



# Heat Shrinkable Products

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3M offers a full line of heat shrinkable tubing. If the product, product size or product length you need is not listed in this catalog, contact your 3M Electrical Products distributor or sales representative for a quote.



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## 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 (black, white, red, blue, clear, green and yellow). Rated to 135°C.	MIL-I-23053/5, Class 1 and 2; AMS-3636; AMS-3637; File E39100; CSA LR38227
Kynar®	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. (black). Rated to 110°C.	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. (black). Rated to 110°C.	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)	MIL-I-23053/15, Class 2
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 1
<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 2
<b>Bus Bar Insulation</b> BBI-A	See page 339	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 & Oil Resistance	Good	Good	Good	Good
Solvent Resistance	Excellent	Excellent	Good	Excellent
Resistance to Acids & Alkalis	Excellent	Excellent	Excellent	Excellent

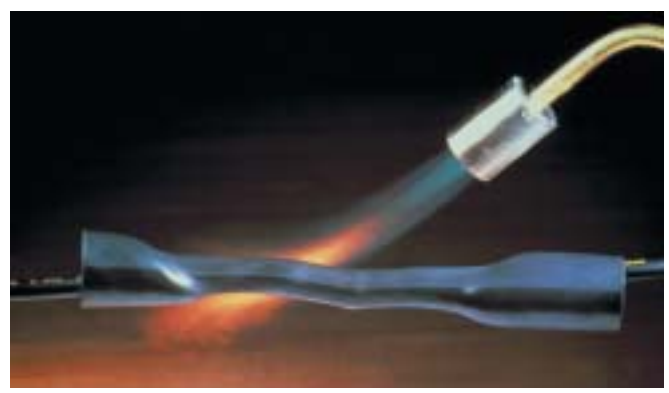
Typical Properties	ITCSN	HDT	MDT	Kynar®
Operating Temperature Range	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +230°F (-55°C to +110°C)	-67°F to +347°F (-55°C to +175°C)
Shrink Temperature (Min.)	250°F (121°C)	250°F (121°C)	250°F (121°C)	347°F (175°C)
Shrink Ratio	3:1	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 & Oil Resistance	Good	Good	Good	Excellent
Solvent Resistance	Good	Good	Good	Excellent
Resistance to Acids & Alkalis	Excellent	Excellent	Excellent	Excellent

# Heavy-Wall Tubing

3M™ ITCSN Heavy-Wall Cable Sleeves for 1 kV

Shrink Ratio 3:1

3M ITCSN heat shrinkable cable sleeves provide reliable performance for electrical splices, connections and terminations, as well as mechanical and environmental protection. ITCSN heavy-wall cable sleeves are cross-linked polyolefin. They are highly split resistant and fast shrinking to provide rapid installation. The cut-to-length sleeves come standard with a factory-applied adhesive/sealant. Order any of several



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packaging choices or look for the counter merchandiser assortment at a 3M authorized distributor. Rated to 1 kV, UL Listed 486 D for 600V. File Number E102356. CSA rating. When ordering, please specify boxed, bulk, tamper evident bag or merchandising display to assure proper pricing.

## Specification and Ordering Information for 3M ITCSN Cut Lengths (Black Only)

Product Number	UPC (054007-)		Typical Cable Range	Expanded/Recovered I.D.	Length	Case Qty		Certifications and Listings
	Boxed	Bulk				Boxed	Bulk	
ITCSN-0400-6	08887	08963	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	6" (15,2 cm)	25 pieces	100	UL E102356 SF
ITCSN-0400-48	08902	08964	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	48" (121,9 cm)	5 pieces	20	UL E102356 SF
ITCSN-0800-6	40067	08965	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	6" (15,2 cm)	25 pieces	100	UL E102356 SF
ITCSN-0800-9	08890	08966	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	9" (22,9 cm)	25 pieces	100	UL E102356 SF
ITCSN-0800-12	08889	08967	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	12" (30,5 cm)	25 pieces	100	UL E102356 SF
ITCSN-0800-48	08903	08968	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	48" (121,9 cm)	5 pieces	20	UL E102356 SF
ITCSN-1100-6	08894	08969	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	6" (15,2 cm)	25 pieces	100	UL E102356 SF
ITCSN-1100-9	08893	08970	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	9" (22,9 cm)	25 pieces	100	UL E102356 SF
ITCSN-1100-12	08892	08971	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	12" (30,5 cm)	10 pieces	100	UL E102356 SF
ITCSN-1100-48	08904	08972	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	48" (121,9 cm)	5 pieces	20	UL E102356 SF
ITCSN-1500-9	08897	08973	3/0 AWG-400 kcmil (95-185 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	9" (22,9 cm)	10 pieces	50	UL E102356 SF
ITCSN-1500-12	08896	08974	3/0 AWG-400 kcmil (95-185 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	12" (30,5 cm)	10 pieces	50	UL E102356 SF
ITCSN-1500-48	08905	08975	3/0 AWG-400 kcmil (95-185 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	48" (121,9 cm)	5 pieces	20	UL E102356 SF
ITCSN-2000-9	08900	08976	250-750 kcmil (150-300 mm <sup>2</sup> )	2.00/0.65" (50,8/16,5 mm)	9" (22,9 cm)	10 pieces	50	UL E102356 SF
ITCSN-2000-12	08899	08977	250-750 kcmil (150-300 mm <sup>2</sup> )	2.00/0.65" (50,8/16,5 mm)	12" (30,5 cm)	10 pieces	50	UL E102356 SF
ITCSN-2000-48	08906	08978	250-750 kcmil (150-300 mm <sup>2</sup> )	2.00/0.65" (50,8/16,5 mm)	48" (121,9 cm)	5 pieces	20	UL E102356 SF
ITCSN-3000-12	08901	08979	600-1250 kcmil (400-625 mm <sup>2</sup> )	3.00/1.00" (76,2/25,4 mm)	12" (30,5 cm)	10 pieces	50	SF
ITCSN-3000-48	08907	08980	600-1250 kcmil (400-625 mm <sup>2</sup> )	3.00/1.00" (76,2/25,4 mm)	48" (121,9 cm)	5 pieces	20	SF
ITCSN-4500-48	37979	08981	1500-2500 kcmil (800-1000 mm <sup>2</sup> )	4.50/1.50" (114,3/38,1 mm)	48" (121,9 cm)	5 pieces	20	SF
ITCSN-6000-48	37980	08982	2.1-4.8" (53-122 mm <sup>2</sup> )	6.00/1.80" (152,4/45,7 mm)	48" (121,9 cm)	5 pieces	20	SF

Note: Flame-retarded ITCSF and other sizes and lengths are available subject to quote. Uncoated product is available on special order—order part number with the suffix "U".

## Specification and Ordering Information for 3M™ ITCSN Tamper Evident Bags

Product Number	UPC (054007-)	Description	Expanded/Recovered I.D.	Case Qty.	Certifications and Listings
ITCSN-0400-6 (black)	50475	6" (15,2 cm) pieces, 6 per bag	0.40/0.15" (10,2/3,8 mm)	12 packs	UL E102356 SP
ITCSN-0400-6 (red)	38153*	6" (15,2 cm) pieces, 6 per bag	0.40/0.15" (10,2/3,8 mm)	12 packs	UL E102356
ITCSN-0800-6 (black)	50474	6" (15,2 cm) pieces, 6 per bag	0.80/0.20" (20,3/5,1 mm)	12 packs	UL E102356 SP
ITCSN-0800-6 (red)	38154*	6" (15,2 cm) pieces, 6 per bag	0.80/0.20" (20,3/5,1 mm)	12 packs	UL E102356
ITCSN-1100-9 (black)	50473	9" (22,9 cm) pieces, 6 per bag	1.10/0.37" (27,9/9,4 mm)	12 packs	UL E102356 SP
ITCSN-1100-9 (red)	38155*	9" (22,9 cm) pieces, 6 per bag	1.10/0.37" (27,9/9,4 mm)	12 packs	UL E102356
ITCSN-1500-9	50472	9" (22,9 cm) pieces, 3 per bag	1.50/0.50" (38,1/12,7 mm)	12 packs	UL E102356 SP
ITCSN-2000-12	50471	12" (30,5 cm) pieces, 3 per bag	2.00/0.65" (50,8/16,5 mm)	12 packs	UL E102356 SP

\* UPC (051135-)

## Specification and Ordering Information for 3M ITCSN 25-Foot Reels

Reeled sleeves come without the factory-applied adhesive/sealant.

Product Number	UPC (054007-)	Cable Range	Expanded/Recovered I.D.	Length	Case Qty.	Certifications and Listings
ITCSN-0400-25-U	08886	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	25' reel (762 cm)	1 reel	SP
ITCSN-0800-25-U	08888	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	25' reel (762 cm)	1 reel	SP
ITCSN-1100-25-U	08891	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	25' reel (762 cm)	1 reel	SP
ITCSN-1500-25-U	08895	3/0 AWG-400 kcmil (95-185 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	25' reel (762 cm)	1 reel	SP
ITCSN-2000-25-U	08898	250-750 kcmil (150-300 mm <sup>2</sup> )	2.00/0.65" (50,8/16,5 mm)	25' reel (762 cm)	1 reel	SP

Note: Reels are not supplied with factory-applied adhesive/sealant.

## Specification and Ordering Information for 3M ITCSN Counter Merchandiser Assortment

UPC 054007-50500, black only, case quantity 1, contents include:

Product Number	Product Length	Product Quantity	Cable Range	Expanded/Recovered I.D.	Certifications and Listings
ITCSN-0400	6" (15,2 cm)	52	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	UL E102356 SP
ITCSN-0800	9" (22,9 cm)	35	8-1/0 AWG (10-50 mm <sup>2</sup> )	0.80/0.20" (20,3/5,1 mm)	UL E102356 SP
ITCSN-1100	9" (22,9 cm)	25	2-4/0 AWG (35-95 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	UL E102356 SP
ITCSN-1500	9" (22,9 cm)	12	3/0 AWG-400 kcmil (95-185 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	UL E102356 SP



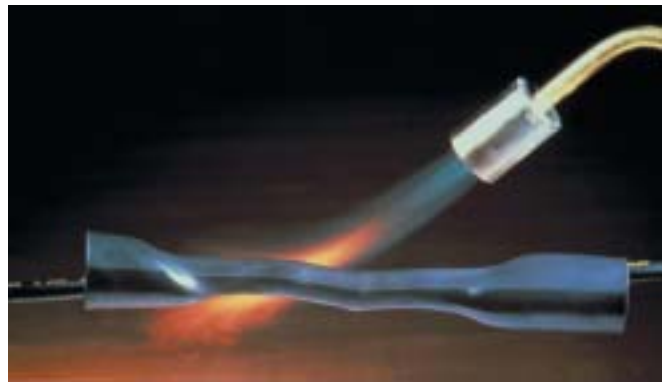
### Product Referral Generator

- Tubing
  - Cold Shrink . . . . .pg. 243
- Taping
  - Vinyl Electrical Tape . . . . .pg. 3
- Sealing
  - Resin Kit . . . . .pg. 243

## 3M™ HDT Heavy-Wall Flame-Retardant Cable Sleeves for 1 kV

### Shrink Ratio 3:1

3M HDT heat shrinkable cable sleeves provide reliable performance for electrical splices, connections and terminations, as well as mechanical and environmental protection. 3M HDT heavy-wall cable sleeves are cross-linked polyolefin. They are flame-retardant, highly split resistant and fast shrinking to provide rapid installation. The 48 in. (121,9 cm) sleeves come standard with a factory-applied adhesive/sealant. Order any of several packaging choices or look for the counter merchandiser assortment at a 3M authorized distributor and are not printed. MIL-DTL-23053/15, Class 1.



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Order in the size equivalent to expanded inside diameter required.

### Specification and Ordering Information for 3M HDT Cable Sleeves 4-Foot Lengths (Black Only)

Product Number	UPC (054007-)	Cable Range	Expanded/Recovered I.D.	4' Lengths Per Case
HDT-0400-48A	40649	#12 – #6 AWG	0.40/0.15" (10,2/3,8 mm)	20
HDT-0800-48A	40650	#8 – 1/0 AWG	0.80/0.20" (20,3/5,1 mm)	20
HDT-1100-48A	40651	#2 – 4/0 AWG	1.10/0.37" (27,9/9,4 mm)	20
HDT-1500-48A	40652	3/0 – 400 MCM	1.50/0.50" (38,1/12,7 mm)	20
HDT-2000-48A	40654	250 – 750 MCM	2.00/0.65" (50,8/16,5 mm)	10
HDT-3000-48A	40655	600 – 1250 MCM	3.00/1.00" (76,2/25,4 mm)	10
HDT-4500-48A	40656	1000 – 2500 MCM	4.50/1.50" (114,3/38,1 mm)	5
HDT-6000-48A	59022	2.1" – 4.8" O.D.	6.00/1.80" (152,4/45,7 mm)	5
HDT-7000-48A	37774	2.5" – 5.6" O.D.	7.00/2.00" (177,8/50,8 mm)	5

# Medium -Wall Tubing

## 3M™ IMCSN Medium-Wall Cable Sleeves for 1kV

3M IMCSN heat shrinkable medium-wall cable sleeves are reliable, tough performers made of split-resistant cross-linked polyolefin. Use for 1 kV splices, connections, terminations and re-jacketing. They protect against mechanical and environmental dangers providing excellent abrasion, corrosion and



chemical resistance. 3M IMCSN sleeves have greater flexibility than the ITCSN, our heavy-wall version. Installation of these fast-shrinking sleeves is easy with little training necessary.

The 48" (121,9 cm) lengths come standard with a factory-applied adhesive/sealant, a thermoplastic material that remains flexible over long periods under adverse environmental conditions. During heating the sealant softens, bonds to underlying surfaces and fills small voids that might be present.

The 25' (7,62 m) reel version is uncoated. Applications include bus bar insulations and phase re-jacketing.

## Specification and Ordering Information for 3M IMCSN 4-Foot Lengths

Product Number	UPC (054007-)	Cable Range	Expanded/Recovered I.D.	Cable O.D.	Case Qty.
IMCSN-0400-48A	58810	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	0.35-0.15" (9-3,3 mm)	20
IMCSN-0800-48A	58811	8-3 AWG (10-25 mm <sup>2</sup> )	0.80/0.22" (20,3/5,6 mm)	0.70-0.22" (18-5,6 mm)	20
IMCSN-1100-48A	58812	2-2/0 AWG (35-60 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	0.95-0.37" (24-9,4 mm)	20
IMCSN-1300-48A	03448*	1-4/0 AWG (50-100 mm <sup>2</sup> )	1.30/0.43" (33/10,9 mm)	1.10-0.43" (28-10,8 mm)	20
IMCSN-1500-48A	58813	1/0-250 kcmil (60-120 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	1.30-0.50" (33-12,1 mm)	20
IMCSN-1700-48A	03317*	4/0-400 kcmil (120-200 mm <sup>2</sup> )	1.70/0.60" (43,2/15,2 mm)	1.45-0.60" (37-15,2 mm)	20
IMCSN-2000-48A	58814	300-500 kcmil (185-250 mm <sup>2</sup> )	2.00/0.75" (50,8/19,1 mm)	1.75-0.75" (44,5-19,0 mm)	15
IMCSN-3000-48A	58815	600-1250 kcmil (325-625 mm <sup>2</sup> )	3.00/1.00" (76,2/25,4 mm)	2.50-1.00" (63,5-25,4 mm)	15
IMCSN-4300-48A	58809	1000-2500 kcmil (625-1000 mm <sup>2</sup> )	4.30/1.50" (109,2/38,1 mm)	3.60-1.50" (91,5-29,5 mm)	10

\*UPC prefix 051135-

**Note:** Flame retardant IMCSF and other sizes and lengths are available subject to quote. Uncoated product is available on special order. Order part number with suffix "u".

## Specification and Ordering Information for 3M IMCSN 25-Foot Reels

Product Number	UPC (051135-)	Cable Range	Expanded/Recovered I.D.	Cable O.D.	Case Qty.
IMCSN-0400-25U	03481	12-6 AWG (4-10 mm <sup>2</sup> )	0.40/0.15" (10,2/3,8 mm)	0.35-0.15" (9-3,3 mm)	1 reel
IMCSN-0800-25U	03482	8-3 AWG (10-25 mm <sup>2</sup> )	0.80/0.22" (20,3/5,6 mm)	0.70-0.22" (18-5,6 mm)	1 reel
IMCSN-1100-25U	03483	2-2/0 AWG (35-60 mm <sup>2</sup> )	1.10/0.37" (27,9/9,4 mm)	0.95-0.37" (24-9,4 mm)	1 reel
IMCSN-1300-25U	03484	1-4/0 AWG (50-100 mm <sup>2</sup> )	1.30/0.43" (33/10,9 mm)	1.10-0.43" (28-10,8 mm)	1 reel
IMCSN-1500-25U	03485	1/0-250 kcmil (60-120 mm <sup>2</sup> )	1.50/0.50" (38,1/12,7 mm)	1.30-0.50" (33-12,1 mm)	1 reel
IMCSN-1700-25U	03486	4/0-400 kcmil (120-200 mm <sup>2</sup> )	1.70/0.60" (43,2/15,2 mm)	1.45-0.60" (37-15,2 mm)	1 reel
IMCSN-2000-25U	03487	300-500 kcmil (185-250 mm <sup>2</sup> )	2.00/0.75" (50,8/19,1 mm)	1.75-0.75" (44,5-19,0 mm)	1 reel
IMCSN-3000-25U	03530	600-1250 kcmil (325-625 mm <sup>2</sup> )	3.00/1.00" (76,2/25,4 mm)	2.50-1.00" (63,5-25,4 mm)	1 reel
IMCSN-4300-25U	03531	1000-2500 kcmil (625-1000 mm <sup>2</sup> )	4.30/1.50" (109,2/38,1 mm)	3.60-1.50" (91,5-29,5 mm)	1 reel

**Note:** Reels are not supplied with factory-applied adhesive/sealant.

### 3M™ MDT Medium-Wall, Flame-Retardant Cable Sleeves for 1kV

3M MDT heat shrinkable medium-wall cable sleeves are reliable, tough performers made of split-resistant cross-linked polyolefin. Use for 1 kV splices, connections, terminations and re-jacketing. They are flame-retardant and protect against mechanical and environmental dangers, providing excellent abrasion, corrosion and chemical resistance. MDT sleeves have greater flexibility than the HDT, our heavy-wall version. Installation of these fast-shrinking sleeves is easy with little training necessary.

The 48" (121,9 cm) lengths are unprinted and come standard with a factory-applied adhesive/sealant, a thermoplastic material that remains flexible over long periods



under adverse environmental conditions. During heating the sealant softens, bonds to underlying surfaces and fills small voids that might be present.

Order in the size equivalent to expanded inside diameter required.

### Specification and Ordering Information for 3M MDT Cable Sleeves 4-Foot Lengths (Black Only)

Product Number	UPC (054007-)	Cable Range	Expanded/Recovered I.D.	4' Lengths Per Case
MDT-0400-48A	40672	#12 – #6 AWG	0.40/0.15" (10,2/3,8 mm)	20
MDT-0800-48A	40673	#8 – #3 AWG	0.80/0.22" (20,3/5,6 mm)	20
MDT-1100-48A	40674	#2 – 2/0 AWG	1.10/0.37" (27,9/9,4 mm)	20
MDT-1300-48A	40675	#1 – 4/0 AWG	1.30/0.43" (33,0/10,9 mm)	20
MDT-1500-48A	40676	1/0 – 250 MCM	1.50/0.50" (38,1/12,7 mm)	20
MDT-1700-48A	40677	4/0 – 400 MCM	1.70/0.60" (43,2/15,2 mm)	20
MDT-2000-48A	40678	300 – 500 MCM	2.00/0.75" (50,8/19,1 mm)	15
MDT-3000-48A	40679	600 – 1250 MCM	3.00/1.00" (76,2/25,4 mm)	15
MDT-4300-48A	40680	1000 – 2500 MCM	4.30/1.50" (109,2/38,1 mm)	10

# Thin-Wall Tubing

## 3M™ Thin-Wall Tubing FP-301

Shrink Ratio 2:1



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3M Thin-Wall Tubing FP-301 is a heat shrinkable flexible polyolefin tubing that offers an outstanding balance of electrical, physical and chemical properties for a wide variety of industrial and military applications. Rated for 275°F(135°C) continuous operation.

3M tubing FP-301 is typically used as a shrink-fit electrical insulation over cable splices and terminations. It is also used for lightweight wire harness covering, wire marking, wire bundling, component packaging and fire resistant covering.

3M clear tubing FP-301 provides excellent visibility for component packing. All 3M tubing FP-301 is split resistant, mechanically tough, easily marked and resists cold flow.

FP-301 is available in black, white, red, blue, yellow and clear in the standard lengths of 6-inch (15,2 cm) cut pieces, 48-inch (1,21 m) and small (8.5-inch core diameter) spools of 50 (15,24 m) and 100 (30,48 m) feet. Four-foot lengths of green tubing are available in sizes 1/16 inch to 1/2 inch. The Assorted Color Kit has a total of 133 pieces and contains seven colors: black, red, white, yellow, blue, green and clear (see chart below.) The Black Kit contains 102 pieces, all 6" (512,4 mm) lengths (see chart below.) Additional sizes, colors and put-ups are available—please contact your 3M Electrical Products Sales Representative.

Application Specifications: UL Recognized and CSA Certified at 600 volts at 257°F(125°C); UL File No. E-39100 and CSA No. 38227. MIL-I-23053/5, Class 1,2. AMS 3636 (Type I) and AMS 3637 (Type II).

To Order: Reference specific product size, color and description on the following pages. Example: FP-301-1/4, white 6" (15,2 cm) pieces.

### Specification and Ordering Information for 3M Thin-Wall Tubing FP-301 Assortment Kits

Description	UPC (051135-)	Case Quantity
Assorted Colors Kit	37677	5 kits
<b>Kit Contents:</b>		
<b>Kit Quantity:</b>		
3/32" (2,35 mm)	35	-
1/8" (3,18 mm)	28	-
3/16" (4,75 mm)	21	-
1/4" (6,35 mm)	21	-
3/8" (9,53 mm)	14	-
1/2" (12,70 mm)	14	-
Assorted Black Kit	38139	5 kits
<b>Kit Contents:</b>		
<b>Kit Quantity:</b>		
3/16" (4,8 mm)	30	-
1/4" (6,5 mm)	28	-
3/8" (9,6 mm)	20	-
1/2" (12,7 mm)	14	-
3/4" (19,1 mm)	6	-
1" (25,4 mm)	4	-

### Specification and Ordering Information for 3M Thin-Wall Tubing FP-301 Six-Inch Pieces—Tamper Evident Bags (Refills for Kits)

Product No.	Size	Color	UPC (051135-)	Description	Expanded/ Recvd. I.D.	Case Qty
FP-301	3/64" (1,19 mm)	Black Clear	36484 36485	40 pcs/bag	0.046/0.023" (1,17/0,58 mm)	10
FP-301	1/16" (1,59 mm)	Black Clear	36486 36487	38 pcs/bag	0.063/0.031" (1,6/0,79 mm)	10
FP-301	3/32" (2,4 mm)	Black Clear	36488 36489	36 pcs/bag	0.093/0.046" (2,36/1,17 mm)	10
FP-301	1/8" (3,18 mm)	Black Clear	36490 36491	34 pcs/bag	0.125/0.062" (3,18/1,57 mm)	10
FP-301	3/16" (4,77 mm)	Black Clear	36492 36493	30 pcs/bag	0.187/0.093" (4,75/2,36 mm)	10
FP-301	1/4" (6,4 mm)	Black Clear	36494 36495	26 pcs/bag	0.250/0.125" (6,35/3,18 mm)	10
FP-301	3/8" (9,55 mm)	Black Clear	36496 36497	24 pcs/bag	0.375/0.187" (9,53/4,75 mm)	10
FP-301	1/2" (12,7 mm)	Black Clear	36498 36499	20 pcs/bag	0.500/0.250" (12,7/6,35 mm)	10
FP-301	3/4" (19,0 mm)	Black Clear	36500 36501	14 pcs/bag	0.750/0.375" (19,05/9,52 mm)	10
FP-301	1" (25,4 mm)	Black Clear	36502 36503	10 pcs/bag	1.000/0.500" (25,4/12,7 mm)	10
FP-301	1-1/2" (38,1 mm)	Black Clear	36504 36505	6 pcs/bag	1.500/0.750" (38,1/19,05 mm)	10
FP-301	2" (50,8 mm)	Black Clear	36506 36507	4 pcs/bag	2.000/1.000" (50,8/25,4 mm)	10
FP-301	3" (76,0 mm)	Black Clear	36508 36509	3 pcs/bag	3.000/1.500" (76,2/38,1 mm)	10
FP-301	4" (102,0 mm)	Black Clear	36510 36511	2 pcs/bag	4.000/2.000" (101,6/50,8 mm)	10

### Specification and Ordering Information for 3M FP-301 Assortment Packs of Six-Inch Lengths—Tamper Evident Bags (Refills for Kits)

Product	Size	Color	UPC (051135-)	Description	Case Qty.
FP-301	3/64-3/16" (1,19-4,77 mm)	Black	36612	6 each of 5 sizes	10
FP-301	1/4-3/4" (6,4-19,0 mm)	Black	36613	4 each of 4 sizes	10
FP-301	1-4" (25,4-102 mm)	Black	36614	2 each of 5 sizes	10
FP-301	3/32" (2,4 mm)	Assort.	36618	5 each of 7 colors	10
FP-301	1/8" (3,18 mm)	Assort.	36619	4 each of 7 colors	10
FP-301	3/16" (4,77 mm)	Assort.	36620	3 each of 7 colors	10
FP-301	1/4" (6,4 mm)	Assort.	36621	3 each of 7 colors	10
FP-301	3/8" (9,55 mm)	Assort.	36622	2 each of 7 colors	10
FP-301	1/2" (12,7 mm)	Assort.	36623	2 each of 7 colors	10



Specification and Ordering Information for  
3M™ Thin-Wall Tubing FP-301 Four-Foot  
Sticks (small box)

Product No.	Size	Color	UPC (051135-)	Descrpt.	Expanded/ Recvd. I.D.	Case Qty
FP-301	3/64" (1,17 mm)	Black	36644	25 48" Sticks (1,22 m)	0.046/0.023" (1,17/0,58 mm)	1
		Clear	36645			
		White	36646			
		Red	36647			
		Blue	36649			
Yellow	36648					
FP-301	1/16" (1,58 mm)	Black	36650	25 48" Sticks (1,22 m)	0.063/0.031" (1,6/0,79 mm)	1
		Clear	36651			
		White	36652			
		Red	36653			
		Blue	36655			
Yellow	36654					
Green	36672					
FP-301	3/32" (2,38 mm)	Black	36673	25 48" Sticks (1,22 m)	0.093/0.046" 2,36/1,17 mm)	1
		Clear	36674			
		White	36675			
		Red	36676			
		Blue	36678			
Yellow	36677					
Green	36679					
FP-301	1/8" (3,18 mm)	Black	36680	25 48" Sticks (1,22 m)	0.125/0.062" (3,18/1,57 mm)	1
		Clear	36681			
		White	36682			
		Red	36683			
		Blue	36685			
Yellow	36684					
Green	36686					
FP-301	3/16" (4,75 mm)	Black	36687	25 48" Sticks (1,22 m)	0.187/0.093" (4,75/2,36 mm)	1
		Clear	36688			
		White	36689			
		Red	36690			
		Blue	36692			
Yellow	36691					
Green	36693					
FP-301	1/4" (6,35 mm)	Black	36694	12 48" Sticks (1,22 m)	0.250/0.125" (6,35/3,18 mm)	1
		Clear	36695			
		White	36696			
		Red	36697			
		Blue	36699			
Yellow	36698					
Green	36700					
FP-301	3/8" (9,5 mm)	Black	36701	12 48" Sticks (1,22 m)	0.375/0.187" (9,53/4,75 mm)	1
		Clear	36702			
		White	36703			
		Red	36704			
		Blue	36706			
Yellow	36705					
Green	36707					
FP-301	1/2" (12,7 mm)	Black	36709	12 48" Sticks (1,22 m)	0.500/0.250" (12,7/6,35 mm)	1
		Clear	36710			
		White	36711			
		Red	36712			
		Blue	36714			
Yellow	36713					
Green	36715					
FP-301	3/4" (19,05 mm)	Black	36716	12 48" Sticks (1,22 m)	0.750/0.375" (19,01/9,53 mm)	1
		Clear	36720			
		White	36721			
		Red	36722			
		Blue	36724			
Yellow	36723					
Green	37764					
FP-301	1" (25,4 mm)	Black	36725	5 48" Sticks (1,22 m)	1.000/0.500" (25,4/12,7 mm)	1
		Clear	36726			
		White	36727			
		Red	36728			
		Blue	36730			
Yellow	36729					
Green	37767					

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Specification and Ordering Information for  
3M Thin-Wall Tubing FP-301 Four-Foot  
Sticks (small box)

Product No.	Size	Color	UPC (051135-)	Descrpt.	Expanded/ Recvd. I.D.	Case Qty
FP-301	1-1/2" (38,1 mm)	Black	36731	5 48" Sticks (1,22 m)	1.500/0.750" (38,1/19,05 mm)	1
		Clear	36732			
		White	36733			
		Red	36734			
		Blue	36736			
Yellow	36735					
FP-301	2" (50,8 mm)	Black	36737	5 48" Sticks (1,22 m)	2.000/1.000" (50,8/25,4 mm)	1
		Clear	36738			
		White	36739			
		Red	36740			
		Blue	36742			
Yellow	36741					
FP-301	3" (76,2 mm)	Black	36743	2 48" Sticks (1,22 m)	3.000/1.500" (76,2/38,1 mm)	1
FP-301	4" (101,6 mm)	Black	36745	2 48" Sticks (1,22 m)	4.000/2.000" (101,6/50,8 mm)	1
		Clear	36746			

### Specification and Ordering Information for 3M™ Thin-Wall Tubing FP-301 Small Spools

Product No.	Size	Color	UPC (051135-) Descript.	Expanded/ Recvd. I.D.	Case Qty
FP-301	3/64" (1,19 mm)	Black Clear	36027** 36028** 100' Spool (30,5 m)	0.046/0.023" (1,17/0,58 mm)	300'
FP-301	1/16" (1,6 mm)	Black Clear White Red Blue Yellow Green	35550 35555 35551 35552 35553 35554 37591 100' Spool (30,5 m)	0.063/0.031" (1,6/0,79 mm)	300'
FP-301	3/32" (2,4 mm)	Black Clear White Red Blue Yellow Green	35556 35548 35557 35558 35559 35560 37592 100' Spool (30,5 m)	0.093/0.046" (2,36/1,17 mm)	300'
FP-301	1/8" (3,2 mm)	Black Clear White Red Blue Yellow Green	35562 35567 35563 35564 35565 35566 37593 100' Spool (30,5 m)	0.125/0.062" (3,18/1,57 mm)	300'
FP-301	3/16" (4,77 mm)	Black Clear White Red Blue Yellow Green	35568 35573 35569 35570 35571 35572 37594 100' Spool (30,5 m)	0.187/0.093" (4,75/2,36 mm)	300'
FP-301	1/4" (6,4 mm)	Black Clear White Red Blue Yellow Green	35574 35579 35575 35576 35577 35578 37346 100' Spool (30,5 m)	0.250/0.125" (6,35/3,18 mm)	300'
FP-301	3/8" (9,6 mm)	Black Clear White Red Blue Yellow Green	35580 35585 35581 35582 35583 35584 37643 100' Spool (30,5 m)	0.375/0.187" (9,53/4,75 mm)	300'
FP-301	1/2" (12,7 mm)	Black Clear White Red Blue Yellow Green	35586 35591 35587 35588 35589 35590 37347 100' Spool (30,5 m)	0.500/0.250" (12,7/6,35 mm)	300'
FP-301	3/4" (19,1 mm)	Black Clear White Red Blue Yellow Green	35592 35597 35593 35594 35595 35596 37348 50' Spool (15,2 m)	0.750/0.375" (19,05/9,52 mm)	150'
FP-301	1" (25,4 mm)	Black Clear White Red Blue Yellow Green	35598 35603 35599 35600 35601 35602 37768 50' Spool (15,2 m)	1.000/0.500" (25,4/12,7 mm)	150'

\* UPC prefix 054007-

\*\* UPC prefix 051138-

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### Specification and Ordering Information for 3M Thin-Wall Tubing FP-301 Small Spools

Product No.	Size	Color	UPC (054007-) Descript.	Expanded/ Recvd. I.D.	Case Qty
FP-301	1-1/2" (38,1 mm)	Black Clear White Red Blue Yellow	36026* 36025* 08515 38860 38857 08516 50' Spool (15,2 m) 100' Spool (30,5 m)	1.500/0.750" (38,1/19,05 mm)	100' 200'
FP-301	2" (50,8 mm)	Black Clear White Red Blue Yellow	36024* 36023* 08519 08518 38870 08520 50' Spool (15,2 m) 100' Spool (30,5 m)	2.000/1.000" (50,8/25,4 mm)	100' 200'
FP-301	3" (76,2 mm)	Black Clear White Red Blue Yellow	08521 38982 08522 38881 38880 38883 50' Spool (15,2 m)	3.000/1.500" (76,2/38,1 mm)	50'
FP-301	4" (101,6 mm)	Black Clear White Red Blue Yellow	38884 38986 38894 38893 58973 38895 50' Spool (15,2 m)	3.000/1.500" (101,6/50,8 mm)	50'

\* UPC prefix 051138-

### Specification and Ordering Information for 3M Thin-Wall Tubing FP 25-Foot Reels Thin-Wall, Flexible Polyolefin

Product Number	UPC (054007-)	Expanded/ Recovered I.D.	Case Qty.
FP-063-BK-25	40058	0.063/0.031" (1,6/0,8 mm)	1
FP-093-BK-25	40059	0.093/0.046" (2,4/1,2 mm)	1
FP-125-BK-25	40060	0.125/0.062" (3,2/1,6 mm)	1
FP-187-BK-25	40061	0.187/0.093" (4,7/2,4 mm)	1
FP-250-BK-25	40062	0.250/0.125" (6,4/3,2 mm)	1
FP-375-BK-25	40063	0.375/0.187" (9,5/4,2 mm)	1
FP-500-BK-25	40064	0.500/0.250" (12,7/6,4 mm)	1
FP-750-BK-25	40065	0.750/0.375" (19,1/9,5 mm)	1
FP-1000-BK-25	40066	1.000/0.500" (25,4/12,7 mm)	1

**Note:** Bulk spools and 4-foot lengths are available subject to quotation. Special cut lengths are also available subject to quotation.

## Specification and Ordering Information for 3M™ Thin-Wall Tubing FP-301 Four-Foot Lengths with Header Cards

Product No.	Size	Color	UPC (051135-)	Descrpt.	Expanded/ Recvd. I.D.	Case Qty
FP-301H	1/16" (1,58 mm)	Black	36748	25 48" Sticks (1,22 m)	0.063/0.031" (1,6/0,79 mm)	1
		Clear	36749			
		White	36750			
		Red	36751			
		Blue	36753			
		Yellow	36752			
		Green	36754			
FP-301H	3/32" (2,38 mm)	Black	36770	25 48" Sticks (1,22 m)	0.093/0.046" 2,36/1,17 mm)	1
		Clear	36771			
		White	36772			
		Red	36773			
		Blue	36775			
		Yellow	36774			
		Green	36776			
FP-301H	1/8" (3,18 mm)	Black	36777	25 48" Sticks (1,22 m)	0.125/0.062" (3,18/1,57 mm)	1
		Clear	36778			
		White	36779			
		Red	36780			
		Blue	36782			
		Yellow	36781			
		Green	36783			
FP-301H	3/16" (4,75 mm)	Black	36784	25 48" Sticks (1,22 m)	0.187/0.093" (4,75/2,36 mm)	1
		Clear	36785			
		White	36786			
		Red	36787			
		Blue	36789			
		Yellow	36788			
		Green	36790			
FP-301H	1/4" (6,35 mm)	Black	36791	12 48" Sticks (1,22 m)	0.250/0.125" (6,35/3,18 mm)	1
		Clear	36792			
		White	36793			
		Red	36794			
		Blue	36796			
		Yellow	36795			
		Green	36797			
FP-301H	3/8" (9,5 mm)	Black	36798	12 48" Sticks (1,22 m)	0.375/0.187" (9,53/4,75 mm)	1
		Clear	36799			
		White	36800			
		Red	36801			
		Blue	36803			
		Yellow	36802			
		Green	36804			
FP-301H	1/2" (12,7 mm)	Black	36805	12 48" Sticks (1,22 m)	0.500/0.250" (12,7/6,35 mm)	1
		Clear	36806			
		White	36807			
		Red	36808			
		Blue	36810			
		Yellow	36809			
		Green	36811			
FP-301H	3/4" (19,05 mm)	Black	36812	12 48" Sticks (1,22 m)	0.750/0.375" (19,01/9,53 mm)	1
		Clear	36813			
		White	36814			
		Red	36815			
		Blue	36817			
		Yellow	36816			
		Green	36763			
FP-301H	1" (25,4 mm)	Black	36818	5 48" Sticks (1,22 m)	1.000/0.500" (25,4/12,7 mm)	1
		Clear	36819			
		White	36820			
		Red	36821			
		Blue	36823			
		Yellow	36822			
		Green	37766			



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## 3M™ Kynar® Heat Shrink, Cross-linked, Thin-walled, Modified Polyvinylidene Fluoride Tubing

3M Kynar tubing is a cross-linked, thin-walled, heat-shrinkable tubing offering a high degree of mechanical strength and high-temperature resistance. Fabricated from polyvinylidene fluoride, the tubing has outstanding abrasion resistance and cut-through properties in combination with high dielectric strength. It is inherently flame retardant, semi-rigid and highly resistant to most industrial fuels, chemicals and solvents. When heated in excess of 347°F (175°C), Kynar tubing rapidly shrinks to a skintight fit. Kynar tubing is rated for continuous operation from -67°F (-55°C) to 347°F (175°C).

Kynar tubing is recommended for shrink-fit protection and strain relief of wires, solder joints, terminals and connections. Kynar tubing has a 2:1 shrink ratio. Standard color is clear. Standard packaging is 4-foot lengths. Order Kynar tubing by product name, size equivalent to the expanded inside diameter, package type and color. Applicable Specifications: MIL-DTL-23053/8, MIL-DTL-23053/18, Class 1; AMS-3632; UL File E-39100, VW-1; CSA LR 38227, OFT.

Kynar® is a registered trademark of Elf Atochem North America, Inc.



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## Specification and Ordering Information for 3M Kynar® Tubing with Header Cards

Product Number	Size	UPC (051135-)	Description	Expanded/Recovered I.D.	Broken Case Qty.	Case Qty.
Kynar-H	1/16"	38759	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.063/0.031" (1,60/0,79 mm)	—	25
Kynar-H	3/32"	38760	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.093/0.046" (2,36/1,17 mm)	—	25
Kynar-H	1/8"	38761	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.125/0.062" (3,18/1,57 mm)	—	25
Kynar-H	3/16"	38762	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.187/0.093" (4,75/2,36 mm)	—	12
Kynar-H	1/4"	38763	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.250/0.125" (6,35/3,18 mm)	—	12
Kynar-H	3/8"	38764	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.375/0.187" (9,53/4,75 mm)	—	12
Kynar-H	1/2"	38765	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.500/0.250" (12,70/6,35 mm)	—	5
Kynar-H	3/4"	38766	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	0.750/0.375" (19,05/9,53 mm)	—	5
Kynar-H	1"	38767	Modified Polyvinylidene Fluoride 48" Sticks w/Header Small Box	1.000/0.500" (25,40/12,70 mm)	—	5

\*See your 3M sales representative for bulk 4' stick packages.

# Adhesive-Lined Tubing

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

Shrink Ratio 3:1



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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 superb 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 four-foot (1,219 m) lengths and six-inch (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 Products 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.

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

UPC 05135-84442, Case quantity 5 kits

Description	# 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

## Specification and Ordering Information for 3M Tubing EPS-300

Product Number	Size	UPC (05135-)	Expanded/Recvr'd I.D.	Case Descrpt.	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
EPS-300 Black	3/16" (4,76 mm)	36875	0.187/0.063" (4,75/1,57 mm)	48" Sticks (1,21 m)	12
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
EPS-300 Black	1/4" (6,35 mm)	36876	0.250/0.080" (6,35/2,03 mm)	48" Sticks (1,21 m)	12
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
EPS-300 Black	3/8" (9,53 mm)	36877	0.375/0.120" (9,53/3,05 mm)	48" Sticks (1,21 m)	12
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
EPS-300 Black	1/2" (12,7 mm)	36878	0.500/0.160" (12,7/4,06 mm)	48" Sticks (1,21 m)	12
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
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
EPS-300 Black	3/4" (19,05 mm)	36879	0.750/0.250" (19,05/6,35 mm)	48" Sticks (1,21 m)	5
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
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
EPS-300 Black	1" (25,4 mm)	36880	1.000/0.320" (25,4/8,13 mm)	48" Sticks (1,21 m)	5
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
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
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
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

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

## Specification and Ordering Information for 3M™ Tubing EPS-300 with Header Cards

Product Number	Size	UPC (051135-)	Expanded/Recvrd I.D.	Descrpt.	Case Qty.
EPS-300H Black	1/8" (3,2 mm)	38749	0.125/0.040" (3,18/1,02 mm)	48" Sticks (1,21 m)	25
EPS-300H Black	3/16" (4,76 mm)	38750	0.187/0.063" (4,75/1,57 mm)	48" Sticks (1,21 m)	12
EPS-300H Black	1/4" (6,35 mm)	38751	0.250/0.080" (6,35/2,03 mm)	48" Sticks (1,21 m)	12
EPS-300H Black	3/8" (9,53 mm)	38752	0.375/0.120" (9,53/3,05 mm)	48" Sticks (1,21 m)	12
EPS-300H Black	1/2" (12,7 mm)	38753	0.500/0.160" (12,7/4,06 mm)	48" Sticks (1,21 m)	12
EPS-300H Red	1/2" (12,7 mm)	38754	0.500/0.160" (12,7/4,06 mm)	48" Sticks (1,21 m)	12
EPS-300H Black	3/4" (19,05 mm)	38755	0.750/0.250" (19,05/6,35 mm)	48" Sticks (1,21 m)	5
EPS-300H Red	3/4" (19,05 mm)	38756	0.750/0.250" (19,05/6,35 mm)	48" Sticks (1,21 m)	5
EPS-300H Black	1" (25,4 mm)	38757	1.000/0.320" (25,4/8,13 mm)	48" Sticks (1,21 m)	5
EPS-300H Red	1" (25,4 mm)	38758	1.000/0.320" (25,4/8,13 mm)	48" Sticks (1,21 m)	5

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



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## 3M Tubing MW Multiple-Wall, Semi-Rigid Polyolefin

### Shrink Ratio: 2.5:1

3M tubing MW is a semi-rigid, heat shrinkable polyolefin tubing that is co-extruded and selectively cross-linked to provide an integral, meltable inner wall. When heated in excess of 275°F (135°C), the inner meltable wall of the tubing is simultaneously softened and forced by the shrink action into intimate contact with all underlying surfaces, interstices and small voids. Upon cooling, the 3M Tubing MW provides a tough protective and insulating barrier, highly resistant to penetration by moisture and the attack of chemicals and solvents. Uses include strain relief for delicate wire terminations, connections, solder joints and harness breakouts — where semi-rigid environmental protective sleeving and insulation is needed.

Standard Color: Black and standard packaging is four-foot (1,219 m) lengths and six-inch (15,2 cm) cut pieces. Additional sizes, colors and put-ups are available — please contact your 3M Electrical Products Sales Representative.

Application Specifications: MIL-I-23053/4, Class 1; AMS-3634. To Order: Reference specific product size, color and description. Example: MW, 1/4, 6" pieces, black.

## Specification and Ordering Information for 3M Tubing MW Multiple Wall, Semi-Rigid Polyolefin

Product Number	Size	UPC (051135-)	Expanded/Recvrd I.D.	Descrpt.	Case Qty.
MW	1/8" (3,18 mm)	36859	0.125/0.023" (3,18/0,58 mm)	48" Sticks (1,21 m)	25
MW	1/8" (3,18 mm)	36563	0.125/0.023" (3,18/0,58 mm)	6" Pieces, 28/Bag (15,2 cm)	10
MW	3/16" (4,76 mm)	36860	0.187/0.060" (4,75/1,52 mm)	48" Sticks (1,21 m)	12
MW	3/16" (4,76 mm)	36564	0.187/0.060" (4,75/1,52 mm)	6" Pieces, 24/Bag (15,2 cm)	10
MW	1/4" (6,35 mm)	36861	0.250/0.080" (6,35/2,03 mm)	48" Sticks (1,21 m)	12
MW	1/4" (6,35 mm)	36565	0.250/0.080" (6,35/2,03 mm)	6" Pieces, 20/Bag (15,2 cm)	10
MW	3/8" (9,53 mm)	36862	0.375/0.135" (9,53/3,43 mm)	48" Sticks (1,21 m)	12
MW	3/8" (9,53 mm)	36566	0.375/0.135" (9,53/3,43 mm)	6" Pieces, 16/Bag (15,2 cm)	10
MW	1/2" (12,7 mm)	36863	0.500/0.195" (12,7/4,95 mm)	48" Sticks (1,21 m)	12
MW	1/2" (12,7 mm)	36567	0.500/0.195" (12,7/4,95 mm)	6" Pieces, 14/Bag (15,2 cm)	10
MW	3/4" (19,05 mm)	36864	0.750/0.313" (19,05/7,95 mm)	48" Sticks (1,21 m)	5
MW	3/4" (19,05 mm)	36568	0.750/0.313" (19,05/7,95 mm)	6" Pieces, 12/Bag (15,2 cm)	10
MW	1" (25,4 mm)	36865	1.000/0.400" (25,4/10,16 mm)	48" Sticks (1,21 m)	5
MW	1" (25,4 mm)	36569	1.000/0.400" (25,4/10,16 mm)	6" Pieces, 8/Bag (15,2 cm)	10

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

# Bus Bar Tubing

## 3M™ Bus Bar Tubing BBI-A Series

3M tubing BBI-A is made of specially formulated, cross-linked, flame-retardant, track-resistant polyolefin that will shrink to fit rectangular, square or round bus bars. 3M Bus Bar Tubing BBI-A will handle voltage ranges from 600 V to 35 kV, reducing your inventory requirements and saving you time and money.

The 3M tubing BBI-A material has a high resistance to splitting, while providing the flexibility to conform to bends in certain applications. Superior split resistance can prevent insulation failures and resulting downtimes. 3M tubing BBI-A is unaffected by normal cleaning fluids and is resistant to physical damage. Good thermal endurance (up to 110°C/230°F) contributes to longer life and more stable performance.

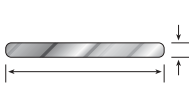
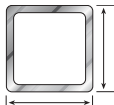
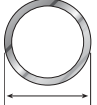
Excellent dielectric strength allows the required space between bus bars and metal enclosures to be substantially reduced. Closer spacing reduces both the overall size of the assembly, and the overall cost.

Note: Bus bar is packaged one roll per case, 20 or 50 feet long.



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# Specification and Ordering Information for 3M™ Bus Bar Tubing BBI-A Series

Product Number	UPC (051135-)	Outside Dimension (Bar Circumference A)	Rectangular	Square	Round (Diameter)	Case Qty.
						

### 5, 8 & 15 kV Bus Bar Size Ranges

BBI-3A	35726 35727	3.28"-5.57" (83-141 mm)	1 1/2" x 1/4"-2 1/2" x 1/2" (38 x 6-64 x 13 mm)	1" x 1"-1 1/2" x 1 1/2" (25 x 25-38 x 38 mm)	1 1/8"-1 3/4" (29-44 mm)	20 50
BBI-4A	35728 35729	5.43"-8.86" (138-225 mm)	2 1/2" x 3/8"-4" x 3/4" (64 x 10-102 x 19 mm)	2" x 2" (51 x 51 mm)	1 3/4"-2 3/4" (44-70 mm)	20 50
BBI-5A	35730 35731	6.67"-10.86" (169-276 mm)	3" x 5/8"-5" x 3/4" (76 x 16-127 x 19 mm)	2" x 2"-2" x 1/2" x 2 1/2" (51 x 51-64 x 64 mm)	2 1/8"-3 3/8" (54-86 mm)	20 50
BBI-6A	35732 35733	7.57"-12.86" (192-327 mm)	3 1/2" x 1/2"-6" x 3/4" (89 x 13-152 x 19 mm)	2 1/2" x 2 1/2"-3" x 3" (64 x 64-76 x 76 mm)	2 1/2"-4" (64-102 mm)	20 50
BBI-7A	35734 35735	8.28"-13.00" (210-330 mm)	4" x 1/4"-6" x 3/4" (102 x 6-152 x 19 mm)	2 1/2" x 2 1/2"-3" x 3" (64 x 64-76 x 76 mm)	2 3/4"-4 1/8" (70-105 mm)	20 50
BBI-8A	35736 35737	10.29"-16.43" (261-417 mm)	5" x 1/4"-8" x 3/8" (127 x 6-203 x 10 mm)	3" x 3"-4 x 4" (76 x 76-102 x 102 mm)	3 3/8"-5 1/8" (86-130 mm)	20 50
BBI-9A	35876 35877	12.29"-19.23" (312-488 mm)	6" x 1/4"-9" x 3/4" (152 x 6-229 x 19 mm)	3 1/2" x 3 1/2"-5" x 5" (89 x 89-127 x 127 mm)	4"-6 1/8" (102-156 mm)	20 50
BBI-10A	35878 35879	15.43"-24.14" (392-612 mm)	8" x 1/4"-10" x 3/4" (203 x 6-254 x 19 mm)	5" x 5"-6" x 6" (127 x 127-152 x 152 mm)	5"-7 5/8" (127-194 mm)	20 50

### 25 kV Bus Bar Size Ranges

BBI-3A	35726 35727	3.28"-3.56" (83-90 mm)	1 1/2" x 1/4"-1 1/2" x 3/8" (38 x 6-38 x 10 mm)	Measure circumference	1 1/8" (29 mm)	20 50
BBI-4A	35728 35729	5.43"-5.80" (138-147 mm)	2 1/2" x 3/8"-2 1/2" x 5/8" (64 x 10-64 x 16 mm)	Measure circumference	1 3/4" (44 mm)	20 50
BBI-5A	35730 35731	6.67"-7.18" (169-182 mm)	3" x 5/8"-3" x 3/4" (76 x 16-76 x 19 mm)	Measure circumference	2 1/8"-2 1/4" (54-57 mm)	20 50
BBI-6A	35732 35733	7.57"-8.43" (192-214 mm)	3 1/2" x 1/2"-4" x 1/4" (89 x 13-102 x 6 mm)	Measure circumference	2 1/2"-2 5/8" (64-67 mm)	20 50
BBI-7A	35734 35735	8.28"-10.44" (210-265 mm)	4" x 1/4"-5" x 3/8" (102 x 6-127 x 10 mm)	2 1/2" x 2 1/2" (64 x 64 mm)	2 3/4"-3 1/4" (70-83 mm)	20 50
BBI-8A	35736 35737	10.29"-12.88" (261-327 mm)	5" x 1/4"-6" x 3/4" (127 x 6-152 x 19 mm)	3 x 3" (76 x 76 mm)	3 3/8"-4" (86-102 mm)	20 50
BBI-9A	35876 35877	12.29"-15.31" (312-389 mm)	6" x 1/4"-7" x 3/4" (152 x 6-178 x 19 mm)	3 1/2" x 3 1/2"-4 x 4" (89 x 89-102 x 102 mm)	4"-4 7/8" (102-124 mm)	20 50
BBI-10A	35878 35879	15.43"-19.79" (392-503 mm)	8" x 1/4"-9" x 3/4" (203 x 6-229 x 19 mm)	5 x 5" (127 x 127 mm)	5"-6 1/4" (127-158 mm)	20 50

### 35 kV Bus Bar Size Ranges

BBI-7A	35734 35735	8.28"-8.86" (210-225 mm)	4" x 1/4"-4" x 3/4" (102 x 6-102 x 19 mm)	Measure circumference	2 3/4" (70 mm)	20 50
BBI-8A	35736 35737	10.29"-10.94" (261-278 mm)	5" x 1/4"-5" x 3/4" (127 x 6-127 x 19 mm)	Measure circumference	3 3/8" (86 mm)	20 50
BBI-9A	35876 35877	12.29"-13.00" (312-330 mm)	6" x 1/4"-6" x 3/4" (152 x 6-152 x 19 mm)	Measure circumference	4"-4 1/8" (102-105 mm)	20 50
BBI-10A	35878 35879	15.43"-16.86" (392-428 mm)	8" x 1/4"-8" x 3/4" (203 x 6-203 x 19 mm)	Measure circumference	5"-5 1/4" (127-133 mm)	20 50

Note: Rectangular and square bar sizes are based on bars having radiused edges and corners.