

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



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)**



Size	As supplied		Fully recovered	
	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

Size	As supplied		Fully recovered	
	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	<b>Standard</b> Black <b>Nonstandard</b> 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
<b>Physical</b>	Dimensions	mm	See reverse	ASTM D 2671
	Longitudinal change			
	ASTM D 2671	percent	+1, -5	ASTM D 2671
	UL 224	percent	+3, -3	UL 224
	Eccentricity (recovered)	percent	30 maximum	ASTM D 2671
	Tensile strength	MPa ( <i>psi</i> )	10.3 ( <i>1500</i> ) minimum	ASTM D 2671
	Ultimate elongation	percent	200 minimum	ASTM D 2671
	Secant modulus (as supplied)	MPa ( <i>psi</i> )	172 ( <i>2.5 x 10<sup>4</sup></i> ) 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 ( <i>psi</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	ASTM D 2671
	Dielectric breakdown	volts	50% minimum of unaged specimens	ASTM D 2671
Dielectric strength	kV/mm ( <i>volts/mil</i> )	19.7 ( <i>500</i> ) minimum	ASTM D 2671	
Restricted shrinkage		Pass	UL 224	
<b>Electrical</b>	Dielectric withstand at 2500 V	seconds	60 minimum	ASTM D 2671
	Dielectric strength	kV/mm ( <i>volts/mil</i> )	19.7 ( <i>500</i> ) minimum	ASTM D 2671
	Volume resistivity	ohm-cm	10 <sup>14</sup> minimum	ASTM D 2671
<b>Chemical</b>	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 ( <i>psi</i> )	10.3 ( <i>1500</i> ) minimum	ASTM D 2671
Ultimate elongation	percent	200 minimum	ASTM D 2671	
Dielectric strength	kV/mm ( <i>volts/mil</i> )	19.7 ( <i>500</i> ) minimum	ASTM D 2671	

Note: Consult RW-3023 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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