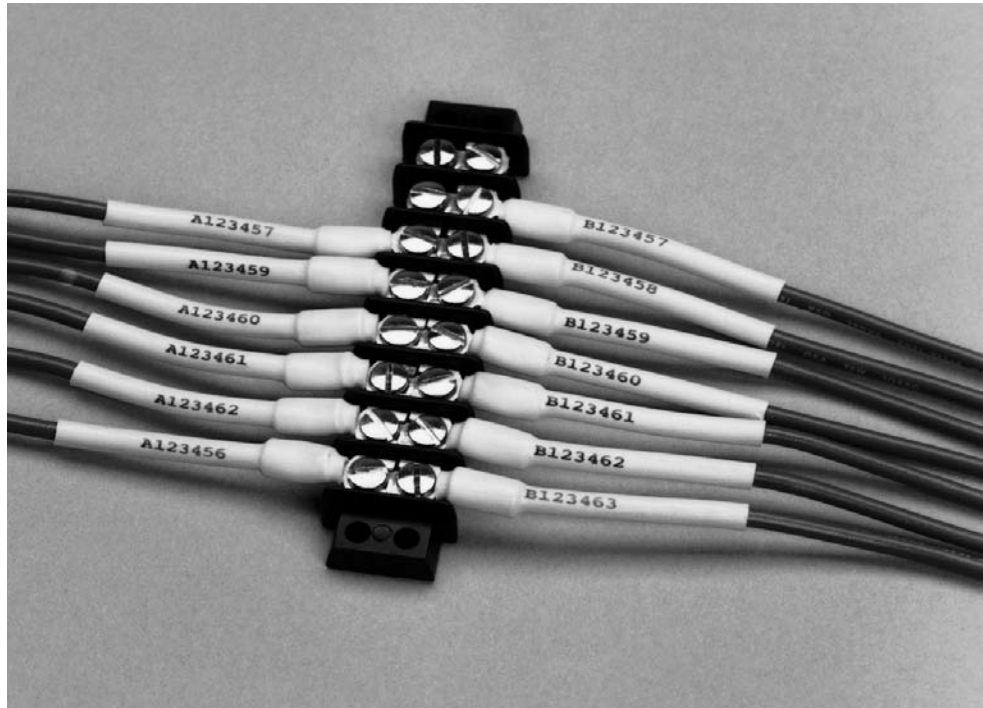


**Flexible, Flame-Retardant,  
General Purpose,  
Polyolefin Tubing**

**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

**RNF-100**



**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**<br>After Heating |
|-------|---------------------------------|------------------------------------|---------------------------------------------|
|       | Minimum Expanded<br>as Supplied | Maximum Recovered<br>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

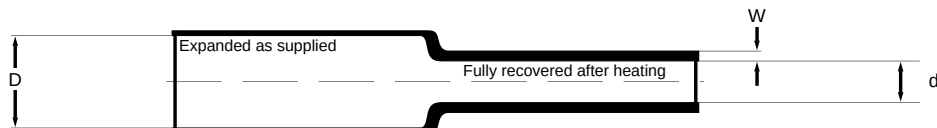
|                                   |                |
|-----------------------------------|----------------|
| Minimum shrink temperature:       | 121°C          |
| Continuous operating temperature: | -55°C to 135°C |

### 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)



| Inside diameter |                                     | Wall thickness                         |                                   | Inside diameter |                                     | Wall thickness                         |                                   |
|-----------------|-------------------------------------|----------------------------------------|-----------------------------------|-----------------|-------------------------------------|----------------------------------------|-----------------------------------|
| Size            | D (min.)<br>Expanded<br>as supplied | d (max.)<br>Recovered<br>after heating | W<br>Recovered<br>after heating** | Size            | D (min.)<br>Expanded<br>as supplied | d (max.)<br>Recovered<br>after heating | W<br>Recovered<br>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

|            | Property                                                                                                                                                                       | Unit                          | Requirement                                                                |                                                                            | Method of test             |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------|----------------------------------------------------------------------------|----------------------------|
|            |                                                                                                                                                                                |                               | Type 1 (colors)                                                            | Type 2 (clear)                                                             |                            |
| 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 (10.3) minimum                                                        | 1500 (10.3) 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> (172) maximum                                        | 2.5 X 10 <sup>4</sup> (172) 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 (19,680) minimum                                                       | 500 (19,680) minimum                                                       | ASTM D 2671                |
|            | 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 (15,760) minimum                                                       | 400 (15,760) minimum                                                       | ASTM D 2671                |
|            | Tensile strength                                                                                                                                                               | psi ( <i>Mpa</i> )            | 1000 (6.9) minimum                                                         | 1000 (6.9) 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.**

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