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# 3M™ Heat Shrinkable Marker Sleeve FP-303MS

## Flexible Polyolefin Heat Shrinkable Tubing

Data Sheet

January 2010

### Description

3M™ Heat Shrinkable Marker Sleeve FP-303MS offers an outstanding balance of electrical, physical and chemical properties for a wide variety of industrial applications. Available in continuous spools, the Heat Shrinkable Marker Sleeve FP-303MS tubing is designed for computer-based printing using the 3M Thermal Roll Printer TRP-303.

3M™ Heat Shrinkable Marker Sleeve FP-303MS has a 3:1 shrink ratio. When freely recovered, the tubing will shrink to 33% of its as-supplied internal diameter. The recovered wall thickness is proportional to the degree of recovery. Minimum shrink temperature is 212°F (100°C). The operating is -67° to 275°F (-55° to +135°C)

### Agency Approvals & Self Certifications

Meets the material requirements of SAE-AMS-DTL-23053/5\*

- Meets the Marker Permanence requirements of:
  - SAE-AS81531 ( 20 rubs ) and
  - MIL-STD-202 Method 215K - ( 10 rubs x 3 cycles each fluid )
- Isopropyl Alcohol / Mineral Spirits
- Terpene Defluxer
- H2O / PGME / Monoethanolamine

When used with 3M Thermal Roll Printer Black Ribbon RBN-BLK series

- UL Recognized, File E-39100, at 600 volts maximum @ 125°C
- CSA Certified, CSA LR38227, at 600 volts maximum @ 125°C

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

RoHS 2002/95/EC



RoHS Compliant 2002/95/EC" means that the product or part ("Product") does not contain any of the substances in excess of the maximum concentration values in EU Directive 2002/95/EC, as amended by Commission Decision 2002/618/EC, unless the substance is in an application that is exempt under RoHS. This information represents 3M's knowledge and belief, which may be based in whole or in part on information provided by third party suppliers to 3M.

# 3M™ Heat Shrinkable Marker Sleeve

## Typical Properties

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

## Physical

Property	Typical Value US units (metric)
<b>Tensile Strength</b>	2400 psi
<b>Elongation (% at break)</b>	400%
<b>Longitudinal change</b>	+5% -15%
<b>Specific Gravity</b>	1.3 (Opaque) .93 (Clear)
<b>Operating Temperature</b>	-67°to 275°F (-55°to +135°C)
<b>Shrink Temperature (minimum)</b>	212°F (100°C)
<b>Heat Aging (336 hrs. @ 175°C)</b>	Elongation 175%
<b>Heat shock (4 hrs. @ 250°C)</b>	No dripping, flowing, cracking, passes mandrel wrap test
<b>Low Temperature Flexibility (4 hrs @ -55°C)</b>	No cracking
<b>Secant Modulus (2%)</b>	13,000 psi
<b>Flammability</b> Self-extinguish, Meets UL 224 All-Tubing Flame Test (Except Clear)	Pass

## Electrical

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

## Chemical

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

# 3M™ Heat Shrinkable Marker Sleeve

Standard Sizes and Dimensions	Ordering Size	Expanded I.D. (Minimum) in. (mm)	Recovered I.D. (Maximum) in. (mm)	Recovered Wall Thickness (Nominal) in. (mm)
	1/8	.125 (3,2)	.043 (1,1)	.024 (0,6)
3/16	.188 (4,8)	.063 (1,6)	.026 (0,65)	
1/4	.250 (6,4)	.083 (2,1)	.028 (0,7)	
3/8	.375 (9,5)	.122 (3,1)	.031 (0,8)	
1/2	.500 (12,7)	.165 (4,2)	.033 (0,85)	
3/4	.750 (19,1)	.248 (6,3)	.039 (1,0)	
1	1.000 (25,4)	.327 (8,3)	.048 (1,2)	

## Recommended Sizing Application Range

Ordering Size	Wire Diameter Range	Nominal THHN Wire Size
1/8	0.046" – 0.106" (1.16mm – 2.70mm)	22 – 16 AWG
3/16	0.069" – 0.159" (1.74mm – 4.04mm)	18 – 12 AWG
1/4	0.092" – 0.213" (2.33mm – 5.40mm)	16 – 10 AWG
3/8	0.138" – 0.319" (3.49mm – 8.10mm)	10 – 6 AWG
1/2	0.183" – 0.425" (4.66mm – 10.80mm)	8 – 2 AWG
3/4	0.275" – 0.638" (6.99mm – 16.19mm)	6 – 3/0 AWG
1	0.367" – 0.850" (9.31mm – 21.59mm)	2 AWG – 350 MCM

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

**Availability** Please contact your local distributor; available from 3M.com/electrical [Where to Buy] or call 1-800-676-8381.

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