



Very-thin-wall, highly flame-retardant, metric-sized heat-shrinkable tubing

Versafit V4 heat-shrinkable tubing is a cost-effective, environmentally friendly choice for many commercial applications. Versafit V4 tubing is a very thin-wall version of Versafit, a specially formulated polyolefin with low recovery temperature, excellent flexibility, and high flame-retardance (VW-1).

Versafit V4 tubing is typically applied where space savings is important,

offering the ability to pack components more closely than is possible with standard tubings. Versafit V4 tubing can shrink more than twice as fast as standard products. This rapid shrinking may be important in the prevention of overheating of temperature-sensitive components.

Unlike other typical flame-retardant tubings, Versafit V4 tubing is free of polybrominated biphenyls (PBBs)

and polybrominated biphenyl oxides (PBBOs). In Europe, these chemicals are classified as environmentally hazardous substances.

Versafit V4 products are UL-recognized at 125°C, 300 V, and CSA-certified at 125°C, 150 V, with UL VW-1 and CSA OFT flame-retardancy ratings.

**Temperature rating**

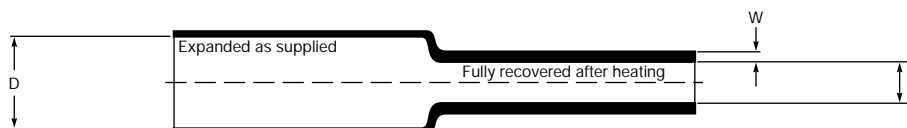
|                                   |                |
|-----------------------------------|----------------|
| Full recovery temperature:        | 90°C           |
| Continuous operating temperature: | -45°C to 125°C |

**Specifications\***

| Type        | Raychem | UL          | CSA          |
|-------------|---------|-------------|--------------|
| Versafit V4 | RW-3023 | E35586 VW-1 | LR31929 VW-1 |

\*When ordering, always specify latest issue.

**Dimensions (millimeters)**



| Size | As supplied       |                          | Fully recovered          |                           | Size | As supplied       |                          | Fully recovered          |                           |
|------|-------------------|--------------------------|--------------------------|---------------------------|------|-------------------|--------------------------|--------------------------|---------------------------|
|      | D Inside diameter | Wall thickness (nominal) | d (max.) Inside diameter | W (min.) Wall thickness** |      | D Inside diameter | Wall thickness (nominal) | d (max.) Inside diameter | W (min.) Wall thickness** |
| 1.0  | 1.4 ± 0.25        | 0.10                     | 0.50                     | 0.25                      | 5.0  | 5.5 ± 0.25        | 0.15                     | 2.5                      | 0.25                      |
| 1.5  | 1.9 ± 0.25        | 0.10                     | 0.75                     | 0.25                      | 6.0  | 6.5 ± 0.40        | 0.15                     | 3.0                      | 0.28                      |
| 2.0  | 2.3 ± 0.25        | 0.10                     | 1.00                     | 0.25                      | 7.0  | 7.5 ± 0.40        | 0.15                     | 3.5                      | 0.28                      |
| 2.5  | 2.8 ± 0.25        | 0.15                     | 1.25                     | 0.25                      | 8.0  | 8.5 ± 0.40        | 0.15                     | 4.0                      | 0.28                      |
| 3.0  | 3.3 ± 0.25        | 0.15                     | 1.50                     | 0.25                      | 9.0  | 9.5 ± 0.40        | 0.15                     | 4.5                      | 0.28                      |
| 3.5  | 3.8 ± 0.25        | 0.15                     | 1.75                     | 0.25                      | 10.0 | 10.5 ± 0.50       | 0.15                     | 5.0                      | 0.28                      |
| 4.0  | 4.4 ± 0.25        | 0.15                     | 2.00                     | 0.25                      |      |                   |                          |                          |                           |

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

**Ordering information**

|                      |   |
|----------------------|---|
| Colors               | <b>Standard</b> Black<br><b>Nonstandard</b> Other colors available on request.          |
| 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, V4 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, -15   | 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> )          | 103 ( <i>1.5 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.

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

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