



# 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 adhesive lining (which flows when heated) are flame retardant. It is designed for insulation and encapsulation of wire splicing and 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
- ★ In stock for immediate shipments
- ★ Continuous operating temperature: - 55 °C (-67 °F) to 150 °C (302 °F)
- ★ Fully Flame-Retardant: Jacket and Adhesive
- ★ Excellent electrical properties
- ★ High resistance to abrasion chemicals and oils

## Standard

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

## Specification Values

Property		Test Method	Value	
Physical	Unaged	Tensile strength	ASTM D638	Min. 2,000 psi
		Elongation		Min. 200%
	Aged	Tensile strength	ASTM D638	Min. 1,400 psi
		Elongation		Min. 100%
	Specific Gravity		ASTM D792	Max. 1.33
	Concentricity		ASTM D2671	Min. 60%
	Heat shock		250 °C /4 hrs	No cracks, flowing or dripping
	Cold bend		ASTM D746	No cracking
Secant Modulus		ASTM D882	Max. 25,000 psi	
Electrical	Dielectric strength		ASTM D2671	Min. 500 Volts/Mil.
	Volume resistivity		ASTM D876	Min. 1 x 10 <sup>14</sup> Ω - cm
Chemical	Copper corrosion		150 °C/16 hrs	No corrosion
	Fungus resistance		ASTM G21	No growth
	Flammability		ASTM D2671	Pass – Jacket & Adhesive

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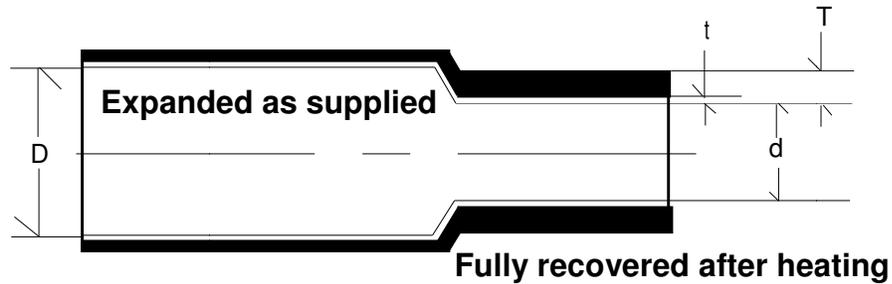
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## Product Dimensions

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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