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 600V, 110°C	AMS-DTL-23053/4,* Class 3	RW-2063 - Black 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 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

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

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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China: 86-400-820-6015
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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Japan: 81-44-844-8013
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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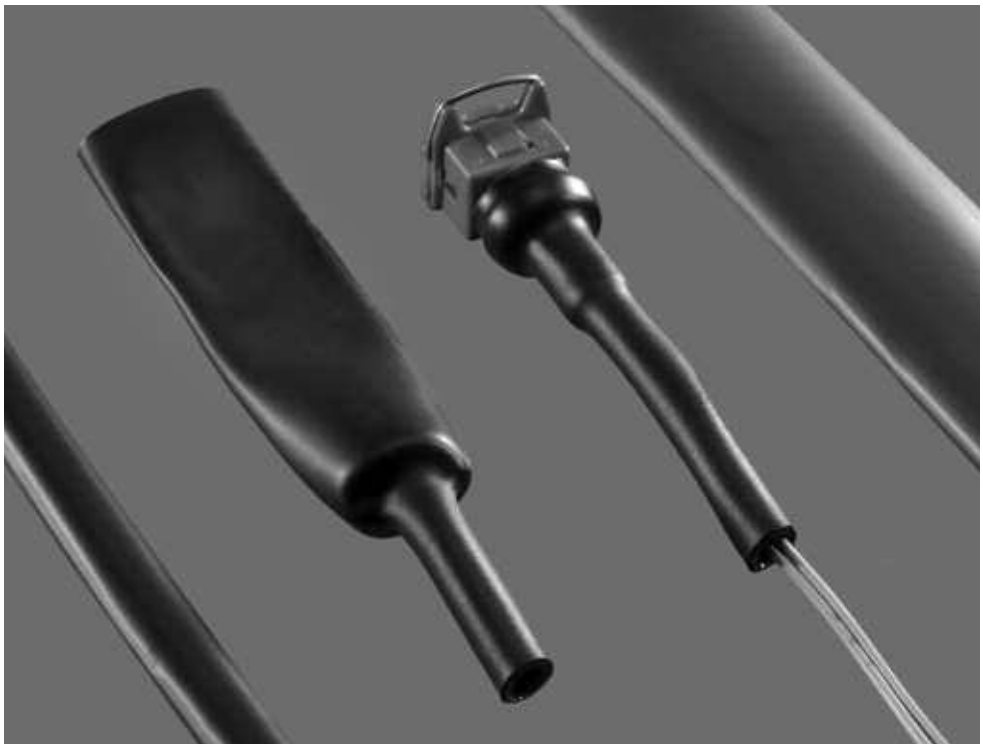
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 600V, 80°C	RW-2050

*Black only. Clear product is not flame-retardant

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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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 (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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Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

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China: 86-400-820-6015
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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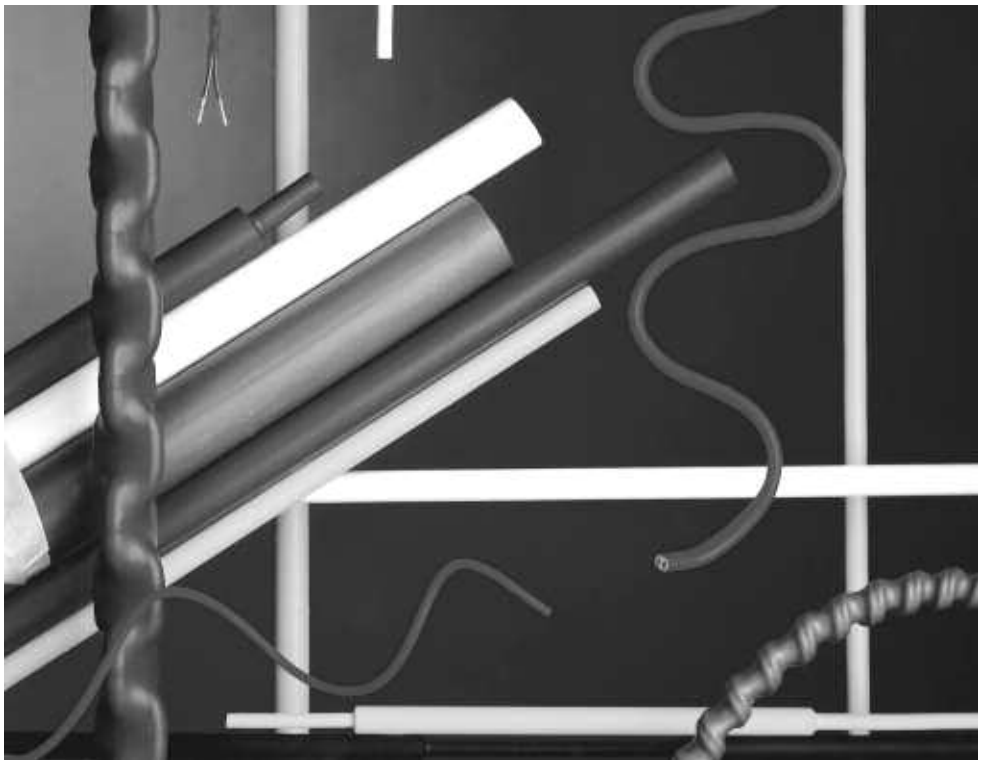
UK: 44-800-267-666

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 600 V, 125°C	LR31929 600 V, 125°C	RW-2059

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

Available in:	Americas	Europe	Asia Pacific
		■	

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

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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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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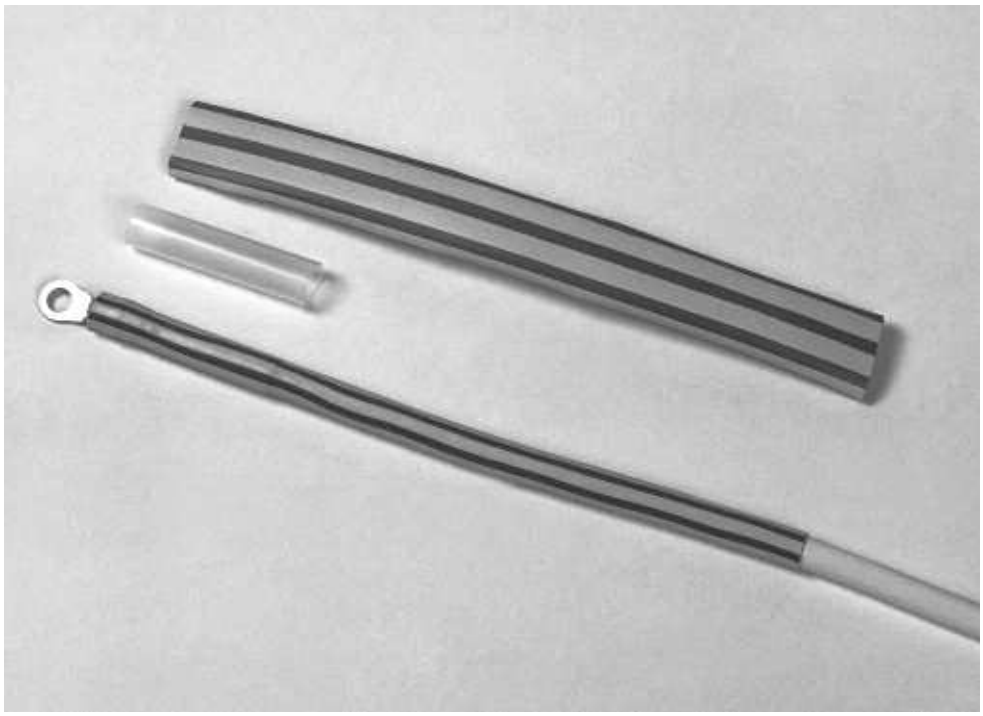
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 600 V, 125°C	LR31929 600 V, 125°C	VG 95343 Pt 5 Type A	AFS 2270 DIN 29807 VDE 0341 Pt 9005 Type A	RW-2056

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

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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Mexico: 52-55-1106-0800
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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* VG95343 Part 5 Type D VDE 0341/Pt 9005 Def Stan 59-97 Issue 3 Type 6B BS 4G-198 Part 3 10A	RT-1116 RK-6008/1

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

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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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

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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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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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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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 600 V, 125°C	LR31929 600 V, 125°C	DWP-125 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

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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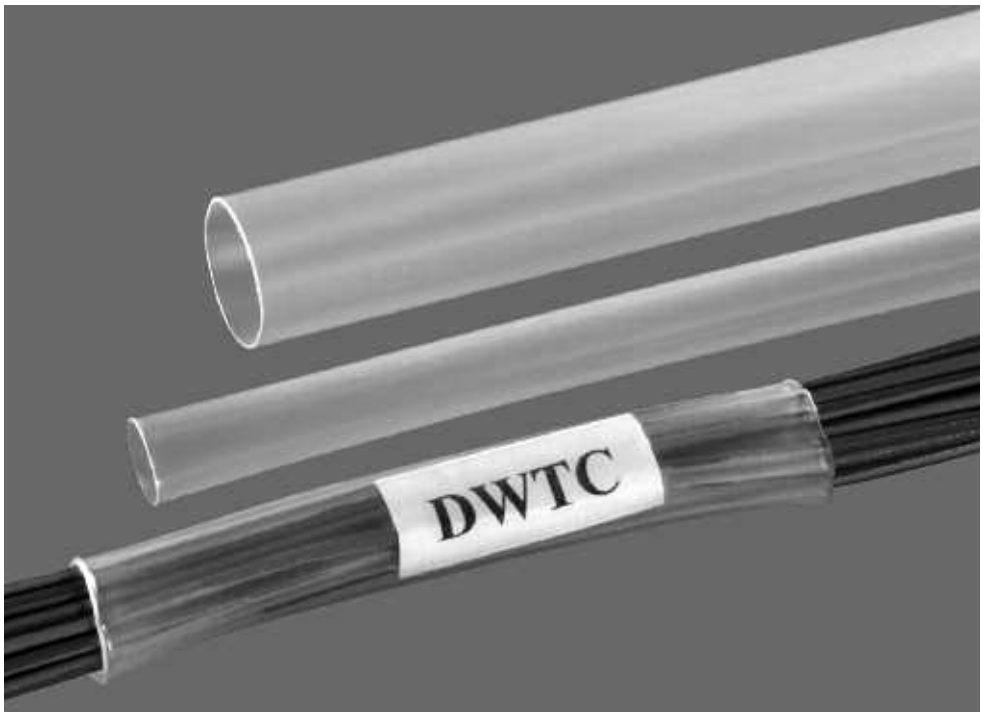
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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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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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L. & S. America: 54-11-4733-2200

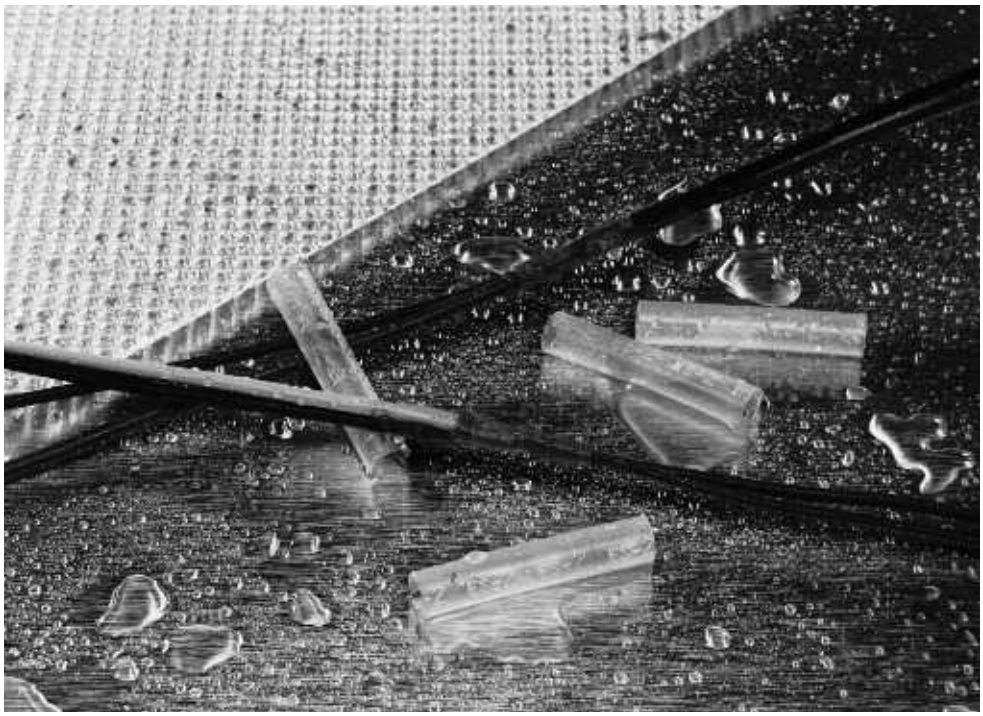
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 600 V, 125°C	RT-1113

Available in:	Americas	Europe	Asia Pacific
	■		■

9-1773447-9
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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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Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

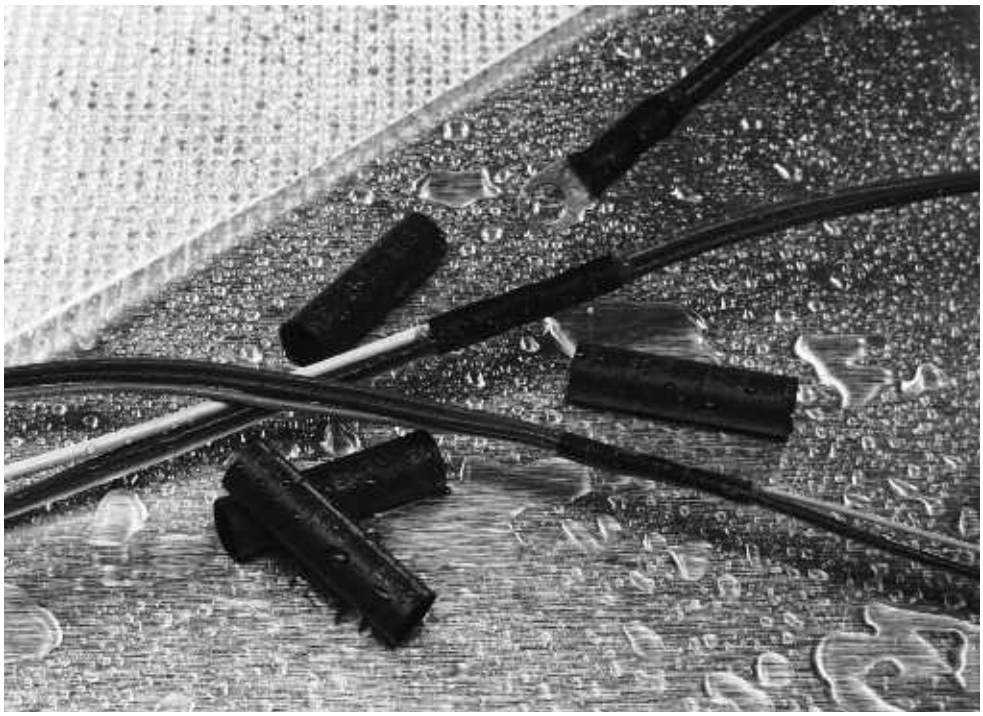
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 600 V, 125°C	RT-1112

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

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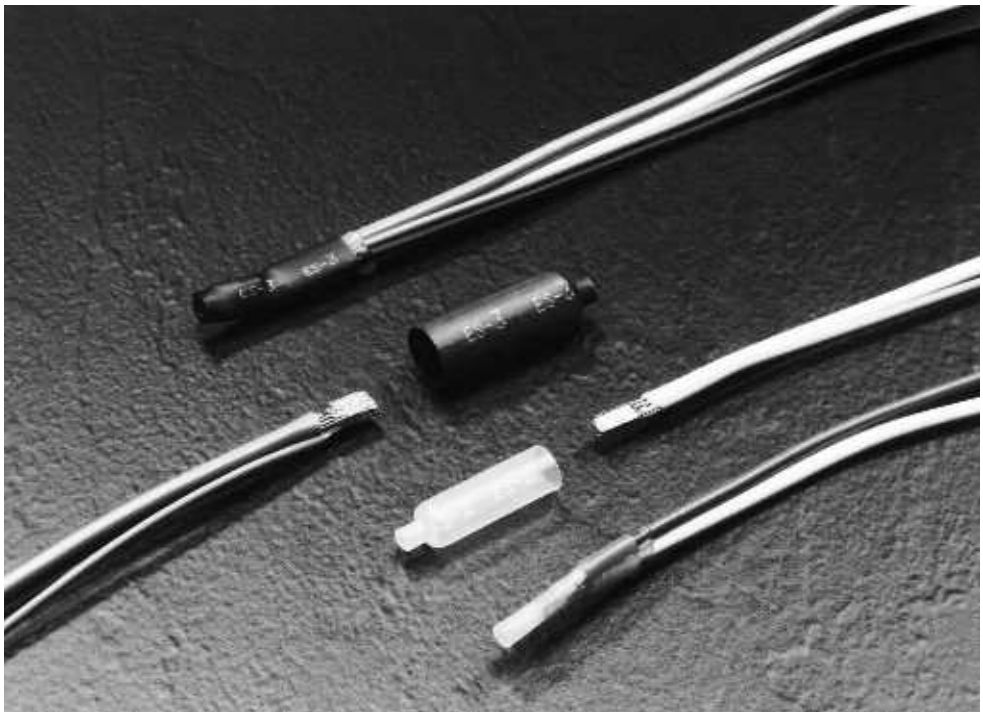
Japan: 81-44-844-8013
UK: 44-800-267-666

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 600 V, 125°C	RW-3006

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

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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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.

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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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L. & S. America: 54-11-4733-2200

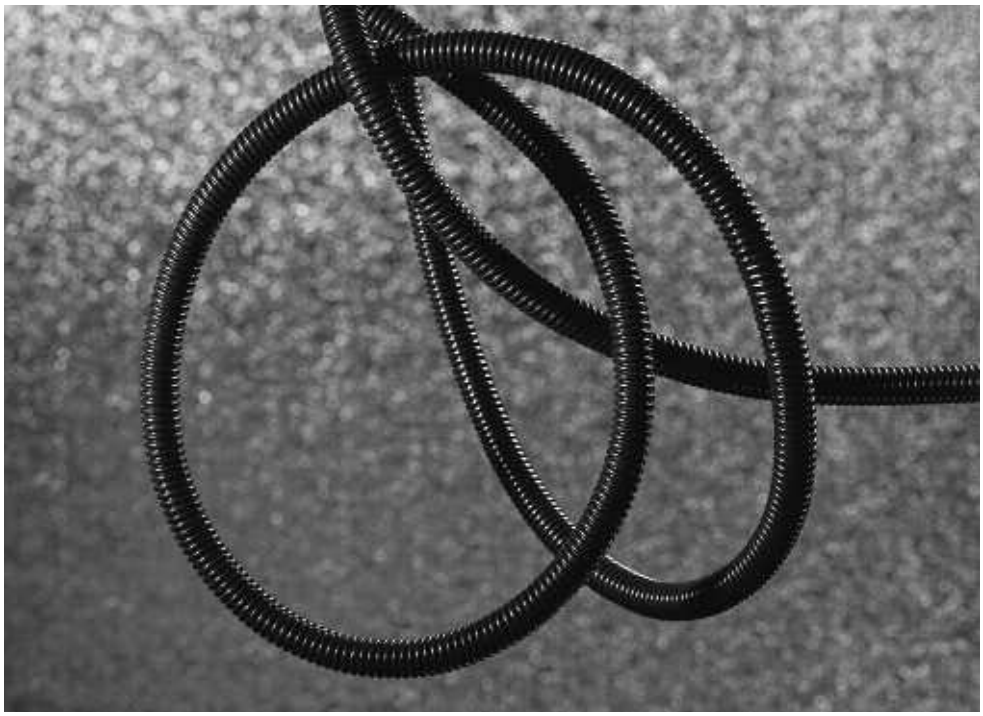
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 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

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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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 shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
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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 _ / _

- **"NM"** - no mark
- **Length** in feet (4 and 25 feet standard)
- **"FR"** - flame-retardant
- **Size**
- **Product Name**

Example: HF-17FRX25/NM

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USA: 1-800-522-6752
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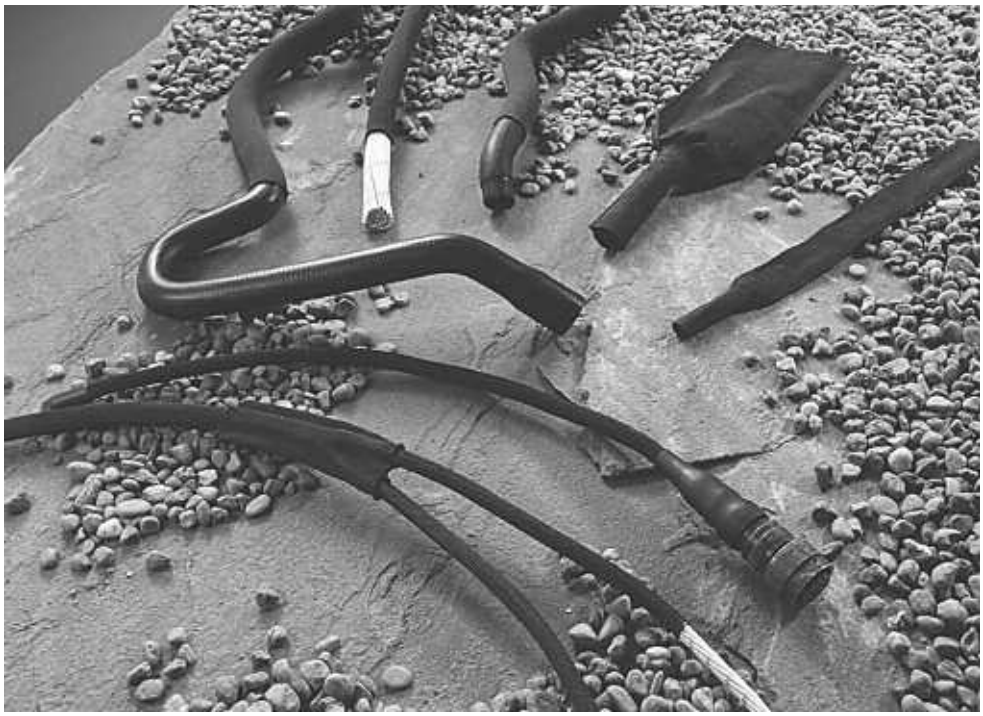
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

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 Rated 135°C	RW-2060

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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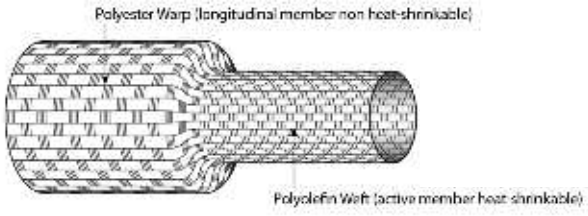
Japan: 81-44-844-8013
UK: 44-800-267-666

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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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

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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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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Japan: 81-44-844-8013
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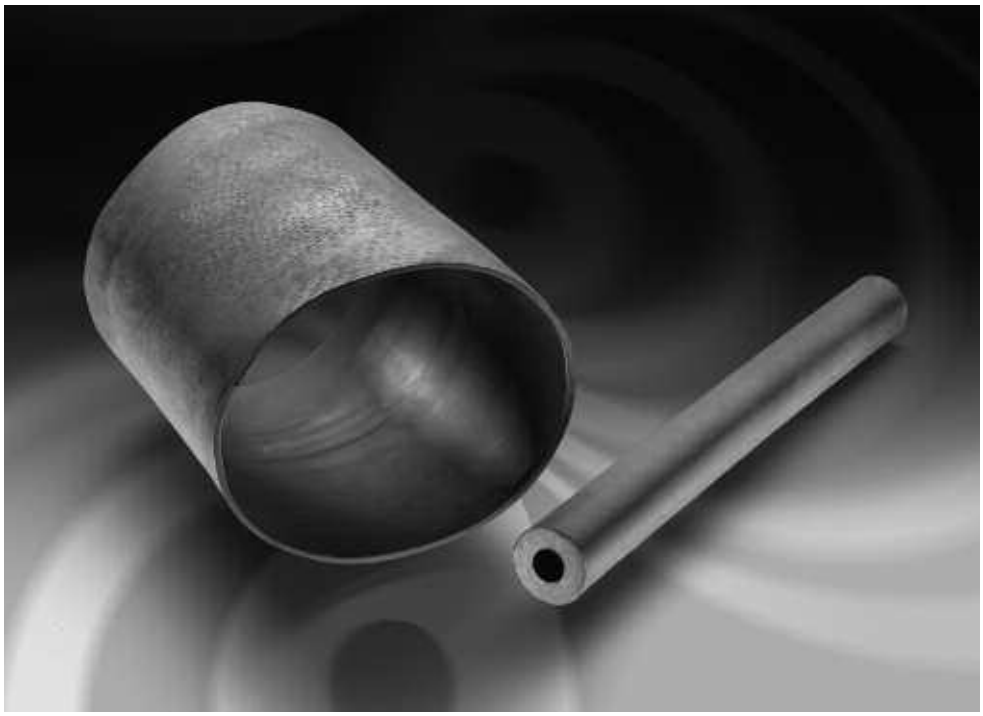
HRHT

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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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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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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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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