



DUNBAR – 4650WS

**4:1 SHRINK RATIO, SEMI-RIGID, DUAL-WALL, POLYOLEFIN TUBING
(Extended Temperature Range)**


Applications

DUNBAR-4650WS is a fully flame retardant, semi-rigid, high shrink ratio, adhesive lined heat shrinkable polyolefin tube. Both jacket and meltable adhesive liner are flame retardant. Designed for insulation and encapsulation of wire splicing. Used to seal and protect a wide variety of electrical applications, including wire splices, breakouts, and connectors-to-cable transitions.

Features

- ★ Shrink ratio: 75% or more in the radial direction, 10% or less in the axial direction
- ★ Continuous operating temperature: - 55°C to 150°C
- ★ Fully Flame-Retardant: Jacket and Adhesive
- ★ Excellent electrical properties with high resistance to chemicals and oils

Standard

- ★ UL 224 (File Number: E319314) 
- ★ RoHS Compliant

Specification Values

Property		Test Method	Value	
Physical	Unaged	Tensile strength	ASTM D 2671	Min. 1.40 kgf/mm ² (2,000 psi)
		Elongation		Min. 300%
	Aged	Tensile strength	ASTM D 2671 158°C/168 hrs	Min. 70% value of unaged specimens
		Elongation		Min. 100%
	Deformation		ASTM D 2671 158°C/168 hrs	Max. 50% decrease wall thickness
	Melt Flow Rate		ASTM D 1238	40 ± 15 gms/min.
	Specific Gravity		ASTM D 792	1.28 ± 0.05
	Concentricity		ASTM D 2671	60% min.
	Longitudinal shrinkage		ASTM D 2671	+0,-10%
	Heat shock		250± 3°C /4 hrs	No crack
	Cold bend		- 55°C/1 hr	No crack
	Flexibility		158°C/168 hrs	No crack or deformation
Secant Modulus		ASTM 2671	Max. 24.57 kgf/mm ² (35,000 psi)	
Electrical	Dielectric strength		ASTM D 149	Min. 19.7kV/mm
	Volume resistivity		ASTM D 257	Min. 1 x 10 ¹⁴ Ω - cm
Chemical	Copper corrosion		150°C/16 hrs	No corrosion
	Fungus resistance		ASTM G 21	No growth
	Flammability		ASTM D 2671 UL VW-1	Pass – Jacket & Adhesive

Rev June 2009



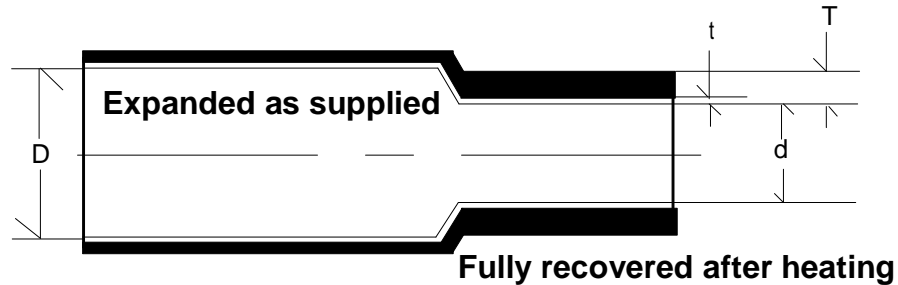
Dunbar Associates
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Product Dimensions

Minimum Shrink Temperature: 130°C

Size	Printed	Expanded		Recovered					
		Internal Diameter (min.) (D)		Internal Diameter (max.) (d)		Total Wall Thickness (Nominal) (T)		Wall Thickness Adhesive Wall (Nominal) (t)	
		In.	mm	In.	mm	In.	mm	In.	mm
6 mm (No. 0)	FDW-0	0.236	6.3	0.050	1.27	0.047	1.20	0.022	0.56
8 mm (No. 1)	FDW-1	0.315	8.2	0.065	1.65	0.060	1.52	0.030	0.76
11 mm (No. 2)	FDW-2	0.433	11.3	0.090	2.29	0.075	1.91	0.040	1.02
12 mm (No. 3)	FDW-3	0.511	12.1	0.100	2.54	0.085	2.15	0.043	1.10
18 mm (No. 4)	FDW-4	0.708	18.1	0.175	4.45	0.095	2.41	0.054	1.30

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