



# Introducing RW-175

Highly flame-resistant, high-temperature, chemical-resistant RW-175 tubing provides tough, semirigid, very-thin-wall insulation and strain relief of multipin connectors, solder joints and other delicate electrical connections and terminations. It is well-suited for applications that require dense packing of components or visual inspection of covered components. It is especially suitable for applications requiring outstanding abrasion and cut-through resistance and superior chemical and solvent resistance. Its high temperature performance meets or exceeds military and industrial standards. RW-175 meets NASA outgassing requirements making it suitable for use in space applications such as satellites.

## KEY FEATURES

- 2:1 shrink ratio for all standard sizes
- Tough, semirigid, very-thin-wall insulation
- High flame-resistance, meeting the requirements of AMS-DTL-23053, Test C, with UL and CSA VW-1 flammability rating
- High temperature performance that meets or exceeds military and industrial standards
- Protection from most industrial solvents, fuels, and chemicals
- Available in several "microtubing" sizes for applications requiring recovered I.D.'s as small as .007" (0.178mm)
- Meets NASA outgassing requirements
- Offers improved clarity (clear version) and increased resistance to crazing when compared to previously offered solutions

## APPLICATIONS

- Appliances
- Military and commercial aircraft
- Satellites
- Commercial electronics and communication
- Industrial equipment

## ELECTRICAL

- Provides excellent electrical insulation
- Not recommended for use as a primary insulator at temperatures exceeding 135°C [275°F]

## MECHANICAL

- Tough modified polyvinylidene fluoride material provides outstanding abrasion and cut-through resistance
- Excellent for strain relief when installed on delicate electrical connections and terminations

## TEMPERATURE RATING

- Full recovery temperature: 175°C [347°F]
- Operating Temperature range: -55°C to 175°C [-67°F to 347°F]

## STANDARDS AND SPECIFICATIONS

- RW-3029/2
- RW-175 Microtubing SCD
- SAE-AMS-DTL-23053/8
- UL 224 VW-1
- CSA C22.2 No. 198.1-98 VW-1

## ORDERING INFORMATION

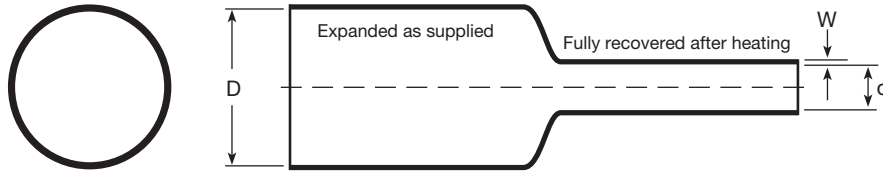
- Color: Clear (-X) (standard); Black (-O) (nonstandard)
- Standard packaging (-STK): 1.2m [4 ft.] lengths  
Optional packaging (-SP): Spool, varying lengths (consult TE for details)
- Ordering description: Specify product name, size, and color; for example, RW-175-3/16-X.

**SAMPLES NOW AVAILABLE**

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**RW-175 DIMENSIONS**

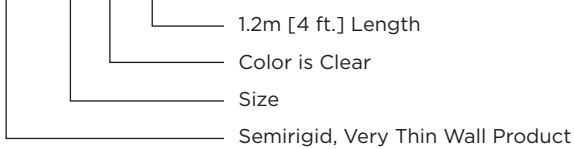


| Size  | Minimum Expanded I.D. (D) |       | Maximum Recovered I.D. (d) |       | Nominal Recovered Jacket Wall (W) |            |
|-------|---------------------------|-------|----------------------------|-------|-----------------------------------|------------|
|       | in.                       | mm.   | in.                        | mm.   | in.                               | mm.        |
| 3/64  | .046                      | 1.17  | .023                       | .58   | .010 ± .002                       | .25 ± .051 |
| 1/16  | .063                      | 1.60  | .031                       | .79   | .010 ± .002                       | .25 ± .051 |
| 3/32  | .093                      | 2.36  | .046                       | 1.17  | .010 ± .002                       | .25 ± .051 |
| 1/8   | .125                      | 3.18  | .062                       | 1.58  | .010 ± .002                       | .25 ± .051 |
| 3/16  | .187                      | 4.75  | .093                       | 2.36  | .010 ± .002                       | .25 ± .051 |
| 1/4   | .250                      | 6.35  | .125                       | 3.18  | .013 ± .002                       | .33 ± .051 |
| 3/8   | .375                      | 9.53  | .187                       | 4.75  | .013 ± .002                       | .33 ± .051 |
| 1/2   | .500                      | 12.70 | .250                       | 6.35  | .013 ± .002                       | .33 ± .051 |
| 3/4   | .750                      | 19.05 | .375                       | 9.53  | .017 ± .003                       | .43 ± .076 |
| 1     | 1.000                     | 25.40 | .500                       | 12.70 | .019 ± .003                       | .48 ± .076 |
| 1-1/2 | 1.500                     | 38.10 | .750                       | 19.05 | .020 ± .003                       | .51 ± .076 |
| 2     | 2.000                     | 50.80 | 1.000                      | 25.40 | .020 ± .003                       | .51 ± .076 |

**RW-175 ORDERING DESCRIPTION**

**Example 1:**

**RW-175-3/8-X-STK**



**Example 2:**

**RW-175-3/4-0-SP**



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**PRODUCT OFFERING**

| Material Description | Material Number |
|----------------------|-----------------|
| RW-175-3/64-X-STK    | CV3299-000      |
| RW-175-3/64-X-SP     | CV3270-000      |
| RW-175-3/64-O-STK    | CV3331-000      |
| RW-175-3/64-O-SP     | CV3269-000      |
| RW-175-1/16-X-STK    | CV3300-000      |
| RW-175-1/16-X-SP     | CV3257-000      |
| RW-175-1/16-O-STK    | CV3322-000      |
| RW-175-1/16-O-SP     | CV3256-000      |
| RW-175-3/32-X-STK    | CV3301-000      |
| RW-175-3/32-X-SP     | CV3267-000      |
| RW-175-3/32-O-STK    | CV3329-000      |
| RW-175-3/32-O-SP     | CV3266-000      |
| RW-175-1/8-X-STK     | CV3302-000      |
| RW-175-1/8-X-SP      | CV3262-000      |
| RW-175-1/8-O-STK     | CV3325-000      |
| RW-175-1/8-O-SP      | CV3261-000      |
| RW-175-3/16-X-STK    | CV3303-000      |
| RW-175-3/16-X-SP     | CV3265-000      |
| RW-175-3/16-O-STK    | CV3328-000      |
| RW-175-3/16-O-SP     | CV3264-000      |
| RW-175-1/4-X-STK     | CV3304-000      |
| RW-175-1/4-X-SP      | CV3260-000      |
| RW-175-1/4-O-STK     | CV3324-000      |
| RW-175-1/4-O-SP      | CV3259-000      |
| RW-175-3/8-X-STK     | CV3305-000      |

| Material Description | Material Number |
|----------------------|-----------------|
| RW-175-3/8-X-SP      | CV3272-000      |
| RW-175-3/8-O-STK     | CV3332-000      |
| RW-175-3/8-O-SP      | CV3271-000      |
| RW-175-1/2-X-STK     | CV3306-000      |
| RW-175-1/2-X-SP      | CV3258-000      |
| RW-175-1/2-O-STK     | CV3323-000      |
| RW-175-3/4-X-STK     | CV3307-000      |
| RW-175-3/4-X-SP      | CV3268-000      |
| RW-175-3/4-O-STK     | CV3330-000      |
| RW-175-1-X-STK       | CV3308-000      |
| RW-175-1-X-SP        | CV3263-000      |
| RW-175-1-O-STK       | CV3326-000      |
| RW-175-1-1/2-X-STK   | CV3309-000      |
| RW-175-1-1/2-O-STK   | CV3327-000      |
| RW-175-2-X-STK       | CV3310-000      |
| RW-175-O30-X-SP†     | CV3281-000      |
| RW-175-NO.1-X-SP†    | CV3293-000      |
| RW-175-NO.2-X-SP†    | CV3294-000      |
| RW-175-NO.13-X-SP†   | CV3291-000      |
| RW-175-NO.14-X-SP†   | CV3292-000      |
| RW-175-NO.33-X-SP†   | CV3296-000      |
| RW-175-NO.33-O-SP†   | CV3295-000      |
| RW-175-NO.65-X-SP†   | CV3298-000      |
| RW-175-NO.65-O-SP†   | CV3297-000      |

† RW-175 microtubing is available in 0.014-0.045 in. (.356-1.143 mm) dia. Consult TE for complete details.

**SAMPLE INVENTORY**

|                    |
|--------------------|
| RW-175-3/64-X-STK  |
| RW-175-1/16-X-STK  |
| RW-175-3/32-X-STK  |
| RW-175-1/8-X-STK   |
| RW-175-3/16-X-STK  |
| RW-175-1/4-X-STK   |
| RW-175-3/8-X-STK   |
| RW-175-1/2-X-STK   |
| RW-175-3/4-X-STK   |
| RW-175-1-X-STK     |
| RW-175-1-1/2-X-STK |
| RW-175-NO.1-X-SP   |
| RW-175-NO.33-X-SP  |

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**PROPERTY REQUIREMENTS**

| Property                                                                                                                                                                                                                                                                                                                                                                           | Unit                              | Requirement                                                         | Test Method                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>PHYSICAL</b>                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                                                     |                                                                                    |
| Dimensions                                                                                                                                                                                                                                                                                                                                                                         | Inch (mm)                         | Table 1                                                             | RW-3029/2, Section 4.3.1                                                           |
| Longitudinal Change                                                                                                                                                                                                                                                                                                                                                                | Percent                           | +0, -10 maximum                                                     | ASTM D 2671                                                                        |
| Tensile Strength                                                                                                                                                                                                                                                                                                                                                                   | psi (MPa)                         | 5000 minimum (34.5)                                                 | RW-3029/2, Section 4.3.2                                                           |
| Ultimate Elongation                                                                                                                                                                                                                                                                                                                                                                | Percent                           | 150 minimum                                                         | ASTM D 2671                                                                        |
| Secant Modulus (expanded)                                                                                                                                                                                                                                                                                                                                                          | psi (MPa)                         | 1 x 10 <sup>5</sup> minimum (690)                                   | ASTM D 2671                                                                        |
| Specific Gravity                                                                                                                                                                                                                                                                                                                                                                   |                                   | 1.8 maximum                                                         | ASTM D 2671                                                                        |
| Low Temperature Flexibility<br>4 hours at -55°C ± 2°C (-67 ± 4°F)                                                                                                                                                                                                                                                                                                                  |                                   | No cracking                                                         | RW-3029/2, Section 4.3.3                                                           |
| Heat Shock<br>4 hours at 300 ± 5°C (572 ± 9°F)                                                                                                                                                                                                                                                                                                                                     |                                   | No dripping, flowing or cracking                                    | RW-3029/2, Section 4.3.4                                                           |
| Heat Resistance<br>168 hours at 250 ± 5°C (482 ± 9°F)<br>Followed by test for:<br>Ultimate elongation                                                                                                                                                                                                                                                                              | Percent                           | 50 minimum                                                          | RW-3029/2, Section 4.3.5<br>ASTM D 2671                                            |
| Vacuum Outgassing<br>TML (Total Mass Loss)                                                                                                                                                                                                                                                                                                                                         | Percent                           | 1.0 maximum                                                         | ASTM E 595                                                                         |
| VCM (Volatile Condensable Material)                                                                                                                                                                                                                                                                                                                                                | Percent                           | 0.1 maximum                                                         |                                                                                    |
| <b>ELECTRICAL</b>                                                                                                                                                                                                                                                                                                                                                                  |                                   |                                                                     |                                                                                    |
| Dielectric Strength<br>Sizes 3/64 through 12<br>Sizes 3/4 through 2                                                                                                                                                                                                                                                                                                                | V/mil (kV/mm)                     | 800 minimum (31,500)<br>600 minimum (2,600)                         | ASTM D 2671                                                                        |
| Volume Resistivity                                                                                                                                                                                                                                                                                                                                                                 | Ohm-cm                            | 1 X 10 <sup>13</sup> minimum                                        | ASTM D 2671                                                                        |
| <b>CHEMICAL</b>                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                                                     |                                                                                    |
| Corrosive Effect Copper Mirror<br>16 hours at 150°C                                                                                                                                                                                                                                                                                                                                |                                   | Noncorrosive                                                        | RW-3029/2, Section 4.3.6.1<br>ASTM D 2671, Proc. A                                 |
| Copper Contact<br>168 hours at 175 ± 3°C (347 ± 5°F)<br>Followed by test for:<br>Ultimate Elongation                                                                                                                                                                                                                                                                               | Percent                           | No pitting or blackening of copper<br>100 minimum                   | RW-3029/2, Section 4.3.6.2<br>ASTM D 2671, Proc. B<br>RW-3029/2, Section 4.3.2     |
| Flammability<br>Average Time of Burning                                                                                                                                                                                                                                                                                                                                            | Seconds                           | 15 maximum                                                          | ASTM D 2671, Proc. A                                                               |
| Fungus Resistance<br>Followed by tests for:<br>Tensile Strength<br>Ultimate Elongation                                                                                                                                                                                                                                                                                             | psi (Mpa)<br>Percent              | 5000 minimum (34.5)<br>150 minimum                                  | ISO 846, Method B<br>RW-3029/2, Section 4.3.2<br>ASTM D 2671                       |
| Dielectric Strength<br>Sizes 3/64 through 1/2<br>Sizes 3/4 through 2                                                                                                                                                                                                                                                                                                               | Volts/mil (volts/mm)              | 800 minimum (31,500)<br>600 minimum (23,600)                        | ASTM D 2671                                                                        |
| Water Absorption<br>24 hours at 23 ± 3°C (73 ± 5°F)                                                                                                                                                                                                                                                                                                                                | Percent                           | 0.5 maximum                                                         | ASTM D 2671                                                                        |
| Fluid Resistance<br>24 hours at 23 ± 3°C (73 ± 5°F)<br>JP-4 Fuel (MIL-T-5624)<br>SKYDROL 500 Hydraulic Fluid (MIL-H-5606)<br>Aviation Gasoline 100/130 (MIL-G-5572)<br>Salt Water (5% salt)<br>Anti-icing Fluid (MIL-A-8243)<br>Lubricating Oil (MIL-L-7808)<br>Followed by tests for:<br>Dielectric Strength<br>Sizes 3/64 through 1/2<br>Sizes 3/4 through 2<br>Tensile Strength | Volts/mil (Volts/mm)<br>psi (MPa) | 700 minimum (27,600)<br>500 minimum (19,700)<br>5000 minimum (34.5) | RW-3029/2, Section 4.3.7<br>ASTM D 2671<br>RW-3029/2, Section 4.3.2<br>ASTM D 2671 |

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