

## Highly flame-retardant, low recovery temperature, heat-shrinkable tubing

Versafit heat-shrinkable tubing is a cost-effective choice for many commercial and military applications. Versafit tubing is made from a specially formulated, crosslinked polyolefin to provide high flame-retardance (VW-1), excellent flexibility, and a low shrink temperature (to reduce installation time).

Versafit tubing performs a variety of functions in commercial and military applications:

- Electrically insulates and protects in-line components, disconnect terminals, and splices.
- Bundles wires for very flexible light-duty harnesses.
- Identifies or color-codes wires, cables, terminals, and components. Versafit tubing hot-stamps extremely well.

Compared to noncrosslinked materials, Versafit tubing has a higher temperature rating and exhibits better

thermal stability and resistance to physical abuse.

Unlike other typical flame-retardant tubings, Versafit tubing is free of polybrominated biphenyls (PBBs) and polybrominated biphenyl oxides and ethers (PBBOs/PBBEs). In Europe, these chemicals are classified as environmentally hazardous substances.

### Temperature rating

Full recovery temperature:	90°C
Continuous operating temperature:	-55°C to 135°C

### Specifications\*

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

\*When ordering, always specify latest issue.

### Dimensions (millimeters/inches)



Size	Inside diameter		d (max.)		Wall thickness	
	D Expanded as supplied		Recovered after heating		Recovered 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 ± 0.007	0.8	0.031	0.43 ± 0.08	0.017 ± 0.003
3/32	2.79 ± 0.2	0.110 ± 0.007	1.2	0.046	0.51 ± 0.08	0.020 ± 0.003
1/8	3.43 ± 0.2	0.135 ± 0.007	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	25.53 ± 0.4	1.055 ± 0.015	12.7	0.500	0.89 ± 0.13	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.

### Ordering information

Colors	<b>Standard</b>	Black, white, red, blue, yellow and green
	<b>Nonstandard</b>	Brown, orange, violet, and gray
Size selection	Always order the largest size that will shrink snugly over the component being covered. A variety of special order sizes are available.	
Standard packaging	On spools.	
Ordering description	Specify product name, size, and color; for example, Versafit 1/4-0 (0=Black).	

## Specification values

	Property	Unit	Requirement	Method of test
Physical	Dimensions	mm ( <i>inches</i> )	See reverse	ASTM D 2671
	Longitudinal change			
	ASTM D 2671	percent	+1, -5	ASTM D 2671
	UL 224	percent	+3, -3	UL224
	Eccentricity (recovered)	percent	30 maximum	ASTM D 2671
	Tensile strength	psi ( <i>MPa</i> )	1500 ( <i>10.3</i> ) minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Secant modulus (expanded)	psi ( <i>MPa</i> )	2.5 X 10 <sup>4</sup> ( <i>172</i> ) maximum	ASTM D 2671
	Low-temperature flexibility (1 hour at -45°C/-49°F)		No cracking	UL 224
	Heat shock (1 hour at 136°C/277°F)		No cracking	UL 224
	Heat resistance (7 days at 158°C/316°F)			ASTM D 2671
	Followed by tests for:			
	Tensile strength	psi ( <i>MPa</i> )	70% minimum of unaged specimens	UL 224
	Ultimate elongation	percent	100 minimum	UL 224
	Flexibility		No cracking	UL 224
	Dielectric withstand at 2500 V	seconds	60 minimum	UL 224
	Dielectric breakdown	volts	50% minimum of unaged specimens	ASTM D 2671
	Dielectric strength	volts/mil ( <i>kV/mm</i> )	500 ( <i>19.7</i> ) minimum	ASTM D 2671
	Restricted shrinkage		Pass	UL 224
Electrical	Dielectric strength	volts/mil ( <i>kV/mm</i> )	500 ( <i>19.7</i> ) minimum	ASTM D 2671
	Dielectric withstand at 2500 V	seconds	60 minimum	UL 224
	Volume resistivity	ohm-cm	10 <sup>14</sup> minimum	ASTM D 2671
Chemical	Corrosive effect (7 days at 158°C/316°F)		No corrosion	ASTM D 2671
	Copper stability (7 days at 158°C/316°F)		No brittleness, glazing, cracking, or severe discoloration of tubing. No pitting or blackening of copper.	ASTM D 2671
	Followed by test for:			
	Ultimate elongation	percent	100 minimum	ASTM D 2671
	Flammability		Pass	UL 224, VW-1
	Water absorption (recovered) (24 hours at 23°C/73°F)	percent	0.5 maximum	ASTM D 2671
	Fungus resistance			ISO 846 Method B
	Followed by tests for:			
	Tensile strength	psi ( <i>MPa</i> )	1500 ( <i>10.3</i> ) minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Dielectric strength	volts/mil ( <i>kV/mm</i> )	500 ( <i>19.7</i> ) minimum	ASTM D 2671

Note: Consult RW-3009 for specific details about test procedures.

Versafit and Raychem are trademarks of Tyco Electronics Corporation.

**Users should independently evaluate the suitability of the product for their application.**

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