tyco Electronics

Versafit V2

Raychem

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

PBBs PBBOs

Versafit V2 heat-shrinkable tubing is a cost-effective, environmentally friendly choice for many commercial applications. V2 tubing is made from a specially formulated, crosslinked polyolefin with low recovery temperature, excellent flexibility, and high flame-retardance (VW-1).

Unlike other typical flame-retardant tubings, V2 tubing is free of polybrominated biphenyls (PBBs) and poly-brominated biphenyl oxides (PBBOs). In Europe, these chemicals are classified as environmentally hazardous substances.

Compared to noncrosslinked materials, V2 tubing has a higher temperature rating and exhibits better thermal stability and resistance to physical abuse.

V2 tubing performs a variety of functions in 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 for long-term reliability.

V2 tubing offers a faster, easier, more reliable replacement for molding in place, dip coating, and tape wrapping.

V2 is UL-recognized and CSA-certified at 125°C, 600 V, with UL VW-1 and CSA OFT flame-retardancy ratings.

Temperature rating

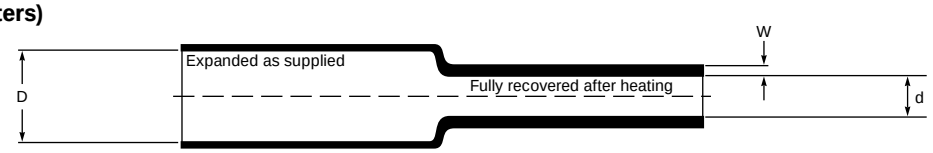
Full recovery temperature:	90°C
Continuous operating temperature:	–45°C to 125°C

*Specifications**

Type	Raychem	UL	CSA
Versafit	RW-3023	E35586 VW-1	LR31929 VW-1

* When ordering, always specify latest issue.

Dimensions (millimeters)



	As supplied		Fully recovered	
Size	D Inside diameter	Wall thickness (nominal)	d (max.) Inside diameter	W (min.) Wall thickness**
1.0	1.6 ± 0.2	0.20	0.50	0.33
1.5	2.1 ± 0.2	0.20	0.75	0.35
2.0	2.6 ± 0.2	0.25	1.00	0.43
2.5	3.1 ± 0.2	0.25	1.25	0.43
3.0	3.6 ± 0.2	0.25	1.50	0.43
3.5	4.1 ± 0.3	0.25	1.75	0.43
4.0	4.6 ± 0.3	0.25	2.00	0.43
5.0	5.6 ± 0.3	0.30	2.50	0.56
6.0	6.6 ± 0.3	0.30	3.00	0.56
7.0	7.6 ± 0.3	0.30	3.50	0.56
8.0	8.6 ± 0.3	0.30	4.00	0.56
9.0	9.6 ± 0.3	0.30	4.50	0.56
10.0	10.4 ± 0.3	0.30	5.00	0.56

	As supplied		Fully recovered	
Size	D Inside diameter	Wall thickness (nominal)	d (max.) Inside diameter	W (min.) Wall thickness**
11.0	11.4 ± 0.3	0.30	5.5	0.56
12.0	12.7 ± 0.3	0.30	6.0	0.56
13.0	13.5 ± 0.3	0.35	6.5	0.66
14.0	14.4 ± 0.4	0.35	7.0	0.68
15.0	15.7 ± 0.4	0.35	7.5	0.68
16.0	16.9 ± 0.4	0.35	8.0	0.68
18.0	19.0 ± 0.4	0.40	9.0	0.76
20.0	21.4 ± 0.4	0.40	10.0	0.76
22.0	23.2 ± 0.4	0.45	11.0	0.89
25.0	26.8 ± 0.4	0.45	12.5	0.89
27.0	28.2 ± 0.5	0.45	12.5	0.89
28.0	30.0 ± 0.5	0.45	14.0	0.89
30.0	32.1 ± 0.5	0.45	15.0	0.89

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

Ordering information

Colors	**Standard**	Black
	Nonstandard	Red, blue, yellow, green, white, orange, brown, violet, gray
Size selection	Always order the largest size that will shrink snugly over the component being covered.	
Standard packaging	On spools	
Marking	Marked with UL, CSA, and Japan -F- Mark legends.	
Ordering description	Specify product name, size, and color; for example, V2 2.0-0 (0=Black).	

Specification values

	Property	Unit	Requirement	Method of test
Physical	Dimensions	mm	See reverse	ASTM D 2671
	Longitudinal change ASTM D 2671 UL 224	 percent percent	 +1, –5 +3, –3	 ASTM D 2671 UL 224
	Eccentricity (recovered)	percent	30 maximum	ASTM D 2671
	Tensile strength	MPa *(psi)*	10.3 *(1500)* minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Secant modulus (as supplied)	MPa *(psi)*	172 *(2.5×10^4)* maximum	ASTM D 2671
	Low-temperature flexibility (1 hour at –30°C/*–22°F*)		No cracking	UL 224
	Heat shock (4 hours at 250°C/*482°F*)		No cracking	UL 224
	Heat aging (7 days at 158°C/*316°F*)			UL 224
	Followed by tests for:			
	Tensile strength	MPa *(psi)*	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	ASTM D 2671
	Dielectric breakdown	volts	50% minimum of unaged specimens	ASTM D 2671
	Dielectric strength	kV/mm *(volts/mil)*	19.7 *(500)* minimum	ASTM D 2671
	Restricted shrinkage		Pass	UL 224
Electrical	Dielectric withstand at 2500 V	seconds	60 minimum	ASTM D 2671
	Dielectric strength	kV/mm *(volts/mil)*	19.7 *(500)* minimum	ASTM D 2671
	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	MPa *(psi)*	10.3 *(1500)* minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Dielectric strength	kV/mm *(volts/mil)*	19.7 *(500)* minimum	ASTM D 2671

Note: Consult RW-3023 for specific details about test procedures.

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

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