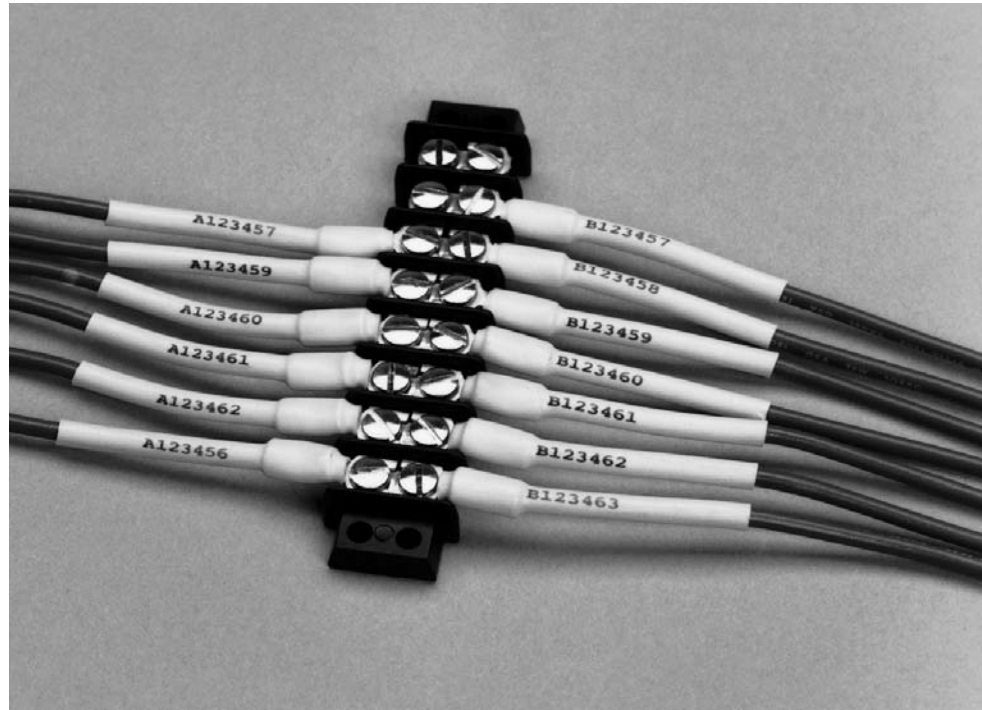


## RNF-100

**Flexible, Flame-Retardant, General Purpose, Polyolefin Tubing**

### Product Facts

- 2:1 shrink ratio
- Superior abrasion and solvent resistance when compared with that of many flexible, general purpose polyolefin tubings
- Excellent physical, chemical, and electrical properties that meet or exceed industrial and military standards for highly reliable, general purpose tubing
- Flexible; conforms to irregular shapes
- Flame-retardant (colors only)
- Wide range of sizes and colors
- RoHS compliant



### Applications

Designed to provide superior mechanical (abrasion, cut-through, and strain relief), thermal, and fluid-resistance performance in demanding environments. Widely used to provide insulation and strain relief of wire terminations and connections. Used for jacketing wire bundles and light-duty harnesses where superior abrasion resistance is a plus. Also used to identify and color-code electrical connections and wire bundles.

### Installation

Minimum shrink temperature: 95°C [203°F]  
Minimum full recovery temperature: 121°C [250°F]

### Operating Temperature Range

-55°C to 135°C  
[-67°F to 275°F]

### Specifications/Approvals

| Series                  | UL                     | CSA                     | Military   | Industry                         | Raychem                   |
|-------------------------|------------------------|-------------------------|--|----------------------------------|---------------------------|
| RNF-100 Type 1 (colors) | E35586<br>600 V, 125°C | LR31929<br>600 V, 125°C | AMS-DTL-23053/5*,<br>Class 1<br>Def. Stan. 59-97 Type 2B | VDE 0341 Pt 9005<br>Type A and B | RT-350, Type 1<br>RK-6001 |
| RNF-100 Type 2 (clear)  | —                      | —                       | AMS-DTL-23053/5*,<br>Class 2<br>VG 95343 Pt 5 Type B     | —                                | RT-350, Type 2<br>RK-6001 |

\*Formerly MIL-I-23053/5 and MIL-DTL-23053/5.

| Available in: | Americas | Europe | Asia Pacific |
|---------------|----------|--------|--------------|
|               | ■        | ■      | ■            |

**RNF-100** (Continued)

**Product Dimensions**

| Size  | Inside Diameter              |                                 | Recovered Wall Thickness**  |
|-------|------------------------------|---------------------------------|-----------------------------|
|       | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating               |
| 3/64  | 1.2 [0.046]                  | 0.6 [0.023]                     | 0.40 ± 0.08 [0.016 ± 0.003] |
| 1/16  | 1.6 [0.063]                  | 0.8 [0.031]                     | 0.43 ± 0.08 [0.017 ± 0.003] |
| 3/32  | 2.4 [0.093]                  | 1.2 [0.046]                     | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/8   | 3.2 [0.125]                  | 1.6 [0.062]                     | 0.51 ± 0.08 [0.020 ± 0.003] |
| 3/16  | 4.8 [0.187]                  | 2.4 [0.093]                     | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/4   | 6.4 [0.250]                  | 3.2 [0.125]                     | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/8   | 9.5 [0.375]                  | 4.8 [0.187]                     | 0.64 ± 0.08 [0.025 ± 0.003] |
| 1/2   | 12.7 [0.500]                 | 6.4 [0.250]                     | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/4   | 19.1 [0.750]                 | 9.5 [0.375]                     | 0.76 ± 0.08 [0.030 ± 0.003] |
| 1     | 25.4 [1.000]                 | 12.7 [0.500]                    | 0.89 ± 0.12 [0.035 ± 0.005] |
| 1 1/4 | 31.8 [1.250]                 | 15.9 [0.625]                    | 1.02 ± 0.15 [0.040 ± 0.006] |
| 1 1/2 | 38.1 [1.500]                 | 19.1 [0.750]                    | 1.02 ± 0.15 [0.040 ± 0.006] |
| 2     | 50.8 [2.000]                 | 25.4 [1.000]                    | 1.14 ± 0.16 [0.045 ± 0.007] |
| 3     | 76.2 [3.000]                 | 38.1 [1.500]                    | 1.27 ± 0.20 [0.050 ± 0.008] |
| 4     | 101.6 [4.000]                | 50.8 [2.000]                    | 1.40 ± 0.23 [0.055 ± 0.009] |
| 5     | 127.0 [5.000]                | 63.5 [2.500]                    | 1.52 ± 0.23 [0.060 ± 0.009] |

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

**Ordering Information**

|                           |  |  |
|---------------------------|--|--|
| Color                     | Standard***  | Black (-0, BK), white (-9, WH), red (-2, RD), blue (-6, BU), yellow (-4, YO), green (-5, GN), clear (-X, CL) |
|                           | Nonstandard  | Brown (-1, BN), orange (-3, OR), violet (-7, VT), gray (-8, GY)  |
| Size selection            | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request |  |
| Standard packaging****    | On spools or in 1.2-meter [4-foot] lengths.  |  |
| Ordering description***** | Specify product name, size and color (for example, RNF-100 1/4-0 [Europe] or RNF-100 1/4-BK [Americas]).                               |  |

\*\*\*Green (-5, GN) is nonstandard in all sizes in Europe, and nonstandard in sizes 1-1/4 through 5-inches in Americas.

\*\*\*\*Available in the convenient Mini-Spool packaging/dispensing system, for sizes 3/64" up to 1".

\*\*\*\*\*Europe only. For supply to MIL, Def Stan and BS add -MS, -DS or -BS to ordering description.

Flexible, flame-retardant, high performance, polyolefin heat-shrinkable tubing

RNF-100 tubing is a high-quality, heat-shrinkable product for a wide variety of uses. It has become the industry standard for insulation, strain relief, wire bundling, and color-coding in both commercial and military applications. RNF-100 tubing meets the requirements of AMS-DTL-23053/5, Class 1 (colors) and Class 2 (clear).

It is also UL-recognized and CSA-certified at 125°C, 600 V.

Made from flame-retardant polyolefin, RNF-100 tubing has excellent physical, chemical, and electrical properties that meet industrial and military requirements for a highly reliable, general-purpose tubing. It sets itself apart in that it offers



a higher level of performance at elevated temperature, including mechanical abrasion and fluid resistance, than many heat-shrinkable polyolefin tubings available in the marketplace today.

Only a few sizes of RNF-100 tubing are required to cover many substrate diameters.

**Temperature rating**

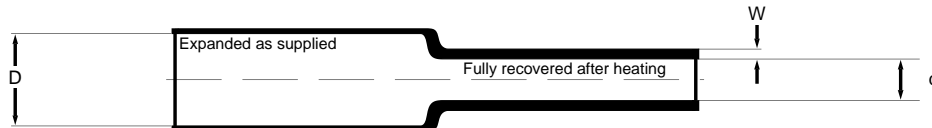
|                                   |                |
|-----------------------------------|----------------|
| Minimum shrink temperature:       | 121°C          |
| Continuous operating temperature: | -55°C to 135°C |

**Specifications\***

| Type                    | Raychem       | Military               | UL  | CSA  |
|-------------------------|---------------|------------------------|--|---|
| RNF-100 Type 1 (colors) | RT-350 Type 1 | AMS-DTL-23053/5, Cl. 1 | E35586   | LR31929   |
| RNF-100 Type 2 (clear)  | RT-350 Type 2 | AMS-DTL-23053/5, Cl. 2 |  |   |

\*When ordering, always specify latest issue.

**Dimensions (millimeters/inches)**



| Size | Inside diameter               |                                  | Wall thickness             |       | Size        | Inside diameter               |                                  | Wall thickness             |       |      |       |             |               |
|------|-------------------------------|----------------------------------|----------------------------|-------|-------------|-------------------------------|----------------------------------|----------------------------|-------|------|-------|-------------|---------------|
|      | D (min.) Expanded as supplied | d (max.) Recovered after heating | W Recovered after heating* |       |             | D (min.) Expanded as supplied | d (max.) Recovered after heating | W Recovered after heating* |       |      |       |             |               |
| 3/64 | 1.2                           | 0.046                            | 0.6                        | 0.023 | 0.40 ± 0.08 | 0.016 ± 0.003                 | 3/4                              | 19.1                       | 0.750 | 9.5  | 0.375 | 0.77 ± 0.08 | 0.030 ± 0.003 |
| 1/16 | 1.6                           | 0.063                            | 0.8                        | 0.031 | 0.43 ± 0.08 | 0.017 ± 0.003                 | 1                                | 25.4                       | 1.000 | 12.7 | 0.500 | 0.89 ± 0.12 | 0.035 ± 0.005 |
| 3/32 | 2.4                           | 0.093                            | 1.2                        | 0.046 | 0.51 ± 0.08 | 0.020 ± 0.003                 | 1 1/4                            | 31.7                       | 1.250 | 15.9 | 0.625 | 1.02 ± 0.15 | 0.040 ± 0.006 |
| 1/8  | 3.2                           | 0.125                            | 1.6                        | 0.062 | 0.51 ± 0.08 | 0.020 ± 0.003                 | 1 1/2                            | 38.1                       | 1.500 | 19.1 | 0.750 | 1.02 ± 0.15 | 0.040 ± 0.006 |
| 3/16 | 4.7                           | 0.187                            | 2.4                        | 0.093 | 0.51 ± 0.08 | 0.020 ± 0.003                 | 2                                | 50.8                       | 2.000 | 25.4 | 1.000 | 1.14 ± 0.16 | 0.045 ± 0.007 |
| 1/4  | 6.4                           | 0.250                            | 3.2                        | 0.125 | 0.64 ± 0.08 | 0.025 ± 0.003                 | 3                                | 76.2                       | 3.000 | 38.1 | 1.500 | 1.27 ± 0.20 | 0.050 ± 0.008 |
| 3/8  | 9.5                           | 0.375                            | 4.8                        | 0.187 | 0.64 ± 0.08 | 0.025 ± 0.003                 | 4                                | 101.6                      | 4.000 | 50.8 | 2.000 | 1.40 ± 0.23 | 0.055 ± 0.009 |
| 1/2  | 12.7                          | 0.500                            | 6.4                        | 0.250 | 0.64 ± 0.08 | 0.025 ± 0.003                 | 5                                | 127.0                      | 5.000 | 63.5 | 2.500 | 1.53 ± 0.23 | 0.060 ± 0.009 |

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

**Ordering information**

|                      |   |  |
|----------------------|---|--|
| Colors               | <b>Standard</b>   | Black (all sizes); clear, white, red, blue, green, and yellow (3/64" through 3")             |
|                      | <b>Nonstandard</b>  | Clear, white, red, blue, and yellow (4" and 5"); brown, orange, violet, and gray (all sizes) |
| Size selection       | Always order the largest size that will shrink snugly over the component being covered. |  |
| Standard packaging   | On spools or in 4 foot lengths  |  |
| Ordering description | Specify product name, size, and color; for example, RNF-100-1/4-BK (BK=Black).          |  |

## Specification values

|                    |  |                               | Requirement  |  |                               |
|--------------------|--|-------------------------------|--|--|-------------------------------|
|                    | Property   | Unit                          | Type 1 (colors)  | Type 2 (clear)   | Method of test                |
| Physical           | Dimensions   | mm ( <i>inches</i> )          | See Reverse  | See Reverse  | ASTM D 2671                   |
|                    | Longitudinal change  | percent                       | +0, -5   | +0, -5   | ASTM D 2671                   |
|                    | Tensile strength   | psi ( <i>Mpa</i> )            | 1500 ( <i>10.3</i> ) minimum   | 1500 ( <i>10.3</i> ) minimum   | ASTM D 2671                   |
|                    | Ultimate elongation  | percent                       | 200 minimum  | 200 minimum  | ASTM D 2671                   |
|                    | Secant modulus (as supplied)   | psi ( <i>Mpa</i> )            | 2.5 X 10 <sup>4</sup> ( <i>172</i> ) maximum                               | 2.5 X 10 <sup>4</sup> ( <i>172</i> ) maximum                               | ASTM D 2671                   |
|                    | Specific gravity   |                               | 1.35 maximum   | 1.0 maximum  | ASTM D 2671                   |
|                    | Low temperature flexibility<br>(4 hours at -55°C/-67°F)  |                               | No cracking  | No cracking  | AMS-DTL-23053                 |
|                    | Heat shock<br>(4 hours at 250°C/482°F)   |                               | No dripping,<br>flowing, or cracking                                       | No dripping,<br>flowing, or cracking                                       | AMS-DTL-23053                 |
|                    | Heat resistance<br>(336 hours at 175°C/347°F)  |                               |  |  | ASTM D 2671                   |
|                    | Followed by test for:  |                               |  |  |                               |
|                    | Ultimate Elongation  | percent                       | 150 minimum  | 150 minimum  | ASTM D 2671                   |
|                    | Color  |                               | MIL-STD-104  |  | MIL-STD-104                   |
|                    | Color stability<br>(48 hours at 175°C/347°F)   |                               | MIL-STD-104  |  | ASTM D 2671                   |
|                    | Electrical   | Dielectric strength           | volts/mil ( <i>volts/mm</i> )  | 500 ( <i>19,680</i> ) minimum  | 500 ( <i>19,680</i> ) minimum |
| Volume resistivity |  | ohm-cm                        | 10 <sup>14</sup> minimum   | 10 <sup>16</sup> minimum   | ASTM D 2671                   |
| Chemical           | Copper mirror corrosion<br>(16 hours at 175°C/347°F)   |                               | No removal of copper   | No removal of copper   | ASTM D 2671<br>Procedure A    |
|                    | Copper contact corrosion<br>(168 hours at 160°C/320°F)   |                               | No pitting or blackening<br>of copper                                      | No pitting or blackening<br>of copper                                      | ASTM D 2671<br>Procedure B    |
|                    | Copper stability<br>(16 hours at 160°C/320°F)  |                               | No brittleness, glazing,<br>cracking, or severe<br>discoloration of tubing | No brittleness, glazing,<br>cracking, or severe<br>discoloration of tubing | ASTM D 2671<br>Procedure B    |
|                    | Followed by test for:  |                               |  |  |                               |
|                    | Ultimate Elongation  | percent                       | 200 minimum  | 200 minimum  | ASTM D 2671                   |
|                    | Flammability   |                               | Self-extinguishing<br>within 1 minute, 25%<br>maximum flag burn            |  | ASTM D 2671<br>Procedure B    |
|                    | Fungus resistance  |                               | Rating of 1 or less  | Rating of 1 or less  | ASTM G 21                     |
|                    | Water absorption<br>(24 hours at 23°C/73°F)  | percent                       | 0.5 maximum  | 0.2 maximum  | ASTM D 2671                   |
|                    | Fluid resistance<br>(24 hours at 23°C/73°F) in:<br>JP-8 fuel (MIL-T-5624)<br>Skydrol 500<br>Hydraulic fluid (MIL-H-5606)<br>Aviation gasoline 100/300<br>(MIL-G-5572)<br>Water |                               |  |  | ASTM D 2671                   |
|                    | Followed by tests for:   |                               |  |  |                               |
|                    | Dielectric strength  | volts/mil ( <i>volts/mm</i> ) | 400 ( <i>15,760</i> ) minimum  | 400 ( <i>15,760</i> ) minimum  | ASTM D 2671                   |
| Tensile strength   | psi ( <i>Mpa</i> )   | 1000 ( <i>6.9</i> ) minimum   | 1000 ( <i>6.9</i> ) minimum  | ASTM D 2671  |                               |

Note: Consult RT-350 for specific details about test procedures.  
Raychem is a trademark 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)