

# 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 (-0) (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**

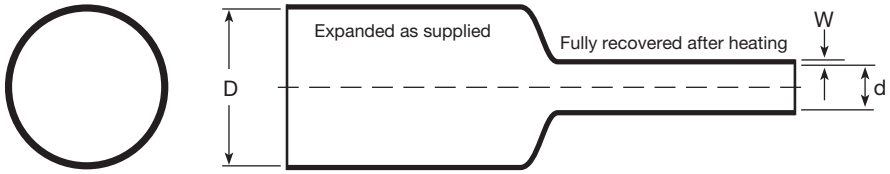
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## RW-175 DIMENSIONS




| 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**

- STK — 1.2m [4 ft.] Length
- X — Color is Clear
- 3/8 — Size
- RW-175 — Semirigid, Very Thin Wall Product

**Example 2:**

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

- SP — Spool Packaging
- 0 — Color is Black
- 3/4 — Size
- RW-175 — Semirigid, Very Thin Wall Product

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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-175-3/64-0-STK | CV3331-000 |
| RW-175-3/64-0-SP | CV3269-000 |
| RW-175-1/16-X-STK | CV3300-000 |
| RW-175-1/16-X-SP | CV3257-000 |
| RW-175-1/16-0-STK | CV3322-000 |
| RW-175-1/16-0-SP | CV3256-000 |
| RW-175-3/32-X-STK | CV3301-000 |
| RW-175-3/32-X-SP | CV3267-000 |
| RW-175-3/32-0-STK | CV3329-000 |
| RW-175-3/32-0-SP | CV3266-000 |
| RW-175-1/8-X-STK | CV3302-000 |
| RW-175-1/8-X-SP | CV3262-000 |
| RW-175-1/8-0-STK | CV3325-000 |
| RW-175-1/8-0-SP | CV3261-000 |
| RW-175-3/16-X-STK | CV3303-000 |
| RW-175-3/16-X-SP | CV3265-000 |
| RW-175-3/16-0-STK | CV3328-000 |
| RW-175-3/16-0-SP | CV3264-000 |
| RW-175-1/4-X-STK | CV3304-000 |
| RW-175-1/4-X-SP | CV3260-000 |
| RW-175-1/4-0-STK | CV3324-000 |
| RW-175-1/4-0-SP | CV3259-000 |
| RW-175-3/8-X-STK | CV3305-000 |

| Material Description | Material Number |
|---|---|
| RW-175-3/8-X-SP | CV3272-000 |
| RW-175-3/8-0-STK | CV3332-000 |
| RW-175-3/8-0-SP | CV3271-000 |
| RW-175-1/2-X-STK | CV3306-000 |
| RW-175-1/2-X-SP | CV3258-000 |
| RW-175-1/2-0-STK | CV3323-000 |
| RW-175-3/4-X-STK | CV3307-000 |
| RW-175-3/4-X-SP | CV3268-000 |
| RW-175-3/4-0-STK | CV3330-000 |
| RW-175-1-X-STK | CV3308-000 |
| RW-175-1-X-SP | CV3263-000 |
| RW-175-1-0-STK | CV3326-000 |
| RW-175-1-1/2-X-STK | CV3309-000 |
| RW-175-1-1/2-0-STK | CV3327-000 |
| RW-175-2-X-STK | CV3310-000 |
| RW-175-030-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.33-0-SP† | CV3295-000 |
| RW-175-NO.65-X-SP† | CV3298-000 |
| RW-175-NO.65-0-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 |
|---|---|---|---|
| **PHYSICAL** | | | |
| 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 $10^5$ 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: | | | RW-3029/2, Section 4.3.5 |
| Ultimate elongation | Percent | 50 minimum | ASTM D 2671 |
| Vacuum Outgasing | | | ASTM E 595 |
| TML (Total Mass Loss) | Percent | 1.0 maximum | |
| VCM (Volatile Condensible Material) | Percent | 0.1 maximum | |
| **ELECTRICAL** | | | |
| Dielectric Strength | V/mil (kV/mm) | | ASTM D 2671 |
| Sizes 3/64 through 12 | | 800 minimum (31,500) | |
| Sizes 3/4 through 2 | | 600 minimum (2,600) | |
| Volume Resistivity | Ohm-cm | 1 X $10^{13}$ minimum | ASTM D 2671 |
| **CHEMICAL** | | | |
| 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: | | No pitting or blackening of copper | RW-3029/2, Section 4.3.6.2<br>ASTM D 2671, Proc. B |
| Ultimate Elongation | Percent | 100 minimum | RW-3029/2, Section 4.3.2 |
| Flammability | | | ASTM D 2671, Proc. A |
| Average Time of Burning | Seconds | 15 maximum | |
| Fungus Resistance | | | ISO 846, Method B |
| Followed by tests for: | | | |
| Tensile Strength | psi (Mpa) | 5000 minimum (34.5) | RW-3029/2, Section 4.3.2 |
| Ultimate Elongation | Percent | 150 minimum | ASTM D 2671 |
| Dielectric Strength | Volts/mil (volts/mm) | | ASTM D 2671 |
| Sizes 3/64 through 1/2 | | 800 minimum (31,500) | |
| Sizes 3/4 through 2 | | 600 minimum (23,600) | |
| 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: | | | RW-3029/2, Section 4.3.7 |
| Dielectric Strength | Volts/mil (Volts/mm) | | ASTM D 2671 |
| Sizes 3/64 through 1/2 | | 700 minimum (27,600) | |
| Sizes 3/4 through 2 | | 500 minimum (19,700) | |
| Tensile Strength | psi (MPa) | 5000 minimum (34.5) | RW-3029/2, Section 4.3.2<br>ASTM D 2671 |

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