

## 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

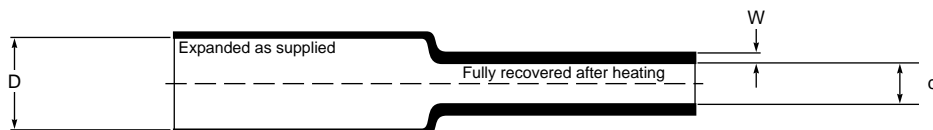
Full recovery temperature:	135°C
Continuous operating temperature:	-70°C to 121°C

### 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)



Inside diameter				Wall thickness				Inside diameter				Wall thickness			
Size	D (min.)	d (max.)	Expanded as supplied	Recovered after heating	Recovered after heating**	Recovered after heating**	Recovered after heating**	Size	D (min.)	d (max.)	Expanded as supplied	Recovered after heating	Recovered after heating**	Recovered after heating**	Recovered after heating**
1/8	3.2	0.125	1.6	0.062	0.66 ± 0.20	0.026 ± 0.008	0.026 ± 0.008	1	25.4	1.000	14.5	0.570	1.77 ± 0.51	0.070 ± 0.020	0.070 ± 0.020
3/16	4.8	0.187	2.4	0.093	0.84 ± 0.25	0.033 ± 0.010	0.033 ± 0.010	1 1/4	31.8	1.250	18.1	0.714	2.20 ± 0.51	0.087 ± 0.020	0.087 ± 0.020
1/4	6.4	0.250	3.6	0.143	0.89 ± 0.25	0.035 ± 0.010	0.035 ± 0.010	1 1/2	38.1	1.500	21.8	0.857	2.41 ± 0.51	0.095 ± 0.020	0.095 ± 0.020
3/8	9.5	0.375	5.4	0.211	1.01 ± 0.25	0.040 ± 0.010	0.040 ± 0.010	1 3/4	44.5	1.750	25.4	1.000	2.71 ± 0.51	0.107 ± 0.020	0.107 ± 0.020
1/2	12.7	0.500	7.3	0.286	1.21 ± 0.38	0.048 ± 0.015	0.048 ± 0.015	2	50.8	2.000	29.0	1.140	2.79 ± 0.51	0.110 ± 0.020	0.110 ± 0.020
5/8	15.9	0.625	9.1	0.357	1.32 ± 0.38	0.052 ± 0.015	0.052 ± 0.015	3	76.2	3.000	43.4	1.710	3.17 ± 0.51	0.125 ± 0.020	0.125 ± 0.020
3/4	19.1	0.750	10.9	0.428	1.44 ± 0.38	0.057 ± 0.015	0.057 ± 0.015	4	101.6	4.000	57.9	2.280	3.55 ± 0.51	0.140 ± 0.020	0.140 ± 0.020
7/8	22.2	0.875	12.7	0.500	1.65 ± 0.38	0.065 ± 0.015	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)		No cracks	AMS-DTL-23053
	Followed by test for:			
	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)			ASTM D 2671
	Followed by tests for:			
	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 <sup>11</sup> 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)			AMS-DTL-23053
	Followed by tests for:			
	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.

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