SCL

Semirigid, Encapsulant-Lined, Polyolefin Tubing

Product Facts

- 3:1 shrink ratio
- Splash-resistant, moisture-resistant covering; not intended for use where immersion in fluids is required
- Rugged protection against abrasion, vibration, and flexing
- Excellent strain relief and insulation of weak points
- RoHS compliant

Applications

Encapsulates components, splices, and terminations where moisture resistance and mechanical protection are required. Encapsulant melts and flows to fill surface irregularities of the substrate. While still hot, the tubing can be blocked to form a wire breakout.

Installation

Minimum shrink temperature: 125°C [257°F]

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

Operating Temperature Range

-55°C to 110°C [-67°F to 230°F]

Specifications/Approvals

Series	UL	Military	Raychem
SCL	E85381 600 V, 125°C	AMS-DTL-23053/4*, Class 1	RT-1301

*Formerly MIL-I-23053/4 and MIL-DTL-23053/4.

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

SCL (Continued)

Product Dimensions

Size	Additional Standard Color	Inside Diameter		Recovered Wall Thickness**	
		Minimum Expanded as Supplied	Maximum Recovered After Heating	Total Wall After Heating	Meltable Wall After Heating (Nominal)
1/8	Brown	3.2 [0.125]	0.6 [0.023]	0.96 ± 0.15 [0.038 ± 0.006]	0.51 [0.020]
3/16	Gray	4.8 [0.187]	1.5 [0.060]	1.09 ± 0.15 [0.043 ± 0.006]	0.64 [0.025]
1/4	White	6.4 [0.250]	2.0 [0.080]	1.19 ± 0.15 [0.047 ± 0.006]	0.69 [0.027]
3/8	Red	9.5 [0.375]	3.4 [0.135]	1.27 ± 0.18 [0.050 ± 0.007]	0.76 [0.030]
1/2	Blue	12.7 [0.500]	5.0 [0.195]	1.39 ± 0.18 [0.055 ± 0.007]	0.89 [0.035]
3/4	Yellow	19.1 [0.750]	8.0 [0.313]	1.65 ± 0.18 [0.065 ± 0.007]	1.02 [0.040]
1	N/A	25.4 [1.000]	10.2 [0.400]	1.90 ± 0.18 [0.075 ± 0.007]	1.02 [0.040]

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

Ordering Information

Color	Standard	Black (-0) for all sizes, plus one additional color per size per Product Dimensions table.
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, SCL 1/4-0).	

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

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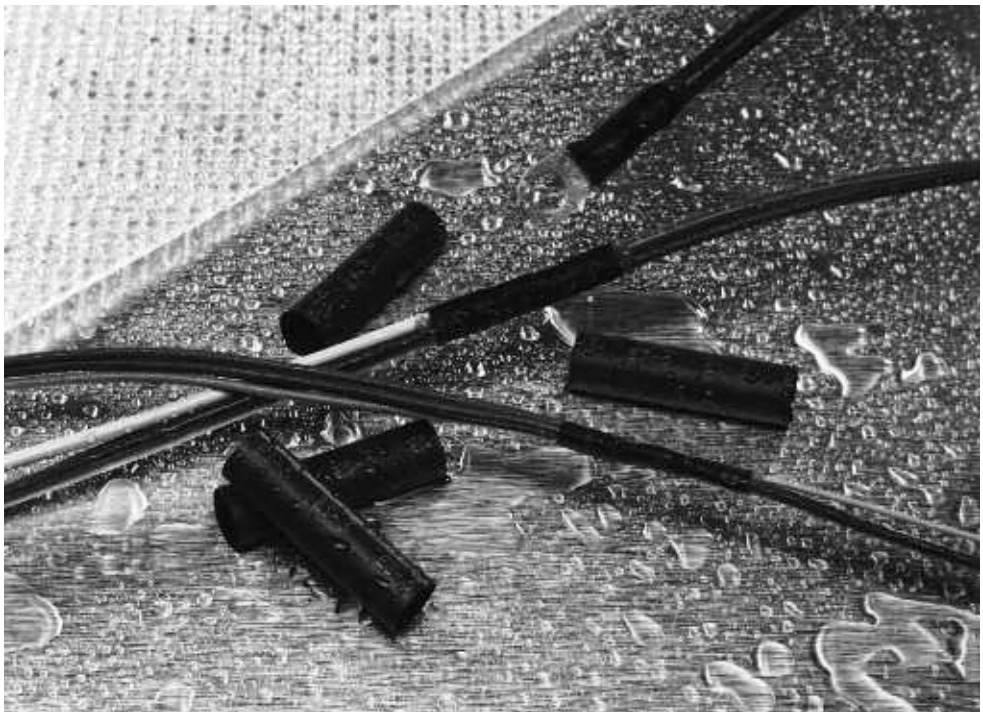
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

SCT

Flame-Retardant, Adhesive-Lined, Semirigid Polyolefin Tubing (Extended Temperature Range)

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**
- **RoHS compliant**



Applications

Specially designed to insulate and seal automotive wire splices and components in an under-the-hood automotive environment. Specially formulated to function at an extended temperature range.

Installation

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

Minimum full recovery temperature: 135°C [266°F]

Operating Temperature Range

-40°C to 150°C [-40°F to 302°F]

Specifications/Approvals

Series	Raychem
SCT	SCT 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

SCT (Continued)

Product Dimensions

Part Number	Inside Diameter		Recovered Wall Thickness*	
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Total Wall After Heating	Meltable Wall After Heating (Nominal)
SCT No. 1	7.6 [0.300]	1.7 [0.065]	1.52 ± 0.30 [0.060 ± 0 .012]	0.76 [0.030]
SCT No. 2	9.0 [0.355]	2.3 [0.090]	1.52 ± 0.30 [0.060 ± 0 .012]	0.76 [0.030]
SCT No. 3	11.6 [0.455]	2.5 [0.100]	2.29 ± 0.30 [0.090 ± 0.012]	1.40 [0.055]
SCT No. 4	17.8 [0.700]	4.4 [0.175]	2.54 ± 0.30 [0.100 ± 0.012]	1.52 [0.060]

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

Ordering Information

Color	Black
Size selection	Always order the largest size that will shrink snugly over the component being covered. Special order sizes are available upon request.
Standard packaging	Cut pieces.
Marking	Tubing will be printed with its numbered size (such as SCT-1, SCT-2, SCT-3, SCT-4).
Ordering description	Specify product name, numbered size, color and cut length (for example, SCT-NO.3-E3-0-75MM).

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UK: 44-800-267-666

SFR

Very Flexible, Flame-Retardant, Silicone Elastomer Tubing

Product Facts

- **Outstanding low-temperature flexibility**
- **Resistance to hydraulic fluids, fuel, and lubricating oil**
- **Very good ablative characteristics: when exposed to flame, surface turns to insulative char or "ablates"**
- **RoHS compliant**

Applications

Provides cable jacketing, harness protection, and strain relief for electronic components, semi-conductor leads, and wire splices. Suitable for applications that require flexibility over a wide range of operating temperatures.

Installation

Minimum shrink temperature: 135°C [285°F]

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

Operating Temperature Range

-75°C to 180°C [-103°F to 356°F]

Specifications/Approvals

Series	Military	Raychem
SFR	AMS-DTL-23053/10* MIL-PRF-46846, Type II, Class 1	RT-1140

*Formerly MIL-I-23053/10 and MIL-DTL-23053/10.

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

SFR (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness**
	Minimum Expanded as Supplied	Maximum Recovered After Heating	After Heating
1/4	6.4 [0.250]	3.6 [0.143]	0.88 ± 0.25 [0.035 ± 0.010]
3/8	9.5 [0.375]	5.4 [0.214]	1.02 ± 0.25 [0.040 ± 0.010]
1/2	12.7 [0.500]	7.3 [0.286]	1.21 ± 0.38 [0.048 ± 0.015]
5/8	15.9 [0.625]	9.1 [0.357]	1.32 ± 0.38 [0.052 ± 0.015]
3/4	19.1 [0.750]	10.9 [0.428]	1.44 ± 0.38 [0.057 ± 0.015]
7/8	22.2 [0.875]	12.7 [0.500]	1.65 ± 0.38 [0.065 ± 0.015]
1	25.4 [1.000]	14.5 [0.570]	1.77 ± 0.51 [0.070 ± 0.020]
1 1/4	31.8 [1.250]	18.1 [0.714]	2.21 ± 0.51 [0.087 ± 0.020]
1 1/2	38.1 [1.500]	21.8 [0.857]	2.41 ± 0.51 [0.095 ± 0.020]
1 3/4	44.5 [1.750]	25.4 [1.000]	2.71 ± 0.51 [0.107 ± 0.020]
2	50.8 [2.000]	29.0 [1.140]	2.79 ± 0.51 [0.110 ± 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, SFR 1/4-0).

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

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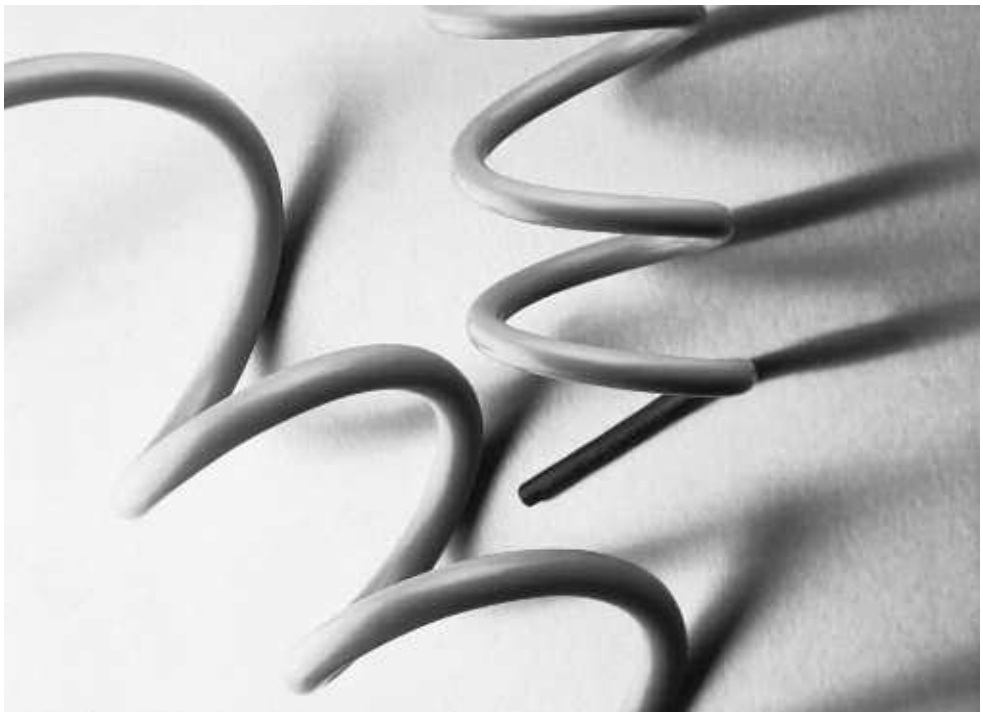
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

SRFR

Highly Flexible, Silicone Rubber Tubing

Product Facts

- Highly flame-retardant
- Extremely flexible at high and low temperatures
- Shrink ratio 1.5:1 minimum except sizes 4/2.9 and 29/20
- RoHS compliant



Applications

Highly flexible and resistant to high and low temperatures. Unlike other silicone materials, SRFR displays outstanding physical strength. It resists extreme heat shocks, and exhibits good thermal insulation. SRFR is non-burning and has outstanding ablative properties as well as excellent physical and electrical properties. SRFR is used in medical equipment where its key properties are outstanding flexibility and ability to withstand exposure to sterilization conditions. Other applications include thyristor power cable insulation, heating element and bus bar insulation, fiber optic bundle sheathing, and rocketry support cable protection.

Installation

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

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

Operating Temperature Range

-75°C to 200°C
[-103°F to 392°F]

Specifications/Approvals

Series	UL	Raychem
SRFR	E85381 VW-1 600V, 200°C	RT-1142 RW-2057

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

SRFR (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness*
	Minimum Expanded as Supplied	Maximum Recovered After Heating	After Heating
2.9/1.7	2.9 [0.114]	1.7 [0.067]	1.0 ± 0.50 [0.039 ± 0.020]
4/2.9	4.0 [0.158]	2.9 [0.114]	1.0 ± 0.50 [0.039 ± 0.020]
7.8/4.6	7.8 [0.307]	4.6 [0.181]	1.0 ± 0.50 [0.039 ± 0.020]
10/6.5	10.0 [0.394]	6.5 [0.256]	1.5 ± 0.50 [0.059 ± 0.020]
15/9.6	15.0 [0.591]	9.6 [0.378]	1.5 ± 0.50 [0.059 ± 0.020]
21/13	21.0 [0.827]	13.0 [0.512]	2.0 ± 0.75 [0.079 ± 0.030]
29/20	29.0 [1.142]	20.0 [0.787]	2.0 ± 0.75 [0.079 ± 0.030]
41/27	41.0 [1.614]	27.0 [1.063]	3.0 ± 1.00 [0.118 ± 0.039]
51/33	51.0 [2.008]	33.0 [1.299]	3.0 ± 1.00 [0.118 ± 0.039]

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

Ordering Information

Color	Standard	Gray (-8)
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, SRFR 2.9/1.7-8).	

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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

SST/SST-FR

Self-Sealing, Heat-Shrinkable Tubing

Product Facts

- Thick adhesive liner forms an effective barrier against fluids and moisture
- Thick-wall insulation, strain relief and abrasion protection
- No need for greases, tape, or epoxy
- Expansion ratios as high as 3:1
- Available in flame-retardant material
- SST has the following agency approvals:
  - ABS (American Bureau of Shipping)
  - Lloyd's (Lloyd's Register of Shipping)
- RoHS compliant

Applications

SST provides a simple, positive splice-sealing method that offers protection under adverse environmental conditions. Tubing supplied with standard sealant provides water sealing and environmental protection in wet or underground applications. The thermoplastic adhesive not only seals, but also provides mechanical strain relief. The polymer tubing has excellent insulating, abrasion-resistance, and strain-relief properties.

Installation

Minimum shrink temperature: 90°C [195°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	Agency	Raychem
SST	—	—		RW-2011
SST-FR	AMS-DTL-23053/15*, Classes 1 and 2	ASTM D 685, nonburning	ABS, Lloyd's	RW-2011

*Formerly MIL-I-23053/I5 and MIL-DTL-23053/15.

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

SST/SST-FR (Continued)

Product Dimensions

Size†	Standard Nominal Length	Inside Diameter		Wall Thickness		Recommended Cable Range for 600-Volt Cable
		Minimum Expanded as Supplied	Maximum Recovered After Heating	Expanded	Nominal Wall After Heating††	
SST*-03	30**, 48	0.300	0.100	0.025	0.070	18 through 14 AWG
SST*-04	30**, 48	0.400	0.150	0.025	0.070	14 through 10 AWG
SST*-07	48	0.750	0.220	0.030	0.095	8 through 1 AWG
SST*-11	48	1.100	0.375	0.040	0.120	2 through 4/0 AWG
SST*-13	48	1.300	0.375	0.035	0.120	2 through 4/0 AWG
SST*-15	48	1.500	0.500	0.050	0.140	2/0 AWG through 500 MCM
SST*-17	48	1.700	0.500	0.045	0.140	2/0 AWG through 500 MCM
SST*-20	48	2.000	0.750	0.050	0.160	350 MCM through 1000 MCM
SST*-27	48	2.700	0.900	0.050	0.160	500 MCM through 1250 MCM
SST*-30	48	3.000	1.250	0.050	0.160	900 MCM through 1500 MCM
SST*-40	48	4.000	1.750	0.050	0.160	1500 MCM through 2500 MCM
SST*-45	48	4.500	1.750	0.050	0.160	1500 MCM through 2500 MCM

†In place of asterisk* substitute length of tubing to be ordered. For example, SST*-11, as the second column indicates, comes in 48-inch lengths, so a 48-inch cut piece of SST tubing would be SST 48-11.
††Wall thickness will be less if tubing recovery is restricted during shrinkage.
**30-inch length standard for /226 coating only.

Ordering Information

Color	Standard	Black
	Nonstandard	White, Red, Yellow 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	See Product Dimensions table.	
Ordering description	Specify product name, cut length, size and color (for example, SST 48-07/FR/97).	

Part Numbering System

SST - _ - _ / _ / _ / _ / _

"NM" - no marking

Color
Black/leave blank (standard)
White/WHT
Red/RED
Yellow/YLW
Clear/CL (non-flame retardant)

Adhesive/sealant
/97 standard with FR
/226 standard with Non FR

"FR" - flame-retardant

Size

Length in inches (48 inch max)

Family

Example: SST-48-07/FR/97/NM

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

TAT-125

Adhesive-Lined, Flexible, Polyolefin Tubing

Product Facts

- 2:1 shrink ratio
- Thin adhesive lining that bonds to outer tubing and surface below, forming a positive environmental seal
- Flexibility of both tubing and adhesive
- Moisture seal that is resistant to bending of the substrate
- Good mechanical strength and cut-through resistance
- Adhesive that bonds to a wide variety of plastics, rubbers, and metals, including polyethylene, neoprene, lead, and steel
- RoHS compliant

Applications

Seals and protects simple in-line splices, bimetallic joints, and components from fluids, moisture, and corrosion. Repairs damaged wire insulation, especially where flexibility is required. Provides one-step electrical insulation and moisture sealing.

Installation

Minimum shrink temperature: 95°C [203°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	UL*	Military	Raychem
TAT-125 Type 1 (colors)	E85381 600 V, 125°C	AMS-DTL-23053/4*, Class 2	RW-3032
TAT-125 Type 2 (clear)	—	—	RW-3032

*Formerly MIL-I-23053/4 and MIL-DTL-23053/4. Sizes 1/4" through 1 1/2" only.

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

TAT-125 (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness**	
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Total Wall After Heating (Nominal)	Adhesive Wall After Heating (Nominal)
1/8	3.2 [0.125]	1.6 [0.062]	0.69 [0.027]	0.23 [0.009]
3/16	4.8 [0.187]	2.4 [0.093]	0.71 [0.028]	0.25 [0.010]
1/4	6.4 [0.250]	3.2 [0.125]	0.74 [0.029]	0.13 [0.005]
3/8	9.5 [0.375]	4.8 [0.187]	0.74 [0.029]	0.13 [0.005]
1/2	12.7 [0.500]	6.4 [0.250]	0.76 [0.030]	0.15 [0.006]
3/4	19.1 [0.750]	9.5 [0.375]	0.89 [0.035]	0.15 [0.006]
1	25.4 [1.000]	12.7 [0.500]	1.07 [0.042]	0.20 [0.008]
1 1/2	38.1 [1.500]	19.1 [0.750]	1.19 [0.047]	0.28 [0.011]

**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), brown (-1), orange (-3), violet (-7), gray (-8), 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, TAT-125 1/4-0).	

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TC Caps

Semirigid, Flame-Retardant Polyolefin Caps

Product Facts

- 2.5:1 shrink ratio
- Flame-retardant
- Permanent or temporary method to terminate wires
- Rapid, simple installation
- Rugged protection against abrasion, vibration, and flexing
- RoHS compliant

Applications

Widely used for wire terminations because of their light weight, small size and durability. Vibration-proof caps are used to insulate and terminate dead-end electrical cables, fixtures, connectors, and other electrical equipment. Also used to protect the ends of wire during storage.

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	Raychem
TC Caps	E85381 600 V, 125°C	TC Caps SCD

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

TC Caps (Continued)

Product Dimensions

Size	Color	Length		Inside Diameter		Recovered Wall Thickness**
		Nominal Overall as Supplied	Minimum Open Barrel after Recovery*	Minimum Expanded as Supplied	Maximum Recovered After Heating	After Heating
TC 4001	White (-9)	19.1 (0.750)	10.2 (0.400)	1.6 (0.063)	0.8 (0.030)	0.51 ± 0.12 (0.020 ± 0.005)
TC 4003	Red (-2)	25.4 (1.000)	14.0 (0.550)	3.2 (0.125)	1.3 (0.050)	0.64 ± 0.12 (0.025 ± 0.005)
TC 4005	Gray (-8)	28.6 (1.125)	14.0 (0.550)	6.4 (0.250)	2.5 (0.100)	0.69 ± 0.12 (0.027 ± 0.005)

*See glossary for definition of “barrel”.
**Wall thickness will be less if tubing recovery is restricted during shrinkage.

Ordering Information

Color	Standard	One color per size per the Product Dimensions table.
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 color (for example, TC-CAPS-4003-2).	

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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

TFE and TFER

High-Temperature, Chemically Inert, Modified Tubing made of PTFE

Product Facts

- **Shrink ratio: 1.8:1 (TFE)**
  3.2:1 (TFER)
- **High flame-resistance**
- **Excellent chemical resistance**
- **RoHS compliant**

Applications

Designed to provide insulation and mechanical protection in severe chemical and thermal environments. Used to cover hydraulic hose and couplings to prevent contamination and corrosion. The high mechanical strength and extremely low coefficient of friction make it good for reducing damage to bearing shafts and similar applications.

Installation

Minimum shrink temperature: 330°C [625°F]

Minimum full recovery temperature: 340°C [644°F]

Operating Temperature Range

-67°C to 250°C
[-88.6°F to 482°F]

Specifications/Approvals

Series	Military	Raychem
TFE, TFER	AMS-DTL-23053/12*, Classes 3 and 5 Def. Stan. 59-97 Type 5A (TFE) Def. Stan. 59-97 Type 5B (TFER)	RW-2055 (TFE) RW-2054 (TFER)

*Formerly MIL-I-23053/12 and MIL-DTL-23053/12.

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

TFE and TFER (Continued)

Product Dimensions

TFE

Size	Inside Diameter		Wall Thickness**
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Nominal Recovered After Heating
30	0.8 [0.032]	0.38 [0.015]	0.23 [0.009]
28	0.9 [0.035]	0.46 [0.018]	0.23 [0.009]
26	1.1 [0.043]	0.56 [0.022]	0.25 [0.010]
24	1.2 [0.047]	0.68 [0.027]	0.25 [0.010]
22	1.4 [0.055]	0.81 [0.032]	0.30 [0.012]
20	1.5 [0.059]	0.99 [0.039]	0.30 [0.012]
18	1.9 [0.075]	1.24 [0.049]	0.30 [0.012]
16	2.3 [0.091]	1.55 [0.061]	0.30 [0.012]
14	3.0 [0.118]	1.83 [0.072]	0.30 [0.012]
12	3.8 [0.150]	2.26 [0.089]	0.30 [0.012]
10	4.8 [0.189]	2.84 [0.112]	0.30 [0.012]
8	6.1 [0.240]	3.58 [0.141]	0.38 [0.015]
6	7.6 [0.299]	4.52 [0.178]	0.38 [0.015]
4	9.4 [0.370]	5.69 [0.224]	0.38 [0.015]
2	10.9 [0.429]	7.06 [0.278]	0.38 [0.015]
0	11.9 [0.469]	8.81 [0.347]	0.38 [0.015]

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

TFER

Size	Inside Diameter		Wall Thickness**
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Nominal Recovered After Heating
5/64	2.0 [0.079]	0.6 [0.024]	0.23 [0.009]
1/8	3.2 [0.126]	1.0 [0.039]	0.25 [0.010]
1/4	6.4 [0.252]	1.6 [0.063]	0.30 [0.012]
3/8	9.5 [0.374]	2.4 [0.095]	0.30 [0.012]
1/2	12.7 [0.500]	3.7 [0.146]	0.38 [0.015]
5/8	15.9 [0.626]	4.5 [0.177]	0.38 [0.015]
3/4	19.0 [0.748]	5.7 [0.224]	0.38 [0.015]
1	25.4 [1.000]	7.1 [0.230]	0.38 [0.015]
1-1/4	32.0 [1.260]	8.8 [0.347]	0.38 [0.015]

**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. 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,TFE 22-X).

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

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Tubing Kits and Mini-Spools

Smaller Packaging Options for Single Wall and Adhesive-Lined Tubing Products

Product Facts

- **VERSAFIT and RNF-100 tubing: 2:1 shrink ratio**
- **DWP-125: 3:1 shrink ratio**
- **ES1000: 4:1 shrink ratio**
- **VERSAFIT tubing's low full recovery temperature reduces installation time and the risk of damage to temperature-sensitive components**
- **RNF-100 offers excellent physical, chemical, and electrical properties that meet or exceed commercial, industrial and military standards for highly reliable, general purpose tubing**
- **DWP-125 and ES1000 have high-shrink-ratios to allow for insulation and sealing of irregular shapes; few sizes cover a wide range of diameters**
- **RoHS compliant**

Applications

Single wall VERSAFIT and RNF-100 tubing provide electrical insulation and strain relief of in-line components, electrical connections, wire terminations, and splices. They can be used to bundle wires for flexible light duty harnesses. Also to identify or color code wires, cables, terminals and electronic components.

Adhesive-lined DWP-125 and ES1000 environmentally seal and protect a wide variety of electrical applications, including wire splices, terminations, breakouts and connector-to-cable transitions.

Installation

Minimum full recovery temperature:

VERSAFIT: 90°C [194°F]

RNF-100: 121°C [250°F]

DWP-125: 125°C [257°F]

ES1000: 135°C [275°F]

Operating Temperature Range

VERSAFIT and RNF-100:
-55°C to 135°C
[-67°F to 275°F]

DWP-125:
-40°C to 110°C
[-40°F to 230°F]

ES1000:
-40°C to 130°C
[-40°F to 266°F]

Specifications/Approvals

Series	UL	CSA	Raychem
VERSAFIT	E35586 VW-1 600 V, 125°C	LR31929 VW-1 600 V, 125°C	RW-3009
RNF-100	E35586 600 V, 125°C	LR31929 600 V, 125°C	RT-350
DWP-125	E35586 600 V, 125°C	—	DWP-125 SCD
ES1000	E85381 600 V, 125°C	—	RT-1113

Available in:	Americas	Europe	Asia Pacific
	■		■

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

Tubing Kits and Mini-Spools (Continued)

Single Wall Tubing

KIT 1 – 2 to 1 Shrink Ratio • Black • 600V, 125°C, UL/CSA VW-1

(KIT 1 PN: A55251-000)

Expanded I.D.	Quantity (6 Inch Pieces)	Fits Wire Gauge Size	Refill Part Number
VERSAFIT-3/16"	30	18 – 14 AWG	D76139-000
VERSAFIT-1/4"	28	12 – 10 AWG	F37063-000
VERSAFIT-3/8"	24	8 AWG	D27573-000
VERSAFIT-1/2"	20	6 –3 AWG	C02462-000
VERSAFIT-3/4"	14	2 – 1/0 AWG	A92664-000
VERSAFIT-1"	10	2/0 – 4/0 AWG	C21270-000

KIT 2 – 2 to 1 Shrink Ratio • 7 Colors • 600V, 125°C, UL/CSA VW-1 (except clear)**

(KIT 2 PN: D54859-000)

Expanded I.D.	Quantity (6 Inch Pieces)	Fits Wire Gauge Size	Refill Part Number
VERSAFIT-3/32"	35	18 AWG	E31091-000
VERSAFIT-1/8"	28	16 AWG	349256-000
VERSAFIT-3/16"	21	14 AWG	C53800-000
VERSAFIT-1/4"	21	12 – 10 AWG	C87605-000
VERSAFIT-3/8"	14	8 AWG	A82691-000
VERSAFIT-1/2"	14	6 – 3 AWG	E10896-000

**Clear tubing in Kit 2 and Kit 2 Refills is RNF-100.

Adhesive-Lined Tubing

KIT 3 – Black/White/Red/Clear • 600V, 125°C, UL

(KIT 3 PN: E42160-000)

Expanded I.D.	Quantity (6 Inch Pieces)	Fits Wire Gauge Size		Refill Part Number
DWP-125-1/8"	25	20 – 16 AWG	(3 to 1 Shrink Ratio)	D14889-000
DWP-125-3/16"	25	14 –10 AWG	(3 to 1 Shrink Ratio)	E87367-000
DWP-125-1/4"	24	12 –10 AWG	(3 to 1 Shrink Ratio)	F91864-000
DWP-125-1/2"	10	6 –3 AWG	(3 to 1 Shrink Ratio)	F41454-000
DWP-125-3/4"	5	2 – 1/0 AWG	(3 to 1 Shrink Ratio)	C67617-000
DWP-125-1"	3	2/0 – 4/0 AWG	(3 to 1 Shrink Ratio)	F66623-000
ES1000-NO.1	6	16 – 12 AWG	(4 to 1 Shrink Ratio)	
ES1000-NO.2	5	12 – 10 AWG	(4 to 1 Shrink Ratio)	
ES1000-NO.3	5	10 – 8 AWG	(4 to 1 Shrink Ratio)	
ES1000-NO.4	3	6 –3 AWG	(4 to 1 Shrink Ratio)	

KITS 1, 2 and 3 are comprised of a durable six section plastic box with hinged lid. Inside the lid are product selection guidelines. Ask your Sales Representative about KIT 4 and KIT 6, our Economy Tubing Kits in a reclosable plastic bag, also used on "point of sale" racks. Here are Part Numbers for those Kits and their content:
KIT 4: E32151-000 (Three pieces each of 3/16", 1/4", 3/8", 1/2", 3/4" and 1" Black tubing in 6 inch pieces)
KIT 6: C72402-000 (Three pieces each of 3/64", 1/16", 3/32" and 1/8" Black tubing in 6 inch pieces)

VERSAFIT MINI-SPOOLS

2 to 1 Shrink Ratio • Black • 600V, 125°C, UL/CSA VW-1

Expanded I.D.	Quantity (Feet)	Part Number
VERSAFIT-3/64"	100	C16404-000
VERSAFIT-1/16"	75	E40870-000
VERSAFIT-3/32	65	D70981-000
VERSAFIT-1/8"	60	C17600-000
VERSAFIT-3/16"	50	F27135-000
VERSAFIT-1/4"	40	F64479-000
VERSAFIT-3/8"	35	D57591-000
VERSAFIT-1/2"	30	E37316-000
VERSAFIT-3/4"	25	449582-000
VERSAFIT-1"	15	F27156-000

VERSAFIT is a very flexible, highly flame-retardant polyolefin tubing, 90°C full recovery temperature, good fluid resistance with a UL 224/CSA VW-1 flammability rating.

RNF-100 MINI-SPOOLS

2 to 1 Shrink Ratio • Black • 600V, 125°C, UL/CSA

Expanded I.D.	Quantity (Feet)	Part Number
RNF-100-3/64"	100	D00409-000
RNF-100-1/16"	75	A66551-000
RNF-100-3/32	65	D42391-000
RNF-100-1/8"	60	F56629-000
RNF-100-3/16"	50	E77288-000
RNF-100-1/4"	40	F75818-000
RNF-100-3/8"	35	D12330-000
RNF-100-1/2"	30	A81736-000
RNF-100-3/4"	25	E40866-000
RNF-100-1"	15	E62131-000

RNF-100 is a flexible, flame-retardant polyolefin tubing, 121°C full recovery temperature, excellent fluid resistance with a UL 224/CSA All Tubing flammability rating.

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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

TUGA-GP

Shiny, Non-Flame-Retardant, Polyolefin Tubing

Product Facts

- 2:1 shrink ratio
- Can be easily hot-stamped
- Bright, shiny surface
- Semiflexible, non-flame-retardant, halogen-free
- Conforms to substrates more uniformly and with less longitudinal change than most PVC-based materials
- RoHS compliant

Applications

TUGA-GP is a commercial grade tubing for general applications where a flame-retardant product is not needed but where electrical insulation and mechanical performance are important. TUGA-GP makes an attractive covering for many automotive, appliance, and consumer-goods applications.

Installation

Minimum shrink temperature: 85°C [85°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
TUGA-GP	RW-2201

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

TUGA-GP (Continued)

Product Dimensions

Size	Inside Diameter		Wall Thickness*
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Nominal After Heating
1.2/0.6	1.2 [0.046]	0.6 [0.023]	0.4 [0.016]
1.6/0.8	1.6 [0.062]	0.8 [0.031]	0.4 [0.016]
2.4/1.2	2.4 [0.093]	1.2 [0.046]	0.5 [0.019]
3/1.5	3.0 [0.118]	1.5 [0.059]	0.5 [0.019]
5/2.5	5.0 [0.197]	2.5 [0.098]	0.5 [0.019]
6.4/32	6.4 [0.250]	3.2 [0.125]	0.6 [0.024]
8/4	8.0 [0.315]	4.0 [0.157]	0.6 [0.024]
9.5/4.8	9.5 [0.375]	4.8 [0.187]	0.6 [0.024]
11/5.5	11.0 [0.433]	5.5 [0.217]	0.6 [0.024]
12.7/6.4	12.7 [0.500]	6.4 [0.250]	0.6 [0.024]
15/7.5	15.0 [0.591]	7.5 [0.295]	0.8 [0.031]
20/10	20.0 [0.787]	10.0 [0.394]	0.8 [0.031]
25.4/12.7	25.4 [1.000]	12.7 [0.500]	0.9 [0.035]
38/19	38.0 [1.496]	19.0 [0.748]	1.0 [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 available upon request.
Standard packaging	On spools.
Ordering description	Specify product name, size and color (for example, TUGA 3/1.5-0).

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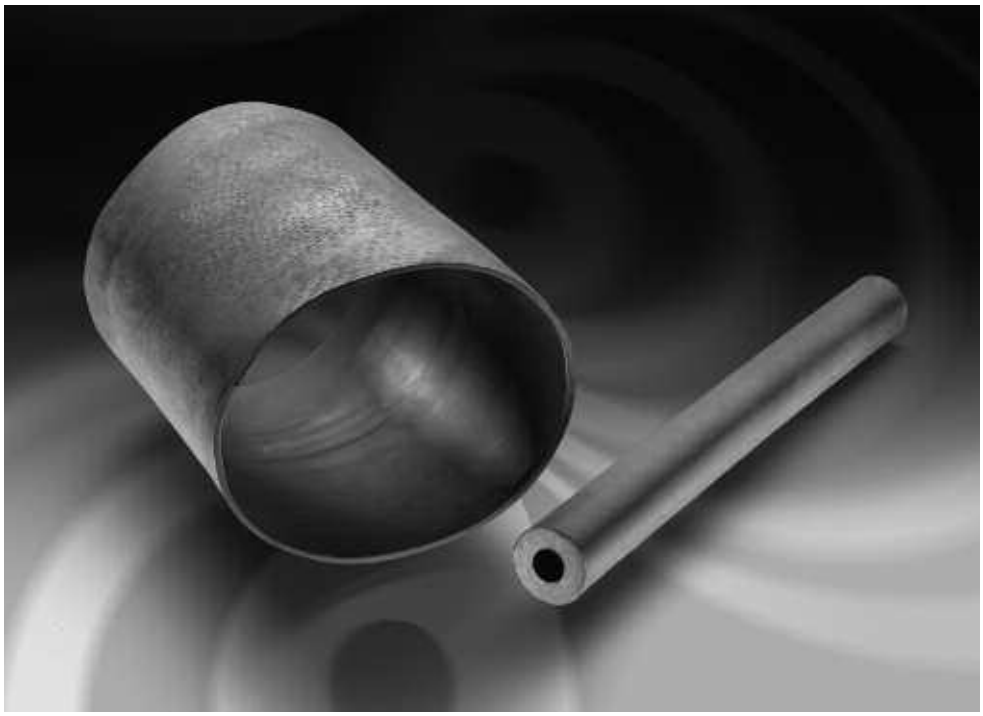
Japan: 81-44-844-8013
UK: 44-800-267-666

URHT

Ultra-High-Ratio, Flame-Retardant, Polyolefin Heat-Shrinkable Tubing

Product Facts

- Shrink ratios as high as 8:1
- 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

Ultra-high-shrink-ratio, heat-shrinkable tubing, with expansion ratios as high as 8-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. Cable harnesses can be repaired and released without disassembly. This product can be used to seal the back end of a connector or simply repair a damaged outer insulation of a cable or wire.

URHT tubing is available with or without a hot melt adhesive lining.

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
URHT	SAE-AS81765/1, Type II*	URHT SCD

*heat-shrinkable, crosslinked, flexible polyolefin

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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

URHT (Continued)

Product Dimensions

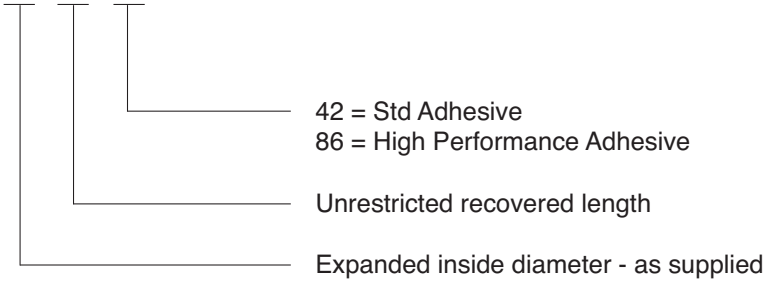
Size	Inside Diameter		Wall Thickness	
	Minimum Expanded as Supplied	Maximum Recovered After Heating	Nominal Recovered After Heating	Unrestricted Full Recovered Length ± 6.35 (.250)
URHT-200	50.80 (2.000)	5.84 (0.230)	3.56 (0.140)	7.62, 101.60, 152.40, 254.00 (3, 4, 6, 10)
URHT-300	76.20 (3.000)	8.64 (0.340)	3.56 (0.140)	7.62, 101.60, 152.40, 254.00 (3, 4, 6, 10)

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, cut length and color (for example, URHT-200-10-0).	

Part Numbering System

URHT - _ / _ / _



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

Versafit

Highly Flame-Retardant, Very Flexible, Low-Shrink-Temperature, Polyolefin Tubing

Product Facts

- 2:1 shrink ratio
- Low shrink temperature reduces installation time and the risk of damage to temperature-sensitive components
- Very flexible; doesn't easily wrinkle when bent
- Highly flame-retardant
- Hot stamps extremely well
- Higher temperature rating, better thermal stability, and higher resistance to physical abuse than noncrosslinked materials
- Free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs and PBBEs), which are classified as environmentally hazardous substances
- RoHS compliant

Applications

Cost-effective choice for many commercial and military applications; electrically insulates and protects in-line components, disconnect terminals, and splices. Bundles wires for very flexible light-duty harnesses. Strain-relieves electrical wire connections for commercial applications. Identifies or color-codes wires, cables, terminals, and components.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-55°C to 135°C
[-67°F to 275°F]

Specifications/Approvals

Series	UL	CSA	Military	Raychem
Versafit	E35586 VW-1 600 V, 125°C	LR31929 VW-1 600 V, 125°C	AMS-DTL-23053/5* Classes 1 & 3	RW-3009

*Formerly MIL-I-23053/5 and MIL-DTL-23053/5.

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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UK: 44-800-267-666

Versafit (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness**
	Expanded as Supplied	Maximum Recovered After Heating	After Heating
3/64	1.63 ± 0.2 [0.064 ± 0.008]	0.6 [0.023]	0.40 ± 0.08 [0.016 ± 0.003]
1/16	1.85 ± 0.2 [0.073 ± 0.008]	0.8 [0.031]	0.43 ± 0.08 [0.017 ± 0.003]
3/32	2.79 ± 0.2 [0.110 ± 0.008]	1.2 [0.046]	0.51 ± 0.08 [0.020 ± 0.003]
1/8	3.43 ± 0.2 [0.135 ± 0.008]	1.6 [0.062]	0.51 ± 0.08 [0.020 ± 0.003]
3/16	5.21 ± 0.3 [0.205 ± 0.010]	2.4 [0.093]	0.51 ± 0.08 [0.020 ± 0.003]
1/4	7.11 ± 0.3 [0.280 ± 0.010]	3.2 [0.125]	0.64 ± 0.08 [0.025 ± 0.003]
3/8	10.16 ± 0.4 [0.400 ± 0.015]	4.8 [0.187]	0.64 ± 0.08 [0.025 ± 0.003]
1/2	13.72 ± 0.4 [0.540 ± 0.015]	6.4 [0.250]	0.64 ± 0.08 [0.025 ± 0.003]
5/8***	16.90 ± 0.4 [0.665 ± 0.015]	8.0 [0.315]	0.76 ± 0.08 [0.030 ± 0.003]
3/4	20.45 ± 0.4 [0.805 ± 0.015]	9.5 [0.375]	0.76 ± 0.08 [0.030 ± 0.003]
1	26.80 ± 0.4 [1.055 ± 0.015]	12.7 [0.500]	0.89 ± 0.12 [0.035 ± 0.005]
1 1/4***	33.40 ± 0.7 [1.315 ± 0.025]	15.9 [0.625]	1.02 ± 0.15 [0.040 ± 0.006]
1 1/2	39.88 ± 0.8 [1.570 ± 0.030]	19.1 [0.750]	1.02 ± 0.15 [0.040 ± 0.006]
2	52.83 ± 1.0 [2.080 ± 0.040]	25.4 [1.000]	1.14 ± 0.16 [0.045 ± 0.007]
3	78.49 ± 1.0 [3.090 ± 0.040]	38.1 [1.500]	1.27 ± 0.20 [0.050 ± 0.008]
4	104.14 ± 1.3 [4.100 ± 0.050]	50.8 [2.000]	1.40 ± 0.23 [0.055 ± 0.009]

**Wall thickness will be less if tubing recovery is restricted during shrinkage.
***Nonstandard size; available by special order only.

Ordering Information

Color	Standard	Black (-0), white (-9), red (-2), blue (-6), yellow (-4)
	Nonstandard	Brown (-1), orange (-3), green (-5), violet (-7), gray (-8)
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, Versafit 1/4-0).	

****Available in the convenient Mini-Spool packaging/dispensing system, for sizes 3/64” up to 1” (black only).
*****Europe only. For supply to MIL, Def Stan and BS add -MS, -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

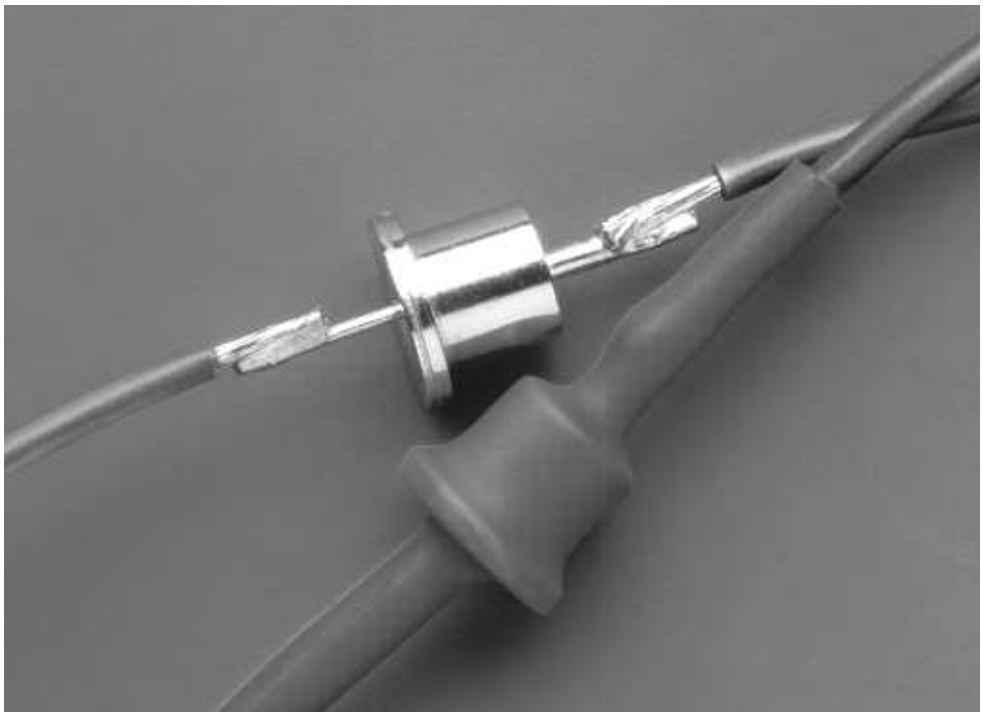
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

Versafit-3X

Very Flexible, High-Shrink-Ratio, Highly Flame-Retardant, Low-Shrink-Temperature, Polyolefin Tubing

Product Facts

- **Highly flame-retardant**
- **3:1 shrink ratio easily accommodates irregular shapes; few sizes cover a wide range of diameters**
- **Low shrink temperature reduces installation time and the risk of damage to temperature-sensitive components**
- **Free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs and PBBEs) which are classified as environmentally hazardous substances**
- **RoHS compliant**



Applications

Provides electrical insulation and strain relief of in-line components, electrical connections, wire terminations, and splices. Bundles wires for flexible light duty harnesses. Identifies or color codes wires, cables, terminals and electrical and electronic components.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-55°C to 135°C
[-67°F to 275°F]

Specifications/Approvals

Series	UL	CSA	Raychem
Versafit-3X	E35586 VW-1 600 V, 125°C	LR31929 VW-1 600 V, 125°C	RW-3009

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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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

Versafit-3X (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)	1.1 (0.042)	0.58 ± 0.08 (0.023 ± 0.003)
1/4	6.4 (0.250)	2.2 (0.083)	0.58 ± 0.08 (0.023 ± 0.003)
3/8	9.5 (0.375)	3.2 (0.125)	0.61 ± 0.08 (0.024 ± 0.003)
1/2	12.7 (0.500)	4.3 (0.166)	0.61 ± 0.08 (0.024 ± 0.003)
3/4	19.1 (0.750)	6.4 (0.250)	0.61 ± 0.08 (0.024 ± 0.003)
1	25.4 (1.000)	8.5 (0.333)	0.64 ± 0.08 (0.025 ± 0.003)

*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), brown (-1), orange (-3), violet (-7), gray (-8)
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, Versafit-3X-1/4-0).	

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

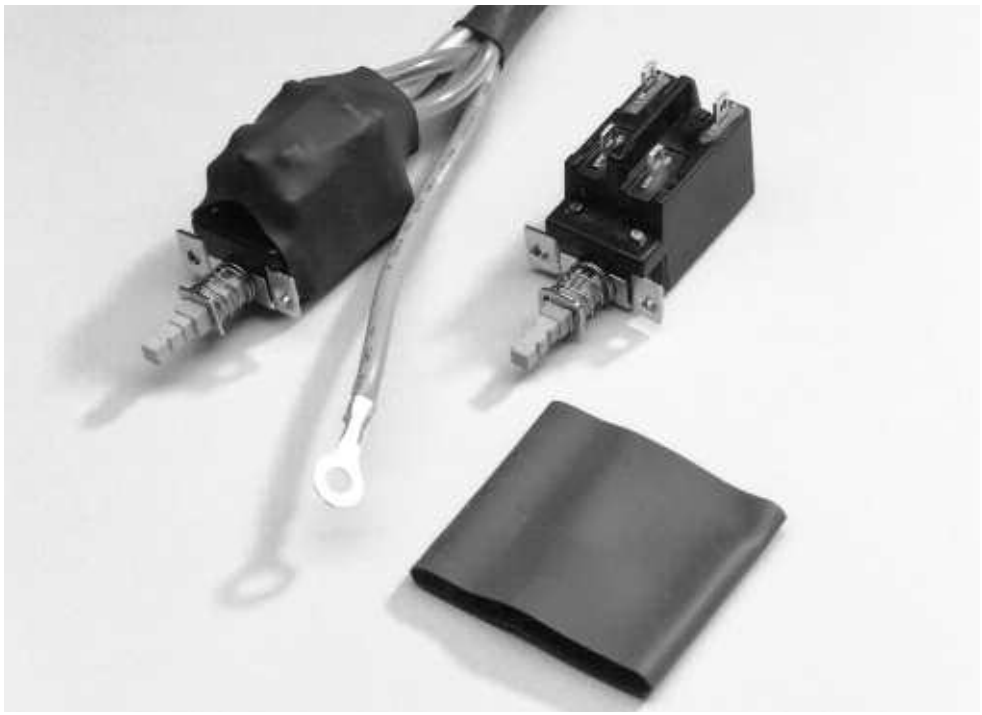
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

Versafit V2

Highly Flame-Retardant, Very Flexible, Low-Shrink-Temperature, Polyolefin Tubing

Product Facts

- **2:1 shrink ratio**
- **Low shrink temperature reduces installation time and the risk of damage to temperature-sensitive components**
- **Very flexible; doesn't easily wrinkle when bent**
- **Highly flame-retardant**
- **Hot stamps extremely well**
- **Higher temperature rating, better thermal stability, and higher resistance to physical abuse than noncrosslinked materials**
- **Free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs and PBBEs), which are classified as environmentally hazardous substances**
- **RoHS compliant**



Applications

Cost-effective choice for many commercial applications; electrically insulates and protects in-line components, disconnect terminals, and splices. Bundles wires for very flexible light-duty harnesses. Strain-relieves electrical wire connections. Identifies or color-codes wires, cables, terminals, and components.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-30°C to 125°C [-22°F to 257°F]

Specifications/Approvals

Series	UL	CSA	Raychem
Versafit V2	E35586 VW-1 600 V, 125°C	LR31929 VW-1 600 V, 125°C	RW-3023

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

Versafit V2 (Continued)

Product Dimensions

Size	Inside Diameter		Wall Thickness	
	Expanded as Supplied	Maximum Recovered After Heating	Expanded as Supplied (Nominal)	Recovered* After Heating (Minimum)
1.0	1.5 ± 0.2 [0.059 ± 0.008]	0.50 [0.020]	0.20 [0.008]	0.33 [0.013]
1.5	2.1 ± 0.2 [0.075 ± 0.008]	0.75 [0.030]	0.20 [0.008]	0.35 [0.014]
2.0	2.6 ± 0.2 [0.102 ± 0.008]	1.00 [0.039]	0.25 [0.010]	0.43 [0.017]
2.5	3.1 ± 0.2 [0.122 ± 0.008]	1.25 [0.049]	0.25 [0.010]	0.43 [0.017]
3.0	3.6 ± 0.2 [0.142 ± 0.008]	1.50 [0.059]	0.25 [0.010]	0.43 [0.017]
3.5	4.1 ± 0.3 [0.161 ± 0.012]	1.75 [0.069]	0.25 [0.010]	0.43 [0.017]
4.0	4.6 ± 0.3 [0.181 ± 0.012]	2.00 [0.079]	0.25 [0.010]	0.43 [0.017]
5.0	5.6 ± 0.3 [0.221 ± 0.012]	2.50 [0.098]	0.30 [0.012]	0.56 [0.022]
6.0	6.6 ± 0.3 [0.260 ± 0.012]	3.00 [0.118]	0.30 [0.012]	0.56 [0.022]
7.0	7.6 ± 0.3 [0.299 ± 0.012]	3.50 [0.138]	0.30 [0.012]	0.56 [0.022]
8.0	8.6 ± 0.3 [0.339 ± 0.012]	4.00 [0.158]	0.30 [0.012]	0.56 [0.022]
9.0	9.6 ± 0.3 [0.378 ± 0.012]	4.50 [0.177]	0.30 [0.012]	0.56 [0.022]
10.0	10.4 ± 0.3 [0.409 ± 0.012]	5.00 [0.197]	0.30 [0.012]	0.56 [0.022]
11.0	11.4 ± 0.3 [0.449 ± 0.012]	5.50 [0.217]	0.30 [0.012]	0.56 [0.022]
12.0	12.7 ± 0.3 [0.500 ± 0.012]	6.00 [0.236]	0.30 [0.012]	0.56 [0.022]
13.0	13.5 ± 0.3 [0.532 ± 0.012]	6.50 [0.256]	0.35 [0.014]	0.66 [0.026]
14.0	14.4 ± 0.4 [0.567 ± 0.016]	7.00 [0.276]	0.35 [0.014]	0.68 [0.027]
15.0	15.7 ± 0.4 [0.618 ± 0.016]	7.50 [0.295]	0.35 [0.014]	0.68 [0.027]
16.0	16.9 ± 0.4 [0.665 ± 0.016]	8.00 [0.315]	0.35 [0.014]	0.68 [0.027]
18.0	19.0 ± 0.4 [0.748 ± 0.016]	9.00 [0.354]	0.40 [0.016]	0.76 [0.030]
20.0	21.4 ± 0.4 [0.843 ± 0.016]	10.00 [0.394]	0.40 [0.016]	0.76 [0.030]
22.0	23.2 ± 0.4 [0.913 ± 0.016]	11.00 [0.433]	0.45 [0.018]	0.89 [0.035]
25.0	26.8 ± 0.4 [1.055 ± 0.016]	12.50 [0.492]	0.45 [0.018]	0.89 [0.035]
27.0	28.2 ± 0.5 [1.110 ± 0.020]	12.50 [0.492]	0.45 [0.018]	0.89 [0.035]
28.0	30.0 ± 0.5 [1.181 ± 0.020]	14.00 [0.551]	0.45 [0.018]	0.89 [0.035]
30.0	32.1 ± 0.5 [1.264 ± 0.020]	15.00 [0.591]	0.45 [0.018]	0.89 [0.035]

*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), orange (-3), violet (-7), brown (-1), gray (-8)
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, V2-3.0-0).	

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

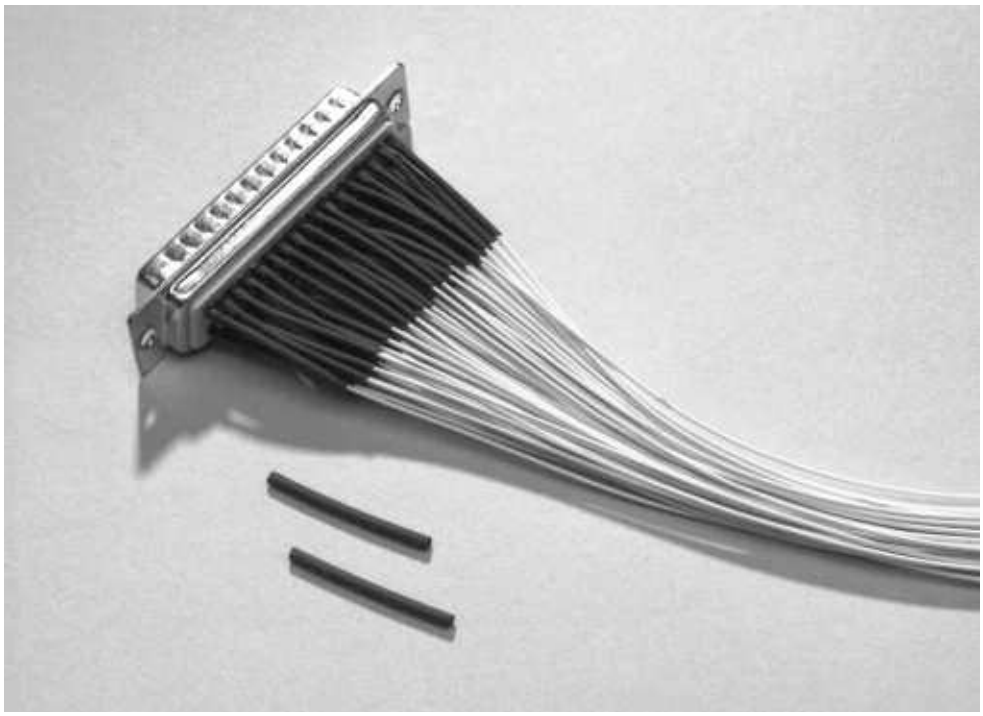
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

Versafit V4

Very-Thin-Wall, Very Flexible, Highly Flame-Retardant, Polyolefin Tubing

Product Facts

- **2:1 shrink ratio**
- **Very thin wall provides space savings and rapid shrinking**
- **Low shrink temperature further reduces installation time and risk of damage to temperature-sensitive components**
- **Very flexible; doesn't easily wrinkle when bent**
- **Free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs and PBBEs), which are classified as environmentally hazardous substances**
- **RoHS compliant**



Applications

Typically used where space saving is important. Offers the ability to pack components more closely than is possible with standard tubings. Cost-effective choice for many commercial applications; electrically insulates and protects in-line components, disconnect terminals, and splices. Used for strain relief on high-density connectors.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-30°C to 125°C
[-22°F to 257°F]

Specifications/Approvals

Series	UL	CSA	Raychem
Versafit V4	E85381 VW-1 300 V, 125°C	LR31929 VW-1 150 V, 125°C	RW-3023

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

Versafit V4 (Continued)

Product Dimensions

Size	Inside Diameter		Wall Thickness	
	Expanded as Supplied	Maximum Recovered After Heating	Expanded as Supplied (Nominal)	Recovered* After Heating (Minimum)
0.6	0.95 ± 0.25 [0.037 ± 0.010]	0.30 [0.012]	0.10 [0.004]	0.25 [0.010]
0.8	1.20 ± 0.25 [0.047 ± 0.010]	0.40 [0.016]	0.10 [0.004]	0.25 [0.010]
1.0	1.40 ± 0.25 [0.055 ± 0.010]	0.50 [0.020]	0.10 [0.004]	0.25 [0.010]
1.5	1.90 ± 0.25 [0.075 ± 0.010]	0.75 [0.030]	0.10 [0.004]	0.25 [0.010]
2.0	2.30 ± 0.25 [0.091 ± 0.010]	1.00 [0.039]	0.10 [0.004]	0.25 [0.010]
2.5	2.80 ± 0.25 [0.110 ± 0.010]	1.25 [0.049]	0.15 [0.006]	0.25 [0.010]
3.0	3.30 ± 0.25 [0.130 ± 0.010]	1.50 [0.059]	0.15 [0.006]	0.25 [0.010]
3.5	3.80 ± 0.25 [0.150 ± 0.010]	1.75 [0.069]	0.15 [0.006]	0.25 [0.010]
4.0	4.40 ± 0.25 [0.173 ± 0.010]	2.00 [0.079]	0.15 [0.006]	0.25 [0.010]
5.0	5.50 ± 0.25 [0.217 ± 0.010]	2.50 [0.098]	0.15 [0.006]	0.25 [0.010]
6.0	6.50 ± 0.40 [0.256 ± 0.016]	3.00 [0.118]	0.15 [0.006]	0.28 [0.011]
7.0	7.50 ± 0.40 [0.295 ± 0.016]	3.50 [0.138]	0.15 [0.006]	0.28 [0.011]
8.0	8.50 ± 0.40 [0.335 ± 0.016]	4.00 [0.158]	0.15 [0.006]	0.28 [0.011]
9.0	9.50 ± 0.40 [0.374 ± 0.016]	4.50 [0.177]	0.15 [0.006]	0.28 [0.011]
10.0	10.50 ± 0.50 [0.413 ± 0.020]	5.00 [0.197]	0.15 [0.006]	0.28 [0.011]

Inch 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]	0.30 ± 0.05 [0.012 ± 0.002]
1/16	1.6 [0.062]	0.8 [0.031]	0.30 ± 0.05 [0.012 ± 0.002]
3/32	2.4 [0.093]	1.2 [0.046]	0.30 ± 0.05 [0.012 ± 0.002]
1/8	3.2 [0.125]	1.6 [0.062]	0.33 ± 0.05 [0.013 ± 0.002]
3/16	4.8 [0.187]	2.4 [0.093]	0.33 ± 0.05 [0.013 ± 0.002]
1/4	6.4 [0.250]	3.2 [0.125]	0.36 ± 0.08 [0.014 ± 0.003]
3/8	9.5 [0.375]	4.8 [0.187]	0.36 ± 0.08 [0.014 ± 0.003]
1/2	12.7 [0.500]	6.4 [0.250]	0.36 ± 0.08 [0.014 ± 0.003]
3/4	19.1 [0.750]	9.5 [0.375]	0.43 ± 0.08 [0.017 ± 0.003]
1	25.4 [1.000]	12.7 [0.500]	0.51 ± 0.08 [0.020 ± 0.003]

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

Ordering Information

Color	Standard	Black (-0)
	Nonstandard	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	On spools.	
Marking	Marked with UL/CSA/-F- legends (metric sizes) or unmarked (inch sizes).	
Ordering description	Specify product name, size (mm or in.) and color (for example, V4-1.0-0).	

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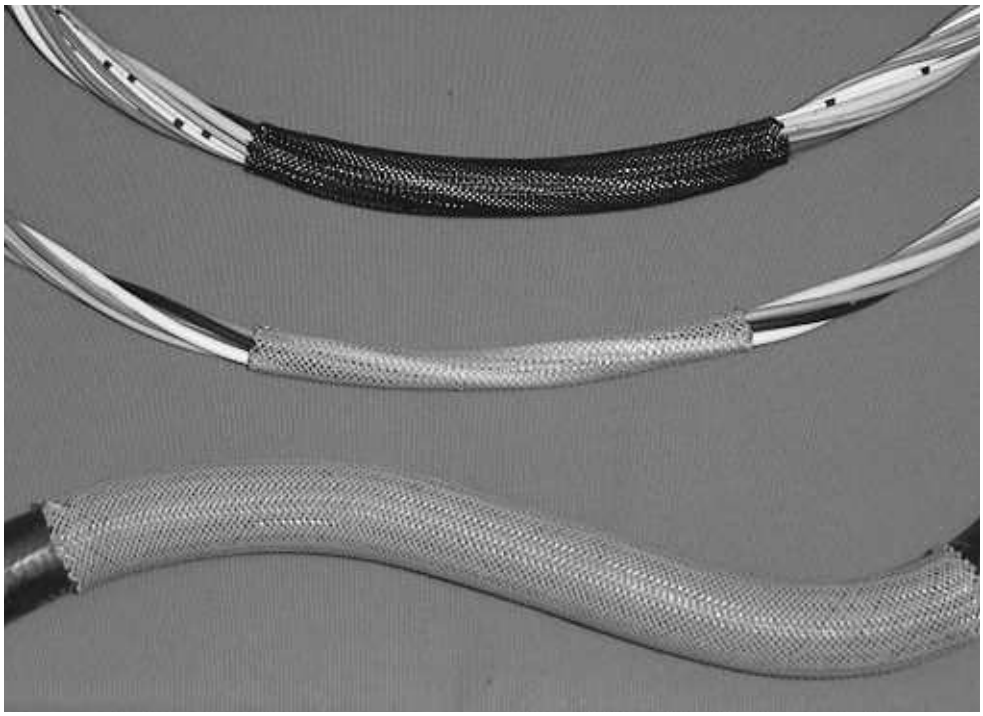
UK: 44-800-267-666

Versaflex

Expandable, Braided, Polyester Sleeving

Product Facts

- Excellent abrasion and cut-through resistance
- Lightweight
- Flexible (even at low temperatures)
- Fungus proof
- Not affected by most chemical and solvents, non-hygroscopic
- Versaflex-FR sleeving meets UL VW-1 and is self-extinguishing
- Wide range of sizes available
- RoHS compliant



Applications

Versaflex sleeving is suited for the mechanical protection of wire harnesses, hoses, and all other applications where exceptional flexibility combined with superior abrasion/cut resistance is required. It also serves as an economical means for wire bundling that will not trap heat or moisture; expanding easily to fit over irregular shapes, then contracting to conform and grip. To prevent fraying, these products should be cut to length using a hot knife.

Installation

This product is cold applied.

Operating Temperature Range

-50°C to 150°C
[-58°F to 302°F]

(220°C [-58°F to 302°F] for short periods)

Specifications/Approvals

Series	UL	Raychem
Versaflex-FR	E306976 VW-1, 125°C	
Versaflex	—	RK-6772

Available in:	Americas	Europe	Asia Pacific
		■	■

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

Versaflex (Continued)

Product Dimensions

Versaflex (metric)		
Nominal Size	Size Range	
	Minimum	Maximum
3 (0.118)	1 (0.039)	5 (0.197)
4 (0.158)	2 (0.079)	7 (0.276)
5 (0.197)	3 (0.118)	9 (0.354)
6 (0.236)	4 (0.158)	12 (0.472)
8 (0.315)	5 (0.197)	12 (0.472)
10 (0.394)	7 (0.276)	15 (0.591)
12 (0.472)	8 (0.315)	17 (0.669)
15 (0.591)	10 (0.394)	20 (0.787)
20 (0.787)	14 (0.551)	26 (1.024)
25 (0.984)	18 (0.709)	34 (1.339)
30 (1.181)	20 (0.787)	40 (1.575)
40 (1.575)	30 (1.181)	50 (1.969)
50 (1.969)	40 (1.575)	60 (2.362)

Versaflex (Imperial)		
Size	Nominal Size	Size Range
1/8	3 (0.118)	2.4 – 6.4 (0.094 – 0.252)
1/4	6 (0.236)	3.2 – 9.5 (0.125 – 0.375)
3/8	10 (0.394)	4.7 – 16 (0.185 – 0.630)
1/2	13 (0.512)	6.4 – 19 (0.252 – 0.748)
3/4	19 (0.748)	13 – 32 (0.512 – 1.260)
1-1/4	32 (1.256)	19 – 45 (0.748 – 1.772)
1-3/4	45 (1.772)	32 – 70 (1.260 – 2.756)
2	51 (2.008)	38 – 76 (1.496 – 2.992)

Versaflex-FR flame retardant, expandable polyester braid		
Size	Nominal Size	Size Range
1/8	3 (0.118)	2.4 – 6.4 (0.094 – 0.252)
1/4	6 (0.236)	3.2 – 9.5 (0.125 – 0.375)
3/8	10 (0.394)	4.7 – 16 (0.185 – 0.630)
1/2	13 (0.512)	6.4 – 19 (0.252 – 0.748)
3/4	19 (0.748)	13 – 32 (0.512 – 1.260)
1-1/4	32 (1.256)	19 – 45 (0.748 – 1.772)
1-3/4	45 (1.772)	32 – 70 (1.260 – 2.756)
2	51 (2.008)	38 – 76 (1.496 – 2.992)

Ordering Information

Color	Standard	Versaflex (metric) : Black (-0) Grey (-8) Versaflex (imperial) : Black (-0) Versaflex-FR : Black with a white X tracer (-09)
Standard packaging	On spools.	
Ordering description	Specify product name, size and color (for example, VERSAFLEX-FR-1/4-09-SP)	

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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

XFFR

Halogen-Free, Flame-Retardant, Heat-Shrinkable Tubing

Product Facts

- Emits minimal amounts of toxic or acid gasses during combustion
- Meets performance requirements of MIL-C-24640 and MIL-C-24643 cable jackets
- Resists moisture, fungus, and weathering
- Available in expansion ratios as high as 3:1
- XFFR has the following approvals:
  - ABS (American Bureau of Shipping)
  - Lloyd's (Lloyd's Register of Shipping)
- RoHS compliant

Applications

XFFR halogen-free tubing can be used for rejacketing and repairing halogen-free cables in any enclosed area where a flame-retardant, halogen-free environment is required. These environments include tunnels, buildings, mass transit vehicles, and ships. When installed with S-1305 tape, the tubing can also be used in applications requiring water sealing and protection from abrasion and corrosion.

Installation

Minimum shrink temperature: 70°C [158°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
XFFR	MIL-C-24640 MIL-C-24643	NES 713 NES 711	RW-2016

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

XFFR (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness*
	Minimum Expanded as Supplied	Maximum Recovered After Heating	After Heating (Nominal)
XFFR-03	7.62 [0.300]	2.54 [0.100]	2.03 [0.080]
XFFR-04	10.16 [0.400]	3.81 [0.150]	2.03 [0.080]
XFFR-07	19.05 [0.750]	5.59 [0.220]	2.03 [0.080]
XFFR-11	27.94 [1.100]	9.52 [0.375]	2.67 [0.105]
XFFR-15	38.10 [1.500]	12.70 [0.500]	3.05 [0.120]
XFFR-20	50.80 [2.000]	19.05 [0.750]	3.05 [0.120]
XFFR-30	76.20 [3.000]	31.75 [1.250]	4.06 [0.160]

*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	1.2-meter [4-foot] or 7.5-meter [25-foot] lengths.	

Part Numbering System

XFFR - 03 X 4 / NM

- **"NM"** - no mark
- **Length** in feet (4 feet standard)
- **Size**
- **Family**

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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

ZH2

Flexible, Highly Flame-Retardant, Low Recovery Temperature, ZEROHAL Polyolefin Tubing

Product Facts

- **2:1 shrink ratio**
- **Highly flame-retardant; UL/CSA VW-1 flammability rating**
- **Environmentally friendly tubing essentially free of halogens**
- **Emits minimal amounts of toxic or acid gasses when burned**
- **RoHS compliant**

Applications

Electrical insulation and strain relief of connections and terminations in computers, appliances, and other commercial electronic products. Jacketing and bundling of light duty harnesses in rail and mass transit vehicles, buildings, and other enclosed areas where emission of toxic gasses from burning materials containing halogens is very undesirable.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-30°C to 125°C
[-22°F to 257°F]

Specifications/Approvals

Series	UL	CSA	Raychem
ZH2	E35586 VW-1 600 V, 125°C	LR31929 VW-1 600 V, 125°C	RW-3036

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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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

ZH2 (Continued)

Product Dimensions

Size	Inside Diameter		Wall Thickness	
	Expanded as Supplied	Maximum Recovered After Heating	Expanded as Supplied (Nominal)	Recovered* After Heating (Minimum)
0.8	1.2 ± 0.2 [0.047 ± 0.008]	0.40 [0.016]	0.20 [0.008]	0.33 [0.013]
1.0	1.5 ± 0.2 [0.059 ± 0.008]	0.50 [0.020]	0.20 [0.008]	0.33 [0.013]
1.5	2.1 ± 0.2 [0.075 ± 0.008]	0.75 [0.030]	0.20 [0.008]	0.34 [0.013]
2.0	2.6 ± 0.2 [0.102 ± 0.008]	1.00 [0.039]	0.25 [0.010]	0.43 [0.017]
2.5	3.1 ± 0.2 [0.122 ± 0.008]	1.25 [0.049]	0.25 [0.010]	0.43 [0.017]
3.0	3.6 ± 0.2 [0.142 ± 0.008]	1.50 [0.059]	0.25 [0.010]	0.43 [0.017]
3.5	4.1 ± 0.3 [0.161 ± 0.012]	1.75 [0.069]	0.25 [0.010]	0.43 [0.017]
4.0	4.6 ± 0.3 [0.181 ± 0.012]	2.00 [0.079]	0.25 [0.010]	0.43 [0.017]
5.0	5.6 ± 0.3 [0.221 ± 0.012]	2.50 [0.098]	0.30 [0.012]	0.56 [0.022]
6.0	6.6 ± 0.3 [0.260 ± 0.012]	3.00 [0.118]	0.30 [0.012]	0.56 [0.022]
7.0	7.6 ± 0.3 [0.299 ± 0.012]	3.50 [0.138]	0.30 [0.012]	0.56 [0.022]
8.0	8.6 ± 0.3 [0.339 ± 0.012]	4.00 [0.158]	0.30 [0.012]	0.56 [0.022]
9.0	9.6 ± 0.3 [0.378 ± 0.012]	4.50 [0.177]	0.30 [0.012]	0.56 [0.022]
10.0	10.4 ± 0.3 [0.409 ± 0.012]	5.00 [0.197]	0.30 [0.012]	0.56 [0.022]
11.0	11.4 ± 0.3 [0.449 ± 0.012]	5.50 [0.217]	0.30 [0.012]	0.56 [0.022]
12.0	12.7 ± 0.3 [0.500 ± 0.012]	6.00 [0.236]	0.30 [0.012]	0.56 [0.022]
13.0	13.5 ± 0.3 [0.532 ± 0.012]	6.50 [0.256]	0.35 [0.014]	0.66 [0.026]
14.0	14.4 ± 0.4 [0.567 ± 0.016]	7.00 [0.276]	0.35 [0.014]	0.68 [0.027]
15.0	15.7 ± 0.4 [0.618 ± 0.016]	7.50 [0.295]	0.35 [0.014]	0.68 [0.027]
16.0	16.9 ± 0.4 [0.665 ± 0.016]	8.00 [0.315]	0.35 [0.014]	0.68 [0.027]
18.0	19.0 ± 0.4 [0.748 ± 0.016]	9.00 [0.354]	0.40 [0.016]	0.76 [0.030]
20.0	21.4 ± 0.4 [0.843 ± 0.016]	10.00 [0.394]	0.40 [0.016]	0.76 [0.030]
22.0	23.2 ± 0.4 [0.913 ± 0.016]	11.00 [0.433]	0.45 [0.018]	0.89 [0.035]
25.0	26.8 ± 0.4 [1.055 ± 0.016]	12.50 [0.452]	0.45 [0.018]	0.89 [0.035]
27.0	28.2 ± 0.5 [1.110 ± 0.020]	12.50 [0.452]	0.45 [0.018]	0.89 [0.035]
28.0	30.0 ± 0.5 [1.181 ± 0.020]	14.00 [0.551]	0.45 [0.018]	0.89 [0.035]
30.0	32.1 ± 0.5 [1.264 ± 0.020]	15.00 [0.591]	0.45 [0.018]	0.89 [0.035]

*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, ZH2-6.0-0).

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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

ZH4

Very-Thin-Wall, Very Flexible, Highly Flame-Retardant, Low Recovery Temperature, ZEROHAL Polyolefin Tubing

Product Facts

- **2:1 shrink ratio**
- **Highly flame-retardant; UL/CSA VW-1 flammability rating**
- **Very thin wall provides space savings and rapid shrinking**
- **Low shrink temperature further reduces installation time and risk of damage to temperature-sensitive components**
- **Environmentally friendly tubing essentially free of halogens**
- **Emits minimal amounts of toxic or acid gasses when burned**
- **RoHS compliant**

Applications

Electrical insulation and protection of in-line components, disconnect terminals, and splices in computers, appliances, and other commercial electronic products. Typically used where space saving is important. Offers the ability to pack components more closely than is possible with standard tubings. Used for strain relief on high-density connectors. Suitable for use in rail and mass transit vehicles, buildings, and other enclosed areas where emission of toxic gasses from burning materials containing halogens is very undesirable.

Installation

Minimum shrink temperature: 70°C [158°F]

Minimum full recovery temperature: 90°C [194°F]

Operating Temperature Range

-30°C to 125°C
[-22°F to 257°F]

Specifications/Approvals

Series	UL	CSA	Raychem
ZH4	E85381 VW-1 300 V, 125ºC	LR31929 VW-1 150 V, 125ºC	RW-3036

Available in:	Americas	Europe	Asia Pacific
	■	■	■

9-1773447-9
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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

ZH4 (Continued)

Product Dimensions

Size	Inside Diameter		Wall Thickness	
	Expanded as Supplied	Maximum Recovered After Heating	Expanded as Supplied (Nominal)	Recovered* After Heating (Minimum)
0.6	0.95 ± 0.25 [0.037 ± 0.010]	0.30 [0.012]	0.10 [0.004]	0.25 [0.010]
0.8	1.20 ± 0.25 [0.047 ± 0.010]	0.40 [0.016]	0.10 [0.004]	0.25 [0.010]
1.0	1.40 ± 0.25 [0.055 ± 0.010]	0.50 [0.020]	0.10 [0.004]	0.25 [0.010]
1.5	1.90 ± 0.25 [0.075 ± 0.010]	0.75 [0.030]	0.10 [0.004]	0.25 [0.010]
2.0	2.30 ± 0.25 [0.091 ± 0.010]	1.00 [0.039]	0.10 [0.004]	0.25 [0.010]
2.5	2.80 ± 0.25 [0.110 ± 0.010]	1.25 [0.049]	0.15 [0.006]	0.25 [0.010]
3.0	3.30 ± 0.25 [0.130 ± 0.010]	1.50 [0.059]	0.15 [0.006]	0.25 [0.010]
3.5	3.80 ± 0.25 [0.150 ± 0.010]	1.75 [0.069]	0.15 [0.006]	0.25 [0.010]
4.0	4.40 ± 0.25 [0.173 ± 0.010]	2.00 [0.079]	0.15 [0.006]	0.25 [0.010]
5.0	5.50 ± 0.25 [0.217 ± 0.010]	2.50 [0.098]	0.15 [0.006]	0.25 [0.010]
6.0	6.50 ± 0.40 [0.256 ± 0.016]	3.00 [0.118]	0.15 [0.006]	0.28 [0.011]
7.0	7.50 ± 0.40 [0.295 ± 0.016]	3.50 [0.138]	0.15 [0.006]	0.28 [0.011]
8.0	8.50 ± 0.40 [0.335 ± 0.016]	4.00 [0.158]	0.15 [0.006]	0.28 [0.011]
9.0	9.50 ± 0.40 [0.374 ± 0.016]	4.50 [0.177]	0.15 [0.006]	0.28 [0.011]
10.0	10.50 ± 0.50 [0.413 ± 0.020]	5.00 [0.197]	0.15 [0.006]	0.28 [0.011]

*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, ZH4-2.0-0).

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

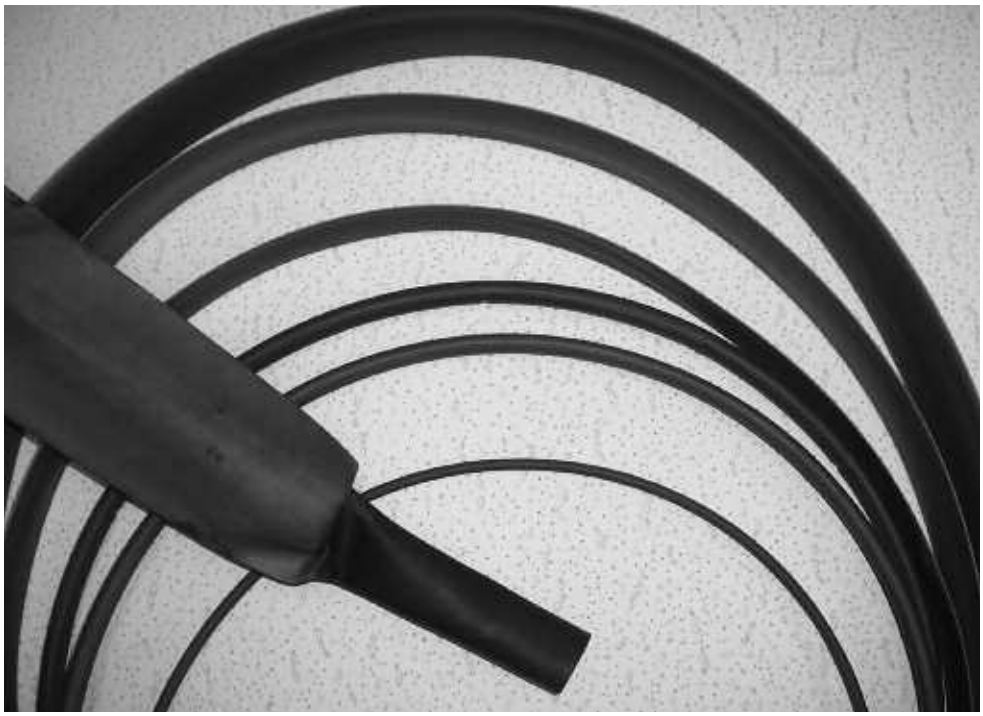
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

ZH-100

Flexible, Thin-Wall, Low-Fire-Hazard Tubing

Product Facts

- 2:1 shrink ratio
- Low smoke emissions
- Flexible, flame-retardant
- No added halogens
- Low evolution of acid gases
- RoHS compliant



Applications

ZH-100 is a flexible, thin-wall, heat-shrinkable tubing designed for low-fire-hazard applications. ZH-100 contains no added halogens, and exhibits excellent fire safety characteristics combined with low evolution of acid gases, while retaining good mechanical and fluid resistance properties.

Installation

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

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

Operating Temperature Range

-30°C to 105°C
[-22°F to 221°F]

Specifications/Approvals

Series	Industry	Raychem
ZH-100	BR 1326A	RW-2031

Available in:	Americas	Europe	Asia Pacific
	■	■	■

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

ZH-100 (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]	0.50 ± 0.10 [0.019 ± 0.004]
3/16	4.8 [0.187]	2.4 [0.093]	0.50 ± .0.10 [0.019 ± 0.004]
1/4	6.4 [0.250]	3.2 [0.125]	0.65 ± 0.15 [0.026 ± 0.006]
3/8	9.5 [0.375]	4.8 [0.187]	0.65 ± 0.15 [0.026 ± 0.006]
1/2	12.7 [0.500]	6.4 [0.250]	0.65 ± 0.15 [0.026 ± 0.006]
3/4	19.0 [0.750]	9.5 [0.375]	0.75 ± 0.15 [0.030 ± 0.006]
1	25.4 [1.000]	12.7 [0.500]	0.90 ± 0.15 [0.035 ± 0.006]
1 1/2	38.0 [1.500]	19.0 [0.750]	1.00 ± 0.20 [0.039 ± 0.008]
2	51.0 [2.000]	25.4 [1.000]	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)
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, ZH-100 1/8-0).

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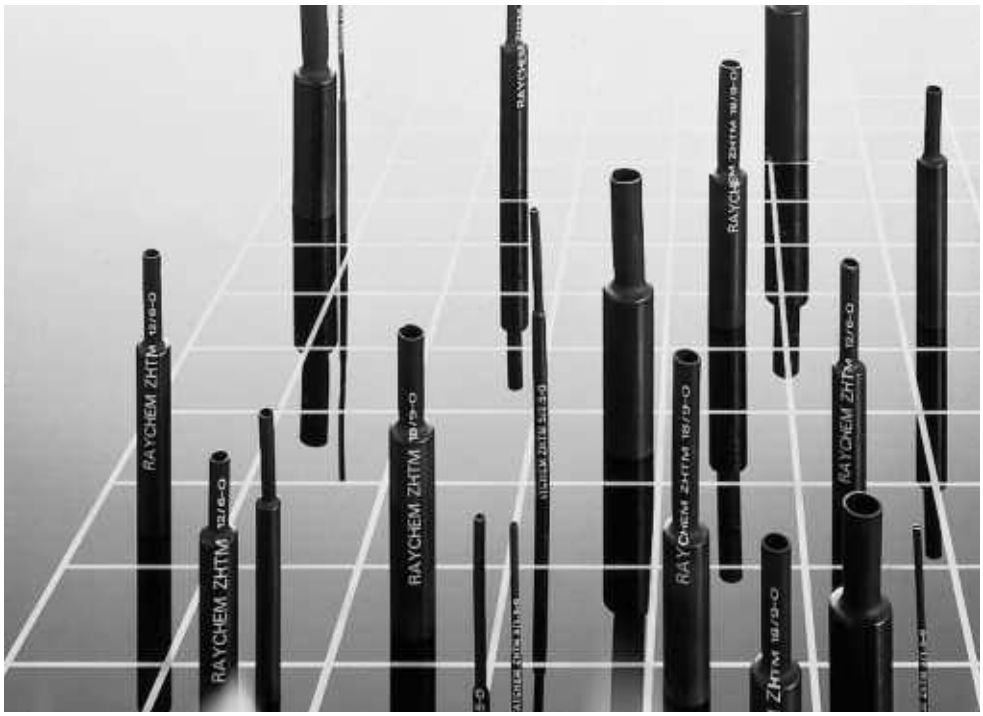
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

ZHTM

Heat-Shrinkable, Flexible Tubing with Low Toxicity for Fire Safety Applications

Product Facts

- 2:1 shrink ratio
- Low smoke emission
- System 100 tubing
- RoHS compliant



Applications

A flexible, thick-wall, heat-shrinkable tubing to be used in conjunction with -100 molded parts and Zerohal cable to form Raychem System 100. This material exhibits excellent fire safety characteristics combined with low smoke emission and low evolution of acid gases while retaining good mechanical and fluid-resistance properties. Used for insulation and protection of cables, harnesses, and electrical and electronic components in enclosed spaces, such as in marine applications, mass transit systems, and offshore installations, to reduce toxicity risks, or where equipment would be irreparably damaged by corrosive products of combustion.

Installation

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

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

Operating Temperature Range

-30°C to 105°C
[-22°F to 221°F]

Specifications/Approvals

Series	Military	Agency	Industry	Raychem
ZHTM	Def. Stan. 59-97 Issue 3 Type 8	BS 4G-198 Part 3 Type 15 VG 95343 Part 5 Type L VDE 0341/Pt 9005	BR 1326A	RW-2058

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

ZHTM (Continued)

Product Dimensions

Size	Inside Diameter		Recovered Wall Thickness*
	Minimum Expanded as Supplied	Maximum Recovered After Heating	After Heating
3/1.5	3.0 [0.118]	1.5 [0.059]	0.70 ± 0.10 [0.028 ± 0.004]
5/2.5	5.0 [0.197]	2.5 [0.098]	0.75 ± 0.12 [0.030 ± 0.005]
8/4	8.0 [0.315]	4.0 [0.157]	0.80 ± 0.15 [0.031 ± 0.006]
12/6	12.0 [0.472]	6.0 [0.236]	0.90 ± 0.15 [0.035 ± 0.006]
18/9	18.0 [0.709]	9.0 [0.354]	1.00 ± 0.18 [0.039 ± 0.007]
24/12	24.0 [0.945]	12.0 [0.472]	1.10 ± 0.20 [0.043 ± 0.008]
40/20	40.0 [1.575]	20.0 [0.789]	1.30 ± 0.23 [0.051 ± 0.009]
50/30	50.0 [1.969]	30.0 [1.181]	1.50 ± 0.28 [0.059 ± 0.011]

*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, ZHTM 8/4-0).

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

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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

OCEAN CHIPS
Океан Электроники
Поставка электронных компонентов

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «**JONHON**», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «**FORSTAR**».

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(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).

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