

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<br><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 (1500) minimum  | ASTM D 2671         |
|                      | Ultimate elongation                                     | percent                    | 200 minimum  | ASTM D 2671         |
|                      | Secant modulus (as supplied)                            | MPa ( <i>psi</i> )         | 172 (2.5 x 10 <sup>4</sup> ) maximum   | ASTM D 2671         |
|                      | Low-temperature flexibility<br>(1 hour at -30°C/-22°F)  |                            | No cracking  | UL 224              |
|                      | Heat shock<br>(4 hours at 250°C/482°F)                  |                            | No cracking  | UL 224              |
|                      | Heat aging<br>(7 days at 158°C/316°F)                   |                            |  | UL 224              |
|                      | Followed by tests for:                                  |                            |  |                     |
|                      | Tensile strength  | MPa ( <i>psi</i> )         | 70% minimum<br>of unaged specimens   | UL 224              |
|                      | Ultimate elongation                                     | percent                    | 100 minimum  | UL 224              |
|                      | Flexibility   |                            | No cracking  | UL 224              |
|                      | Dielectric withstand<br>at 2500 V                       | seconds                    | 60 minimum   | ASTM D 2671         |
|                      | Dielectric breakdown                                    | volts                      | 50% minimum<br>of unaged specimens   | ASTM D 2671         |
| Dielectric strength  | kV/mm ( <i>volts/mil</i> )                              | 19.7 (500) minimum         | ASTM D 2671  |                     |
| Restricted shrinkage |   | Pass                       | UL 224   |                     |
| <b>Electrical</b>    | Dielectric withstand<br>at 2500 V                       | seconds                    | 60 minimum   | ASTM D 2671         |
|                      | Dielectric strength                                     | kV/mm ( <i>volts/mil</i> ) | 19.7 (500) minimum   | ASTM D 2671         |
|                      | Volume resistivity                                      | ohm-cm                     | 10 <sup>14</sup> minimum   | ASTM D 2671         |
| <b>Chemical</b>      | Corrosive effect<br>(7 days at 158°C/316°F)             |                            | No corrosion   | ASTM D 2671         |
|                      | Copper stability<br>(7 days at 158°C/316°F)             |                            | No brittleness, glazing,<br>cracking, or severe<br>discoloration of tubing.<br>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)<br>(24 hours at 23°C/73°F) | percent                    | 0.5 maximum  | ASTM D 2671         |
|                      | Fungus resistance                                       |                            |  | ISO 846<br>Method B |
|                      | Followed by tests for:                                  |                            |  |                     |
|                      | Tensile strength  | MPa ( <i>psi</i> )         | 10.3 (1500) minimum  | ASTM D 2671         |
| Ultimate elongation  | percent   | 200 minimum                | ASTM D 2671  |                     |
| Dielectric strength  | kV/mm ( <i>volts/mil</i> )                              | 19.7 (500) 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.**

### Tyco Electronics Corporation

300 Constitution Drive  
Menlo Park, CA 94025-1164  
USA  
Tel: (800) 926-2425 (US & Canada)  
Tel: +1 (650) 361-3860 (All other countries)

Faraday Road  
Dorcan, Swindon, SN3 5HH  
United Kingdom  
Tel: +44 1793 528171

3816 Noborito, Tama-ku  
Kawasaki, Kanagawa 214-8533  
Japan  
Tel: +81 44 900 5102

Asia Pacific Headquarters  
26 Ang Mo Kio, Industrial Park 2  
Singapore 569507  
Tel: +65 4866 151

All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their application. Tyco Electronics Corporation makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. Tyco Electronics Corporation's only obligations are those in the Standard Terms and Conditions of Sale for these products and in no case will Tyco Electronics Corporation be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of the product. Tyco Electronics Corporation's Specifications are subject to change without notice. In addition, Tyco Electronics Corporation reserves the right to make changes in materials or processing without notification to the Buyer which do not affect compliance with any applicable specification.

**For more information about this product visit [www.tycoelectronics.com](http://www.tycoelectronics.com)**

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А