tyco Electronics

Versafit

Raychem

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

PBBs PBBEs PBBOs

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

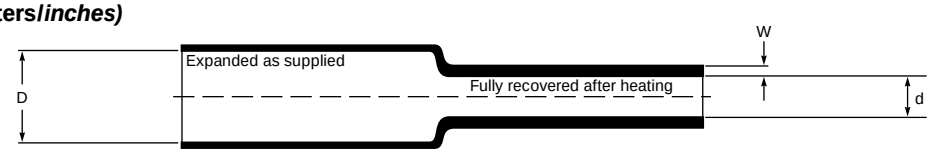
Full recovery temperature:	90°C
Continuous operating temperature:	–55°C to 135°C

*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)*



	Inside diameter				Wall thickness	
	D		d (max.)		W	
Size	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	**Standard**	Black, white, red, blue, yellow and green
	Nonstandard	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 *(inches)*	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 *(MPa)*	1500 *(10.3)* minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Secant modulus (expanded)	psi *(MPa)*	2.5 X 10^4 *(172)* 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 *(MPa)*	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 *(kV/mm)*	500 *(19.7)* minimum	ASTM D 2671
	Restricted shrinkage		Pass	UL 224
Electrical	Dielectric strength	volts/mil *(kV/mm)*	500 *(19.7)* minimum	ASTM D 2671
	Dielectric withstand at 2500 V	seconds	60 minimum	UL 224
	Volume resistivity	ohm-cm	10^{14} 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 *(MPa)*	1500 *(10.3)* minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Dielectric strength	volts/mil *(kV/mm)*	500 *(19.7)* minimum	ASTM D 2671

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

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

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