



## DUNBAR-PHWT-FR

**3:1 SHRINK RATIO, FLEXIBLE, SEMI-RIGID, HEAVY WALL, FLAME-RETARDANT, ADHESIVE-LINED POLYOLEFIN TUBING**


### Applications

DUNBAR-PHWT-FR is designed to provide reliable performance as well as excellent mechanical and environmental protection. DUNBAR-PHWT-FR is designed for sealing and insulation of cable splices, electrical connections, terminations and jacket repairs. Ideally suited for shipboard, submersible, direct-buried installations, or wherever tougher mechanical protection is required in an electrical insulation system.

### Features

- ★ Operating temperature range: -55°C ~ 125°C
- ★ Shrink ratio of 3:1 – 67% or more in the radial direction
- ★ Exceptional flexibility prior to recovery
- ★ Minimum shrink temperature: 120°C
- ★ Flammability: VTFT (IEEE 383)
- ★ High Carbon Black composition to resist UV radiation
- ★ RoHS Compliant

### Standard

- ★ MIL-DTL-23053/15 Class 1 & Class 2
- ★ UL 224 (File Number E319303) 
- ★ DNV File No. E-7977, E-7978
- ★ ABS File No. 02-SE23285-X

### Specification Values

Property		Test Method	Value	
Physical	Unaged	Tensile strength	ASTM D 412	Min. 1.06 kgf/mm <sup>2</sup>
		Elongation	ASTM D 2671	Min. 200%
	Aged	Tensile strength	ASTM D 412	Min. 0.76 kgf/mm <sup>2</sup>
		Elongation	ASTM D 2671	Min. 100%
	Low temperature flexibility		ASTM D 2671	No crack @ -55° C x 4 hrs
	Heat shock		ASTM D 2671	No crack @ 225° C x 4 hrs
Thermal endurance		IEC 60216	TI/120° C	
Electrical	Dielectric strength		ASTM D 149 & 2671	Min. 7.9 kV/mm
	Volume resistivity		IEC 60093	Min. 10 <sup>13</sup> Ω - cm
Chemical	Copper corrosion		ASTM D 2671	No corrosion
	Water absorption		ASTM D 570	Max 0.5% @ 23° C/24 hrs
	Resistance to mold		ASTM G 21	Pass rating 1
	Fluid resistance	Retention of Tensile Strength	ASTM D 412	ASTM No. 2 OR IRM 902 oil @ 70° C Min. 0.53 kgf/mm <sup>2</sup> Min. 100%
Retention of Elongation		ASTM D 2671		

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**Dunbar Associates**

Your Stocking Partner for Quality Components

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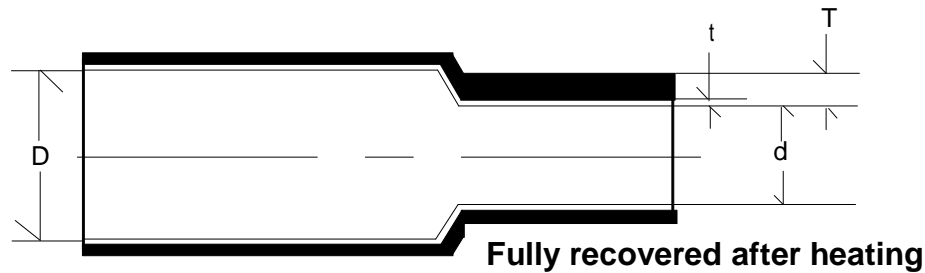
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Available Colors



Black Red



## Product Dimensions Minimum Shrink Temperature: 120°C

Mil Spec	Expanded		Recovered				
	As Supplied ID* (min.) (D)		Adhesive Inner Wall (t)	Internal Diameter (max.) (d)		Wall Thickness (nominal) (T)	
X = Color Code	In.	mm	In.	In.	mm	In.	mm
101-X	.750	19.1	.0294	.220	5.59	.105	2.7
102-X	1.100	27.9	.0348	.375	9.53	.120	3.1
103-X	1.500	38.1	.0410	.500	12.7	.140	3.6
104-X	2.000	50.8	.0375	.750	19.1	.155	3.44
105-X	3.000	76.2	.0353	1.250	31.8	.155	3.44
106-X	4.000	101.6	.0455	1.750	44.5	.155	3.44
107-X	.300	7.6	.0107	.100	2.5	.050	1.3
108-X	.400	10.2	.0134	.150	3.8	.060	1.5
109-X	1.300	33.0	.0348	.375	9.5	.120	3.1
110-X	1.700	43.2	.0410	.500	12.7	.155	3.4
111-X	2.700	68.6	.0482	.900	22.9	.155	3.4
112-X	4.500	114.3	.0442	1.750	44.5	.170	4.3

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\* Per M23053/15 – "As Supplied" ID is for uncoated product. An allowance may be necessary depending on coating.



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