Micro Molded Heat-Shrink Shapes

TE connectivity

MICRO MOLDED SHAPES

Introduction

Connector manufacturers are increasingly offering smaller high performance, rugged, micro circular connectors for use in wiring harnesses in both civilian and defense markets.
The range of small heat-shrink molded shapes from TE Connectivity (TE) has evolved in order to cater for these requirements for smaller, lighter-weight products that still offer a great balance of protection properties at the connector-wire interface.
Produced in a variety of shapes and materials, TE's range of Raychem branded molded shapes are supplied in an expanded form. On the application of heat, they shrink to a pre-determined size and shape, providing a tough, protective covering for the components over which they are installed.

FEATURES

- Small size
- Supplied in expanded form
- Adhesive lined options
- Strain relief
- Available in a range of different cross-linked polymeric materials

BENEFITS

- Weight and space savings
- Facilitates installation
- Environmental sealing against fluid and dirt ingression
- Provides protection against mechanical abuse at the cable-connector interface
- Suitable for a wide range of application and environmental requirements for low fire hazard, flame retardance, high temperatures and fluid resistant characteristics. Applications from underwater to outer space, in military vehicles to cars, rail and mass transit

Material

-25 MOLDED PART MATERIAL

A heat-shrinkable, semi-rigid, fluid and temperature resistant, elastomeric molding compound, designed to offer excellent performance in harsh environments. Ideal for use in military and commercial vehicles where high temperatures and long-term exposure to hot fluids is expected.

-100 MOLDED PART MATERIAL*

A heat-shrinkable, semi-flexible, low-fire-hazard molding compound designed to offer excellent fire safety characteristics combined with low smoke and low acid gas emission. 100 also exhibits good mechanical and fluid resistance properties.

-12 MOLDED PART MATERIAL*

A high-temperature, heat-shrinkable, flexible, flame-retarded, fluoroelastomeric molding compound with excellent resistance to long-term fluid immersion and heat exposure.

Ordering Information

203W301-*-G02/**

- ** — Adhesive Slash Number (if required see compatibility chart)
- G02 — Modification Number
- * — Material Dash Number (refer to product drawing)
- 203W301 — Base Part Number

Min = Minimum inner diameter of the supplied expanded shape. We would supply to this dimension or greater.

Max = Recovered dimensions after heating.

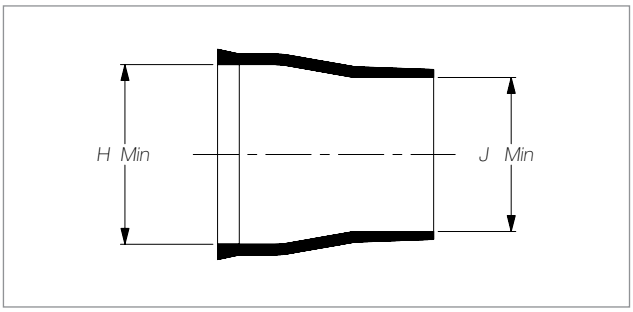
The recommended usage range for the part is from 10% less than minimum expanded inside diameter to 10% greater than the maximum recovered inside diameter.

For more information please search by Part Number on: **www.te.com/adm** or contact our TE sales representatives.

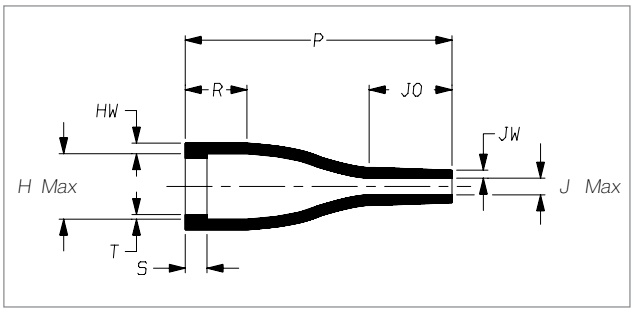
Materials:
*As Supplied/Expanded dimensions may be slightly reduced due to the nature of the material.
After recovery sizes are not affected.

Selection Guide

AS SUPPLIED (a)

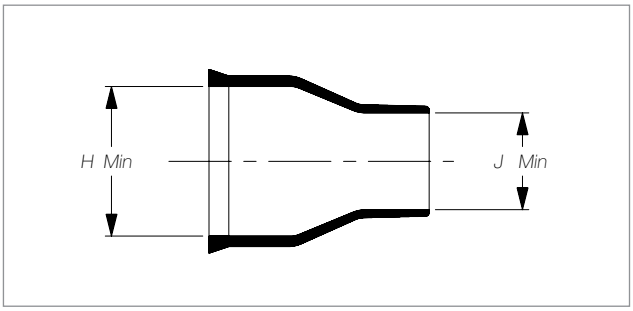


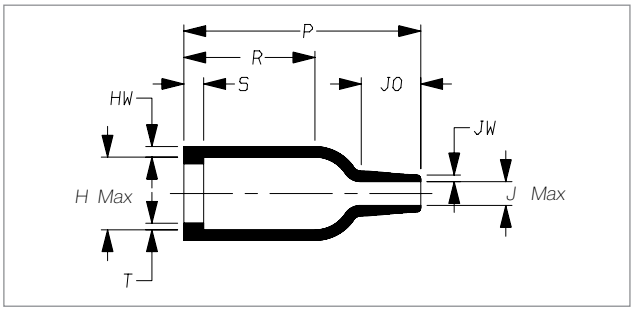
AFTER RECOVERY (b)



DIMENSIONS in millimeters (in inches, for reference)

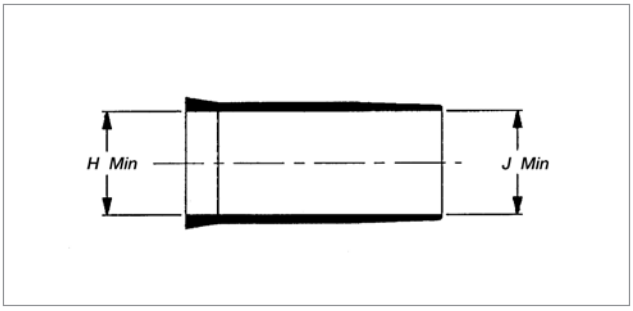
	AS SUPPLIED		AFTER RECOVERY								
	H	J	H	J	P	R	S	T	JO	HW	JW
Part	Min	Min	Max	Max	±10%	±10%	±10%	±10%	±10%	±20%	±20%
Number	a	a	b	b	b	b	b	b	b	b	b
204W201	10 (0.39)	9.0 (0.35)	5.2 (0.20)	1.5 (0.06)	20 (0.79)	4.0 (0.16)	0.8 (0.03)	0.35 (0.01)	6.6 (0.26)	0.8 (0.03)	0.6 (0.02)

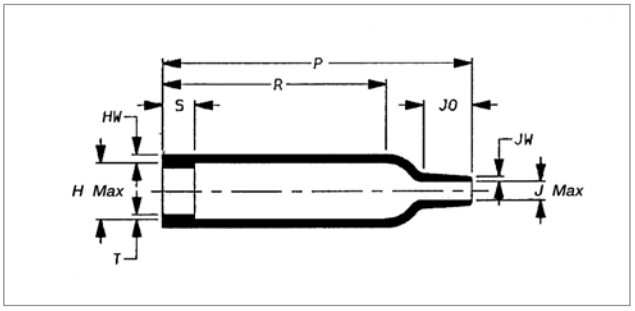




DIMENSIONS in millimeters (in inches, for reference)

	AS SUPPLIED		AFTER RECOVERY								
	H	J	H	J	P	R	S	T	JO	HW	JW
Part	Min	Min	Max	Max	±10%	±10%	±10%	±10%	±10%	±20%	±20%
Number	a	a	b	b	b	b	b	b	b	b	b
203W301-*-G02	10 (0.39)	6.0 (0.24)	5.8 (0.23)	2.2 (0.09)	19 (0.75)	11 (0.43)	1.5 (0.06)	0.5 (0.02)	4.5 (0.18)	0.8 (0.03)	0.5 (0.02)



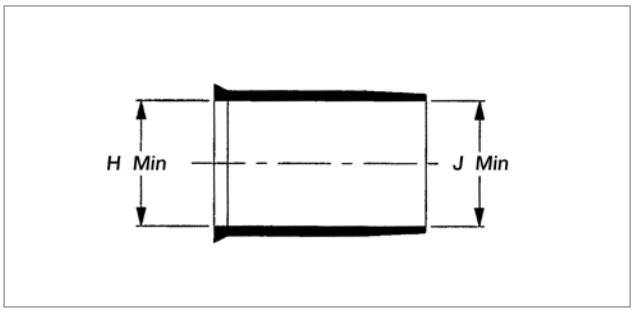


DIMENSIONS in millimeters (in inches, for reference)

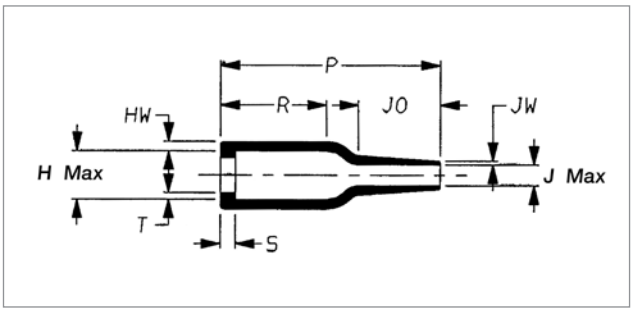
	AS SUPPLIED		AFTER RECOVERY								
	H	J	H	J	P	R	S	T	JO	HW	JW
Part	Min	Min	Max	Max	±10%	±10%	±10%	±10%	±10%	±20%	±20%
Number	a	a	b	b	b	b	b	b	b	b	b
203W301	10 (0.39)	10 (0.39)	5.8 (0.23)	2.2 (0.09)	29 (1.14)	21 (0.83)	3.0 (0.12)	0.5 (0.02)	4.5 (0.18)	0.8 (0.03)	0.5 (0.02)

Selection Guide

AS SUPPLIED (a)

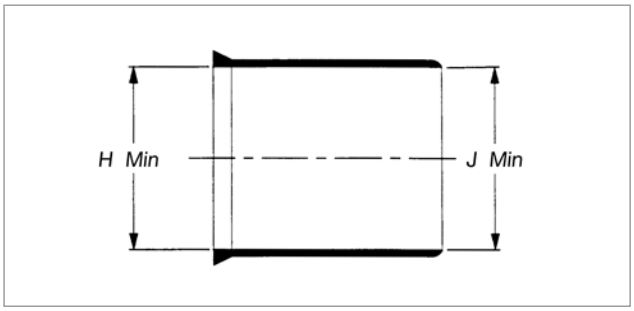


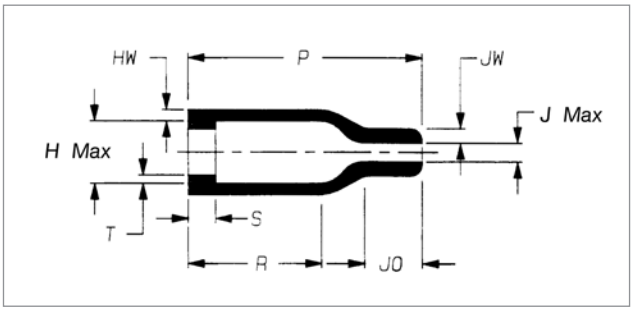
AFTER RECOVERY (b)



DIMENSIONS in millimeters (in inches, for reference)

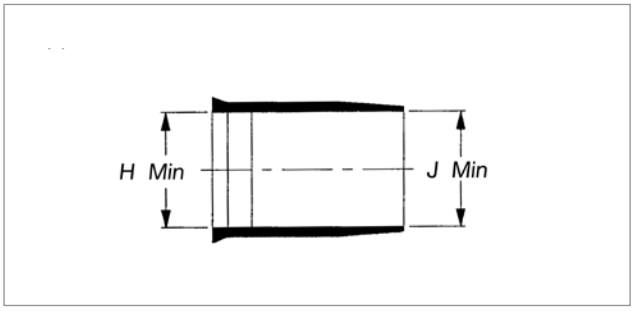
	AS SUPPLIED		AFTER RECOVERY								
	H	J	H	J	P	R	S	T	JO	HW	JW
Part Number	Min a	Min a	Max b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b
202K111-*-01	17 (0.67)	17 (0.67)	6.9 (0.27)	3.0 (0.12)	29 (1.14)	14 (0.55)	1.7 (0.07)	0.9 (0.04)	10.8 (0.43)	1.3 (0.05)	0.7 (0.03)

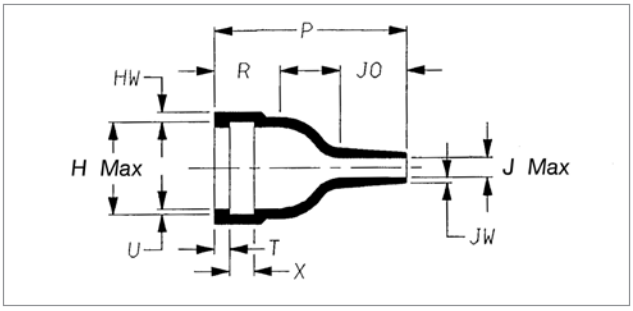




DIMENSIONS in millimeters

	AS SUPPLIED		AFTER RECOVERY								
	H	J	H	J	P	R	S	T	JO	JW	HW
Part Number	Min a	Min a	Max b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b
202A111-*-G07	17 (0.67)	17 (0.67)	7.9 (0.31)	2.2 (0.09)	25 (0.98)	14 (0.55)	3.0 (0.12)	1.0 (0.04)	6.0 (0.24)	1.7 (0.07)	1.0 (0.04)



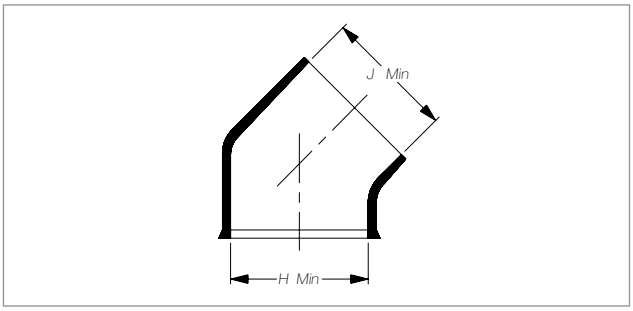


DIMENSIONS in millimeters

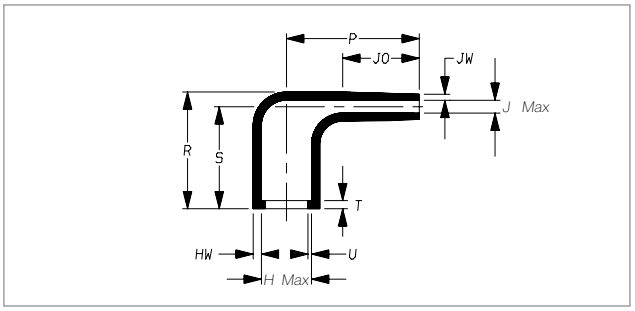
	AS SUPPLIED		AFTER RECOVERY									
	H	J	H	J	P	R	T	U	X	JO	HW	JW
Part Number	Min a	Min a	Max b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b
204W221	11 (0.43)	11 (0.43)	9.3 (0.37)	2.1 (0.08)	19 (0.75)	6.5 (0.26)	1.5 (0.06)	0.55 (0.02)	2.4 (0.09)	6.6 (0.26)	1.1 (0.04)	0.5 (0.02)

Selection Guide

AS SUPPLIED (a)

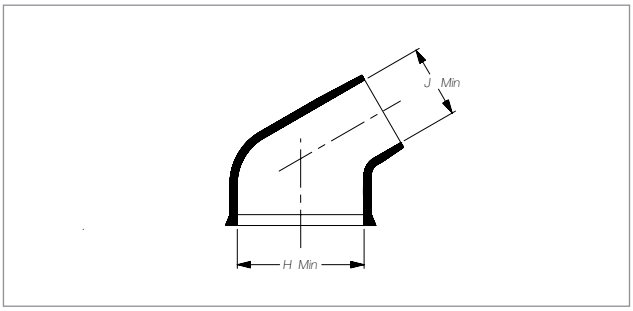


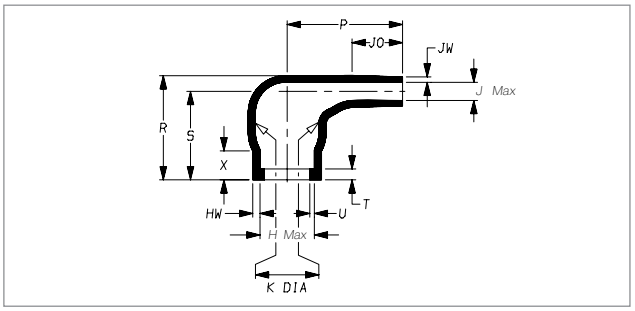
AFTER RECOVERY (b)



DIMENSIONS in millimeters (in inches, for reference)

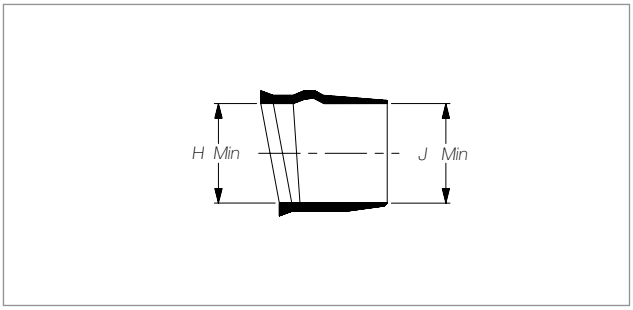
	AS SUPPLIED		AFTER RECOVERY									
	H	J	H	J	P	R	S	T	U	JO	HW	JW
Part Number	Min a	Min a	Max b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b
224W201	11 (0.43)	9.0 (0.35)	5.2 (0.20)	1.6 (0.06)	13 (0.51)	11.5 (0.45)	10 (0.39)	0.8 (0.03)	0.35 (0.01)	7.5 (0.30)	0.8 (0.03)	0.6 (0.02)

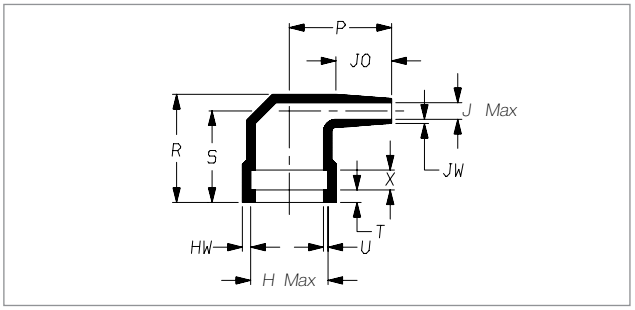




DIMENSIONS in millimeters (in inches, for reference)

	AS SUPPLIED		AFTER RECOVERY												
	H	J	H	J	K		P	R	S	T	U	JO	HW	JW	X
Part Number	Min a	Min a	Max b	Max b	Min b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b	±20% b
223W601	10 (0.39)	6.0 (0.24)	6.3 (0.25)	2.0 (0.08)	10 (0.39)	7.4 (0.29)	12.5 (0.49)	11.5 (0.45)	9.8 (0.39)	1.2 (0.05)	0.5 (0.02)	6.0 (0.24)	1.0 (0.04)	0.6 (0.02)	3.2 (0.13)





DIMENSIONS in millimeters (in inches, for reference)

	AS SUPPLIED		AFTER RECOVERY										
	H	J	H	J	P	R	S	T	U	X	JO	HW	JW
Part Number	Min a	Min a	Max b	Max b	±10% b	±10% b	±10% b	±10% b	±10% b	±10% b	±10% b	±20% b	±20% b
224W221	11 (0.43)	11 (0.43)	9.3 (0.37)	2.1 (0.08)	12.3 (0.48)	13 (0.51)	11 (0.43)	1.5 (0.06)	0.55 (0.02)	2.4 (0.09)	6.6 (0.26)	1.0 (0.04)	0.5 (0.02)

Additional Products from TE Connectivity

WIRE AND CABLE

TRANSITIONAL BREAKOUTS

COLD-APPLIED SPLICES

ADHESIVES

SIDE-ENTRY BUSHINGS

NBCCS HEAT-SHRINK TUBING

ADAPTORS

SOLDERSLEEVES/DEVICES

HARNWARE SOFTWARE

MICRO MOLDED SHAPES

FOR MORE INFORMATION

Technical Support

Internet:	www.te.com/ADM
E-mail:	product.info@te.com
USA:	+1 (800) 522-6752
Canada:	+1 (905) 470-4425
Mexico:	+52 (0) 55-1106-0814
C. America:	+52 (0) 55-1106-0814
South America:	+55 (0) 11-2103-6000
Germany:	+49 (0) 6251-133-1999
Great Britain:	+44 (0) 8706-080208
France:	+33 (0) 1-3420-8686
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China:	+86 (0) 400-820-6015

te.com

16544221-1 ADM 2.5M 08/2011

TE connectivity

RAYCHEM
RAYOLON ROLL-ON SEALING SLEEVES

REUSABLE SEALING SLEEVES REQUIRE NO HEAT FOR RELIABLE SEALING AGAINST HARSH ENVIRONMENTS

TIME-SAVING EASE OF USE

- Rolls on and off
- Allows multiple reentries
- No heat required

RELIABLE

- Enhanced sealing with supplied gel strips
- Helps protect connectors, splices, and other components from corrosion

CONVENIENT

- Application centered kits of general use, connectors, and ship or shore power cable needs

APPLICATIONS

- Naval
- Marine Docks
- Ship Building
- Offshore

Heatless, Reenterable Sealing

With easy application without the need for special tools, TE Connectivity's (TE) **Raychem RayOLOn** sleeves help protect components such as connectors and splices from salt spray and moisture. They easily roll over the components. If reentry is needed, they can be rolled back and then back into position.

Without the need for heat, installation is fast and easy anywhere—no external power required. And reusability helps eliminate the need for replacement spares. An inner paper sleeve makes installation even easier.

Kits Give You Everything You Need

RayOLOn sleeves are available in kits to simplify specifying and stocking. Each kit gives you a ready-to-apply solution. In addition to the RayOLOn sleeve and instructions, specific kits contain:

General Kit (GK): Gel strip, cable tie and core tube

Connector Sealing Kit (CK): Cable tie, connector flange cover, and gel strip

Ship or Shore Power Cable Kit (SS): Woven heat shield

RAYOLON ROLL-ON SEALING SLEEVES

For Reliable Sealing Against Harsh Environments

MATERIALS

- Sleeve: Cross-linked EPDM, black

PRODUCT SPECIFICATION

- RW-3031

PHYSICAL/CHEMICAL

- Tensile Strength: 8.3 MPa (1200 psi) min. (ASTM D2671)
- Ultimate Elongation: 100% min. (ASTM D412)
- Physical/ Density: 1.1 g/cm^3 max. (ASTM D792)
- Chemical/Water Absorption: 0.5% over 24 hours at 23°C max. ASTM D570)
- Flammability: 40 mm/minute max. (ASTM D635)

ELECTRICAL

- Dielectric Strength: 90 kV/cm min. (ASTM D149)
- Volume Resistivity: 1 x 10^{12} Ω-cm (ASTM D257)

TEMPERATURE RATINGS

- Continuous Operating: -40°C to 70°C
- Short-Term Exposure: -63°C to 90°C
- Minimum Installation: -25°C

Product Offering

Base Part No.	Available Kit	Sleeve Diameter	Sleeve Length	Recommended Usage Range	Connection Length
LNCL-11-125	GK	0.51 [13.0]	4.92 [125]	0.22 - 0.68 [6 - 17]	3 [75]
LNCL-11-205	GK	0.51 [13.0]	8.07 [205]	0.22 - 0.68 [6 - 17]	6 [150]
LNCL-12-140	GK, CK-N	0.56 [14.2]	5.51 [140]	0.48 - 0.90 [12 - 23]	4 [100]
LNCL-12-240	GK, CK-N	0.56 [14.2]	9.45 [240]	0.48 - 0.90 [12 - 23]	7 [175]
LNCL-13-155	GK	0.75 [19.0]	6.10 [155]	0.69 - 1.20 [18 - 30]	4 [100]
LNCL-13-305	GK	0.75 [19.0]	12.00 [305]	0.69 - 1.20 [18 - 30]	9 [225]
LNCL-14-185	GK	1.02 [25.9]	7.28 [185]	0.96 - 1.50 [25 - 38]	5 [125]
LNCL-14-355	GK	1.02 [25.9]	14.00 [355]	0.96 - 1.50 [25 - 38]	10 [250]
LNCL-15-185	GK	1.45 [36.8]	7.28 [185]	1.40 - 2.00 [36 - 46]	5 [125]
LNCL-15-260	GK, SS	1.45 [36.8]	10.2 [260]	1.40 - 2.00 [36 - 46]	7.5 [190]
LNCL-15-450	GK, SS	1.45 [36.8]	17.72 [450]	1.40 - 2.00 [36 - 46]	12 [300]

Note: Dimensions are Inch [mm]
To specify a kit, add the kit identifier to the end of the base part number: LNCL-12-240-CK-N

TE Components . . . TE Technology . . . TE Know-how . . .
AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Raychem | Rochester | DEUTSCH
L.L. Rowe | Phoenix Optix | SEACON

Get your product to market faster with a smarter, better solution.

www.te.com/RAYOLON

1-1773840-7 ADM/RRD 2.5M 09/2014

RAYCHEM
INSTALITE MOLDED BOOTS

ADVANCED MATERIALS SCIENCE DRIVES UP TO 30% WEIGHT SAVINGS . . . REDUCES INSTALLATION TIME WITH HIGH-PERFORMANCE HEAT-SHRINK SHAPE MEMORY BOOTS

INSTALITE MOLDED BOOTS

High-Performance Heat-Shrink Boots

WEIGHT SAVINGS

- 20% to 30% lighter than standard -25 parts

TIME SAVINGS

- Optimized interior geometry speeds installation time
- Faster recovery

RUGGED

- -75°C to 150°C temperature range
- Resists most common military fuels, oils, and greases
- Abrasion resistant

COMPATIBLE

- Part of System 25 harnessing components
- Lighter weight drop-in replacement for standard -25 boots
- Meets the requirements of VG 95343 Parts 6 and 18

APPLICATIONS

- Military ground systems
- Aerospace
- Marine

INSTALITE boots are a lighter weight alternative of our -25 heat-shrink boots. Utilizing our expertise in fluid-resistant, modified elastomers, we've created semi-rigid, abrasion-resistant boots that are up to 30% lighter than our standard -25 boots. INSTALITE boots offer the same balance of high-temperature fluid resistance and long-term heat resistance.

Product Performance

PHYSICAL CHARACTERISTICS

- **Tensile strength:** 10 MPa (1450 psi) min.
- **Ultimate elongation:** 400% min.
- **Specific gravity:** 1 (±0.05)

THERMAL CHARACTERISTICS

- **Heat aging** (168 hr @ 160°C): 400% min. ultimate elongation
- **Heat shock** (4 hr @ 215°C): 400% min. ultimate elongation
- **Low-temperature flexing** (4 hr @ -75°C): No cracking
- **Flammability burn time:** 120 seconds max

ELECTRICAL

- **Electrical strength:** 15 MV/m (4.6 MV/ft)

FLUID RESISTANCE

(Aviation Fuel, Hydraulic Fluids, Lubricating Oil, Cleaning Fluids, Deicers)

- **After 24-hr immersion:** 8 MPa (1160 psi) min. tensile strength
300% min. ultimate elongation

DOCUMENTS

- **RW-3040:** Product specification
- **ELE-3COP-555:** Installation of 90° boot
- **ELE-3COP-554:** Installation of straight boot

TOOLING

- **Heat gun:** CV 1981

INSTALLATION TIME

(Timings are representative across the range based on our codes of practice)

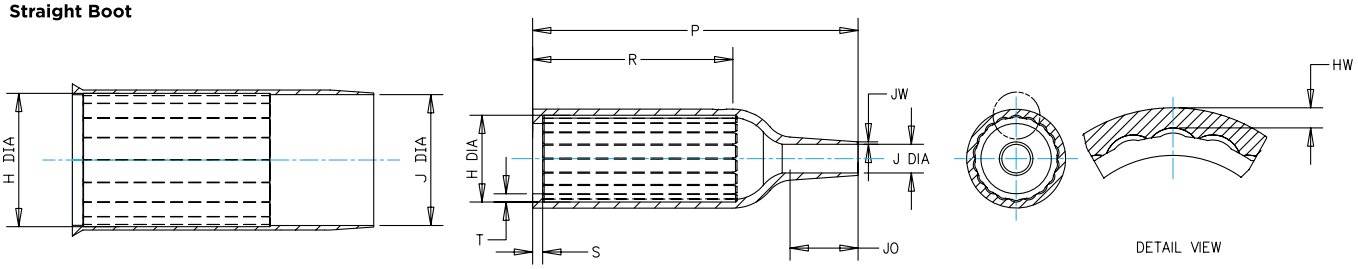
- **System 25 boot:** 2 minutes 24 seconds
- **System 25L boot:** 1 minute 41 seconds

Visit **www.te.com/INSTALITE** to view our installation video.

TE Components . . . TE Technology . . . TE Know-how . . .
AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Raychem | Rochester | DEUTSCH

Get your product to market faster with a smarter, better solution.

Straight Boot



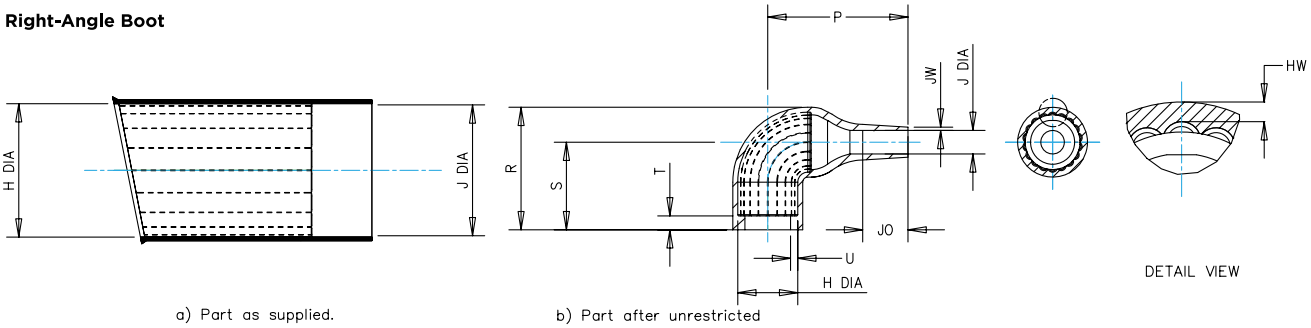
a) Part as supplied.

b) Part after unrestricted recovery.

Part No.	H		J		P ±10% b	R ±10% b	HW ±20% b	JW Min. b	Avg Weight Savings
	Min. a	Max. b	Min. a	Max. b					
202K121-25L-0	24 [0.95]	10.4 [0.41]	24 [0.95]	5.6 [0.22]	38 [1.50]	21 [0.83]	1.3 [0.05]	0.9 [0.04]	**20%**
202K132-25L-0	30 [1.18]	14.2 [0.56]	30 [1.18]	5.9 [0.23]	55 [2.17]	32 [1.26]	1.3 [0.05]	1.0 [0.04]	**20%**
202K142-25L-0	31 [1.22]	18 [0.71]	31 [1.22]	7.1 [0.28]	67 [2.64]	35 [1.38]	1.2 [0.04]	1.0 [0.04]	**20%**
202K153-25L-0	36 [1.42]	22.4 [0.88]	36 [1.42]	8.4 [0.33]	80 [3.15]	42 [1.65]	1.5 [0.06]	1.0 [0.04]	**23%**
202K163-25L-0	43 [1.69]	28.2 [1.11]	43 [1.69]	9.9 [0.39]	99 [3.90]	61 [2.40]	2.0 [0.08]	1.2 [0.05]	**28%**
202K174-25L-0	60 [2.36]	35.1 [1.38]	60 [2.36]	15.7 [0.62]	130 [5.12]	72 [2.83]	2.3 [0.09]	1.5 [0.06]	**22%**
202K185-25L-0	66 [2.60]	44.5 [1.75]	66 [2.60]	16.8 [0.66]	170 [6.69]	90 [3.54]	1.8 [0.07]	2.0 [0.08]	**21%**

See the latest Specification Control Document for full dimensions

Right-Angle Boot



a) Part as supplied.

b) Part after unrestricted recovery.

Part No.	H		J		P ±10% b	R ±10% b	S ±10% b	HW ±20% b	JW Min. b	Avg Weight Savings
	Min. a	Max. b	Min. a	Max. b						
222K121-25L-0	24 [0.95]	10.4 [0.41]	24 [0.95]	5.6 [0.22]	25 [0.98]	25 [0.98]	19 [0.75]	1.3 [0.05]	0.5 [0.02]	**30%**
222K132-25L-0	30 [1.18]	14.2 [0.56]	30 [1.18]	5.9 [0.23]	32 [1.26]	27 [1.06]	20 [0.79]	1.3 [0.05]	0.8 [0.03]	**26%**
222K142-25L-0	31 [1.22]	18 [0.71]	31 [1.22]	7.1 [0.28]	39 [1.54]	31 [1.22]	21 [0.83]	1.2 [0.04]	1.0 [0.04]	**21%**
222K152-25L-0	36 [1.42]	22.4 [0.88]	36 [1.42]	8.4 [0.33]	46 [1.81]	38 [1.50]	26 [1.02]	1.5 [0.06]	1.0 [0.04]	**26%**
222K163-25L-0	43 [1.69]	28.2 [1.11]	43 [1.69]	9.9 [0.39]	55 [2.17]	45 [1.77]	30 [1.18]	2.0 [0.08]	1.0 [0.04]	**21%**
222K174-25L-0	60 [2.36]	35.1 [1.38]	60 [2.36]	15.7 [0.62]	80 [3.15]	54 [2.13]	35 [1.38]	2.3 [0.09]	1.5 [0.06]	**23%**
222K185-25L-0	66 [2.60]	44.5 [1.75]	66 [2.60]	16.8 [0.66]	108 [4.25]	68 [2.68]	42 [1.65]	1.8 [0.07]	2.0 [0.08]	**25%**

See the latest Specification Control Document for full dimensions

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1-1773847-4 ADM/RRD 2.5M 11/2014

HarnWare V6

Computer-Aided Electrical Wiring Harness Design Software

TE connectivity

EVERY CONNECTION COUNTS

HARNWARE V6

Introduction

A new version of TE Connectivity's (TE's) popular harness design software has been re-engineered using the latest Microsoft programming tools to offer improvements in performance and enhance the user interface. Additional improvements include new product ranges added to the database, which now includes over 100,000 TE products and several thousand standard military connectors. The HarnWare design wizard also has a more modern appearance and includes hyperlinks to relevant product information.

The HarnWare computer-aided design package enables users to produce high-quality wiring harness assembly drawings, parts lists/bill of materials, labour estimates, RoHS compliance codes for each component, cable cross-section designs, connector planform drawings, wiring schematics and schedules. Data can also be exported in a variety of formats to allow transfer of information into other computer systems.

TE's extensive product ranges and systems approach to harness design provide complete harness solutions to meet the requirements of most markets, especially demanding applications in the defence, rail, aerospace, naval and motor sport industries.

The HarnWare software uses a drag and drop drawing interface that enables the designer to rapidly draw and designate the overall parameters of the harness. This drawing combines with the HarnWare software to guide the designer through a series of design operations. The harness system can be specified and a range of fully compatible components can be selected.

Features

- Compare Design.
- Updated COP Listing.
- Materials and Equipment Listing.
- Extended User Parts Library editable by users.
- Data Import Option from Microsoft Excel.
- Improved export of Parts Listing.
- Create Shape Function.
- Fibre Optic Module including PRO BEAM Connectors.
- Database File Path Selection for Drawing Translator, User Parts Library and Weights.
- Users can supplement the databases of preferred parts by adding other component data into the HarnWare User Parts Library.

Benefits

- More detailed and accurate design with the use of preferred parts, helping provide best delivery and price.
- Designs and quotations produced up to 20 times faster.
- Promotes a systems approach for choosing components, materials, adhesives, etc to help confirm parts are compatible with the intended service conditions and with mating parts.
- More cost effective designs, minimised transcription errors and a more disciplined approach to harness design.

New Products Included in Version 6

- Micro Heat Shrink Moulded Parts.
- Spin-Lock Adaptors.
- STXR Adaptors.
- ADK Rectangular Backshells.
- SolderTacts Contact Devices.
- RF Connectors including TNC, BNC and N Types
- GPR Rectangular Connectors.
- AMPLIMITE Rectangular Connectors.
- VG95218 Pt 28 Multicore Cables.
- RG Coaxial Cables.
- D-SCE Range of Identification Sleeves.
- RT-780 Heat Shrink Tubing.

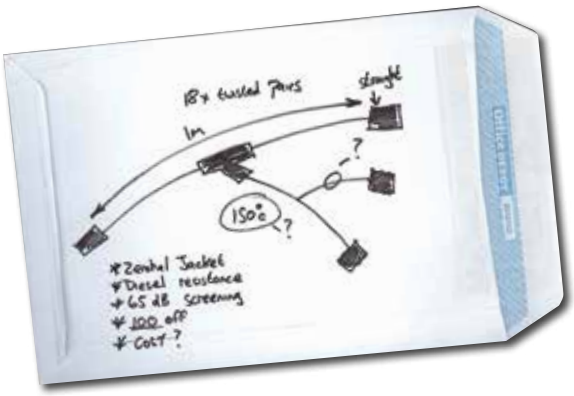
HarnWare V6

TE's extensive product ranges and systems approach to harness design enable the company to provide complete harness solutions to meet the requirements of most markets, especially demanding applications in the defence, rail, aerospace, naval and motor sport industries.
Since the introduction of the HarnWare software V1 in December 1995, many key changes and new features have been introduced. Version 6 of the software contains design modules for heat shrink sealed systems, conduit systems, MIL-STD-1553 data bus and fiber optical assemblies. The new V6 version gives a smarter, faster, better solution for harness design and component selection.

System Specifications

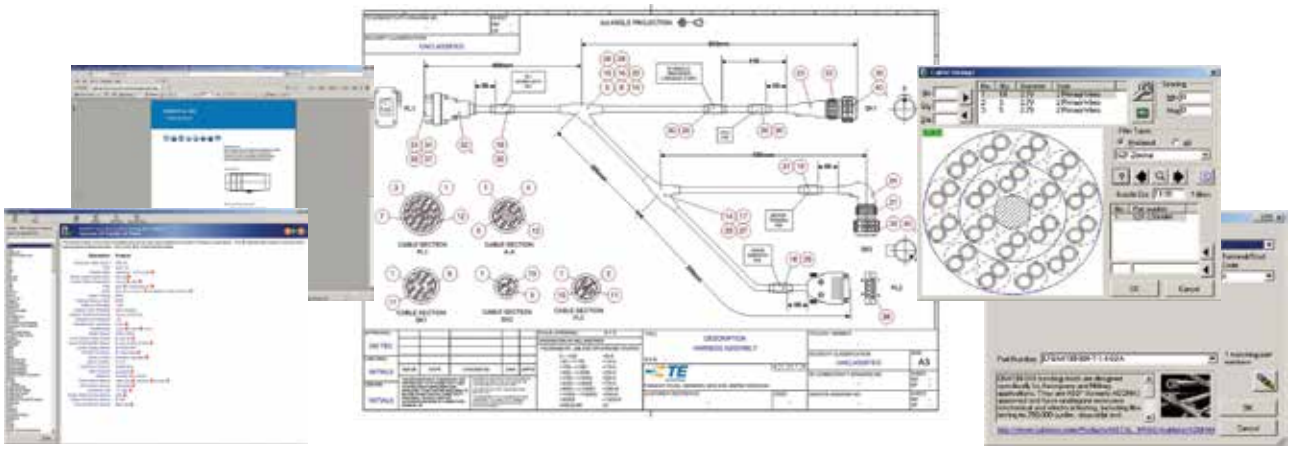
Microsoft Visio: For HarnWare software V6, Visio 2007, 2010, or 2013 software can be used. Only the 32-bit versions of Visio are supported for use with HarnWare.
Microsoft Windows: HarnWare software is compatible with the 32-bit versions of Windows XP Service Pack 3, Windows Vista Service Pack 1, Windows 7, and Windows 8.1. It is also compatible with the 64-bit version of Windows 7.

From Initial Concept



- Materials Selection for given Applications
- Wire Selection Advice
- Wire Routes
- Cable Lays
- Component Selection
- User Parts Library
- Design Checker

Links to Data Sheets and an Extensive Help Section



To Full Manufacturing Documentation

Export Parts List
Export Parts List menu options allow parts lists contained in the current Visio document or a selected set of documents to be exported to the Windows clipboard or a text file. This data can then be used in a spread sheet, database.

Codes of Practice
HarnWare can list the Codes of Practice (COPs) TE uses to support its harnessing products including information on laying wires, shrinking tubing/moulded parts and terminating connectors.

Export Wiring Data to ATE
HarnWare forms allow data such as connectivity, connector references and contact references to be exported to a text file or to the Windows Clipboard. This data can then be used in other systems, for example, automatic test equipment or other electrical design software.

Export Marker Data to TE Wintotal Software System
A Marker Sleeve page can be generated in Microsoft Visio software and or cable marker text and formatting details can be generated in an '.xmt' or COMMS file that is suitable for import into the TE WinTotal labelling software.

Labour Estimates
HarnWare will total up the assembly times for all of the products in a harness, selected by using the database, and output a grand total. The labour estimate sheet, that forms part of the HarnWare document package, works like a spread sheet, and the times and labour rates within it can be adjusted to suit local conditions.

Tooling and Equipment
The HarnWare Materials and Equipment option analyses the drawing and wire list. Materials and equipment that are relevant to the parts contained in the harness design are listed based on TE Codes of Practice.

RoHS Listing
The HarnWare Restriction on Hazardous Substances (RoHS) Codes option analyses the parts referenced in the drawing and wire list. A list of RoHS compliance codes for each part can be added to a page in the Visio document

Weight Estimates
The HarnWare Weight option provides a means of estimating the weight of a harness. Where component weight data is not available, users can add the relevant data to the database.

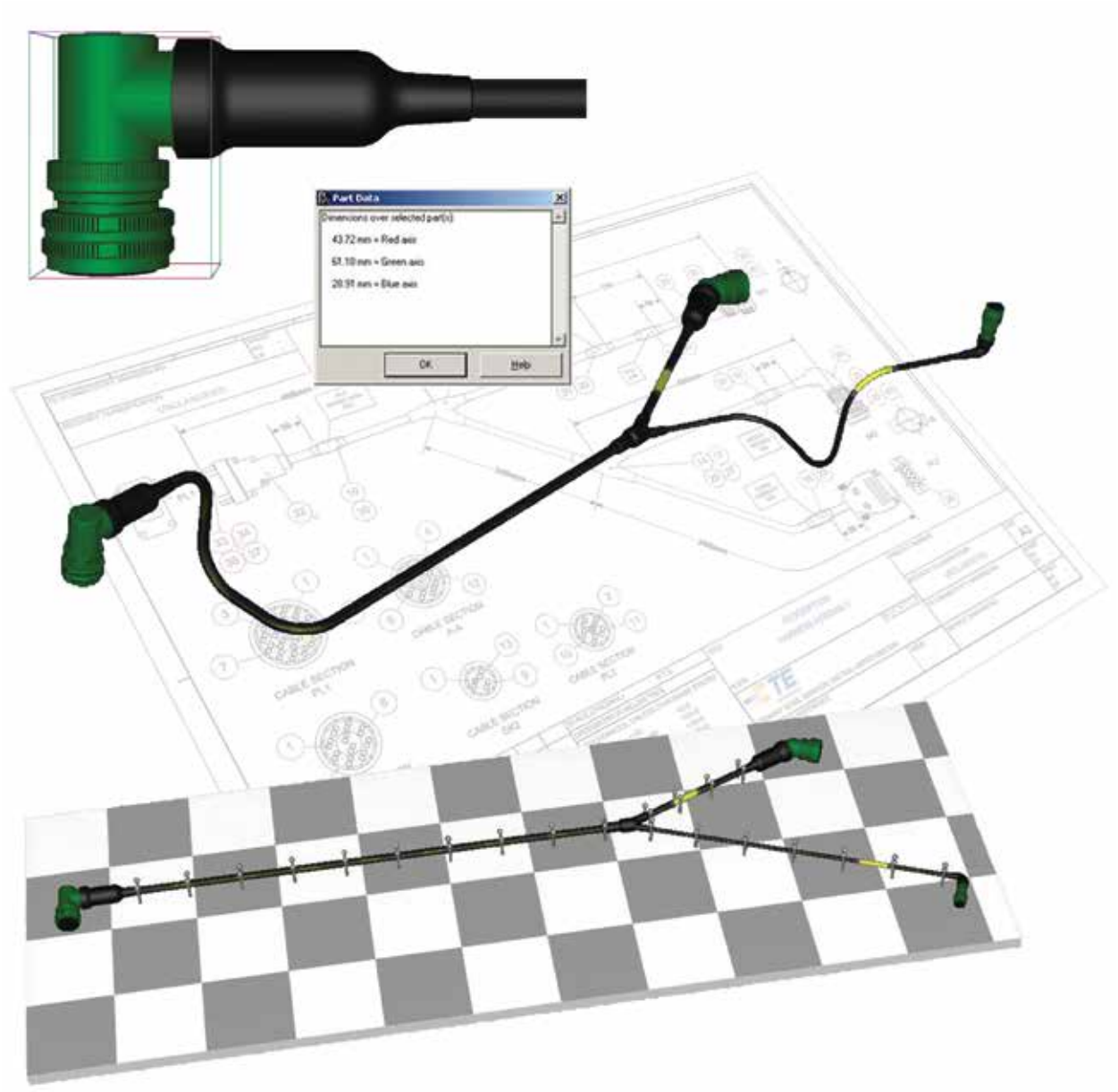
Composite Weights and Parts Lists
This option generates a composite parts or weights list for a number of drawings.

Design Comparison
This option is initiated from the HarnWare Tools menu and is used to analyse the changes between two Visio design documents, typically two different revisions of a harness design or two similar designs.

3D Modelling and Lay-up Boards

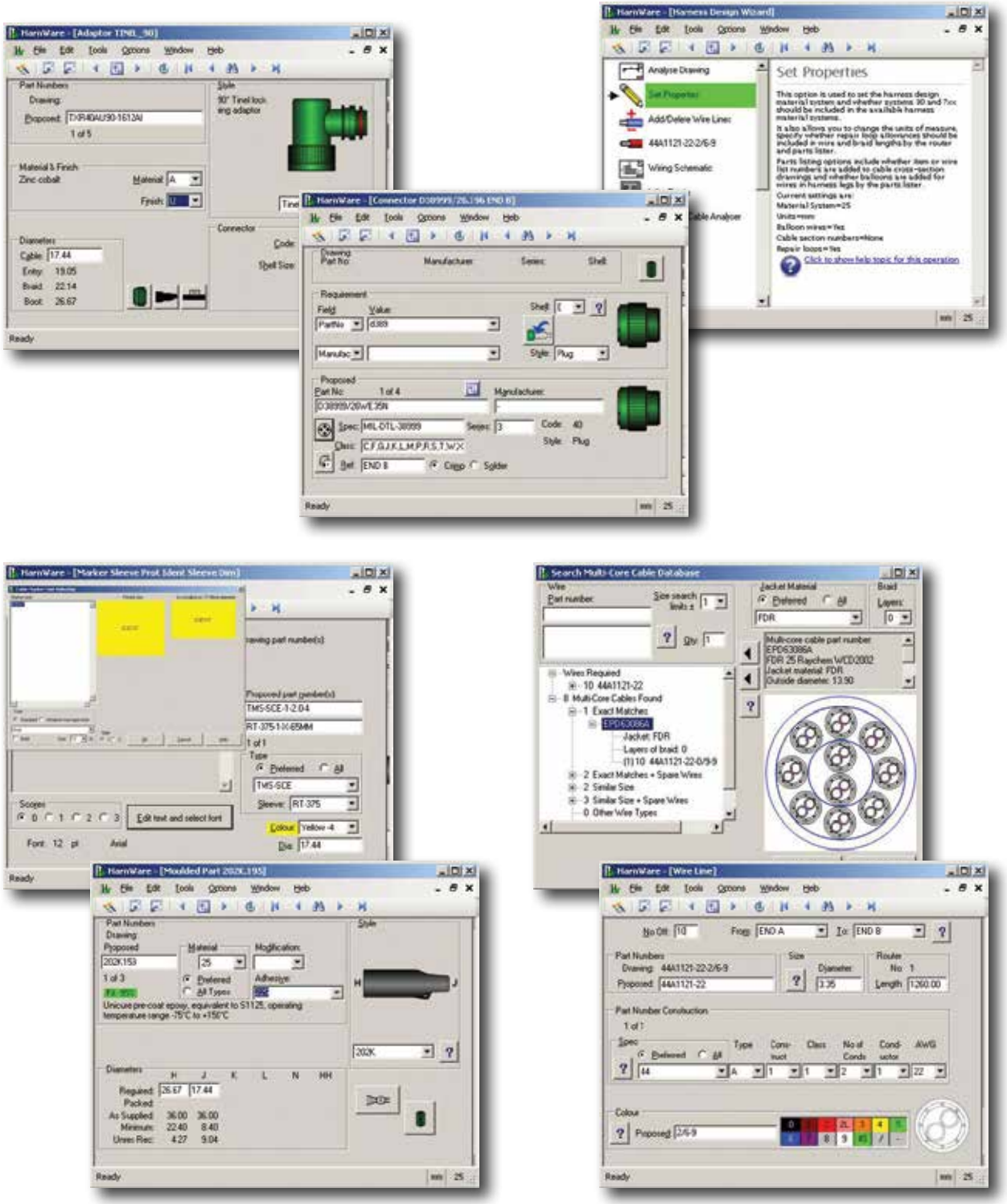
The HarnVis 3D harness design visualisation system offers automatic generation of to-scale 3D models of wiring harnesses and components. These 3D models provide “virtual prototypes” of harnesses allowing the user to see the harness with lengths, diameters and parts shown to-scale. By simply clicking on a part, the user can access such data as part numbers, materials, finishes, adhesives, etc.

These “virtual prototypes” reduce the potential for errors, harness lay-up boards (also known as nail, form and peg boards) can be modelled and pegs can be automatically positioned along the harness legs. When a long harness leg makes it necessary, legs can be bent to fit a lay-up board. 3D models of harnesses and of many TE parts can be exported from the HarnVis system in the form of IGES files for use in other CAD systems.



HarnWare V6 User Friendly Forms

The forms for selecting the wide range of TE components are clear and easy to use with many links to data sheets and design help topics.



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5-1773462-2 ADM/RRD 5M 01/2014

TE connectivity

EVERY CONNECTION COUNTS

RAYCHEM
C-WRAP SIDE ENTRY REPAIR SLEEVE

SELF-ADHESIVE FOR FAST, EASY, RELIABLE REPAIR AND SEALING TO DAMAGED WIRE JACKETS

RAYCHEM C-WRAP SIDE ENTRY REPAIR SLEEVE

Rugged, Reliable, and Easy Wire Jacket Sealing and Repair

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

Description

TE Connectivity's (TE) C-Wrap side 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 HL1910E or HL2010E
- **SolderSleeve Reflector:** Steinel HL1802E-074616
- **Mil Spec installation tools:**
  D-150-C-11: M81969/8-07
  D-150-C-12: M81969/8-08
  D-150-C-13: M81969/8-09
  D-150-C-14: M81969/8-10

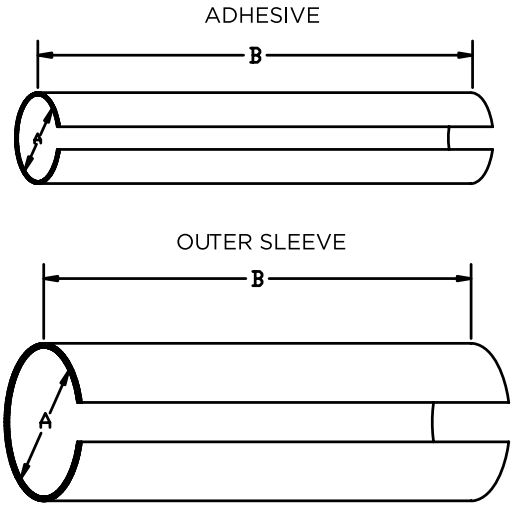
APPLICATIONS

- 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

TE Components . . . TE Technology . . . TE Know-how . . .
AMP | Agastat | CII | Hartman | Kilovac | Microdot | Nanonics | Raychem | Rochester | DEUTSCH

Get your product to market faster with a smarter, better solution.

ORDERING INFORMATION



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)

D-150-C-12
(Part No. CX2096-000)

D-150-C-13
(Part No. CX2097-000)

D-150-C-14
(Part No. CX2098-000)

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te.com/c-wrap

4-1773463-8 ADM/RRD 2.5M 01/2015

Adhesives Selection Guide

EVERY CONNECTION COUNTS

TE connectivity

S1006

Raychem Two-Part Polyamide Epoxy

DESCRIPTION

Raychem-brand S1006 flexible high-viscosity, two-part polyamide epoxy is supplied in a bi-pack to ensure correct mixing. S1006 consists of a pale yellow epoxy resin and an amber polyamide hardener.

APPLICATION

S1006 is an excellent adhesive for many substrates including:

- Polyolefin tubing
- Heat shrink polyolefin molded parts
- Aluminum alloy adapters and connector end fittings
- Mild steel, brass and copper
- Raychem RNF-100 heat-shrink tubing
- Raychem Versafit heat-shrink tubing
- Raychem CRN heat-shrink tubing
- Raychem NT and NTFR heat-shrink tubing
- Raychem -3, -4, -8 and -71 molded parts

TEMPERATURE RANGE

-55°C to +135°C

PACKAGING

S1006 Kit 1: 2 sachets, 15 g each
S1006 Kit 2: 4 sachets, 7.5 g each
S1006 Kit A: 10 sachets, 3 g each
(Kit A is Mil-Spec certified)

SPECIFICATIONS

Raychem RT-1006
Raychem RK-6612
A-A56031

S1009

Raychem Two-Part Modified Epoxy Adhesive

DESCRIPTION

Raychem-brand S1009 adhesive is a two-part modified epoxy that provides an environmental seal that is flexible, watertight, low outgassing, and permanent in a variety of applications, including space equipment and vehicles.

APPLICATION

The adhesive is specifically formulated for use with TE polyolefin tubing, such as

- Raychem RNF-100 heat-shrink tubing
- Raychem RT-218 and RT-220 heat-shrink tubing
- Raychem Versafit heat-shrink tubing
- Raychem CRN heat-shrink tubing
- Raychem NT and NTFR heat-shrink tubing
- Raychem -3, -4, -8, and -71 molded parts

S1009 adhesive also bonds well to PVC tubing.

TEMPERATURE RANGE

-55°C to +135°C

PACKAGING

S1009 Kit A: 10 sachets, 3 g each

SPECIFICATIONS

Raychem RT-1009

S1125

Raychem Chemical and Heat-Resistant Adhesive

DESCRIPTION

Raychem brand S1125 high performance adhesive has been developed to match the superior chemical and heat resistance properties of DR-25 heat-shrinkable tubing and -25 heat-shrinkable molded parts. The adhesive forms the third member of the System 25 product trio.

APPLICATION

Although developed for Raychem System 25 cable harnessing products range, S1125 is an excellent adhesive for many other substrates including:

- Raychem RNF-100 heat-shrink tubing
- Raychem Versafit heat-shrink tubing
- Raychem CRN heat-shrink tubing
- Raychem Convolex and HCTE convoluted tubing
- Raychem -3, -4, -12 and -100 molded parts
- Raychem System 100 components
- Aluminum alloy adapters and connector fittings

TEMPERATURE RANGE

-55°C to +150°C

PACKAGING

S1125 Kit 1: 5 sachets, 10 g each + accessories
S1125 Kit 2: 2 sachets, 10 g each
S1125 Kit 3: 1 sachet, 100 g
S1125 Kit 4: 5 sachets, 10 g each
S1125 Kit 5: 1 sachet, 10 g
S1125 Kit 8: One 50 ml dual syringe + 3 mixing nozzles, 5 mixing sticks, 5 abrasive, and 1 installation leaflet

SPECIFICATIONS

Raychem RT-1011
Raychem RK-6619
DIN VG-95343

S1264
Raychem NBCCS* Adhesive

DESCRIPTION

TE's Raychem brand S1264 high performance adhesive has been developed to match the superior chemical and heat resistance properties of TE's Raychem System 770. The adhesive material has been hardened to withstand the damaging effect of NBC contamination and decontamination washdowns.

APPLICATION

S1264 adhesive is suitable for use in wire harness systems requiring resistance to the effects of nuclear, biological and chemical agent exposure and decontamination when used with other NBC compatible components. S1264 will adhere to

- Raychem DR-25 heat-shrink tubing
- Raychem -25 molded parts
- Raychem FDR cable jackets
- Raychem RT-770 tubing and -770 molded parts

TEMPERATURE RANGE

-55°C to +150°C

PACKAGING

S1264 Kit 1: 1 sachet, 10 g
S1264 Kit 8: One 50 ml dual syringe, 5 mixing sticks, 5 abrasive, and 1 installation leaflet

SPECIFICATIONS

Raychem RT-1012

*Nuclear, Biological, Chemical, Contamination, Survivable

S1017

Raychem Hot-Melt Thermoplastic Adhesive Tape

DESCRIPTION

S1017 is a general purpose, hot-melt thermoplastic adhesive supplied in tape form for easy application to cable substrates. A tough yet flexible adhesive, it is suitable for bonding polyolefins, vinyls and neoprenes, and metals such as steel and aluminum.

APPLICATION

Raychem -3 and -4 molded parts

TEMPERATURE RANGE

-20°C to +60°C

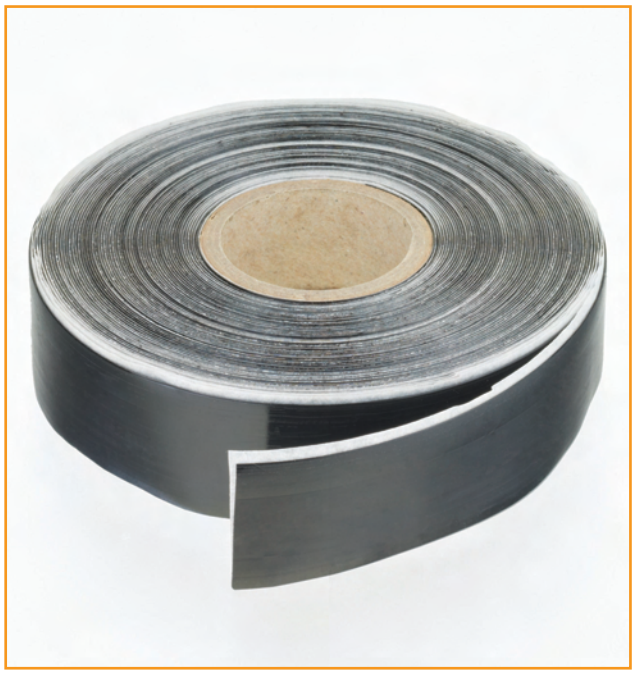
PACKAGING

1 in x .010 in. x 50 ft roll
(25.4 mm x 0.3 mm x 15.2 m)

SPECIFICATIONS

Raychem RW-1050/1

S1030
Raychem Hot-Melt Adhesive Tape



DESCRIPTION

Raychem-brand S1030 tape is a non-flame-retarded polyolefin-based hot-melt adhesive tape. The product is recommended for high flexibility at temperatures as low as -80°C. The tape is often pre-applied to molded parts; its pre-coat designation is /180.

APPLICATION

S1030 is recommended for marine applications where salt water is a threat. The adhesive is very user-friendly, exhibiting excellent flow when heated under normal installation conditions. It is not recommended where aggressive solvents may be present or for terminations under in-service flexural stress at temperatures above 40°C.

With good adhesion to a wide range of substrates, S1030 hot-melt adhesive tape is recommended for use with polyurethane materials and for the following TE products:

- Raychem System 100 ZEROHAL tubing, cable jackets, and -100 molded parts
- Raychem System 25 molded parts
- Raychem DR-25, RNF and RW-175 heat-shrink tubing,
- Raychem FDR-jacketed cable

TEMPERATURE RANGE

-80°C to +80°C

PACKAGING

3/4 in. x 0.010 in. x 33 ft. roll
(20 mm x 0.3 mm x 10 m roll)

SPECIFICATIONS

Raychem RT-1050/6
Raychem RK-6017

S1048
Raychem Hot-Melt Adhesive Tape

DESCRIPTION

Raychem-brand S1048 is a hot-melt adhesive that can be supplied coated onto molded parts as /86. It is generally used as a high-strength hot-melt adhesive.

APPLICATION

S1048 will adhere extremely well to most cable jacket materials, such as ZHTM, DR-25, FDR or RNF, as long as enough heat has been applied at the installation stage to ensure complete flow and wetting of the adhesive to a substrate.

- Raychem ZHTM low-fire-hazard, zero-halogen heat shrink tubing, cable jackets and -100 molded parts
- Raychem DR-25 jackets and tubing
- Raychem FDR jackets and tubing
- Raychem RNF jackets and tubing

TEMPERATURE RANGE

-55°C to +120°C

PACKAGING

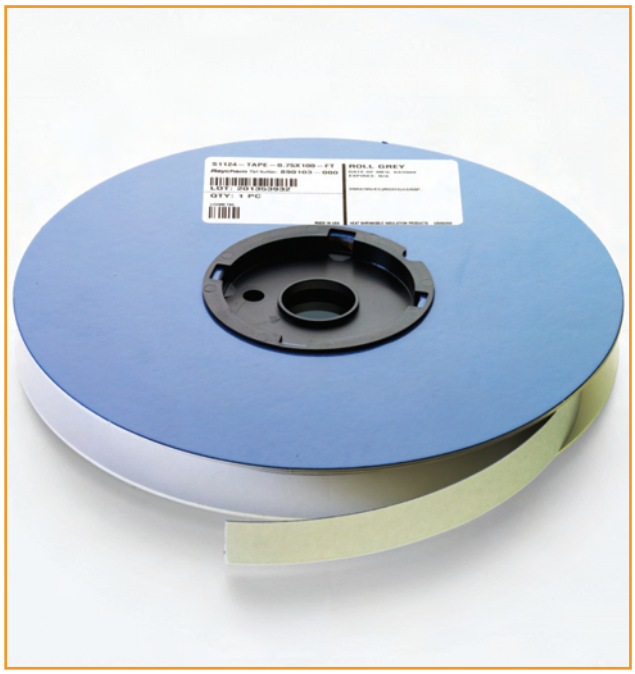
1 in. x .026 in. x 100 ft. roll
(25.4 mm x 0.66 mm x 30 m roll)

SPECIFICATIONS

Raychem RT-1050/3
Raychem RK-6626 for /86 pre-coat
VG95343 for /86 pre-coat on -100 molded parts

S1124

Raychem Elastomeric Adhesive Tape



DESCRIPTION

Raychem-brand S1124 is a flexible adhesive based on elastomeric polymers. This adhesive was developed for use with heat-shrinkable products, NT, NT-MIL, NTFR and elastomeric polymer blend (EPB) molded parts. This adhesive provides good bonds to metals, such as steel and aluminum when bond line is heated to 150°C.

APPLICATION

S1124 tape is well suited for military ground vehicle electrical harness sealing due to its temperature and fluid resistance characteristics.

- Raychem NR, NTFR, and NT-MIL heat-shrink tubing
- Raychem EPB (-51) molded parts

TEMPERATURE RANGE

-55°C to +105°C

PACKAGING

3/4 in. x .018 in. x 100 ft. roll
(20 mm x 0.46 x 30 m)

SPECIFICATIONS

Raychem RT-1050/13

S1297

Raychem Hot-Melt Thermoplastic Adhesive Tape

DESCRIPTION

S1297 is a hot-melt thermoplastic pre-coat adhesive designed for use with TE's heavy-duty boots and cable entry seals. It is suitable for bonding to various cable jacket substrates including polyethylene, PVC, polychloroprene, and metals such as steel and aluminum.

APPLICATION

CES
CSGA cable entry seals
SST-FR

TEMPERATURE RANGE

-20°C to +90°C

PACKAGING

1 in x .010 in. x 10 ft roll
(25.4 mm x 0.3 mm x 3 m)

SPECIFICATIONS

Raychem RW-2019

S1255-04
Raychem NBCCS Adhesive Tape

DESCRIPTION

Raychem-brand S1255-04 one-part epoxy tape has been developed to match the superior chemical and heat resistance properties of TE's Raychem System 200, 300, 780 and 790.

APPLICATION

Developed originally to match the +200°C temperature performance of Raychem System 200 components. S1255-04 also offers resistance to the effects of nuclear, biological and chemical agent exposure and decontamination when used with other compatible components.

- Raychem System 200 fluoroelastomeric tubing and molded parts
- Raychem System 300 fluoroplastic tubing and -55 molded parts
- Raychem System 780 fluoroelastomeric tubing and molded parts
- Raychem System 790 fluoroplastic tubing and molded parts

Note: S1255-02 is specified for use on legacy programs only.

TEMPERATURE RANGE

-55°C to +200°C

PACKAGING

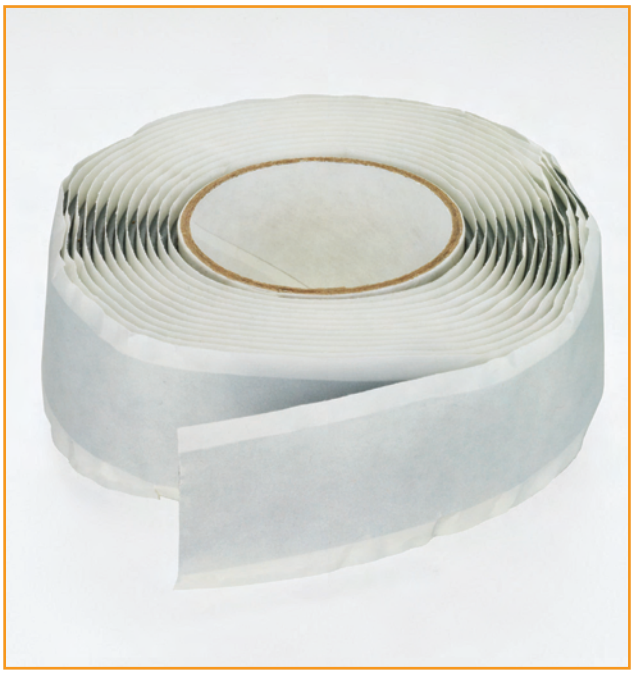
3/4 in. x .020 in. x 100 ft. roll
(20 mm x 0.5 mm x 30 m)

SPECIFICATIONS

Raychem RT-1014

S1278

Raychem General-Purpose Hot-Melt Sealant Tape



DESCRIPTION

Raychem-brand S1278 is a hot-melt thermoplastic grey butyl sealant designed for use with TE's heavy-duty breakout molded parts to offer excellent water sealing and weatherproofing.

APPLICATION

General purpose sealant and filler/potting medium for cable breakouts. Specify S1278 when fire retardantancy is required.

TEMPERATURE RANGE

-40°C to +90°C

PACKAGING

S1278-01: 1 in. x .062 in. x 25 ft. roll (25.4 mm x 1.57 mm x 7.6 m)

S1278-02: 3-3/4 in. x .125 in. x 10 ft. roll (95 mm x 3.18 mm x 3 m)

SPECIFICATIONS

Raychem RW-2020

S1305

Raychem Halogen-Free Hot-Melt Sealant Tape

DESCRIPTION

Raychem-brand S1305 is a hot-melt thermoplastic grey butyl sealant designed for use with TE's heavy-duty breakout molded parts to offer excellent water sealing and weatherproofing.

APPLICATION

S1305 hot-melt tape was developed as a halogen-free, flame retardant sealant and filler/potting medium for cable breakouts.

TEMPERATURE RANGE

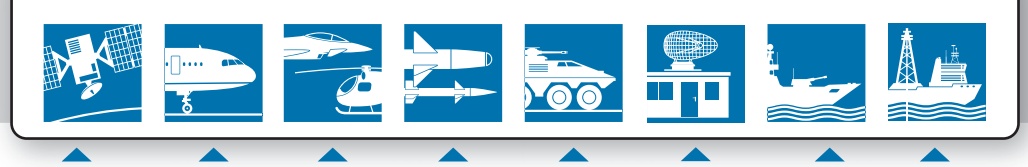
-40°C to +90°C

PACKAGING

1 in. x .062 in. x 25 ft. roll
(25.4 mm x 1.57 mm x 7.6 m)

SPECIFICATIONS

Raychem RW-2020



TE manufacturers Raychem adhesives and sealants to accommodate a wide range of applications, materials, and environmental conditions. Raychem adhesives include both thermosets and thermoplastics. Thermosets are curable two-part epoxies or crosslinked elastomers. Thermoplastics are hot-melt adhesives that flow when heated and set when cooled. They reflow when reheated to simplify component repair. TE also manufactures Raychem products that include a thermoplastic adhesive or a mastic-type sealant for water holdout applications. The sealants adhere to nonoily substrates and can be removed where reentry is necessary

SELECTION GUIDE

To determine the adhesive or sealant most compatible with a Raychem part, you must know the part's product type.

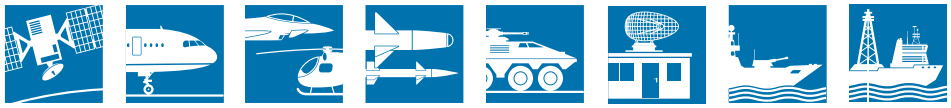
Use the Adhesive/Sealant Selection Table on page 16 to determine a Raychem part's product type and the adhesive/sealant compatible with that type.

Use the Adhesive/Sealant Product Characteristics Table (pages 14 and 15) to be sure the adhesive or sealant has the product characteristics your application requires.

Note: Users should independently evaluate the suitability of the product for their application. Before ordering, check with TE for most current data.

To use the Selection Table, follow these four steps:

1. Under "Substrate Category," find the product material and product name/part number for the Raychem part.
2. Across the top of the table, find the part's product type and dash number.
3. At the intersection of the substrate category (product material/name/part number) and the product type (by designated dash number) you will find the part number for the most compatible adhesive for the Raychem part.
4. See the Adhesive/Sealant Product Characteristics Table to verify the characteristics of the adhesive/sealant you selected.

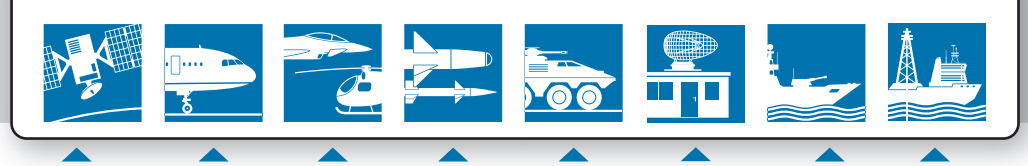


Adhesive/Sealant Product Characteristics Tables

Product Type	Precoat Designation	Type	Operating Temperature Range	Product Designation	Available Form/ Packaging
Thermosets					
S1006	—	Epoxy/polyamide two-part paste	-55°C to 135°C [-67°F to 275°F]	S1006 Kit 8	50-ml dual syringe
				S1006 Kit 1	Two 15-gram packs
				S1006 Kit 2	Four 7.5-gram packs
				S1006 Kit A	Ten 3-gram packs
S1009	—	Epoxy/polymercaptan two-part paste	-55°C to 135°C [-67°F to 275°F]	S1009 Kit A	Ten 3-gram packs
				S1009 Kit 8	50-ml dual syringe
S1255-04	—	One-part epoxy tape adhesive	-55°C to 200°C [-67°F to 392°F]	S1255-04	Tape [3/4 in. x .020 x 100 ft.]
S1125	—	Epoxy/polyamide two-part paste	-55°C to 150°C [-67°F to 302°F]	S1125 Kit 1	Five 10-gram packs
				S1125 Kit 2	Two 10-gram packs
				S1125 Kit 3	One 100-gram pack
				S1125 Kit 4	Five 10-gram packs
				S1125 Kit 5	One 10-gram pack
				S1125 Kit 8	50-ml dual syringe
S1264	—	Epoxy/polyamide two-part paste	-55°C to 150°C [-67°F to 302°F]	S1264 Kit 1	One 10-gram pack
				S1264 Kit 8	50-ml dual syringe
	/225	Precoated latent-curing epoxy/polyamide	-75°C to 150°C [-103°F to 302°F]	Precoat only on -25 molded parts	—
Thermoplastics					
S1017	/42	Hot-melt/ polyamide	-20°C to 60°C*** [-4°F to 140°F]	S1017	Tape [1 in. x .010 in. x 50 ft.]
S1030	/180	Hot-melt/ polyolefin	-80°C to 80°C [-112°F to 176°F]	S1030	Tape [3/4 in. x .010 in. x 33 ft.]
S1048	/86	Hot-melt, high performance	-55°C to 120°C [-67°F to 248°F]	S1048	Tape [1 in. x .026 in. x 100 ft.]
S1124	/164	Hot-melt, elastomeric polymer	-55°C to 105°C [-67°F to 221°F	S1124	Tape [3/4 in. x .018 in.x 10 ft.]
S1297	/97	Hot-melt/ polyamide adhesive	-20°C to 90°C [-4°F to 194°F]	S1297	Tape [1 in. x .010 in. x 10 ft.]
Sealants					
S1278	—	Hot-melt grey butyl sealant	-40°C to 90°C [-40°F to 194°F]	S1278-01	Tape [1 in. x .062 in. x 25 ft.]
				S1278-02	Tape [3-3/4 in. x .125 in. x 10 ft.]
S1305	—	Hot-melt grey butyl sealant, FR	-40°C to 90°C [-40°F to 194°F]	S1305-01	Tape [1 in. x .062 in. x 25 ft.]

*Shelf life from date of manufacture.
**For specific adhesion properties, see product specification sheets.
***Passes cold bend at -40°C [-40°F] per RT-4204.
****Only S1006 Kit A conforms to A-A-56031.

For full details on installation procedures and curing conditions, please refer to the applicable TE Code of Practice or installation document.

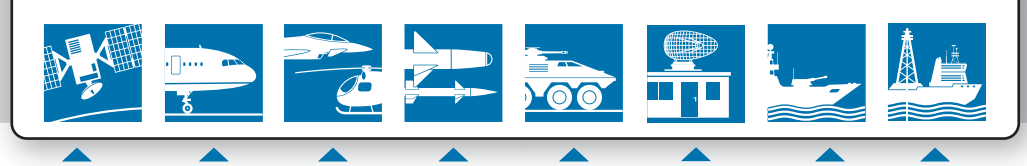


Adhesive/Sealant Product Characteristics Tables (Continued)

Product Type	Pot Life at 23°C [73.4°F]	Curing Conditions	Shelf life* at or below 25°C [77°F]	Specifications**	Comments
Thermosets					
S1006	1 hr	96 hr at 20°C [68°F] min. or 1 hr at 120°C [248°F]	2 years 1 year Kit 8	RT-1006 RK-6612 A-A-56031****	General purpose harnessing adhesive. Not used on fluoroelastomers, silicone or PVDF
S1009	20 min.	24 hr at 20°C [68°F] min. or 1 hr at 95°C [203°F] 45 min at 120°C [248°F]	2 years 1 year Kit 8	RT-1009	General purpose harnessing adhesive. Not used on fluoroelastomers or silicone
S1255-04	—	90 min at 155°C [311°F] or 15 min at 26 0°C [464°F]	1 year with refrigeration	RT-1014	One-part epoxy tape used with fluoroelastomer harness systems.
S1125	—	24 hr at 20°C min. or 1 hr at 85°C [185°F]	18 months	RT-1011 RK-6619 VG-95343	Good fluid-resistant epoxy used with System 25
S1264	90 min.	24 hr at 20°C min. or 1 hr at 85°C [185°F]	18 months	RT-1012	Tested to NBC requirements
/225	—	Cure during installation of molded parts	36 months	VG-95343 RK-6630	Precoated epoxy system for System 25
Thermoplastics					
S1017	—	120°C [248°F]	Unlimited	RT-1050/1	General purpose harnessing adhesive Standard precoated adhesive for -3 and -4 molded parts
S1030	—	120°C [248°F]	Unlimited	RT-1050/6 RK-6017	Good low-temperature flexibility Available as a preinstalled tape for molded parts
S1048	—	160°C [320°F]	Unlimited	RT-1050/3 RK-6626	Requires high temperature to achieve bonding. Highest service temperature for hot melt
S1124	—	150°C [302°F]	Unlimited	RT-1050/13	Requires reflowing in an oven at 150°C [302°F] for 90 minutes. Designed to bond to -51 molded parts.
S1297	—	120°C [248°F]	Unlimited	RW-2019	General purpose harnessing adhesive Standard precoated adhesive in Sigmaform molded parts, CES and CSGA cable entry seals, and SST-FR heat-shrinkable tubing
Sealants					
S1278	—	110°C [230°F]	Unlimited	RW-2020	General purpose sealant and cable breakout area filler
S1305	—	110°C [230°F]	Unlimited	RW-2020	Halogen-free, flame-retardant sealant and cable breakout area filler

*Shelf life from date of manufacture.
**For specific adhesion properties, see product specification sheets.
***Passes cold bend at -40°C [-40°F] per RT-4204.
****Only S1006 Kit A conforms to A-A-56031.

For full details on installation procedures and curing conditions, please refer to the applicable TE Code of Practice or installation document.

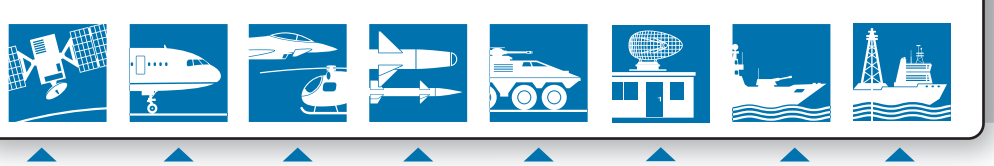


Adhesive/Sealant Selection Table

Substrate Category	Product Name Examples	Molded Part Material Dash Number												
		-3	-4	-6	-8	-12	-25	-50	-51	-55	-71	-100	-125	-130
Polyolefin	RNF-100	S1006	S1006	—	—	—	—	—	—	—	S1006	—	—	S1006
	Versafit	S1009	S1009	—	—	—	—	—	—	—	S1009	—	—	S1009
	CRN	S1017	S1017	—	—	—	—	—	—	—	S1017	—	—	S1017
	BSTS	S1030	S1030	—	—	—	—	—	—	—	S1030	—	—	—
	SST	S1048	S1048	—	—	—	—	—	—	—	S1048	—	—	—
	HR	S1297	S1297	—	—	—	—	—	—	—	S1297	—	—	—
Fluoro-polymer	PVDF	S1009	S1009		S1009	—	S1125	—	—	—	S1009	—	S1009	—
		S1048	S1048	—	—	—	—	—	—	—	S1048	—	S1048	—
		S1125	S1125	—	—	—	—	—	—	—	S1125	—	S1125	—
	RT-555	—	—	—	—	S1255-04	—	—	—	S1255-04	—	—	S1255-04	—
	HCTE	—	—	—	—	S1255-04	S1125	—	—	S1255-04	—	—	—	—
	Convolex	—	—	—	—	S1125	—	—	—	S1125	—	—	—	—
Vinyl	PVC	S1006	S1006	—	—	—	—	—	—	—	S1006	—	—	—
		S1009	S1009	—	—	—	—	—	—	—	S1009	—	—	—
		S1017	S1017	—	—	—	—	—	—	—	S1017	—	—	—
Elastomer	DR-25	—	—	—	—	—	S1125	S1125	S1125	—	—	—	—	—
	NT	S1006	S1006	—	—	—	—	—	S1124	—	S1006	—	—	—
		S1009	S1009	—	—	—	—	—	—	—	S1009	—	—	—
		S1017	S1017	—	—	—	—	—	—	—	S1017	—	—	—
	NTFR	—	—	—	—	—	S1125	—	S1124	—	—	—	—	—
	SFR	—	—	*	—	—	—	—	—	—	—	—	—	—
	SRFR	—	—	*	—	—	—	—	—	—	—	—	—	—
	RW-200	—	—	—	—	S1255-04	—	—	—	S1255-04	—	—	S1255-04	—
	VPB	—	—	—	—	—	—	S1125	—	—	—	—	—	—
		—	—	—	—	—	—	S1255-04	—	—	—	—	—	—
ZEROHAL	XFFR	—	—	—	—	—	—	—	—	—	—	S1030	—	—
	ZHTM	—	—	—	—	—	—	—	—	—	—	S1030	—	—

*GE RTV 108 used with SFR, SRFR, and -6 (silicone) molded parts.

Substrate Category	Product Name Examples	Molded Part Material Dash Number		
		-770	-780	-790
Nuclear Fluoro-polymers	RT770	S1264	—	—
	RT780	—	S1255-04	—
	RT790	—	—	S1255-04



SUBSTRATE PREPARATION PROCEDURES

Preparation of the substrate depends on the part to be bonded. Following are two preparation procedures. The first applies to plated metals and adapters; the second applies to polymer molded parts, cable jackets, and tubing materials.

For full details on installation procedures and curing conditions, please refer to the applicable TE Code of Practice or installation document.

Note:

- Avoid contamination of the prepared surface. If using primer, apply it according to the manufacturer's instructions and allow it to dry.
- Epoxy adhesives may cause skin and eye irritation. Be sure to observe the handling instructions.
- When using hot-melt adhesives on substrates with high heat-sink capacity (such as connector backshells), preheat the substrate until it is hot to touch, then apply the adhesive tape and shrink the molded part in place.

Caution:

The use of cleaning solvent is described in the preparation of various components for adhesive bonding. Please observe the solvent manufacturer's safety recommendations. Several Raychem epoxy adhesives and solvent base primers are also described in some cases. For specific handling precautions, please consult the appropriate Raychem material safety data sheet for the adhesive being used.

FOR MORE INFORMATION

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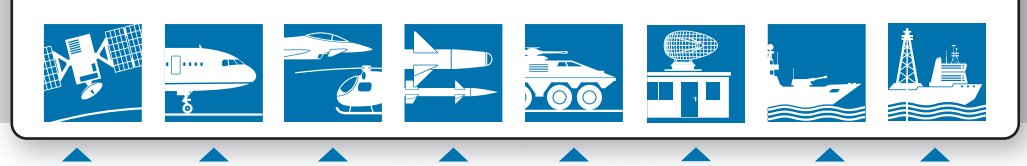
2-1773464-2 ADM/RRD 5M 06/2012



Installation Guide

INSTALLATION PROCEDURES

Preparation of the substrate depends on the part to be bonded.

Following are two preparation procedures. The first applies to plated metals and adapters; the second applies to polymer molded parts, cable jackets, and tubing materials.

Bonding between molded parts, plated metals and adapters

To ensure the best possible bond between a molded part and plated materials and adapters, degrease the end of the molded part which will recover onto the plated metal or adaptor with isopropyl alcohol or isopropanol (IPA) impregnated tissue wipe. NEVER abrade plated metals and adapters.

Where preheating of the plated metal or adapter is judged to be necessary for large and high heat sink terminations, care must be taken to ensure the connector insulation and primary wire insulation are not damaged. Ensure heat is directed to the metal area and all other areas are avoided. TE cannot be held responsible for damage caused during the preheating of plated metals or adapters.

Bonding between molded parts, cable jackets and tubing materials

To ensure the best possible bond between the molded part, cable jacket or tubing degrease the cable jacket in the area where the molded part will recover onto the cable using Isopropyl alcohol. (Approximately 30 mm). Abrade the cable jacket thoroughly in the same area with 100 grit emery cloth. The whole surface of the cable jacket should be abraded removing any print on the cable jacket. Remove loose particles from the abraded area using a dry tissue. DO NOT use a solvent wipe.

Ensure sufficient cable jacket has been abraded to incorporate the strip length requirement. Degrease the inner area of the molded part at each end thoroughly (Approximately 30mm) using Isopropyl alcohol. Abrade the inner area of the molded part at each end thoroughly (Approximately 30mm) with 100 grit emery cloth. Remove loose particles from the abraded area using a dry tissue. DO NOT use a solvent wipe.

Installation of heat shrink molded parts

For the installation of the wide range of TE heatshrink molded parts including straight, 45°, 90° and transitions refer to the appropriate Code of Practice Installation Procedures.

Installation of adhesives

For details of installation of the wide range of TE adhesives including epoxy, hot melt, tapes and pre-installed options refer to the appropriate Code of Practice Installation Procedures.

These Codes of Practice include information such as recommended tooling, installation temperatures, curing cycles and visual standards.

Heath and Safety

Adhere to local Codes and Regulations relating to Safe Working practices.

The installation should be carried out in a well ventilated area. Always wear heat resistant safety gloves when handling hot plastics and adhesives. The use of suitable protective gloves and barrier cream is recommended when using solvents.

Avoid prolonged repeated skin contact with solvents and always wash hands after using solvents. Care should be taken to wear safety glasses when using and handling chemical solvents. If eyes do become contaminated, flush with water and obtain medical assistance immediately. For specific handling precautions please consult appropriate TE material safety data sheet for adhesive being used.

FOR MORE INFORMATION

Technical Support

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Raychem Heat-Shrinkable Cable Entry Seals

www.te.com/ADM

1-1773456-0 ADM/RRD 2.5M 01/2012

Cable Entry Seals

KEY FEATURES

Strain relief

NPT capacity

Cable entry sealing

Metal or nylon nut

Multi-leg breakouts

Available in right-angle

DESCRIPTION

Heat-shrinkable cable entry seals (CES) provide a watertight, fume-tight seal where cables enter connection boxes, bulkheads, or other enclosures. CESs are available in two basic types: standard and threaded.

The standard CES for thin-wall enclosures consists of a three-part assembly: a rigid nylon nut, an O-ring, and a heat-shrinkable molded body. The CES for threaded-hole applications is a one-part assembly that combines a tapered national pipe thread (NPT) in rigid nylon with a heat-shrinkable molded body. To meet sealing requirements, all CESs have factory-applied adhesive that provides the seal to wire and cable jackets.

APPLICATIONS

Cable penetration into panels, junction boxes and sealed cabinets

Bulkhead penetration

ELECTRICAL

Rated to 600 volts

PHYSICAL OR OTHER PROPERTIES

Polyolefin shrinkable body

Metal or nylon nut

Hot melt thermoplastic adhesive

MECHANICAL

Pressure sealing:	25 psi

MATERIALS

Molded heat-shrink body:	Flame retardant polyolefin
Adhesive:	Hot melt adhesive

STANDARDS & SPECS

Raychem CES Specification RT-1335

SAE-AS81765/1 Type 1

Raychem Molded Heat-Shrink Body Specification RT-301

Raychem Adhesive Specification RW-2019

ORDERING INFORMATION

Minimum order quantity varies by part

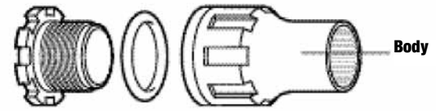
APPLICATION TOOLING

Raychem CV Series, HL Series and HG Series hot air heating tools

PRODUCT DIMENSIONS

Standard CES

Dimensions are mm [inches]

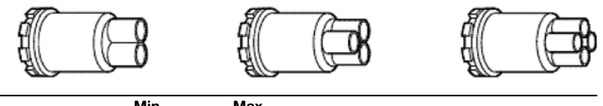


Part No.	No. of Legs	Overall Nom. Recommended Length	Min. Expanded I.D. Body	Max. Recovered I.D. Body	Max. I.D. of Part	Drill Size	Max. O.D. of Nut
CES-1	1	69.85 [2.75]	12.70 [0.50]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.410]
CES-2	1	69.85 [2.75]	19.05 [0.75]	6.35 [0.25]	19.05 [0.75]	25.40 [1.00]	35.81 [1.410]
CES-3	1	95.25 [3.75]	28.45 [1.12]	12.70 [0.50]	27.94 [1.10]	35.05 [1.38]	48.31 [1.902]
CES-4	1	114.30 [4.50]	40.64 [1.60]	19.05 [0.75]	39.62 [1.56]	50.80 [2.00]	69.09 [2.720]
CES-4S*	1	114.30 [4.50]	50.80 [2.00]	19.05 [0.75]	53.34 [2.10]	59.94 [2.36]	85.09 [3.350]
CES-5	1	177.80 [7.00]	69.85 [2.75]	36.32 [1.43]	73.66 [2.90]	88.90 [3.50]	103.38 [4.070]

*Part configuration may be different than depicted in figure. Contact TE for specification.
Also available in threaded version.

Breakout CES

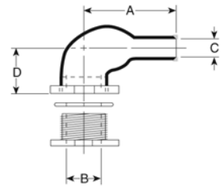
Dimensions are mm [inches]



Part No.	No. of Legs	Overall Nom. Recommended Length	Min. Expanded I.D. (Each Leg)	Max. Recovered I.D. (Each Leg)	Max. I.D. of Part	Drill Size	Max. O.D. of Nut
CES-2-D1A	2	69.85 [2.75]	15.24 [0.60]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-T1	3	69.85 [2.75]	10.16 [0.40]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-T1B	3	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-F1A	4	69.85 [2.75]	10.16 [0.40]	2.79 [0.11]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-2-F1	4	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	19.05 [0.75]	25.40 [1.00]	35.81 [1.41]
CES-3-D1	2	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-3-T1	3	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-3-F1	4	88.90 [3.50]	15.24 [0.60]	4.32 [0.17]	27.94 [1.10]	35.05 [1.38]	48.26 [1.90]
CES-4-D3	2	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-4-T1	3	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-4-F1	4	101.60 [4.00]	22.86 [0.90]	7.62 [0.30]	40.64 [1.60]	50.80 [2.00]	69.09 [2.72]
CES-5-T4	3	127.00 [5.00]	31.75 [1.25]	12.70 [0.50]	73.66 [2.90]	63.50 [2.50]	103.38 [4.07]
CES-5-F4	4	127.00 [5.00]	31.75 [1.25]	12.70 [0.50]	73.66 [2.90]	63.50 [2.50]	103.38 [4.07]

Right-Angle Breakout CES

Dimensions are mm [inches]



Part No.	C		B	Length		Drill Size
	Min. Exp. ID	Max. Rec. ID	ID Min	D	A	
CES-1R	12.70 [0.50]	7.11 [0.28]	12.70 [0.50]	35.56 [1.4]	42.67 [1.68]	25.40 [1.00]
CES-2R	18.03 [0.71]	8.38 [0.33]	19.05 [0.75]	43.18 [1.7]	44.96 [1.77]	25.40 [1.00]
CES-3R	27.94 [1.10]	9.65 [0.38]	27.94 [1.10]	53.34 [2.1]	58.42 [2.30]	34.80 [1.37]
CES-4R	40.64 [1.60]	15.75 [0.62]	40.64 [1.60]	78.74 [3.1]	71.12 [2.80]	50.80 [2.00]

FOR MORE INFORMATION

Technical Support

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www.te.com/ADM

1-1773456-1 ADM/RRD 2.5M 01/2012

Introducing

High Temperature, Heat-Shrinkable, Fluid Resistant Sealing Sleeves

High Temperature Sealing Sleeves

KEY FEATURES

Sealing material is pre-installed in high temperature heat shrink sleeve

No oven curing equipment needed

Available in four product sizes in two different lengths

Labor saving preinstall sealing sleeves

Temperature and fluid resistant fluoropolymer tubing rated to 200˚C continuous with excursions to 260˚C

TE product is thin, tough and lightweight with robust fluid resistance

DESCRIPTION

High temperature fluoropolymer sealing sleeve provides a robust, lightweight cover which shrinks to environmentally seal in-line compression joints and terminal lugs.

APPLICATIONS

High temperature circuit lug and splice covers

Aerospace

Ground Vehicles

Commercial Aviation

MATERIALS

Insulation Sleeve:	Heat-shrinkable, radiation cross-linked modified fluoropolymer. Color: Black
Meltable Insert:	Environmentally resistant modified thermoplastic fluoroelastomer. Color: Light Blue

STANDARDS & SPECS

Meets TE RT-555 high temperature fluoropolymer fluid specification

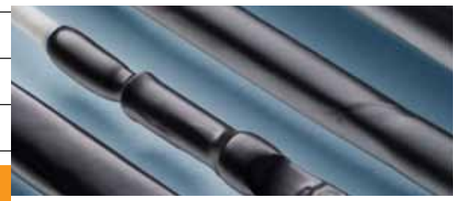
Meets FAR Part 25 appendix F of the FAA standards

ORDERING INFORMATION

Minimum Order Quantity: 200 pieces for all sizes

APPLICATION TOOLING

A heat gun rated at 2200 watts or greater is recommended.

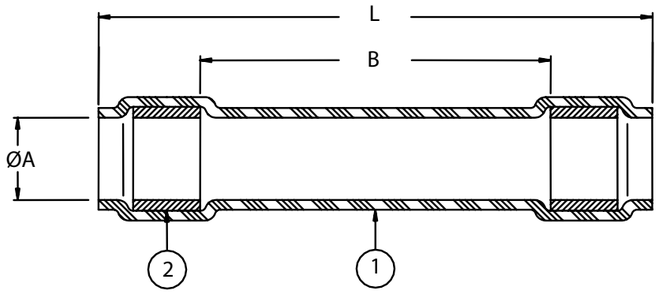


PRODUCT DIMENSIONS

Product Dimensions

Part Description	L Max.	B Nom.	ØA Min.
RT-555-3/8-2.75-A260-0	69.9 (2.75)	25.4 (1.00)	8.3 (0.33)
RT-555-3/8-4.75-A260-0	120.7 (4.75)	76.2 (3.00)	8.4 (0.33)
RT-555-1/2-2.75-A260-0	69.9 (2.75)	25.4 (1.00)	11.4 (0.45)
RT-555-1/2-5.75-A260-0	146.1 (5.75)	101.6 (4.00)	11.4 (0.45)
RT-555-3/4-3.00-A260-0	76.2 (3.00)	31.8 91.25)	17.7 (0.70)
RT-555-3/4-6.75-A260-0	171.5 (6.75)	127.0 (5.00)	17.7 (0.70)
RT-555-1.0-3.75-A260-0	95.3 (3.75)	50.8 (2.00)	22.8 (0.90)
RT-555-1.0-6.75-A260-0	171.5 (6.75)	127.0 (5.00)	22.8 (0.90)

Dimensions are mm [inches]



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Introducing

Raychem Side Entry Bushing (SEB)

www.te.com/ADM

8-1773459-5 ADM/RRD 2.5M 01/2012

Side Entry Bushing

KEY FEATURES

Fewer wraps needed than conventional silicone tapes

High temperature resistant silicone material rated to 180˚C

Trim to fit capabilities. Fit any size saddle clamp/wire bundle combination

Thermally formed so it naturally conforms to circular wire bundles

Re-usable

6 standard sizes available

No adhesive layer for easy removal

DESCRIPTION

Pre-coiled side entry reusable silicone bushing designed to be used in high temperature applications where tape or other molded grommets are used.

One strip of this Side Entry Bushing replaces as much as 6 feet and 40 wraps of traditional tapes. The material is crosslinked and thermoformed to naturally conform to the tight bundle configuration of its application.

The standard Side Entry Bushing has no adhesive layer, so it is easily removed and can be re-used often after repairs have been made.

APPLICATIONS

Used in a non-environmentally sealed backshell (also known as a saddle clamp) and in clamping and wire management applications

STANDARDS & SPECS

Conforms to Mil Standard AMS-DTL-23053/10, MIL-PRF-46846 Type II Class 1 and TE RT-1140

ORDERING INFORMATION

25 per bag

MATERIALS

Flexible, flame-retardant, silicone elastomer strip

ELECTRICAL

Volume resistance: 10^{11} ohms-cm min.

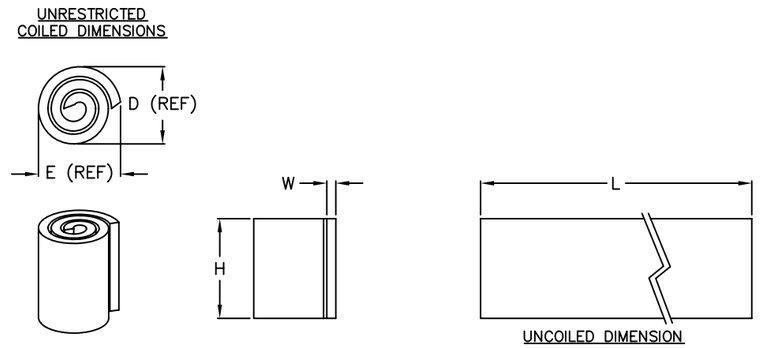
Dielectric strength: 350 V/mil min.

Operating temperature range: -75˚C to +180˚C

PHYSICAL OR OTHER PROPERTIES

Durometer Shore A: 60 ±5

PART NUMBERS



Part Number	E Ref	D Ref	H ±10%	L±10%	W±10%	Bundle O.D. Minimum
SEB-A	.27 (6.9)	.30 (7.6)	.40 (10.2)	1.00 (25.4)	.06 (1.5)	.05 (1.3)
SEB-B	.35 (8.9)	.40 (10.2)	.40 (10.2)	2.00 (50.8)	.06 (1.5)	.05 (1.3)
SEB-C	.48 (12.2)	.53 (13.5)	.50 (12.7)	3.00 (76.2)	.06 (1.5)	.05 (1.3)
SEB-D	.55 (14.0)	.60 (15.2)	.60 (15.2)	4.00 (101.6)	.06 (1.5)	.10 (2.5)
SEB-E	.65 (16.5)	.70 (17.8)	.60 (15.2)	6.00 (152.4)	.06 (1.5)	.30 (7.6)
SEB-F	.85 (21.6)	.88 (22.4)	.60 (15.2)	9.00 (228.6)	.06 (1.5)	.30 (7.6)

Dimensions are in inches, metric in brackets.

Number of wraps will vary for each size.

For More Information

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1-1773735-5 ADM/RRD 1M 07/2014

HARNESS REPAIR PRODUCTS

EVERYTHING YOU NEED TO HELP KEEP HARNESSES MISSION READY

QUICK REFERENCE GUIDE

Flexible

- Convenient permanent or temporary repairs to restore the harness
- Rugged solutions matched to your application hazards

Fast and Easy

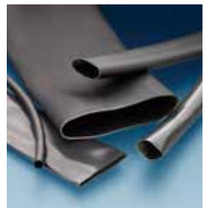
- Complete line for quick, effective field repairs
- Repair conductors, jackets, bundles, shields, and backshells

AEROSPACE, DEFENSE & MARINE /// REPAIR PRODUCTS QRG

Wire and Conductor Repair

	Product Family	Description	Standards	Features	Max. Temperature	Temporary / Permanent	Re-Enterable / Re-Workable	Side Entry	Installation Practices & Instructions	Tooling
	**MiniSeal Splices** D-436-XX	Sealed wire-to-wire crimp splice	SAE AS81824/11	Sealed Immersion resistant 26 thru 12 AWG	150°C	Perm	–	–	RCPS-200-20	AD-1377 Heat gun
	MiniSeal Splices D-200-XX	Sealed wire-to-wire crimp splice	SAE AS81824	High temperature Sealed Immersion resistant 26 thru 12 AWG	200°C	Perm	–	–	RCPS-200-20	AD-1377 Heat gun
	In-Line Sealed Crimp Splices W-096-XX	Sealed wire-to-wire crimp/solder splice	EN3373-001 & 013	High temperature Immersion resistant 26 thru 12 AWG	260°C	Perm	–	–	RPIP-685-00	AS-1377-S Heat gun
	**SolderSleeve Shield Terminators** S-200-XX	Silver/nickel braid termination	SAE AS83519 (modified for 200°C)	High temperature Seals to PTFE	200°C	Perm	–	–	RCPS-100-71	Heat gun
	SolderSleeve Splices D-1744-XX	Sealed wire-to-wire solder splice	NAS 1744	Sealed Immersion resistant 26 thru 12 AWG	150°C	Perm	–	–	RPIP-850-00	Heat gun
	**RF One-Step Connectors** RBD-XX-X-XX RTD-XX-X-XX	Solder termination	Meets performance requirements of MIL-C-39012 up to 2.8 GHz	Excellent strain relief Sealed	150°C	Perm	v	–	RPIP-683-00	Heat gun
	**Data Bus Splice Kit** D-150-0708-5		MIL-STD-1553b Data Bus USAF 8340708	Sealed EMI resistant	150°C	Perm	–	–	RPIP-600-12	AD-1377 Heat gun
	**SolderShield Splices** D-150-0XXX	Shielded splice for coax and twisted pairs		Sealed EMI resistant	150°C	Perm	–	–	RCPS-150-02	AD-1377 Heat gun
	SolderShield Splices D-155-XXXX	Shield-only splice		Sealed EMI resistant	150°C	Perm	–	–	c/w drawing	Heat gun
	**Cold Applied Splices** D-436-3X-COLD	Gel sealed in-line butt crimp	SAE AS81824/12	Sealed Altitude immersion No heat gun required 26 thru 12 AWG	150°C	Perm	–	–	RPIP-1102	AD-1381-1
	**C-Wrap Repair Sleeves** D-150-C-1X	Jacket repair wrap	SAE AS6224/1 pending	Sealed 26 thru 12 AWG	150°C	Perm	–	✓	RPIP-1101	Heat gun M81969/8 removal tool
	**SolderTacts Coax Contacts** D-602-0140 Pin D-602-0141 Socket	One-piece solder contact	MIL-DTL-38999 Series I thru IV M39029/76 and 77	Unsealed	150°C	Perm	–	✓	ES61226	Heat gun AD-1565 fixture
	**DEUTSCH Crimp Contacts** 38943-2238941-22	Crimp Contact (Size 22)	M39029/56-348 Socket M39029/58-360 Pin MIL-DTL-38999 Series I thru IV M39029/56 & 59	Unsealed	125°C	Perm	–	–	Crimp tool specific	Crimp tool
	**SOLISTRAND Splices**	Butt or inline crimp splice	MIL-T-7928 T Type 1, Class 1 & 2	Unsealed 26 thru 2 AWG 1/0 AWG thru 600 MCM	170°C	Perm	–	–	Crimp tool specific	Various crimp
	STRATO-THERM Splices	High-temp splice		Unsealed 22 thru 10 AWG	649°C	Perm	–	–	Crimp tool specific	Various crimp
	**COPALUM Splices**	Butt or inline crimp splice for copper or aluminum		Unsealed Dry crimp 8 thru 3/0 AWG aluminum 10 thru 2/0 AWG copper	150°C	Perm	–	–	Crimp tool specific	Various crimp
	**LightCrimp Fiber Optic Splices**	Fiber-optic field splice 250/ 900 um buffered fiber 1.8/2.0 mm jacket		Sealed	70°C	Perm	–	–	408-10193	Kit

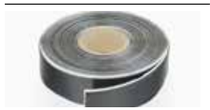
Bundle and Shield Repair

	Product Family	Description	Standards	Features	Max. Temperature	Temporary / Permanent	Re-Enterable / Re-Workable	Side Entry	Installation Practices & Instructions	Tooling
	**High-Shrink-Ratio Tubing** RP-4800-XX	4:1 shrink ratio	VDE 0341 PT 9005 Part A SAE AMS-DTL-23053/5	High temperature Sealed & Unsealed	135°C	Perm	✓	–	COP551	Heat gun
	High-Shrink-Ratio Flexible Tubing HRHF-XX	5.5:1 shrink ratio		High temperature Sealed & Unsealed	135°C	Perm	✓	–	COP551	Heat gun
	High-Shrink-Ratio Tubing HRHT-XX	5.5:1 shrink ratio	SAE AMS-DTL-23053/15 (except some sizes)	High temperature Sealed & Unsealed	135°C	Perm	✓	–	COP551	Heat gun
	Ultra-High-Shrink-Ratio Tubing URHT-XX	Up to 8:1 shrink ratio	UL E85381	High temperature Sealed & Unsealed	135°C	Perm	✓	–	COP551	Heat gun
	**RayOLOn Roll-On Sealing Sleeves** LNCL-XX-XXX	Roll-on sleeve		Reusable Nonshrink Gel strips for sealing NSN listed	70°C	Perm & Temp	✓	–	TUS-41-3007	–
	**RayRim Edging Material**	Protective, self-adhering edging profile		Edge protection	80°C	Perm	✓	✓	PIP-067	Heat gun
	**Side-Entry Bushing** SEB-XX	Coiled bushing	SAE AMS-DTL-23052/10 MIL-PRF-46846 Type II Class 1	Side entry	180°C	Perm	✓	✓	N/A	–
	**RayBraid Tubular Copper Braid** Ray101-XX (tin plated) Ray103-XX (nickel plated)	Copper braid over plastic former		Pull on Add heat shrink tubing for sealing Alternative to braiding machine	150°C 200°C	Perm	✓	No: sleeve Yes: tape wrap in flat form	COP361	–
	**Electrical Shielding Tape** 000W280	Shielded gauze tape		Tinned copper Wrapping transitions	150°C 200°C	Perm	✓	✓	–	–
	Lacing Cord (Not by TE)	Nomex aramid filament		Securing and spot tying wire bundles and shields Alternate to solder at shield over laps	260°C	Perm	✓	✓	IPC/WHMA-A-620, 14.1 & 14.2	Scissors

Backshell Terminations

	Product Family	Description	Standards	Features	Max. Temperature	Temporary / Permanent	Re-Enterable / Re-Workable	Side Entry	Installation Practices & Instructions	Tooling
	**Wrap-Around Heat-Shrink Boot** 209W2XX-XX	Zipper termination spine Allows repair when there is no access to end of harness			200°C	Perm	–	✓		Heat gun
	Tinel-Lock Splice TXS51-XX	Split metal ferrule, for bandstrap shield splice		Two piece Midpoint shield butt splice	150°C to 200°C	Perm	✓	✓		Banding tool
	Tinel-Lock Splice TSR-XX	Metal ferrule for Tinel shield splice		Midpoint shield butt splice	150°C to 200°C	Perm	✓	–		Tinel heat tool
	**HexaShield Adapters** Hex-XX….	Metal ferrule individual shield terminations		Overall shield termination	150°C to 200°C	Perm	✓	–		Torque tool
	**Bandstrap** BND-1225S	Steel straps, nickel or cadmium plated		Easy replacement of shield termination	150°C to 200°C	Perm	✓	✓		Banding tool
	**Side-Entry Tinel Ring** SETR-XX	Split Tinel Ring shield termination		Notch engagement Easy replacement of Tinel Ring	150°C to 200°C	Perm	✓	✓		Tinel heat tool

Jacket Repair

	Product Family	Description	Standards	Features	Max. Temperature	Temporary / Permanent	Re-Enterable / Re-Workable	Side Entry	Installation Practices & Instructions	Tooling
	**High-Temp Heat-Shrink Tape** RT-555-TX.X-A260-XX	High-temperature, side-entry, shrinkable repair tape	RT-1381	High temperature Sealed Fluids resistant Altitude immersion Moderate peel strength	200°C	Perm	✓	✓	TUS-41-3032	Heat gun PTFE tape
	**Self-Amalgamating Tape** S-1081	Bonds to itself	RK-6019	Supplement with adhesive at ends for sealing	130°C	Perm & Temp	✓	✓	ELE-3COP-606 c/w data sheet HSL#04146	Heat gun
	**Silicone Fusion Tape** 608036			High temperature sealing Low peel Supplement with heat shrink tubing for mechanical protection	200°C	Temp	✓	✓	408-9716	N/A
	**Chemical- and Abrasion-Resistant Heat-Shrink Tubing** DR-25	2:1 shrink ratio	SAE AMS-DTL-23053/16 VG95343 Part 5 Type D DEF STAN 59-97 Issue 3	Sealing, strain-relief Mechanical protection Supplement with adhesive	150°C	Perm	✓	–	ELE-3COP-551 PIP-068 COP551TUS-41-3024	Heat gun
	High-Temperature Heat-Shrink Tubing RT-555-XX	2:1 shrink ratio	RT-555	High temp Mechanical protection Supplement with adhesive	200°C	Perm	✓	–	ELE-3COP-551	Heat gun
	Semiflexible Dual-Wall Heat-Shrink Tubing HTAT-XX	4:1 shrink ratio Hotmelt adhesive	SAE AMS-DTL-23053/16	Sealing, strain-relief	125°C	✓	✓	No	COP610	Heat gun
	**Heat-Shrink Molded Parts** AT-099-XX	2:1 shrink ratio Elastomer sleeve		Sealing, strain-relief Heat-activated epoxy adhesive Refurbish back-shell Anti-rotation	150°C	Perm	✓	–	COP554	Heat gun
	**Helical Convolex Conduit Tubing** HCTE	High temperature, fluid resistant Conduit, nonheat shrink	VG96936 Part 6 RT-1162	High temp Impact protection Flexing Supplement with shrink boots Supplement with adhesive	200°C	Perm	✓	–	COP566	N/A
	**COPALUM Splice Cover** RT555-XXX-YYY-A260	High-temperature, heat-shrinkable, fluid-resistant sealing sleeves	FAR Part 25 FAA Standard	Sealed, high temp	200°C	✓	✓	No	TUS-41-3026	Heat gun
	**Wrap-Around Marker** WM-SCE	Wrap around heat-shrink identification marker		Adhesive lined Harness marking Any difficult to access area	135°C	✓	✓	✓	411-121004	Heat gun PTFE tape Thermal printer
	PTFE Tape (Not by TE)	Temporary installation aid for assisting with install of wrap-around products during shrinking and sealing		Fixturing	200°C	Temp	–	✓	–	Scissors
	**Epoxy Adhesive** S-1125	Two-component liquid Sealing and mechanical bonding		Flexibility Potting High peel strength Room temp cure, no oven required	150°C	Perm	–	✓	COP604	N/A
	**Hotmelt Adhesive Tape** S-1048	Sealing and mechanical bonding		Flexibility High peel strength No curing Heat gun set Re-workable	120°C	Perm	✓	✓	COP607	Heat gun
	Conductive Epoxy S-1184 (Not safety approved for USA)	Two-component liquid Sealing and mechanical bonding		Flexibility, Potting, Braid shield termination Low electrical resistance No heat, no solder, no clamping Supplement with structural/ sealing epoxy Caution with shelf life & storage	150°C	Perm	–	✓	COP522 COP505	N/A
	Shrink Tape T-DR-25	No adhesive Sealing and mechanical bonding		Flexibility Mechanical protection Nonself-amalgamating Supplement with adhesive for sealing and bonding	135°C	Perm	–	✓	TDR25INSTALL	Heat gun

-25S

Fluid-Resistant Screened Elastomer

Product Facts

- Fuel and heat resistance
- RFI, EMI protection

Applications

Rayaten screened molded parts in -25S material are designed for use with FDR-25 or DR-25 jacketed screened multiconductor cable and S1125 adhesive to provide a complete high-performance harness system offering high levels of RFI and EMI protection. This -25 material provides optimum high-temperature fluid-resistance and long-term heat-aging properties. The material is particularly suitable for providing encapsulation, mechanical protection, and strain relief on terminations and cable transitions in harsh environments.The standard color is black. Products made from this material are normally used in an assembly (see section 7).

Operating Temperature Range

-55°C to 150°C
[-67°F to 302°F]

Available in:	Americas	Europe	Asia Pacific
	■	■	■

Catalog 1654025
Revised 5-12

www.te.com

-25S (Continued)

Specifications/Approvals

Military	TE
VG 95343 Pt. 20, Pt. 22	RW-2077

Product Characteristics

		Specification Requirements*	Screening effectiveness in dB at 3 KHz to 30 MHz (min.)	Screening effectiveness in dB at >30 MHz to 100 MHz (min.)
Initial values		Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Metal adhesion: 15 N/cm (min.)	—	—
		Shielding effectiveness	75	70
Thermal	Heat shock (1/2 h at 200°C [392°F])	Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Shielding effectiveness	75	70
	Heat aging (168 h at 160°C [320°F])	Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Shielding effectiveness	75	70
	3 thermal cycles of -75°C to 150°C [-103°F to 302°F]	Shielding effectiveness	75	70
Immersion in the following fluids for 24 h:				
Chemical	Lubricating oil (O-156, at 100°C [212°F])	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Hydraulic fluid H515, at 50°C [122°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Aviation fuel JP4 F40, at 23°C [73°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Diesel fuel F54, at 23°C [73°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	1, 1, 1, trichloroethane (1 h, at 23°C [73°F])	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70

*Values quoted are for the polymer/metal composite in all cases when terminated using epoxy adhesives.

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China: +86 (0) 400-820-6015

-25S

Fluid-Resistant Screened Elastomer

Product Facts

- Fuel and heat resistance
- RFI, EMI protection

Applications

Rayaten screened molded parts in -25S material are designed for use with FDR-25 or DR-25 jacketed screened multiconductor cable and S1125 adhesive to provide a complete high-performance harness system offering high levels of RFI and EMI protection. This -25 material provides optimum high-temperature fluid-resistance and long-term heat-aging properties. The material is particularly suitable for providing encapsulation, mechanical protection, and strain relief on terminations and cable transitions in harsh environments.The standard color is black. Products made from this material are normally used in an assembly (see section 7).

Operating Temperature Range

-55°C to 150°C
[-67°F to 302°F]

Available in:	Americas	Europe	Asia Pacific
	■	■	■

Catalog 1654025
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-25S (Continued)

Specifications/Approvals

Military	TE
VG 95343 Pt. 20, Pt. 22	RW-2077

Product Characteristics

		Specification Requirements*	Screening effectiveness in dB at 3 KHz to 30 MHz (min.)	Screening effectiveness in dB at >30 MHz to 100 MHz (min.)
Initial values		Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Metal adhesion: 15 N/cm (min.)	—	—
		Shielding effectiveness	75	70
Thermal	Heat shock (1/2 h at 200°C [392°F])	Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Shielding effectiveness	75	70
	Heat aging (168 h at 160°C [320°F])	Tensile strength: 12 MPa (min.)	—	—
		Ultimate elongation: 400% (min.)	—	—
		Shielding effectiveness	75	70
	3 thermal cycles of -75°C to 150°C [-103°F to 302°F]	Shielding effectiveness	75	70
Immersion in the following fluids for 24 h:				
Chemical	Lubricating oil (O-156, at 100°C [212°F])	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Hydraulic fluid H515, at 50°C [122°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Aviation fuel JP4 F40, at 23°C [73°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	Diesel fuel F54, at 23°C [73°F]	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70
	1, 1, 1, trichloroethane (1 h, at 23°C [73°F])	Tensile strength: 10 MPa (min.)	—	—
		Ultimate elongation: 300% (min.)	—	—
		Shielding effectiveness	75	70

*Values quoted are for the polymer/metal composite in all cases when terminated using epoxy adhesives.

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-100S

Low-Fire-Hazard Screened Material

Product Facts

- Screened Zerohal material
- Low smoke index as defined by NES 711
- Low toxicity index as defined by NES 713
- High temperature index as defined by NES 715

Applications

-100S is the Zerohal material option in the Rayaten shield (screen) termination system. This material combines the fire safety properties of -100 with the excellent EMI and RFI screening of Rayaten screened molded parts where there is a need to lower the risk.

-100S is suitable for high-performance screen terminations in areas where Zerohal materials are required.

The standard color is black.

Products made from these materials are normally used in an assembly with boot and adapter. See KTKK, TCFS in section 7.

Operating Temperature Range

-30°C to 105°C
[-22°F to 221°F]

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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-100S (Continued)

Specifications/Approvals

Military	TE
VG 95343 Pt. 20, Pt. 22	RW-2078

Product Characteristics

		Specification Requirements*	Screening Effectiveness in dB at	
			3 KHz to 30 MHz (min.)	>30 MHz to 100 MHz (min.)
Initial values		Tensile strength: 7 MPa (min.) Metal adhesion: 15 N/cm (min.) Shielding effectiveness	75	70
Thermal	Heat shock (1/2 h at 200°C [392°F])	Metal adhesion: 15 N/cm (min.) Shielding effectiveness	75	70
	Heat aging (168 h at 150°C [302°F])	Metal adhesion: 15 N/cm (min.) Shielding effectiveness	75	70
Fluids	Immersion in the following fluids for 24 h:			
	Phosphate ester hydraulic fluid DTD900/4881 at 23°C [73°F]	Tensile strength: 5 MPa (min.) Shielding effectiveness	75	70
	Water at 23°C [73°F]	Tensile strength: 5 MPa (min.) Shielding effectiveness	75	70
	Lubricating oil O-149 at 50°C [122°F]	Tensile strength: 5 MPa (min.) Shielding effectiveness	75	70
	Transformer oil S-756 at 50°C [122°F]	Tensile strength: 5 MPa (min.) Shielding effectiveness	75	70

*Values quoted are for the polymer/metal composite in all cases when terminated using epoxy adhesives. (Refer to section 5.)

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End Caps, 101A011 to 094

TE end caps provide optimum waterproofing and environmental protection for underwater, underground, or outdoor applications.

The end caps are highly resistant to moisture, fungus, and weathering.

Applications

Use for protecting cables and pipes or capping unused outlets in transitions. Provides an environmental seal when used with adhesive.

As Supplied (a)

After Unrestricted Recovery (b)

Product Dimensions

Part No.	H		P	HW
	Min. a	Max. b	Min. b	±20% b
101A011	5.10 [.20]	2.00 [.08]	22.90 [.90]	1.02 [.04]
101A021	7.40 [.29]	3.30 [.13]	25.40 [1.00]	1.27 [.05]
101A031	10.20 [.40]	4.80 [.18]	30.50 [1.20]	1.52 [.06]
101A041	15.20 [.60]	6.40 [.25]	40.60 [1.60]	1.78 [.07]
101A062	25.40 [1.00]	11.40 [.45]	68.80 [2.70]	2.29 [.09]
101A083	50.80 [2.00]	22.90 [.90]	101.60 [4.00]	2.79 [.11]
101A094	83.80 [3.30]	38.10 [1.50]	114.30 [4.50]	3.05 [.12]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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End Caps, 101A011 to 094 (Continued)

Materials Available

Material*	Material Description	Precoating No.	Adhesive Part No.**
-3	Semirigid polyolefin	/42 or /86	S-1017 or S-1048
-4	Flexible polyolefin	/42 or /86	S-1017 or S-1048
-12	Fluoroelastomer	N/A	S-1255-04
-25	Fluid-resistant elastomer	/42 or /86	S-1017 or S-1048 or S-1125
-100	Polyolefin, Zerohal	/180	S-1030

*For more information, please see the appropriate material page in this section.
**For more information, please see section 5.

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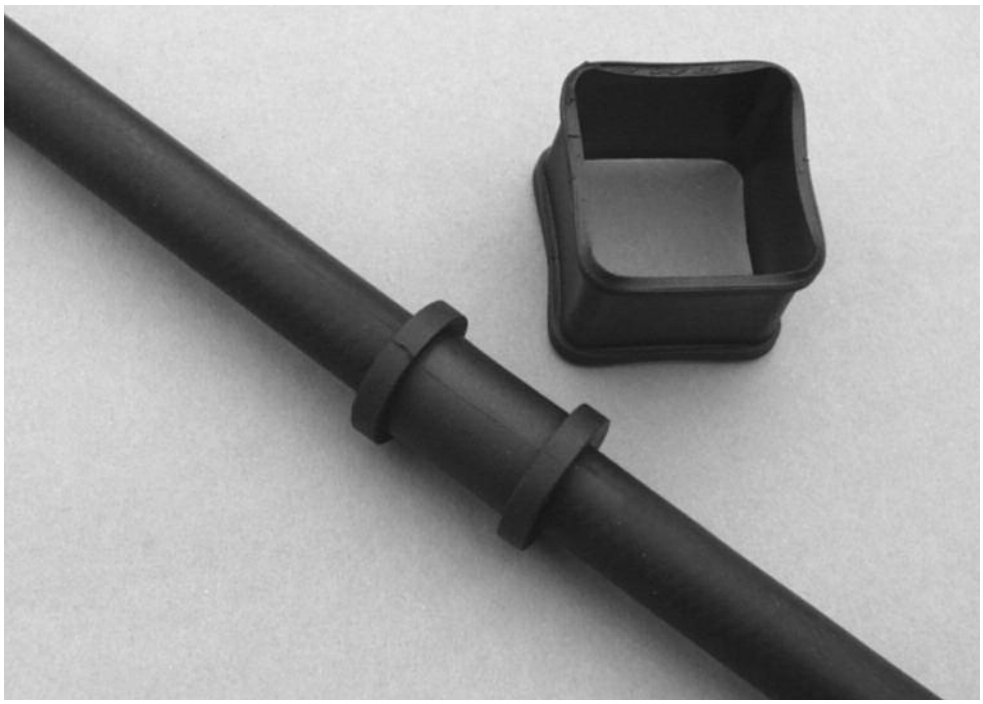
202W302 to 342

Heat-Shrink Bobbins

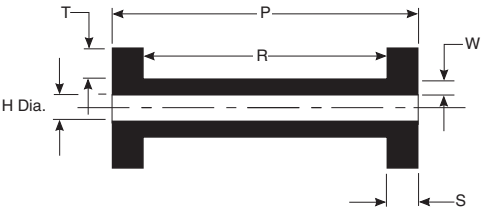


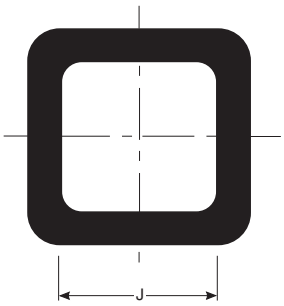
Product Facts

- Good abrasion resistance
- Fits range of diameters
- Excellent location, cushioning and protection of cable or hoses from P clips and wire ties
- Low cost, high volume installation
- Shrinks onto hose/pipe/wire harnesses
- Good mechanical, thermal and chemical properties
- Stays in place
- No expensive tooling required

As Supplied (a)

After Unrestricted Recovery (b)





Square expanded = -130 material

Circular expanded = -12 and -25 material
-3, -4

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202W302 to 342 (Continued)

Materials Available

Material	Material Description	Precoating No.	Adhesive Part No.
-3	Polyolefin, semi-rigid	/42, /86	S-1017, S-1048
-4	Polyolefin, flexible	/42, /86	S-1017, S-1048
-12	Fluoroelastomer	N/A	S-1255-04
-25	Fluid resistant elastomer	/86 or /225	S-1017 or S-1048 or S-1125
-130	Flexible polyolefin	/42, /86	S-1017

Product Dimensions

Part No.	H		J	P	R	S	T	W	Recommended Hose Sizes	
	Min. a	Max. b	Min. a	±10% b	±10% b	±10% b	±10% b	±20% b	Min.	Max.
202W302	29.0 [1.142]	9.5 [.374]	29.0 [1.142]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	1.5 [.059]	11.0 [.433]	25.0 [.984]
202W312	39.0 [1.535]	12.7 [.500]	39.0 [1.535]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	2.0 [.079]	14.0 [.551]	34.0 [1.339]
202W321	10.0 [.394]	3.0 [.118]	10.0 [.394]	29.0 [1.142]	23.0 [.906]	3.0 [.118]	3.0 [.118]	1.5 [.059]	4.0 [.157]	8.0 [.315]
202W331	19.0 [.748]	6.4 [.252]	19.0 [.748]	29.0 [1.142]	24.0 [.945]	2.5 [.098]	2.0 [.079]	1.5 [.059]	8.0 [.315]	17.0 [.669]
202W342	54.0 [2.126]	18.0 [.709]	54.0 [2.126]	35.0 [1.378]	25.0 [.984]	5.0 [.197]	3.0 [.118]	2.0 [.079]	20.0 [.787]	48.0 [1.889]

Note: Coating is optional. As supplied dimensions appearing in table are for uncoated parts. When coating is added, entry diameters will be reduced by 1.5 [.06] max.

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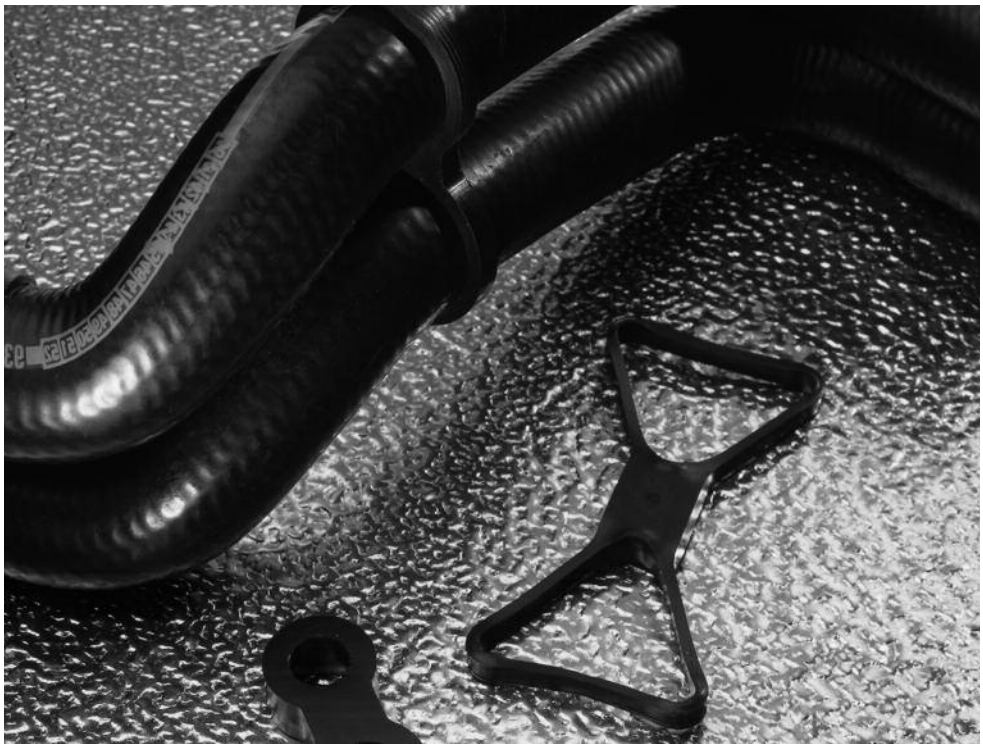
400W242

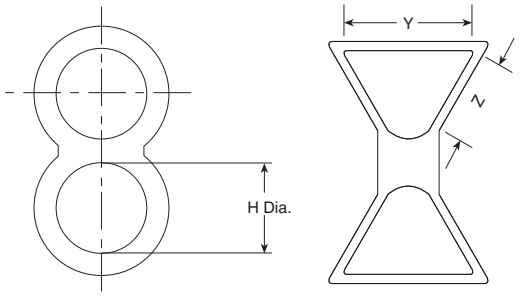
Heat-Shrink Positioning Ring



Product Facts

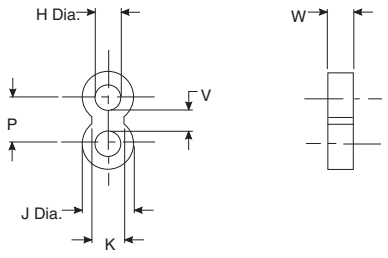
- Easy to install
- Bundles hoses/pipe
- Fits range of diameters due to high expansion
- Low cost, high volume installation
- Shrinks onto hose/pipe
- Minimum distance between substrates
- Good mechanical, thermal and chemical properties
- Push on fit to hose/pipe
- Stays in place when installed
- No expensive tooling required
- Keeps hoses/pipes together, optimizing space
- Twinning two hoses/pipes rationalizes part descriptions
- Hose/pipe can be orientated correctly for ease of fitting to vehicle
- Vibration damping

As Supplied (a)



-3, -4, -25, -100 -130

After Unrestricted Recovery (b)



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400W242 (Continued)

Materials Available

Material	Material Description	Precoating no.	Adhesive part no.
-3	Polyolefin, semi-rigid	/42, /86	S-1017 or S-1048
-4	Polyolefin, flexible	/42, /86	S-1017 or S-1048
-25	Elastomer, fluid resistant	/86, /225	S-1017 or S-1048
-100	Polyolefin, Zerohal	-100-CS1972 (S1030 tape supplied in bag)	S-1030
-130	Flexible polyolefin	/42, /86	S-1017

As supplied dimensions are for uncoated parts, when coating is added, entry diameters will reduce by 1.5 [.06] max.

Part Numbering System

400W242 -/**-0**

Adhesive Slash Number
(if required see compatibility chart)

Material Dash Number
(see compatibility chart)

Base Part Number

Product Dimensions

Part No.	H		J	K	P	V	W	Y*	Z*
	Min. a	Max. b	Max. b	± 1.2 b	± 1.7 b	± 0.45 b	± 1 b	± 2 a	± 2 a
400W242	28 [1.102]	10.2 [.402]	19.3 [.760]	12 [.472]	17 [.669]	7.0 [.276]	10 [.394]	29 [1.142]	25 [.984]

*Applicable for -130 only.

Catalog 1654025
Revised 5-12

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SSC

Heat-Shrinkable End Caps

Product Facts

- **Self-sealing for waterproofing (sealant-coated parts only)**
- **Electrical insulation to 1000 V**
- **Abrasion-resistance**
- **Mechanical protection**
- **Easy installation, requiring no special skills**
- **Operating temperature range of -40°C to 85°C [-40°F to 185°F]**
- **Minimum shrink temperature of 121°C [250°F]**

Applications

These SSC heat-shrinkable end caps are made from a thermally stabilized, modified polyolefin, which makes them highly resistant to moisture, fungus, and weathering. The end caps also have excellent electrical properties. End caps coated with sealant are available for underwater or underground applications with a pressure differential up to 20 psi between the inside of the cable and the outside environment. End caps may be used over lead, steel, aluminum, copper, polyethylene, polyolefin, EPR, and PVC jacketing materials.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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SSC (Continued)

Specifications/Approvals

Type	TE	Military/Commercial
SSC-X and SSC-XTV	SSC specification control drawing	PPS-3011/6
—	RW-2024	—

Adhesive is /239 = PPS = 3012/70

Product Dimensions

Part No.	Inner Diameter* As Supplied (min.)	Recovered Inside Dia. (max.)	Length Recovered ± 10 %	Wall Thickness Recovered ± 20 %
SSC-1	10.00 [.390]	4.00 [.160]	33.50 [1.320]	2.00 [.080]
SSC-2	20.00 [.790]	7.50 [.300]	55.30 [2.180]	2.30 [.090]
SSC-3	35.00 [1.380]	15.00 [.590]	89.90 [3.540]	3.00 [.120]
SSC-4	55.00 [2.170]	25.00 [.980]	143.20 [5.640]	3.30 [.130]
SSC-5	75.00 [2.950]	32.00 [1.250]	150.10 [5.910]	3.30 [.130]
SSC-5M1	75.00 [2.950]	32.00 [1.250]	79.25 [3.120]	3.30 [.130]
SSC-6	100.00 [3.940]	45.00 [1.770]	162.50 [6.400]	4.00 [.160]
SSC-7	120.00 [4.720]	70.00 [2.760]	145.00 [5.710]	3.80 [.150]

*As-supplied dimensions appearing in table are for uncoated parts. When adhesive is added, entry diameters will be reduced by 1.5 [.06] maximum.

Ordering Information

Military	
SSC-XTV	Sealing end cap with adhesive , w/ pressure valve
SSC-X	Sealing end cap with adhesive
SSC-XU	End cap, uncoated

Catalog 1654025
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KTKK Product Family Overview

Applications

KTKK cable assemblies are one-part assemblies for screened and unscreened cables. Constructed from heat-shrinkable screened molded parts and connector adapters, the assembly consists of parts already well proven in harsh military environments.

Installation is simply effected by coupling the adapter to the connector and shrinking the rear of the molded part onto the cable with a hot air gun.

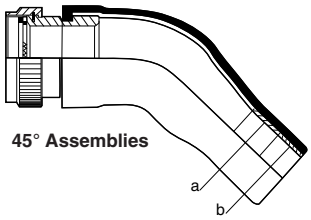
The molded part has a hot-melt adhesive preinstalled to provide a bond between the cable jacket and the molded part.

When used in conjunction with shielded (screened) cables, the assembly provides electrical continuity between the cable shield and the connector with Rayaten molded parts.

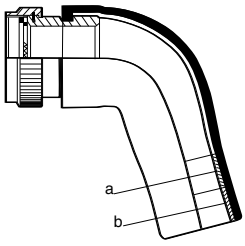
Rayaten molded parts are shielded, heat-shrinkable parts providing shielding levels better than 80 dB at 100 MHz.

Assembly Types

Straight Assemblies



45° Assemblies



90° Assemblies

a = Preinstalled conductive adhesive for use with Rayaten screened molded parts only.

b = Preinstalled environment adhesive for use with screened and unscreened KTKK assemblies (see “Preinstalled adhesives,” page 7-9).

Materials Available

Material		Specification
-25 fluid-resistant modified elastomer	-25S fluid-resistant modified elastomer; shielded	RW-2077
-100 low-fire-hazard material	-100S low-fire-hazard; shielded	RW-2078

Precoated Adhesives

Material	Available Coatings (Unshielded)	Available Coatings (Shielded)
-25	S1048 (/86) high-temperature hot-melt adhesive	—
-25S	—	S1030 (/180) low-fire-hazard hot-melt adhesive
-100	S1030 (/180) low-fire-hazard hot-melt adhesive	—
-100S	—	S1275 conductive adhesive for use with Rayaten molded parts.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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KTKK Assemblies Screened

Pattern 105 Connectors or Connector Code 76

25S Fluid Resistant Elastomer

Connector Shell Size	Straight Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range	Part Number	Cable O.D. Range
08	KTKK 0520	5.0-8.0 [.197-.315]	—	—
10	KTKK 0521	6.0-13.0 [.236-.512]	KTKK 1051	6.0-13.0 [.236-.512]
12	KTKK 0522	7.2-15.0 [.283-.591]	KTKK 1052	7.2-15.0 [.283-.591]
14	KTKK 0523	7.2-15.0 [.283-.591]	KTKK 1053	7.2-15.0 [.283-.591]
16	KTKK 0524	8.5-19.0 [.335-.748]	KTKK 1054	8.5-19.0 [.335-.748]
18	KTKK 0525	8.5-20.0 [.335-.748]	KTKK 1055	8.5-19.0 [.335-.748]
20	KTKK 0526	10.0-24.0 [.394-.945]	KTKK 1056	10.0-24.0 [.394-.945]
22	KTKK 0527	10.0-24.0 [.394-.945]	KTKK 1057	10.0-24.0 [.394-.945]
24	KTKK 0528	15.8-33.0 [.622-1.299]	KTKK 1058	15.8-33.0 [.622-1.299]

100S Low Fire Hazard Material

08	KTKK 0465	5.0-7.0 [.197-.276]	—	—
10	KTKK 0466	6.0-9.0 [.236-.354]	KTKK 1251	6.0-9.0 [.236-.354]
12	KTKK 0467	7.2-11.0 [.283-.433]	KTKK 1252	7.2-11.0 [.283-.433]
14	KTKK 0468	7.2-11.0 [.283-.433]	KTKK 1253	7.2-11.0 [.283-.433]
16	KTKK 0469	8.5-17.0 [.335-.669]	KTKK 1254	8.5-17.0 [.335-.669]
18	KTKK 0470	8.5-17.0 [.335-.669]	KTKK 1255	8.5-17.0 [.335-.669]
20	KTKK 0471	10.0-21.0 [.394-.827]	KTKK 1256	10.0-21.0 [.394-.827]
22	KTKK 0472	10.0-21.0 [.394-.827]	KTKK 1257	10.0-21.0 [.394-.827]
24	KTKK 0473	15.8-29.0 [.622-1.142]	KTKK 1258	15.8-29.0 [.622-1.142]

Pattern 602 Connectors or Connector Code 54

25S Fluid Resistant Elastomer

Connector Shell Size	Straight Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range	Part Number	Cable O.D. Range
08	KTKK 0840	5.0-8.0 [.197-.315]	—	—
10	KTKK 0841	6.0-13.0 [.236-.512]	KTKK 0851	6.0-13.0 [.236-.512]
12	KTKK 0842	7.2-15.0 [.283-.591]	KTKK 0852	7.2-15.0 [.283-.591]
14	KTKK 0843	7.2-15.0 [.283-.591]	KTKK 0853	7.2-15.0 [.283-.591]
16	KTKK 0844	8.5-19.0 [.335-.748]	KTKK 0854	8.5-19.0 [.335-.748]
18	KTKK 0845	8.5-19.0 [.335-.748]	KTKK 0855	8.5-19.0 [.335-.748]
20	KTKK 0846	10.0-24.0 [.394-.945]	KTKK 0856	10.0-24.0 [.394-.945]
22	KTKK 0847	10.0-24.0 [.394-.945]	KTKK 0857	10.0-24.0 [.394-.945]
24	KTKK 0848	15.8-33.0 [.622-1.299]	KTKK 0858	15.8-33.0 [.622-1.299]

100S Low Fire Hazard Material

08	KTKK 0612	5.0-7.0 [.197-.276]	—	—
10	KTKK 0613	6.0-9.0 [.236-.354]	KTKK 1241	6.0-9.0 [.236-.354]
12	KTKK 0614	7.2-11.0 [.283-.433]	KTKK 1242	7.2-11.0 [.283-.433]
14	KTKK 0615	7.2-11.0 [.283-.433]	KTKK 1243	7.2-11.0 [.283-.433]
16	KTKK 0616	8.5-17.0 [.335-.669]	KTKK 1244	8.5-17.0 [.335-.669]
18	KTKK 0617	8.5-17.0 [.335-.669]	KTKK 1245	8.5-17.0 [.335-.669]
20	KTKK 0618	10.0-21.0 [.394-.827]	KTKK 1246	10.0-21.0 [.394-.827]
22	KTKK 0619	10.0-21.0 [.394-.827]	KTKK 1247	10.0-21.0 [.394-.827]
24	KTKK 0620	15.8-29.0 [.622-1.142]	KTKK 1248	15.8-29.0 [.622-1.142]

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KTKK Assemblies Screened (Continued)

Pattern 608 Connectors or Connector Code 79

100S Low Fire Hazard Material

Connector Shell Size	Straight Assemblies		45° Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range (mm)	Part Number	Cable O.D. Range (mm)	Part Number	Cable O.D. Range (mm)
08	KTKK 0444	5.0-7.0 [.197-.276]	KTKK 0580	5.0-7.0 [.197-.276]	—	—
10	KTKK 0445	6.0-9.0 [.236-.354]	KTKK 0581	6.0-9.0 [.236-.354]	KTKK 1021	6.0-9.0 [.236-.512]
12	KTKK 0446	7.2-11.0 [.283-.433]	KTKK 0582	7.2-11.0 [.283-.433]	KTKK 1022	7.2-11.0 [.283-.591]
14	KTKK 0447	7.2-11.0 [.283-.433]	KTKK 0583	7.2-11.0 [.283-.433]	KTKK 1023	7.2-11.0 [.283-.591]
16	KTKK 0448	8.5-17.0 [.335-.669]	KTKK 0584	8.5-17.0 [.335-.669]	KTKK 1024	8.5-17.0 [.335-.748]
18	KTKK 0449	8.5-17.0 [.335-.669]	KTKK 0585	8.5-17.0 [.335-.669]	KTKK 1025	8.5-17.0 [.335-.748]
20	KTKK 0450	10.0-21.0 [.394-.827]	KTKK 0586	10.0-21.0 [.394-.827]	KTKK 1026	10.0-21.0 [.394-.827]
22	KTKK 0451	10.0-21.0 [.394-.827]	KTKK 0587	10.0-21.0 [.394-.827]	KTKK 1027	10.0-21.0 [.394-.827]
24	KTKK 0452	15.8-29.0 [.622-1.142]	KTKK 0588	15.8-29.0 [.622-1.142]	KTKK 1028	15.8-29.0 [.622-1.142]

38999 Series III and IV Connectors or Connector Code 40- Cadmium Plated

25S Fluid Resistant Elastomer

Connector Shell Size	Straight Assemblies		45° Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range (mm)	Part Number	Cable O.D. Range (mm)	Part Number	Cable O.D. Range (mm)
08	KTKK 1110	5.0-8.0 [.197-.315]	KTKK 1120	5.0-7.0 [.197-.276]	—	—
10	KTKK 1111	6.0-13.0 [.236-.512]	KTKK 1121	6.0-9.0 [.236-.354]	KTKK 1131	6.0-13.0 [.236-.512]
12	KTKK 1112	7.2-15.0 [.283-.591]	KTKK 1122	7.2-11.0 [.283-.433]	KTKK 1132	7.2-15.0 [.283-.591]
14	KTKK 1113	7.2-15.0 [.283-.591]	KTKK 1123	7.2-11.0 [.283-.433]	KTKK 1133	7.2-15.0 [.283-.591]
16	KTKK 1114	8.5-19.0 [.335-.748]	KTKK 1124	8.5-17.0 [.335-.669]	KTKK 1134	8.5-19.0 [.335-.748]
18	KTKK 1115	8.5-19.0 [.335-.748]	KTKK 1125	8.5-17.0 [.335-.669]	KTKK 1135	8.5-19.0 [.335-.748]
20	KTKK 1116	10.0-24.0 [.394-.945]	KTKK 1126	10.0-21.0 [.394-.827]	KTKK 1136	10.0-24.0 [.394-.945]
22	KTKK 1117	10.0-24.0 [.394-.945]	KTKK 1127	10.0-21.0 [.394-.827]	KTKK 1137	10.0-24.0 [.394-.945]
24	KTKK 1118	15.8-33.0 [.622-1.299]	KTKK 1128	15.8-29.0 [.622-1.142]	KTKK 1138	15.8-33.0 [.622-1.299]

100S Low Fire Hazard Material

08	KTKK 0670	5.0-7.0 [.197-.276]	KTKK 0660	5.0-7.0 [.197-.276]	—	—
10	KTKK 0671	6.0-9.0 [.236-.354]	KTKK 0661	6.0-9.0 [.236-.354]	KTKK 1181	6.0-9.0 [.236-.354]
12	KTKK 0672	7.2-11.0 [.283-.433]	KTKK 0662	7.2-11.0 [.283-.433]	KTKK 1182	7.2-11.0 [.283-.433]
14	KTKK 0673	7.2-11.0 [.283-.433]	KTKK 0663	7.2-11.0 [.283-.433]	KTKK 1183	7.2-11.0 [.283-.433]
16	KTKK 0674	8.5-17.0 [.335-.669]	KTKK 0664	8.5-17.0 [.335-.669]	KTKK 1184	8.5-17.0 [.335-.669]
18	KTKK 0675	8.5-17.0 [.335-.669]	KTKK 0665	8.5-17.0 [.335-.669]	KTKK 1185	8.5-17.0 [.335-.669]
20	KTKK 0676	10.0-21.0 [.394-.827]	KTKK 0666	10.0-21.0 [.394-.827]	KTKK 1186	10.0-21.0 [.394-.827]
22	KTKK 0677	10.0-21.0 [.394-.827]	KTKK 0667	10.0-21.0 [.394-.827]	KTKK 1187	10.0-21.0 [.394-.827]
24	KTKK 0678	15.8-29.0 [.622-1.142]	KTKK 0668	15.8-29.0 [.622-1.142]	KTKK 1188	15.8-29.0 [.622-1.142]

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KTKK Assemblies Screened (Continued)

38999 Series III and IV Connectors or Connector Code 40- Ni Al Bronze

100S Low Fire Hazard Material

Connector Shell Size	Straight Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range	Part Number	Cable O.D. Range
08	KTKK 2610	5.0-7.0 [.197-.276]	—	—
10	KTKK 2611	6.0-9.0 [.236-.354]	KTKK 2621	6.0-9.0 [.236-.354]
12	KTKK 2612	7.2-11.0 [.283-.433]	KTKK 2622	7.2-11.0 [.283-.433]
14	KTKK 2613	7.2-11.0 [.283-.433]	KTKK 2623	7.2-11.0 [.283-.433]
16	KTKK 2614	8.5-17.0 [.335-.669]	KTKK 2624	8.5-17.0 [.335-.669]
18	KTKK 2615	8.5-17.0 [.335-.669]	KTKK 2625	8.5-17.0 [.335-.669]
20	KTKK 2616	10.0-21.0 [.394-.827]	KTKK 2626	10.0-21.0 [.394-.827]
22	KTKK 2617	10.0-21.0 [.394-.827]	KTKK 2627	10.0-21.0 [.394-.827]
24	KTKK 2618	15.8-29.0 [.622-1.142]	KTKK 2628	15.8-29.0 [.622-1.142]

38999 Series I and II Connectors or Connector Code 41

25S Fluid Resistant Elastomer

Connector Shell Size	Straight Assemblies		90° Assemblies	
	Part Number	Cable O.D. Range	Part Number	Cable O.D. Range
08	KTKK 0500	5.0-8.0 [.197-.315]	—	—
10	KTKK 0501	6.0-13.0 [.236-.512]	KTKK 0831	6.0-13.0 [.236-.512]
12	KTKK 0502	7.2-15.0 [.283-.591]	KTKK 0832	7.2-15.0 [.283-.591]
14	KTKK 0503	7.2-15.0 [.283-.591]	KTKK 0833	7.2-15.0 [.283-.591]
16	KTKK 0504	8.5-19.0 [.335-.748]	KTKK 0834	8.5-19.0 [.335-.748]
18	KTKK 0505	8.5-19.0 [.335-.748]	KTKK 0835	8.5-19.0 [.335-.748]
20	KTKK 0506	10.0-24.0 [.394-.945]	KTKK 0836	10.0-24.0 [.394-.945]
22	KTKK 0507	10.0-24.0 [.394-.945]	KTKK 0837	10.0-24.0 [.394-.945]
24	KTKK 0508	15.8-33.0 [.622-1.299]	KTKK 0838	15.8-33.0 [.622-1.299]

100S Low Fire Hazard Material

08	KTKK 0640	5.0-7.0 [.197-.276]	—	—
10	KTKK 0641	6.0-9.0 [.236-.354]	KTKK 0721	6.0-9.0 [.236-.354]
12	KTKK 0642	7.2-11.0 [.283-.433]	KTKK 0722	7.2-11.0 [.283-.433]
14	KTKK 0643	7.2-11.0 [.283-.433]	KTKK 0723	7.2-11.0 [.283-.433]
16	KTKK 0644	8.5-17.0 [.335-.669]	KTKK 0724	8.5-17.0 [.335-.669]
18	KTKK 0645	8.5-17.0 [.335-.669]	KTKK 0725	8.5-17.0 [.335-.669]
20	KTKK 0646	10.0-21.0 [.394-.827]	KTKK 0726	10.0-21.0 [.394-.827]
22	KTKK 0647	10.0-21.0 [.394-.827]	KTKK 0727	10.0-21.0 [.394-.827]
24	KTKK 0648	15.8-29.0 [.622-1.142]	KTKK 0728	15.8-29.0 [.622-1.142]

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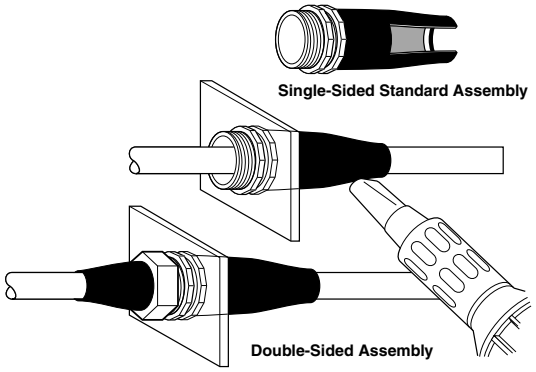
TCFS/R

Product Facts

- Screened or unscreened cables
- One-piece part
- Each size covers a wide cable range
- Light weight
- Single- or double-sided assembly



Applications

Provides environmental sealing and screen continuity to a bulkhead as a cable passes through. The assembly consists of a specifically designed locknut and O-ring seal, onto the rear of which is preinstalled a Raychem brand heat-shrinkable molded part. Feedthrough installation is simply effected by tightening the locknut on the rear of the bulkhead, which compresses the O-ring and ensures that a small knife-edge provides electrical contact between the assembly and the bulkhead.

When heat is applied to the molded part in the form of hot air, a seal to the cable is formed with hot-melt adhesive. When specified for screened cables, the assembly contains a conductive adhesive, which provides electrical continuity between the screen and the bulkhead via Rayaten molded parts.

These molded parts are shielded (screened), heat-shrinkable parts providing shielding levels better than 80 dB at 100 MHz.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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TCFS/R (Continued)

Part Numbering System

TCFX* - 12 62C - 0 - 20 - 100 A H

Adhesive System
E = Epoxy (consult factory)
H = S1030 hot melt
W = S1048 hot melt

Molded Part Type
A = Straight unscreened
B = 90° unscreened
C = Straight screened
D = 45° screened
E = 90° screened (16–36 only)

Molded Part Material
-25 = Semirigid elastomer
-100 = Low fire hazard

Thread Length
(may be three digits if more than 95 mm required)
20 mm standard
5 mm increments, minimum 15 mm

Assembly Modification Code
0 = Standard assembly
1 = Double-sided assembly (only straight unshielded boot available on double nut)
2 = Same as 1 but with potting ports
3 = Locknut
4 = 60° metalwork
5 = Same as 0 but with potting ports

Feedthrough Material/Finish
01W = Nickel aluminium bronze, shotblast
19B = Aluminium-alloy–plated cadmium, olive drab, over electroless nickel
19C = Aluminium-alloy–plated electroless nickel
62C = Stainless-steel–plated electroless nickel

Feedthrough Size

Part Description
TCFS uses a full-length molded part
TCFR uses a shortened molded part
(only available on straight assemblies)

*See Molded Parts Materials Section 4 for -25 and -100 information.

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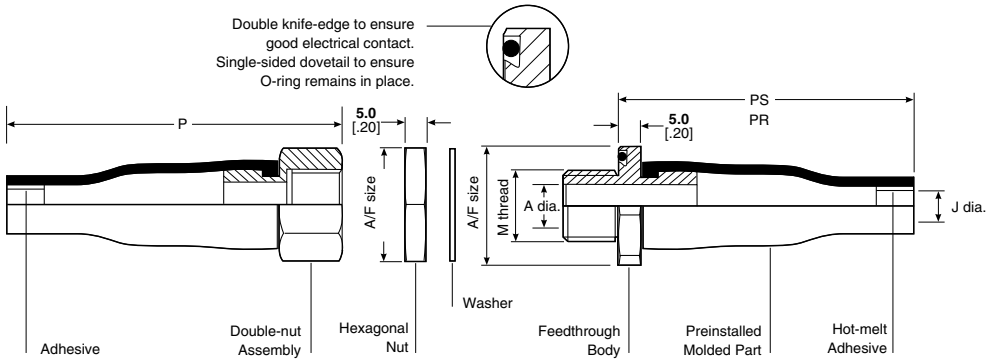
TCFS/R (Continued)



Product Dimensions

Feed-through Size	J Diameter*					M Thread	A Dia. Max.	A/F Body	A/F Nut	P ±10% Unscreened			Hole Size
	Unshielded		Shielded										
	a Min.	b Max.	a Min. -25S	-100S	b Max.					P	PS	PR	
TCFS/R-12	11 [.43]	5.6 [.22]	7.5 [.30]	6.5 [.26]	5.0 [.20]	M12 x 1.5	7.5 [.30]	24 [.95]	17 [.67]	52	50	43	13.0 [.51]
TCFS/R-16	15 [.59]	5.9 [.23]	12.5 [.49]	8.5 [.33]	6.0 [.24]	M16 x 1.5	10.2 [.40]	29 [1.14]	22 [.87]	57	65	48	17.0 [.67]
TCFS/R-20	19 [.75]	7.1 [.28]	14.5 [.57]	10.5 [.41]	7.2 [.28]	M20 x 1.5	14.0 [.55]	34 [1.34]	27 [1.06]	61	77	52	21.0 [.83]
TCFS/R-24	23 [.90]	8.4 [.33]	18.5 [.73]	16.5 [.65]	8.5 [.33]	M24 x 1.5	19.2 [.76]	38 [1.50]	30 [1.18]	74	90	65	25.0 [.98]
TCFS/R-30	29 [1.14]	9.9 [.39]	23.5 [.93]	20.5 [.81]	10.0 [.39]	M30 x 1.5	24.2 [.95]	48 [1.89]	36 [1.48]	73	115	64	31.0 [1.22]
TCFS/R-36	35 [1.38]	15.7 [.62]	32.5 [1.28]	28.5 [1.12]	15.8 [.62]	M36 x 1.5	30.2 [1.49]	52 [2.05]	41 [1.61]	104	140	95	37.0 [1.46]
TCFR-48	45 [1.77]	16.8 [.66]	38.5 [1.52]	35.5 [1.40]	N/A	M48 x 1.5	40.2 [1.58]	67 [2.64]	55 [2.17]	144	110	135	50.0 [1.97]

*a = Supplied dimension
b = Dimension after free recovery

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