



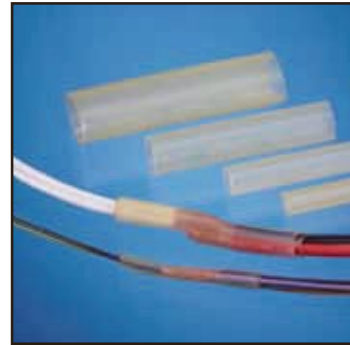
## RAYCHEM Tubing Products Selection Guide



# RAYCHEM

Versatile Raychem brand heat-shrinkable tubing products will cover just about all your needs. With high-performance tubing from TE Connectivity, you can cover, protect, bundle, strain-relieve, seal, identify and otherwise take care of a broad range of projects.

Single wall tubing gives optimum flexibility and space savings along with mechanical protection and chemical resistance. Dual wall tubing, with inner walls of adhesive or encapsulant, also reliably seals out moisture. Elastomeric tubing products are specifically designed for use in applications where resistance to abrasion, chemicals and other fluids,



## Electrical insulation/strain relief/flame-retardance

General-purpose polyolefin tubing is widely used to provide insulation and strain relief of wire terminations and connections, plus a variety of other applications.

- The tubing is cost effective, and with its low shrink temperature, installs quickly.
- It is flexible but does not easily wrinkle when bent.
- Flame-retardant tubing is available in a wide range of sizes and colors.
- Most polyolefin tubing products meet UL and CSA standards for a wide range of commercial applications as well as military specifications.



## Wire Bundling

Raychem single wall tubing products allow you to bundle wires to create very flexible, lightweight harnesses that can stand up to harsh environments. Raychem elastomeric tubings are intended for use in the most rugged harnessing applications where abrasion and temperature resistance as well as resistance to chemicals and fluids are required.

- The broad range of tubing products in the Raychem line ensures that the appropriate solution to your wire bundling and harnessing requirements will be available.
- A variety of tubing products meet military and commercial standards.
- Where space saving is important, very-thin-wall tubing allows you to pack components tightly.



## Mechanical protection

Raychem tubing products provide mechanical protection to assure reliability of harnesses and terminations.

- Many tubing products offer excellent protection for cables and harnesses that are dragged along the ground, flexed frequently, or subjected to abrasion during installation.
- HFT5000 heat-shrinkable fabric tubing is designed to provide mechanical protection for components such as rubber hoses, plastic pipes, and harness wiring bundles.
- Semirigid tubing products provide strain relief to ensure that delicate connections will be protected from damage during use.



## Environmental sealing and protection

High-shrink-ratio tubing products environmentally protect connector-to-cable transitions. The adhesives used in our dual wall tubing products bond to a wide variety of plastics, rubbers and metals.

- High shrink ratios accommodate large size differences between cables and cable connectors and backshells, thus simplifying cable repair.
- Medium wall tubing is available for increased mechanical protection.
- Other tubing products are available in flexible, semirigid, or flame-retardant materials.

and flexibility over a wide range of temperatures is required. Heavy duty tubing products are intended for use in the most rugged environments. Whether your application is commercial, industrial, or military, there are Raychem brand tubing products to meet your precise needs.

Part numbers in this Selection Guide are RoHS Compliant. These products comply with European Union Directive 2002/95/EC, as amended 1 January 2006, that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.



## Protection from moisture and corrosion

Adhesive-lined, flexible polyolefin tubing seals and protects electrical splices and in-line electronic components from fluids, moisture and corrosion. Rugged, adhesive-lined tubing protects wiring and components from the corrosive effects of moisture, engine fuels and lubricants.

- Tubing provides one-step electrical insulation and moisture sealing.
- When adhesive-lined flexible polyolefin tubing is used both the tubing and adhesive are flexible, creating a moisture seal that accommodates bending.
- In more rugged applications, specially formulated hot-melt adhesive forms an effective barrier against fluids and moisture.
- The dimensions of some tubing products are engineered to accommodate multiple wire splices.



## Mechanical and environmental protection

Heat-shrinkable end caps fully encapsulate or seal terminations and protect them from dust, dirt, and moisture. The encapsulant or adhesive lining in the caps melts and flows to fill surface irregularities in the substrate.

- End caps inexpensively insulate and encapsulate or seal crimped electrical connections.
- These caps resist abrasion, vibration and flexing.
- End caps' splash resistant, moisture resistant coverings provide environmental protection.



## Protection from impact and abrasion

Heavy duty tubing products were designed for applications where strength and durability are needed such as underground splice sealing, high ratio back end connector sealing, battery terminal insulation, and mechanical protection for wiring systems.

- Thick wall tubing is highly resistant to impact and abrasion and provides a high level of strain relief.
- Flame-retardant and halogen-free tubing products are available.
- Heavy duty tubing products are resistant to chemicals, moisture and oils.

Note: Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For the latest compliance status and to answer all of your RoHS questions, refer to [www.te.com/customer-support/product-compliance](http://www.te.com/customer-support/product-compliance).

| Product Category | Product Name            | Operating Temperature °C[°F]  | Minimum Full Recovery Temperature °C[°F] | Shrink Ratio                                 | Product Description  | Features/Benefits  | Standard Size Range (Inside Diameter as supplied) MM [In.]                        | Colors  | Applicable Specifications  | Flammability Rating  | Typical Applications   | Available in                       |
|------------------|-------------------------|---|--|--|--|--|---|---|--|--|--|------------------------------------|
| Single Wall      | BRST                    | -40 to 120 [-40 to 248]   | 130 [266]                                | 2:1  | Single wall non-flame-retardant polyolefin tubing  | Low shrink temperature tubing with satin finish. General purpose polyolefin tubing provides excellent electrical insulation.   | 4.0 to 24.0 [0.157 - 0.945]   | Black   | RK-6766  | N/A  | Provides excellent electrical insulation. Can be used where noise suppression and mechanical protection are needed.  | Europe<br>Asia Pacific             |
|                  | CGPE-105                | -70 to 105 [-40 to 257]   | Black 110 [230]; All Others 100 [212]    | 2:1  | Flexible, brightly colored, non-flame-retardant polyolefin tubing  | Bright, shiny appearance; clear offers exceptional clarity. Easily hotstamped.   | 1.2 to 50.8 [0.046 to 2.000]  | Black, white, clear, red, blue, yellow, green and violet  | CGPE-105 SCD   | N/A  | Insulation and protection of components and wires. Color coding and identification. Clear tubing is ideal for protecting marked surfaces.  | Americas<br>Asia Pacific           |
|                  | CGPT                    | -40 to +135 [-40 to +275]   | 120 [248]                                | 2:1<br>3:1                                   | Single wall flame-retardant polyolefin tubing  | Tough and flexible with good chemical resistance. Flame-retardant (except clear).  | 2:1: 1.2 to 102.0 [0.046 to 4.016]<br>3:1: 1.5 to 39.0 [0.059 to 1.540]           | Standard: Black, white, red, blue, yellow, brown, gray, clear (non-flame-retardant), yellow/green (limited size range); Nonstandard: Orange, green, violet (2:1 sizes 1.2 through 51.0 only)                | RW-2059, UL  | ASTM D2671, Procedure B (not clear)  | Suitable for a wide range of applications including electrical insulation, strain relief, cable bundling, color-coding, and mechanical protection.   | Europe<br>Asia Pacific             |
|                  | CRN                     | -55 to 135 [-67 to 275]   | 135 [275]                                | 2:1  | Semirigid polyolefin tubing  | High abrasion resistance. Transfers flex stress away from typically weak points. Excellent chemical and solvent resistance properties.                               | 1.2 to 19.1 [0.046 to 0.750]  | Standard: Black; Nonstandard: Clear   | RT-360; AMS-DTL-23053/6, Cl. 1 & 2; UL/CSA (Black only)  | AMS-DTL-23053 Test B (Black only); UL/CSA All Tubing Flame Test (Black only)   | Strain relief, insulation and mechanical protection of soldered or crimped connections, wire splices and terminations.   | Americas<br>Europe<br>Asia Pacific |
|                  | DCPT                    | -55 to 135 [-67 to 275]   | 120 [248]                                | 2:1<br>3:1                                   | Flexible, flame-retardant, dual-color polyolefin tubing  | Dual colors (yellow/green) for instant identification. Color permanence superior to conventional ink marking.  | 2:1: 3.0 to 51.0 [0.118 to 2.000];<br>3:1: 3.0 to 39.0 [0.118 to 1.535]           | Yellow/green stripe   | RW-2056; UL/CSA  | UL/CSA All Tubing Flame Test   | Identification of "ground" on wires and cables.  | Americas<br>Europe<br>Asia Pacific |
|                  | LSTT                    | -40 to +125 [-40 to +275]   | 110 [230]                                | 2:1  | Low-shrink-temperature single wall non-flame-retardant polyolefin tubing   | Low shrink temperature for fast recovery. Meets FMVSS 302 standard for flammability. Flexible.   | 1.6 to 52.0 [0.063 to 2.047]  | Standard: Black, red, blue, yellow; Nonstandard: Green, gray, white, clear  | RW-2051  | FMVSS 302  | Electrical insulation, color-coding, covering of temperature-sensitive devices, cosmetic coverings and mechanical protection.  | Europe<br>Asia Pacific             |
|                  | NETM 1000/<br>NETM 2000 | NETM1000 -55 to +135 [-67 to +275];<br>NETM2000 -55 to +150 [-67 to +302] | N/A                                      | N/A  | Non-heat-shrinkable polyolefin tubing  | NETM1000 is more flexible allowing it to be easily routed through tight spaces. NETM2000 has greater mechanical strength and abrasion resistance.                    | NETM1000: 3.0 to 14.0 [0.118 to 0.551];<br>NETM2000: 6.0 to 12.0 [0.236 to 0.500] | Black   | NETM1000 SCD<br>NETM2000 SCD   | FMVSS 302  | Bundling and routing of wires in automotive applications.  | Americas<br>Europe<br>Asia Pacific |
|                  | RNF-100                 | -55 to 135 [-67 to 275]   | 121 [250]                                | 2:1  | Flexible, flame-retardant, general purpose polyolefin tubing   | Excellent physical, chemical and electrical properties. Abrasion and solvent resistance superior to that of many polyolefin tubings. Wide range of sizes and colors. | 1.2 to 127.0 [0.046 to 5.000]   | Standard: Black (all sizes); White, blue, yellow, and clear (sizes 3/64" through 3"); Nonstandard: White, red, blue, yellow, and clear (sizes 4" and 5"); Brown, green, violet, orange and gray (all sizes) | RT-350, RK-6001; AMS-DTL-23053/5, Cl. 1 & 2, Def. Stan. 59-97 Type 2B (Colors only), VG 95343 Pt 5 Type B (Clear only); UL/CSA (Colors only) | AMS-DTL-23053 Test B (Colors only); UL/CSA All Tubing Flame Test (Colors only)   | Insulation and strain relief of wire terminations and connections. Jacketing wire bundles and harnesses where superior abrasion resistance is a plus. Color coding and identification. Protection of wire markers (clear). | Americas<br>Europe<br>Asia Pacific |
|                  | RNF-3000                | -55 to 135 [-67 to 275]   | 120 [248]                                | 3:1  | Flexible, high-shrink-ratio, flame-retardant, general purpose polyolefin tubing  | 3:1 shrink ratio easily accommodates irregular shapes. Few sizes cover a wide range of diameters. Flame-retardant (Colors only).                                     | 1.5 to 39.0 [0.060 to 1.534]  | Standard: Black (All Regions); White, red, blue, yellow, and clear (non-flame-retardant) (EMEA only); Nonstandard: Green, violet, and gray (all Regions)  | RW-2053; UL/CSA  | UL/CSA All Tubing Flame Test (Colors only)   | Insulation and strain relief of wire terminations and electrical connections. Electrical and mechanical protection of components with irregular dimensions.  | Americas<br>Europe<br>Asia Pacific |
|                  | RP-4800                 | -55 to 135 [-67 to 275]   | 121 [250]                                | 4:1  | Flexible, high-shrink-ratio, flame-retardant polyolefin tubing   | Conforms well to highly variable substrate dimensions. Excellent physical, chemical and electrical properties.   | 19.1 to 114.3 [0.750 to 4.500]  | Standard: Black; Nonstandard: White, red, blue, yellow, green, brown, orange, violet, and gray  | RT-1112; AMS-DTL-23053/5, Cl.1 Overexpanded; UL (Black only)   | AMS-DTL-23053 Test B; UL All Tubing Flame Test (Black only)  | Repair of harness and cable jackets; will pass over large-diameter connectors or transitions then shrink tightly on harnesses and cables. Provides abrasion and fluid resistance required in many harness applications.    | Americas<br>Europe<br>Asia Pacific |
| RT-3             | -55 to 135 [-67 to 275] | 135 [275]   | 2.5:1                                    | Semirigid, flame-retardant polyolefin tubing | Excellent mechanical properties; transfers flex stress away from typically weak points. Tightly controlled expanded diameters; well suited for semiautomated installation. | 6.1 to 12.3 [0.240 to 0.485]   | Black   | RT-360; UL/CSA  | UL/CSA All Tubing Flame Test   | Strain relief, insulation and mechanical protection of soldered or crimped connections, wire splices and terminations. Mechanical protection of delicate components. | Americas<br>Europe<br>Asia Pacific   |                                    |



| Product Category    | Product Name | Operating Temperature °C[°F] | Minimum Full Recovery Temperature °C[°F] | Shrink Ratio   | Product Description  | Features/Benefits   | Standard Size Range (Inside Diameter as supplied) MM [In.]                   | Colors   | Applicable Specifications   | Flammability Rating  | Typical Applications  | Available in                        |
|---------------------|--------------|------------------------------|--|----------------|--|---|--|--|---|--|---|-------------------------------------|
| Single Wall (contd) | TUGA-GP      | -55 to 125 [-67 to 275]      | 110 [230]                                | 2:1            | Single wall, non-flame-retardant polyolefin tubing   | Glossy finish. Semiflexible, non-flame-retardant and halogen-free. Easily hotstamped.   | 1.2 to 38.0 [0.046 to 1.496]   | Black  | RW-2201   | FMVSS 302  | Electrical insulation, mechanical protection, beautification.   | Europe<br>Asia Pacific              |
|                     | VERSAFIT     | -55 to 135 [-67 to 275]      | 90 [194]                                 | 2:1            | Highly flame-retardant, very flexible, low-shrink-temperature polyolefin tubing  | Meets AMS-DTL-23053/5, Cl. 1 and 3 as well as UL and CSA standards. UL/CSA VW-1 flame rating. Low shrink temperature for fast installation.   | 1.2 to 101.6 [0.046 to 4.000]  | Standard: Black, white, red, blue, and yellow; Nonstandard: Brown, orange, green, violet and gray                                  | RW-3009; AMS-DTL-23053/5, Cl. 1 & 3; UL/CSA VW-1  | AMS-DTL-23053 Test C; UL/CSA VW-1  | Insulation and protection of in-line components, wire splices and terminations. Very flexible light-duty military and commercial harnessing. Use where a UL/CSA VW-1 flame rating is needed. Use where rapid installation is desirable. | Americas<br>Europe<br>Asia Pacific  |
|                     | VERSAFIT-3X  | -55 to 135 [-67 to 275]      | 90 [194]                                 | 3:1            | Highly flame-retardant, very flexible, high-shrink-ratio, low-shrink-temperature overexpanded polyolefin tubing            | UL/CSA VW-1 flame rating. Low shrink temperature for fast installation. 3:1 shrink ratio easily accommodates irregular shapes. Few sizes cover a wide range of diameters.   | 3.2 to 25.4 [0.125 to 1.00]  | Standard: Black; Nonstandard: White, red, blue, yellow, green, brown, orange, violet, and gray                                     | RW-3009   | UL/CSA VW-1  | Insulation and protection of in-line components, wire splices and terminations. Very flexible light-duty harnessing. Use where larger expansion ratio and UL/CSA VW-1 rating are needed.  | Americas<br>Europe<br>Asia Pacific  |
|                     | VERSAFIT V2  | -30 to 125 [-22 to 257]      | 90 [194]                                 | 2:1            | Highly flame-retardant, very flexible, low-shrink-temperature metric-sized polyolefin tubing                               | Many sizes to cover a wide variety of applications. UL/CSA VW-1 flame rating. Low shrink temperature for fast installation.   | 0.8 to 30.0 [0.032 to 1.181]   | Standard: Black; Nonstandard: White, red, blue, yellow, green, brown, orange, violet, and gray                                     | RW-3023; UL/CSA VW-1  | UL/CSA VW-1  | Insulation and protection of in-line components, wire splices and terminations. Very flexible light-duty harnessing. Use where a UL/CSA VW-1 flame rating is needed. Use where rapid installation is desirable.                         | Americas<br>Europe<br>Asia Pacific  |
|                     | VERSAFIT V4  | -30 to 125 [-22 to 257]      | 90 [194]                                 | 2:1            | Very-thin-wall, very flexible, highly flame-retardant, low-shrink-temperature imperial- and metric-sized polyolefin tubing | Very thin wall and low shrink temperature for fast installation and space savings. UL/CSA VW-1 flame rating.  | Imperial: 1.2 to 25.4 [0.046 to 1.000]; Metric: 1.0 to 10.0 [0.039 to 0.394] | Standard: Black; other colors available upon request   | RW-3023; UL/CSA VW-1  | UL/CSA VW-1  | Insulation of in-line components, wire splices and terminations. Especially suited for covering temperature-sensitive components and wires. Strain relief on high-density connectors.   | Americas<br>Europe<br>Asia Pacific  |
| Dual Wall           | AP2000       | -40 to 80 [-40 to 176]       | 110 [230]                                | 1.3:1 to 2.9:1 | Flexible, adhesive-lined non-flame-retardant polyolefin tubing   | Sized for use on specific standard sizes of metal pipe. Provides environmental and mechanical protection for automotive brake and fuel lines. Flexibility allows pipes to be bent after tubing has been installed.        | 6.0 to 30.0 [0.236 to 1.182]   | Black  | RW-1001, AP2000 Special Sizes SCD   | N/A  | Protecting automotive brake and fuel lines from damage in areas exposed to mechanical abuse and moisture which can cause corrosion. Sized for use on specific standard sizes of metal pipe.   | Americas<br>Europe<br>Asia Pacific  |
|                     | ATUM         | -55 to 110 [-67 to 230]      | 110 [230]                                | 3:1 & 4:1      | High-shrink-ratio, adhesive-lined polyolefin tubing  | 3:1 and 4:1 shrink ratios allow for connector-to-cable sealing. Medium wall provides increased mechanical protection. ATUM adhesive bonds to a wide variety of materials.   | 3:1: 3.0 to 40.0 [0.118 to 1.570]; 4:1: 4.0 to 52.0 [0.158 to 2.050]         | Standard: Black; Nonstandard: Clear (non-flame-retardant); other colors available upon request                                     | RW-2063 (Black), RK-6024 (Clear and colors); AMS-DTL-23053/4, Cl. 3 (specific 3:1 sizes in Black only); UL (Black only, except sizes 3/1 and 4/1) | AMS-DTL-23053 Test B (Black only)  | Sealing and protection of connector backshells, breakouts and connector-to-cable transitions. High shrink ratio allows for repair of damaged cable jackets without removing connectors.   | Americas<br>Europe<br>Asia Pacific  |
|                     | CGAT         | -30 to 80 [-22 to 176]       | 115 [239]                                | 3:1            | Adhesive-lined, flexible polyolefin tubing   | General-purpose adhesive-lined tubing for the commercial marketplace. Offers good adhesive bonding to a variety of substrates to provide environmental sealing.   | 3.0 to 39.0 [0.118 to 1.535]   | Black, Clear (non-flame-retardant)   | RW-2051   | FMVSS 302  | Environmental protection of electrical components. Sealing of wire breakouts and cable jackets.   | Europe<br>Asia Pacific              |
|                     | DSPL         | -40 to 125 [-40 to 257]      | 135 [275]                                | 4:1            | High-shrink-ratio, adhesive-lined semirigid polyolefin tubing  | 4:1 shrink ratio allows a few sizes to cover a wide range of applications. Excellent environmental sealing. Mechanically tough providing protection from flexing and abrasion. Flame-retardant (except clear).            | 5.7 to 17.5 [0.224 to 0.689]   | Black, Clear (non-flame-retardant)   | RK-6755   | ASTM D 2671, Procedure B (Black only)  | Environmental sealing, electrical insulation and mechanical protection of wire splices, terminals and other components.   | Europe                              |
|                     | DWP-125      | -40 to 110 [-40 to 230]      | 125 [257]                                | 3:1            | Flexible, high-shrink-ratio, adhesive-lined polyolefin tubing  | 3:1 shrink ratio allows for insulation and sealing of irregular shapes. Medium wall provides increased mechanical protection while maintaining flexibility when installed. Adhesive bonds to a wide variety of materials. | 3.2 to 50.8 [0.125 to 2.000]   | Standard: Black; Nonstandard: White, red, blue, yellow, green and clear (non-flame-retardant); other colors available upon request | DWP-125 SCD; UL/CSA; AMS-DTL-23053/4, Cl. 3*  | UL/CSA All Tubing Flame Test (Colors only); AMS-DTL-23053 Test B (Colors only) | Sealing and protection of wire splices, break-outs and connector-to-cable transitions. Ideal for applications where a UL recognized/CSA certified adhesive-lined tubing is required.  | Americas<br>Asia Pacific            |
|                     | DWTC         | -55 to 75 [-67 to 167]       | 100 [212]                                | 4:1            | Clear adhesive-lined polyolefin tubing   | Limited number of sizes cover a full range of irregular shapes and widely varying dimensions. Clear tubing offers excellent clarity for protection of substrates needing inspection during service.                       | 4.0 to 16.0 [0.157 to 0.630]   | Clear  | RK-6204   | N/A  | Environmental sealing of components where mechanical toughness or split resistance are needed.  | Americas<br>Europe,<br>Asia Pacific |

\*Meets the material properties except for sealing efficiency

| Product Category       | Product Name           | Operating Temperature °C[°F] | Minimum Full Recovery Temperature °C[°F] | Shrink Ratio                                     | Product Description   | Features/Benefits   | Standard Size Range (Inside Diameter as supplied) MM [In.]           | Colors   | Applicable Specifications  | Flammability Rating   | Typical Applications  | Available in                       |
|------------------------|------------------------|------------------------------|--|--|---|---|--|--|--|---|---|------------------------------------|
| Dual Wall (contd)      | ES1000                 | -40 to 130 [-40 to 266]      | 135 [275]                                | 4:1  | Clear, high-shrink-ratio, adhesive-lined semirigid polyolefin tubing  | 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters. Mechanically tough providing strain relief and abrasion protection.  | 5.72 to 17.78 [0.225 to 0.700]                                       | Clear  | RT-1113; UL  | N/A   | Specially designed for environmental sealing and electrical insulation of wire splices, terminations and components where see-through inspection is required.   | Americas<br>Asia Pacific           |
|                        | ES2000                 | -40 to 130 [-40 to 266]      | 135 [275]                                | 4:1  | Flame-retardant, high-shrink-ratio, adhesive-lined semirigid polyolefin tubing  | 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters. Flame-retardant and mechanically tough providing strain relief and abrasion protection.  | 5.72 to 17.78 [0.225 to 0.700]                                       | Black  | RT-1112; UL  | ASTM D 2671, Procedure B  | Specially designed for environmental sealing and electrical insulation of wire splices, terminations and components.  | Americas<br>Asia Pacific           |
|                        | FL2500                 | -40 to 135 [-40 to 275]      | 135 [275]                                | 4:1  | Fully flame-retardant, high-shrink-ratio, adhesive-lined semirigid polyolefin tubing  | 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters. Flame-retardant jacket and adhesive.   | 7.62 to 17.79 [0.300 to 0.700]                                       | Black  | FL2500 SCD   | SAE J1128, Note 5   | Fully flame-retardant and mechanically tough to provide strain relief and abrasion protection of wire splices, terminals, fuse links and in-line components.  | Americas<br>Europe<br>Asia Pacific |
|                        | HTAT                   | -55 to 125 [-67 to 275]      | 110 [230]                                | 4:1  | Semiflexible, high-shrink-ratio, adhesive-lined polyolefin tubing   | 4:1 shrink ratio allows for connector-to-cable sealing. Medium wall provides increased mechanical protection. High-temperature adhesive forms a strong bond to a variety of materials.  | 4.0 to 48.0 [0.158 to 1.890]   | Black  | RW-2052  | ASTM D 2671, Procedure B  | Sealing and protection of connector back-shells, breakouts and connector-to-cable transitions at elevated temperatures. High shrink ratio allows HTAT to provide superior environmental protection to a wide range of shapes with irregular dimensions. | Americas<br>Europe<br>Asia Pacific |
|                        | RPPM                   | -40 to 85 [-40 to 185]       | 80 [176]                                 | 4:1  | Clear adhesive-lined polyolefin tubing  | Tough outer jacket offers excellent mechanical strength. High shrink ratio allows use on a range of substrate diameters. Black has a high gloss finish. Clear has excellent optical clarity allowing inspection of substrates after installation. | 4.0 to 16.0 [0.157 to 0.630]   | Black and Clear  | RK-6214  | N/A   | Use the black for cosmetic applications where a high gloss finish is desired. Use the clear where optical clarity is desired for later inspection.  | Americas<br>Europe<br>Asia Pacific |
|                        | SCL                    | -55 to 110 [-67 to 230]      | 135 [275]                                | 3:1  | Semirigid, encapsulant-lined polyolefin tubing  | Splash-resistant, moisture-resistant covering. Provides rugged protection against abrasion, vibration and flexing.  | 3.2 to 25.4 [0.125 to 1.000]   | Black plus one additional color per size (except 1")   | RT-1301; AMS-DTL-23053/4, Cl. 1; UL                                      | N/A   | Encapsulation of components, splices, and terminations where splash resistance and mechanical protection are required.  | Americas<br>Europe<br>Asia Pacific |
|                        | SCT                    | -40 to 150 [-40 to 302]      | 135 [275]                                | 4:1  | Flame-retardant, adhesive-lined semirigid polyolefin tubing (extended temperature range)                                      | 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters. Flame-retardant and mechanically tough. Adhesive wall forms a barrier against fluids and moisture at an extended temperature range.                  | 7.6 to 17.8 [0.300 to 0.700]   | Black  | SCT SCD  | ASTM D 2671, Procedure B  | Specially designed for insulation, strain relief and sealing of automotive wire splices and components in an under-hood automotive environment.   | Americas<br>Europe<br>Asia Pacific |
|                        | TAT-125                | -55 to 110 [-67 to 230]      | 121 [250]                                | 2:1  | Flexible, adhesive-lined polyolefin tubing  | Flexible adhesive lining and tubing jacket. Thin adhesive lining to seal simple constructions. Good mechanical strength and cut-through resistance. Adhesive bonds to a wide variety of materials.  | 3.2 to 101.6 [0.125 to 4.000]  | Standard: Black; Nonstandard: White, red, blue, yellow, green, brown, orange, violet, gray, and clear (non-flame-retardant). | TAT-125 SCD; AMS-DTL-23053/4, Cl. 2; UL                                  | AMS-DTL-23053 Test B  | Sealing and protection of simple in-line splices, bimetallic joints, and components from fluids, moisture, and corrosion. Repair damaged wire insulation, especially where flexibility is required.   | Americas<br>Asia Pacific           |
| Heavy Duty             | TECT                   | -40 to 80 [-40 to +176]      | 135 [275]                                | 3:1  | Semiconductive, adhesive-lined polyolefin tubing  | Conductive polyolefin jacket lined with conductive adhesive.  | 13.5 [0.531]<br>One size only  | Black  | RW-2080  | N/A   | Electrical grounding of coated automotive fuel lines.   | Europe                             |
|                        | BSTS/<br>BSTS-FR       | -55 to 90 [-67 to 194]       | 121 [250]                                | 3:1  | Rugged, thick wall, general purpose polyolefin tubing   | Excellent thick-wall insulation and abrasion protection. BSTS-FR is flame-retardant.  | 7.62 to 114.30 [0.300 to 4.500]                                      | Standard: Black; Nonstandard: Red, white, and clear (non-flame-retardant)  | RW-2017; AMS-DTL-23053/15, Cl. 1 and 2 (except coating requirement); ABS | AMS-DTL-23053 Test C (Flame-retardant version only); ASTM D 685   | Used in demanding applications where insulation, abrasion resistance and strain relief are required. Resists moisture, fungus and weathering.   | Americas<br>Europe<br>Asia Pacific |
|                        | HF                     | -55 to 90 [-67 to 194]       | 121 [250]                                | 3:1  | High-flex, heavy wall polyolefin tubing   | Offers high flexibility. Provides excellent insulation and abrasion protection. Flame-retardant.  | 10.16 to 68.58 [0.400 to 2.700]                                      | Black  | RW-2023; AMS-DTL-23053/15, Cl. 2 (except coating requirement); ABS       | AMS-DTL-23053 Test C  | Ideal for jacketing cables where sharp bends or turns are required. Also ideal for applications where the cable is subject to motion.   | Americas<br>Europe<br>Asia Pacific |
| HRHF/<br>HRNF/<br>HRSR | -55 to 90 [-67 to 194] | 121 [250]                    | 5.6:1                                    | High-ratio, durable heavy wall polyolefin tubing | Excellent insulation and abrasion protection. Available in flame-retardant material. Available with factory-applied sealants. | 15.24 to 101.60 [0.600 to 4.000]  | Standard: Black; Nonstandard: Clear (non-flame-retardant; HRHF only) | RW-2013; ABS   | AMS-DTL-23053 Test C (Flame-retardant version only)                      | Designed to accommodate large size differences between cable diameters and cable connectors and backshells to simplify cable repair and protection. | Americas<br>Europe<br>Asia Pacific  |                                    |

| Product Category   | Product Name | Operating Temperature °C[°F]   | Minimum Full Recovery Temperature °C[°F] | Shrink Ratio   | Product Description   | Features/Benefits   | Standard Size Range (Inside Diameter as supplied) MM [In.] | Colors  | Applicable Specifications  | Flammability Rating                                 | Typical Applications  | Available in                       |
|--------------------|--------------|--|--|----------------|---|---|--|---|--|---|---|------------------------------------|
| Heavy Duty (contd) | HRHT         | -55 to 135 [-67 to 275]  | 150 [302]                                | As high as 6:1 | High-ratio, high-temperature polyolefin tubing              | Shrink ratios as high as 6:1. Specially-formulated for thick wall insulation, strain relief, and abrasion protection. Designed to conform to odd shapes and shrink over large transitions. Available with optional adhesive lining.                 | 19.05 to 114.30 [0.750 to 4.500]                           | Black   | HRHT SCD   | ASTM D 635  | Recovery over odd shapes and large cable transitions. Sealing the back end of a connector or repairing the damaged outer insulation of a cable.   | Americas<br>Europe<br>Asia Pacific |
|                    | RHW          | -55 to 110 [-67 to 230]  | 125 [257]                                | 4:1            | Rugged, heavy wall, adhesive-lined polyolefin tubing        | Highly resistant to impact, flexing and abrasion for increased product reliability. Resistant to chemicals, moisture and oils. Provides a moisture-proof seal to prevent corrosion. Halogen-free and UV resistant jacket.                           | 12.0 to 390.0 [0.472 to 15.354]                            | Black   | RHW SCD; UL (limited size range)   | N/A   | Insulation, protection and sealing of electrical connections and joints in low-voltage cables. Combines maximum reliability and product performance with simplified installation.                             | Americas<br>Europe<br>Asia Pacific |
|                    | RMW          | -55 to 110 [-67 to 230]  | 125 [257]                                | 3:1            | Medium wall, general purpose polyolefin tubing              | Withstands mechanical abuse for increased product reliability. Highly resistant to impact and abrasion. Resistant to chemicals and moisture. Adhesive-lined version provides a moisture-proof seal to prevent corrosion.                            | 10.0 to 180.0 [0.394 to 7.087]                             | Black   | RMW SCD  | N/A   | Insulation and protection of cable joints as well as cable repair. Uncoated RMW provides insulation and strain relief. Adhesive-lined RMW also provides an environmental seal.                                | Americas<br>Europe<br>Asia Pacific |
|                    | SST/SST-FR   | -55 to 90 [-67 to 194]   | 121 [250]                                | 3:1            | Thick wall, adhesive-lined polyolefin tubing                | Thick wall insulation, strain relief and abrasion protection. Thick adhesive liner forms a barrier against fluids and moisture. SST-FR is flame-retardant.  | 7.62 to 114.30 [0.300 to 4.500]                            | Standard: Black; Nonstandard: Red, white, and clear (non-flame-retardant) | RW-2011; AMS-DTL-23053/15, Cl. 1 and 2 (flame-retardant version with /97 coating only);  | AMS-DTL-23053 Test C (Flame-retardant version only) | Insulation, strain relief, and sealing of splices in wire harnesses. Environmental protection in wet or underground applications.   | Americas<br>Europe<br>Asia Pacific |
|                    | URHT         | -55 to 135 [-67 to 275]  | 150 [302]                                | As high as 8:1 | Ultra-high-ratio, flame-retardant polyolefin tubing         | Shrink ratios as high as 8:1. Specially formulated for thick wall insulation, strain relief, and abrasion protection. Designed to conform to odd shapes and shrink over large transitions. Optional adhesive lining provides environmental sealing. | 50.8 to 76.2 [2.000 to 3.000]                              | Black   | URHT SCD   | ASTM D 635  | Recovery over odd shapes and large cable transitions. Sealing the back end of a connector or repairing the damaged outer insulation of a cable.   | Americas<br>Europe<br>Asia Pacific |
| Special Purpose    | DR-25        | -75 to 150 [-103 to 302]   | 175 [347]                                | 2:1            | Flexible, chemical and abrasion-resistant tubing            | Long-term fluid and heat resistance. Resistance to aviation and diesel fuels, and hydraulic fluids. Flexible, flame-retardant.  | 3.2 to 76.0 [0.125 to 3.000]                               | Black   | RT-1116, RK-6008/1; AMS-DTL-23053/16, VG95343 Part 5 Type D, VDE 0341/Pt 9005, Def. Stan. 59-97 Issue 3 type 6B,BS 4G-198 Part 3 10A | AMS-DTL-23053 Test B                                | Particularly suitable as a jacketing material for cables and harnesses on military ground vehicles and race cars.   | Americas<br>Europe<br>Asia Pacific |
|                    | ES Caps      | -40 to 105 [-40 to 221]  | 135 [275]                                | 4:1            | High-shrink-ratio, adhesive-lined semirigid polyolefin caps | 4:1 shrink ratio allows a few sizes to cover a wide range of splice diameters. Mechanically tough jacket provides strain relief and abrasion protection. Flame-retardant jacket (black only).   | 5.72 to 10.85 [0.225 to 0.427]                             | Black and Clear (non-flame-retardant)                                     | RW-3006; UL  | ASTM D 2671, Procedure B (Black only)               | Specially designed to provide mechanical and environmental protection of stub splices in electrical harnesses. Clear caps allow see-through inspection.   | Americas<br>Europe<br>Asia Pacific |
|                    | HCTE         | -55 to 200 [-67 to 392]  | N/A                                      | N/A            | Irradiated, modified ETFE helical convolex conduit          | Helical construction with excellent flexibility and high crush resistance. Highly flame-retardant. Highly fluid resistant.  | 4.6 to 49.2 [0.181 to 1.937]                               | Black   | RT-1162; VG 96936 Part 6   | ASTM D 876  | Mechanical protection for electrical wiring systems in applications requiring flexibility, high temperature performance, and good solvent resistance.   | Americas<br>Europe<br>Asia Pacific |
|                    | HFT5000      | -40 to 125 [-40 to 257] for 3,000 hours; -40 to 150 [-40 to 302] for 1,000 hours | 110 [230]                                | 2:1            | Heat-shrinkable fabric tubing                               | Highly flexible for easy installation on a variety of substrates. Outstanding abrasion resistance over a wide temperature range. Heat-shrinkable to grip tightly. Resistant to harsh environments. Halogen-free.                                    | 12.0 to 70.0 [0.472 to 2.756]                              | Black   | RW-2060; UL  | FMVSS 302   | Abrasion protection for rubber hoses, plastic pipes, and harness wire bundles. Provides outstanding abrasion, chafing and cut-through resistance even at high temperatures.                                   | Americas<br>Europe<br>Asia Pacific |
|                    | NT           | -55 to 90 [-67 to 194]   | 135 [275]                                | 1.8:1          | Flexible, general purpose, modified elastomeric tubing      | Remains flexible at temperatures as low as -55°C [-67°F]. Good resistance to abrasion and physical abuse. Resistant to most common fluids and solvents.   | 3.2 to 101.6 [0.125 to 4.000]                              | Black   | RT-510   | ASTM D 2671, Procedure A                            | Insulation, strain relief, and abrasion protection on cable harnesses and wire bundles in commercial electronics industries. Suitable for applications requiring some exposure to common fluids and solvents. | Americas<br>Europe<br>Asia Pacific |
|                    | NT-MIL       | -70 to 121 [-94 to 250]  | 135 [275]                                | 1.8:1          | Flexible, rugged, modified elastomeric tubing               | Remains flexible at temperatures as low as -70°C [-94°F]. Excellent resistance to abrasion and physical abuse. Resistant to most fluids and solvents, including fuels and oils.   | 3.2 to 101.6 [0.125 to 4.000]                              | Black   | RW-3030; AMS-DTL-23053/1, Cl. 1 & 2  | AMS-DTL-23053 Test A                                | Insulation, strain relief, and abrasion protection on cable harnesses and wire bundles in the military and aerospace industries. Applications requiring exposure to fluids and solvents.                      | Americas<br>Europe<br>Asia Pacific |
|                    | NTFR         | -70 to 121 [-94 to 250]  | 135 [275]                                | 1.8:1          | Very flexible, rugged neoprene elastomer tubing             | Performance exceeds the stringent requirements of AMS-DTL-23053/1, Cl. 2. Outstanding resistance to abrasion and physical abuse. Resistant to most fluids and solvents, including fuels, oils and hydraulic fluids.                                 | 3.2 to 76.2 [0.125 to 3.000]                               | Black   | RT-511; SC-X-15112; AMS 3623   | ASTM D 2671, Procedure A                            | Harnessing applications for which fluid resistance, ruggedness, and flexibility at low temperatures are important. Applications requiring exposure to fluids and solvents at elevated temperatures.           | Americas<br>Europe<br>Asia Pacific |



| Product Category        | Product Name          | Operating Temperature °C[°F]                                  | Minimum Full Recovery Temperature °C[°F]                                     | Shrink Ratio | Product Description   | Features/Benefits   | Standard Size Range (Inside Diameter as supplied) MM [In.] | Colors   | Applicable Specifications  | Flammability Rating                     | Typical Applications  | Available in                       |                        |
|-------------------------|-----------------------|---|--|--------------|---|---|--|--|--|---|---|------------------------------------|------------------------|
| Special Purpose (contd) | PD Caps               | -55 to 110 [-67 to 230]                                       | 135 [275]  | 3:1          | Semirigid, encapsulant-lined polyolefin caps  | End cap with meltable encapsulant inner wall for splash resistance. Permanent or temporary method to terminate wires.   | 3.2 to 12.7 [0.125 to 0.500]                               | Black  | PD Caps SCD; UL  | N/A                                     | Insulation and encapsulation of crimped electrical connections, especially stub splices, providing rugged protection against abrasion, vibration, and flexing.  | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RayBlock 85           | -40 to 85 [-40 to 185]  | 110 [230]  | 4:1          | Heat-shrinkable water blocking system   | Environmentally seals and provides strain relief to wire bundles of up to 20 wires. Withstands excursions to 105°C [221°F].   | 12.0 to 32.0 [0.472 to 1.260]                              | Black  | RayBlock 85 SCD; RW-2101   | N/A                                     | Sealing of cable bundles and the back of connectors.  | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RayBlock 105          | -40 to 105 [-40 to 221]                                       | 110 [230]  | 4:1          | High-temperature heat-shrinkable water blocking system                                    | Environmentally seals and provides strain relief to wire bundles of up to 20 wires. Withstands excursions to 120°C [248°F].   | 12.0 to 32.0 [0.472 to 1.260]                              | Black  | RayBlock 105 SCD; RW-2102  | N/A                                     | Sealing of cable bundles and the back of connectors.  | Americas<br>Europe<br>Asia Pacific |                        |
|                         | Rayrim                | -67 to 80 [-40 to 176]  | 150 [302]  | N/A          | Commercial protective self-adhering, V-shaped polyolefin edging material                  | Flexible and self-adhering to allow for protection of curved and straight edges. Rapid installation to both internal and external radii. Operating temperature range offers protection in demanding environments. | 5 sizes to cover thicknesses 0.31 to 5.38 [0.012 to 0.212] | Black  | RK-6182  | N/A                                     | Protection of metal, wood, and glass edges.   | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RaySpool              | See individual product families                               | See individual product families  | 2:1 & 3:1    | CGPT (2:1 & 3:1), LSTT and CGAT   | Selected heat-shrinkable tubings supplied in a convenient dispensing system.  | See individual product families                            | See individual product families                    | See individual product families  | See individual product families         | See individual product families   | See individual product families    | Europe<br>Asia Pacific |
|                         | RNF-150               | -55 to 150 [-67 to 302]                                       | 150 [302]  | 2:1          | High-performance, flame-resistant, flexible fluoropolymer tubing                          | Thinner wall than most general-purpose polyolefin tubings. Highly flame-resistant. Excellent physical and electrical properties after exposure to many chemicals and solvents at 50°C [122°F].                    | 1.2 to 25.4 [0.046 to 1.000]                               | Standard: Black;<br>Nonstandard: White             | RT-370;<br>AMS-DTL-23053/18,<br>Cl. 2; UL VW-1   | AMS-DTL-23053<br>Test C;<br>UL VW-1     | Jacketing and bundling wires to form light-duty harnesses, especially where a low profile, abrasion resistance, and flexibility are needed. Insulation and strain relief of electrical connections and wire terminations.                         | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RT-375                | -55 to 150 [-67 to 302]                                       | 150 [302]  | 2:1          | Clear, flame-resistant, flexible fluoropolymer tubing                                     | Exceptional clarity and clarity stability. Highly flame-resistant. Toughness, chemical resistance, and high temperature performance.  | 1.2 to 50.8 [0.046 to 2.000]                               | Clear  | RT-375;<br>AMS-DTL-23053/18,<br>Cl. 2; UL/CSA VW-1   | AMS-DTL-23053<br>Test C;<br>UL/CSA VW-1 | Protection of components and wire markers subject to extreme abuse while permitting full identification and inspection.   | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RT555                 | -65 to 200 [-85 to 392]                                       | 220 [428]  | 2:1          | Fluid-resistant, chemical-resistant, fluoropolymer tubing with extended temperature range | Resistant to high temperatures, solvents, corrosive chemicals, hydrocarbons, and radiation. Highly flame-retardant. Low outgassing.   | 3.2 to 50.8 [0.125 to 2.000]                               | Black  | RT-555;<br>AR70-75;<br>UL  | ASTM D 2671,<br>Procedure C             | Applications requiring resistance to high temperatures and resistance to a variety of chemicals and fluids. Insulation and strain relief on appliances. Protection of delicate electronic instruments.  | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RW-175                | -55 to 175 [-67 to 347]                                       | 175 [347]  | 2:1          | High-temperature, chemical-resistant polyvinylidene fluoride tubing                       | Tough, semirigid, very-thin-wall insulation. Highly flame-resistant. High temperature performance. Resistant to most solvents, fuels, and chemicals.  | 1.2 to 50.8 [0.046 to 2.000]                               | Standard:<br>Translucent;<br>Nonstandard:<br>Black | RW-3029/1 & 2;<br>AMS-DTL-23053/8<br>(Translucent only);<br>UL/CSA VW-1  | AMS-DTL-23053<br>Test C;<br>UL/CSA VW-1 | Insulation and strain relief of delicate electrical connections and terminations. Offers high temperature performance, outstanding abrasion and cut-through resistance, and superior chemical and solvent resistance.                             | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RW-200                | -40 to 200 [-40 to 392]                                       | 175 [347]  | 2:1          | Chemical-resistant, high-temperature fluoroelastomer tubing                               | Outstanding performance in severe chemical and thermal environments. High resistance to impact and abrasion.  | 3.2 to 50.8 [0.125 to 2.000]                               | Black  | RW-3037;<br>AMS-DTL-23053/13   | AMS-DTL-23053<br>Test A;<br>ASTM D 876  | Insulation and protection of cables and components exposed to high temperatures and/or solvents, fuels, hydraulic fluids, lubricants, and acids. Suitable for use in engine compartments.   | Americas<br>Europe<br>Asia Pacific |                        |
|                         | RW-200-E              | -40 to 200 [-40 to 392]                                       | 175 [347]  | 2:1          | Heavy wall, chemical-resistant, high-temperature fluoroelastomer tubing                   | Outstanding performance in severe chemical and thermal environments. Heavy wall provides increased protection against mechanical abuse.   | 3.2 to 50.8 [0.125 to 2.000]                               | Black  | RW-3037;<br>MIL-PRF-46846 Type III<br>Cl. 1, Def. Stan.<br>59-97 Issue 3 Type<br>4A, VG95343 Part<br>5 Type E, VDE<br>0341/Pt9005, BS<br>4G-198 Part 3 12A | ASTM D 876                              | Especially suitable for the most demanding harnessing requirements in aircraft, missiles, satellite systems, and chemical plants.   | Americas<br>Europe<br>Asia Pacific |                        |
|                         | SAS/<br>SASR/<br>TSAS | -80 to 125 [-112 to 257]<br>(See individual product families) | Minimum sealing temperature will depend on the adhesive type and application | N/A          | Slit adhesive sleeves made of selected adhesives  | For use with single and dual wall tubings to provide additional adhesive in applications where it is needed.  | 1.4 to 9.5 [0.055 to 0.375]                                | Amber<br>or<br>Gray                                | See individual product families  | N/A                                     | Use under single wall tubing to create a seal around a wire or splice. Use under dual wall tubing where additional adhesive is needed for consistent sealing. Use several on individual wires to create a water block at the back of a connector. | Americas<br>Europe<br>Asia Pacific |                        |
|                         | SFR                   | -75 to 180 [-103 to 356]                                      | 175 [347]  | 1.75:1       | Very flexible, flame-retardant, silicone elastomer tubing                                 | Outstanding low-temperature flexibility. Resistance to hydraulic fluids, fuel, and lubricating oil. Very good ablative characteristics.   | 6.4 to 50.8 [0.250 to 2.000]                               | Black  | RT-1140;<br>AMS-DTL-23053/10;<br>MIL-PRF-46846<br>Type II Cl. 1  | AMS-DTL-23053<br>Test B                 | Cable harness protection where maximum flexibility in temperature extremes is required. Strain relief for electronic components, semiconductor leads, and wire splices.   | Americas<br>Europe<br>Asia Pacific |                        |

| Product Category        | Product Name                | Operating Temperature °C[°F]    | Minimum Full Recovery Temperature °C[°F] | Shrink Ratio   | Product Description  | Features/Benefits  | Standard Size Range (Inside Diameter as supplied) MM [In.] | Colors  | Applicable Specifications  | Flammability Rating   | Typical Applications  | Available in                       |
|-------------------------|-----------------------------|---------------------------------|--|----------------|--|--|--|---|--|---|---|------------------------------------|
| Special Purpose (contd) | SRFR                        | -75 to 200 [-102 to 392]        | 175 [392]                                | 1.5:1          | Highly flexible silicone rubber tubing   | Highly flexible. Resistant to high and low temperatures and medical sterilization. SRFR is non-burning with outstanding ablative properties.   | 2.9 to 51.0 [0.114 to 2.008]                               | Gray  | RT-1142, RW-2057; UL VW-1  | ASTM 2671, Procedure B; UL VW-1   | Used in medical equipment where flexibility and the ability to withstand sterilization are needed. Thyristor power cable insulation, heating element and bus bar insulation, fiber optic bundle sheathing, and rocketry support cable protection. | Americas<br>Europe<br>Asia Pacific |
|                         | TC Caps                     | -55 to 135 [-67 to 275]         | 135 [275]                                | 2:1            | Semirigid, flame-retardant polyolefin end caps   | Single wall caps provide permanent or temporary insulation and termination. Vibration- and abrasion-resistant.   | 1.6 to 6.4 [0.063 to 0.250]                                | White, red and gray (One standard color per size)       | TC Caps SCD; UL  | UL All Tubing Flame Test (Material)   | Widely used for wire terminations because of light weight, small size, and durability.  | Americas<br>Europe<br>Asia Pacific |
|                         | TFE/TFER                    | -67 to 250 [-89 to 482]         | 340 [644]                                | 1.8:1 to 3.2:1 | High-temperature, chemically inert modified PTFE tubing  | Provides insulation and mechanical protection in severe chemical and thermal environments. High mechanical strength and an extremely low coefficient of friction.  | 0.8 to 32.0 [0.031 to 1.260]                               | Clear   | RK-2055 and RK-2054  | ASTM D876 15 sec max.   | Covering hydraulic hose and couplings to prevent contamination and corrosion. The high mechanical strength and extremely low coefficient of friction make it good for reducing damage to bearing shafts and similar applications.                 | Europe<br>Asia Pacific             |
|                         | Tubing Kits & MiniSpools    | See individual product families | See individual product families          | 2:1 to 4:1     | VERSAFIT, RNF-100, DWP-125 and ES1000  | Smaller packaging options for our most popular sizes of select single wall and adhesive-lined products.  | See individual product families                            | See individual product families                         | See individual product families  | See individual product families   | See individual product families.  | Americas<br>Asia Pacific           |
|                         | Versaflex/<br>Versaflex -FR | -50 to 150 [-58 to 302]         | N/A                                      | N/A            | Expandable, Braided Polyester Tubing   | Suitable for mechanical protection of wire harnesses where exceptional flexibility combined with superior abrasion and cut-through resistance is required. Will not trap heat or moisture. Expands easily over irregular shapes. Available in non-flame-retardant or flame-retardant versions. | 3.0 to 50.0 [0.118 to 2.000] Nominal                       | Black & Gray. Flame-retardant version has white tracer. | RK-6772  | N/A   | Mechanical protection of wire harnesses, hoses, and other substrates where exceptional flexibility is needed. Wire bundling without trapping heat and moisture. Provides additional abrasion and cut-through resistance where required.           | Americas<br>Europe<br>Asia Pacific |
|                         | XFFR                        | -55 to 105 [-67 to 221]         | 121 [250]                                | 3:1            | Halogen-free, flame-retardant tubing   | Halogen-free. Emits minimal amounts of toxic or acid gasses during combustion.   | 7.62 to 76.20 [0.300 to 3.000]                             | Black   | RW-2016; MIL-C-24643 (Cable jacket flame performance); NES 713; NES 711; ABS | MIL-C-24643   | Harnessing, re-jacketing and repair of cable in enclosed areas requiring a halogen-free, flame-retardant environment.   | Americas<br>Europe<br>Asia Pacific |
|                         | ZH2                         | -30 to 125 [-22 to 257]         | 90 [194]                                 | 2:1            | Very flexible, low-shrink-temperature, highly flame-retardant, non-halogenated polyolefin tubing                 | Low shrink temperature for fast installation. Environmentally friendly non-halogen material emits minimal amounts of toxic or acid gasses during combustion. UL/CSA VW-1 flame rating.   | 0.8 to 30.0 [0.032 to 1.181]                               | Black   | RW-3036; UL/CSA VW-1   | UL/CSA VW-1   | Insulation and protection of in-line components, wire splices and terminations. Very flexible light-duty harnessing. Use where a non-halogenated product with a UL/CSA VW-1 rating is needed. Use where rapid installation is desirable.          | Americas<br>Europe<br>Asia Pacific |
|                         | ZH4                         | -30 to 125 [-22 to 257]         | 90 [194]                                 | 2:1            | Very-thin-wall, very flexible, low-shrink-temperature, highly flame-retardant, non-halogenated polyolefin tubing | Very thin wall and low shrink temperature for fast installation and space savings. Environmentally friendly non-halogen material emits minimal amounts of toxic or acid gasses during combustion. UL/CSA VW-1 flame rating.  | 0.6 to 10.0 [0.024 to 0.394]                               | Black   | RW-3036; UL/CSA VW-1   | UL/CSA VW-1   | Insulation and protection of in-line components, wire splices and terminations. Especially suited for covering temperature-sensitive components where a non-halogenated product is needed. Strain relief on high-density connectors.              | Americas<br>Europe<br>Asia Pacific |
|                         | ZH-100                      | -30 to 105 [-22 to 221]         | 120 [248]                                | 2:1            | Flexible, thin-wall, low-fire-hazard tubing  | Low smoke emissions. Flexible, flame-retardant. No added halogens.   | 3.2 to 51.0 [0.125 to 2.000]                               | Black   | RW-2031  | ASTM D 876  | Jacketing wire bundles and light-duty harnesses for use in areas where low-fire-hazard materials are required.  | Americas<br>Europe<br>Asia Pacific |
|                         | ZHTM                        | -30 to 105 [-22 to 221]         | 121 [250]                                | 2:1            | Flexible, thick-wall tubing with low toxicity for fire safety applications                                       | Low smoke emissions. Flexible, flame-retardant.  | 3.0 to 50.0 [0.118 to 1.969]                               | Black   | RW-2058  | ASTM D 2671, Procedure B (Sizes 12/6 & below); ASTM D 876 (Sizes 18/9 and larger) | Insulation and protection of cables, harnesses, and electrical and electronic components in enclosed spaces, such as in ships, mass transit systems and offshore installations.   | Americas<br>Europe<br>Asia Pacific |



| Product Type            | UL file     | CSA file     | AMS-DTL-23053*<br>Sheet | AMS-DTL-23053*<br>Class | MIL-PRF-46846<br>Type | MIL-PRF-46846<br>Class | Raychem<br>Specification                     | Product Type                      | UL file     | CSA file     | AMS-DTL-23053*<br>Sheet | AMS-DTL-23053*<br>Class | MIL-PRF-46846<br>Type | MIL-PRF-46846<br>Class | Raychem<br>Specification |
|-------------------------|-------------|--------------|-------------------------|-------------------------|-----------------------|------------------------|--|-----------------------------------|-------------|--------------|-------------------------|-------------------------|-----------------------|------------------------|--------------------------|
| AP2000                  |             |              |                         |                         |                       |                        | RW-1001                                      | TAT-125 Type 1 (Colors)           | E85381      |              | /4                      | 2                       |                       |                        | RW-3032                  |
| ATUM                    | E85381**    |              | /4                      | 3                       |                       |                        | RW-2063 (Black),<br>RK-6024 (Colors & Clear) | TAT-125 Type 2 (Clear)<br>TC Caps | E85381      |              |                         |                         |                       |                        | RW-3032<br>TC Caps SCD   |
| BRST                    |             |              |                         |                         |                       |                        | RK-6766                                      | TECT                              |             |              |                         |                         |                       |                        | TECT SCD                 |
| BSTS                    |             |              |                         |                         |                       |                        | RW-2017                                      | TFE/TFER                          |             |              |                         |                         |                       |                        | RW-2054, RW-2055         |
| BSTS-FR                 |             |              | /15                     | 1 & 2***                |                       |                        | RW-2017                                      | TSAS                              |             |              |                         |                         |                       |                        | TSAS SCD                 |
| CGPE-105                |             |              |                         |                         |                       |                        | CGPE-105 SCD                                 | Tubing Kits/MiniSpools            |             |              |                         |                         |                       |                        | Various                  |
| CGAT                    | E85381      |              |                         |                         |                       |                        | RW-2050                                      | TUGA-GP                           |             |              |                         |                         |                       |                        | RW-2201                  |
| CGPT                    | E35586      | LR31929      |                         |                         |                       |                        | RW-2059                                      | URHT                              |             |              |                         |                         |                       |                        | URHT SCD                 |
| CRN Type 1 (Black)      | E35586      | LR31929†     | /6                      | 1                       |                       |                        | RT-360, Type 1                               | VERSAFIT                          | E35586 VW-1 | LR31929 VW-1 | /5                      | 1 & 3                   |                       |                        | RW-3009                  |
| CRN Type 2 (Clear)      |             |              | /6                      | 2                       |                       |                        | RT-360, Type 2                               | VERSAFIT-3X                       | E35586 VW-1 | LR31929 VW-1 |                         |                         |                       |                        | RW-3009                  |
| DCPT                    | E35586      | LR31929      |                         |                         |                       |                        | RW-2056                                      | VERSAFIT V2                       | E35586 VW-1 | LR31929 VW-1 |                         |                         |                       |                        | RW-3023                  |
| DR-25                   |             |              | /16                     |                         |                       |                        | RT-1116, RK-6008/1                           | VERSAFIT V4                       | E85381 VW-1 | LR31929 VW-1 |                         |                         |                       |                        | RW-3023                  |
| DSPL                    |             |              |                         |                         |                       |                        | RK-6755                                      | VERSAFLEX/VERSAFLEX-FR            |             |              |                         |                         |                       |                        | RK-6772                  |
| DWP-125                 | E35586      | LR31929      | /4****                  | 3                       |                       |                        | DWP-125 SCD                                  | XFFR                              |             |              |                         |                         |                       |                        | RW-2016                  |
| DWTC                    |             |              |                         |                         |                       |                        | RK-6204                                      | ZH2                               | E35586 VW-1 | LR31929 VW-1 |                         |                         |                       |                        | RW-3036                  |
| ES1000                  | E85381      |              |                         |                         |                       |                        | RT-1113                                      | ZH4                               | E85381 VW-1 | LR31929 VW-1 |                         |                         |                       |                        | RW-3036                  |
| ES2000                  | E85381      |              |                         |                         |                       |                        | RT-1112                                      | ZH-100                            |             |              |                         |                         |                       |                        | RW-2031                  |
| ES Caps                 | E85381      |              |                         |                         |                       |                        | RW-3006                                      | ZHTM                              |             |              |                         |                         |                       |                        | RW-2058                  |
| FL2500                  |             |              |                         |                         |                       |                        | FL2500 SCD                                   |                                   |             |              |                         |                         |                       |                        |                          |
| HCTE                    |             |              |                         |                         |                       |                        | RT-1162                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HF                      |             |              | /15                     | 1***                    |                       |                        | RW-2023                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HFT5000                 | E199379     |              |                         |                         |                       |                        | RW-2060                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HRHF                    |             |              |                         |                         |                       |                        | RW-2013                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HRHT                    |             |              |                         |                         |                       |                        | HRHT SCD                                     |                                   |             |              |                         |                         |                       |                        |                          |
| HRNF                    |             |              |                         |                         |                       |                        | RW-2013                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HRSR                    |             |              |                         |                         |                       |                        | RW-2013                                      |                                   |             |              |                         |                         |                       |                        |                          |
| HTAT                    |             |              |                         |                         |                       |                        | RW-2052                                      |                                   |             |              |                         |                         |                       |                        |                          |
| LSTT                    |             |              |                         |                         |                       |                        | RW-2051                                      |                                   |             |              |                         |                         |                       |                        |                          |
| NETM1000                |             |              |                         |                         |                       |                        | NETM1000 SCD                                 |                                   |             |              |                         |                         |                       |                        |                          |
| NETM2000                |             |              |                         |                         |                       |                        | NETM2000 SCD                                 |                                   |             |              |                         |                         |                       |                        |                          |
| NT                      |             |              |                         |                         |                       |                        | RT-510                                       |                                   |             |              |                         |                         |                       |                        |                          |
| NT-MIL                  |             |              | /1                      | 1 & 2                   |                       |                        | RW-3030                                      |                                   |             |              |                         |                         |                       |                        |                          |
| NTRF                    |             |              |                         |                         |                       |                        | RT-511                                       |                                   |             |              |                         |                         |                       |                        |                          |
| PD Caps                 | E85381      |              |                         |                         |                       |                        | PD Caps SCD                                  |                                   |             |              |                         |                         |                       |                        |                          |
| RayBlock 85             |             |              |                         |                         |                       |                        | RW-2101                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RayBlock 105            |             |              |                         |                         |                       |                        | RW-2102                                      |                                   |             |              |                         |                         |                       |                        |                          |
| Rayrim                  |             |              |                         |                         |                       |                        | RK-6182                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RaySpool                |             |              |                         |                         |                       |                        | Various                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RHW                     | E91151†††   |              |                         |                         |                       |                        | RHW SCD                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RMW                     |             |              |                         |                         |                       |                        | RMW SCD                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RNF-100 Type 1 (Colors) | E35586      | LR31929      | /5                      | 1                       |                       |                        | RT-350, Type 1                               |                                   |             |              |                         |                         |                       |                        |                          |
| RNF-100 Type 2 (Clear)  |             |              | /5                      | 2                       |                       |                        | RT-350, Type 2                               |                                   |             |              |                         |                         |                       |                        |                          |
| RNF-150                 | E35586 VW-1 |              | /18                     | 2                       |                       |                        | RT-370                                       |                                   |             |              |                         |                         |                       |                        |                          |
| RNF-3000                | E35586      | LR31929      |                         |                         |                       |                        | RW-2053                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RP-4800                 | E35586      |              | /5                      | 1††                     |                       |                        | RT-1122                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RPPM                    |             |              |                         |                         |                       |                        | RK-6214                                      |                                   |             |              |                         |                         |                       |                        |                          |
| RT-3                    | E35586      | LR31929†     |                         |                         |                       |                        | RT-360††††                                   |                                   |             |              |                         |                         |                       |                        |                          |
| RT-375                  | E35586 VW-1 | LR31929 VW-1 | /18                     | 2                       |                       |                        | RT-375                                       |                                   |             |              |                         |                         |                       |                        |                          |
| RT555                   | E85381      |              |                         |                         |                       |                        | RT-555                                       |                                   |             |              |                         |                         |                       |                        |                          |
| RW-175                  | E35586 VW-1 | LR31929 VW-1 | /8                      |                         |                       |                        | RW-3029/1 & 2                                |                                   |             |              |                         |                         |                       |                        |                          |
| RW-200/RW-200-E         |             |              | /13                     |                         | III                   | 1                      | RW-3037                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SAS                     |             |              |                         |                         |                       |                        | Various                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SASR                    |             |              |                         |                         |                       |                        | SASR SCD                                     |                                   |             |              |                         |                         |                       |                        |                          |
| SCL                     | E85381      |              | /4                      | 1                       |                       |                        | RT-1301                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SCT                     |             |              |                         |                         |                       |                        | SCT SCD                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SFR                     |             |              | /10                     |                         | II                    | 1                      | RT-1140                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SRFR                    | E85381 VW-1 |              |                         |                         |                       |                        | RT-1142/RW-2057                              |                                   |             |              |                         |                         |                       |                        |                          |
| SST                     |             |              |                         |                         |                       |                        | RW-2011                                      |                                   |             |              |                         |                         |                       |                        |                          |
| SST-FR                  |             |              | /15                     | 1 & 2                   |                       |                        | RW-2011                                      |                                   |             |              |                         |                         |                       |                        |                          |

\*Formerly MIL-I-23053 and MIL-DTL-23053 \*\*Black only, except sizes 3/1 and 4/1 \*\*\*Without adhesive \*\*\*\*Meets the material properties of AMS-DTL-23053/4, Cl. 3 except for sealing efficiency †Black only ††Overexpanded †††Sizes 12/3 through 70/20 only. ††††With exception to dimensions and longitudinal change.



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