



FP-221VW Tubing

Flexible Polyolefin

Data Sheet

Product Description

3M™ FP-221VW Tubing has the same outstanding balance of electrical, physical and chemical properties as FP-221 Tubing and is specially engineered for superior flame resistance.

FP-221VW is UL Recognized and CSA Certified at 600 volts @ 125°C (UL File No. E-39100; CSA file No.LR38227).

Typical applications

FP-221VW Tubing is ideal for fire-resistant coverings of components and flammable wire assemblies.

Shrink Ratio

FP-221VW 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-221VW (flame retardant)-black, white, red, yellow, blue and green.

Standard Packaging

Large spools. Cut pieces available subject to factory quotation.

Ordering Information

Order FP-221VW 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-221VW, 4mm, white.

Typical Properties

Applicable Specification

UL File E-39100, CSA file LR38227

Physical

Tensile Strength	2400 PSI
Ultimate Elongation	400%
Longitudinal Change	+1, -10%
Secant Modulus (2%)	13,000 PSI
Specific Gravity	1.5
Heat Aging (168hrs.@175 °C)	Elongation, 175%
Heat Shock (4 hrs.@250 °C)	no dripping, cracking, passed mandrel wrap test
Low Temperature Flexibility (4 hrs. @-55 °C)	no cracking
Flammability Test	Self-extinguish, Meets UL 224 VW-1

Electrical

Dielectric Strength	900 V/mil
Volume Resistivity	10 ¹⁵ 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.

Standard Sizes and Dimensions (Metric Sizes)

Size (mm)	I.D of as supply (mm)	Wall thickness of as supply (mm)	Recovered I.D (mm)	Recovered wall thickness (mm)
1.0/5	>1.0	0.2+/-0.05	≤0.5	0.4+/-0.05
1.5/75	>1.5	0.2+/-0.05	≤0.75	0.4+/-0.05
2.0/1.0	>2.0	0.25+/-0.05	≤1.0	0.45+/-0.05
2.5/1.25	>2.5	0.25+/-0.05	≤1.25	0.45+0.1
3.0/1.5	>3.0	0.25+/-0.05	≤1.5	0.45+0.1
3.5/1.75	>3.5	0.25+/-0.05	≤1.75	0.45+0.1
4.0/2.0	>4.0	0.25+/-0.05	≤2.0	0.45+0.1
4.5/2.0	>4.5	0.35+/-0.1	≤2.0	0.60+0.1
5.0/2.5	>5.0	0.35+/-0.1	≤2.5	0.55+0.1
6.0/3.0	>6.0	0.35+/-0.1	≤3.0	0.55+0.1
7.0/3.5	>7.0	0.35+/-0.1	≤3.5	0.55+0.1
8.0/4.0	>8.0	0.35+/-0.1	≤4.0	0.55+0.1
9.0/4.5	>9.0	0.35+/-0.1	≤4.5	0.55+0.1
10.0/5.0	>10.0	0.35+/-0.1	≤5.0	0.60+0.1
11.0/5.5	>11.0	0.35+/-0.1	≤5.5	0.60+0.1
12.0/6.0	>12.0	0.35+/-0.15	≤6.0	0.70+0.1
13.0/6.5	>13.0	0.35+/-0.15	≤6.5	0.70+0.1
14.0/7.0	>14.0	0.35+/-0.15	≤7.0	0.70+0.1
15.0/7.5	>15.0	0.35+/-0.15	≤7.5	0.70+0.1
16.0/8.0	>16.0	0.35+/-0.15	≤8.0	0.70+0.1
17.0/8.5	>17.0	0.35+/-0.15	≤8.5	0.70+0.1
18.0/9.0	>18.0	0.4+/-0.15	≤9.0	0.80+0.1
20.0/10.0	>20.0	0.5+/-0.15	≤10.0	0.90+0.1
22.0/11.0	>22.0	0.5+/-0.15	≤11.0	0.90+0.1
25.0/12.5	>25.0	0.5+/-0.15	≤12.5	0.90+0.1
28.0/14.0	>28.0	0.5+/-0.15	≤14.0	0.90+0.1
30.0/15.0	>30.0	0.55+/-0.2	≤15.0	1.00+0.2
35.0/17.5	>35.0	0.55+/-0.2	≤17.5	1.00+0.2
40.0/20.0	>40.0	0.55+/-0.2	≤20.0	1.00+0.2
50.0/25.0	>50.0	0.55+/-0.2	≤25.0	1.00+0.2

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**