Micro Molded Heat-Shrink 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 ingress
- 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.

**-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.

**-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.

Ordering Information

203W301-*-G02/**

- **Adhesive Slash Number** (if required see compatibility chart)
- **Modification Number**
- **Material Dash Number** (refer to product drawing)
- **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](http://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)

![Diagram of a micro-molded shape]

DIMENSIONS (in millimeters (in inches, for reference))

<table>
<thead>
<tr>
<th>Part Number</th>
<th>H Min</th>
<th>J Min</th>
<th>H Max</th>
<th>J Max</th>
<th>P ±10%</th>
<th>R ±10%</th>
<th>S ±10%</th>
<th>T ±10%</th>
<th>JO ±10%</th>
<th>HW ±20%</th>
<th>JW ±20%</th>
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<td>6.6</td>
<td>0.8</td>
<td>0.6</td>
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<td>(0.35)</td>
<td>(0.60)</td>
<td>(0.79)</td>
<td>(0.08)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.26)</td>
<td>(0.03)</td>
<td>(0.02)</td>
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</tbody>
</table>

AFTER RECOVERY (b)

![Diagram of a recovered micro-molded shape]

DIMENSIONS (in millimeters (in inches, for reference))

<table>
<thead>
<tr>
<th>Part Number</th>
<th>H Min</th>
<th>J Min</th>
<th>H Max</th>
<th>J Max</th>
<th>P ±10%</th>
<th>R ±10%</th>
<th>S ±10%</th>
<th>T ±10%</th>
<th>JO ±10%</th>
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<td>(0.83)</td>
<td>(0.12)</td>
<td>(0.02)</td>
<td>(0.18)</td>
<td>(0.05)</td>
<td>(0.02)</td>
<td></td>
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Selection Guide

**AS SUPPLIED (a)**

![Diagram of AS Supplied (a)](image1)

**AFTER RECOVERY (b)**

![Diagram of After Recovery (b)](image2)

**DIMENSIONS in millimeters (in inches, for reference)**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>H (Min)</th>
<th>J (Min)</th>
<th>H (Max)</th>
<th>J (Max)</th>
<th>P (±10%)</th>
<th>R (±10%)</th>
<th>S (±10%)</th>
<th>T (±10%)</th>
<th>JO (±20%)</th>
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<td>202K111-*-01</td>
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**Micro Molded Shapes**

Literature No. 1654422-1 · Rev. 08/2011
Selection Guide

AS SUPPLIED (a)  

DIMENSIONS (in millimeters (in inches, for reference))

<table>
<thead>
<tr>
<th>Part Number</th>
<th>H Min</th>
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<th>P ±10%</th>
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<tr>
<td></td>
<td>(0.43)</td>
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AS SUPPLIED (b)  

DIMENSIONS (in millimeters (in inches, for reference))

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<th>H Max</th>
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<th>T ±10%</th>
<th>U ±10%</th>
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<td>(0.24)</td>
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<th>T ±10%</th>
<th>U ±10%</th>
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<td>1.0</td>
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<td>(0.43)</td>
<td>(0.37)</td>
<td>(0.08)</td>
<td>(0.48)</td>
<td>(0.51)</td>
<td>(0.43)</td>
<td>(0.06)</td>
<td>(0.09)</td>
<td>(0.26)</td>
<td>(0.04)</td>
<td>(0.02)</td>
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</table>
Additional Products from TE Connectivity

Wire and Cable
 Transition Breakouts
 Cold-Applied Splices

Adhesives
 Side-Entry Bushings
 NBCCS Heat-Shrink Tubing

Adaptors
 Solder Sleeves/Devices
 Hardware Software
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
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France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015
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

PHYSICAL/CHEMICAL
• Tensile Strength: 8.3 MPa (1200 psi) min. (ASTM D2671)
• Ultimate Elongation: 100% min. (ASTM D412)
• Physical/ Density: 1.1 g/cm³ 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 10¹² 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

MATERIALS
• Sleeve: Cross-linked EPDM, black

PRODUCT SPECIFICATION
• RW-3031

Product Offering

<table>
<thead>
<tr>
<th>Base Part No.</th>
<th>Available Kit</th>
<th>Sleeve Diameter</th>
<th>Sleeve Length</th>
<th>Recommended Usage Range</th>
<th>Connection Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNCL-11-125</td>
<td>GK</td>
<td>0.51 [13.0]</td>
<td>4.92 [125]</td>
<td>0.22 - 0.68 [6 - 17]</td>
<td>3 [75]</td>
</tr>
<tr>
<td>LNCL-11-205</td>
<td>GK</td>
<td>0.51 [13.0]</td>
<td>8.07 [205]</td>
<td>0.22 - 0.68 [6 - 17]</td>
<td>6 [150]</td>
</tr>
<tr>
<td>LNCL-12-140</td>
<td>GK, CK-N</td>
<td>0.56 [14.2]</td>
<td>5.51 [140]</td>
<td>0.48 - 0.90 [12 - 23]</td>
<td>4 [100]</td>
</tr>
<tr>
<td>LNCL-12-240</td>
<td>GK, CK-N</td>
<td>0.56 [14.2]</td>
<td>9.45 [240]</td>
<td>0.48 - 0.90 [12 - 23]</td>
<td>7 [175]</td>
</tr>
<tr>
<td>LNCL-13-155</td>
<td>GK</td>
<td>0.75 [19.0]</td>
<td>6.10 [155]</td>
<td>0.69 - 1.20 [18 - 30]</td>
<td>4 [100]</td>
</tr>
<tr>
<td>LNCL-13-305</td>
<td>GK</td>
<td>0.75 [19.0]</td>
<td>12.00 [305]</td>
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<td>LNCL-14-185</td>
<td>GK</td>
<td>1.02 [25.9]</td>
<td>7.28 [185]</td>
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<td>5 [125]</td>
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<td>LNCL-14-355</td>
<td>GK</td>
<td>1.02 [25.9]</td>
<td>14.00 [355]</td>
<td>0.96 - 1.50 [25 - 38]</td>
<td>10 [250]</td>
</tr>
</tbody>
</table>

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

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Consult TE for the latest dimensions and design specifications.
RAYCHEM
INSTALITE MOLDED BOOTS
ADVANCED MATERIALS SCIENCE DRIVES UP TO 30% WEIGHT SAVINGS . . . REDUCES INSTALLATION TIME WITH HIGH-PERFORMANCE HEAT-SHRINK SHAPE MEMORY 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 MOLDED BOOTS
High-Performance Heat-Shrink Boots

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.
Instalite Molded Boots

**Straight Boot**

![Diagram of Straight Boot]

**Part No.** | **H** | **J** | **P** | **R** | **HW** | **JW** | **Avg Weight Savings**
--- | --- | --- | --- | --- | --- | --- | ---
202K121-25L-0 | 24 [0.95] | 10.4 [0.41] | 24 [0.95] | 5.6 [0.22] | 38 [1.50] | 21 [0.83] | 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] | **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] | **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] | **23%**
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] | **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] | **21%**

See the latest Specification Control Document for full dimensions

**Right-Angle Boot**

![Diagram of Right-Angle Boot]

**Part No.** | **H** | **J** | **P** | **R** | **S** | **HW** | **JW** | **Avg Weight Savings**
--- | --- | --- | --- | --- | --- | --- | --- | ---
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] | **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] | **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] | **21%**

See the latest Specification Control Document for full dimensions
For More Information

TE Technical Support Center

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Austria          +43 1 905 601 228
Baltic Regions   +46 8 5072 5000
Benelux          +31 73 6246 999
Czech Republic   +420 800 701 462
France           +33 1 34 20 86 86
Germany          +49 6251 133 1999
Hungary          +36 809 874 04
Italy            +39 011 401 2632
Nordic           +46 8 5072 5000
Poland           +48 800 702 309
Russia           +7495 790 790 2
Spain/Portugal   +34 93 2910366
Switzerland      +41 52 633 66 26
United Kingdom   +44 800 267 666

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HarnWare V6
Computer-Aided Electrical Wiring Harness Design Software
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.

**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.

**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.
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 spreadsheet, database.

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 spreadsheet, and the times and labour rates within it can be adjusted to suit local conditions.

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 the Windows Clipboard. This data can then be used in other systems, for example, automatic test equipment or other electrical design software.

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.

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.

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.

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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Follow us on Twitter for all the latest product news
@TEConnectivity, and on Facebook, TEConnectivity.

Connect with one of our Subject Matter Experts
at www.DesignSmarterFaster.com
RAYCHEM
C-WRAP SIDE ENTRY
REPAIR SLEEVE

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

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Color Code</th>
<th>Adhesive ±.05 (.002)</th>
<th>Sleeve ±.05 (.002)</th>
<th>Adhesive ±.5 (.02)</th>
<th>Sleeve ±.5 (.02)</th>
<th>AWG</th>
<th>Wire OD (Note*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-150-C-11 Green</td>
<td>1.11 (.044)</td>
<td>2.29 (.090)</td>
<td>21.59 (.85)</td>
<td>19.05 (.75)</td>
<td>26 - 24</td>
<td>0.80 - 1.10 (.031 - .043)</td>
<td></td>
</tr>
<tr>
<td>D-150-C-12 Red</td>
<td>1.68 (.066)</td>
<td>2.74 (.108)</td>
<td>21.59 (.85)</td>
<td>19.05 (.75)</td>
<td>22 - 20</td>
<td>1.10 - 1.50 (.043 - .029)</td>
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</tr>
<tr>
<td>D-150-C-13 Blue</td>
<td>2.13 (.084)</td>
<td>3.43 (.135)</td>
<td>21.59 (.85)</td>
<td>19.05 (.75)</td>
<td>18 - 16</td>
<td>1.50 - 2.30 (.059 - .090)</td>
<td></td>
</tr>
<tr>
<td>D-150-C-14 Yellow</td>
<td>3.34 (.133)</td>
<td>4.80 (.189)</td>
<td>21.59 (.85)</td>
<td>19.05 (.75)</td>
<td>14 - 12</td>
<td>2.30 - 2.80 (.090 - .110)</td>
<td></td>
</tr>
</tbody>
</table>

### 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.

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**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)**
Adhesives Selection Guide
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 Convolx 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
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.

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

-55°C to +120°C

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

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

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 (-SI) molded parts

**DESCRIPTION**

**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

**TEMPERATURE RANGE**

-55°C to +200°C

**PACKAGING**

3/4 in. x 0.020 in. x 100 ft. roll (20 mm x 0.5 mm x 30 m)

**SPECIFICATIONS**

Raychem RT-1014

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

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Precoat Designation</th>
<th>Type</th>
<th>Operating Temperature Range</th>
<th>Product Designation</th>
<th>Available Form/ Packaging</th>
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<tbody>
<tr>
<td><strong>Thermosets</strong></td>
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<tr>
<td>S1006</td>
<td>—</td>
<td>Epoxy/polyamide two-part paste</td>
<td>-55°C to 135°C [-67°F to 275°F]</td>
<td>S1006 Kit 8</td>
<td>50-ml dual syringe</td>
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<td></td>
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<td>S1006 Kit 1</td>
<td>Two 15-gram packs</td>
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<td></td>
<td>S1006 Kit 2</td>
<td>Four 7.5-gram packs</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>S1006 Kit A</td>
<td>Ten 3-gram packs</td>
</tr>
<tr>
<td>S1009</td>
<td>—</td>
<td>Epoxy/polymercaptan two-part paste</td>
<td>-55°C to 135°C [-67°F to 275°F]</td>
<td>S1009 Kit A</td>
<td>Ten 3-gram packs</td>
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<tr>
<td>S1255-04</td>
<td>—</td>
<td>One-part epoxy tape adhesive</td>
<td>-55°C to 200°C [-67°F to 392°F]</td>
<td>S1255-04</td>
<td>Tape [3/4 in. x .020 x 100 ft.]</td>
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<td>S1125 Kit 1</td>
<td>Five 10-gram packs</td>
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<td></td>
<td>S1125 Kit 2</td>
<td>Two 10-gram packs</td>
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<tr>
<td>S1125</td>
<td>—</td>
<td>Epoxy/polyamide two-part paste</td>
<td>-55°C to 150°C [-67°F to 302°F]</td>
<td>S1125 Kit 3</td>
<td>One 100-gram pack</td>
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<td></td>
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<td></td>
<td>S1125 Kit 4</td>
<td>Five 10-gram packs</td>
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<td>S1125 Kit 5</td>
<td>One 10-gram pack</td>
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<td></td>
<td>S1125 Kit 8</td>
<td>50-ml dual syringe</td>
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<tr>
<td>S1264</td>
<td>—</td>
<td>Epoxy/polyamide two-part paste</td>
<td>-55°C to 150°C [-67°F to 302°F]</td>
<td>S1264 Kit 1</td>
<td>One 10-gram pack</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>S1264 Kit 8</td>
<td>50-ml dual syringe</td>
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<tr>
<td>/225</td>
<td>Precoated latent-curing epoxy/polyamide</td>
<td>-75°C to 150°C [-103°F to 302°F]</td>
<td>Precoat only on -25 molded parts</td>
<td>—</td>
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<td><strong>Thermoplastics</strong></td>
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<tr>
<td>S1017</td>
<td>/42</td>
<td>Hot-melt/ polyamide</td>
<td>-20°C to 60°C [-4°F to 140°F]</td>
<td>S1017</td>
<td>Tape [1 in. x .010 in. x 50 ft.]</td>
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<tr>
<td>S1030</td>
<td>/180</td>
<td>Hot-melt/ polyolefin</td>
<td>-80°C to 80°C [-112°F to 176°F]</td>
<td>S1030</td>
<td>Tape [3/4 in. x .010 in. x 33 ft.]</td>
</tr>
<tr>
<td>S1048</td>
<td>/66</td>
<td>Hot-melt, high performance</td>
<td>-55°C to 120°C [-67°F to 248°F]</td>
<td>S1048</td>
<td>Tape [1 in. x .026 in. x 100 ft.]</td>
</tr>
<tr>
<td>S1124</td>
<td>/164</td>
<td>Hot-melt, elastomeric polymer</td>
<td>-55°C to 105°C [-67°F to 221°F]</td>
<td>S1124</td>
<td>Tape [3/4 in. x .018 in. x 10 ft.]</td>
</tr>
<tr>
<td>S1297</td>
<td>/97</td>
<td>Hot-melt/ polyamide adhesive</td>
<td>-20°C to 90°C [-4°F to 194°F]</td>
<td>S1297</td>
<td>Tape [1 in. x .010 in. x 10 ft.]</td>
</tr>
<tr>
<td><strong>Sealants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1278</td>
<td>—</td>
<td>Hot-melt grey butyl sealant</td>
<td>-40°C to 90°C [-40°F to 194°F]</td>
<td>S1278-01</td>
<td>Tape [1 in. x .062 in. x 25 ft.]</td>
</tr>
<tr>
<td>S1305</td>
<td>—</td>
<td>Hot-melt grey butyl sealant, FR</td>
<td>-40°C to 90°C [-40°F to 194°F]</td>
<td>S1305-01</td>
<td>Tape [1 in. x .062 in. x 25 ft.]</td>
</tr>
</tbody>
</table>

*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)

<table>
<thead>
<tr>
<th>Product Type</th>
<th>Pot Life at 23°C [73.4°F]</th>
<th>Curing Conditions</th>
<th>Shelf life* at or below 25°C [77°F]</th>
<th>Specifications**</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermosets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1006</td>
<td>1 hr</td>
<td>96 hr at 20°C [68°F] min. or 1 hr at 120°C [248°F]</td>
<td>2 years 1 year Kit 8</td>
<td>RT-1006 RK-6612 A-A-56031****</td>
<td>General purpose harnessing adhesive. Not used on fluoroelastomers, silicone or PVDF</td>
</tr>
<tr>
<td>S1009</td>
<td>20 min.</td>
<td>24 hr at 20°C [68°F] min. or 1 hr at 95°C [203°F] 45 min at 120°C [248°F]</td>
<td>2 years 1 year Kit 8</td>
<td>RT-1009</td>
<td>General purpose harnessing adhesive. Not used on fluoroelastomers or silicone</td>
</tr>
<tr>
<td>S1255-04</td>
<td>—</td>
<td>90 min at 155°C [311°F] or 15 min at 260°C [464°F]</td>
<td>1 year with refrigeration</td>
<td>RT-1014</td>
<td>One-part epoxy tape used with fluoroelastomer harness systems.</td>
</tr>
<tr>
<td>S1125</td>
<td>—</td>
<td>24 hr at 20°C min. or 1 hr at 85°C [185°F]</td>
<td>18 months</td>
<td>RT-1011 RK-6619 VG-95343</td>
<td>Good fluid-resistant epoxy used with System 25</td>
</tr>
<tr>
<td>S1264</td>
<td>90 min.</td>
<td>24 hr at 20°C min. or 1 hr at 85°C [185°F]</td>
<td>18 months</td>
<td>RT-1012</td>
<td>Tested to NBC requirements</td>
</tr>
<tr>
<td>/225</td>
<td>—</td>
<td>Cure during installation of molded parts</td>
<td>36 months</td>
<td>VG-95343 RK-6630</td>
<td>Precoated epoxy system for System 25</td>
</tr>
</tbody>
</table>

| 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 |

| 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

<table>
<thead>
<tr>
<th>Substrate Category</th>
<th>Product Name</th>
<th>Examples</th>
<th>Molded Part Material Dash Number</th>
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</thead>
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<td></td>
<td></td>
<td></td>
<td>-790</td>
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<tr>
<td>Nuclear Fluoro-</td>
<td>RT770</td>
<td>S1264</td>
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<td>RT780</td>
<td>S1255-04</td>
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<tr>
<td></td>
<td>RT790</td>
<td>S1255-04</td>
<td></td>
</tr>
</tbody>
</table>

*GE RTV 108 used with SFR, SRFR, and -6 (silicone) molded parts.*
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.
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2-1775464-2 ADM/RRD SM 06/2012

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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.
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 thermostatic 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-A38176/S1 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

Cable Entry Seals

TE Connectivity

Cable Entry Seals

Right-Angle Breakout CES
Dimensions are mm (inches)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CES-1R</td>
<td>12.70 [0.50]</td>
<td>7.11 [0.28]</td>
<td>12.70 [0.50]</td>
<td>35.56 [1.4]</td>
<td>14.27 [0.56]</td>
<td>25.40 [1.00]</td>
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<td></td>
</tr>
<tr>
<td>CES-2N</td>
<td>18.03 [0.71]</td>
<td>9.65 [0.38]</td>
<td>19.05 [0.75]</td>
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<td>50.80 [2.00]</td>
<td>69.85 [2.75]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CES-4R</td>
<td>40.64 [1.60]</td>
<td>15.75 [0.62]</td>
<td>40.64 [1.60]</td>
<td>78.74 [3.1]</td>
<td>71.12 [2.80]</td>
<td>50.80 [2.00]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions are mm [inches]
Introducing High Temperature, Heat-Shrinkable, Fluid Resistant Sealing Sleeves

FOR MORE INFORMATION

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Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-620-6015

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**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**
- Meltalbe 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**

<table>
<thead>
<tr>
<th>Part Description</th>
<th>L Max.</th>
<th>B Nom.</th>
<th>ØA Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-555-3/8-2.75-A260-0</td>
<td>69.9 (2.75)</td>
<td>25.4 (1.00)</td>
<td>8.3 (0.33)</td>
</tr>
<tr>
<td>RT-555-3/8-4.75-A260-0</td>
<td>120.7 (4.75)</td>
<td>76.2 (3.00)</td>
<td>8.4 (0.33)</td>
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<tr>
<td>RT-555-1/2-2.75-A260-0</td>
<td>69.9 (2.75)</td>
<td>25.4 (1.00)</td>
<td>11.4 (0.45)</td>
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<td>11.4 (0.45)</td>
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<td>RT-555-3/4-3.00-A260-0</td>
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<td>31.8 (1.25)</td>
<td>17.7 (0.70)</td>
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<tr>
<td>RT-555-3/4-6.75-A260-0</td>
<td>171.5 (6.75)</td>
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<td>171.5 (6.75)</td>
<td>127.0 (5.00)</td>
<td>22.8 (0.90)</td>
</tr>
</tbody>
</table>

Dimensions are mm [inches]
Introducing
Raychem Side Entry
Bushing (SEB)

FOR MORE INFORMATION

Technical Support

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Netherlands:  +31 (0) 73-6246-999
China:  +86 (0) 400-820-6015

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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-4703/10, 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: $10^8$ 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

<table>
<thead>
<tr>
<th>Part Number</th>
<th>E Ref</th>
<th>D Ref</th>
<th>H ±10%</th>
<th>L ±10%</th>
<th>W ±10%</th>
<th>Bundle O.D. Minimum</th>
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</thead>
<tbody>
<tr>
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<td>(6.9)</td>
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<td>(15.2)</td>
<td>(228.6)</td>
<td>(1.5)</td>
<td>(7.6)</td>
</tr>
</tbody>
</table>

Dimensions are in inches, metric in brackets.
Number of wraps will vary for each size.

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

PART NUMBERS
For More Information

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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
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>MiniSeal Splices</td>
<td>D-436-XX Sealed wire-to-wire crimp splice SAE AS50184/11</td>
<td>Sealed Immersion resistant 26 thru 12 AWG</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>RCPS-200-20 Heat gun</td>
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<tr>
<td>MiniSeal Splices</td>
<td>D-200-XX Sealed wire-to-wire crimp splice SAE AS50184</td>
<td>High temperature sealed Immersion resistant 26 thru 12 AWG</td>
<td>200°C Perm</td>
<td>—</td>
<td>—</td>
<td>RCPS-200-20 Heat gun</td>
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<tr>
<td>In-Line Sealed Crimp Splices</td>
<td>V-005-XX Sealed wire-to-wire crimp/solder splice EN2373-001 &amp; 013</td>
<td>High temperature Immersion resistant 26 thru 12 AWG</td>
<td>260°C Perm</td>
<td>—</td>
<td>—</td>
<td>RPPP-685-00 AS-1377-5 Heat gun</td>
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<tr>
<td>SolderSleeve Shield Terminals</td>
<td>D-200-XX Silver nickel braid termination SAE AS83519 (modified for 200°C)</td>
<td>High temperature Seals to PTFE</td>
<td>200°C Perm</td>
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<td>—</td>
<td>RCPS-100-71 Heat gun</td>
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<tr>
<td>SolderSleeve Splices</td>
<td>D-1744-XX Sealed wire-to-wire solder splice NAS 1744</td>
<td>Sealed Immersion resistant 26 thru 12 AWG</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>RPPP-850-00 Heat gun</td>
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<tr>
<td>RF One-Step Connectors</td>
<td>RBD-XX-XX RTD-XX-XX</td>
<td>Solder termination</td>
<td>Meets performance requirements of MIL-C-39013 up to 2.8 GHz Excellent strain relief Sealed</td>
<td>150°C Perm</td>
<td>v</td>
<td>—</td>
<td>RPPP-683-00 Heat gun</td>
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<tr>
<td>Data Bus Splice Kit</td>
<td>D-155-0708-5 MIL-STD-1552a Data Bus USAF 834070B</td>
<td>Sealed ENR resistant</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>RPPP-502-12 Heat gun</td>
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<tr>
<td>SolderShield Splices</td>
<td>D-150-XXXX Shielded splice for coax and twisted pairs</td>
<td>Sealed ENR resistant</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>RCPS-150-02 Heat gun</td>
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<tr>
<td>SolderShield Splices</td>
<td>D-155-XXXX Shield-only splice</td>
<td>Sealed ENR resistant</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>cr/w drawing Heat gun</td>
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<td>Cold Applied Splices</td>
<td>D-436-3X-COLD Gel sealed in-line butt crimp SAE AS50184/13</td>
<td>Sealed Altitude immersion No heat gun required 26 thru 12 AWG</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>RPPP-1122 AD-1381-1 Heat gun</td>
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<tr>
<td>C-Wrap Repair Sleeves</td>
<td>D-150-C-1X Jacket repair wrap SAE AS5224/1 pending</td>
<td>Sealed 26 thru 12 AWG</td>
<td>150°C Perm</td>
<td>—</td>
<td>✓</td>
<td>RPPP-1121 Heat gun</td>
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<tr>
<td>SolderTact Coax Contacts</td>
<td>D-602-0140 Pin D-602-0141 Socket One-piece solder contact MIL-CTL-38999 Series I thru IV M39029/76 and 77</td>
<td>Unsealed</td>
<td>150°C Perm</td>
<td>—</td>
<td>✓</td>
<td>ES61206 Heat gun</td>
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<tr>
<td>DEUTSCH Crimp Contacts</td>
<td>8894-22507-12 Crimp Contact (Size 22) M39029/56-38 Socket M39029/56-360 Pin MIL-CTL-38999 Series I thru IV M39029/56 &amp; 59</td>
<td>Unsealed</td>
<td>125°C Perm</td>
<td>—</td>
<td>—</td>
<td>Crimp tool specific Crimp tool</td>
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<td>SOLISTRAND Splices</td>
<td>Butt or inline crimp splice MIL-T-7928 T Type 1, Class 1 &amp; 2</td>
<td>Unsealed 26 thru 12 AWG 1/0 AWG 500 MCM 170°C Perm</td>
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<td>—</td>
<td>Crimp tool specific Various crimp</td>
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<tr>
<td>STRATO- THERM Splices</td>
<td>High-temp splice</td>
<td>Unsealed 2 thru 10 AWG</td>
<td>649°C Perm</td>
<td>—</td>
<td>—</td>
<td>Crimp tool specific Various crimp</td>
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<tr>
<td>COPALUM Splices</td>
<td>Butt or inline crimp splice for copper or aluminum</td>
<td>Unsealed Dry crimp 8 thru 6 AWG aluminum 10 thru 20 AWG copper</td>
<td>150°C Perm</td>
<td>—</td>
<td>—</td>
<td>Crimp tool specific Various crimp</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>LightCrimp Fiber Optic Splices</td>
<td>Fiber-optic field splice 250/900 um buffered fiber 1.8/2.0 mm jacket</td>
<td>Sealed</td>
<td>70°C Perm</td>
<td>—</td>
<td>—</td>
<td>408-10193 Kit</td>
<td></td>
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</tr>
</tbody>
</table>
## Bundle and Shield Repair

### High-Shrink-Ratio Tubing
- **Product Family:** HRHT-XX
- **Description:** High-shrink-ratio tubing
- **Standards:** SAE AMS-DTL-23053/15 (except some sizes)
- **Features:** High temperature, sealed and unsealed
- **Max. Temperature:** 135°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** Yes
- **Installation Practices & Instructions:**
- **Tooling:** COP551, Heat gun

### High-Shrink-Ratio Flexible Tubing
- **Product Family:** HRHF-XX
- **Description:** High-shrink-ratio flexible tubing
- **Standards:** SAE AMS-DTL-23053/15
- **Features:** High temperature, sealed and unsealed
- **Max. Temperature:** 135°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** Yes
- **Installation Practices & Instructions:**
- **Tooling:** COP551, Heat gun

### Ultra-High-Shrink-Ratio Tubing
- **Product Family:** URHT-XX
- **Description:** Ultra-high-shrink-ratio tubing
- **Standards:** UL E85381
- **Features:** High temperature, sealed and unsealed
- **Max. Temperature:** 135°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** Yes
- **Installation Practices & Instructions:**
- **Tooling:** COP551, Heat gun

### RayON Roll-On Sealing Sleeves
- **Product Family:** LNCL-XX-XXX
- **Description:** Roll-on sleeve
- **Features:** Reusable, non-shrink
- **Max. Temperature:** 70°C
- **Temporary / Permanent:** Perm & Temp
- **Installation Practices & Instructions:**
- **Tooling:** TUS-41-3007

### RayRim Edging Material
- **Product Family:** Protective, self-adhering edging profile
- **Features:** Edges protection
- **Max. Temperature:** 80°C
- **Temporary / Permanent:** Perm
- **Installation Practices & Instructions:**
- **Tooling:** PIP-067, Heat gun

### Side-Entry Bushing
- **Product Family:** SEB-XX
- **Description:** Coiled bushing
- **Standards:** SAE AMS-DTL-23053/15
- **Features:** Pull-on, add heat shrink tubing for sealing
- **Max. Temperature:** 180°C
- **Temporary / Permanent:** Perm
- **Installation Practices & Instructions:**
- **Tooling:** N/A

### RayBraid Tubular Copper Braid
- **Product Family:** Ray101-XX (tin plated), Ray103-XX (nickel plated)
- **Description:** Copper braid over plastic former
- **Features:** Pull-on, add heat shrink tubing for sealing, alternative to braiding machine
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Installation Practices & Instructions:**
- **Tooling:** COP361

### Electrical Shielding Tape
- **Product Family:** 000W280
- **Description:** Shielded gauze tape
- **Features:** Tinned copper, wrapping transitions
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Installation Practices & Instructions:**
- **Tooling:** IPC/WHMA-A-620, 14.1 & 14.2, Scissors

### Lacing Cord
- **Product Family:** Nomex aramid filament
- **Description:** Securing and spot tying wire bundles and shields
- **Features:** Alternate to solder at shield over laps
- **Max. Temperature:** 260°C
- **Temporary / Permanent:** Perm
- **Installation Practices & Instructions:**
- **Tooling:** IPC/WHMA-A-620, 14.1 & 14.2, Scissors

### Wrap-Around Heat-Shrink Boot
- **Product Family:** 200W2XX-XX
- **Description:** Zipper termination spine
- **Features:** Allows repair when there is no access to end of harness
- **Max. Temperature:** 200°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** No
- **Installation Practices & Instructions:**
- **Tooling:** Heat gun

### Tin-Lock Splice
- **Product Family:** TKO51-XX
- **Description:** Splice metal ferrule, for bandstrap shield splice
- **Features:** Two piece, midpoint shield Butt splice
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** No
- **Installation Practices & Instructions:**
- **Tooling:** Banding tool

### HexShield Adapters
- **Product Family:** Hex-XX...
- **Description:** Metal ferrule individual shield terminations
- **Features:** Overall shield termination
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** No
- **Installation Practices & Instructions:**
- **Tooling:** Torque tool

### Bandstrap
- **Product Family:** SN3-12335
- **Description:** Steel strips, nickel or cadmium plated
- **Features:** Easy replacement of shield termination
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** No
- **Installation Practices & Instructions:**
- **Tooling:** Banding tool

### Side-Entry Tinel Ring
- **Product Family:** SETH-XX
- **Description:** Split Tinel Ring shield termination
- **Features:** Notch engagement
- **Max. Temperature:** 150°C to 200°C
- **Temporary / Permanent:** Perm
- **Re-Extendable / Re-Workable:** No
- **Installation Practices & Instructions:**
- **Tooling:** Tinel heat tool
<table>
<thead>
<tr>
<th>Product Family</th>
<th>Description</th>
<th>Standards</th>
<th>Features</th>
<th>Max. Temperature</th>
<th>Temporary / Permanent</th>
<th>Re-Usable / Re-Workable</th>
<th>Side Entry</th>
<th>Installation Practices &amp; Instructions</th>
<th>Tooling</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jacket Repair</strong></td>
<td></td>
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<tr>
<td><strong>High-Temp Heat-Shrink Tape</strong></td>
<td>RT-525-75-A260-XX</td>
<td>High-temperature, side-entry, shrinkable repair tape</td>
<td>RT-1381</td>
<td>High temperature Sealed Fluids resistant Altitude immersion Moderate peel strength</td>
<td>200°C Perm ✓ ✓</td>
<td>TUS-41-3032</td>
<td>Heat gun PTFE tape</td>
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<tr>
<td><strong>Self-Amalgamating Tape</strong></td>
<td>S-1081</td>
<td>Bonds to itself</td>
<td>RK-6019</td>
<td>Supplement with adhesive at ends for sealing</td>
<td>130°C Perm &amp; Temp ✓ ✓</td>
<td>ELE-3COP-006 c/w data sheet HLS#04146</td>
<td>Heat gun</td>
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<td><strong>Silicone Fusion Tape</strong></td>
<td>652603</td>
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<tr>
<td><strong>Chemical- and Abrasion-Resistant Heat-Shrink Tubing</strong></td>
<td>2:1 shrink ratio</td>
<td>SAE AMS-DTL-23035/16 VG28348 Part 5 Type D DEF STAN 59-07 Issue 3</td>
<td>Sealing, strain-relied Mechanical protection Supplement with adhesive</td>
<td>150°C Perm ✓ ✓</td>
<td>— ELE-3COP-551 PIP-S68 COP615TUS-41-9204</td>
<td>Heat gun</td>
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<tr>
<td><strong>High-Temperature Heat-Shrink Tubing</strong></td>
<td>2:1 shrink ratio</td>
<td>RT-555</td>
<td>High temp</td>
<td>Mechanical protection Supplement with adhesive</td>
<td>200°C Perm ✓ ✓</td>
<td>— ELE-3COP-551</td>
<td>Heat gun</td>
<td></td>
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<tr>
<td><strong>Semi-flexible Dual-Wall Heat-Shrink Tubing</strong></td>
<td>4:1 shrink ratio Hotmelt adhesive</td>
<td>SAE AMS-DTL-23035/16</td>
<td>Sealing, strain-relied</td>
<td>125°C ✓ ✓ No COP610</td>
<td>Heat gun</td>
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<td><strong>Heat-Shrink Molded Parts</strong></td>
<td>AT-099-XX</td>
<td>2:1 shrink ratio Elastomer sleeve</td>
<td>Sealing, strain-relied Heat-activated epoxy adhesive Refurbish backshell Anti-rotation</td>
<td>150°C Perm ✓ ✓ — COP654</td>
<td>Heat gun</td>
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<tr>
<td><strong>Helical Convex Conduit Tubing</strong></td>
<td>HCTE</td>
<td>High temperature, fluid resistant Conduit, nonheat shrink</td>
<td>VGF8995 Part 6 IR-1162</td>
<td>High temp Impact protection Flexing Supplement with shrink boots Supplement with adhesive</td>
<td>200°C Perm ✓ ✓ — COP665</td>
<td>N/A</td>
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<tr>
<td><strong>COPALUM Splice Cover</strong></td>
<td>RT555-XXX-YYY-A260</td>
<td>High temperature, heat-shrinkable, fluid-resistant sealing sleeves</td>
<td>FAR Part 25 FAA Standard</td>
<td>Sealed, high temp</td>
<td>200°C ✓ ✓ No TUS-41-3026</td>
<td>Heat gun</td>
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<tr>
<td><strong>Wrap-Around Marker</strong></td>
<td>WM-SCE</td>
<td>Wraps around heat-shrink identification marker</td>
<td>Adhesive lined Harness marking Any difficult to access area</td>
<td>135°C ✓ ✓ ✓ 411-1210B4</td>
<td>Heat gun PTFE tape Thermal printer</td>
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<tr>
<td><strong>PTFE Tape</strong></td>
<td>(Not by TE)</td>
<td>Temporary installation aid for assisting with install of wrap-around products during shrinking and sealing</td>
<td></td>
<td>Fixturing</td>
<td>200°C Temp — ✓ —</td>
<td></td>
<td>Scissors</td>
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<tr>
<td><strong>Epoxy Adhesive</strong></td>
<td>S-1125</td>
<td>Two-component liquid</td>
<td>Sealing and mechanical bonding</td>
<td>Flexibility Potting High peel strength Room temp cure, no oven required</td>
<td>150°C Perm — ✓ COP604</td>
<td>N/A</td>
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<tr>
<td><strong>Hotmelt Adhesive Tape</strong></td>
<td>S-1048</td>
<td>Sealing and mechanical bonding</td>
<td>Flexibility High peel strength No curing Heat gun set Ref-workable</td>
<td>120°C Perm ✓ ✓ COP607</td>
<td>Heat gun</td>
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<tr>
<td><strong>Conductive Epoxy</strong></td>
<td>S-1184 (Not safety approved for USA)</td>
<td>Two-component liquid</td>
<td>Sealing and mechanical bonding</td>
<td>Flexibility Potting, Braided shield termination Low electrical resistance No heat, no solder, no clamping Supplement with structural/ sealing epoxy Caution with shell life &amp; storage</td>
<td>150°C Perm — ✓ COP622 COP605</td>
<td>N/A</td>
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<tr>
<td><strong>Shrink Tape</strong></td>
<td>T-DR-25</td>
<td>No adhesive</td>
<td>Sealing and mechanical bonding</td>
<td>Flexibility Mechanical protection Non-self-amalgamating Supplement with adhesive for sealing and bonding</td>
<td>135°C Perm — ✓ TDR2INSTALL</td>
<td>Heat gun</td>
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</table>
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
### Specifications/Approvals

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<th>Military</th>
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<tr>
<td></td>
<td>VG 95343 Pt. 20, Pt. 22</td>
<td>RW-2077</td>
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#### Product Characteristics

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<tr>
<th>Spec. Requirement</th>
<th>3 KHz to 30 MHz (min.)</th>
<th>&gt;30 MHz to 100 MHz (min.)</th>
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</thead>
<tbody>
<tr>
<td><strong>Initial values</strong></td>
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<tr>
<td>Tensile strength: 12 MPa (min.)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Ultimate elongation: 400% (min.)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Metal adhesion: 15 N/cm (min.)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Shielding effectiveness</td>
<td>75</td>
<td>70</td>
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**Thermal**

<table>
<thead>
<tr>
<th>Spec. Requirement</th>
<th>3 KHz to 30 MHz (min.)</th>
<th>&gt;30 MHz to 100 MHz (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat shock (1/2 h at 200°C [392°F])</td>
<td>Tensile strength: 12 MPa (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Ultimate elongation: 400% (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
</tr>
<tr>
<td>Heat aging (168 h at 160°C [320°F])</td>
<td>Tensile strength: 12 MPa (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Ultimate elongation: 400% (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
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</tbody>
</table>

**Chemical**

<table>
<thead>
<tr>
<th>Spec. Requirement</th>
<th>3 KHz to 30 MHz (min.)</th>
<th>&gt;30 MHz to 100 MHz (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lubricating oil (O-156, at 100°C [212°F])</td>
<td>Tensile strength: 10 MPa (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Ultimate elongation: 300% (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
</tr>
<tr>
<td>Hydraulic fluid H515, at 50°C [122°F]</td>
<td>Tensile strength: 10 MPa (min.)</td>
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<tr>
<td></td>
<td>Ultimate elongation: 300% (min.)</td>
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<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
</tr>
<tr>
<td>Aviation fuel JP4 F40, at 23°C [73°F]</td>
<td>Tensile strength: 10 MPa (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Ultimate elongation: 300% (min.)</td>
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</tr>
<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
</tr>
<tr>
<td>Diesel fuel F54, at 23°C [73°F]</td>
<td>Tensile strength: 10 MPa (min.)</td>
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<tr>
<td></td>
<td>Ultimate elongation: 300% (min.)</td>
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<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
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<tr>
<td>1, 1, 1, trichloroethane (1 h, at 23°C [73°F])</td>
<td>Tensile strength: 10 MPa (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Ultimate elongation: 300% (min.)</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Shielding effectiveness</td>
<td>75</td>
</tr>
</tbody>
</table>

*Values quoted are for the polymer/metal composite in all cases when terminated using epoxy adhesives.*
Fluid-Resistant Screened Elastomer

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]

Product Facts
■ Fuel and heat resistance
■ RFI, EMI protection

Available in:
<table>
<thead>
<tr>
<th>Americas</th>
<th>Europe</th>
<th>Asia Pacific</th>
</tr>
</thead>
</table>
### Specifications/Approvals

<table>
<thead>
<tr>
<th>Military</th>
<th>TE</th>
</tr>
</thead>
<tbody>
<tr>
<td>VG 95343 Pt. 20, Pt. 22</td>
<td>RW-2077</td>
</tr>
</tbody>
</table>

### Product Characteristics

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

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

<table>
<thead>
<tr>
<th>Specification Requirements*</th>
<th>Screening Effectiveness in dB at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 KHz to 30 MHz (min.)</td>
</tr>
<tr>
<td><strong>Initial values</strong></td>
<td></td>
</tr>
<tr>
<td>Tensile strength: 7 MPa (min.)</td>
<td>75</td>
</tr>
<tr>
<td>Metal adhesion: 15 N/cm (min.)</td>
<td></td>
</tr>
<tr>
<td>Shielding effectiveness</td>
<td></td>
</tr>
<tr>
<td><strong>Thermal</strong></td>
<td></td>
</tr>
<tr>
<td>Heat shock (1/2 h at 200°C [392°F])</td>
<td>Metal adhesion: 15 N/cm (min.)</td>
</tr>
<tr>
<td>Heat aging (168 h at 150°C [302°F])</td>
<td>Metal adhesion: 15 N/cm (min.)</td>
</tr>
<tr>
<td><strong>Fluids</strong></td>
<td></td>
</tr>
<tr>
<td>Immersion in the following fluids for 24 h:</td>
<td>Shielding effectiveness</td>
</tr>
<tr>
<td>Phosphate ester hydraulic fluid DT/D900/9881 at 23°C [73°F]</td>
<td>Tensile strength: 5 MPa (min.)</td>
</tr>
<tr>
<td>Water at 23°C [73°F]</td>
<td>Tensile strength: 5 MPa (min.)</td>
</tr>
<tr>
<td>Shielding effectiveness</td>
<td></td>
</tr>
<tr>
<td>Lubricating oil O-149 at 50°C [122°F]</td>
<td>Tensile strength: 5 MPa (min.)</td>
</tr>
<tr>
<td>Transformer oil S-756 at 50°C [122°F]</td>
<td>Tensile strength: 5 MPa (min.)</td>
</tr>
</tbody>
</table>

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

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)

![Diagram of as supplied end cap]

After Unrestricted Recovery (b)

![Diagram of after unrestricted recovery end cap]

Product Dimensions

<table>
<thead>
<tr>
<th>Part No.</th>
<th>H Min.</th>
<th>H Max.</th>
<th>P Min.</th>
<th>HW ±20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>101A011</td>
<td>5.10</td>
<td>2.00</td>
<td>22.90</td>
<td>1.02</td>
</tr>
<tr>
<td>101A021</td>
<td>7.40</td>
<td>3.30</td>
<td>35.50</td>
<td>1.52</td>
</tr>
<tr>
<td>101A031</td>
<td>10.20</td>
<td>4.60</td>
<td>40.60</td>
<td>1.78</td>
</tr>
<tr>
<td>101A041</td>
<td>15.20</td>
<td>6.40</td>
<td>68.40</td>
<td>2.29</td>
</tr>
<tr>
<td>101A062</td>
<td>25.40</td>
<td>11.40</td>
<td>114.30</td>
<td>3.05</td>
</tr>
<tr>
<td>101A083</td>
<td>50.80</td>
<td>22.90</td>
<td>101.60</td>
<td>2.79</td>
</tr>
<tr>
<td>101A094</td>
<td>83.80</td>
<td>38.10</td>
<td>114.30</td>
<td>3.05</td>
</tr>
</tbody>
</table>

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 \( \pm 0.06 \) max.
### End Caps, 101A011 to 094 (Continued)

<table>
<thead>
<tr>
<th>Material</th>
<th>Material Description</th>
<th>Precoating No.</th>
<th>Adhesive Part No.**</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Semirigid polyolefin</td>
<td>/42 or /86</td>
<td>S-1017 or S-1048</td>
</tr>
<tr>
<td>-4</td>
<td>Flexible polyolefin</td>
<td>/42 or /86</td>
<td>S-1017 or S-1048</td>
</tr>
<tr>
<td>-12</td>
<td>Fluoroelastomer</td>
<td></td>
<td>S-1255-04</td>
</tr>
<tr>
<td>-25</td>
<td>Fluid-resistant elastomer</td>
<td>/42 or /86</td>
<td>S-1017 or S-1048 or S-1125</td>
</tr>
<tr>
<td>-100</td>
<td>Polyolefin, Zerohal</td>
<td>/180</td>
<td>S-1030</td>
</tr>
</tbody>
</table>

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

**For more information, please see section 5.
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

Dimensions are shown for reference purposes only. Specifications subject to change.

Accessories

202W302 to 342
## Molded Parts

### 202W302 to 342 (Continued)

#### Materials Available

<table>
<thead>
<tr>
<th>Material</th>
<th>Material Description</th>
<th>Precoating No.</th>
<th>Adhesive Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Polyolefin, semi-rigid</td>
<td>/42, /86</td>
<td>S-1017, S-1048</td>
</tr>
<tr>
<td>-4</td>
<td>Polyolefin, flexible</td>
<td>/42, /86</td>
<td>S-1017, S-1048</td>
</tr>
<tr>
<td>-12</td>
<td>Fluororubber</td>
<td>N/A</td>
<td>S-1255-04</td>
</tr>
<tr>
<td>-25</td>
<td>Fluid resistant elastomer</td>
<td>/86 or /225</td>
<td>S-1017 or S-1048 or S-1125</td>
</tr>
<tr>
<td>-130</td>
<td>Flexible polyolefin</td>
<td>/42, /86</td>
<td>S-1017</td>
</tr>
</tbody>
</table>

#### Product Dimensions

<table>
<thead>
<tr>
<th>Part No.</th>
<th>H Min.</th>
<th>H Max.</th>
<th>J Min.</th>
<th>P ±10% b</th>
<th>R ±10% b</th>
<th>S ±10% b</th>
<th>T ±10% b</th>
<th>W ±20% b</th>
<th>Recommended Hose Sizes</th>
</tr>
</thead>
<tbody>
<tr>
<td>202W302</td>
<td>29.0 [1.142]</td>
<td>9.5 [0.374]</td>
<td>29.0 [1.142]</td>
<td>35.0 [1.378]</td>
<td>25.0 [0.984]</td>
<td>5.0 [0.197]</td>
<td>3.0 [0.118]</td>
<td>1.5 [0.059]</td>
<td>11.0 [0.433]</td>
</tr>
<tr>
<td>202W312</td>
<td>39.0 [1.535]</td>
<td>12.7 [0.500]</td>
<td>39.0 [1.535]</td>
<td>35.0 [1.378]</td>
<td>25.0 [0.984]</td>
<td>5.0 [0.197]</td>
<td>3.0 [0.118]</td>
<td>2.0 [0.079]</td>
<td>14.0 [0.551]</td>
</tr>
<tr>
<td>202W321</td>
<td>10.0 [0.394]</td>
<td>3.0 [0.118]</td>
<td>10.0 [0.394]</td>
<td>29.0 [1.142]</td>
<td>23.0 [0.906]</td>
<td>3.0 [0.118]</td>
<td>3.0 [0.118]</td>
<td>1.5 [0.059]</td>
<td>4.0 [0.157]</td>
</tr>
<tr>
<td>202W331</td>
<td>19.0 [0.748]</td>
<td>6.4 [0.252]</td>
<td>19.0 [0.748]</td>
<td>29.0 [1.142]</td>
<td>24.0 [0.945]</td>
<td>2.5 [0.098]</td>
<td>2.0 [0.079]</td>
<td>1.5 [0.059]</td>
<td>8.0 [0.315]</td>
</tr>
<tr>
<td>202W342</td>
<td>54.0 [2.126]</td>
<td>18.0 [0.709]</td>
<td>54.0 [2.126]</td>
<td>35.0 [1.378]</td>
<td>25.0 [0.984]</td>
<td>5.0 [0.197]</td>
<td>3.0 [0.118]</td>
<td>2.0 [0.079]</td>
<td>20.0 [0.787]</td>
</tr>
</tbody>
</table>

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.
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

Heat-Shrink Positioning Ring

As Supplied (a)

After Unrestricted Recovery (b)
### Accessories

#### Materials Available

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

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

|----------|------------|------------|------------|------------|------------|------------|------------|------------|------------|

*Applicable for -130 only.

---

Catalog 1654025
Revised 5-12
www.te.com

Dimensions are shown for reference purposes only. Specifications subject to change.
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:

<table>
<thead>
<tr>
<th></th>
<th>Americas</th>
<th>Europe</th>
<th>Asia Pacific</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: +1 (800) 522-6752
Canada: +1 (905) 475-6222
Mexico/C. Am.: +52 (0) 55-1106-0800
Latin/S. Am.: +54 (0) 11-4733-2200
Germany: +49 (0) 6251-133-1999
UK: +44 (0) 800-267666
France: +33 (0) 1-3420-8686
Netherlands: +31 (0) 73-6246-999
China: +86 (0) 400-820-6015
### SSC (Continued)

<table>
<thead>
<tr>
<th>Type</th>
<th>TE</th>
<th>Military/Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSC-X and SSC-XTV</td>
<td>SSC specification control drawing</td>
<td>PPS-3011/6</td>
</tr>
<tr>
<td></td>
<td>RW-2024</td>
<td>—</td>
</tr>
</tbody>
</table>

Adhesive is /239 = PPS = 3012/70

### Product Dimensions

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Inner Diameter* As Supplied</th>
<th>Recovered Inside Dia.</th>
<th>Length Recovered ± 10%</th>
<th>Wall Thickness Recovered ± 20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSC-1</td>
<td>10.00 [.390]</td>
<td>4.00 [.160]</td>
<td>33.50 [1.320]</td>
<td>2.00 [.080]</td>
</tr>
<tr>
<td>SSC-2</td>
<td>20.00 [.790]</td>
<td>7.50 [.300]</td>
<td>55.30 [2.180]</td>
<td>2.30 [.090]</td>
</tr>
<tr>
<td>SSC-3</td>
<td>35.00 [1.380]</td>
<td>15.00 [0.590]</td>
<td>89.90 [3.540]</td>
<td>3.00 [.120]</td>
</tr>
<tr>
<td>SSC-4</td>
<td>55.00 [2.170]</td>
<td>25.00 [0.980]</td>
<td>143.20 [5.640]</td>
<td>3.30 [.130]</td>
</tr>
<tr>
<td>SSC-5</td>
<td>75.00 [2.950]</td>
<td>32.00 [1.250]</td>
<td>150.10 [5.910]</td>
<td>3.30 [.130]</td>
</tr>
<tr>
<td>SSC-5M1</td>
<td>75.00 [2.950]</td>
<td>32.00 [1.250]</td>
<td>79.25 [3.120]</td>
<td>3.30 [.130]</td>
</tr>
<tr>
<td>SSC-6</td>
<td>100.00 [3.940]</td>
<td>45.00 [1.770]</td>
<td>162.50 [6.400]</td>
<td>4.00 [.160]</td>
</tr>
<tr>
<td>SSC-7</td>
<td>120.00 [4.720]</td>
<td>70.00 [2.760]</td>
<td>145.00 [5.710]</td>
<td>3.80 [.150]</td>
</tr>
</tbody>
</table>

*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

<table>
<thead>
<tr>
<th>Military</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SSC-XTV</td>
<td>Sealing end cap with adhesive, w/ pressure valve</td>
</tr>
<tr>
<td>SSC-X</td>
<td>Sealing end cap with adhesive</td>
</tr>
<tr>
<td>SSC-XU</td>
<td>End cap, uncoated</td>
</tr>
</tbody>
</table>
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**

Precoated Adhesives

<table>
<thead>
<tr>
<th>Material</th>
<th>Available Coatings (Unshielded)</th>
<th>Available Coatings (Shielded)</th>
</tr>
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Materials Available

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### KTKK Assemblies Screened

#### Pattern 105 Connectors or Connector Code 76

**25S Fluid Resistant Elastomer**

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#### 100S Low Fire Hazard Material

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### Pattern 602 Connectors or Connector Code 54

**25S Fluid Resistant Elastomer**

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#### 100S Low Fire Hazard Material

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### KTKK Assemblies Screened (Continued)

#### 100S Low Fire Material

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#### 25S Fluid Resistant Elastomer

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#### 100S Low Fire Hazard Material

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#### 38999 Series I and II Connectors or Connector Code 41

#### 25S Fluid Resistant Elastomer

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#### 100S Low Fire Hazard Material

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Cable Feedthroughs

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 lock-nut and O-ring seal, onto the rear of which is pre-installed 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:

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<th></th>
<th>Americas</th>
<th>Europe</th>
<th>Asia Pacific</th>
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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 unsheilded 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.
Double knife-edge to ensure good electrical contact. Single-sided dovetail to ensure O-ring remains in place.

Product Dimensions

<table>
<thead>
<tr>
<th>Feedthrough Size</th>
<th>J Diameter*</th>
<th>Unshielded</th>
<th>Shielded</th>
<th>M Thread</th>
<th>A Dia. Max.</th>
<th>A/F Body</th>
<th>A/F Nut</th>
<th>P ±10% Unscreened</th>
<th>Hole Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a Min.</td>
<td>b Max.</td>
<td>a Min.</td>
<td>b Max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCFS/R-12</td>
<td>[1.43]</td>
<td>[5.6]</td>
<td>[7.5]</td>
<td>[30]</td>
<td>M12 x 1.5</td>
<td>7.5 [30]</td>
<td>24 [95]</td>
<td>17 [67]</td>
<td>[52]</td>
</tr>
<tr>
<td>TCFS/R-16</td>
<td>[1.59]</td>
<td>[5.9]</td>
<td>[12.5]</td>
<td>[49]</td>
<td>M16 x 1.5</td>
<td>10.2 [40]</td>
<td>29 [114]</td>
<td>22 [87]</td>
<td>[57]</td>
</tr>
<tr>
<td>TCFS/R-20</td>
<td>[1.75]</td>
<td>[7.1]</td>
<td>[14.5]</td>
<td>[57]</td>
<td>M20 x 1.5</td>
<td>14.0 [55]</td>
<td>34 [134]</td>
<td>27 [106]</td>
<td>[61]</td>
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<td>TCFS/R-24</td>
<td>[1.90]</td>
<td>[8.4]</td>
<td>[18.5]</td>
<td>[73]</td>
<td>M24 x 1.5</td>
<td>19.2 [76]</td>
<td>38 [150]</td>
<td>30 [118]</td>
<td>[74]</td>
</tr>
<tr>
<td>TCFS/R-30</td>
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<td>[9.9]</td>
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<td>[93]</td>
<td>M30 x 1.5</td>
<td>24.2 [95]</td>
<td>48 [189]</td>
<td>36 [148]</td>
<td>[73]</td>
</tr>
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<td>[15.7]</td>
<td>[32.5]</td>
<td>[128]</td>
<td>M36 x 1.5</td>
<td>30.2 [149]</td>
<td>52 [205]</td>
<td>41 [161]</td>
<td>[104]</td>
</tr>
<tr>
<td>TCFS/R-48</td>
<td>[1.77]</td>
<td>[16.8]</td>
<td>[38.5]</td>
<td>[152]</td>
<td>M48 x 1.5</td>
<td>40.2 [158]</td>
<td>67 [264]</td>
<td>55 [217]</td>
<td>[144]</td>
</tr>
</tbody>
</table>

*a = Supplied dimension
b = Dimension after free recovery