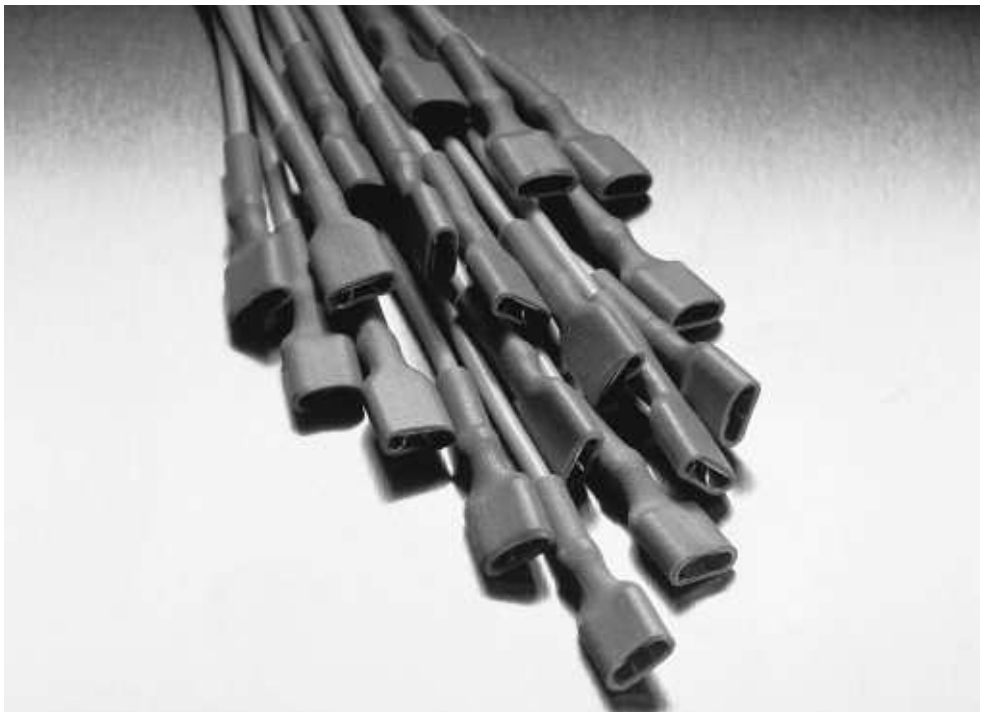
# LSTT

**Low-Shrink-Temperature, Non-Flame-Retardant, Heat-Shrinkable, Polyolefin tubing**

## Product Facts

- 2:1 shrink ratio
- Rapid recovery at low temperatures
- Can be used with temperature-sensitive materials
- Flexible
- Not flame-retardant
- Excellent physical and electrical performance
- RoHS compliant



### Applications

LSTT is a highly flexible, low-shrink-temperature, heat-shrinkable tubing. Its low shrink temperature offers exceptionally fast recovery for maximum efficiency in high-volume commercial applications and makes it suitable for use on or near delicate, temperature-sensitive materials, such as PVC jacketed wire and cable. Although not flame-retardant, LSTT meets the automotive flame propagation standard MVSS 302.

Typical applications include electrical termination insulation, color-coding, covering of heat-sensitive devices, cosmetic coverings, and mechanical protection.

### Installation

Minimum shrink temperature: 65°C [149°F]

Minimum full recovery temperature: 110°C [230°F]

### Operating Temperature Range

-40°C to 125°C
[-40°F to 257°F]

### Specifications/Approvals

| Series | Industry | Raychem |
|---|---|---|
| LSTT | MVSS302 | RW-2051 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## LSTT (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | Nominal After Heating |
| 1.6 | 1.6 [0.063] | 0.8 [0.031] | 0.50 ± 0.12 [0.018 ± 0.005] |
| 2.4 | 2.4 [0.093] | 1.2 [0.046] | 0.55 ± 0.12 [0.022 ± 0.005] |
| 3.2 | 3.2 [0.125] | 1.6 [0.062] | 0.55 ± 0.12 [0.022 ± 0.005] |
| 4.8 | 4.8 [0.187] | 2.4 [0.093] | 0.55 ± 0.12 [0.022 ± 0.005] |
| 6.4 | 6.4 [0.250] | 3.2 [0.125] | 0.65 ± 0.15 [0.026 ± 0.006] |
| 9.5 | 9.5 [0.375] | 4.8 [0.187] | 0.65 ± 0.15 [0.026 ± 0.006] |
| 12.7 | 12.7 [0.500] | 6.4 [0.250] | 0.65 ± 0.15 [0.026 ± 0.006] |
| 19.0 | 19.0 [0.748] | 9.5 [0.375] | 0.80 ± 0.15 [0.032 ± 0.006] |
| 25.4 | 25.4 [1.000] | 12.7 [0.500] | 0.95 ± 0.18 [0.037 ± 0.007] |
| 32.0 | 32.0 [1.260] | 16.0 [0.630] | 1.05 ± 0.20 [0.041 ± 0.008] |
| 38.0 | 38.0 [1.496] | 19.0 [0.748] | 1.05 ± 0.20 [0.041 ± 0.008] |
| 52.0** | 52.0 [2.047] | 26.0 [1.024] | 1.14 ± 0.18 [0.045 ± 0.007] |

*Wall thickness will be les if tubing recovery is restricted during shrinkage.
**Available in black only.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), red (-2), blue (-6), yellow (-4) |
| | Nonstandard | Green (-5), grey (-8), white (-9), clear (-X) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Other sizes are available upon request. | |
| Standard packaging | On spools*** | |
| Ordering description | Specify product name, size and color (for example, LSTT 6.4-0). | |

***Available in the convenient RaySpool packaging/dispensing system, for sizes 2.4 up to 25.4



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MicroFit

## Small-Diameter, High-Shrink-Ratio Tubing

### Product Facts

- Small diameter
- High shrink ratio
- Thin wall
- Polyolefin and fluoropolymer materials
- RoHS compliant
- ISO 10993-1 compliant
- USP Class VI material, no heavy metals
- Compatibility with gamma, ETO, steam and dry-heat sterilization




### Applications

The family of MicroFit small diameter, high-shrink-ratio tubing is suitable for electrical insulation, mechanical protection, and strain relief in smaller, more compact medical devices and commercial electronics products. Offered in a variety of materials.

### Installation

Minimum full recovery temperature:

175°C [347°F] (MT1000)

140°C [284°F] (MT2000)

### Operating Temperature Range

MT1000: -55°C to 150°C [-67°F to 302°F]

MT2000: -40°C to 105°C [-40°F to 221°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT1000 is semi-rigid polyvinylidene fluoride material | USP Class VI (MT1000) | Altera MicroFit SCD |
| MT2000 is medical grade polyolefin material | USP Class VI (MT2000) | |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MicroFit (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | |
|---|---|---|---|
| | Expanded I.D. Minimum (D) | Recovered I.D. Maximum (d) | Recovered Wall Maximum (W) |
| MFT-*-No. 14-** | 0.356 [0.014] | 0.203 [0.008] | 0.152 [0.006] |
| MFT-*-No. 2-** | 0.610 [0.024] | 0.305 [0.012] | 0.152 [0.006] |
| MFT-*-No. 33-** | 1.143 [0.045] | 0.432 [0.017] | 0.118 [0.007] |
| MFT-*-No. 65-** | 0.635 [0.025] | 0.254 [0.010] | 0.330 [0.013] |

*Replace single asterisk with material type: MT1000 or MT2000.
**Replace double asterisk with color-code number.
***Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | MT1000 | MT2000 |
|---|---|---|---|
| Color | Standard | Translucent (-X) | Black (-0), clear (-X) |
| | Nonstandard | Black (-0) | White (-9), red (-2), yellow (-4), blue (-6), orange (-3) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. | | |
| Standard packaging | On plastic spools**** | | |
| Ordering description | Specify product name, material, size and color (for example, MFT-MT2000-NO.14-0). | | |

****MFT-MT1000 and MFT-MT2000 are double bagged.



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

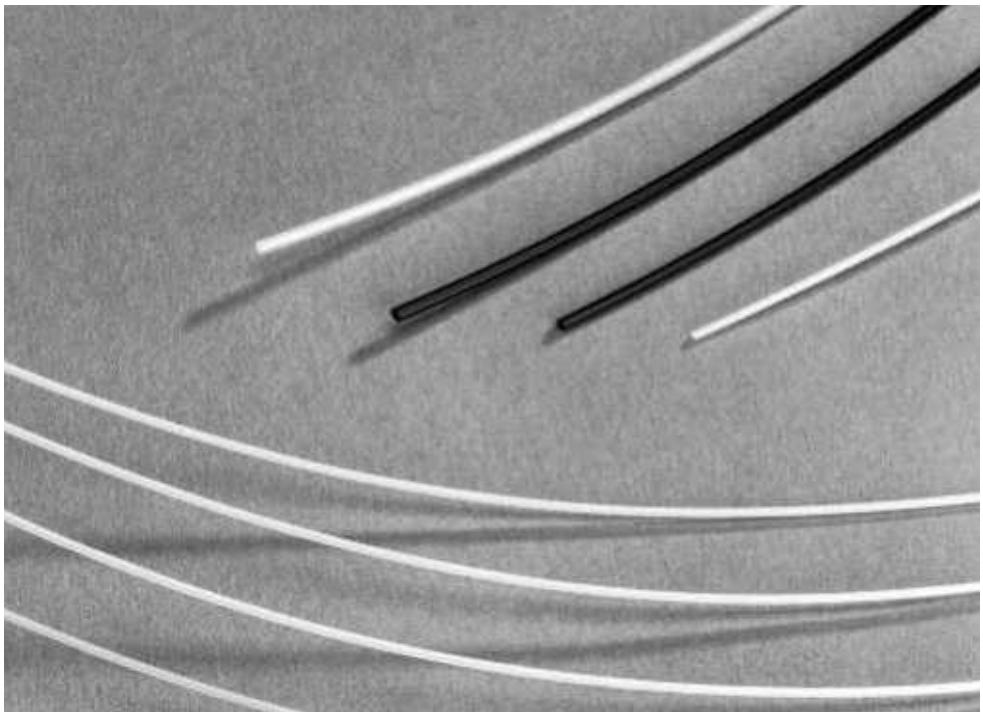
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT1000

**Altera Medical-Grade, USP Class VI, High-Temperature, Semirigid, Fluoropolymer Tubing**

## Product Facts

- **2:1 shrink ratio**
- **Tough, semirigid, very-thin-wall insulation**
- **Excellent resistance to a variety of fluids**
- **Optional inner adhesive lining (MT1000A)**
- **USP Class VI material, no heavy metals**
- **ISO 10993-1 compliant**
- **Double-bagged packaging**
- **Compatibility with gamma, ETO, steam, and dry-heat sterilization**
- **RoHS compliant**



### Applications

Well-suited for electrical insulation and strain relief of components that are exposed to high temperatures - either during operation or during sterilization.

Thin-wall construction is well-suited for applications with clearance constraints.

### Installation

Minimum shrink temperature: 155°C [311°F]

Minimum full recovery temperature: 175°C [347°F]

### Operating Temperature Range

-55°C to 150°C [-67°F to 302°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT1000 | USP Class VI | MT1000 SCD |
| MT1000A | USP Class VI | MT1000A SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT1000 (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Maximum | Nominal |
| 3/64 | 1.17 [0.046] | 0.58 [0.023] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 1/16 | 1.60 [0.063] | 0.79 [0.031] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 3/32 | 2.36 [0.093] | 1.17 [0.046] | 0.20 [0.009] | 0.31 [0.12] | 0.25 [0.010] |
| 1/8 | 3.18 [0.125] | 1.58 [0.062] | 0.20 [0.009] | 0.31 [0.12] | 0.25 [0.010] |
| 3/16 | 4.75 [0.187] | 2.36 [0.093] | 0.20 [0.009] | 0.31 [0.12] | 0.25 [0.010] |
| 1/4 | 6.35 [0.250] | 3.18 [0.125] | 0.28 [0.011] | 0.38 [0.15] | 0.33 [0.013] |
| 3/8 | 9.53 [0.375] | 4.75 [0.187] | 0.28 [0.011] | 0.38 [0.15] | 0.33 [0.013] |
| 1/2 | 12.70 [0.500] | 6.35 [0.250] | 0.28 [0.011] | 0.38 [0.15] | 0.33 [0.013] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), Translucent (-X) |
| | Nonstandard | White (-9) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | In 1.2-meter (4-foot) lengths, double bagged. | |
| Ordering description | Specify product name, size and color (for example, MT1000-1/8-X). Specify MT1000A for adhesive-lined constructions (special order). | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT2000

## Altera Medical-Grade, USP Class VI, Lubricious, Thin-Wall, Polyolefin Tubing

### Product Facts

- 2.5:1 shrink ratio
- Lubricity comparable to FEP
- Excellent electrical insulation properties
- Can be manufactured with a very thin wall
- Optional inner adhesive lining (MT2000A)
- USP Class VI material, no heavy metals
- ISO 10993-1 compliant
- Plastic spools and double-bagged packaging
- Compatibility with gamma and ETO sterilization
- RoHS compliant



### Applications

Especially suitable for medical applications requiring lubricity, flexibility, and excellent electrical insulation performance. A cost-effective alternative to FEP (fluorinated ethylene-propylene) while maintaining performance after gamma sterilization.

### Installation

Minimum shrink temperature: 110°C [230°F]

Minimum full recovery temperature: 140°C [284°F]

### Operating Temperature Range

-40°C to 105°C [-40°F to 221°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT2000 | USP Class VI | MT2000 SCD |
| MT2000A | USP Class VI | MT2000A SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT2000 (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Maximum | Nominal |
| 1 mm | 1.0 [0.040] | 0.45 [0.018] | 0.20 [0.008] | 0.30 [0.12] | 0.25 [0.010] |
| 2 mm | 2.0 [0.080] | 0.80 [0.032] | 0.20 [0.008] | 0.30 [0.12] | 0.25 [0.010] |
| 3 mm | 3.0 [0.120] | 1.20 [0.048] | 0.20 [0.008] | 0.30 [0.12] | 0.25 [0.010] |
| 6 mm | 6.0 [0.240] | 2.40 [0.096] | 0.20 [0.008] | 0.30 [0.12] | 0.25 [0.010] |
| 10 mm | 10.0 [0.400] | 4.00 [0.160] | 0.30 [0.012] | 0.41 [0.16] | 0.36 [0.014] |

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), clear (-X) |
| | Nonstandard | White (-9), red (-2), blue (-6), yellow (-4), orange (-3) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | On plastic spools, double-bagged. | |
| Ordering description | Specify product name, size and color (for example, MT2000-3.0-0). Specify MT2000A for adhesive-lined constructions (special order). | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT3000

**Altera Medical-Grade, USP Class VI, High-Temperature, Flexible, Fluoropolymer Tubing**

## Product Facts

- **2:1 shrink ratio**
- **Tough, flexible, very-thin-wall insulation**
- **Excellent resistance to a variety of fluids**
- **Optional inner adhesive lining (MT3000A)**
- **USP Class VI material, no heavy metals**
- **ISO 10993-1 compliant**
- **Plastic spools and double-bagged packaging**
- **Compatibility with steam (limited cycles), gamma, ETO, and dry-heat sterilization**
- **RoHS compliant**



### Applications

Used for electrical insulation and strain relief of components that are exposed to high temperatures - either during operation or during sterilization. Exceptional flexibility and thin-wall construction are well-suited for applications where pliancy coupled with small overall bundle size is desired.

### Installation

Minimum shrink temperature: 140°C [284°F]

Minimum full recovery temperature: 150°C [302°F]

### Operating Temperature Range

-55°C to 140°C
[-67°F to 284°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT3000 | USP Class VI | MT3000 SCD |
| MT3000A | USP Class VI | MT3000A SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT3000 (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Wall Thickness (W) Maximum | Wall Thickness (W) Nominal |
| 3/64 | 1.17 [0.046] | 0.58 [0.023] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 1/16 | 1.60 [0.063] | 0.79 [0.031] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 3/32 | 2.36 [0.093] | 1.17 [0.046] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 1/8 | 3.18 [0.125] | 1.58 [0.062] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 3/16 | 4.75 [0.187] | 2.36 [0.093] | 0.20 [0.008] | 0.31 [0.12] | 0.25 [0.010] |
| 1/4 | 6.35 [0.250] | 3.18 [0.125] | 0.28 [0.009] | 0.38 [0.15] | 0.33 [0.012] |
| 3/8 | 9.53 [0.375] | 4.75 [0.187] | 0.28 [0.009] | 0.38 [0.15] | 0.33 [0.012] |
| 1/2 | 12.70 [0.500] | 6.35 [0.250] | 0.28 [0.009] | 0.38 [0.15] | 0.33 [0.012] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0) |
| | Nonstandard | White (-9) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | On plastic spools, double-bagged. | |
| Ordering description | Specify product name, size and color (for example, MT3000 1/4-0). | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT5000

## Altera Medical-Grade, USP Class VI, Flexible, Polyolefin Tubing

### Product Facts

- 2:1 shrink ratio
- Flexibility; variety of colors
- Excellent electrical insulation properties
- Inner adhesive lining optional (MT5000A)
- USP Class VI material, no heavy metals
- ISO 10993-1 compliant
- Plastic spools and double-bagged packaging
- Compatibility with gamma and ETO sterilization
- RoHS compliant



### Applications

Especially suitable for applications requiring excellent electrical insulation performance and resistance to abrasion and harmful solvents such as electrosurgical instruments. Also used for strain relief, color coding, and identification of many medical components and devices.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 110°C [230°F]

### Operating Temperature Range

-70°C to 90°C [-94°F to 194°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT5000 | USP Class VI | MT5000 SCD |
| MT5000A | USP Class VI | MT5000A SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT5000 (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Wall Thickness (W) Maximum | Wall Thickness (W) Nominal |
| 3/64 | 1.17 [0.046] | 0.58 [0.023] | 0.33 [0.013] | 0.48 [0.019] | 0.40 [0.016] |
| 1/16 | 1.60 [0.063] | 0.79 [0.031] | 0.35 [0.014] | 0.50 [0.020] | 0.43 [0.017] |
| 3/32 | 2.36 [0.093] | 1.17 [0.046] | 0.43 [0.017] | 0.58 [0.023] | 0.50 [0.020] |
| 1/8 | 3.18 [0.125] | 1.58 [0.062] | 0.43 [0.017] | 0.58 [0.023] | 0.50 [0.020] |
| 3/16 | 4.75 [0.187] | 2.36 [0.093] | 0.43 [0.017] | 0.58 [0.023] | 0.50 [0.020] |
| 1/4 | 6.35 [0.250] | 3.18 [0.125] | 0.56 [0.022] | 0.71 [0.028] | 0.64 [0.025] |
| 3/8 | 9.53 [0.375] | 4.75 [0.187] | 0.56 [0.022] | 0.71 [0.028] | 0.64 [0.025] |
| 1/2 | 12.70 [0.500] | 6.35 [0.250] | 0.56 [0.022] | 0.71 [0.028] | 0.64 [0.025] |
| 3/4 | 19.05 [0.750] | 9.53 [0.375] | 0.69 [0.027] | 0.84 [0.033] | 0.76 [0.030] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), clear (-X), and blue (-6) |
| | Nonstandard | White (-9), red (-2), yellow (-4), green (-5) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. | |
| Standard packaging | On plastic spools, double-bagged. | |
| Ordering description | Specify product name, size and color (for example, MT5000-1/4-0). Specify MT5000A for adhesive-lined constructions (special order). | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

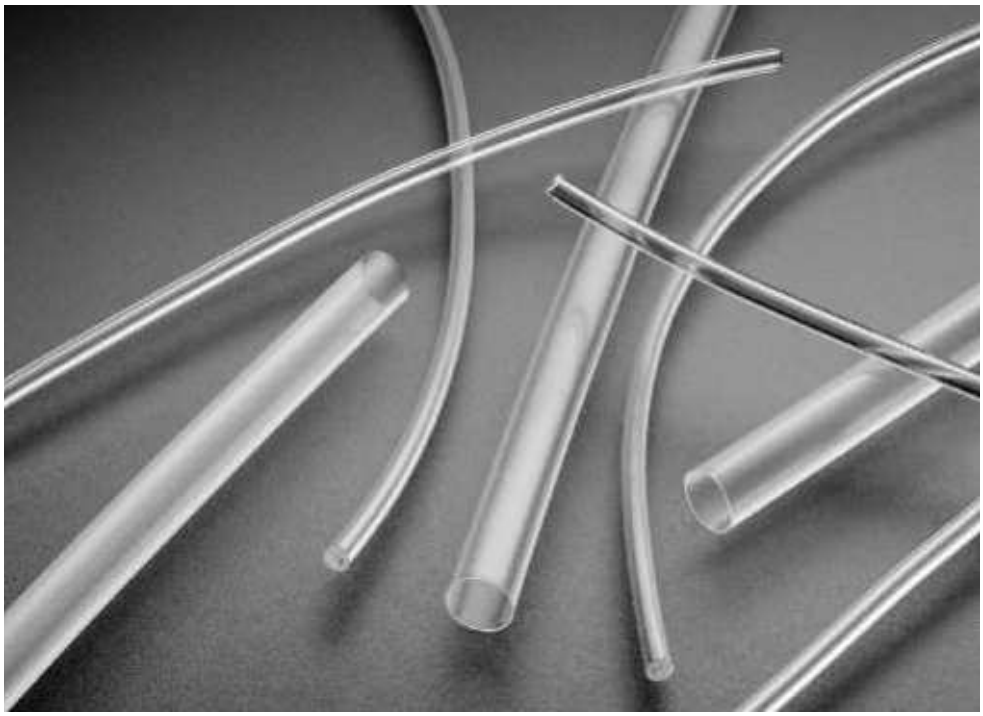
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT6000

**Altera Medical-Grade, USP Class VI, High Shrink Ratio, Polyolefin Tubing**

## Product Facts

- 4:1 shrink ratio or greater
- Custom and larger shrink ratios available
- Flexible; variety of colors
- Excellent electrical insulation properties
- Inner adhesive lining optional (MT6000A)
- USP Class VI material, no heavy metals
- ISO 10993-1 compliant
- Plastic spools and double-bagged packaging
- Compatibility with gamma and ETO sterilization
- RoHS compliant



### Applications

Designed for applications that need 4:1 or larger shrink ratios. Provides excellent electrical insulation performance and resistance to abrasion and harmful solvents. Also used for strain relief, color coding, identification of components and devices, and process aid.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 110°C [230°F]

### Operating Temperature Range

-70°C to 90°C
[-94°F to 194°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT6000 | USP Class VI | MT6000 SCD |
| MT6000A | USP Class VI | MT6000A SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT6000 (Continued)

## Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Maximum | Nominal |
| 3/16 | 4.75 [0.187] | 1.17 [0.046] | 0.43 [0.017] | 0.58 [0.023] | 0.51 [0.020] |
| 1/4 | 6.35 [0.250] | 1.57 [0.062] | 0.43 [0.017] | 0.58 [0.023] | 0.51 [0.020] |
| 3/8 | 9.53 [0.375] | 2.36 [0.093] | 0.43 [0.017] | 0.58 [0.023] | 0.51 [0.020] |
| 1/2 | 12.70 [0.500] | 3.18 [0.125] | 0.56 [0.022] | 0.71 [0.028] | 0.64 [0.025] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

## Ordering Information

| | | |
|---|---|---|
| Color | Standard | Black (-0), clear (-X) |
| | Nonstandard | Blue (-6), red (-2), white (-9), yellow (-4), green (-5) |
| Size selection | Always order the largest size that will recover snugly over the substrate. Special order sizes are available upon request. | |
| Standard packaging | On plastic spools, double-bagged. | |
| Ordering description | Specify product name, size and color (for example, MT6000-3/16-X) Specify MT6000A for adhesive-lined constructions (special order). | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

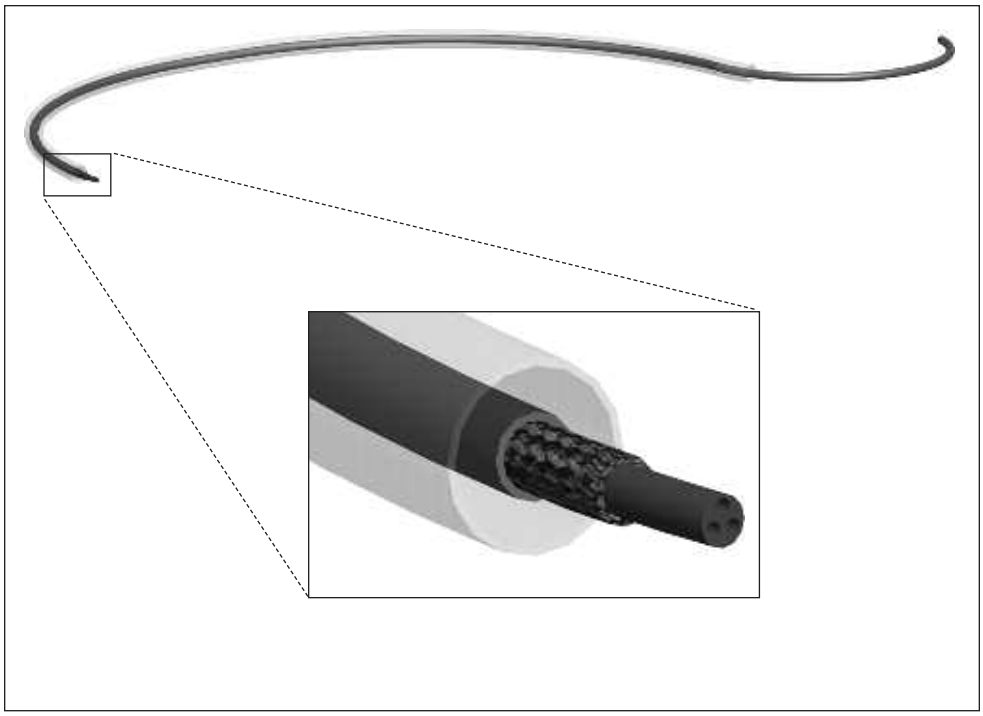
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT-FEP (Heat-Shrinkable Fluorinated Ethylene Propylene)

## Altera Medical-Grade, USP Class VI, Heat-Shrinkable FEP Tubing

### Product Facts

- Standard 1.6:1 shrink ratio
- Tight control of longitudinal change, standard +/- 5%
- High temperature, low friction, non-reactive material
- Excellent electrical insulation, mechanical protection, and chemical resistance
- Cut pieces, double bagged
- Transparent and resistant to UV damage
- USP Class VI material, no heavy metals
- ISO 10993-1 compliant
- Compatible with autoclave sterilization; ethylene oxide, steam, and dry-heat
- RoHS compliant



### Applications

Designed specifically to meet the demanding needs of the catheter and medical device industry. Well-suited for process aid as well as electrical insulation, mechanical protection, and chemical resistance.

### Installation

Minimum shrink temperature: 190°C [374°F]

Minimum full recovery temperature: 210°C [410°F]

### Specifications/Approvals

| Series | Material | Raychem |
|---|---|---|
| MT-FEP | USP Class VI | MT-FEP SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT-FEP (Continued)

### Product Dimensions

| Size | As Supplied mm [inches] | Recovered mm [inches] | | | |
|---|---|---|---|---|---|
| | Inside Diameter Minimum (D) | Inside Diameter Maximum (d) | Wall Thickness (W) Minimum | Wall Thickness (W) Maximum | Wall Thickness (W) Nominal |
| 1/32 | 0.9 [0.035] | 0.6 [0.025] | 0.15 [0.006] | 0.25 [0.010] | 0.20 [0.008] |
| 3/64 | 1.1 [0.045] | 0.8 [0.032] | 0.15 [0.006] | 0.25 [0.010] | 0.20 [0.008] |
| 1/16 | 1.6 [0.063] | 1.0 [0.040] | 0.15 [0.006] | 0.25 [0.010] | 0.20 [0.008] |
| 3/32 | 2.7 [0.093] | 1.4 [0.056] | 0.15 [0.006] | 0.25 [0.010] | 0.20 [0.008] |
| 1/8 | 3.2 [0.125] | 1.9 [0.075] | 0.18 [0.007] | 0.33 [0.013] | 0.25 [0.010] |
| 3/16 | 4.8 [0.188] | 2.9 [0.115] | 0.18 [0.007] | 0.33 [0.013] | 0.25 [0.010] |
| 1/4 | 6.4 [0.250] | 3.8 [0.150] | 0.18 [0.007] | 0.33 [0.013] | 0.25 [0.010] |
| 3/8 | 9.5 [0.375] | 5.7 [0.225] | 0.23 [0.009] | 0.38 [0.015] | 0.30 [0.012] |
| 1/2 | 12.7 [0.500] | 7.6 [0.300] | 0.28 [0.011] | 0.48 [0.019] | 0.38 [0.015] |

### Ordering Information

| | |
|---|---|
| Color | Clear (-X) standard |
| Size selection | Order the appropriate FEP size based on your substrate.<br>Special order sizes are available upon request. |
| Standard packaging | In 4-foot (1.2 meter) lengths (-stk) double bagged. |
| Ordering description | Specify product name and size (for example, MT-FEP-093-056-X-STK). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

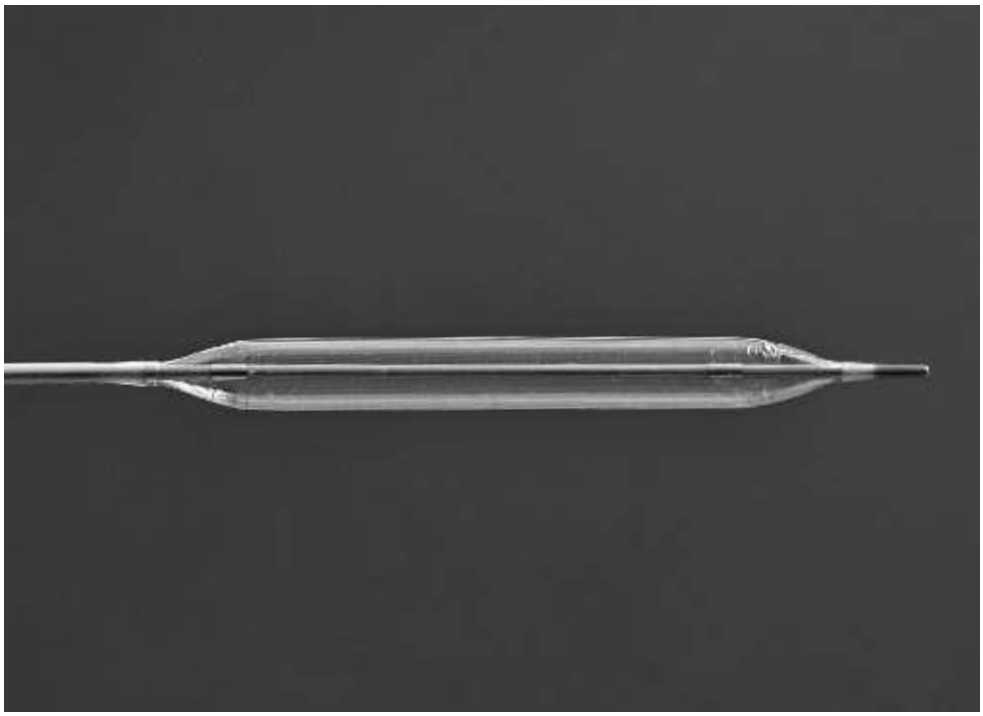
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# MT-LWA

**Altera Medical Grade, Laser-Welding Application Process Aid, Polyolefin Tubing**

## Product Facts

- **3:1 shrink ratio, custom ratios and sizes available**
- **Flexible; forms to irregular shapes**
- **Good clarity needed for laser welding and other bonding operations**
- **Excellent electrical insulation properties**
- **Removes easily after application, good axial tear propagation**
- **On plastic spools double bag packaging**
- **USP Class VI, no heavy metals**
- **ISO 10993-1 compliant**
- **RoHS compliant**



### Applications

Well-suited for laser-welding operations of stents and balloons, hot jaw bonding or other secondary value-added processes. Heat-shrinkable product will hold joints in place during operation and removes easily without residue or damage to the end product.

### Installation

Minimum shrink temperature: 95°C [203°F]

Minimum full recovery temperature: 121°C [250°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| MT-LWA | MT-LWA SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## MT-LWA (Continued)

### Product Dimensions

### 2:1 Expansion Ratio Dimensions (±)

| Size | As Supplied mm [inches] Inside Diameter (D) | Recovered mm [inches] Inside Diameter (d) | Recovered mm [inches] Wall Thickness (W) |
|---|---|---|---|
| 1/32 | 1.02 ± 0.13 [0.040 ± 0.005] | 0.33 ± 0.05 [0.013 ± 0.002] | 0.25 ± 0.05 [0.010 ± 0.002] |
| 3/64 | 1.40 ± 0.13 [0.055 ± 0.005] | 0.51 ± 0.08 [0.020 ± 0.003] | 0.31 ± 0.05 [0.012 ± 0.002] |
| 1/16 | 1.83 ± 0.13 [0.072 ± 0.005] | 0.69 ± 0.10 [0.027 ± 0.004] | 0.43 ± 0.08 [0.017 ± 0.003] |
| 3/32 | 2.72 ± 0.20 [0.107 ± 0.008] | 1.07 ± 0.10 [0.042 ± 0.004] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/8 | 3.56 ± 0.25 [0.140 ± 0.010] | 1.45 ± 0.13 [0.057 ± 0.005] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 3/16 | 5.21 ± 0.25 [0.205 ± 0.010] | 2.18 ± 0.18 [0.086 ± 0.007] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 1/4 | 6.99 ± 0.38 [0.275 ± 0.015] | 2.97 ± 0.20 [0.117 ± 0.008] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 3/8 | 10.54 ± 0.51 [0.415 ± 0.020] | 4.34 ± 0.41 [0.171 ± 0.016] | 0.64 ± 0.08 [0.025 ± 0.003] |

### 3:1 Expansion Ratio Dimensions (Min./Max)

| Size | As Supplied mm [inches] Inside Diameter (D) Minimum | Recovered mm [inches] Inside Diameter (d) Maximum | Recovered mm [inches] Wall Thickness (W) Nominal |
|---|---|---|---|
| 0.032 | 0.81 [0.032] | 0.28 [0.011] | 0.25 ± 0.05 [0.010 ± 0.002] |
| 0.063 | 1.60 [0.063] | 0.53 [0.021] | 0.41 ± 0.05 [0.016 ± 0.002] |
| 0.078 | 1.98 [0.078] | 0.64 [0.025] | 0.41 ± 0.05 [0.016 ± 0.002] |
| 0.094 | 2.39 [0.094] | 0.79 [0.031] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 0.110 | 2.79 [0.110] | 0.86 [0.034] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 0.125 | 3.18 [0.125] | 1.07 [0.042] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 0.188 | 4.78 [0.188] | 1.60 [0.063] | 0.51 ± 0.08 [0.020 ± 0.003] |
| 0.250 | 6.35 [0.250] | 2.11 [0.083] | 0.64 ± 0.08 [0.025 ± 0.003] |
| 0.375 | 9.53 [0.375] | 3.18 [1.125] | 0.64 ± 0.08 [0.025 ± 0.003] |

### Ordering Information

| | |
|---|---|
| Color | Clear (-X) Only |
| Size selection | Always order the largest size that will recover snugly over the substrate. Special order sizes are available upon request. |
| Standard packaging | On plastic spools (SP), double-bagged. |
| Ordering description | Specify product name and size (for example, MT-LWA-032-X-SP). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# NT

## Flexible, General Purpose Modified Elastomeric Tubing

### Product Facts

- **Remains flexible at temperatures as low as -55˚C [-67˚F]**
- **Offers good resistance to abrasion and physical abuse while providing the flexibility and strain relief needed in general-purpose harnessing applications**
- **Resistant to most common fluids and solvents**
- **RoHS compliant**



### Applications

Widely used for insulation, strain relief, and abrasion protection on cable harnesses and wire bundles in the commercial electronics industries where a reliable general-purpose tubing is needed. Suitable for applications requiring some exposure to common fluids and solvents.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-55°C to 90°C [-67°F to 194°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| NT | RT-510 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## NT (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 1/8 | 3.2 [0.125] | 1.6 [0.061] | 0.69 ± 0.20 [0.027 ± 0.008] |
| 3/16 | 4.8 [0.187] | 2.5 [0.100] | 0.84 ± 0.25 [0.033 ± 0.010] |
| 1/4 | 6.4 [0.250] | 3.6 [0.143] | 0.89 ± 0.25 [0.035 ± 0.010] |
| 3/8 | 9.5 [0.375] | 5.5 [0.214] | 1.01 ± 0.25 [0.040 ± 0.010] |
| 1/2 | 12.7 [0.500] | 7.3 [0.286] | 1.21 ± 0.38 [0.048 ± 0.015] |
| 5/8 | 15.9 [0.625] | 9.1 [0.357] | 1.32 ± 0.38 [0.052 ± 0.015] |
| 3/4 | 19.1 [0.750] | 10.9 [0.428] | 1.44 ± 0.38 [0.057 ± 0.015] |
| 7/8 | 22.2 [0.875] | 12.7 [0.500] | 1.65 ± 0.38 [0.065 ± 0.015] |
| 1 | 25.4 [1.000] | 14.5 [0.570] | 1.77 ± 0.51 [0.070 ± 0.020] |
| 1 1/4 | 31.8 [1.250] | 18.1 [0.714] | 2.20 ± 0.51 [0.087 ± 0.020] |
| 1 1/2 | 38.1 [1.500] | 21.8 [0.857] | 2.41 ± 0.51 [0.095 ± 0.020] |
| 1 3/4 | 44.5 [1.750] | 25.4 [1.000] | 2.71 ± 0.51 [0.107 ± 0.020] |
| 2 | 50.8 [2.000] | 29.0 [1.140] | 2.79 ± 0.51 [0.110 ± 0.020] |
| 3 | 76.2 [3.000] | 43.4 [1.710] | 3.17 ± 0.51 [0.125 ± 0.020] |
| 4 | 101.6 [4.000] | 57.9 [2.280] | 3.55 ± 0.51 [0.140 ± 0.020] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, NT 1/4-0). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# NT-MIL

## Flexible, Rugged, Modified Elastomeric Tubing

### Product Facts

- **Remains flexible at temperatures as low as -70°C [94°F] without cracking**
- **Withstands heat shock at 200°C [392°F] without dripping, flowing or cracking**
- **Offers outstanding resistance to abrasion and physical abuse while providing flexibility and strain relief needed in rugged harnessing applications**
- **Resistant to most fluids and solvents, including aviation and ground vehicle fuels, lubricating oil, and hydraulic fluids**
- **Meets the stringent requirements of SAE-AMS-DTL-23053/1, Classes 1 and 2**
- **RoHS compliant**



### Applications

Widely used for insulation, strain relief and abrasion protection on cable harnesses and wire bundles in the military and aerospace industries where a reliable rugged tubing is needed. Especially suitable for applications requiring exposure to common fluids and solvents.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-70°C to 121°C
[-94°F to 250°F]

### Specifications/Approvals

| Series | Military | Raychem |
|---|---|---|
| NT-MIL | AMS-DTL-23053/1*, Classes 1 & 2 | RW-3030 |

*Formerly MIL-I-23053/1 and MIL-DTL-23053/1

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## NT-MIL (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 1/8 | 3.2 [0.125] | 1.6 [0.061] | 0.69 ± 0.20 [0.027 ± 0.008] |
| 3/16 | 4.8 [0.187] | 2.5 [0.100] | 0.84 ± 0.25 [0.033 ± 0.010] |
| 1/4 | 6.4 [0.250] | 3.6 [0.143] | 0.89 ± 0.25 [0.035 ± 0.010] |
| 3/8 | 9.5 [0.375] | 5.4 [0.211] | 1.01 ± 0.25 [0.040 ± 0.010] |
| 1/2 | 12.7 [0.500] | 7.3 [0.286] | 1.21 ± 0.38 [0.048 ± 0.015] |
| 5/8 | 15.9 [0.625] | 9.1 [0.357] | 1.32 ± 0.38 [0.052 ± 0.015] |
| 3/4 | 19.1 [0.750] | 10.9 [0.428] | 1.44 ± 0.38 [0.057 ± 0.015] |
| 7/8 | 22.2 [0.875] | 12.7 [0.500] | 1.65 ± 0.38 [0.065 ± 0.015] |
| 1 | 25.4 [1.000] | 14.5 [0.570] | 1.77 ± 0.51 [0.070 ± 0.020] |
| 1 1/4 | 31.8 [1.250] | 18.1 [0.714] | 2.20 ± 0.51 [0.087 ± 0.020] |
| 1 1/2 | 38.1 [1.500] | 21.8 [0.857] | 2.41 ± 0.51 [0.095 ± 0.020] |
| 1 3/4 | 44.5 [1.750] | 25.4 [1.000] | 2.71 ± 0.51 [0.107 ± 0.020] |
| 2 | 50.8 [2.000] | 29.0 [1.140] | 2.79 ± 0.51 [0.110 ± 0.020] |
| 3 | 76.2 [3.000] | 43.4 [1.710] | 3.17 ± 0.51 [0.125 ± 0.020] |
| 4 | 101.6 [4.000] | 57.9 [2.280] | 3.55 ± 0.51 [0.140 ± 0.020] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, NT-MIL 1/4-0). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

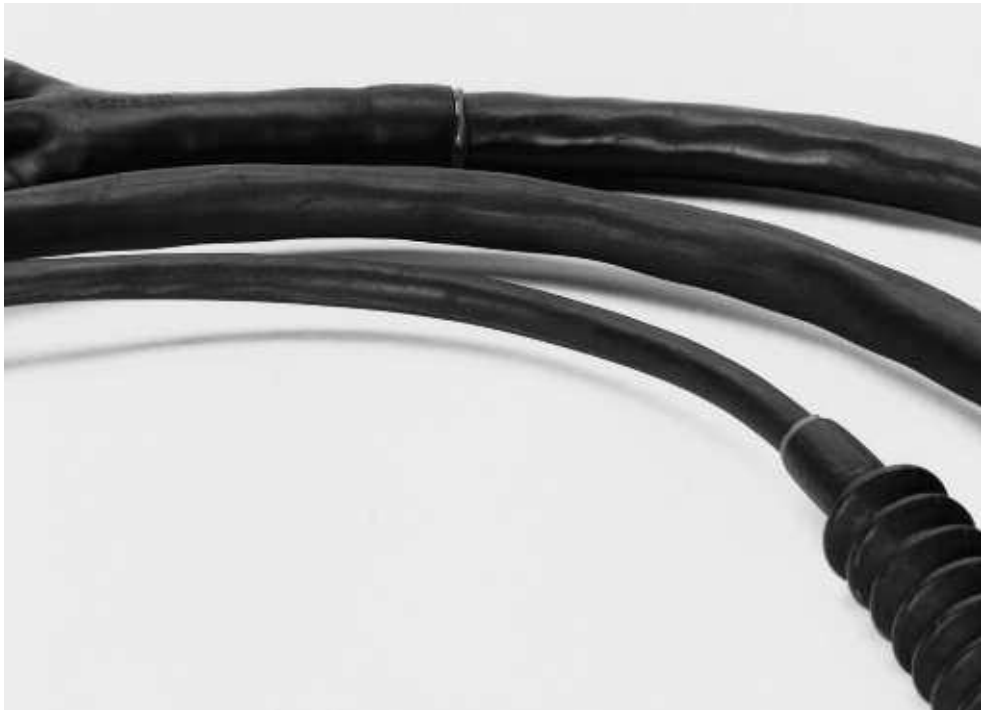
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# NTFR

## Very Flexible, Rugged Neoprene Elastomer Tubing

### Product Facts

- Remains flexible at low temperatures without cracking
- Offers outstanding resistance to abrasion and physical abuse while providing the flexibility and strain relief needed for rugged applications
- Resistant to most fluids and solvents, including aviation and ground-vehicle fuels, lubricating oil, and hydraulic fluids (see Raychem Specification RT-511)
- Performance exceeds the stringent requirements of SAE-AMS-DTL-23053/1, Class 2
- System 20
- RoHS compliant



### Applications

Widely used for insulation, strain relief, and abrasion protection on cable harnesses and wire bundles in the military and aerospace industries. Especially suitable for applications requiring exposure to fluids and solvents at elevated temperatures.

### Installation

Minimum shrink temperature: 90°C [194°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-70°C to 121°C
[-94°F to 250°F]

### Specifications/Approvals

| Series | Military | Agency | Raychem |
|---|---|---|---|
| NTFR | SC-X-15112 | AMS 3623 | RT-511 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## NTFR (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness** |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 1/8 | 3.2 [0.125] | 1.6 [0.061] | 0.69 ± 0.20 [0.027 ± 0.008] |
| 3/16 | 4.8 [0.187] | 2.5 [0.100] | 0.84 ± 0.25 [0.033 ± 0.010] |
| 1/4 | 6.4 [0.250] | 3.6 [0.143] | 0.89 ± 0.25 [0.035 ± 0.010] |
| 3/8 | 9.5 [0.375] | 5.5 [0.214] | 1.01 ± 0.25 [0.040 ± 0.010] |
| 1/2 | 12.7 [0.500] | 7.3 [0.286] | 1.21 ± 0.38 [0.048 ± 0.015] |
| 5/8 | 15.9 [0.625] | 9.1 [0.357] | 1.32 ± 0.38 [0.052 ± 0.015] |
| 3/4 | 19.1 [0.750] | 10.9 [0.428] | 1.44 ± 0.38 [0.057 ± 0.015] |
| 7/8 | 22.2 [0.875] | 12.7 [0.500] | 1.65 ± 0.38 [0.065 ± 0.015] |
| 1 | 25.4 [1.000] | 14.5 [0.570] | 1.77 ± 0.51 [0.070 ± 0.020] |
| 1 1/4 | 31.8 [1.250] | 18.1 [0.714] | 2.20 ± 0.51 [0.087 ± 0.020] |
| 1 1/2 | 38.1 [1.500] | 21.8 [0.857] | 2.41 ± 0.51 [0.095 ± 0.020] |
| 1 3/4 | 44.5 [1.750] | 25.4 [1.000] | 2.71 ± 0.51 [0.107 ± 0.020] |
| 2 | 50.8 [2.000] | 29.0 [1.140] | 2.79 ± 0.51 [0.110 ± 0.020] |
| 3 | 76.2 [3.000] | 43.4 [1.710] | 3.17 ± 0.51 [0.125 ± 0.020] |

**Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | On spools. |
| Ordering description | Specify product name, size and color (for example, NTFR 1/4-0). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# PD Caps

## Semirigid, Encapsulant-Lined, Polyolefin Caps

### Product Facts

- 3:1 shrink ratio
- Permanent or temporary way to terminate wires
- Rapid, simple installation
- Rugged protection against abrasion, vibration, and flexing
- PD caps provide a splash-resistant, moisture-resistant covering (but not intended for use where immersion in fluids is required)
- RoHS compliant



### Applications

PD Caps offer an improved, inexpensive way to encapsulate crimped electrical connections, including those on motor coils. Their encapsulant lining melts and flows to fill surface irregularities of the substrate. These vibration-proof caps are used to insulate and terminate dead-end electrical cables, fixtures, connectors, and other electrical components.

### Installation

Minimum shrink temperature: 125°C [257°F]

Minimum full recovery temperature: 135°C [275°F]

### Operating Temperature Range

-55°C to 110°C
[-67°F to 230°F]

### Specifications/Approvals

| Series | UL | Raychem |
|---|---|---|
| PD Caps | E85381<br>600 V, 125°C | PD Caps SCD |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | ■ | ■ | ■ |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# PD Caps (Continued)

## Product Dimensions

| Size | Length | | Inside Diameter | | Recovered Wall Thickness** Total Wall After Heating |
|---|---|---|---|---|---|
| | Nominal Overall as Supplied | Minimum Open Barrel as Supplied* | Minimum Expanded as Supplied | Maximum Recovered After Heating | |
| 1/8 | 25.4 [1.00] | 12.7 [0.50] | 3.18 [0.125] | 0.58 [0.023] | 1.22 ± 0.15 [0.048 ± 0.006] |
| 3/16 | 25.4 [1.00] | 15.2 [0.60] | 4.75 [0.187] | 1.52 [0.060] | 1.57 ± 0.20 [0.062 ± 0.008] |
| 1/4 | 28.4 [1.12] | 15.2 [0.60] | 6.35 [0.250] | 2.03 [0.080] | 1.98 ± 0.25 [0.078 ± 0.010] |
| 3/8 | 31.8 [1.25] | 18.3 [0.72] | 9.53 [0.375] | 2.29 [0.090] | 2.08 ± 0.25 [0.082 ± 0.010] |
| 1/2 | 38.1 [1.50] | 21.6 [0.85] | 12.70 [0.500] | 2.29 [0.090] | 2.54 ± 0.25 [0.100 ± 0.010] |

*See glossary for definition of “barrel.”
**Wall thickness will be less if recovery is restricted during shrinkage.

## Ordering Information

| | |
|---|---|
| Color | Standard Black (-0) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. Special order sizes are available upon request. |
| Standard packaging | In pieces. |
| Ordering description | Specify product name, size and color (for example, PD Caps 1/4-0). |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

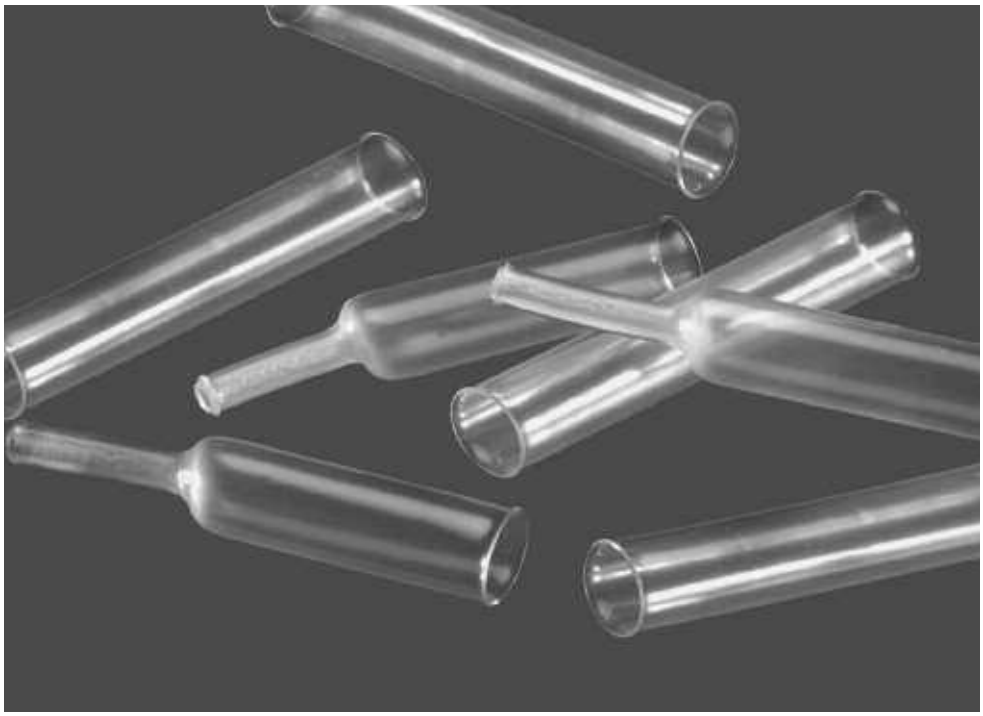
Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

# PTCM

## Very High-Shrink-Ratio, Dual Wall, Flexible Heat-Shrinkable Tubing

### Product Facts

- 6:1 shrink ratio
- Exceptional abrasion and cut through resistance
- Low shrink temperature for rapid installation
- Excellent mechanical strength
- RoHS compliant



### Applications

PTCM is a flexible, heat-shrinkable, dual wall tubing with an integrally bonded meltable adhesive liner. PTCM offers outstanding mechanical and environmental protection to wire splices and terminals and is used for moisture proof encapsulation of a wide variety of components. In particular, it adheres well to PVC. With an impressive 6:1 expansion ratio, one product can protect and insulate a wide range of applications. PTCM also offers exceptional clarity for protection of substrates that may need to be inspected during service.

### Installation

Minimum shrink temperature: 60°C [140°F]

Minimum full recovery temperature: 80°C [176°F]

### Operating Temperature Range

-40°C to 85°C
[-40°F to 185°F]

### Specifications/Approvals

| Series | Raychem |
|---|---|
| PTCM | RK-6768 |

| Available in: | Americas | Europe | Asia Pacific |
|---|---|---|---|
| | | ■ | |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666

## PTCM (Continued)

### Product Dimensions

| Size | Inside Diameter | | Recovered Wall Thickness* |
|---|---|---|---|
| | Minimum Expanded as Supplied | Maximum Recovered After Heating | After Heating |
| 9/1.5 | 9.0 [0.354] | 1.5 [0.059] | 1.60 ± 0.20 [0.062 ± 0.008] |

*Wall thickness will be less if tubing recovery is restricted during shrinkage.

### Ordering Information

| | |
|---|---|
| Color | Standard Clear (-X) |
| Size selection | Always order the largest size that will shrink snugly over the component to be covered. |
| Standard packaging | On spools. |
| Ordering description | PTCM-9/1.5-X-SP |



9-1773447-9
CIS WR 08/2011

te.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-475-6222
Mexico: 52-55-1106-0800
L. & S. America: 54-11-4733-2200

Germany: 49-6251-133-1999
China: 86-400-820-6015
Japan: 81-44-844-8013
UK: 44-800-267-666