FL2500
Heat - Shrinkable Tubing

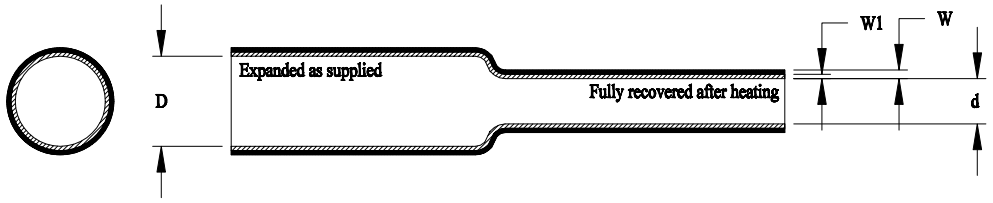


Table 1: Dimensions

Size	Expanded I.D. Minimum (D)	Recovered I.D. Maximum (d)	Recovered Total Wall (W) ± 0.012 *(.31)*	Recovered Adhesive Wall Minimum (W1)	Marking (in White Ink)
No. 0	0.200 *(5.1)*	0.050 *(1.3)*	0.055 *(1.39)*	0.027 *(0.68)*	FL-0
No. 1	0.300 *(7.6)*	0.065 *(1.7)*	0.060 *(1.52)*	0.028 *(0.71)*	FL-1
No. 2	0.355 *(9.0)*	0.090 *(2.3)*	0.060 *(1.52)*	0.028 *(0.71)*	FL-2
No. 3	0.455 *(11.6)*	0.100 *(2.5)*	0.090 *(2.29)*	0.052 *(1.32)*	FL-3
No. 4	0.700 *(17.8)*	0.175 *(4.4)*	0.100 *(2.54)*	0.053 *(1.35)*	FL-4

Color: Jacket shall be black; adhesive liner shall be white.

Table 2: Properties

Property	Unit	Requirement	Test Method
Dimensions	Inches	Table 1	ASTM D 2671
Tensile Strength	PSI	1500 minimum	ASTM D 2671 Speed 2 in. / min. Note 1
Ultimate Elongation	Percent	300 minimum	ASTM D 2671 Speed 2 in. / min.
Secant Modulus (Expanded Form)	PSI	35000 minimum	ASTM D 2671 Note 1
Longitudinal Change	Percent	+0, -10	ASTM D 2671
Concentricity (Expanded Form)	Percent	60 minimum	ASTM D 2671
Dielectric Strength (Jacket Only)*	Volts / mil	500 minimum	ASTM D 149
Volume Resistively	ohm-cm	10^{13} minimum	ASTM D 257
Immersion Leak Resistance	micro-amps	0.25 maximum	Note 2
Thermal Cycling 5 cycles 5°C to 130°C	micro-amps	0.25 maximum	Note 3

*Remove adhesive manually prior to testing.

SPECIFICATION CONTROL DRAWING

tyco Electronics	Tyco Electronics Corporation 300 Constitution Drive Menlo Park, CA 94025 USA	Raychem	Title: **FL2500** **Heat - Shrinkable Tubing**	
Tyco Electronics reserves the right to amend this drawing at any time. Users should evaluate the suitability of the product for their application.			Document No : **FL2500**	
Unless otherwise specified dimensions are in inches. [Metric dimensions are shown in brackets]				
Cage Code: 06090	Scale: None	Size: A	Rev. Date: July 14, 2006	Rev.: G	Sheet: 1 of 3

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Properties: (continued)

Property	Unit	Requirement	Test Method
Heat Shock 4 hrs. at 250°C	--	No dripping, flowing, or cracking of jacket	ASTM D 2671
Thermal Aging 168 hrs. at 130°C followed by Immersion Leak Resistance, Note 2	micro-amps	0.25 maximum	Note 4
Flame Test	--	Self-extinguishing within 30 seconds	SAE J1128, Note 5
Fluid Resistance 24 hrs. at 25°C ± 3°C ASTM Reference Fuel C VV-F-800 Diesel Fuel	micro-amps	0.25 maximum	Note 6
1hr. at 100°C ± 3°C ASTM #3 Oil			

Qualification Sizes: FL2500-2 qualifies FL2500-0, -1, -2, -3 and -4.

Note 1: Tensile Strength & Secant Modulus
Calculate Tensile Strength and Secant Modulus based on wall thickness of jacket only.

Note 2: Immersion Leak Resistance
Prepare 3 test assemblies insulated with FL2500-2 as follows: Construct a 3-wire to 3-wire inline splice in any suitable manner (crimped, soldered, twisted or welded). Splice an AWG 14 and two AWG 12 wires to an AWG 14 and two AWG 12 wires. Each wire shall be approximately 12 inches long. The wire insulation shall be crosslinked polyolefin (TXL) and the conductor shall be bare copper. Shrink a 2.5-inch length of FL2500-2 over the splice area using a forced air oven set at 150 ± 3°C *(302 ± 5°F)* for 5 minutes. Allow the test assemblies to cool to room temperature and immerse them, except for the ends, in a 5% salt solution for 24 hours at room temperature. Apply 50 volts d-c to the immersed specimens and measure the leakage current.

Note 3: Thermal Cycling
Prepare 3 splice assemblies in accordance with Note 2 and subject them to 5 thermal cycles. One cycle consists of 30 minutes in a 5% saline solution at 5 ± 5°C and 30 minutes at 130 ± 5°C with a maximum of 2 minutes between temperatures. Specimens shall then be allowed to cool to room temperature for one hour minimum and shall be measured for leakage current in accordance with Note 2.

Note 4: Thermal Aging
Prepare 3 splice assemblies in accordance with Note 2 and hold for 168 hours at 130 ± 5°C. The specimens shall then be allowed to cool to room temperature for one hour minimum and shall be measured for leakage current in accordance with Note 2.

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Note 5: Flammability

Prepare 6 splice assemblies in accordance with Note 2. Suspend a 24 in. (600 mm) sample of the finished spliced cable taut in a horizontal position within a partial enclosure which allows a flow of air sufficient for complete combustion, but is free from drafts. Use a flame spreader apparatus as described in SAE J1128. Position the top of the 2 in. (50 mm) vertical flame so that the top of the flame just touches the suspended specimen, with the flame spreader parallel to the axis of the spliced cable. Test 3 separate specimens with the flame in each of two positions: 1) Center the flame spreader under the edge of the heat-shrinkable tubing such that the flame is applied to approximately 1 in. (25 mm) of tubing and 1 in. (25 mm) of wire on the side with the single wire and 2) Center the flame spreader under the center of the approximately 2 inch long splice. Apply the flame for 15 seconds, as described in SAE J1128,. After removal of the Bunsen burner flame, the splice and adhesive shall not continue to burn for more than 30 seconds.

Note 6: Fluid Resistance

Prepare 9 splice assemblies in accordance with Note 2 and immerse 3 assemblies in each of the fluids specified for the time and temperature given. Measure leakage current in accordance with Note 2.

Acceptance tests shall consist of:
- Dimensions
- Tensile Strength
- Ultimate Elongation
- Heat Shock

Acceptance tests shall be performed on each lot of tubing or an a skip-lot basis per a statistically justified control plan determined by the TRM Division of Tyco Electronics.

Qualification tests shall consist of all the tests in this Specification Control Drawing.

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