



Heat Shrink Tubing FP-301

Flexible Polyolefin

Data Sheet

January 2008

Product Description

3M™ Heat Shrink Tubing FP-301 offers an outstanding balance of electrical, physical and chemical properties for a wide variety of industrial and military applications. Rated for 135°C continuous operation, all FP-301 Tubing is split resistant, mechanically tough, easily marked and resists cold flow.

FP-301 Tubing meets MIL-DTL-23053/5 Class 1 & 2 and AMS-3636, AMS-3637 requirements. It is UL Recognized and CSA Certified at 600 volts @ 125°C (UL File Nos. E-39100 and CSA No. 38227).

FP-301 Tubing is rated for continuous operation at -55°C (-67°F) to 135°C (275°F), and is designed to withstand elevated temperatures to 300°C (572°F) for short periods. Minimum shrink temperature for all FP-301 Tubing is 100°C (212°F).

Applications

FP-301 Tubing 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.

NOTE: Technical information provided consists of typical product data and should not be used for specification purposes. Unless otherwise noted, all tests are performed at room temperature.

Applicable Specification

MIL-DTL-23053/5, Class 1, 2; AMS-3636, AMS-3637; UL File E-39100; CSALR38227; ABS

Typical Physical Properties

Tensile Strength	2400 psi
Ultimate Elongation	400%
Longitudinal Change	±5%
Secant modulus (2%)	13,000 PSI
Specific Gravity	1.3 (Black) .93 (Clear)
Heat Aging (336 hrs. @ 175°C)	Elongation 175%
Heat Shock (4 hrs. @ 250°C)	No dripping, flowing, cracking passes mandrel wrap test
Low Temperature Flexibility (4 hrs @ -55°C)	No Cracking
Flammability	Self-extinguish meets UL224 All-Tubing Flame Test (Class 1 only)

Typical Electrical Properties

Dielectric Strength	900 V/mil
Volume Resistivity	10 ¹⁵ ohm-cm

Typical Chemical Properties

Corrosive Effect	Non-corrosive
Solvent Resistance	
Tensile Strength	1000 PSI
Dielectric Strength	400 V/mil
Water Absorption	0.2%
Fungus Resistance	Non-nutrient

Standard Sizes and Dimensions

Ordering Size	Expanded I.D. (Minimum) in. (mm)	Recovered .I.D (Maximum) in. (mm)	Recovered Wall Thickness (Nominal) in. (mm)
3/64	.046 (1,17)	0.23 (0,58)	.016 (0,41)
3/16	.063 (1,60)	.031 (0,79)	.017 (0,43)
3/32	.093 (2,36)	.046 (1,17)	.020 (0,51)
1/8	.125 (3,18)	.062 (1,57)	.020 (0,51)
3/16	.187 (4,75)	.093 (2,36)	.020 (0,51)
1/4	.250 (6,35)	.125 (3,18)	.025 (0,64)
3/8	.375 (9,53)	.187 (4,75)	.025 (0,64)
1/2	.500 (12,70)	.250 (6,35)	.025 (0,64)
3/4	.750 (19,05)	.375 (9,53)	.030 (0,76)
1	1,000 (25,40)	.500 (12,70)	.035 (0,89)
1 1/2	1,500 (38,10)	.750 (19,05)	.040 (1,02)
2	2,000 (50,80)	1,000 (25,40)	.045 (1,14)
3	3,000 (76,20)	1,500 (38,10)	.050 (1,27)
4	4,000 (101,60)	2,000 (50,80)	.055 (1,40)

Shrink Ratio

3M™ Heat Shrink Tubing FP-301 has a 2:1 shrink ratio. When freely recovered, the polyolefin tubing will shrink to 50% of its as-supplied internal diameter. The recovered wall thickness of the tubing is proportional to the degree of recovery.

High expansion-ratio FP-301 Tubing meeting MIL-DTL-23053/5 Class 1 requirements for overexpansion are available subject to factory quotation.

Standard Colors

FP-301 Tubing, Class I (flame retardant) – black, white, red, blue, green (1/16”-1” green only) and yellow. FP-301, Class 2 (non-flame retardant)-clear. Other colors available subject to factory quotation.

Standard Packaging

Four-foot lengths, large spools (21” diameter) and small spools (8 1/2” diameter).

Ordering Information

Order FP-301 Tubing by product name, size equivalent to expanded inside diameter, package type and color. Always order the largest size that will shrink snugly over the item to be covered.

Example: FP-301 Tubing, 1/4”, 4 ft., white.

Important Notice

All statements, technical information, and recommendations related to 3M's products are based on information believed to be reliable, but the accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use. Any statements related to the product which are not contained in 3M's current publications, or any contrary statements contained on your purchase order shall have no force or effect unless expressly agreed upon, in writing, by an authorized officer of 3M.

**Warranty; Limited Remedy;
Limited Liability:**

This product will be free from defects in material and manufacture at time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**

3M is a trademark of 3M Company.

3M
Electrical Markets Division
6801 River Place Blvd.
Austin, TX 78726-9000
800 676 8381
FAX 800 828 0329
www.3M.com/oem

Please recycle. Printed in U.S.A.
© 3M 2008 All rights reserved.
78-8131-7399-0_A