

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

Clear, adhesive-lined ES1000 heat-shrinkable tubing is specifically designed for environmental sealing and electrical insulation of wire splices, terminations, and components where see-through inspection is required.

ES1000 tubing has an outer jacket of radiation-crosslinked, semirigid polyolefin. The jacket is mechanically tough, providing 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 seal to most types of commercial wire insulation, and to perform well at an extended temperature range. The thick adhesive forms an effective barrier against fluids and moisture, helping to protect the harness from the effects of corrosion and water wicking.

Because ES1000 tubing has a high shrink ratio, only a few sizes are needed to cover a wide range of splice and component diameters. ES1000 tubing dimensions have been engineered to provide low-cost sealing solutions on multiple-wire splices (up to seven wires per side), using standard Raychem application equipment.

**Temperature rating**

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

**Specifications\***



Type	Raychem	UL
ES1000	RT-1113	E85381

\*When ordering, always specify latest issue.

**Dimensions (millimeters/inches)**



Part number	Inside diameter (including core)		Recovered wall thickness**		
	D (min.) Expanded as supplied	d (max.) Recovered after heating	W Minimum total wall	W1 Minimum jacket wall	W2 Minimum adhesive wall
ES1000-No.1	5.72 0.225	1.27 0.050	1.20 0.047	0.64 0.025	0.56 0.022
ES1000-No.2	7.44 0.293	1.65 0.065	1.52 0.060	0.76 0.030	0.76 0.030
ES1000-No.3	10.85 0.427	2.41 0.095	1.91 0.075	0.89 0.035	1.02 0.040
ES1000-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	Clear
Size selection	Always order the largest size that will shrink snugly over the component being covered.
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, ES1000-No.2-X-50MM (X=Clear).

## Specification values

	Property	Unit	Requirement	Method of test
Physical	Dimensions	mm ( <i>inches</i> )	See reverse	ASTM D 2671
	Longitudinal change	percent	0, -10	ASTM D 2671
	Tensile strength*	psi ( <i>MPa</i> )	1500 ( <i>10.3</i> ) minimum	ASTM D 2671
	Ultimate elongation*	percent	200 minimum	ASTM D 2671
	Low-temperature flexibility (-40°C/-40°F)		No cracking	ASTM D 2671
	Heat shock (4 hours at 225°C/437°F)		No cracking of outer jacket	ASTM D 2671
	Heat aging (168 hours at 175°C/347°F)	No cracking		See note below
Electrical	Volume resistivity	ohm-cm	1.0 x 10 <sup>12</sup> minimum	ASTM D 257
	Dielectric strength (jacket only)**	volts/mil	350 minimum	ASTM D 149
Chemical	Water absorption	percent	1.0 maximum	ASTM D 570 Procedure A

Note: Consult Raychem RT-1113 for specific details about test procedures.

\*Calculation based on wall thickness of jacket only.

\*\*Adhesive liner manually removed prior to testing.

## Standard cut lengths

Part number	Standard cut length	Cut length tolerance
ES1000-No. 1	27 mm, 50 mm, 65 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES1000-No. 2	27 mm, 50 mm, 65 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES1000-No. 3	27 mm, 65 mm, 75 mm 1220 mm	± 1.5 mm ± 25.4 mm
ES1000-No. 4	27 mm, 75 mm, 90 mm 1220 mm	± 1.5 mm ± 25.4 mm

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

### Tyco Electronics Corporation

300 Constitution Drive  
Menlo Park, CA 94025-1164  
USA  
Tel: (800) 926-2425 (US & Canada)  
Tel: +1 (650) 361-3860 (All other countries)

Faraday Road  
Dorcan, Swindon, SN3 5HH  
United Kingdom  
Tel: +44 1793 528171

3816 Noborito, Tama-ku  
Kawasaki, Kanagawa 214-8533  
Japan  
Tel: +81 44 900 5102

Asia Pacific Headquarters  
26 Ang Mo Kio, Industrial Park 2  
Singapore 569507  
Tel: +65 4866 151

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