

# 3M™ Heat Shrink Tubing Selector Guide

Product	Material/Typical Applications	Application Specifications
<b>THIN-WALL TUBINGS</b>		
FP-301	Flexible Polyolefin (2:1 Shrink) tubing for general purpose insulation; identification; UL, CSA and MIL-I-23053/5 applications; cable and component covering. Rated to 135°C. (black, white, red, blue, clear, green and yellow)	MIL-I-23053/5, Class 1 and 2; AMS-3636; AMS-3637; File E39100; CSA LR38227
MFP	Semi-rigid, thin-wall (2:1 Shrink) heat-resistant transparent insulation and marking for electronic and appliance applications. Rated to 175°C.	MIL-DTL-23053/18, Class 1; MIL-DTL-23053/8; AMS-3632; UL File E-39100, VW-1, E69751; CSA LR38227 OFT
<b>THIN-WALL ADHESIVE-LINED</b>		
EPS-300	Flexible, polyolefin tubing (3:1 Shrink) with adhesive; insulation, strain relief and environmental protection for automotive and marine wire bundles and splices. Rated to 110°C. (black)	MIL-I-23053/4, Class 3; File 15227
MW	Semi-rigid, polyolefin tubing (2.5:1 Shrink) with adhesive; insulation strain relief and sealing electrical connections and electrical components. Rated to 110°C. (black)	MIL-I-23053/4, Class 1; AMS-3534 File 15227
<b>MEDIUM-WALL</b>		
IMCSN	Adhesive lined, medium wall polyolefin (3:1 Shrink). Split resistant tubing for electrical splices, connections; moisture seals and mechanical protection. Rated to 1000V. (black)	
MDT	Adhesive lined, thick wall polyolefin (3:1 Shrink). Flame-retardant, split resistant tubing for electrical splices, connections; mechanical and abrasion resistance. Rated to 1000V. (black, not printed)	MIL-I-23053/15, Class 2
<b>HEAVY-WALL</b>		
ITCSN	Adhesive lined, thick wall polyolefin (3:1 Shrink), split resistant tubing for electrical splices, connections; mechanical and abrasion resistance. Rated to 1000V. (black)	UL 486D, File E102356
HDT	Adhesive lined, medium wall polyolefin (3:1 Shrink). Flame-retardant, split resistant, tubing for electrical splices, connections; moisture seals and mechanical protection. Rated to 1000V. (black, not printed)	MIL-I-23053/15, Class 1
<b>BUS BAR INSULATION</b>		
BBI-A	See page 439	Conforms to requirements of ANSI/IEEE #C37.20

## 3M™ Heat Shrink Tubing Selector Guide

Typical Properties	FP-301	MW	EPS-300	IMCSN
Operating Temperature Range	-67°F to +275°F (-55°C to +135°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)
Shrink Temperature (Min.)	212°F (100°C)	275°F (135°C)	250°F (121°C)	250°F (121°C)
Shrink Ratio	2:1	2.5:1	3:1	3:1
Standard Sizes Expanded Diameter	3/64" to 4" (1,19 to 101,6 mm)	1/8" to 1" (3,18 to 25,4 mm)	1/8" to 1 1/2" (3,18 to 38,1 mm)	0.400" to 6" (10,16 to 152,4 mm)
Dielectric Strength (V/Mil)	900	900	700	500
Volume Resistivity (ohm-cm)	10 <sup>15</sup>	10 <sup>15</sup>	10 <sup>14</sup>	10 <sup>14</sup>
Tensile Strength (psi)	2400	2200	2100	2400
Elongation (%)	400	400	450	450
Longitudinal Change (± %)	±5%	+1, -10%	+1, -15%	+1, -10%
Specific Gravity	1.3	1.0	1.3	1.28
Flammability	Self-extinguish meets UL 224 flame test except clear	n/a	Outer jacket self-extinguish meets UL 224 flame test	N/A
Corrosive Effect	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive
Abrasion Resistance	Good	Good	Good	Good
Fuel and Oil Resistance	Good	Good	Good	Good
Solvent Resistance	Excellent	Excellent	Good	Excellent
Resistance to Acids and Alkalis	Excellent	Excellent	Excellent	Excellent

## 3M™ Heat Shrink Tubing Selector Guide

Typical Properties	ITCSN	HDT	MDT	MFP
Operating Temperature Range	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +347°F (-55°C to +175°C)
Shrink Temperature (Min.)	250°F (121°C)	250°F (121°C)	250°F (121°C)	347°F (175°C)
Shrink Ratio	3:1	3:1	3:1	2:1
Standard Sizes Expanded Diameter	0.400" to 4.30" (10,16 to 152,4 mm)	0.300" to 7.00" (7,62 to 177,8 mm)	0.400" to 4.30" (10,16 to 152,4 mm)	3/64" to 2" (1,19 to 50,8 mm)
Dielectric Strength (V/Mil)	500	500	500	900
Volume Resistivity (ohm-cm)	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>
Tensile Strength (psi)	2400	2400	2400	5500
Elongation (%)	475	475	475	350
Longitudinal Change (± %)	+1, -10%	+1, -10%	+1, -10%	+1, -10%
Specific Gravity	1.28	1.28	1.28	1.7
Flammability	N/A	Flame retardant	Flame retardant	Self-extinguish meets UL 224 VW-1 Test
Corrosive Effect	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive
Abrasion Resistance	Good	Good	Good	Excellent
Fuel and Oil Resistance	Good	Good	Good	Excellent
Solvent Resistance	Good	Good	Good	Excellent
Resistance to Acids and Alkalis	Excellent	Excellent	Excellent	Excellent

# Adhesive-Lined Tubing

## 3M™ Thin-Wall, Flexible Polyolefin Adhesive-Lined Tubing EPS-300

Shrink Ratio 3:1

3M tubing EPS 300 is a thin-wall tubing offering the advantages of integral, dual wall construction. The tubing is made from flame-retardant, flexible polyolefin lined with an internal layer of special thermoplastic adhesive. The heat shrinkable outer wall is selectively radiation cross-linked, while the adhesive maintains high flow and excellent adhesion characteristics. 3M tubing EPS-300 is an environmental protection sleeve and insulation. It offers environmental protection for electronic components, twisted pigtail and inline wire splices, crimp splices, wire bundles and wire harness breakouts in automotive, truck fleet, marine and industrial applications.

Standard Color: Black and standard packaging is 4' (1,219 m) lengths and 6" (15,2 cm) cut pieces. Also available in a kit containing 42 pieces of 6-inch lengths in assorted sizes (see chart below). Additional sizes, colors and put-ups



are available — please contact your 3M Electrical Markets Sales Representative.

Application Specifications: MIL-I-23053/4, Class 3.  
To Order: Reference specific product size, color and description. Example: EPS-300-1/4, 48" (1,21 m) sticks, black.

## Specifications and Ordering Information for 3M™ EPS-300 4' Sticks (Bulk Box)

Product Number	Size	Expanded/Recovered I.D.	Color	UPC (051135-)	Case Qty.
EPS-300	1/8" (3,2 mm)	0.125/0.040" (3,18/1,02 mm)	Black	37902	1,000'
			Clear	37903	1,000'
EPS-300	3/16" (4,76 mm)	0.187/0.063" (4,75/1,57 mm)	Black	36105	1,000'
			Clear	36106	1,000'
EPS-300	1/4" (6,35 mm)	0.250/0.080" (6,35/2,03 mm)	Black	36107	800'
			Clear	36108	800'
EPS-300	3/8" (9,53 mm)	0.375/0.120" (9,53/3,05 mm)	Black	36109	500'
			Clear	36110	500'
EPS-300	1/2" (12,7 mm)	0.500/0.160" (12,7/4,06 mm)	Black	36111	300'
			Clear	36112	300'
			Red	36113	300'
EPS-300	3/4" (19,05 mm)	0.750/0.250" (19,05/6,35 mm)	Black	36114	180'
			Clear	36115	180'
			Red	36116	180'
EPS-300	1" (25,4 mm)	1.000/0.320" (25,4/8,13 mm)	Black	36117	96'
			Clear	36118	96'
			Red	36119	96'
EPS-300	1-1/2" (38,1 mm)	1.500/0.500" (38,1/12,95 mm)	Black	36120	96'
			Clear	36121	96'

Note: Special cut lengths are available subject to quotation.

# Specifications and Ordering Information for 3M™ Tubing Kit EPS-300

UPC 051135-38444, case quantity 5 kits

Description	No. of 6" Size	Pieces
EPS-300 Red	1/2" (12,70 mm)	12
EPS-300 Black	1/2" (12,70 mm)	12
EPS-300 Red	3/4" (19,05 mm)	6
EPS-300 Black	3/4" (19,05 mm)	6
EPS-300 Red	1" (25,40 mm)	3
EPS-300 Black	1" (25,40 mm)	3

# Specifications and Ordering Information for 3M™ Tubing EPS-300

Small box 4' sticks and 6" pieces

Product Number	Size	UPC (051135-)	Expanded/Recovered I.D.	Description	Case Qty.
EPS-300 Black	1/8" (3,2 mm)	37483	0.125/0.040" (3,18/1,02 mm)	48" Sticks (1,21 m)	25 sticks
EPS-300 Black	3/16" (4,76 mm)	36875	0.187/0.063" (4,75/1,57 mm)	48" Sticks (1,21 m)	12 sticks
EPS-300 Black	3/16" (4,76 mm)	36592	0.187/0.063" (4,75/1,57 mm)	6" Pieces, 24/Bag (15,2 cm)	10 bags
EPS-300 Black	1/4" (6,35 mm)	36876	0.250/0.080" (6,35/2,03 mm)	48" Sticks (1,21 m)	12 sticks
EPS-300 Black	1/4" (6,35 mm)	36593	0.250/0.080" (6,35/2,03 mm)	6" Pieces, 20/Bag (15,2 cm)	10 bags
EPS-300 Black	3/8" (9,53 mm)	36877	0.375/0.120" (9,53/3,05 mm)	48" Sticks (1,21 m)	12 sticks
EPS-300 Black	3/8" (9,53 mm)	36594	0.375/0.120" (9,53/3,05 mm)	6" Pieces, 16/Bag (15,2 cm)	10 bags
EPS-300 Black	1/2" (12,7 mm)	36878	0.500/0.160" (12,7/4,06 mm)	48" Sticks (1,21 m)	12 sticks
EPS-300 Black	1/2" (12,7 mm)	36595	0.500/0.160" (12,7/4,06 mm)	6" Pieces, 14/Bag (15,2 cm)	10 bags
EPS-300 Red	1/2" (12,7 mm)	38441	0.500/0.160" (12,7/4,06 mm)	6" Pieces, 14/Bag (15,2 cm)	10 bags
EPS-300 Black	3/4" (19,05 mm)	36879	0.750/0.250" (19,05/6,35 mm)	48" Sticks (1,21 m)	5 sticks
EPS-300 Black	3/4" (19,05 mm)	36596	0.750/0.250" (19,05/6,35 mm)	6" Pieces, 12/Bag (15,2 cm)	10 bags
EPS-300 Red	3/4" (19,05 mm)	38442	0.750/0.250" (19,05/6,35 mm)	6" Pieces, 12/Bag (15,2 cm)	10 bags
EPS-300 Black	1" (25,4 mm)	36880	1.000/0.320" (25,4/8,13 mm)	48" Sticks (1,21 m)	5 sticks
EPS-300 Black	1" (25,4 mm)	36597	1.000/0.320" (25,4/8,13 mm)	6" Pieces, 8/Bag (15,2 cm)	10 bags
EPS-300 Red	1" (25,4 mm)	38443	1.000/0.320" (25,4/8,13 mm)	6" Pieces, 8/Bag (15,2 cm)	10 bags
EPS-300 Black	1-1/2" (38,1 mm)	36881	1.500/0.500" (38,1/12,95 mm)	48" Sticks (1,21 m)	5 sticks
EPS-300 Black	1-1/2" (38,1 mm)	36598	1.500/0.500" (38,1/12,95 mm)	6" Pieces, 4/Bag (15,2 cm)	10 bags

Note: Bulk 48" sticks and special cut lengths are available subject to quotation.