

# 3M™ Heat Shrink Tubing FP-301VW

## Flexible, Polyolefin

### Data Sheet

July 2010

#### Description

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

FP-301VW 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-301VW tubing is 100°C (212°F).

#### Agency Approvals & Self Certifications

Meets requirements of:

- MIL-DTL-23053/5, Class 3
- UL Recognized, File E-39100, vw-1 and E-69751 at 600 volts maximum @ 125°C
- CSA Certified, CSA LR38227, OFT at 600 volts maximum @ 125°C

#### 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 is proportional to the degree of recovery. High expansion ratios available subject to factory quotation.

#### Standard Sizes and Dimensions

| Ordering Size (Nominal) | Expanded I.D. (Minimum)<br>In. (mm) | Recovered I.D. (Maximum)<br>In. (mm) | Recovered Wall Thickness (Nominal)<br>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)                                    |

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## 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<br>US units (metric)                 |
|---------------------------------------------------------|----------------------------------------------------|
| Tensile Strength                                        | 2400 psi                                           |
| Ultimate Elongation                                     | 400%                                               |
| Longitudinal Change                                     | ±1 -10%                                            |
| Secant Modulus (2%)                                     | 13,000 psi                                         |
| Specific Gravity                                        | 1.5                                                |
| Heat Aging (168 hrs. @ 175° C)                          | Elongation 175%                                    |
| Heat shock (4 hrs. @ 250° C)                            | No dripping, cracking,<br>passes mandrel wrap test |
| Low Temperature Flexibility<br>(4 hrs @ -55° C)         | No cracking                                        |
| Scant Modules (2%)                                      | 13,000 psi                                         |
| Flammability<br>Self-extinguish, Meets UL 224 VW-1 Test | Pass                                               |

| Electrical Property (Test Method) | Typical Value           |
|-----------------------------------|-------------------------|
| Dielectric Strength               | 900 V/mil               |
| Volume Resistivity                | 10 <sup>15</sup> ohm/cm |

| Chemical Property (Test Method)                               | Typical Value        |
|---------------------------------------------------------------|----------------------|
| Corrosion Effect                                              | Non-corrosive        |
| Fungus Resistance                                             | Non-nutrient         |
| Water Absorption                                              | 0.2%                 |
| Solvent Resistance<br>Tensile Strength<br>Dielectric Strength | 1000 PSI<br>400V/mil |

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## Standard Colors

Black

Also available in Blue, Green, Red, White and Yellow. Price, MOQ and Lead Time will vary for these colors. Please contact Local Sales Representative or Customer Service Representative for more information.

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| <b>Shelf Life &amp; Storage</b> | 3M™ Heat Shrink Tubing FP-301VW 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). |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Availability</b> | <b>Standard Packaging</b>                                                                                                               |
|                     | Four-foot lengths and large spools. Cut pieces available subject to factory quotation.                                                  |
|                     | Please contact your local distributor; available from <a href="http://3M.com/oem">3M.com/oem</a> [Where to Buy] or call 1-800-676-8381. |

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