

3MTM Heat Shrink Tubing FP-301

Flexible Polyolefin

Data Sheet

November 2008

Description

3MTM 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 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).

Agency Approvals, Self Certifications, MIL Specs

Meets requirements of:

- SAE-AMS-DTL-23053/5, Class 1, Class 2 (Clear)
- AMS-3636, AMS-3637
- UL Recognized, File E-39100, at 600 volts maximum @ 125°C
- CSA Certified, CSA LR38227, at 600 volts maximum @ 125°C
- ABS

***Formerly MIL-I-23053/5 and MIL-DTL-23053/5**

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.



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Typical Properties

Data is not for specifications. Values are typical and should not be considered minimum or maximum. Properties measured at room temperature 73° F (~23° C) unless otherwise stated.

Physical

Property	Typical Value US units (metric)
Tensile Strength	2400 psi
Elongation (% at break)	400%
Longitudinal change	±5%
Specific Gravity	1.3 (Opaque) .93 (Clear)
Operating Temperature	-67° to 275°F (-55° to +135°C)
Shrink Temperature (minimum)	212°F (100°C)
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
Scant Modules (2%)	13,000 psi
Flammability Self-extinguish, Meets UL 224 All-Tubing Flame Test (Except Clear)	Pass

Electrical

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

Chemical

Property	Typical Value
Corrosive Resistance	Non-corrosive
Solvent Resistance	Excellent
Water Absorption	0.2%
Fungus Resistance	Non-nutrient

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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)	.023 (0,58)	.016 (0,41)
1/16	.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 tubing will shrink to 50% of its as-supplied internal diameter. The recovered wall thickness is proportional to the degree of recovery.

Shelf Life & Storage

This product has a 10-year shelf life from date of manufacture when stored in a humidity controlled storage (50°F/10°C to 80°F/27°C and <75% relative humidity).

Availability

Standard Packaging:

Four-foot lengths, large spools (21" diameter) and small spools (8½" diameter).

Standard Colors:

FP-301 tubing, Class 1 (flame retardant) – black, white, red, blue, green (3/64" – 1" green only) and yellow.

FP-301 tubing, Class 2 (non-flame retardant) –clear.

*Other colors available are subject to factory quotation.

For availability, please contact your local distributor. Names and addresses are available from 3M.com/electrical [Where to Buy], or call 1-800-676-8381.

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