# ATUM

## High-Shrink-Ratio, Adhesive-Lined Polyolefin Tubing

### Product Facts

- 3:1 and 4:1 shrink ratios allow for connector-to-cable sealing
- Tubing environmentally seals and protects components and interconnections
- Medium wall provides increased mechanical protection
- The adhesive in ATUM tubing bonds to a wide variety of plastics, rubbers, and metals, including polyethylene, aluminum, steel, and copper
- RoHS compliant



### Applications

Environmentally seals and protects a wide variety of electrical applications, including back end connector sealing, breakouts, and connector-to-cable transitions. High expansion ratio makes it possible to repair most damaged cable jackets without removing connectors.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 110°C [230°F]

### Operating Temperature Range

-55°C to 110°C
[-67°F to 230°F]

### Specifications/Approvals

| Series | UL** | Military | Raychem |
|---|---|---|---|
| ATUM | E85381<br>600V, 110°C | AMS-DTL-23053/4,* Class 3 | RW-2063 - Black<br>RK-6024 - Colors and clear |

*Formerly MIL-I-23053/4 and MIL-DTL-23053/4. Sizes 3/1, 6/2, 12/4, 24/8, and 40/13 only.
**Black only, except sizes 3/1 and 4/1.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# ATUM (Continued)

## Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Total Wall After Heating | Adhesive Wall After Heating (Nominal) |
| **3:1** | | | | |
| 3/1 | 3.0 [0.118] | 1.0 [0.039] | 1.00 ± 0.28 [0.039 ± 0.010] | 0.50 [0.020] |
| 4.5/1.5 | 4.5 [0.177] | 1.5 [0.059] | 1.10 ± 0.25 [0.043 ± 0.011] | 0.50 [0.020] |
| 6/2 | 6.0 [0.236] | 2.0 [0.079] | 1.00 ± 0.28 [0.039 ± 0.010] | 0.50 [0.020] |
| 9/3 | 9.0 [0.354] | 3.0 [0.118] | 1.40 ± 0.28 [0.055 ± 0.010] | 0.61 [0.024] |
| 12/4 | 12.0 [0.472] | 4.0 [0.157] | 1.78 ± 0.38 [0.070 ± 0.015] | 0.76 [0.030] |
| 19/6 | 19.0 [0.748] | 6.0 [0.236] | 2.25 ± 0.55 [0.088 ± 0.022] | 0.76 [0.030] |
| 24/8 | 24.0 [0.940] | 8.0 [0.315] | 2.54 ± 0.55 [0.100 ± 0.022] | 1.02 [0.040] |
| 40/13 | 40.0 [1.570] | 13.0 [0.512] | 2.54 ± 0.55 [0.100 ± 0.022] | 1.02 [0.040] |
| **4:1** | | | | |
| 4/1 | 4.0 [0.157] | 1.0 [0.039] | 1.00 ± 0.28 [0.039 ± 0.010] | 0.50 [0.020] |
| 8/2 | 8.0 [0.315] | 2.0 [0.079] | 1.00 ± 0.28 [0.039 ± 0.010] | 0.50 [0.020] |
| 12/3 | 12.0 [0.472] | 3.0 [0.118] | 1.40 ± 0.28 [0.055 ± 0.010] | 0.61 [0.024] |
| 16/4 | 16.0 [0.630] | 4.0 [0.157] | 1.78 ± 0.38 [0.070 ± 0.015] | 0.76 [0.030] |
| 24/6 | 24.0 [0.945] | 6.0 [0.236] | 2.25 ± 0.55 [0.088 ± 0.022] | 0.76 [0.030] |
| 32/8 | 32.0 [1.260] | 8.0 [0.315] | 2.54 ± 0.55 [0.100 ± 0.022] | 1.02 [0.040] |
| 52/13 | 52.0 [2.050] | 13.0 [0.512] | 2.54 ± 0.55 [0.100 ± 0.022] | 1.02 [0.040] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

## Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| | Nonstandard | Clear in 3:1 sizes only (-X, non-flame-retardant jacket); other colors available on request. |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging*** | In 1.2-meter [4-foot] lengths or on spools. | |
| Ordering description**** | Specify product name, size and color (for example, ATUM 8/2-0). | |

***Only 1.2 meter [4-foot] lengths are standard in the Americas. ATUM tubing on spools is nonstandard.
****For supply to MIL spec., add -MS to ordering description.



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# BRST

## Simple Specification, Single Wall Polyolefin Tubing

### Product Facts

- 2:1 shrink ratio
- Non-flame-retardant
- Quick shrinking
- Satin finish
- RoHS compliant



### Applications

Provides excellent electrical insulation. Can be used for noise suppression and where mechanical protection is required.

### Installation

Minimum shrink temperature: 95°C [203°F)

Minimum full recovery temperature: 130°C [266°F]

### Operating Temperature Range

-40°C to 120°C
[-40°F to 248°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| BRST | RK-6766 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



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Japan: 81-44-844-8013
UK: 44-800-267-666

## BRST (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 4/2 | 4 [0.157] | 2 [0.079] | 0.4 ± 0.08 [0.016 ± 0.003] |
| 6/3 | 6 [0.236] | 3 [0.118] | 0.4 ± 0.08 [0.016 ± 0.003] |
| 10/5 | 10 [0.394] | 5 [0.197] | 0.5 ± 0.08 [0.020 ± 0.003] |
| 16/8 | 16 [0.630] | 8 [0.315] | 0.75 ± 0.08 [0.030 ± 0.003] |
| 24/12 | 24 [0.945] | 12 [0.472] | 0.85 ± 0.08 [0.033 ± 0.003] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, BRST-4/2-0). |



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UK: 44-800-267-666

# BSTS/BSTS-FR

## General Purpose, Heat-Shrinkable Tubing

### Product Facts

- **Excellent thick-wall insulation and abrasion protection**
- **No adhesive – can be removed easily**
- **Expansion ratios as high as 3:1**
- **Availability in flame-retardant material with FR callout (see "Ordering information and Part numbering system" on the next page)**
- **BSTS has the following agency approvals:**
  - **ABS (American Bureau of Shipping)**
  - **Lloyd's (Lloyd's Register of Shipping)**
- **RoHS compliant**



### Applications

BSTS heat-shrinkable tubing is made of a rugged polymer that resists moisture, fungus, and weathering. It also has excellent electrical properties. This tubing is useful in applications where insulation, abrasion resistance, and strain relief are important. When used with sealant tape (S-1305 for flame-retardant or S-1278 for non-flame-retardant), it can provide a watertight system in nonpressurized applications.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 121°C [250°F]

### Operating Temperature Range

-55°C to 110°C
[-67°F to 230°F]

### Specifications/Approvals

| Series | Military | Industry | Raychem |
|---|---|---|---|
| BSTS | — | — | RW-2017 |
| BSTS-FR | AMS-DTL-23053/15*, Class 1 and Class 2** | ASTM D 685, nonburning | RW-2017 |

*Formerly MIL-I-23053/15 and MIL-DTL-23053/15.
**Except for coatings requirement. Refer to SST-FR when coating is required.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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Japan: 81-44-844-8013
UK: 44-800-267-666

## BSTS/BSTS-FR (Continued)

### Product Dimensions

| Size | Inside Diameter | | Wall Thickness (Nominal) | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Expanded as Supplied | Recovered After Heating*** |
| BSTS-03 | 7.62 [0.300] | 2.54 [0.100] | 0.63 [0.025] | 1.78 [0.070] |
| BSTS-04 | 10.16 [0.400] | 3.81 [0.150] | 0.63 [0.025] | 1.78 [0.070] |
| BSTS-07 | 19.05 [0.750] | 5.59 [0.220] | 0.76 [0.030] | 2.41 [0.095] |
| BSTS-11 | 27.94 [1.100] | 9.52 [0.375] | 1.02 [0.040] | 3.05 [0.120] |
| BSTS-13 | 33.02 [1.300] | 9.52 [0.375] | 0.89 [0.035] | 3.05 [0.120] |
| BSTS-15 | 38.10 [1.500] | 12.70 [0.500] | 1.27 [0.050] | 3.56 [0.140] |
| BSTS-17 | 43.18 [1.700] | 12.70 [0.500] | 1.14 [0.045] | 3.56 [0.140] |
| BSTS-20 | 50.80 [2.000] | 19.05 [0.750] | 1.27 [0.050] | 3.94 [0.160] |
| BSTS-27 | 65.58 [2.700] | 22.86 [0.900] | 1.27 [0.050] | 3.94 [0.160] |
| BSTS-30 | 76.20 [3.000] | 31.75 [1.250] | 1.27 [0.050] | 3.94 [0.160] |
| BSTS-35 | 88.90 [3.500] | 31.75 [1.250] | 1.27 [0.050] | 3.94 [0.160] |
| BSTS-40 | 101.60 [4.000] | 44.45 [1.750] | 1.27 [0.050] | 3.94 [0.160] |
| BSTS-45 | 114.30 [4.500] | 44.45 [1.750] | 1.27 [0.050] | 3.94 [0.160] |

***Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black |
| | Nonstandard | White, Yellow, Red and Clear (Clear is non-flame retardant) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | 1.2-meter [4-foot] or 7.5-meter [25-foot] lengths. | |
| Ordering description | See below. | |

### Part Numbering System

**BSTS - _ x _ _ / _ / _**

- **"NM"** - no mark
- **Color**
  - Black / leave blank (standard)
  - White / WHT
  - Red / RED
  - Clear / CL
- **"FR"** - flame-retardant
- **Length** in feet (4 and 25 feet standard)
- **Size**
- **Family**

**Example: BSTS-11X4/NM**



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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

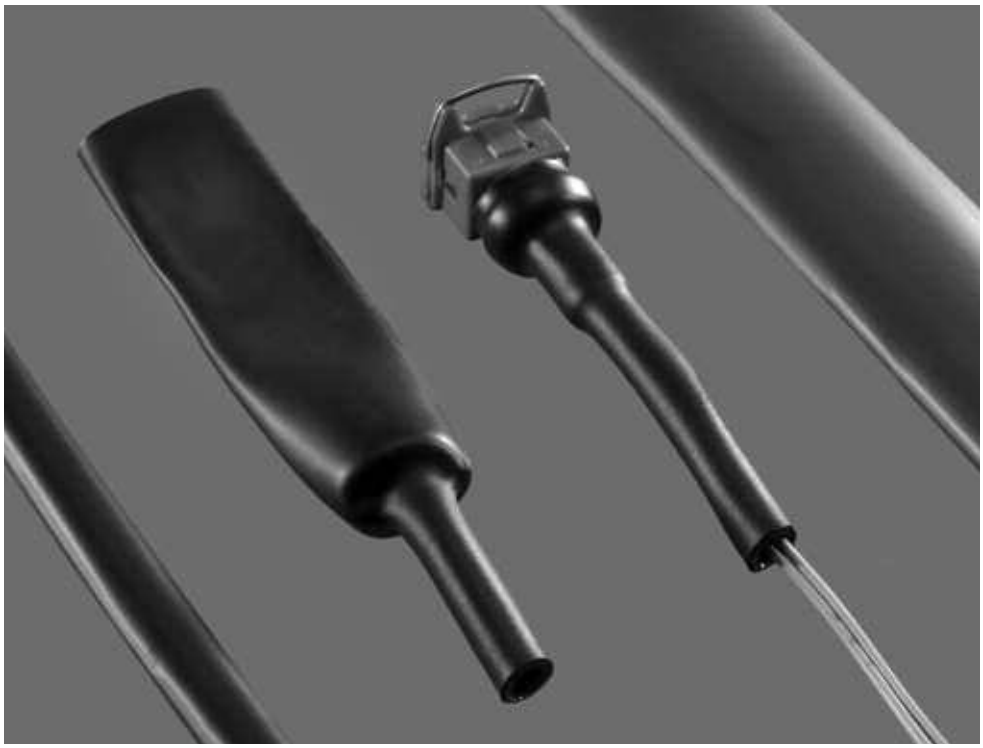
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# CGAT

## Adhesive-Lined, Flexible, Polyolefin Heat-Shrinkable Tubing

### Product Facts

- 3:1 Shrink ratio
- High-strength bonding
- Moisture-proof
- Environmental sealing
- RoHS compliant



### Applications

CGAT is a flexible polyolefin heat-shrinkable tubing with an inner meltable adhesive lining designed for the commercial marketplace. It is suitable for the environmental protection of electrical components and the sealing of conductors. Typical applications are environmental sealing for electrical components, wire breakouts and cable jackets.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 115°C [239°F]

### Operating Temperature Range

-30°C to 80°C
[-22°F to 176°F]

### Specifications/Approvals

| Series | UL* | Raychem |
|---|---|---|
| CGAT | E85381<br>600V, 80°C | RW-2050 |

*Black only. Clear product is not flame-retardant

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



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Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## CGAT (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating Black | After Heating Clear |
| 3/1 | 3.0 [0.118] | 1.0 [0.039] | 1.00±0.25 [0.039±.010] | 1.00±0.30 [0.039±.012] |
| 6/2 | 6.0 [0.236] | 2.0 [0.079] | 1.00±0.25 [0.039±.010] | 1.00±0.30 [0.039±.012] |
| 9/3 | 9.0 [0.354] | 3.0 [0.118] | 1.35±0.25 [0.053±.010] | 1.40±0.30 [0.055±.012] |
| 12/4 | 12.0 [0.472] | 4.0 [0.157] | 1.50±0.25 [0.059±.010] | 1.75±0.40 [0.039±.012] |
| 18/6 | 18.0 [0.709] | 6.0 [0.236] | 1.70±0.25 [0.067±.010] | 2.25±0.55 [0.089±.022] |
| 24/8 | 24.0 [0.945] | 8.0 [0.315] | 1.90±0.25 [0.075±.010] | 2.55±0.55 [0.100±.022] |
| 39/13 | 39.0 [1.535] | 13.0 [0.512] | 2.10±0.25 [0.083±.010] | 2.55±0.55 [0.100±.022] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) Clear (X, non-flame-retardant jacket) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. | |
| Standard packaging** | In 1.2 meter (4 foot) lengths or on spools. | |
| Ordering description | Specify product name, size and color (for example, CGAT-3/1-0). | |

**Available in the convenient RaySpool packaging/dispensing system, for sizes 3/1 to 24/8.



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Japan: 81-44-844-8013
UK: 44-800-267-666

# CGPE-105

**Brightly Colored, Shiny, Non-Flame-Retardant Polyolefin Tubing**

## Product Facts

- **Bright, shiny surface; clear version offers exceptional clarity**
- **Can be easily hot-stamped**
- **Economical, yet offers the improved performance of a crosslinked material**
- **Conforms to substrates more uniformly and with less longitudinal change than most PVC-based materials**
- **RoHS compliant**



### Applications

Attractive covering for many automotive, appliance, and consumer-goods applications. Commercial grade tubing for applications where a flame-retardant product is not needed. Provides both insulation and protection of components and wires while also providing a smooth, glossy finish with a choice of seven colors as well as clear. Exceptional transparency of clear CGPE-105 makes it a well-suited choice for protecting marked surfaces.

### Installation

Minimum shrink temperature: 85°C [185°F]

Minimum full recovery temperature: 110°C [230°F] for black; 100°C [212°F] for all other colors and clear

### Operating Temperature Range

-70°C to 105°C
[-94°F to 221°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| CGPE-105 | CGPE-105 SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | | ■ |



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Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## CGPE-105 (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 3/64 | 1.2 [0.046] | 0.6 [0.023] | 0.40 ± 0.08 [0.016 ± 0.003] |
| 1/16 | 1.6 [0.063] | 0.8 [0.031] | 0.43 ± 0.08 [0.017 ± 0.003] |
| 3/32 | 2.4 [0.093] | 1.2 [0.046] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/8 | 3.2 [0.125] | 1.6 [0.062] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 3/16 | 4.8 [0.187] | 2.4 [0.093] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/4 | 6.4 [0.250] | 3.2 [0.125] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/8 | 9.5 [0.375] | 4.8 [0.187] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 1/2 | 12.7 [0.500] | 6.4 [0.250] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/4 | 19.1 [0.750] | 9.5 [0.375] | 0.76 ± 0.08 [0.030 ± 0.003] |
| 1 | 25.4 [1.000] | 12.7 [0.500] | 0.89 ± 0.12 [0.035 ± 0.005] |
| 1 1/2 | 38.1 [1.500] | 19.1 [0.750] | 1.02 ± 0.15 [0.040 ± 0.006] |
| 2 | 50.8 [2.000] | 25.4 [1.000] | 1.14 ± 0.18 [0.045 ± 0.007] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Black (-0), White (-9), Clear (-X), Red (-2), Bue (-6), Yellow (-4) Green (-5), Violet (-7) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, CGPE-105-1/4-0). |



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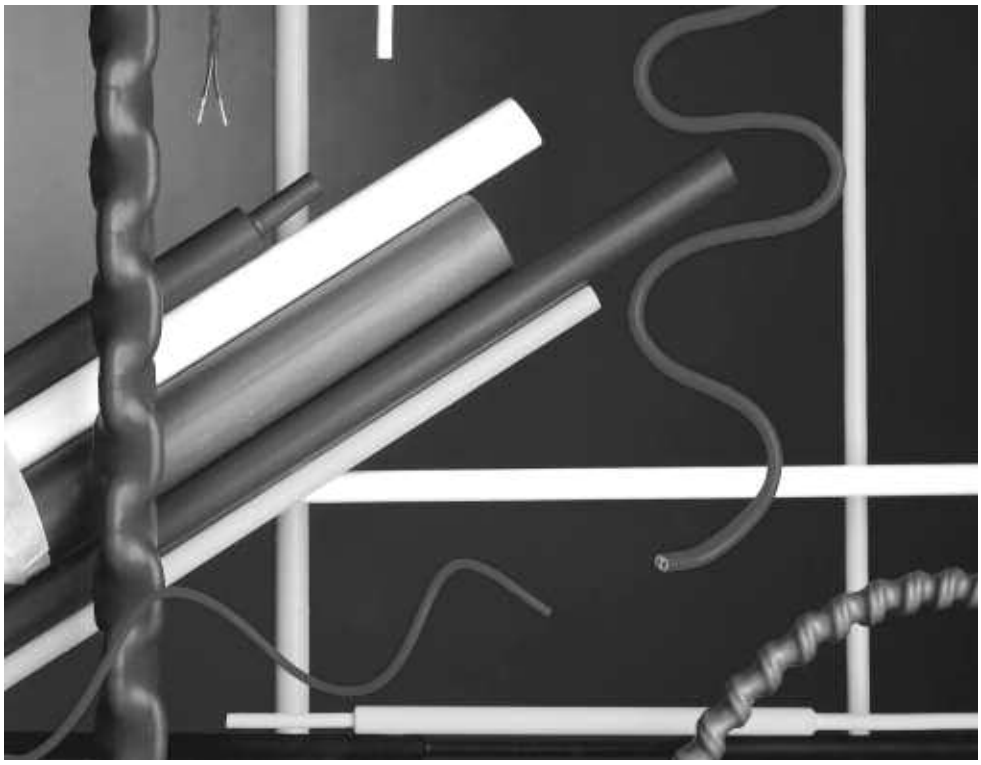
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# CGPT

**General Purpose, Flame-Retardant* Polyolefin Tubing**

## Product Facts

- 2:1 and 3:1 shrink ratio
- Very good chemical and solvent resistance
- Flexible
- Excellent physical and electrical performance
- RoHS compliant



### Applications

CGPT is a tough, flexible, general purpose polyolefin tubing with good resistance to common fluids and solvents and a high dielectric strength. Its unique blend of chemical, electrical, and physical properties makes it suitable for a wide range of applications, including electrical insulation, strain relief, cable bundling, color-coding and identification of wires, cables, pipes, and electrical and electronic components, and mechanical protection.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 120°C [248°F]

### Operating Temperature Range

-40°C to 135°C
[-40°F to 275°F]

### Specifications/Approvals

| Series | UL | CSA | Raychem |
|---|---|---|---|
| CGPT | E35586<br>600 V, 125°C | LR31929<br>600 V, 125°C | RW-2059 |

*Clear product (-X) is not flame-retardant.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



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## CGPT (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| **2:1** | | | |
| 1.2/06 | 1.2 [0.046] | 0.6 [0.023] | 0.45 ± 0.12 [0.018 ± 0.005] |
| 1.6/0.8 | 1.6 [0.062] | 0.8 [0.031] | 0.45 ± 0.12 [0.018 ± 0.005] |
| 2.4/1.2 | 2.4 [0.093] | 1.2 [0.046] | 0.50 ± 0.12 [0.019 ± 0.005] |
| 3.2/1.6 | 3.2 [0.125] | 1.6 [0.062] | 0.50 ± 0.12 [0.019 ± 0.005]*** |
| 4.8/2.4 | 4.8 [0.187] | 2.4 [0.093] | 0.50 ± 0.12 [0.019 ± 0.005]*** |
| 6.4/3.2 | 6.4 [0.250] | 3.2 [0.125] | 0.65 ± 0.15 [0.026 ± 0.006]*** |
| 9.5/4.8 | 9.5 [0.375] | 4.8 [0.187] | 0.65 ± 0.15 [0.026 ± 0.006]*** |
| 12.7/6.4 | 12.7 [0.500] | 6.4 [0.250] | 0.65 ± 0.15 [0.026 ± 0.006]*** |
| 19/9.5 | 19.0 [0.748] | 9.5 [0.375] | 0.75 ± 0.15 [0.029 ± 0.006]*** |
| 25.4/12.7 | 25.4 [1.000] | 12.7 [0.500] | 0.90 ± 0.20 [0.035 ± 0.008]*** |
| 32/16 | 32.0 [1.250] | 16.0 [0.630] | 0.95 ± 0.20 [0.037 ± 0.008] |
| 38/19 | 38.0 [1.496] | 19.0 [0.748] | 1.00 ± 0.20 [0.039 ± 0.008]*** |
| 51/26 | 51.0 [2.000] | 26.0 [1.000] | 1.15 ± 0.25 [0.045 ± 0.010] |
| 76/38 | 76.0 [2.992] | 38.0 [1.496] | 1.25 ± 0.25 [0.049 ± 0.010] |
| 102/51 | 102.0 [4.016] | 51.0 [2.008] | 1.40 ± 0.30 [0.055 ± 0.012] |
| **3:1** | | | |
| 1.5/0.5 | 1.5 [0.059] | 0.5 [0.020] | 0.45 ± 0.12 [0.018 ± 0.005] |
| 3/1 | 3.0 [0.118] | 1.0 [0.040] | 0.55 ± 0.12 [0.022 ± 0.005] |
| 6/2 | 6.0 [0.236] | 2.0 [0.079] | 0.65 ± 0.12 [0.026 ± 0.005] |
| 9/3 | 9.0 [0.354] | 3.0 [0.118] | 0.75 ± 0.15 [0.030 ± 0.006] |
| 12/4 | 12.0 [0.472] | 4.0 [0.157] | 0.75 ± 0.15 [0.030 ± 0.006] |
| 18/6 | 18.0 [0.709] | 6.0 [0.236] | 0.85 ± 0.15 [0.033 ± 0.006] |
| 24/8 | 24.0 [0.945] | 8.0 [0.315] | 1.00 ± 0.20 [0.039 ± 0.008] |
| 39/13 | 39.0 [1.540] | 13.0 [0.512] | 1.15 ± 0.25 [0.045 ± 0.010] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), White (-9), Red (-2), Blue (-6), Yellow (-4), Brown (-1), Grey (-8), Clear (-X), Yellow/Green (-45) as indicated by an *** |
| | Nonstandard | Orange (-3), Green (-5), Violet (-7), in 2:1 sizes, 1.2/0.6 through 51/26 only. |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging**** | On spools. | |
| Ordering description | Specify product name, size and color (for example, CGPT 4.8/2.4-0). | |

****Available in the convenient RaySpool packaging/dispensing system for sizes:
2:1 - 2.4/1.2 up to 25.4/12.7
3:1 - 3/1 up to 24/8



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# CRN

**Semirigid, Flame-Retardant, Polyolefin Tubing**

## Product Facts

- 2:1 shrink ratio
- High abrasion resistance
- Transfer of flex stress away from typically weak points such as solder and crimp joints, helping ensure a reliable connection
- Flame-retardance (black only)
- Outstanding physical and electrical performance
- Excellent chemical and solvent-resistance properties
- RoHS compliant



### Applications

Well-suited for wire strain-relief applications such as soldered or crimped connections, wire splices, and terminations. Provides mechanical protection for delicate components. Can be used for component packaging and for rugged marking of cables.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-55°C to 135°C [-67°F to 275°F]

### Specifications/Approvals

| Series | UL | CSA | Military | Raychem |
|---|---|---|---|---|
| CRN Type 1 (black) | E35586 600 V, 125°C | LR31929 (black only) 600 V, 125°C | AMS-DTL-23053/6*, Class I | RT-360, Type 1 RK-6003 |
| CRN Type 2 (clear) | — | — | AMS-DTL-23053/6*, Class 2 | RT-360, Type 2 |

*Formerly MIL-I-23053/6 and MIL-DTL-23053/6.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## CRN (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 3/64 | 1.2 [0.046] | 0.6 [0.023] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/16 | 1.6 [0.063] | 0.8 [0.031] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 3/32 | 2.4 [0.093] | 1.2 [0.046] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/8 | 3.2 [0.125] | 1.6 [0.062] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 3/16 | 4.8 [0.187] | 2.4 [0.093] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 1/4 | 6.4 [0.250] | 3.2 [0.125] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/8 | 9.5 [0.375] | 4.8 [0.187] | 0.76 ± 0.08 [0.030 ± 0.003] |
| 1/2 | 12.7 [0.500] | 6.4 [0.250] | 0.76 ± 0.08 [0.030 ± 0.003] |
| 3/4 | 19.1 [0.750] | 9.5 [0.375] | 0.89 ± 0.12 [0.035 ± 0.005] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| | Nonstandard | Clear (-X, not flame-retardant) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | In 1.2-meter [4-foot] lengths. | |
| Ordering description*** | Specify product name, size and color (for example, CRN 1/4-0). | |

***Europe only. For supply to MIL spec., add -MS to ordering description.



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

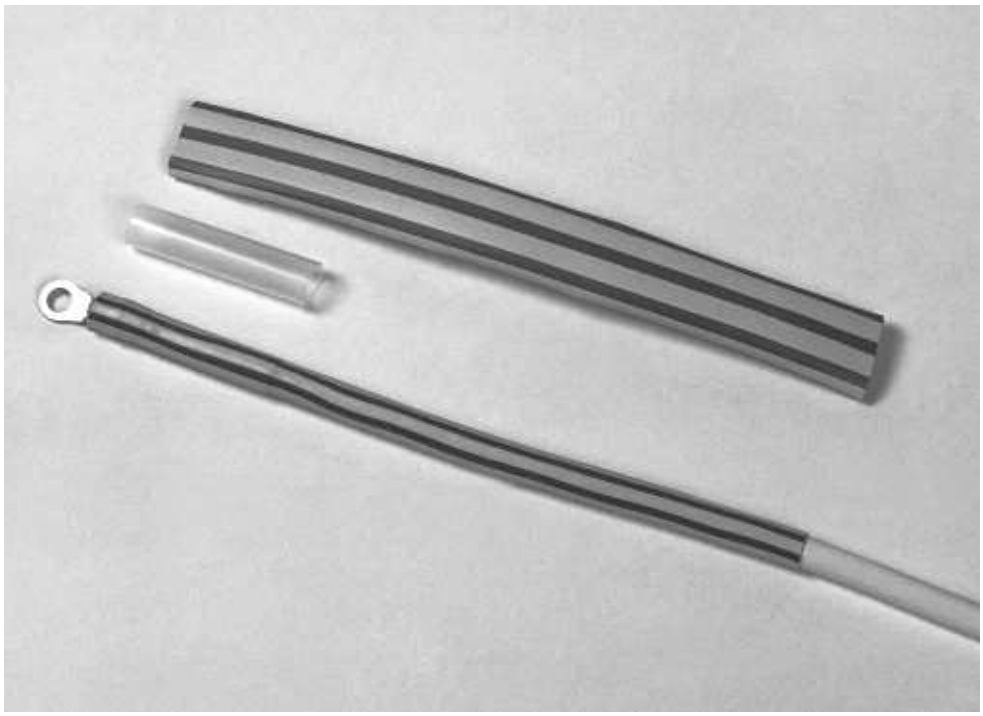
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# DCPT

## Flexible, Flame-Retardant, Dual-Color, Polyolefin Tubing

### Product Facts

- 2:1 and 3:1 shrink ratio
- Dual colors (yellow/green) for instant identification
- Co-extrusion of tubing colors, giving color permanence superior to that of conventional ink marking
- Flame-retardance
- Flexibility: able to conform to irregular shapes
- Excellent physical, chemical, and electrical properties that meet industry standards for highly reliable, general purpose tubing
- RoHS compliant



### Applications

Used to identify “ground” on wires and in cables, and to jacket and insulate light-duty harnesses.

Easily marked by conventional techniques for additional identification of wires and cables.

### Installation

Minimum shrink temperature: 95°C [203°F]

Minimum full recovery temperature: 120°C [248°F]

### Operating Temperature Range

-55°C to 135°C [-67°F to 275°F]

### Specifications/Approvals

| Series | UL | CSA | Military | Agency | Raychem |
|---|---|---|---|---|---|
| DCPT | E35586<br>600 V, 125°C | LR31929<br>600 V, 125°C | VG 95343 Pt 5 Type A | AFS 2270<br>DIN 29807<br>VDE 0341<br>Pt 9005 Type A | RW-2056 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## DCPT (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| **2:1** | | | |
| 3/1.5 | 3.0 [0.118] | 1.5 [0.059] | 0.51 ± 0.10 [0.020 ± 0.004] |
| 6/3 | 6.0 [0.236] | 3.0 [0.118] | 0.58 ± 0.10 [0.023 ± 0.004] |
| 8/4 | 8.0 [0.315] | 4.0 [0.158] | 0.64 ± 0.10 [0.025 ± 0.004] |
| 10/5 | 10.0 [0.394] | 5.0 [0.197] | 0.64 ± 0.10 [0.025 ± 0.004] |
| 12/6 | 12.0 [0.472] | 6.0 [0.236] | 0.64 ± 0.10 [0.025 ± 0.004] |
| 19/9 | 19.0 [0.748] | 9.0 [0.354] | 0.76 ± 0.12 [0.030 ± 0.005] |
| 26/13 | 26.0 [1.024] | 13.0 [0.512] | 0.89 ± 0.12 [0.035 ± 0.005] |
| 38/19 | 38.0 [1.500] | 19.0 [0.748] | 1.00 ± 0.12 [0.039 ± 0.005] |
| 51/19 | 51.0 [2.000] | 19.0 [0.748] | 1.02 ± 0.15 [0.040 ± 0.006] |
| **3:1** | | | |
| 3/1 | 3.0 [0.118] | 1.0 [0.039] | 0.55 ± 0.10 [0.022 ± 0.004] |
| 6/2 | 6.0 [0.236] | 2.0 [0.079] | 0.65 ± 0.10 [0.026 ± 0.004] |
| 9/3 | 9.0 [0.354] | 3.0 [0.118] | 0.75 ± 0.15 [0.030 ± 0.006] |
| 12/4 | 12.0 [0.472] | 4.0 [0.157] | 0.75 ± 0.15 [0.030 ± 0.006] |
| 18/6 | 18.0 [0.709] | 6.0 [0.236] | 0.85 ± 0.15 [0.033 ± 0.006] |
| 24/8 | 24.0 [0.945] | 8.0 [0.315] | 1.00 ± 0.20 [0.039 ± 0.008] |
| 39/13 | 39.0 [1.535] | 13.0 [0.512] | 1.15 ± 0.20 [0.045 ± 0.008] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Yellow/green stripe (-45) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | On spools. | |
| Ordering description | Specify product name, size and color (for example, DCPT 8/4-45). | |



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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# DR-25

**Heat-Shrinkable, Flexible, Chemical and Abrasion Resistant Tubing**

## Product Facts

- Flame-retardant
- System 25 tubing
- Shrink ratio 2:1
- RoHS compliant



### Applications

Specially formulated for optimum high-temperature fluid resistance, and long term heat resistance. Resistant to aviation and diesel fuels, hydraulic fluids and lubricating oils.

Particularly suitable as a jacketing material for military ground vehicle cables and harnesses. It is also well suited for the demands of motorsport cable harnesses. When used in conjunction with System 25 heat-shrinkable molded shapes and S1125 high performance adhesive, these products provide a complete cable harness system.

### Installation

Minimum shrink temperature: 150°C [302°F]

Minimum full recovery temperature: 175°C [347°F]

### Operating Temperature Range

-75°C to 150°C
[-103°F to 302°F]
(per VG 95343 Part 5 Type D)

### Specifications/Approvals

| Series | Military | Raychem |
|---|---|---|
| DR-25 | AMS-DTL-23053/16*<br>VG95343 Part 5 Type D<br>VDE 0341/Pt 9005<br>Def Stan 59-97 Issue 3 Type 6B<br>BS 4G-198 Part 3 10A | RT-1116<br>RK-6008/1 |

*Formerly MIL-I-23053/16 and MIL-DTL-23053/16.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## DR-25 (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 1/8 | 3.2 [0.125] | 1.6 [0.062] | 0.76 ± 0.15 [0.030 ± 0.006] |
| 3/16 | 4.8 [0.187] | 2.4 [0.093] | 0.84 ± 0.15 [0.033 ± 0.006] |
| 1/4 | 6.4 [0.250] | 3.2 [0.125] | 0.89 ± 0.15 [0.035 ± 0.006] |
| 3/8 | 9.5 [0.375] | 4.8 [0.187] | 1.02 ± 0.20 [0.040 ± 0.008] |
| 1/2 | 12.7 [0.500] | 6.4 [0.250] | 1.22 ± 0.20 [0.048 ± 0.008] |
| 3/4 | 19.0 [0.748] | 9.5 [0.375] | 1.45 ± 0.28 [0.057 ± 0.011] |
| 1 | 25.4 [1.000] | 12.7 [0.500] | 1.78 ± 0.28 [0.070 ± 0.011] |
| 1 1/2 | 38.0 [1.500] | 19.1 [0.750] | 2.41 ± 0.41 [0.095 ± 0.016] |
| 2 | 51.0 [2.000] | 25.4 [1.000] | 2.79 ± 0.41 [0.110 ± 0.016] |
| 3 | 76.0 [3.000] | 38.0 [1.500] | 3.18 ± 0.50 [0.125 ± 0.020] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | On spools. |
| Ordering description*** | Specify product name, size and color (for example, DR-25 1/8-0). |

***Europe only. For supply to Def Stan and BS add -DS or -BS to ordering description.



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Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# DSPL

## Commercial, Dual Wall, Heat-Shrinkable Tubing to Seal and Protect Splices

### Product Facts

- 4:1 shrink ratio allows a few sizes to cover a wide range of applications
- Flame-retardant jacket (black only)
- Performs well at elevated temperatures and in aggressive environments
- Provides excellent environmental sealing from dust, dirt and many fluids, which can cause wire splices to corrode or electrical systems to fail
- Mechanically tough tubing provides protection from flexing and abrasion
- RoHS compliant



### Applications

Specially designed for environmental sealing, electrical insulation and protection of electrical splices, terminals and other components in areas where they will be exposed to moisture.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-40°C to 125°C
[-40°F to 257°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| DSPL | RK-6755 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## DSPL (Continued)

### Product Dimensions

| Part Number | Minimum Expanded as Supplied | Maximum Recovered After Heating | Recovered Wall Thickness* After Heating |
|---|---|---|---|
| DSPL-NR1 | 5.69 [0.224] | 1.27 [0.050] | 1.15 [0.045] |
| DSPL-NR2 | 7.49 [0.295] | 1.65 [0.065] | 1.40 [0.055] |
| DSPL-NR3 | 10.80 [0.425] | 2.40 [0.094] | 1.80 [0.071] |
| DSPL-NR4 | 17.50 [0.689] | 4.50 [0.177] | 2.10 [0.083] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), Clear (-X) (except DSPL-NR4) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered.** | |
| Standard packaging | In cut pieces and 1.2 meter [4-foot] lengths. | |
| Ordering description | Specify product name, size and color (for example, DSPL-NR1-0). | |

** Sleeves are number coded to assist with correct size selection



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USA: 1-800-522-6752
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Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# DWP-125

## Flexible, High-Shrink-Ratio, Adhesive-Lined, Polyolefin Tubing

### Product Facts

- 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 plastics, rubber, and metals, including polyethylene, neoprene, and steel
- RoHS compliant



### Applications

Environmentally seals and protects a wide variety of electrical applications, including wire splices, breakouts, and connector-to-cable transitions. Suitable for applications where UL recognized/CSA certified adhesive-lined tubing is required.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 125°C [257°F]

### Operating Temperature Range

-40°C to 110°C
[-40°F to 230°F]

### Specifications/Approvals

| Series | UL | CSA | Raychem |
|---|---|---|---|
| DWP-125 | E35586<br>600 V, 125°C | LR31929<br>600 V, 125°C | DWP-125 SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## DWP-125 (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal Total Wall After Heating | Nominal Adhesive Wall After Heating |
| 1/8 | 3.2 [0.125] | 1.0 [0.040] | 1.02 [0.040] | 0.18 [0.007] |
| 3/16 | 4.8 [0.187] | 1.5 [0.060] | 1.40 [0.055] | 0.51 [0.020] |
| 1/4 | 6.4 [0.250] | 2.0 [0.080] | 1.45 [0.057] | 0.56 [0.022] |
| 3/8 | 9.5 [0.375] | 3.1 [0.120] | 1.65 [0.065] | 0.68 [0.027] |
| 1/2 | 12.7 [0.500] | 4.0 [0.157] | 1.78 [0.070] | 0.76 [0.030] |
| 3/4 | 19.1 [0.750] | 5.8 [0.230] | 2.03 [0.080] | 0.76 [0.030] |
| 1 | 25.4 [1.000] | 8.1 [0.320] | 2.50 [0.100] | 0.76 [0.030] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| | Nonstandard | White (-9), Red (-2), Blue (-6), Yellow (-4), Green (-5), Clear (-X, non-flame-retardant jacket). Other colors available upon request. |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | In 1.2-meter [4-foot] lengths. | |
| Ordering description | Specify product name, size and color (for example, DWP-125 1/4-0). | |



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USA: 1-800-522-6752
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Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

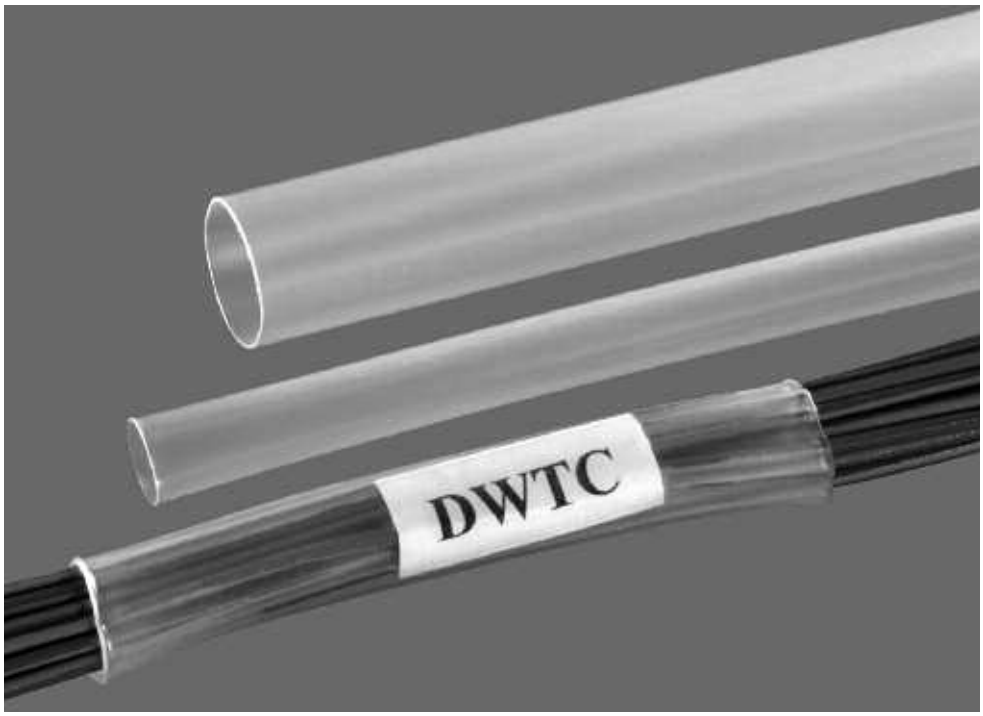
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# DWTC

**Flexible, Dual Wall, Moisture-Proof, Heat-Shrinkable Polyolefin Tubing**

## Product Facts

- Excellent mechanical strength
- Abrasion resistance
- Excellent optical clarity
- Environmental sealing
- Shrink ratio 4:1
- RoHS compliant




### Applications

DWTC is a flexible, heat-shrinkable, dual wall tubing with an integrally bonded meltable adhesive inner liner designed to offer moisture proof encapsulation to a wide variety of substrates. In particular, it adheres well to PVC. Available in clear, DWTC offers excellent clarity for protection of substrates that may need to be inspected during service.

The tough outer jacket gives excellent mechanical strength with a high resistance to splitting. The high-shrink-ratio means that only four sizes are needed to give protection to a full range of irregular shapes with widely varying dimensions.

### Installation

Minimum shrink temperature: 60°C [140°F]

Minimum full recovery temperature: 100°C [212°F]

### Operating Temperature Range

-55°C to 75°C
[-67°F to 167°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| DWTC | RK-6204 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## DWTC (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal Total Wall After Heating | Nominal Adhesive Wall After Heating |
| 4/1 | 4.0 [0.158] | 1.0 [0.039] | 0.8 [0.032] | 0.3 [0.012] |
| 8/2 | 8.0 [0.315] | 2.0 [0.079] | 0.9 [0.035] | 0.3 [0.012] |
| 12/3 | 12.0 [0.472] | 3.0 [0.118] | 1.2 [0.047] | 0.4 [0.016] |
| 16/4 | 16.0 [0.630] | 4.0 [0.158] | 1.5 [0.059] | 0.5 [0.020] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Clear (-X) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | On spools, in 1.2-meter [4-foot] lengths. |
| Ordering description | Specify product name, size and color (for example DWTC-4/1-X-STK). |



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

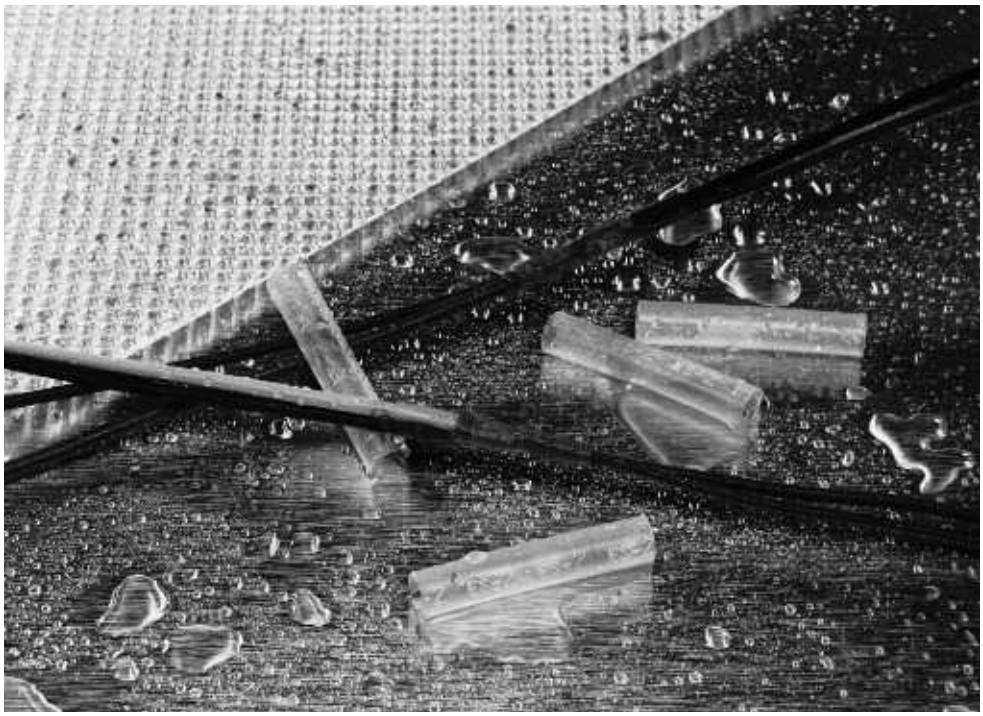
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# ES1000

## Clear, High-Shrink-Ratio, Adhesive-Lined, Semirigid Polyolefin Tubing

### Product Facts

- 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters
- Mechanically tough tubing provides strain relief and abrasion protection of wire splices, terminals and other components
- Thick adhesive liner forms an effective barrier against fluids and moisture and performs well at an extended temperature range
- UL recognized
- RoHS compliant



### Applications

Specially designed for environmental sealing and electrical insulation of wire splices, terminations, and components where see-through inspection is required.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-40°C to 130°C
[-40°F to 266°F]

### Specifications/Approvals

| Series | UL* | Raychem |
|---|---|---|
| ES1000 | E85381<br>600 V, 125°C | RT-1113 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | | ■ |



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Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## ES1000 (Continued)

### Product Dimensions

| Part Number | Inside Diameter (Including Core) | | Recovered Wall Thickness* | | |
|---|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Minimum Total Wall After Heating | Minimum Jacket Wall After Heating | Minimum Adhesive Wall After Heating |
| ES1000-No.1 | 5.72 [0.225] | 1.27 [0.050] | 1.20 [0.047] | 0.64 [0.025] | 0.56 [0.022] |
| ES1000-No.2 | 7.44 [0.293] | 1.65 [0.065] | 1.52 [0.060] | 0.76 [0.030] | 0.76 [0.030] |
| ES1000-No.3 | 10.85 [0.427] | 2.41 [0.095] | 1.91 [0.075] | 0.89 [0.035] | 1.02 [0.040] |
| ES1000-No.4 | 17.78 [0.700] | 4.45 [0.175] | 2.41 [0.095] | 1.04 [0.041] | 1.37 [0.054] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Clear (-X) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | Cut pieces. |
| Marking | Tubing will be printed with its numbered size (such as ES-1, ES-2, ES-3, or ES-4). |
| Ordering description | Specify product name, numbered size, color, and cut length (for example, ES1000-NO. 2-B9-X-50MM). |



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

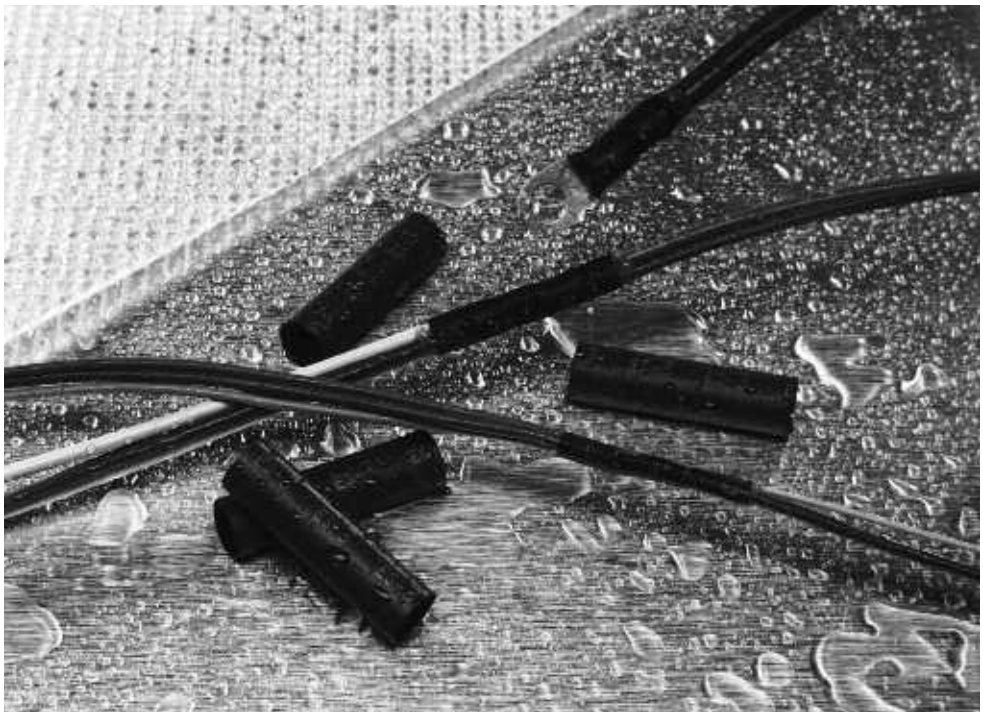
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# ES2000

## Flame-Retardant, High-Shrink-Ratio, Adhesive-Lined Semirigid Polyolefin Tubing

### Product Facts

- **4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters**
- **Flame-retardant and mechanically tough, the tubing provides strain relief and abrasion protection of wire splices, terminals, and other components**
- **Thick adhesive liner forms an effective barrier against fluids and moisture and performs well at an extended temperature range**
- **UL recognized**
- **RoHS compliant**



### Applications

Specially designed for environmental sealing and electrical insulation of wire splices, terminations, and components.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-40°C to 130°C
[-40°F to 266°F]

### Specifications/Approvals

| Series | UL* | Raychem |
|---|---|---|
| ES2000 | E85381<br>600 V, 125°C | RT-1112 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## ES2000 (Continued)

### Product Dimensions

| Part Number | Inside Diameter (Including Core) | | Recovered Wall Thickness* | | |
|---|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Minimum Total Wall After Heating | Minimum Jacket Wall After Heating | Minimum Adhesive Wall After Heating |
| ES2000-No.1 | 5.72 [0.225] | 1.27 [0.050] | 1.20 [0.047] | 0.64 [0.025] | 0.56 [0.022] |
| ES2000-No.2 | 7.44 [0.293] | 1.65 [0.065] | 1.52 [0.060] | 0.76 [0.030] | 0.76 [0.030] |
| ES2000-No.3 | 10.85 [0.427] | 2.41 [0.095] | 1.91 [0.075] | 0.89 [0.035] | 1.02 [0.040] |
| ES2000-No.4 | 17.78 [0.700] | 4.45 [0.175] | 2.41 [0.095] | 1.04 [0.041] | 1.37 [0.054] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | Cut pieces. |
| Marking | Tubing will be printed with its numbered size (such as ES-1, ES-2, ES-3, or ES-4). |
| Ordering description | Specify product name, numbered size, color, and cut length (for example, ES2000-NO. 2-B9-0-50MM). |



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

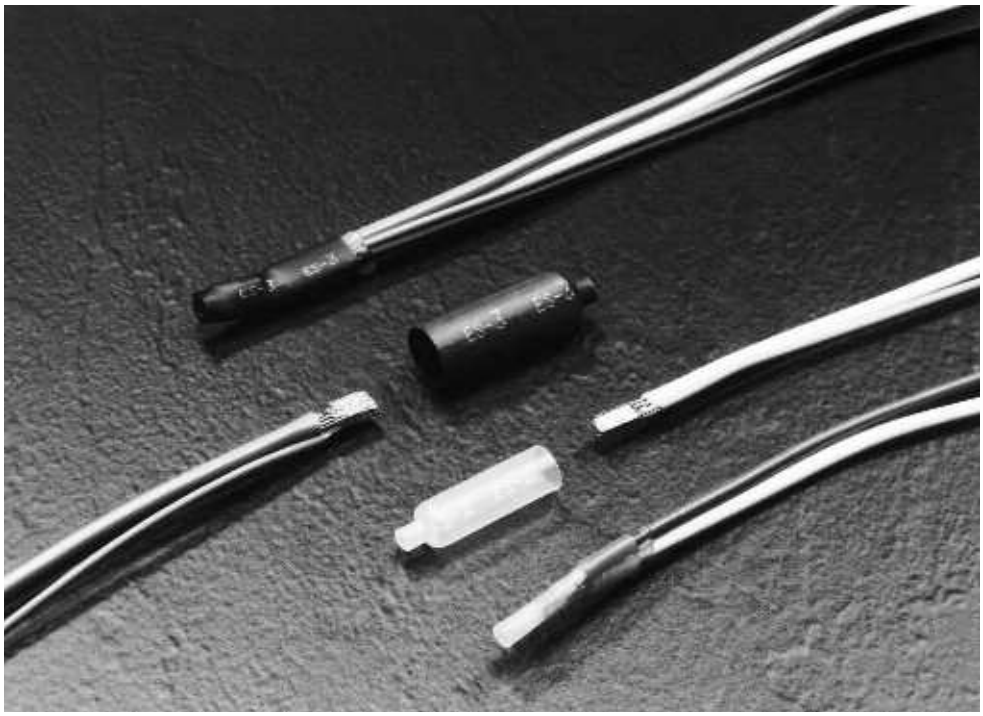
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# ES Caps

## High-Shrink-Ratio, Adhesive-Lined, Semirigid Polyolefin Caps

### Product Facts

- 4:1 shrink ratio allows a few sizes to cover a wide range of splice and component diameters
- Mechanically tough jacket provides strain relief and abrasion protection
- Thick adhesive liner forms an effective barrier against fluids and moisture and performs well at an extended temperature range
- UL recognized
- RoHS compliant



### Applications

Specially designed to provide mechanical and environmental protection of stub splices in electrical harnesses. Clear caps allow see-through inspection; black caps are flame-retardant.

### Installation

Minimum shrink temperature: 100°C [212°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-40°C to 105°C
[-40°F to 221°F]

### Specifications/Approvals

| Series | UL* | Raychem |
|---|---|---|
| ES Caps | E85381<br>600 V, 125°C | RW-3006 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## ES Caps (Continued)

### Product Dimensions

| Part Number | Standard Length* as Supplied (Millimeters) | Inside Diameter (Including Core) | | Recovered Wall Thickness** | | |
|---|---|---|---|---|---|---|
| | | Minimum Expanded as supplied | Maximum Recovered After Heating | Minimum Total Wall After Heating | Minimum Jacket Wall After Heating | Minimum Adhesive Wall After Heating |
| ES Cap-No.1 | 30, 35 | 5.72 [0.225] | 1.27 [0.050] | 1.20 [0.047] | 0.64 [0.025] | 0.56 [0.022] |
| ES Cap-No.2 | 30, 35 | 7.44 [0.293] | 1.65 [0.065] | 1.52 [0.060] | 0.76 [0.030] | 0.76 [0.030] |
| ES Cap-No.3 | 40, 50 | 10.85 [0.427] | 2.41 [0.095] | 1.91 [0.075] | 0.89 [0.035] | 1.02 [0.040] |

*Other cap lengths available upon request.
**Wall thickness will be less if cap recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0), clear (-X) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Other cap lengths available on request. |
| Standard packaging | In pieces. |
| Marking | Caps will be marked with their numbered size (such as ES-1, ES-2, or ES-3). |
| Ordering description | Specify product name, size, color, and length (for example, ES CAP-NO. 2-B9-X-35MM). |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# FL2500

## Fully Flame-Retardant, Adhesive-Lined, Polyolefin Heat-Shrinkable Tubing

### Product Facts

- **4:1 shrink ratio allows a few sizes to cover a wide range of wire terminations and components**
- **Flame-retardant tubing jacket and adhesive provide full flame-retardancy**
- **Fully flame-retardant and mechanically tough, the tubing provides strain relief and abrasion protection of wire splices, terminals and other components**
- **Thick high-performance adhesive lining offers permanent sealing of splices, fusible links, terminals and in-line components**
- **RoHS compliant**



### Applications

Tough flame-retardant polyolefin tubing lined with a flame-retardant adhesive provides the optimum solution for applications where full flame-retardancy is preferred or specified.

Rated to 135°C [275°F] for 3000 hours, FL2500 is suitable for use in the automotive harness market and other harsh environments. As the tubing shrinks, the adhesive lining melts and flows to fill all voids and create a complete seal against moisture, oils, chemicals and other fluids.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-40°C to 135°C [-40°F to 275°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| FL2500 | FL2500 SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## FL2500 (Continued)

### Product Dimensions

| Part Number | Inside Diameter (Including Core) | | Recovered Wall Thickness* | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Total Wall After Heating | Minimum Adhesive Wall After Heating |
| FL2500-No. 1 | 7.62 [0.300] | 1.65 [0.065] | 1.52 ± 0.3 [0.060 ± 0.012] | 0.71 [0.028] |
| FL2500-No. 2 | 9.02 [0.355] | 2.29 [0.090] | 1.52 ± 0.3 [0.060 ± 0.012] | 0.71 [0.028] |
| FL2500-No. 3 | 11.56 [0.455] | 2.54 [0.100] | 2.29 ± 0.3 [0.090 ± 0.012] | 1.32 [0.052] |
| FL2500-No. 4 | 17.79 [0.700] | 4.45 [0.175] | 2.54 ± 0.3 [0.100 ± 0.012] | 1.35 [0.053] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Black (-0) with a white adhesive liner. |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | Cut pieces. |
| Marking | Tubing will be marked with its numbered size (such as FL-1, FL-2, FL-3, or FL-4). |
| Ordering description | Specify product name, size, color, and cut length (for example, FL2500-NO.2-I9-0-50MM). |



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

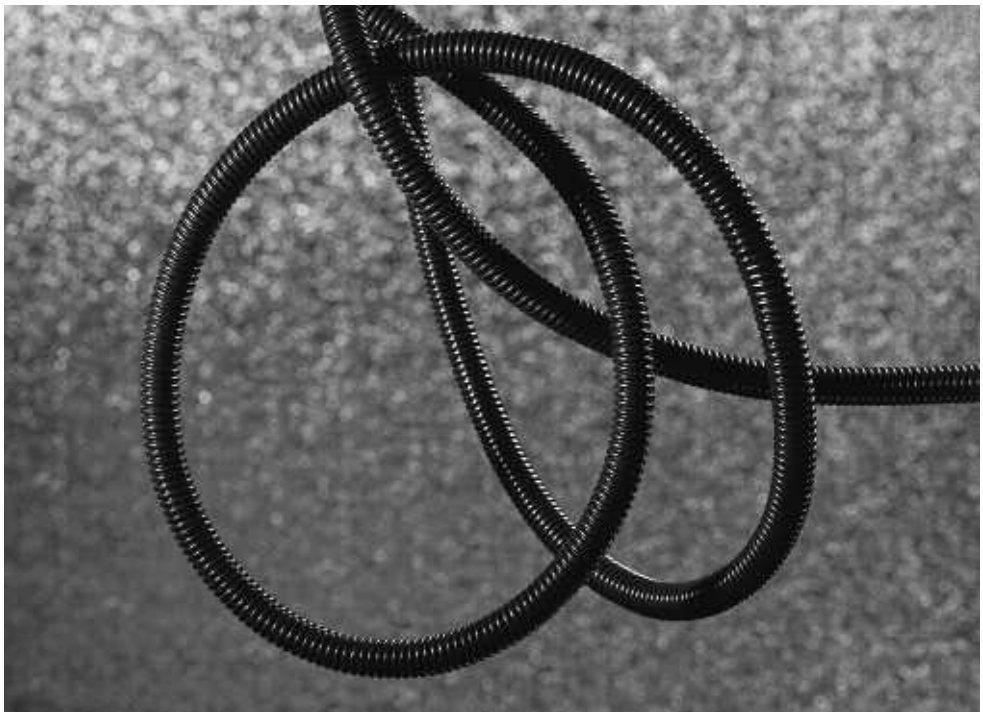
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HCTE

## Helical Convolex Tubing with a High Crush Resistance

### Product Facts

- Highly flame-retardant
- Highly flexible and fluid resistant
- Not heat-shrinkable
- High crush resistance
- System 300 conduit tubing
- RoHS compliant



### Applications

Used as a conduit to provide mechanical protection for electrical wiring systems in applications requiring flexibility, high-temperature performance and good resistance to a variety of fluids. Widely used in the military and commercial aerospace industries. Can be used in conjunction with other Raychem components to form an integrated harnessing system.

### Installation

It is recommended that no more than 70% of the internal area (“fill factor”) of the HCTE conduit be occupied by wires in any application.

### Operating Temperature Range

-55°C to 200°C
[-67°F to 392°F]

### Specifications/Approvals

| Series | Military | Raychem |
|---|---|---|
| HCTE | VG 96936 Part 6 | RT-1162 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## HCTE (Continued)

### Product Dimensions

| Size | Inside Diameter Minimum | Outside Diameter Maximum | Maximum Wall Thickness |
|---|---|---|---|
| 0187 | 4.60 [0.181] | 8.10 [0.320] | 0.46 [0.018] |
| 0281 | 6.90 [0.273] | 10.50 [0.414] | 0.46 [0.018] |
| 0312 | 7.70 [0.306] | 11.80 [0.450] | 0.46 [0.018] |
| 0375 | 9.20 [0.364] | 12.90 [0.510] | 0.46 [0.018] |
| 0437 | 10.80 [0.427] | 14.50 [0.571] | 0.46 [0.018] |
| 0500 | 12.30 [0.485] | 16.50 [0.650] | 0.58 [0.023] |
| 0625 | 15.40 [0.608] | 19.50 [0.770] | 0.58 [0.023] |
| 0750 | 17.90 [0.730] | 23.60 [0.930] | 0.58 [0.023] |
| 0875 | 21.80 [0.860] | 27.20 [1.073] | 0.58 [0.023] |
| 1000 | 24.70 [0.975] | 31.10 [1.226] | 0.58 [0.023] |
| 1250 | 30.70 [1.210] | 35.30 [1.539] | 0.58 [0.023] |
| 1500 | 36.50 [1.437] | 46.50 [1.832] | 0.58 [0.023] |
| 1625 | 39.60 [1.562] | 50.17 [1.975] | 0.58 [0.023] |
| 1750 | 42.67 [1.688] | 52.88 [2.082] | 0.58 [0.023] |
| 2000 | 49.20 [1.937] | 59.23 [2.332] | 0.58 [0.023] |

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order a conduit size that will ensure that a “fill factor” of 70% is not exceeded. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, HCTE-0187-0). |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HF

## High-Flex, Heavy-Wall, Heat-Shrinkable Tubing

### Product Facts

- Offers high flexibility
- Provides excellent insulation and abrasion protection, per U.S. Mine Safety and Health Administration (MSHA) regulations
- Flame-retardant
- HF has the following agency approvals:
  - ABS (American Bureau of Shipping)
  - Lloyd's (Lloyd's Register of Shipping)
- RoHS compliant



### Applications

Developed for cable jacketing applications where cable flexibility is important, high-flex (HF) tubing is good for jacketing cables where sharp bends or turns are required. Also suitable for situations where the cable is subject to motion. Such situations are common for industrial machinery, transportation equipment, robotics, welding, and many other cabling applications. To complete the cable jacket seal, the ends may be sealed for further water and corrosion protection by using available tape sealant or adhesive.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 121°C [250°F]

### Operating Temperature Range

-55°C to 90°C
[-67°F to 194°F]

### Specifications/Approvals

| Series | Military | Agency | Raychem |
|---|---|---|---|
| HF | AMS-DTL-23053/15* Class 2** | ABS, Lloyd's | RW-2023 |

*Formerly MIL-I-23053/15 and MIL-DTL-23053/15.
**Except for coatings requirement.

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## HF (Continued)

### Product Dimensions

| Size | Standard Nominal Length (m/ft) | Inside Diameter | | Wall Thickness** |
|---|---|---|---|---|
| | | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal Recovered After Heating |
| HF04 | 1.2, 7.5 [4, 25] | 10.16 [0.400] | 3.81 [0.150] | 1.52 [0.060] |
| HF07 | 1.2, 7.5 [4, 25] | 19.05 [0.750] | 5.59 [0.220] | 1.52 [0.060] |
| HF11 | 1.2, 7.5 [4, 25] | 27.94 [1.100] | 9.52 [0.375] | 2.67 [0.105] |
| HF13 | 1.2, 7.5 [4, 25] | 33.02 [1.300] | 9.52 [0.375] | 2.67 [0.105] |
| HF15 | 1.2, 7.5 [4, 25] | 38.10 [1.500] | 12.70 [0.500] | 3.05 [0.120] |
| HF17 | 1.2, 7.5 [4, 25] | 43.14 [1.700] | 12.70 [0.500] | 3.05 [0.120] |
| HF20 | 1.2, 7.5 [4, 25] | 50.80 [2.000] | 19.05 [0.750] | 3.56 [0.140] |
| HF27 | 1.2, 7.5 [4, 25] | 68.58 [2.700] | 22.86 [0.900] | 3.94 [0.155] |

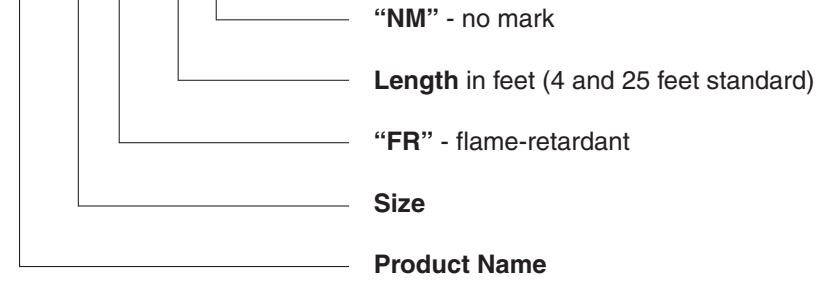
**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | 1.2-meter [4-foot] or 7.5-meter [25-foot] lengths. Nonstandard lengths are available upon request. |
| Ordering description | See below. |

### Part Numbering System

**HF - _ FR X _ / _**




**Example: HF-17FRX25/NM**



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

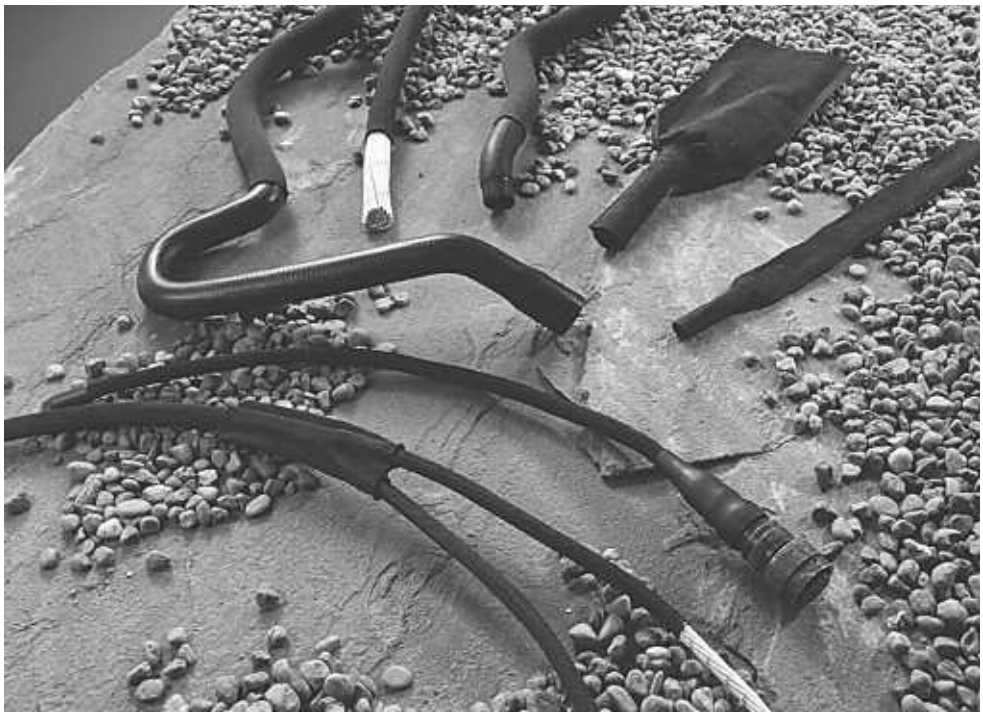
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HFT5000

## Heat-Shrinkable Fabric Tubing

### Product Facts

- Highly flexible woven fabric tubing
- Polyethylene/polyester construction for excellent abrasion resistance
- Halogen free
- Heat-shrinkable to grip substrates tightly without additonal fixing
- 2:1 shrink ratio for easy installation onto different substrate diameters and sizes
- Highly flexible woven fabric construction for easy, compliant installation onto awkward substrates such as bent hoses
- Outstanding abrasion resistance over a wide temperature range
- Easily cut with standard industrial cutting equipment
- Resistant to harsh environments
- Multifilament construction that ensures soft, safe handling
- Low shrink temperature for safe installation onto heat sensitive substrates
- RoHS compliant



### Applications

Designed primarily to provide mechanical abrasion protection for components such as rubber hoses, plastic pipes, and harness wiring bundles. Also suitable for other applications, such as noise and rattle suppression.

The woven construction makes HFT5000 extremely flexible and resistant to trapping water, heat and humidity. Provides outstanding abrasion, chafing and cutting protection, even at high-temperatures.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 110°C [230°F]

Maximum storage temperature: 60°C [140°F]

### Operating Temperature Range

3000 hours:
-40°C to 125°C
[-40°F to 257°F]

1000 hours:
-40°C to 150°C
[-40°F to 302°F]

### Specifications/Approvals

| Series | UL* | Raychem |
|---|---|---|
| HFT5000 | E199379<br>Rated 135°C | RW-2060 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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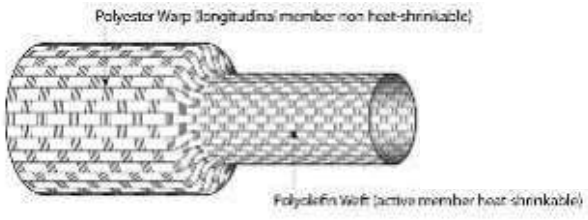
Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## HFT5000 (Continued)

### Product Dimensions




| Size | Inside Diameter | |
|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating |
| Standard | | |
| 12/6 | 12 [0.47] | 6 [0.24] |
| 20/10 | 20 [0.79] | 10 [0.39] |
| 30/15 | 30 [1.18] | 15 [0.59] |
| 40/20 | 40 [1.57] | 20 [0.79] |
| 50/25 | 50 [1.97] | 25 [0.98] |
| 60/30 | 60 [2.36] | 30 [1.18] |
| 70/35 | 70 [2.76] | 35 [1.38] |
| Non-Standard High Volume | | |
| 25/12 | 25 [0.98] | 12 [0.47] |
| 34/17 | 34 [1.34] | 17 [0.67] |
| 80/40 | 80 [3.15] | 40 [1.57] |

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| Standard packaging | On spools. | |
| Ordering description | Specify product name, size and color (for example, HFT5000-12/6-0). | |



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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HRHF/HRNF/HRSR

## High-Ratio, Heat-Shrinkable Tubing

### Product Facts

- **Offers toughness and durability**
- **Provides excellent insulation and abrasion protection**
- **Is available in flame-retardant material**
- **Shrinks to fit (5.6:1)**
- **FR callouts meet all of the requirements of AMS-DTL-23053/15*, except for some of the tubing sizes, which do not meet the exact recovered wall thickness requirements**
- **HRHF and HRSR have the following agency approvals:**
  - **ABS (American Bureau of Shipping)**
  - **Lloyd's (Lloyd's Register of Shipping**
- **RoHS compliant**



### Applications

High-ratio (HR) heat-shrinkable tubing, with expansion ratios as high as 5.6 to 1, is designed to accommodate large size differences between cables and cable connectors and backshells, thus simplifying repair of damaged cable. High-ratio tubing is available in semirigid flame-retardant (SR), standard (NF), or high-flex flame-retardant (HF) material and with or without factory-applied sealants and adhesives. The water-proofing sealant provides environmental sealing and is watertight in wet and corrosive locations. The thermoplastic adhesive coating offers excellent strain relief and environmental sealing.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 121°C [250°F]

### Operating Temperature Range

-55°C to 110°C
[-67°F to 230°F]

### Specifications/Approvals

| Series | Agency | Raychem |
|---|---|---|
| HRSR | ABS, Lloyd's | RW-2013 |
| HRHF | ABS, Lloyd's | RW-2013 |
| HRNF | — | RW-2013 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## HRHF/HRNF/HRSR (Continued)

### Product Dimensions

| Size† | Inside Diameter | | Recovered Wall Thickness†† |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal After Heating |
| HR**060 | 15.24 [0.600] | 3.81 [0.150] | 1.52 [0.060] |
| HR**125 | 31.75 [1.250] | 6.10 [0.240] | 1.52 [0.060] |
| HR**175 | 44.45 [1.750] | 8.00 [0.315] | 2.41 [0.095] |
| HR**200 | 50.80 [2.000] | 9.52 [0.375] | 2.67 [0.105] |
| HR**250 | 63.50 [2.500] | 12.70 [0.500] | 3.05 [0.120] |
| HR**300 | 76.20 [3.000] | 19.05 [0.750] | 3.05 [0.120] |
| HR**400 | 101.60 [4.000] | 22.86 [0.900] | 3.56 [0.140] |

†For ** substitute HF, NF or SR for material required.
††Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| | Nonstandard | Clear available on request (not flame-retardant; HRHF only) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Other sizes are available upon request. | |
| Standard packaging | Up to 18 inch lengths maximum.* | |
| Ordering description | See below. | |

*Cutting tolerance is ± 0.125".

### Part Numbering System

**HRHF - _ _ - _ / _ _**

**"NM"** - no mark

**Coating**
Adhesive (/97)
Sealant (/226)
Blank for no coating

**Length** in inches (up to 18 inch length maximum)

**"FR"** - flame-retardant for SR and HF
**"CL"** - Clear, non-flame-retardant; HF only

**Size**

**Product Name**
HRHF - high flex
HRNF - non-flame-retardant
HRSR - semirigid

**Example: HRHF-125FR-10/226-NM**



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

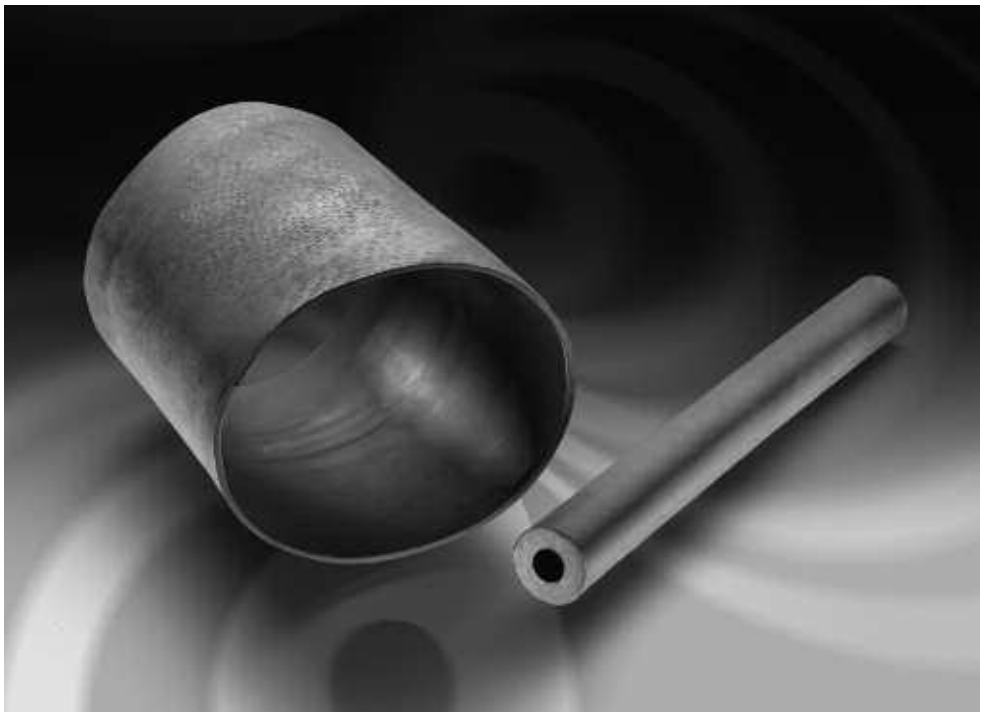
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HRHT

## High-Ratio, High-Temperature, Flexible, Thick Wall Polyolefin Heat-Shrinkable Tubing

### Product Facts

- Shrink ratios as high as 6:1
- Specially formulated for thick wall insulation, strain relief and abrasion protection
- Flame-retardant passing ASTM D 635
- Excellent performance in both hot and cold environments
- Optional factory applied adhesive provides watertight environmental sealing in wet and corrosive locations
- RoHS compliant



### Applications

High-ratio (HR), high–temperature (HT) heat-shrinkable tubing, with shrink ratios as high as 6-to-1, is designed to conform to odd shapes and shrink over large transitions, allowing for the repair and sealing of cable connectors and equipment. This product can be used to seal the back end of a connector or simply repair the damaged outer insulation of a cable or wire.

Cable harnesses can be repaired and released without disassembly.

HRHT tubing is available with an optional hot melt adhesive lining. A high-performance adhesive is also available for more demanding applications.

### Installation

Minimum shrink temperature: 135°C [275°F]

Minimum full recovery temperature: 150°C [302°F]

### Operating Temperature Range

-55°C to 135°C
[-67°F to 275°F]

### Specifications/Approvals

| Series | Military | Raychem |
|---|---|---|
| HRHT | SAE-AS81765/1, Type II* | HRHT SCD |

*heat-shrinkable, crosslinked, flexible polyolefin

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## HRHT (Continued)

### Product Dimensions

| Size† | Inside Diameter | | Wall Thickness†† |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal Recovered After Heating |
| HRHT-1/X | 19.05 [0.750] | 3.05 [0.120] | 3.94 [0.155] |
| HRHT-2/X | 38.16 [1.500] | 5.84 [0.230] | 3.94 [0.155] |
| HRHT-3/X | 50.80 [2.000] | 9.14 [0.360] | 3.94 [0.155] |
| HRHT-4/X | 76.20 [3.000] | 12.70 [0.500] | 3.94 [0.155] |
| HRHT-5/X | 114.30 [4.500] | 19.05 [0.750] | 3.94 [0.155] |

†"X" indicates recovered length in inches (e.g. for 3.0-inch length: HRHT-2/3). The tolerance shall be +/- 10% of the specified recovered length.
††Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | In pieces. |
| Ordering description | Specify product name, size and cut length (for example, HRHT-1/3). |

### Part Numbering System

**HRHT - _ / _ _**

Add **"NA"** to the end of the part number if no adhesive is required

Unrestricted recovered length

Expanded inside diameter - as supplied



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USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HTAT

**Semiflexible, Dual Wall, Moisture-Resistant, Heat-Shrinkable Tubing**

## Product Facts

- 4:1 shrink ratio
- Environmental sealing
- High-strength bonding
- Well-suited connector sealing covering large diameter differences
- RoHS compliant



### Applications

Designed to provide environmental sealing for a range of substrates, at elevated temperatures. Manufactured by TE from radiation-crosslinked polyolefins, the inner wall melts when heated and is forced into interstices by the shrinking of the outer wall so that, when cooled, the substrate is encapsulated by a tough, protective moisture barrier.

An operating range of -55˚C to 125˚C [-67˚F to 257˚F] and a high-shrink-ratio as standard, mean that the tubing offers superior environmental protection to a wide range of irregular shapes with varying dimensions. The jacket is flame-retardant to reduce flame propagation.

### Installation

Minimum shrink temperature: 80°C [176°F]

Minimum full recovery temperature: 110°C [230°F]

### Operating Temperature Range

-55°C to 125°C [-67°F to 257°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| HTAT | RW-2052 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



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

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# HTAT (Continued)

## Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* | |
|---|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal Total Wall After Heating | Nominal Adhesive Wall After Heating |
| 4/1 | 4.0 [0.158] | 1.0 [0.039] | 1.00 [0.039] | 0.40 [0.016] |
| 8/2 | 8.0 [0.315] | 2.0 [0.079] | 1.00 [0.039] | 0.50 [0.020] |
| 12/3 | 12.0 [0.472] | 3.0 [0.118] | 1.40 [0.055] | 0.60 [0.024] |
| 16/4 | 16.0 [0.630] | 4.0 [0.158] | 1.75 [0.069] | 0.75 [0.030] |
| 24/6 | 24.0 [0.945] | 6.0 [0.236] | 2.25 [0.088] | 0.80 [0.032] |
| 32/8 | 32.0 [1.260] | 8.0 [0.315] | 2.50 [0.098] | 1.00 [0.039] |
| 48/13 | 48.0 [1.890] | 13.0 [0.512] | 2.55 [0.100] | 1.00 [0.039] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

## Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | In 1.2-meter [4-foot] lengths. |
| Ordering description | Specify product name, size and color (for example, HTAT 8/2-0). |



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