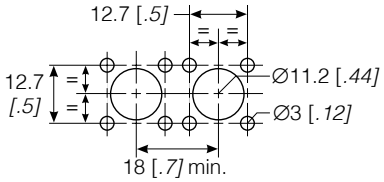
TNC Coaxial Connectors

Impedance (ohms)	Cable Type RG Cables	Cables	Cable Dimensions D (Min.–Max.)	E (Min.–Max.)	F (Max.)	G (Max.)	Part No.
TNC Straight Plugs, Male Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-50-S-00
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RTD-50-M-00
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-50-L-00
75	RG-179, RG-187	7530A1317	1.50–5.50 [.060–.217]	0.90-3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-75-S-00
75	—	7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RTD-75-M-00
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-75-L-00
TNC Straight Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.5–5.5 [.060–.217]	0.9–3.0 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-50-S-03
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.5–7.0 [.138–.276]	2.1–5.0 [.083–.197]	3.0 [.118]	1.25 [.050]	RTD-50-M-03
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.0–12.5 [.197–.500]	4.1–9.5 [.161–.375]	7.3 [.287]	2.45 [.100]	RTD-50-L-03
75	RG-179, RG-187	7530A1317	1.5–5.5 [.060–.217]	0.9–3.0 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-75-S-03
75	—	7524A1311, 7528A1317	3.5–7.0 [.138–.276]	2.1–5.0 [.083–.197]	3.7 [.146]	1.25 [.050]	RTD-75-M-03
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.0–12.5 [.197–.500]	4.1–9.5 [.161–.375]	7.3 [.287]	2.45 [.100]	RTD-75-L-03
TNC Straight Panel Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.5–5.5 [.060–.217]	0.9–3.0 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-50-S-04
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.5–7.0 [.138–.276]	2.1–5.0 [.083–.197]	3.0 [.118]	1.25 [.050]	RTD-50-M-04
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.0–12.5 [.197–.500]	4.1–9.5 [.161–.375]	7.3 [.287]	2.45 [.100]	RTD-50-L-04
75	RG-179, RG-187	7530A1317	1.5–5.5 [.060–.217]	0.9–3.0 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-75-S-04
75	—	7524A1311, 7528A1317	3.5–7.0 [.138–.276]	2.1–5.0 [.083–.197]	3.7 [.146]	1.25 [.050]	RTD-75-M-04
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.0–12.5 [.197–.500]	4.1–9.5 [.161–.375]	7.3 [.287]	2.45 [.100]	RTD-75-L-04

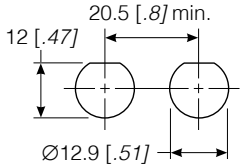
TNC Coaxial Connectors

Panel thickness: 3.2 [.125] max.

RBD-XX-X-04
RTD-XX-X-04

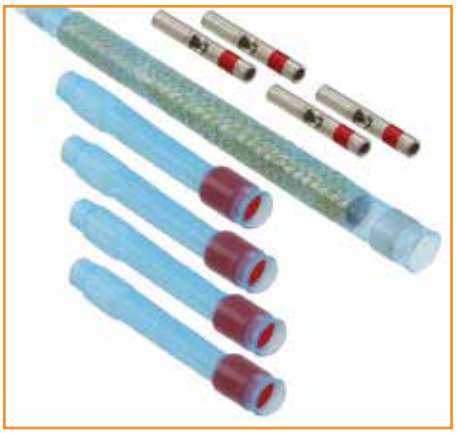


RBD-XX-X -02
RTD-XX-X -02



Cable Type			Cable Dimensions				Part No.
Impedance (ohms)	RG Cables	Cables	D (Min.–Max.)	E (Min.–Max.)	F (Max.)	G (Max.)	
TNC Straight Bulkhead Jacks, Female Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-50-S-02
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.5–7.0 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RTD-50-M-02
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.0–12.5 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-50-L-02
75	RG-179, RG-187	7530A1317	1.5–5.5 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-75-S-02
75	—	7524A1311, 7528A1317	3.5–7.0 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RTD-75-M-02
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.0–12.5 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-75-L-02
TNC Right-Angle Plugs, Male Contacts							
50	RG-174, RG-178, RG-188, RG-196,RG–316	5026A1311, 5028A1317, 5030A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-50-S-01
50	RG-58, RG-141, RG-142, RG-303, RG-400	5019D3318, 5021D1331, 5020A1311	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.00 [.118]	1.25 [.050]	RTD-50-M-01
50	RG-165, RG-215, RG-213, RG-225, RG-214	5012F3332, 5012A3311	5.00–12.50 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-50-L-01
75	RG-179, RG-187	7530A1317	1.50–5.50 [.060–.217]	0.90–3.00 [.035–.118]	1.55 [.060]	0.65 [.025]	RTD-75-S-01
75	—	7524A1311, 7528A1317	3.50–7.00 [.138–.276]	2.10–5.00 [.083–.197]	3.70 [.146]	1.25 [.050]	RTD-75-M-01
75	RG-6, RG-11, RG-12, RG-59 RG-144, RG-216	—	5.0–12.5 [.197–.500]	4.10–9.50 [.161–.375]	7.30 [.287]	2.45 [.100]	RTD-75-L-01

Cable-to-Cable Splicing



Introduction

The question is, how to meet growing performance requirements for shielded cable system fabrication and maintenance while minimizing electromagnetic interference (EMI). The answer is TE SolderShield cable splices. SolderShield devices are one-piece products consisting of a flux-coated, solder-impregnated copper shield braid encased in a heat-shrinkable insulation sleeve.

SolderShield cable-to-cable splice kits, designed for single-conductor or multiconductor shielded cables, are ideal for fabrication/repair/rework while restoring the electrical integrity of the cable.

SolderShield devices perform even in demanding environments. They are reliable, versatile, and easy to install.



VERSATILE

- 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

EASY TO USE

- One-piece design means easy installation and lower installed cost

CAPABLE

- Circumferential (360°) shielding results in EMI protection and shield continuity equal to or better than the original cable
- Conductor splices are made using MiniSeal crimp products, which are recognized by MIL-S-81824 and MIL-W-5088

SolderSleeve Shielded and Coaxial Cable Splices

Product Selection Process

1. Select product series from the Product Options table below.
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 below for cable dimensions).

Installation Requirements

For proper installation of these devices, the correct heating tool and reflector attachment must be used. Any one of the following TE heating tools is recommended:

- HL1920E/HL2020E
- IR-1759 MiniRay
- CV-1981

Refer to TE installation procedure RCPS-150-02 (D-150 series) and RPIP-699-00 (B-202 series) for detailed instructions and recommended reflector attachment.

Applications

Used for splicing a wide range of cables, including coaxial and multiconductor cables.

SolderShield devices can be used to repair or splice shielded or coaxial cables. These products consist of a MiniSeal crimp splice plus a flux-coated, solder-impregnated copper shield encased in a heat-shrinkable sealing sleeve, for splicing the shields. SolderShield kits terminate single- or multiple-conductor cables, eliminate EMI problems at the splice, and provide strain relief for the cable.

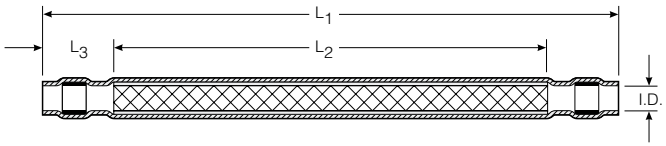
Specifications/Approvals

Series	Military	TE
D-150	US: M81824 (conductor splice only) UK: RAF AP 1130-2008-1	RT-1404

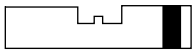
Table A. Multiconductor Cable Splices

Each SolderShield part consists of a SolderShield splice and one or more conductor splices. Refer to information below for description and numbers of conductor splices.

SolderShield Splice



Crimp Splice



SolderShield Product Dimensions

Part No.		Dimensions				Conductor Splice Size Range CMA [mm²] Min.–Max.	Color Code	Quantity Per Kit
Tin Plated	Nickel Plated	L1 Max.	L2 Nom.	L3 Min.	ID Min.			
D-150-0168	D-150-0228	80.50 [3.17]	50.00 [1.97]	10.20 [.400]	3.00 [.118]	304–1510 [0.15–0.75]	Red	1
D-150-0169	D-150-0229	80.50 [3.17]	50.00 [1.97]	10.20 [.400]	4.00 [.157]	779–2680 [0.39–1.34]	Blue	1
D-150-0170	D-150-0230	80.50 [3.17]	50.00 [1.97]	10.20 [.400]	5.00 [.197]	1900–6755 [0.95–3.37]	Yellow	1
D-150-0174	D-150-0231	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	4.00 [.157]	304–1510 [0.15–0.75]	Red	2
D-150-0175	D-150-0232	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	5.00 [.197]	779–2680 [0.39–1.34]	Blue	2
D-150-0176	D-150-0233	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	6.00 [.236]	1900–6755 [0.95–3.37]	Yellow	2
D-150-0177	D-150-0234	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	9.00 [.356]	304–1510 [0.15–0.75]	Yellow	2
D-150-0178	D-150-0235	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	4.00 [.157]	304–1510 [0.15–0.75]	Red	4
D-150-0179	D-150-0236	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	5.00 [.197]	779–2680 [0.39–1.34]	Red	4
D-150-0180	D-150-0237	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	6.00 [.236]	1900–6755 [0.95–3.37]	Blue	4
D-150-0181	D-150-0238	10.60 [4.17]	75.00 [2.95]	10.20 [.400]	9.00 [.353]	1900–6755 [0.95–3.37]	Yellow	4

Note: The SolderShield splice kits listed in this table are for 1:1 cable splices. The kits can be used on cables with tin-, silver-, and nickel-plated copper conductors. All the kits have environmental-sealing capability. The cable temperature rating must be 125°C minimum.

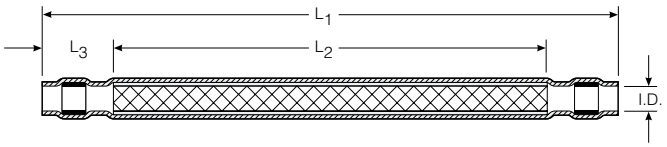
To find the splice kit part number for your application:

1. Determine the number of conductors in the cable to be spliced.
2. Determine the gauge of each conductor or the maximum jacket OD.
3. Determine the conductor plating.
4. Select the appropriate part number from the table above.

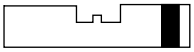
Table B. Coaxial Cable Splices

Each SolderShield part consists of a SolderShield splice and one or more conductor splices. Refer to information below for description and numbers of conductor splices.

SolderShield Splice



Crimp Splice



RG Cable No.	Cable Description	Conductor Splice Qty/Kit	Part No.	SolderShield Dimensions		
				L1 Max	L2 Min	ID Min
8A, 9B, 11	5012A3311	1	D-150-0214	80.50 [3.170]	50.00 [1.970]	12.00 [.472]
13, 26, 31	5012E1339					
115, 144, 149	7518A1311					
165, 213, 214	—					
216, 235, 391	—					
393, 397	—					
178, 196,	5028A1317	1	D-150-0094	80.50 [3.170]	50.00 [1.970]	3.00 [.118]
179, 187, 188,	7528A1317					
316, 404, M17/138-00001,	5030A1317					
M17/136-00001	7530A1317					
180, 195	5024A1311	1	D-150-0095	80.50 [3.170]	50.00 [1.970]	4.00 [.157]
M17/137-00001	7526A1311					
M17/139-00001	9527A1318					
—	9530E1014					
124, 140, 141	5020A1311	1	D-150-0096	80.50 [3.170]	50.00 [1.970]	5.00 [.236]
159, 302, 303	5022A1311					
—	7522A1311					
—	7523D1331					
—	7524A1311					
29, 30, 55B	5019D3318	1	B-202-81*	56.00 [2.200]	23.00 [.900]	7.00 [.275]
58, 223	5021D1331					
—	5022A1311					
59, 62, 71	7523D1331	1	B-202-82*	56.00 [2.200]	23.00 [.900]	7.00 [.275]
—	7524A1311					
—	9524A1311					

*These kits use solder to terminate the center conductors. All other kits use crimp.
All kits are for one-to-one coaxial cable splices, and all kits have environmental sealing capability. Each kit contains products to splice conductors, build up dielectric, splice the shield, and provide insulation.

Product Characteristics

Materials	
Insulation sleeve	Radiation-crosslinked polyvinylidene fluoride
Meltable 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 and flux coating: Type Sn63 Pb37. Flux: ROM1 per ANSI - J - STD - 004 (RA flux)

Parameter	Test Method	Requirement
Electromechanical Performance		
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 2.0-millivolt increase
Insulation resistance (shield connection)	—	1000 megohms minimum at 500 Vdc
Insulation resistance (conductor connection)	—	5000 megohms
Tensile strength for MiniSeal	MIL-S-81824	Exceed yield strength (pounds) of wire.
Tensile strength for SolderShield	MIL-S-81824	75% of strength (pounds) of unspliced cable
Temperature rating	—	-55°C to 150°C [-67°F to 302°F]
Environmental Resistance		
Salt spray	MIL-STD-202 M101	Meet voltage drop requirement.
Heat aging	750 hours at 150°C [302°F]	Meet all electromechanical requirements.
Temperature cycling	MIL-STD-202 M107C	Meet all electromechanical requirements.
Altitude immersion	Immersion at 22,860m [75,000 ft]	Meet insulation-resistance requirement.
Corrosion resistance	with MIL-STD-202, Method 101, Test Condition A	No evidence of corrosion after testing in accordance



EASY INSTALLATION

- Easy to install: saves time, manpower, and cost
- Color-coded to ensure proper sizing for each application
- Low profile (small diameter and short length)
- Side entry for easy access to damaged wire

MECHANICALLY ROBUST

- 150˚C rated
- Long-term performance provides a permanent repair
- Wrap-around design eliminates de-pinning of connector for repair

Raychem C-Wrap Side Entry Repair Sleeve

TE Connectivity's (TE) C-Wrap repair sleeve is a side-entry sleeve designed to repair and seal a damaged wire jacket that is either chafed or has a radial crack or cut on the insulation. It consists of two pieces: the outer tubing and an adhesive inner layer.

MECHANICAL/ENVIRONMENTAL

- Environmental resistant
- Ideal for use on insulations rated at 135˚C or higher
- **Temperature range:** -65˚C to +150˚C

MATERIALS

- **Meltable Adhesive:** Modified thermoplastic fluoroelastomer
- **Insulation Sleeve:** Radiation cross-linked modified fluoropolymer

STANDARDS

- **SAE AS81824** (fluid and sealing requirements)
- **TE Performance Specification:** D-6201
- **TE Application Specification:** RPIP-1101
- **TE Qualification Test Reports:** ISTR-1134 and ISTR-1206

APPLICATION TOOLING

- **General Purpose Heat Gun:** Steinel HL19XX or HL20XX
- **SolderSleeve Reflector:** Steinel HL1802E-074616
- **Mil Spec installation tools:**
  D-150-C-11: M81969/8-08
  D-150-C-12: M81969/8-08
  D-150-C-13: M81969/8-10
  D-150-C-14: M81969/8-10

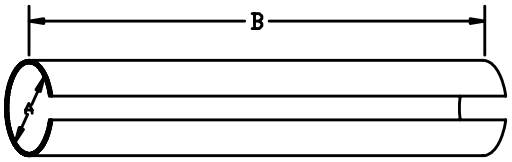
  Contact TE for details on installation tooling

APPLICATIONS

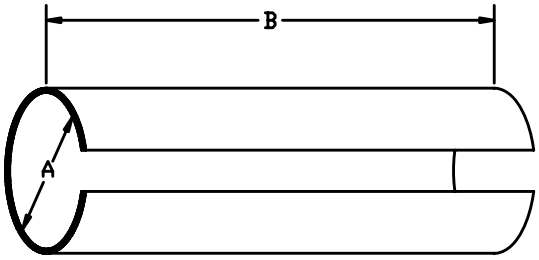
- Used as a side-entry repair kit
- Repair of nicks, chafed and radial cracks on the wire in most Aerospace, Defense and Marine applications
- Prevents galvanic corrosion on center conductor
- RoHS compliant

ORDERING INFORMATION

ADHESIVE



OUTER SLEEVE



Part Description	Color Code	Product Dimension				Conductor	
		I.D. (A)		Cut Length (B)		AWG	Wire OD (Note*)
		Adhesive ±.05 (.002)	Sleeve ±.05 (.002)	Adhesive ±.5 (.02)	Sleeve ±.5 (.02)		
D-150-C-11	Green	1.11 (.044)	2.29 (.090)	21.59 (.85)	19.05 (.75)	26 - 24	0.80 - 1.10 (.031 - .043)
D-150-C-12	Red	1.68 (.066)	2.74 (.108)	21.59 (.85)	19.05 (.75)	22 - 20	1.10 - 1.50 (.043 - .029)
D-150-C-13	Blue	2.13 (.084)	3.43 (.135)	21.59 (.85)	19.05 (.75)	18 - 16	1.50 - 2.30 (.059 - .090)
D-150-C-14	Yellow	3.34 (.133)	4.80 (.189)	21.59 (.85)	19.05 (.75)	14 - 12	2.30 - 2.80 (.090 - .110)

MATERIALS

- **Meltable Adhesives:** Environment-resistant modified thermoplastic fluoroelastomer. Color coded.
- **Insulation Sleeve:** Heat-shrinkable, transparent, radiation cross-linked modified fluoropolymer. Color coded.

APPLICATION

- Parts are designed to provide an environment-resistant repair to damaged primary wire that has a radial crack up to 360°, nicks/scrapes not longer than 1/4" on insulations rated for 135°C minimum with no damage to the wire conductor. For insulation procedures, refer to RPIP 1101.
- Install using TE approved convection or infrared heating tools in accordance with TE. When installed with approved convection or infrared heating tools, assemblies will meet the performance requirements of TE D-6201 specification. Infrared tools are not recommended for use with black cable jackets.
- Temperature range: -65°C to +150°C.

Note*: If the O.D. of the wire is out of the range that is specified in the Table, use the next size of C-Wrap up or down





D-150-C-11
(Part No. CX2001-000)
NSN 5970-01-611-8609



D-150-C-12
(Part No. CX2096-000)
NSN 5970-01-611-8596



D-150-C-13
(Part No. CX2097-000)
NSN 5970-01-611-8600



D-150-C-14
(Part No. CX2098-000)
NSN 5970-01-611-8586



Rayseal High-Performance, Large-Gauge Cable Repair

The Rayseal large gauge cable repair sleeve is a high-performance side-entry repair product for large gauge and power feeder cables (8 AWG to 4/0 AWG) with chafed or cracked insulation.

Its tough fluoropolymer material has been specially formulated by TE to give greater resistance to mechanical abrasion and common aerospace fuels and fluids. The high-temperature adhesive lining, by sealing around the underlying damage to the cable jacket, maintains the cable jacket properties as close as possible to its original specification.

The operating temperature range from -65°C to +260°C helps ensure excellent high-temperature performance.

RUGGED PERFORMANCE

- Designed for 8 AWG to 4/0 AWG cable
- Abrasion-resistant fluoropolymer
- Resists aerospace fuels and fluids

COST SAVINGS

- Easy to install: helps save manpower and cost
- Permanent, tough and robust repair
- Side entry helps reduce repair times

VERSATILE

- Make permanent repairs to chafed and cracked cable insulation
- High-temperature adhesive lining seals around repair
- -65°C to +260°C temperature range

APPLICATIONS

- Military Aerospace and Defense
- Commercial Air
- Military Ground Systems

ENVIRONMENTAL/MECHANICAL

- **Operating temperatures:** -65°C to +260°C
- **Durability:** Adheres and seals for permanent repair
- **Fluid resistance:** Resists aggressive fluids used in military and aerospace platforms

MATERIALS

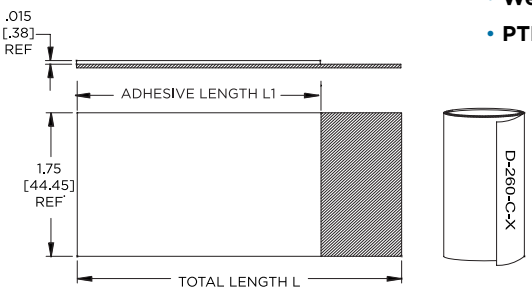
- **Sleeve:** Fluoropolymer, black
- **Adhesive:** Fluoropolymer

TOOLING

- **Heat gun:** CV2014-JETS-120V460W-UL (US plug)
  CV2014-JETS-230V460W-EU (European plug)
  CV2014-JETS-230V460W-UK (UK plug)
  PR-38-B-REFLECTOR

EACH KIT ALSO CONTAINS:

- **Abrasive Cleaning Pad, 2" x 2"**
- **Wet/Dry Cleaning Wipes, 2-Package Kit**
- **PTFE Tape, 2 Mils Thick, 1" Wide, 30" Long**



Cable		Sleeve Dimensions		Part Description	Kit Part No.
Wire Size (AWG)	Cable OD	L	L1		
10, 8	.137-203 [3.48-5.16]	1.40 [35.6]	1.00 [24.5]	D-260-C-A	**EF7428-000**
6, 4	.225-.308 [5.72-7.82]	1.70 [43.2]	1.25 [31.8]	D-260-C-B	**EF7429-000**
2, 1/0	.356-.465 [9.04-11.81]	2.20 [55.9]	1.75 [44.5]	D-260-C-C	**EF7430-000**
2/0, 3/0	.485-.590 [14.99-12.32]	2.67 [67.8]	2.10 [53.3]	D-260-C-D	**EF7431-000**
4/0	.590-.640 [14.99-16.26]	3.10 [78.8]	2.50 [63.5]	D-260-C-E	**EF7432-000**



DURABLE SPLICING

- Resistant to most common aerospace fluids
- Flexible splice for long-term performance
- Immersion resistant, sealed cable splice with 360° shielding

HIGH PERFORMANCE

- Rated for 200°C continuous operating temperature
- Resists vibration and mechanical shock without loss of signal
- Splice allows bending without insulation cracking

VERSATILE

- Cables can be spliced with existing heating and crimping tools
- Additional sealing rings allow splicing 1 to 1, 2 to 1, and 2 to 2 constructions
- Works with shielded single, paired, and triple cables
- 26 AWG to 10 AWG wire range

Raychem D-200 Flexible Splice Kit

Our D-200 flexible splice kit features environmentally resistant, high-temperature splices with EMI protection and flexibility.

In-Line Splicing for Harsh Aerospace and Defense Applications

An important extension of the Raychem family of termination devices, the D-200 splice kit is specially designed for use in demanding high temperature aerospace and defense applications.

Fast Installation and Lower Costs

Make in-line splices fast and easy with the D-200 flexible splice kit. Whether splicing shielded single, twisted pair, or trio cables, the D-200 splice kit creates a permanent, flexible, immersion-resistant splice for long-term reliable performance in the harshest environments. Easy installation with existing crimp and heating tools results in a lower total installed cost.


D-200-0232-RT


D-200-0233-RT


D-200-0237-RT

STANDARDS AND TEST REPORT

- **SAE AMS-DTL-23053/13** (applies to insulation sleeve only)
- **SAE AS81824/11**
- **TE Performance Specification:** D-6203
- **TE Qualification Test Report:** ISTR-1404

MATERIALS

- **Cable Sealing Sleeve**
  Insulation Sleeve: Heat-shrinkable fluoropolymer, black
  Meltable Inserts: Environment-resistant thermoplastic fluoroelastomer, light blue
- **SolderSleeve Device**
  Insulation Sleeve: Heat-shrinkable fluoropolymer, transparent blue
  Solder Preform with Flux: 96% tin per ANSI/J-STD-006. ROM1 per ANSI/J-STD-004
  Meltable Insert: Thermoplastic, blue
- **Crimp Splice**: Nickel-plated copper alloy
- **Sealing Splice Sleeve**: Heat-shrinkable fluoropolymer, containing two environment-resistant sealing rings, transparent blue
- **Meltable Insert**: Environment-resistant thermoplastic fluoroelastomer, light blue

PHYSICAL PROPERTIES

- **Tensile Strength**: 75% min. of an unspliced cable
- **Vibration and Mechanical Shock**: Resistant without loss of signal
- **Temperature Range**: -55°C to 200°C

CHEMICAL PROPERTIES

- **Immersion Resistance**: Resists most common aerospace fluids (e.g., fuels, oils, MPK, etc.)
- **Immersion Resistance Altitude**: 75,000 feet

ELECTRICAL PROPERTIES

- **Voltage Drop**: Voltage drop across spliced conductors and shield do not exceed equivalent length of unspliced cable
- **Dielectric Strength**: 2500 V
- **Insulation Resistance**: 100 V

TOOLING

- Steinel HL20XXE heat gun
- TE IR-550 infrared tool
- TE AD-1377 crimp tool
- TE 46447 crimp tool

Number of Conductors	Wire Range (AWG)	Color Code	Part Description	Part Number
1	26 – 20	Red	D-200-0228-RT	CV7712-000
	20 – 16	Blue	D-200-0230-RT	EG4031-000
	16 – 12	Yellow	D-200-0232-RT	EG4032-000
	12 – 10	None	D-200-0242-RT	EG3869-000
2	26 – 20	Red	D-200-0233-RT	EG3678-000
	20 – 16	Blue	D-200-0234-RT	CU1642-000
	16 – 12	Yellow	D-200-0235-RT	EG3865-000
	12 – 10	None	D-200-0249-RT	CW7956-000
3	20 – 16	Blue	D-200-0237-RT	EG3867-000
	16 – 12	Yellow	D-200-0238-RT	EG3868-000
	12 – 10	None	D-200-0243-RT	CW7949-000

Shielded Contacts



Introduction

TE SolderTacts shielded contacts are designed to provide reliable, one-piece solder terminations for use with circular and rectangular connectors. These controlled soldering contacts help speed installation and reduce installed costs while eliminating the variables associated with hard-to-handle crimped terminations.

With TE's controlled soldering technology, the connections typically exceed the strength of the wire. Transparent insulation and inspection windows permit fully inspectable terminations.

SolderTacts products are available to terminate coaxial cable and twisted wire pairs in both military and commercial applications.



ECONOMICAL

- One-piece contact design with integrated soldering technology
- One-step installation process
- One contact fits multiple cable sizes
- No special tools required

RELIABLE

- 360° shielding reduces crosstalk and improves signal transmission
- Reflow solder joints are strong and reliable
- Controlled reflow soldering process yields reliable, consistent terminations
- Terminations are fully inspectable

VERSATILE

- Compatible with a variety of commercial and military connectors
- Termination available for coax cables, shielded pairs, twisted pairs, and triaxial cables
- 150°C temperature rating

SolderTacts Shielded One-Piece Solder Contacts

One-piece controlled-reflow-solder SolderTacts contacts are designed to terminate coaxial cables, shielded wires and twisted pairs faster and more reliably than other methods. SolderTacts contacts help eliminate the variables of crimping. The one-step installation process helps cut down on production time while reducing handling and installed costs.

Controlled Soldering and Strain Relief

SolderTacts contacts provide the optimum amount and type of solder and flux in a prefluxed solder preform that controls soldering and reduces operator sensitivity. The geometry of the coaxial cable is carried through the connector to eliminate separate pins, help reduce crosstalk, and supports improved shielding effectiveness and signal transmission.

These contacts contain two SolderSleeve terminations. One terminator connects the cable's signal conductor to the contact's inner pin. The other terminator connects the shield or ground lead to the contact body. When the contact is heated, the solder melts to provide a precise solder connection. SolderTacts contacts provide a simultaneous electrical connection and strain relief. Heat shrinkable tubing insulations help eliminate stress concentration on the wire within the contact.

Improved Signal Integrity

For digital and RF signals, SolderTacts contacts offer better signal transmission than obtained with crimp contacts. They reduce crosstalk, signal attenuation, and reflections, while providing excellent protection against outside noise.

Compatibility

SolderTacts contacts are compatible with a wide range of circular and rectangular military and commercial connectors, including MIL-DTL-38999, MIL-DTL-83723 and MIL-DTL-28748. Compatible with most standard connector cavities, SolderTacts contacts are intermateable and intermountable with contacts qualified to the above connector specifications. They use standard insertion and extraction tools.

APPLICATION TOOLING

- **Steinel HL1920E or HL2020E**
- **Steinel HL1802E-074616**
- **Raychem CV-1981**
- **Raychem CV-1983**
- **Raychem AA-400**

For more details, please see TE Application Tooling brochure 1-1773872-1

SPECIFICATION

- **D-6002:** SolderTacts Military-Grade Electrical Contacts for Solder Termination

APPLICATIONS

- **Commercial Aerospace**
- **Military Aerospace**
- **C4ISR**
- **Ground Defense**
- **Military Marine**
- **Missile Defense**
- **Offshore/Civil Marine**
- **Space**

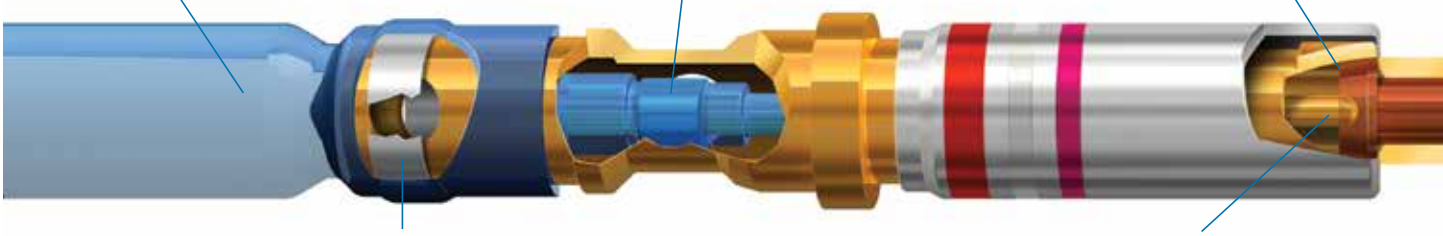




The outer SolderSleeve termination is a cross-linked heat-shrinkable insulating sleeve supplied in the expanded state. Cables insert easily, with no spacers or other parts required.

The inner SolderSleeve termination is a heat-shrinkable sleeve with a precisely prefluxed solder preform conforming to QQ-S-571.

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



The outer solder preform contains precise amounts of solder and flux conforming to QQ-S-571.

Inner pin and socket contacts are permanently fixed within the assembly to provide proper setback and concentricity.

SolderTact Series	Part No. (D-602-)	Engineering Standard (Termination Instructions)	Repair Wand	
			Part No.	Part Description
Submin	0218, 0219	ES-61170	959014-000	AD-1481-SUBMN-SLDTK-HOLDR
	0238, 0239	ES-61169		
748	44, 45	ES-61133	994040-000	AD-1480
	0172, 0173	ES-61240		
	54, 55	ES-61132		
	0126, 0127	ES-61199		
	D-610-09, -10	ES-61187	551737-000	AD-1571-1-POWERTACT-HOLDR
723	0094, 0095	ES-61128	994057-000	AD-14940723-SLTC-HLD-ASY
	0106, 0107	ES-61134		
	0104, 0105	ES-61129		
No. 12	16, 17	ES-61161	966800-000	AD-1508-REP-FOR-12-CONT
482	46, 47	ES-61137	181779-000	AD-1565-1-SLDTCT-HLDR-ASY
	56, 57	ES-61138		
999 Size 16	0140, 0141	ES-61226	859747-000	AD-1572-1-SOLD-HOLDER-ASY
	0142, 0143	ES-61224		
	0171	ES-61226		
	0174	ES-61124		
999 Size 12	0144, 0145	ES-61206	122917-000	AD-1566-1-HOLDER-ASSEMBLY
	0146, 0147	ES-61218		
	0159/0151	ES-61223		
999 Size 8	1108/1109	ES-61172	635308-000	AD-1568-1-SOLDERTACT-HLDR
	1110/1111			
	1112/1113	ES-61184		
	0156/0157-X	ES-61231		
	0169/0170-X	ES-61235		

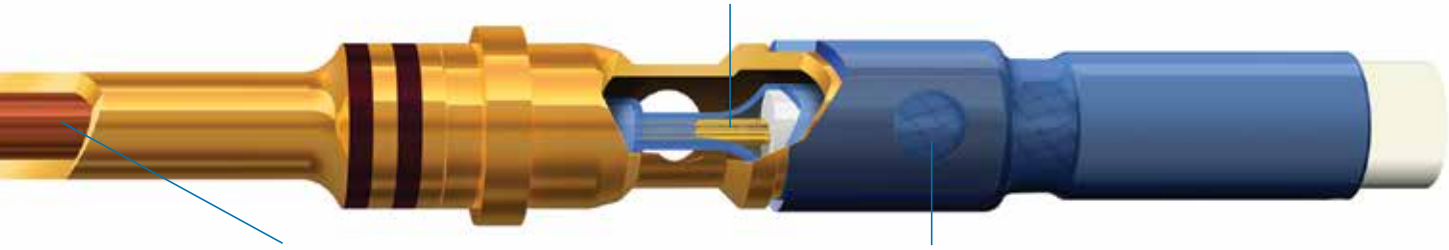




Table I: SolderTacts Contacts-to-Cable Cross Reference

	Submin Series	723 Series Size 12	723 Series Size 12	748 Series Size 16	748 Series Size 16	847 Series Size 16	748 Series Size 16
	D-602-0278 D-602-0279	D-602-0094 D-602-0095	D-602-0106 D-602-0107	D-602-44 D-602-45	D-602-0172 D-602-0173	D-602-72 D-602-73	D-602-76 D-602-77
Cheminax Coaxial Cables							
5021K1X1X							
5022A1X1X							
5024A1X1X	✔	✔					
5026A1X1X	✔			✔		✔	✔
5026D1X2X	✔			✔		✔	✔
5028A1X1X	✔						
5028A1X2X	✔						
5030A1X1X	✔			✔[4]	✔	✔	✔
7522A1X1X							
7524A1X1X							
7528A1X1X	✔	✔		✔[4]	✔	✔	✔
7530A1X1X	✔			✔[4]	✔	✔	✔
7530D1X2X							
9526A1X1X							
9528A1X1X			✔				
9528D1X2X			✔				
9530A1X1X		✔					
9530H1X1X	✔	✔					
9532A1X1X	✔	✔		✔[4]	✔	✔	✔
RG/U Coaxial Cables							
RG-58							
RG-174	✔	✔		✔		✔	✔
RG-178	✔	✔		✔[1]	✔	✔[1]	✔[1]
RG-179	✔	✔		✔	✔	✔	✔
RG-180			✔				
RG-195			✔				
RG-316	✔	✔		✔		✔	✔
Twisted Pair Cables							
	Submin Series	**723 Series Size 12**	**723 Series Size 12**	**748 Series Size 16**	**748 Series Size 16**	**847 Series Size 16**	**748 Series Size 16**
	D-602-0288 D-602-0289	D-602-0104 D-602-0105	–	D-602-54 D-602-55	D-602-0126 D-602-0127	D-602-74 D-602-75	–
22-26					✔		
24-26		✔					
24-30[3]	✔[2]			✔		✔	
26-30[3]							

1. Requires use of barrier.
2. .048" maximum insulation diameter.
3. Smaller cables can be accommodated. Consult product management.
4. These cables can be accommodated by D-602-44 and D-602-45. However, the D-602-0172 and the D-602-0173 are preferred for these cables.

The cross reference list above is not intended to be exhaustive. Please consult TE.



Table I: SolderTacts Contacts-to-Cable Cross Reference

	482 Series Size 16	No. 12 Size 12	999 Series Size 8	999 Series Size 12	999 Series Size 12	999 Series Size 16
	D-602-46 D-602-47	D-602-16 D-602-17	D-602-0122 D-602-0123	D-602-0144 D-602-0145	D-602-0150 D-602-0151	D-602-0140 D-602-0141 D-602-0171
Cheminax Coaxial Cables						
5021K1X1X			✔			
5022A1X1X			✔		✔	
5024A1X1X		✔		✔		
5026A1X1X	✔	✔		✔		✔
5026D1X2X	✔	✔				✔
5028A1X1X						✔
5028A1X2X		✔				
5030A1X1X	✔	✔				✔
7522A1X1X			✔			
7524A1X1X			✔			
7528A1X1X	✔	✔		✔		✔
7530A1X1X	✔	✔		✔		✔
7530D1X2X		✔				
9526A1X1X			✔			
9528A1X1X			✔		✔	
9528D1X2X			✔		✔	
9530A1X1X				✔		
9530H1X1X		✔		✔		
9532A1X1X	✔	✔		✔		
RG/U Coaxial Cables						
RG-58			✔			
RG-174	✔	✔		✔		
RG-178	✔					✔
RG-179	✔[1]	✔		✔		✔
RG-180			✔		✔	
RG-195			✔			
RG-316	✔	✔		✔		✔
Twisted Pair Cables						
	482 Series Size 16	**No. 12 Size 12**	**999 Series Size 8**	**999 Series Size 12**	**999 Series Size 12**	**999 Series Size 16**
	D-602-56 D-602-57	–	–	D-602-0146 D-602-0147	–	–
22-26 AWG				✔		
24-26						
24-30[3]	✔					
26-30[3]						✔

1. Requires use of barrier.
2. .048" maximum insulation diameter.
3. Smaller cables can be accommodated. Consult product management.
4. These cables can be accommodated by D-602-44 and D-602-45. However, the D-602-0172 and the D-602-0173 are preferred for these cables.

The cross reference list above is not intended to be exhaustive. Please consult TE.



Table II: Connector Accommodation: SolderTacts Shielded Contacts

Military Specification	SolderTacts Contacts Series/Contact Size	Specification	Cable Type	Contact Type	Part No.
NAS 1599 MIL-DTL-26482 Series II SAE-AS81703 Series III MIL-DTL-83723 Series I & III MIL-DTL-83733	723 Series Size 12 Contact	AS39029/74	Small Coaxial	Pin	D-602-0094
		AS39029/73	Small Coaxial	Socket	D-602-0095
		AS39029/74	Large Coaxial	Pin	D-602-0106
		AS39029/73	Large Coaxial	Socket	D-602-0107
		AS39029/74	Twisted Pair	Pin	D-602-0104
		AS39029/73	Twisted Pair	Socket	D-602-0105
MiL-DTL-26482 Series I MIL-DTL-26500 MIL-PRF-81733 Series II	No. 12 Series Size 12 Contact	MIS-20067 (Army)	Coaxial	Pin	D-602-17
			Coaxial	Socket	D-602-16
	482 Series Size 16 Contact		Coaxial	Pin	D-602-46
			Coaxial	Socket	D-602-47
			Twisted Pair	Pin	D-602-56
			Twisted Pair	Socket	D-602-57
MIL-DTL- 28748/3,4,9,10 MIS-20065 (Army)	748 Series Size 16 Contact	MIS20067 (Army)	Coaxial	Pin	D-602-44
			Coaxial	Socket	D-602-45
			Twisted Pair	Pin	D-602-54
			Twisted Pair	Socket	D-602-55
			Power	Pin	D-610-09
			Power	Socket	D-610-10
			Coaxial	Pin	D-602-0173
			Coaxial	Socket	D-602-0172
			Twisted Pair (MIL-STD-1553)	Pin	D-602-0126
			Twisted Pair	Socket	D-602-0127
MIL-DTL-38999 Series I, II*, III, IV	999 Series Size 16 Contact	AS39029/76	Coaxial	Pin	D-602-0140
		AS39029/77	Coaxial	Socket	D-602-0141
		AS39029/77	Coaxial*	Socket	D-602-0171
		AS39029/76	Twisted Pair	Pin	D-602-0142
		AS39029/77	Twisted Pair	Socket	D-602-0143
		AS39029/77	Twisted Pair*	Socket	D-602-0174
	999 Series Size 12 Contact	AS39029/28	Coaxial	Pin	D-602-0144
		AS39029/75	Coaxial	Socket	D-602-0145
		AS39029/28	Twisted Pair	Pin	D-602-0146
		AS39029/75	Twisted Pair	Socket	D-602-0147
		AS39029/28	Large Coaxial	Pin	D-602-0150
		AS39029/75	Large Coaxial	Socket	D-602-0151
	999 Series Size 8 Contact	AS39029/60	Coaxial	Pin	D-602-0122
		AS39029/59	Coaxial	Socket	D-602-0123
		USAF8340712-1^	Shielded Twisted Pair (MIL-STD-1553)	Socket	D-602-1108
		USAF8340713-1^	Shielded Twisted Pair (MIL-STD-1553)	Pin	D-602-1109
		USAF8340712-2^	Shielded Twisted Pair (MIL-STD-1553)	Socket	D-602-1112
		USAF8340713-2^	Shielded Twisted Pair (MIL-STD-1553)	Pin	D-602-1113
			Triaxial	Socket	D-602-1110
			Triaxial	Pin	D-602-1111
—	Submin Series Size 16		Coaxial	Pin	D-602-0278
			Coaxial	Socket	D-602-0279
			Twisted Pair	Pin	D-602-0288
			Twisted Pair	Socket	D-602-0289

* Size 16 contacts only for use with MTCP and MIL-DTL-38999 Series II connectors only.
^ Intermountable and intermatable, replaces crimp style termination.



Table III: SolderTacts Contact Compatibility

Contact Military Specification	TE Equivalent* Part Numbers	Nature of Compatibility	SolderTacts - Compatible Connector Specifications	SolderTact Series
M39029/73-396 M39029/73-397 M39029/73-398 M39029/73-555	D-602-0107 D-602-0095 D-602-0105 D-602-0093	Equivalent product. TE is a qualified vendor.	MIL-DTL-26482 Series II MIL-DTL-81703 Series III MIL-DTL-83723 Series I, III MIL-DTL-83733 NAS-1599	723 Series
M39029/74-399 M39029/74-400 M39029/74-401	D-602-0106 D-602-0094 D-602-0104			
M39029/28	D-602-0144 D-602-0146 D-602-0150	Intermountable and intermatable. Replaces crimp-style termination.	MIL-DTL-38999 Series I, II*, III, IV *Size 16 only	999 Series
M39029/59	D-602-0123			
M39029/60	D-602-0122			
M39029/75	D-602-0145 D-602-0147 D-602-0151			
M39029/76	D-602-0140 D-602-0142			
M39029/77	D-602-0141 D-602-0143 D-602-0171 D-602-0174			
M39029/90	DK-602-0156-N-X DK-602-0169-N-X	Intermountable and intermatable. Replaces crimp-style termination.		
M39029/91	DK-602-0157-N-X DK-602-0170-N-X			
USAF8340712-1 USAF8340712-2 USAF8340713-1 USAF8340713-2	D-602-1108 D-602-1112 D-602-1109 D-602-1113	Equivalent product. TE is a qualified vendor.		
M39029/25 M39029/26	D-602-17 D-602-16	Intermountable and intermatable. Replaces crimp-style termination.	MIL-DTL-26482 Series I MIL-DTL-26500 MIL-DTL-81703 Series II	No. 12 Series
MIS20067/5 MIS20067/6	D-602-16 D-602-17	Equivalent product. TE is a qualified vendor.		
M39029/40 M39029/41 M39029/42 M39029/43	D-602-76 D-602-77 D-602-77 D-602-76	Intermountable and intermatable. Replaces crimp-style termination.	MIL-DTL-28748/3, /4, /9, /10	748 Series
M39029/79	D-602-72 D-602-74	Intermountable and intermatable. Replaces crimp-style termination.	MIS-20065 (Army)	847 Series
M39029/80	D-602-73 D-602-75			
MIS20067/1 MIS20067/2 MIS20067/3 MIS20067/4 MIS20067/7 MIS20067/8	D-602-45 D-602-44 D-602-55 D-602-54 D-610-10 D-610-09	Equivalent products. TE is a qualified vendor.		748 Series
	D-602-77 D-602-76 D-602-76 D-602-77	Intermountable and intermatable. Replaces crimp-style termination.		748 Series
	D-602-0278 D-602-0279 D-602-0288 D-602-0289	Intermountable and intermatable. Replaces crimp-style termination.	Souriau Trim Trio Connector Family	Submin Series

* SolderTacts contacts are intermatable and interchangeable with existing MIL-spec contacts.

Additional Repair Products



MATCHED IMPEDANCE
- Maintains cable's electrical properties
- Meets MIL-PRF-32517 performance requirements
- Matches cable's impedance +10%/-3%

TIME AND COST SAVING
- Repairs made in situ
- No need to remove or replace cable

SEALED
- Heat-shrinkable outer layer plus thermoplastic adhesive for sealing and strain relief

ROBUST
- Withstands high vibration
- Corrosion resistant
- Wide temperature range
- Excellent fluid resistance
- Suitable for high EMI environments

APPLICATIONS
- Military Aerospace
- Commercial Aerospace

Raychem Matched Impedance Splices

With the matched impedance splice, TE Connectivity (TE) solves the problem of costly removal and replacement of damaged coaxial cable. Not only does the new splice allow fast, easy repair of the cable in situ, it maintains the characteristic impedance and other electrical properties. System performance is not affected by the repair.

Save Time and Money

Removing and replacing a damaged coaxial cable can be time consuming and expensive. The matched impedance splice's ability to be applied without removing the cable can significantly speed the repair, saving time and cost.

Simple and Effective

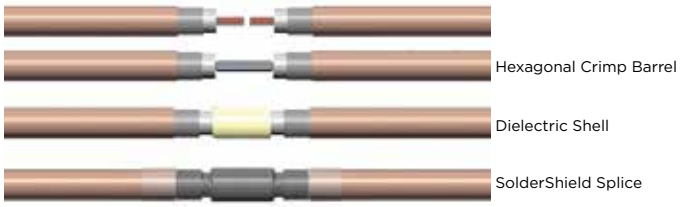
The splice contains three components: a hexagonal crimp barrel for the center conductors, a dielectric shell that helps maintain cable geometry for impedance control, and a SolderShield splice that both terminates the cable's shield and provides sealing to protect the splice environmentally.

The SolderShield splice uses a flux-coated, solder-impregnated copper shield inside an adhesive-lined, heat-shrinkable sleeve. The completed assembly provides an environmentally sealed termination and strain relief.

Part Numbers

Cable Type	Part Number
RG-393	D-150-Z393





Specifications

Electrical

Impedance:	MIL-PRF-32517
Insertion Loss:	MIL-PRF-32517
Return Loss:	MIL-PRF-32517
Insulation Resistance:	5000 MΩ

Environmental/Mechanical

Altitude Immersion:	75,000 ft
Heat Aging:	750 hr. at +165°C
Temperature Range:	-55° C to 150°C

Cable Compatibility

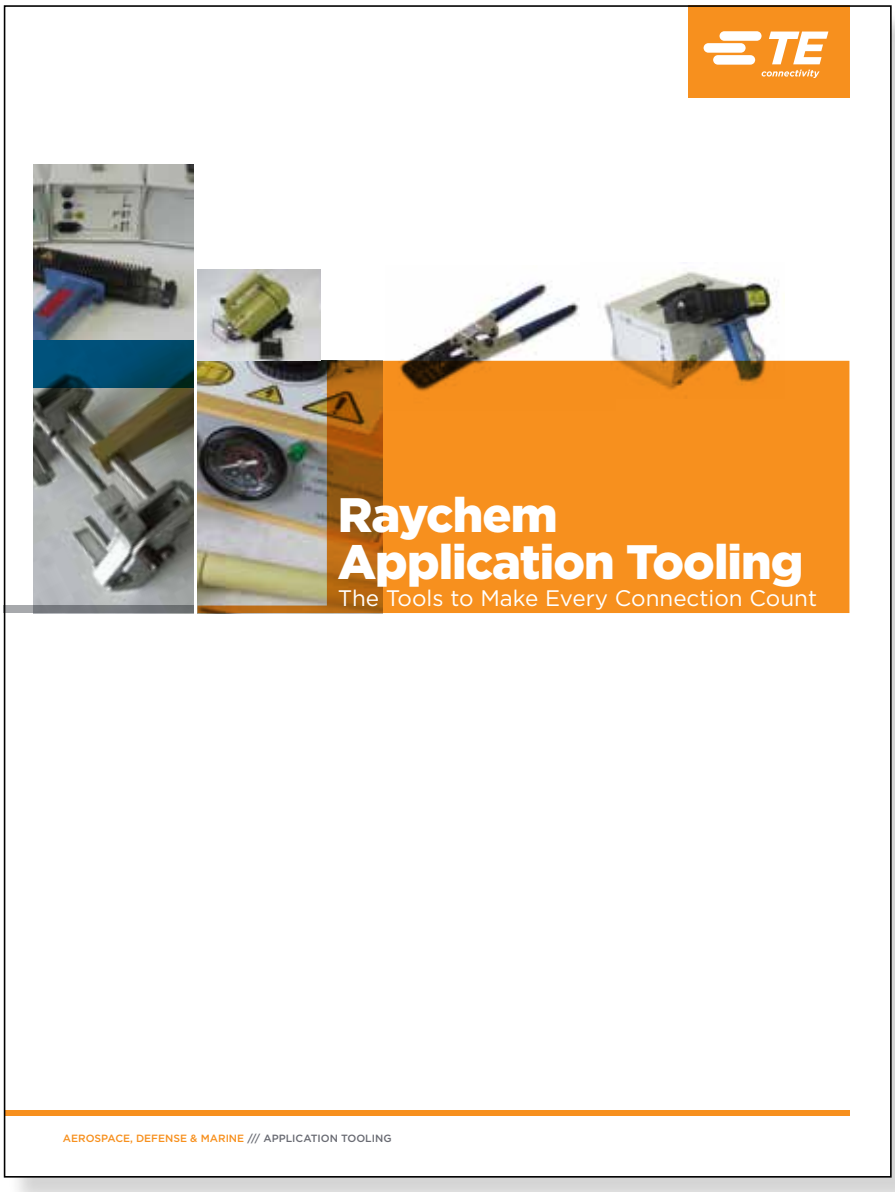
Cable Types:	RG-393

TE Specifications

Application Specification:	D-6204
Product Specification:	D-6204
Qualification Test Reports:	HT4203 (for D-150-Z393)
Installation Instructions:	RPIP-1108

Raychem Application Tooling

Lit #1-1773872-1





Notes



Notes

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