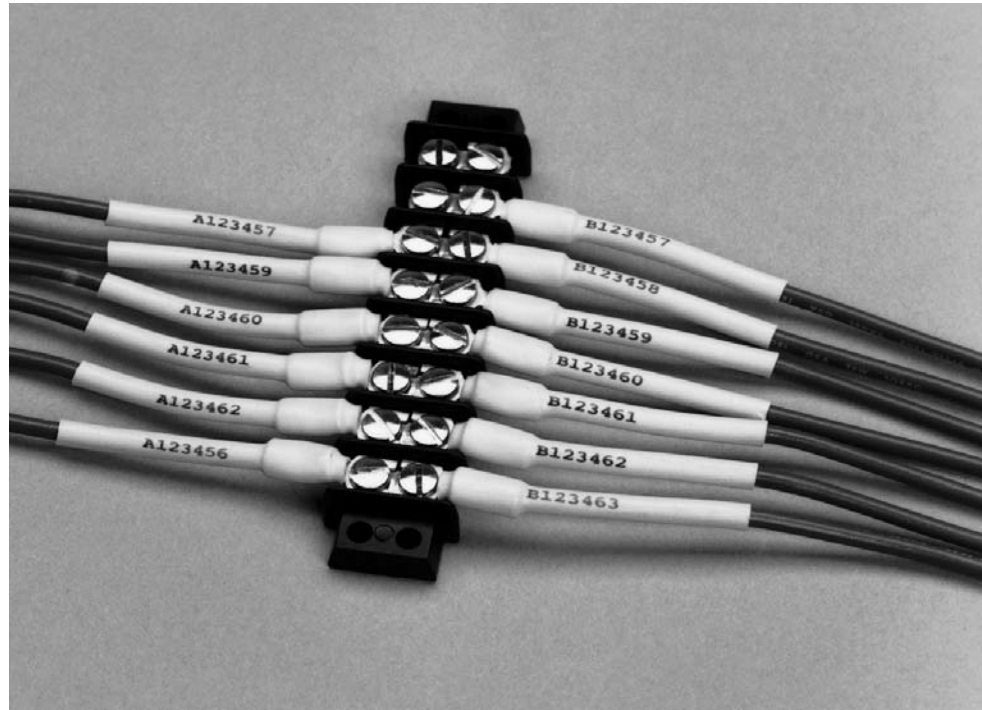


RNF-100

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 600 V, 125°C | LR31929 600 V, 125°C | AMS-DTL-23053/5*, Class 1 Def. Stan. 59-97 Type 2B | VDE 0341 Pt 9005 Type A and B | RT-350, Type 1 RK-6001 |
| RNF-100 Type 2 (clear) | — | — | AMS-DTL-23053/5*, Class 2 VG 95343 Pt 5 Type B | — | RT-350, Type 2 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 | Standard | Black (all sizes); clear, white, red, blue, green, and yellow (3/64" through 3") |
| | Nonstandard | 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 ⁴ (<i>172</i>) maximum | 2.5 X 10 ⁴ (<i>172</i>) maximum | ASTM D 2671 |
| | Specific gravity | | 1.35 maximum | 1.0 maximum | ASTM D 2671 |
| | Low temperature flexibility (4 hours at -55°C/-67°F) | | No cracking | No cracking | AMS-DTL-23053 |
| | Heat shock (4 hours at 250°C/482°F) | | No dripping, flowing, or cracking | No dripping, flowing, or cracking | AMS-DTL-23053 |
| | Heat resistance (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 (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 ¹⁴ minimum | 10 ¹⁶ minimum | ASTM D 2671 |
| Chemical | Copper mirror corrosion (16 hours at 175°C/347°F) | | No removal of copper | No removal of copper | ASTM D 2671 Procedure A |
| | Copper contact corrosion (168 hours at 160°C/320°F) | | No pitting or blackening of copper | No pitting or blackening of copper | ASTM D 2671 Procedure B |
| | Copper stability (16 hours at 160°C/320°F) | | No brittleness, glazing, cracking, or severe discoloration of tubing | No brittleness, glazing, cracking, or severe discoloration of tubing | ASTM D 2671 Procedure B |
| | Followed by test for: | | | | |
| | Ultimate Elongation | percent | 200 minimum | 200 minimum | ASTM D 2671 |
| | Flammability | | Self-extinguishing within 1 minute, 25% maximum flag burn | | ASTM D 2671 Procedure B |
| | Fungus resistance | | Rating of 1 or less | Rating of 1 or less | ASTM G 21 |
| | Water absorption (24 hours at 23°C/73°F) | percent | 0.5 maximum | 0.2 maximum | ASTM D 2671 |
| | Fluid resistance (24 hours at 23°C/73°F) in: JP-8 fuel (MIL-T-5624) Skydrol 500 Hydraulic fluid (MIL-H-5606) Aviation gasoline 100/300 (MIL-G-5572) 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.

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