



# FP-301 VW Tubing

Flexible Polyolefin

## Data Sheet

### Product Description

3M™ FP-301VW Tubing has the same outstanding balance of electrical, physical and chemical properties as FP-301 Tubing and is specially engineered for superior flame resistance.

FP-301VW Tubing meets MIL-DTL-23053/5, Class 3 requirements. It is UL Recognized and CSA Certified at 600 volts @ 125°C (UL File Nos. E-39100, VW-1 and E-69751; CSANo. 38227, OFT).

FP-301VW Tubing is rated for continuous operation from -55°C (-67°F) to 135°C (275°F) and withstands elevated temperatures to 300°C (572°F) for brief periods. Minimum shrink temperature for all FP-301VW Tubing is 100°C (212°F).

### Typical Applications

FP-301VW Tubing is ideal for fire-resistant coverings of components and flammable wire assemblies.

### Shrink Ratio

FP-301VW Tubing 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 of the tubing is proportional to the degree of recovery. High expansion ratios are available subject to factory quotation.

### Standard Colors

FP-301VW (flame retardant)—black, white, red, blue and yellow.

### Standard Packaging

Four-foot lengths or large spools. Cut pieces available subject to factory quotation.

### Ordering Information

Order FP-301VW 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-301VW, 1/4", 4 ft., white.

### Standard Sizes and Dimensions

Ordering Size	Expanded I.D. (Minimum)		Recovered I.D. (Maximum)		Recovered Wall Thickness (Nominal)	
	in.	(mm)	in.	(mm)	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)

### Typical Properties

#### Applicable Specification

**MIL-DTL-23053/5, Class 3; UL File E-39100, VW-1, E-69751; CSALR38227, OFT**

#### Physical

Tensile Strength 2400 PSI  
Ultimate Elongation 400%  
Longitudinal Change +1, -10%

Secant Modulus (2%) 13,000 PSI

Specific Gravity 1.5

Heat Aging Elongation (168 hrs. @ 175°C) 175%

Heat Shock No dripping, cracking, passes mandrel wrap test (4 hrs. @ 250°C)

Low Temperature Flexibility (4 hrs. @ -55°C) No cracking

Flammability Self-extinguish meets UL 224 VW-1 Test

#### Electrical

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

#### Chemical

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

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.

**Limited Warranty** – 3M expressly warrants that for a period of ninety days from the date of purchase, 3M static control products will be free of defects in materials (parts) and workmanship (labor). Defects occurring during the warranty period will be repaired or products will be replaced at 3M's option and expense, if 3M receives notice during the warranty period. Defective products must be returned to 3M with proof of purchase date.

**Warranty Exclusions** – THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESS AND IMPLIED, INCLUDING FITNESS AND MERCHANTABILITY. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean, or repair products.

**Limit of Liability** – In no event will 3M or Seller be responsible or liable for special, incidental, or consequential losses or damages, whether based in tort or contract. Fulfillment of 3M's warranty obligations will be Customer's exclusive remedy and 3M's and Seller's limit of liability for any breach of warranty or otherwise.

**For your nearest distributor or to order, call 1-800-328-1368**

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