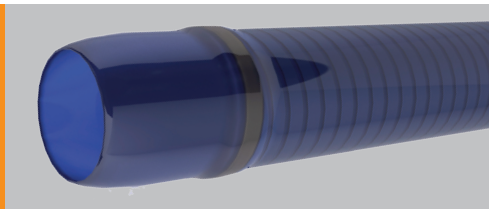
# MT-FEP
## FEP Heat Shrink Tubing

## Applications

- Process aid for reflowing catheter shafts
- Process aid for joint bonding



### PROFILE

- Shrink ratio ≤ 1.6:1
- Full recovery at 210°C (410°F) minimum
- Tight longitudinal change control as low as ± 2%
- Manufactured to ISO 10993 standards
- Custom sizing, finishing options available
- Translucent for high optical clarity
- Color blending option available

### ABOUT

- MT-FEP is a fluorinated ethylene propylene (FEP) heat shrink tubing. FEP offers excellent consistency, high dielectric strength and is chemically inert. MT-FEP is lubricious and semi-rigid with shrink ratios up to 2:1*. FEP is the industry gold standard for reflowing catheter shafts and bonding joints.
- For our MT-FEP, we can control longitudinal growth ± 2% ensuring consistency on lot-to-lot, reducing waste and cost.

**Upper limit on select applications. Optimal shrink ratio is 1.6:1*

### TABLE 1: DIMENSIONS

| Size | As Supplied | | Recovered | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | | Inside Diameter Maximum (d) | | Wall Thickness (W) Minimum | | | Wall Thickness (W) Maximum | Nominal | |
| | in. | mm. | in. | mm. | in. | mm. | in. | mm. | in. | mm. |
| 1/32 | 0.035 | 0.9 | 0.025 | 0.6 | 0.006 | 0.15 | 0.010 | 0.25 | 0.008 | 0.20 |
| 3/64 | 0.045 | 1.1 | 0.032 | 0.8 | 0.006 | 0.15 | 0.010 | 0.25 | 0.008 | 0.20 |
| 1/16 | 0.063 | 1.6 | 0.040 | 1.0 | 0.006 | 0.15 | 0.010 | 0.25 | 0.008 | 0.20 |
| 3/32 | 0.093 | 2.4 | 0.056 | 1.4 | 0.006 | 0.15 | 0.010 | 0.25 | 0.008 | 0.20 |
| 1/8 | 0.125 | 3.2 | 0.075 | 1.9 | 0.007 | 0.18 | 0.013 | 0.33 | 0.010 | 0.25 |
| 3/16 | 0.188 | 4.8 | 0.115 | 2.9 | 0.007 | 0.18 | 0.013 | 0.33 | 0.010 | 0.25 |
| 1/4 | 0.250 | 6.4 | 0.150 | 3.8 | 0.007 | 0.18 | 0.013 | 0.33 | 0.010 | 0.25 |
| 3/8 | 0.375 | 9.5 | 0.225 | 5.7 | 0.009 | 0.23 | 0.015 | 0.38 | 0.012 | 0.30 |
| 1/2 | 0.500 | 12.7 | 0.300 | 7.6 | 0.011 | 0.28 | 0.019 | 0.48 | 0.015 | 0.38 |



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## TABLE 3: PROPERTIES

| Property | Unit | Requirement | Test Method |
|---|---|---|---|
| **Physical** | | | |
| Dimensions* | inches *(mm)* | In accordance with Table 1 | |
| Longitudinal change* | percent | +0, -10 maximum | ASTM D 2671 |
| Concentricity as supplied* | percent | 70 minimum (2:1 Exp. ratio)<br>60 minimum (3:1 Exp. ratio) | ASTM D 2671 |
| Tensile strength* | psi *(MPa)* | 2000 minimum *(10:3)* | ASTM D 2671, 20″/minute |
| Ultimate elongation* | percent | 200 minimum | |
| Secant modulus* (expanded) | psi *(MPa)* | 2.5 x $10^4$ maximum *(172)* | ASTM D 2671 |
| Heat resistance<br>168 hours at 175°C (347°F)<br>Followed by test for:<br>Ultimate elongation | <br><br>percent | <br><br>100 minimum | <br><br>ASTM D 2671, 20″/minute |
| **Electrical**<br>Dielectric strength | volts/mil *(volts/mm)* | 500 minimum *(19.7)* | ASTM D 2671 |
| Dielectric withstand<br>3000V, 60Hz | sec | 60 minimum | ASTM D 2671 |
| **Chemical**<br>Fluid resistance<br>24 hours at 23 ± 3°C (77 ± 5°F)<br>Isopropyl alcohol<br>5% saline solution<br>Disinfectant | | | ASTM D 2671 |
| Followed by tests for:<br>Dielectric strength | volts/mil *(volts/mm)* | 400 minimum *(15.7)* | |
| Tensile strength | psi *(MPa)* | 1000 minimum *(6.9)* | ASTM D 2671 |
| Heavy metals analysis<br>Cadmium<br>Mercury<br>Lead<br>Bismuth<br>Antimony | ppm | 1 maximum<br>(total of all metals) | USP XXII Physiochemical tests-plastic (Note 1) |

*Denotes lot acceptance test

*Note 1: Sample preparation and extraction is per USP XXII. Metals analysis may be colorimetric as described in USP XXII or by equivalent quantitative analytical method.*

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