tyco Electronics

ES2000

Raychem

Flame-retardant, adhesive-lined heat-shrinkable tubing (extended temperature range)

Adhesive-lined ES2000 heat-shrinkable tubing is specifically designed to meet automotive industry requirements for environmental sealing and electrical insulation of automotive wire splices, terminations, and components.

ES2000 tubing has an outer jacket of radiation-crosslinked, semirigid polyolefin. Flame-retardant and mechanically tough, the jacket provides strain relief and abrasion protection of wire splices and mechanically sensitive components. The inner layer of the tubing is a unique hot-melt adhesive, specially formulated to adhere to all major types of automotive wire insulation and to perform well at an extended temperature range. The adhesive forms an effective barrier against automotive fluids and moisture, helping to protect the harness from the effects of corrosion and water wicking.

Because ES2000 tubing has a high shrink ratio, only a few sizes are needed to cover a wide range of splice and component diameters. ES2000 tubing dimensions have been engineered to provide low-cost sealing solutions on multiple-wire splices (up to seven wires per side), using standard Tyco Electronics application equipment.

Temperature rating

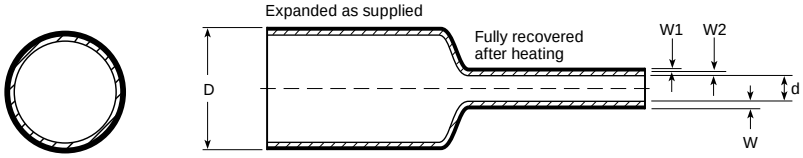
Full recovery temperature:	135°C
Continuous operating temperature:	–40°C to 130°C

*Specifications**

Type	Raychem	UL
ES2000	RT-1112	E85381

*When ordering, always specify latest issue.

*Dimensions (*millimeters*/inches)*



	Inside diameter (including core)				Recovered wall thickness**					
	D (min.) Expanded		d (max.) Recovered after		W Minimum		W1 Minimum		W2 Minimum	
Part number	as supplied		heating		total wall		jacket wall		adhesive wall	
ES2000-No.1	5.72	*0.225*	1.27	*0.050*	1.20	*0.047*	0.64	*0.025*	0.56	*0.022*
ES2000-No.2	7.44	*0.293*	1.65	*0.065*	1.52	*0.060*	0.76	*0.030*	0.76	*0.030*
ES2000-No.3	10.85	*0.427*	2.41	*0.095*	1.91	*0.075*	0.89	*0.035*	1.02	*0.040*
ES2000-No.4	17.78	*0.700*	4.45	*0.175*	2.41	*0.095*	1.04	*0.041*	1.37	*0.054*

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

Ordering information

Color	Black
Size selection	Consult manufacturer's recommended size selection guidelines.
Standard packaging	Cut pieces. See reverse for information on standard cut lengths.
Marking	Tubing will be marked with the number size (for example, ES-1, ES-2, ES-3, or ES-4).
Ordering description	Specify product name, size, color, and cut length; for example, ES2000-No.2-0-50MM (0=Black).

Specification values

	Property	Unit	Requirement	Method of test
Material	Dimensions	mm *(inches)*	See reverse	ASTM D 2671
	Longitudinal change	percent	0 to –10	ASTM D 2671
	Tensile strength	psi *(MPa)*	1500 *(10.3)* minimum	ASTM D 2671
	Ultimate elongation	percent	250 minimum	ASTM D 2671
	Secant modulus at 2% (expanded)*	psi *(MPa)*	20,000 *(137)* minimum	ASTM D 2671
	Heat shock (4 hours at 225°C/*437°F*)		No dripping, flowing or cracking of outer jacket	ASTM D 2671
	Dynamic cut through	pounds *(kg)*	30 *(13.6)* minimum	ASTM D3032
	Volume resistivity	ohm-cm	1.0 X 10^{12} minimum	ASTM D 2671
	Flammability		Self-extinguishing within 30 seconds	See note below
Splice performance	Current leakage	microamps	0.25 maximum	See note below
	Room temperature flex test Current leakage	 microamps	 0.25 maximum	See note below
	Thermal shock Current leakage	 microamps	 0.25 maximum	See note below
	Low-temperature flexibility Dielectric withstand 1 minute at 1000 V	 	 No breakdown	See note below
	Heat aging Current leakage	 microamps	 0.25 maximum	See note below
	Fluid immersion Current leakage Swell	 microamps percent	 0.25 maximum 50 maximum	See note below

Note: Consult Raychem RT-1112 for specific details about test procedures.
*Calculate based on wall thickness of jacket only.

Standard cut lengths

Part number	Standard cut length	Cut length tolerance
ES2000-No. 1	27 mm, 50 mm, 65 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES2000-No. 2	27 mm, 50 mm, 65 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES2000-No. 3	27 mm, 65 mm, 75 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES2000-No. 4	27 mm, 75 mm, 90 mm 1220 mm	± 1.5 mm ± 25.4 mm

Raychem is a trademark of Tyco Electronics Corporation.

Users should independently evaluate the suitability of the product for their application.

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