

Flexible, rugged, modified elastomeric heat-shrinkable tubing

NT-MIL modified elastomeric heat-shrinkable tubing offers outstanding resistance to abrasion and physical abuse while providing flexibility and strain relief needed in many harnessing applications. NT-MIL tubing is widely used for insulation, strain relief and abrasion protection on cable harnesses and wire bundles in the military and aerospace industries. It meets the stringent requirements of AMS-DTL-23053/1, Classes 1 and 2.

NT-MIL tubing remains flexible at temperatures as low as -70°C without cracking. It also withstands heat shock at 200°C without dripping, flowing or cracking.

NT-MIL tubing is resistant to common fluids and solvents including aviation and ground vehicle fuels, lubricating oil, and hydraulic fluids. It retains excellent physical and electrical properties following exposure.

No special skills are required to install NT-MIL tubing. Using standard heating tools, one operator can complete an installation in minutes, substantially reducing labor costs.

NT-MIL tubing is supplied in a wide range of sizes. Because NT-MIL is heat-shrinkable, each size can accommodate a variety of harness sizes, minimizing inventory and related costs.

Temperature rating

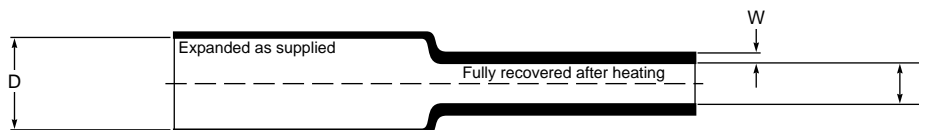
Full recovery temperature:	135°C
Continuous operating temperature:	-70°C to 121°C

Specifications*

Type	Raychem	Military
NT-MIL	RW-3030	AMS-DTL-23053/1, Cl. 1 and 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	Recovered after heating**		D (min.) Expanded as supplied	d (max.) Recovered after heating	W Recovered after heating	Recovered after heating**				
1/8	3.2	0.125	1.6	0.062	0.66 ± 0.20	0.026 ± 0.008	1	25.4	1.000	14.5	0.570	1.77 ± 0.51	0.070 ± 0.020
3/16	4.8	0.187	2.4	0.093	0.84 ± 0.25	0.033 ± 0.010	1 1/4	31.8	1.250	18.1	0.714	2.20 ± 0.51	0.087 ± 0.020
1/4	6.4	0.250	3.6	0.143	0.89 ± 0.25	0.035 ± 0.010	1 1/2	38.1	1.500	21.8	0.857	2.41 ± 0.51	0.095 ± 0.020
3/8	9.5	0.375	5.4	0.211	1.01 ± 0.25	0.040 ± 0.010	1 3/4	44.5	1.750	25.4	1.000	2.71 ± 0.51	0.107 ± 0.020
1/2	12.7	0.500	7.3	0.286	1.21 ± 0.38	0.048 ± 0.015	2	50.8	2.000	29.0	1.140	2.79 ± 0.51	0.110 ± 0.020
5/8	15.9	0.625	9.1	0.357	1.32 ± 0.38	0.052 ± 0.015	3	76.2	3.000	43.4	1.710	3.17 ± 0.51	0.125 ± 0.020
3/4	19.1	0.750	10.9	0.428	1.44 ± 0.38	0.057 ± 0.015	4	101.6	4.000	57.9	2.280	3.55 ± 0.51	0.140 ± 0.020
7/8	22.2	0.875	12.7	0.500	1.65 ± 0.38	0.065 ± 0.015							

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

Ordering information

Colors	Black
Size selection	Always order the largest size that will shrink snugly over the component being covered.
Standard packaging	On spools
Ordering description	Specify product name, size, and color; for example, NT-MIL 1/4-0 (0=Black).

Specification values

	Property	Unit	Requirement	Method of test	
Material	Dimensions	mm (<i>inches</i>)	See Reverse	ASTM D 2671	
	Longitudinal change	percent	+1, -10	ASTM D 2671	
	Tensile strength	psi (<i>Mpa</i>)	1500 (<i>10.3</i>) minimum	ASTM D 412	
	Ultimate elongation	percent	225 minimum	ASTM D 412	
	Tensile stress at 200% elongation	psi (<i>Mpa</i>)	1500 (<i>10.3</i>) maximum	AMS-DTL-23053	
	Restricted shrinkage (30 minutes at 135°C/275°F) Followed by test for:		No cracks	AMS-DTL-23053	
	Voltage withstand		Pass		
	Low temperature flexibility (4 hours at -70°C/-94°F)		No cracks	AMS-DTL-23053	
	Heat shock (4 hours at 200°C/392°F)		No cracks, flowing or dripping	AMS-DTL-23053	
	Heat resistance (168 hours at 121°C/250°F) Followed by tests for:			ASTM D 2671	
	Tensile strength	psi (<i>Mpa</i>)	1200 (<i>8.3</i>) minimum	ASTM D 412	
	Ultimate elongation	percent	175 minimum	ASTM D 412	
	Dielectric strength	volts/mil (<i>kV/mm</i>)	Sizes up to 7/8: 300 (<i>11.8</i>) minimum Sizes 1 and larger: 200 (<i>7.8</i>) minimum	ASTM D 2671	
	Electrical	Dielectric strength	volts/mil (<i>kV/mm</i>)	Sizes up to 7/8: 300 (<i>11.8</i>) minimum Sizes 1 and larger: 200 (<i>7.8</i>) minimum	ASTM D 2671
		Volume resistivity	ohm-cm	1 x 10 ¹¹ minimum	ASTM D 876
	Chemical	Copper mirror corrosion (16 hours at 150°C/302°F)		No pitting or corrosion	AMS-DTL-23053
		Copper contact corrosion (16 hours at 150°C/302°F)		No pitting or blackening of copper	AMS-DTL-23053
Flammability			Self-extinguishing in 15 seconds; 3 inches maximum burn length	ASTM D 2671 Procedure A	
Fungus resistance			No growth	ASTM G 21	
Water absorption (24 hours at 23°C/73°F)		percent	1.0 maximum	ASTM D 570	
Fluid resistance (24 hours at 23°C/73°F) in: JP-8 fuel (MIL-T-83133) Hydraulic fluid (MIL-H-5606) Lubricating oil (MIL-L-7808) Lubricating oil (MIL-L 23699) Salt water (5% salt) Anti-icing fluid (MIL-A-8243) Followed by tests for:				AMS-DTL-23053	
Tensile strength		psi (<i>Mpa</i>)	1000 (<i>6.9</i>) minimum	ASTM D 412	
Ultimate elongation		percent	175 minimum	ASTM D 412	
Dielectric strength		volts/mil (<i>kV/mm</i>)	250 (<i>9.8</i>) minimum	ASTM D 2671	

Note: Consult RW-3030 for specific details about test procedures.

Raychem is a trademark of Tyco Electronics Corporation.

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