



## An Installer's Pocket Guide For FITOK Tube Fittings

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## Ordering Information

Select a basic ordering number.

Example: -CM-FL4-NS4

Add a material designator.

Example: SS-CM-FL4-NS4

## Materials

| Material              | Bar Stock                              | Forging                                | Designator |
|-----------------------|----------------------------------------|----------------------------------------|------------|
| 316 stainless steel   | ASTM A276,<br>ASME SA479,<br>EN 1.4401 | ASTM A182,<br>ASME SA182,<br>EN 1.4401 | SS         |
| 316L stainless steel  | ASTM A479,<br>ASME SA479,<br>EN 1.4404 | ASTM A182,<br>ASME SA182,<br>EN 1.4404 | 6L         |
| 304 stainless steel   | ASTM A479,<br>ASME SA479,<br>EN 1.4301 | ASTM A182,<br>ASME SA182,<br>EN 1.4301 | S4         |
| 321 stainless steel   | ASTM A479,<br>ASME SA479,<br>EN 1.4541 | ASTM A182,<br>ASME SA182,<br>EN 1.4541 | S1         |
| 316Ti stainless steel | ASTM A479,<br>ASME SA479,<br>EN 1.4571 | ASTM A182,<br>ASME SA182,<br>EN 1.4571 | 6T         |
| 6Mo (S31254)          | ASTM A479                              | ASTM A182                              | S12        |
| 904L stainless steel  | ASTM A479                              | ASTM A182                              | 904L       |
| Titanium (grade 4)    | ASTM B348                              | ASTM B381                              | TI         |
| Duplex 2205           | ASTM A479                              | ASTM A182                              | D5         |
| Duplex 2507           | ASTM A479                              | ASTM A182                              | D7         |
| Alloy 20              | ASTM A479                              | ASTM B462                              | A20        |
| Alloy 400             | ASTM B164,<br>ASME SB164               | ASTM B564,<br>ASME SB564               | M          |
| Alloy 600             | ASTM B166,<br>ASME SB166               | ASTM B564,<br>ASME SB564               | INC        |
| Alloy 625             | ASTM B446                              | ASTM B564,<br>ASME SB564               | A65        |
| Alloy 718             | ASTM B637                              | ASTM B637                              | A78        |
| Alloy 825             | ASTM B425                              | ASTM B564                              | A85        |
| Alloy C-276           | ASTM B574                              | ASTM B564                              | HC         |
| Carbon steel          | ASTM A108                              | ASTM A105                              | CS         |
| Brass                 | ASTM B16/B453                          | ASTM B283                              | B          |
| Nylon                 | ASTM D4066                             | /                                      | PA         |
| PTFE                  | ASTM D1710                             | ASTM D3294                             | T          |

## Cautions:

- ⦿ Do not loosen or tighten fittings when the system is pressurized.
- ⦿ Make sure that the tubing rests firmly on the shoulder of the port.
- ⦿ Always leave enough straight length of the tubing for the fittings.
- ⦿ Always use an insert for extremely soft plastic tubing.
- ⦿ The allowable working pressure of the tube fitting is rated to the maximum working pressure of the corresponding tubing, which can be found in FITOK tubing data sheet. For those which can not be found in FITOK tubing data sheet, please contact the authorized representatives or FITOK Group for related information.
- ⦿ Keep the tubing end and surface clean and smooth.
- ⦿ Always use proper thread sealants on tapered pipe threads. Make sure that its working temperature does not exceed that of the sealants.
- ⦿ When assembling the tube fitting, hold the body with a wrench and turn the nut instead of holding the nut.
- ⦿ When assembling the valve with tube fitting end, hold the valve body with a wrench and turn the nut.
- ⦿ When assembling the fitting to a valve with thread, hold the valve body with a wrench and turn the body of the fitting.

# Instructions

## Tube Fitting

### Installation

#### For Tube Fittings up to 1 in.(25 mm)

1. Insert the tubing into the tube fitting. Make sure the tubing rests firmly on the shoulder of the fitting body. Finger tight the nut. (Fig. 1)



Fig. 1

#### For High-Pressure Applications and High Safety-Factor Systems:

*Further tighten the nut with a wrench until the tubing could not be turned by hand or moved axially in the fitting before Step 2 and Step 3.*

2. Mark the nut at 6 o'clock position. (Fig. 2)

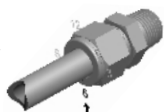


Fig. 2

3. For tube fittings below or equal to 3/16" (4mm) O.D., tighten the nut 3/4 turn to 3 o'clock position with a wrench, while holding the fitting body steady. For tube fittings above 3/16" (4mm) O.D., tighten the nut 1-1/4 turns to 9 o'clock position. (Fig.3)

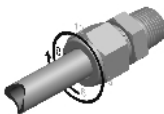


Fig. 3

#### For Tube Fittings Over 1 in.(25 mm)

1. Preset the ferrules onto the tubing using the FITOK Hydraulic Presetting Tool (HPT) by reference to the HPT Instructions.
2. Apply the lubricant packaged with the fitting lightly to the body threads and the rear surface of the back ferrule.
3. Install the presetted assembly (tubing, nut, front and back ferrules) into the fitting body finger-tight. Finally, tighten the nut 1/2 turn further with a wrench, while holding the fitting body steady.

### Gaugeability

For initial installation, the FITOK Gap Inspection Gauge helps to judge whether the fitting has been sufficiently tightened by trying to enter the FITOK Gap Inspection Gauge into the gap between the nut and body. (Fig. 4)

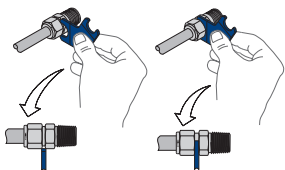


Fig. 4

- ⊙ If the gauge could not enter the gap, the fitting is sufficiently tightened.
- ⊙ If the gauge enters the gap, additional tightening is required.

### Reassembly

The FITOK tube fittings can be disassembled and reassembled for multiple times. Prior to disassembly, make sure to mark a straight line along the tubing, the nut and the fitting body to ensure the reassembled fittings are properly tightened. (Fig. 5)

1. Insert tubing with the presetted ferrules into the fitting body until the front ferrule seats.
2. While holding the fitting body steady, rotate the nut with a wrench back to the original position as indicated by the marks on the tubing and the fitting body. At this point, there shall be a significant increase in resistance. (Fig. 6)
3. Tighten the nut slightly further with a wrench so as to complete the reassembly.

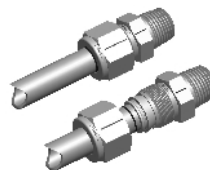


Fig. 5



Fig. 6

▲ *The FITOK Gap Inspection Gauge is not applicable to reassembled fittings.*

## Plugs and Port Connectors

### Installation

1. While holding the fitting body steady, tighten the plug and the machined ferrule end of port connector one-quarter turn from the finger-tight position. Fig. 7 & Fig. 8

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the plug and the machined ferrule end of port connector one-eighth turn.*

*For over 1 in. and over 25 mm tube fittings, tighten the plug and the machined ferrule end of port connector one-quarter turn.*

2. For the tube adapter end of port connector, assemble as per Tube Fitting Installation on page 3. Fig. 9



Fig. 7

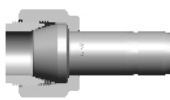


Fig. 8

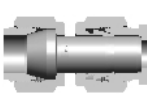


Fig. 9

Reassembly

1. Make subsequent connections by slightly tightening with a wrench after the nut is rotated snug tight by hand.  
2. For the tube adapter end of port connector, reassemble as stated in the tube fitting reassembly instructions on page 4.

Presetting Tool

1. Install the nut and ferrules onto the presetting tool.  
2. Insert tubing into the presetting tool, make sure the tubing rests firmly on the shoulder of the presetting tool, then rotate the nut finger-tight.  
3. Assemble the fitting as per Tube Fitting Installation on page 3. Fig. 10  
4. Loosen the nut and insert the tubing with preset ferrules into the fitting body. Fig. 11  
5. Reassemble as stated in the reassembly instructions. Fig. 12

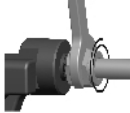


Fig. 10



Fig. 11

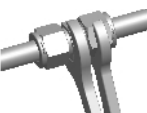


Fig. 12

Over 1 in. (25 mm) sizes require use of a Hydraulic Presetting Tool to preset the ferrules onto the tubing.

Pipe Fittings and Weld Fittings

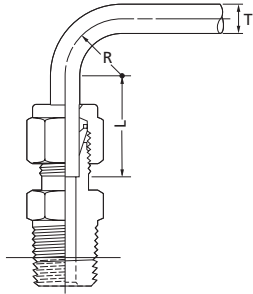
Please refer to the 6 Series Pipe Fittings catalog, FK-IC-GF-02, and 6 Series Weld Fittings catalog, FK-IC-GF-03, for the installation of thread ends and weld ends.

Tubing Installation

Tubing properly selected and handled, combined with properly installed FITOK tube fittings, will give you a leaktight system and provide reliable service in a wide variety of applications. For maximum assurance of reliable performance, use:

- Properly selected and handled high-quality tubing—such as provided by FITOK.
- FITOK tube fittings assembled in accordance with catalog instructions.
- An appropriate tube support system to limit the movement of tubing and fluid system components.

When installing fittings near tube bends, there must be a sufficient straight length of tubing to allow the tubing to be bottomed in the FITOK fitting (see tables).



T Tube O.D.  
L Required straight tube length (see tables)  
R Radius of tubing bend

| Fractional, in. |         |
|-----------------|---------|
| T<br>Tube O.D.  | L       |
| 1/16            | 1/2     |
| 1/8             | 23/32   |
| 3/16            | 3/4     |
| 1/4             | 13/16   |
| 5/16            | 7/8     |
| 3/8             | 15/16   |
| 1/2             | 1 3/16  |
| 5/8             | 1 1/4   |
| 3/4             | 1 1/4   |
| 7/8             | 1 5/16  |
| 1               | 1 1/2   |
| 1 1/4           | 2       |
| 1 1/2           | 2 13/32 |
| 2               | 3 1/4   |

| Metric, mm     |    |
|----------------|----|
| T<br>Tube O.D. | L  |
| 3              | 19 |
| 6              | 21 |
| 8              | 23 |
| 10             | 25 |
| 12             | 31 |
| 14             | 32 |
| 15             | 32 |
| 16             | 32 |
| 18             | 32 |
| 20             | 34 |
| 22             | 34 |
| 25             | 40 |
| 28             | 46 |
| 30             | 50 |
| 32             | 54 |
| 38             | 63 |
| 50             | 80 |

## Tubing Selection

Proper selection, handling, and installation of tubing, when combined with proper selection of FITOK tube fittings, are essential for reliable tubing systems. The following variables should be considered when ordering tubing for use with FITOK tube fittings:

- ⦿ Surface finish
- ⦿ Material
- ⦿ Wall thickness

### Surface Finish

Surface finish is very important for proper sealing. Tubing with any kind of depression, scratch, raised portion, or other surface defect will be difficult to seal, particularly in gas service.

### Material

Metal tubing material should be softer than fitting material. For example, stainless steel tubing should not be used with brass fittings. When tubing and fittings are made of the same material, tubing must be fully annealed.

### Wall Thickness

The accompanying tables show working pressure ratings of tubing in a wide range of wall thicknesses. Except as noted, allowable pressure ratings are calculated from S values as specified by ASME B31.3, Process Piping. FITOK tube fittings have been repeatedly tested in both the minimum and maximum wall thicknesses shown. FITOK tube fittings are not recommended for tube wall thicknesses outside the ranges shown in the accompanying tables for each size.

## Tubing Handling

It is important to properly handle the tubing in order to reduce the scratches and protect the surface finish.

- ⦿ Tubing should never be dragged out of a tubing rack or across a rough surface.
- ⦿ Tube cutters or hacksaws should be sharp. Do not take deep cuts with each turn of the cutter or stroke of the saw.
- ⦿ Removing burrs on the tube end which will be helpful for the tubing to go through the ferrules without damaging the ferrule sealing edge.

## Gas Service

Gases (air, hydrogen, helium, nitrogen, etc.) have very small molecules that can escape through even the most minute leak path. Some surface defects on the tubing can provide such a leak path. As tube outside diameter (O.D.) increases, so does the likelihood of a scratch or other surface defect interfering with proper sealing. The most successful connection for gas service will occur if all installation instructions are carefully followed and the heavier wall thicknesses of tubing on the accompanying tables are selected. A heavy-wall tube resists ferrule action more than a thin-wall tube, allowing the ferrules to coin out minor surface imperfections and grip the tube more firmly. Within the applicable suggested allowable working pressure table, select a tube wall thickness whose working pressure is outside of the shaded areas.

## Suggested Allowable Pressure Tables

Figures and tables are for reference only. No implication is made that these values can be used for design work. Applicable codes and practices in industry should be considered.

- ⦿ All pressures are calculated from formulas in ASME B31.3, Process Piping. See factors for calculating working pressures in accordance with ASME B31.1, Power Piping.
- ⦿ Calculations are based on maximum O.D. and minimum wall thickness, except as noted in individual tables.  
**Example:** 1/2 in. O.D. x 0.049 in. wall thickness stainless steel tubing according to ASTM A269:  
**O.D. Tolerance  $\pm 0.005$  in. / Wall Thickness Tolerance  $\pm 10\%$**   
 Calculations are based on 0.505 in. O.D. x 0.0441 in. wall thickness tubing.
- ⦿ No allowance is made for corrosion or erosion.

## Suggested Allowable Working Pressure for Stainless Steel Tubing

Allowable working pressures are calculated from an S value of 20 000 psig (137.8 MPa) for ASTM A269 tubing at -20 to 100°F (-28 to 37°C), as listed in ASME B31.3 and ASME B31.1.

### For Welded Tubing

For welded and drawn tubing, a derating factor must be applied for weld integrity:

- ⦿ For double-welded tubing, multiply working pressure by 0.85.
- ⦿ For single-welded tubing, multiply working pressure by 0.80.

### Suggested Ordering Information

High-quality, fully annealed (Type 304, 304/304L, 316, 316/316L, 317, 317/317L) (seamless or welded and drawn) stainless steel hydraulic tubing, ASTM A269 or A213, or equivalent. Hardness not to exceed 90 HRB or 200 HV. Tubing to be free of scratches, suitable for bending and flaring. O.D. tolerances not to exceed  $\pm 0.003$  in. for 1/16 in. O.D. tubing.

**Note:** Certain austenitic stainless tubing has an allowable ovality tolerance double the O.D. tolerance and may not fit into FITOK precision tube fittings. Dual-certified grades such as 304/304L, 316/316L, and 317/317L meet the minimum chemistry and the mechanical properties of both alloy grades.

**Table 1 — Fractional Stainless Steel Seamless Tubing**

| Tube<br>O.D.<br>(in.) | Nominal Wall Thickness, in. |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       | Working Pressure, psig |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                       | 0.010                       | 0.012 | 0.014 | 0.016 | 0.020 | 0.028 | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 | 0.134 | 0.156 | 0.188 |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                       | 5600                        | 6800  | 8100  | 9400  | 12000 |       |       |       |       |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/16                  |                             |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/8                   |                             |       |       |       |       | 8500  | 10900 |       |       |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/16                  |                             |       |       |       |       | 5400  | 7000  | 10200 |       |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/4                   |                             |       |       |       |       | 4000  | 5100  | 7500  | 10200 |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/16                  |                             |       |       |       |       |       | 4000  | 5800  | 8000  |       |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/8                   |                             |       |       |       |       |       | 3300  | 4800  | 6500  | 7500  |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1/2                   |                             |       |       |       |       |       | 2600  | 3700  | 5100  | 6700  |       |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5/8                   |                             |       |       |       |       |       |       | 2900  | 4000  | 5200  | 6000  |       |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3/4                   |                             |       |       |       |       |       |       | 2400  | 3300  | 4200  | 4900  | 5800  |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7/8                   |                             |       |       |       |       |       |       | 2000  | 2800  | 3600  | 4200  | 4800  |       |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1                     |                             |       |       |       |       |       |       |       | 2400  | 3100  | 3600  | 4200  | 4700  |       |       |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/4                 |                             |       |       |       |       |       |       |       |       | 2400  | 2800  | 3300  | 3600  | 4100  | 4900  |       |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 1/2                 |                             |       |       |       |       |       |       |       |       |       | 2300  | 2700  | 3000  | 3400  | 4000  | 4900  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                     |                             |       |       |       |       |       |       |       |       |       |       | 2000  | 2200  | 2500  | 2900  | 3600  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Note:** For gas service, select a tube thickness outside of the shaded area.

Table 2 — Metric Stainless Steel Seamless Tubing

| Tube<br>O.D.<br>(mm) | Nominal Wall Thickness, mm |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|----------------------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|                      | 0.8                        | 1.0 | 1.2 | 1.5 | 1.8 | 2.0 | 2.2 | 2.5 | 2.8 | 3.0 | 3.5 | 4.0 | 4.5 | 4.5 |  |
|                      | Working Pressure, bar      |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| 3                    | 670                        |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
| 6                    | 310                        | 420 | 540 | 710 |     |     |     |     |     |     |     |     |     |     |  |
| 8                    |                            | 310 | 390 | 520 |     |     |     |     |     |     |     |     |     |     |  |
| 10                   |                            | 240 | 300 | 400 | 510 | 580 |     |     |     |     |     |     |     |     |  |
| 12                   |                            | 200 | 250 | 330 | 410 | 470 |     |     |     |     |     |     |     |     |  |
| 14                   |                            | 160 | 200 | 270 | 340 | 380 | 430 | 490 |     |     |     |     |     |     |  |
| 15                   |                            | 150 | 190 | 250 | 310 | 360 | 400 | 450 |     |     |     |     |     |     |  |
| 16                   |                            |     | 170 | 230 | 290 | 330 | 370 | 400 |     |     |     |     |     |     |  |
| 18                   |                            |     | 150 | 200 | 260 | 290 | 320 | 370 |     |     |     |     |     |     |  |
| 20                   |                            |     | 140 | 180 | 230 | 260 | 290 | 330 | 380 |     |     |     |     |     |  |
| 22                   |                            |     | 140 | 160 | 200 | 230 | 260 | 300 | 340 |     |     |     |     |     |  |
| 25                   |                            |     |     |     | 180 | 200 | 230 | 260 | 290 | 320 |     |     |     |     |  |
| 28                   |                            |     |     |     |     | 180 | 200 | 230 | 260 | 280 | 330 |     |     |     |  |
| 30                   |                            |     |     |     |     | 170 | 180 | 210 | 240 | 260 | 310 |     |     |     |  |
| 32                   |                            |     |     |     |     | 160 | 170 | 200 | 220 | 240 | 290 | 330 |     |     |  |
| 38                   |                            |     |     |     |     |     | 140 | 160 | 190 | 200 | 240 | 270 | 310 |     |  |
| 50                   |                            |     |     |     |     |     |     |     |     | 150 | 180 | 210 | 240 | 270 |  |

Note: For gas service, select a tube thickness outside of the shaded area.

Suggested Allowable Working Pressure for Carbon Steel Tubing

Table 3 — Fractional Carbon Steel Tubing

Allowable working pressures are calculated from an S value of 15 700 psi (108.2 MPa) for ASTM A179 tubing at -20°F to 100°F (-28°C to 37°C), as listed in ASME B31.3. For working pressure in accordance with ASME B31.1, multiply by 0.85.

Suggested Ordering Information

High-quality, soft annealed seamless carbon steel hydraulic tubing, ASTM A179 or equivalent. Hardness not to exceed 72 HRB or 130 HV. Tubing to be free of scratches, suitable for bending and flaring.

| Tube<br>O.D.<br>(in.) | Tube Wall Thickness, in. |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
|-----------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                       | 0.028                    | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 | 0.134 | 0.148 | 0.165 | 0.180 | 0.220 | 0.220 |  |
|                       | Working Pressure, psig   |       |       |       |       |       |       |       |       |       |       |       |       |       |  |
| 1/8                   | 8000                     | 10200 |       |       |       |       |       |       |       |       |       |       |       |       |  |
| 3/16                  | 5100                     | 6600  | 9600  |       |       |       |       |       |       |       |       |       |       |       |  |
| 1/4                   | 3700                     | 4800  | 7000  | 9600  |       |       |       |       |       |       |       |       |       |       |  |
| 5/16                  |                          | 3700  | 5500  | 7500  |       |       |       |       |       |       |       |       |       |       |  |
| 3/8                   |                          | 3100  | 4500  | 6200  |       |       |       |       |       |       |       |       |       |       |  |
| 1/2                   |                          | 2300  | 3200  | 4500  | 5900  |       |       |       |       |       |       |       |       |       |  |
| 5/8                   |                          | 1800  | 2600  | 3500  | 4600  | 5300  |       |       |       |       |       |       |       |       |  |
| 3/4                   |                          |       | 2100  | 2900  | 3700  | 4300  | 5100  |       |       |       |       |       |       |       |  |
| 7/8                   |                          |       | 1800  | 2400  | 3200  | 3700  | 4300  |       |       |       |       |       |       |       |  |
| 1                     |                          |       | 1500  | 2100  | 2700  | 3200  | 3700  | 4100  |       |       |       |       |       |       |  |
| 1 1/4                 |                          |       |       | 1600  | 2100  | 2500  | 2900  | 3200  | 3600  | 4000  | 4600  | 5000  |       |       |  |
| 1 1/2                 |                          |       |       |       | 1800  | 2000  | 2400  | 2600  | 2900  | 3300  | 3700  | 4100  | 5100  |       |  |

Note: For gas service, select a tube thickness outside of the shaded area.

Table 4 — Metric Carbon Steel Tubing

Allowable working pressures are based on equations from ASME B31.3 for DIN 2391 tubing, using a stress value of 113 MPa (16 300 psi) and tensile strength of 340 MPa (49 300 psi).

Suggested Ordering Information

High-quality, soft annealed carbon steel tubing, DIN 2391 or equivalent. Hardness not to exceed 72 HRB or 130 HV. Tubing to be free of scratches, suitable for bending and flaring.

| Tube<br>O.D.<br>(mm) | Tube Wall Thickness, mm |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
|----------------------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|
|                      | Working Pressure, bar   |     |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
|                      | 0.8                     | 1.0 | 1.2 | 1.5 | 1.8 | 2.0 | 2.2 | 2.5 | 2.8 | 3.0 | 3.5 | 4.0 | 4.5 |  |  |  |
| 3                    | 630                     | 790 |     |     |     |     |     |     |     |     |     |     |     |  |  |  |
| 6                    | 290                     | 370 | 460 | 590 |     |     |     |     |     |     |     |     |     |  |  |  |
| 8                    |                         | 270 | 330 | 430 |     |     |     |     |     |     |     |     |     |  |  |  |
| 10                   |                         | 210 | 260 | 330 |     |     |     |     |     |     |     |     |     |  |  |  |
| 12                   |                         | 170 | 210 | 270 | 330 | 380 | 420 |     |     |     |     |     |     |  |  |  |
| 14                   |                         | 150 | 180 | 230 | 280 | 320 | 350 |     |     |     |     |     |     |  |  |  |
| 15                   |                         | 140 | 170 | 210 | 260 | 290 | 330 |     |     |     |     |     |     |  |  |  |
| 16                   |                         | 130 | 150 | 200 | 240 | 270 | 300 | 350 |     |     |     |     |     |  |  |  |
| 18                   |                         |     | 140 | 170 | 210 | 240 | 270 | 310 |     |     |     |     |     |  |  |  |
| 20                   |                         |     | 120 | 160 | 190 | 210 | 240 | 270 | 310 |     |     |     |     |  |  |  |
| 22                   |                         |     | 110 | 140 | 170 | 190 | 210 | 240 | 280 |     |     |     |     |  |  |  |
| 25                   |                         |     | 100 | 120 | 150 | 170 | 180 | 210 | 240 | 260 |     |     |     |  |  |  |
| 28                   |                         |     |     |     |     | 150 | 160 | 190 | 210 | 230 | 270 |     |     |  |  |  |
| 30                   |                         |     |     |     |     | 140 | 150 | 170 | 200 | 210 | 250 |     |     |  |  |  |
| 32                   |                         |     |     |     |     | 130 | 140 | 160 | 180 | 200 | 230 | 270 |     |  |  |  |
| 38                   |                         |     |     |     |     |     | 120 | 130 | 150 | 160 | 190 | 230 | 260 |  |  |  |

Note: For gas service, select a tube thickness outside of the shaded area.

Suggested Allowable Working Pressure for Copper Tubing

Allowable working pressures are calculated from an S value of 6000 psi (41.3 MPa) for ASTM B75 (B75M) and ASTM B88 (B88M) tubing at -20°F to 100°F (-28°C to 37°C), as listed in ASME B31.3 and ASME B31.1.

Suggested Ordering Information

High-quality, soft annealed seamless copper tubing, ASTM B75 (B75M) or equivalent. Also soft annealed (Temper O) copper water tube, type K or type L to ASTM B88 (type A or type B to ASTM B88M).

Table 5 — Fractional Copper Tubing

| Tube<br>O.D.<br>(in.) | Tube Wall Thickness, in. |       |       |       |       |       |       |       |       |       |  |  |
|-----------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|
|                       | Working Pressure, psig   |       |       |       |       |       |       |       |       |       |  |  |
|                       | 0.028                    | 0.030 | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 | 0.134 |  |  |
| 1/8                   | 2700                     | 3000  | 3600  |       |       |       |       |       |       |       |  |  |
| 3/16                  | 1800                     | 1900  | 2300  | 3400  |       |       |       |       |       |       |  |  |
| 1/4                   | 1300                     | 1400  | 1600  | 2500  | 3500  |       |       |       |       |       |  |  |
| 5/16                  |                          |       | 1300  | 1900  | 2700  |       |       |       |       |       |  |  |
| 3/8                   |                          |       | 1000  | 1600  | 2200  |       |       |       |       |       |  |  |
| 1/2                   |                          |       | 800   | 1100  | 1600  | 2100  |       |       |       |       |  |  |
| 5/8                   |                          |       |       | 900   | 1200  | 1600  | 1900  |       |       |       |  |  |
| 3/4                   |                          |       |       | 700   | 1000  | 1300  | 1500  | 1800  |       |       |  |  |
| 7/8                   |                          |       |       | 600   | 800   | 1100  | 1300  | 1500  |       |       |  |  |
| 1                     |                          |       |       | 500   | 700   | 900   | 1100  | 1300  | 1500  |       |  |  |
| 1 1/8                 |                          |       |       |       | 600   | 800   | 1000  | 1100  | 1300  | 1400  |  |  |

Note: For gas service, select a tube thickness outside of the shaded area.

Table 6 — Metric Copper Tubing

| Tube<br>O.D.<br>(mm) | Tube Wall Thickness, mm |     |     |     |     |     |     |     |     |     |
|----------------------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                      | 0.8                     | 1.0 | 1.2 | 1.5 | 1.8 | 2.0 | 2.2 | 2.5 | 2.8 | 3.0 |
|                      | Working Pressure, bar   |     |     |     |     |     |     |     |     |     |
| 6                    | 110                     | 140 | 170 | 220 |     |     |     |     |     |     |
| 8                    |                         | 100 | 120 | 160 |     |     |     |     |     |     |
| 10                   |                         |     | 80  | 100 | 130 |     |     |     |     |     |
| 12                   |                         |     | 60  | 80  | 100 | 130 | 140 |     |     |     |
| 14                   |                         |     |     | 50  | 60  | 90  | 110 | 120 | 130 |     |
| 15                   |                         |     |     |     | 60  | 80  | 100 | 110 | 120 |     |
| 16                   |                         |     |     |     |     | 70  | 90  | 100 | 110 | 120 |
| 18                   |                         |     |     |     |     |     | 60  | 80  | 90  | 100 |
| 20                   |                         |     |     |     |     |     |     | 60  | 70  | 80  |
| 22                   |                         |     |     |     |     |     |     |     | 50  | 60  |
| 25                   |                         |     |     |     |     |     |     |     |     | 40  |
| 28                   |                         |     |     |     |     |     |     |     |     |     |

Note: For gas service, select a tube thickness outside of the shaded area.

Basic Ordering Number  
Fractional Stainless Steel Seamless Tubing

| Tube<br>O.D.<br>(in.) | Wall<br>Thickness<br>(in.) | Basic Ordering Number |                | Weight<br>lb/ft |
|-----------------------|----------------------------|-----------------------|----------------|-----------------|
|                       |                            | 316/316L              | 304/304L       |                 |
| 1/4                   | 0.035                      | SS-TMP-4-035-         | S4-TMP-4-035-  | 0.082           |
|                       | 0.049                      | SS-TMP-4-049-         | S4-TMP-4-049-  | 0.107           |
| 3/8                   | 0.049                      | SS-TMP-6-049-         | S4-TMP-6-049-  | 0.173           |
|                       | 0.065                      | SS-TMP-6-065-         | S4-TMP-6-065-  | 0.219           |
| 1/2                   | 0.049                      | SS-TMP-8-049-         | S4-TMP-8-049-  | 0.240           |
|                       | 0.065                      | SS-TMP-8-065-         | S4-TMP-8-065-  | 0.307           |
| 3/4                   | 0.065                      | SS-TMP-12-065-        | S4-TMP-12-065- | 0.484           |
| 1                     | 0.083                      | SS-TMP-16-083-        | S4-TMP-16-083- | 0.827           |
| 1 1/2                 | 0.134                      | SS-TMP-24-134-        | S4-TMP-24-134- | 1.989           |

Metric Stainless Steel Seamless Tubing

| Tube<br>O.D.<br>(mm) | Wall<br>Thickness<br>(mm) | Basic Ordering Number |                 | Weight<br>Kg/m |
|----------------------|---------------------------|-----------------------|-----------------|----------------|
|                      |                           | 316/316L              | 304/304L        |                |
| 6                    | 1.0                       | SS-TMP-6M-1.0-        | S4-TMP-6M-1.0-  | 0.125          |
| 8                    | 1.0                       | SS-TMP-8M-1.0-        | S4-TMP-8M-1.0-  | 0.175          |
| 10                   | 1.0                       | SS-TMP-10M-1.0-       | S4-TMP-10M-1.0- | 0.226          |
|                      | 1.5                       | SS-TMP-10M-1.5-       | S4-TMP-10M-1.5- | 0.320          |
| 12                   | 1.5                       | SS-TMP-12M-1.5-       | S4-TMP-12M-1.5- | 0.395          |
|                      | 2.0                       | SS-TMP-12M-2.0-       | S4-TMP-12M-2.0- | 0.501          |
| 14                   | 1.5                       | SS-TMP-14M-1.5-       | S4-TMP-14M-1.5- | 0.470          |
|                      | 2.0                       | SS-TMP-14M-2.0-       | S4-TMP-14M-2.0- | 0.602          |
| 16                   | 1.5                       | SS-TMP-16M-1.5-       | S4-TMP-16M-1.5- | 0.545          |
|                      | 2.0                       | SS-TMP-16M-2.0-       | S4-TMP-16M-2.0- | 0.702          |
| 18                   | 1.5                       | SS-TMP-18M-1.5-       | S4-TMP-18M-1.5- | 0.620          |
|                      | 2.0                       | SS-TMP-18M-2.0-       | S4-TMP-18M-2.0- | 0.802          |
| 20                   | 2.0                       | SS-TMP-20M-2.0-       | S4-TMP-20M-2.0- | 0.903          |
| 25                   | 2.5                       | SS-TMP-25M-2.5-       | S4-TMP-25M-2.5- | 1.410          |
| 28                   | 2.5                       | SS-TMP-28M-2.5-       | S4-TMP-28M-2.5- | 1.769          |
| 30                   | 3.0                       | SS-TMP-30M-3.0-       | S4-TMP-30M-3.0- | 2.031          |
| 32                   | 3.5                       | SS-TMP-32M-3.5-       | S4-TMP-32M-3.5- | 2.501          |
| 38                   | 4.0                       | SS-TMP-38M-4.0-       | S4-TMP-38M-4.0- | 3.410          |

Weight unit conversion: 1 lb/ft=1.488 Kg/m 1 Kg/m=0.672 lb/ft

Male Connectors



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -CM-FL1-NS1           |
| 1/16            | 1/8      | -CM-FL1-NS2           |
| 1/16            | 1/4      | -CM-FL1-NS4           |
| 1/8             | 1/16     | -CM-FL2-NS1           |
| 1/8             | 1/8      | -CM-FL2-NS2           |
| 1/8             | 1/4      | -CM-FL2-NS4           |
| 1/8             | 3/8      | -CM-FL2-NS6           |
| 1/8             | 1/2      | -CM-FL2-NS8           |
| 3/16            | 1/16     | -CM-FL3-NS1           |
| 3/16            | 1/8      | -CM-FL3-NS2           |
| 3/16            | 1/4      | -CM-FL3-NS4           |
| 1/4             | 1/16     | -CM-FL4-NS1           |
| 1/4             | 1/8      | -CM-FL4-NS2           |
| 1/4             | 1/4      | -CM-FL4-NS4           |
| 1/4             | 3/8      | -CM-FL4-NS6           |
| 1/4             | 1/2      | -CM-FL4-NS8           |
| 1/4             | 3/4      | -CM-FL4-NS12          |
| 5/16            | 1/8      | -CM-FL5-NS2           |
| 5/16            | 1/4      | -CM-FL5-NS4           |
| 5/16            | 3/8      | -CM-FL5-NS6           |
| 5/16            | 1/2      | -CM-FL5-NS8           |
| 3/8             | 1/8      | -CM-FL6-NS2           |
| 3/8             | 1/4      | -CM-FL6-NS4           |
| 3/8             | 3/8      | -CM-FL6-NS6           |
| 3/8             | 1/2      | -CM-FL6-NS8           |

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 3/8             | 3/4      | -CM-FL6-NS12          |
| 3/8             | 1        | -CM-FL6-NS16          |
| 1/2             | 1/8      | -CM-FL8-NS2           |
| 1/2             | 1/4      | -CM-FL8-NS4           |
| 1/2             | 3/8      | -CM-FL8-NS6           |
| 1/2             | 1/2      | -CM-FL8-NS8           |
| 1/2             | 3/4      | -CM-FL8-NS12          |
| 1/2             | 1        | -CM-FL8-NS16          |
| 5/8             | 1/4      | -CM-FL10-NS4          |
| 5/8             | 3/8      | -CM-FL10-NS6          |
| 5/8             | 1/2      | -CM-FL10-NS8          |
| 5/8             | 3/4      | -CM-FL10-NS12         |
| 3/4             | 3/8      | -CM-FL12-NS6          |
| 3/4             | 1/2      | -CM-FL12-NS8          |
| 3/4             | 3/4      | -CM-FL12-NS12         |
| 3/4             | 1        | -CM-FL12-NS16         |
| 7/8             | 1/2      | -CM-FL14-NS8          |
| 7/8             | 3/4      | -CM-FL14-NS12         |
| 7/8             | 1        | -CM-FL14-NS16         |
| 1               | 1/2      | -CM-FL16-NS8          |
| 1               | 3/4      | -CM-FL16-NS12         |
| 1               | 1        | -CM-FL16-NS16         |
| 1 1/8           | 1        | -CM-FL18-NS16         |
| 1 1/4           | 1        | -CM-FL20-NS16         |
| 1 1/4           | 1 1/4    | -CM-FL20-NS20         |
| 1 1/2           | 1 1/2    | -CM-FL24-NS24         |

## Male Connectors



| Fractional Tube |                         | ISO Tapered Thread (RT) |
|-----------------|-------------------------|-------------------------|
| Tube O.D. (in.) | ISO Tapered Thread Size | Basic Ordering Number   |
| 1/8             | 1/8                     | -CM-FL2-RT2             |
| 1/8             | 1/4                     | -CM-FL2-RT4             |
| 1/4             | 1/8                     | -CM-FL4-RT2             |
| 1/4             | 1/4                     | -CM-FL4-RT4             |
| 1/4             | 3/8                     | -CM-FL4-RT6             |
| 1/4             | 1/2                     | -CM-FL4-RT8             |
| 5/16            | 1/8                     | -CM-FL5-RT2             |
| 5/16            | 1/4                     | -CM-FL5-RT4             |
| 3/8             | 1/8                     | -CM-FL6-RT2             |
| 3/8             | 1/4                     | -CM-FL6-RT4             |
| 3/8             | 3/8                     | -CM-FL6-RT6             |
| 3/8             | 1/2                     | -CM-FL6-RT8             |
| 3/8             | 3/4                     | -CM-FL6-RT12            |
| 1/2             | 1/4                     | -CM-FL8-RT4             |
| 1/2             | 3/8                     | -CM-FL8-RT6             |
| 1/2             | 1/2                     | -CM-FL8-RT8             |
| 1/2             | 3/4                     | -CM-FL8-RT12            |
| 5/8             | 1/2                     | -CM-FL10-RT8            |
| 3/4             | 3/4                     | -CM-FL12-RT12           |
| 3/4             | 1                       | -CM-FL12-RT16           |
| 1               | 3/4                     | -CM-FL16-RT12           |
| 1               | 1                       | -CM-FL16-RT16           |

## Male Connectors



| Fractional Tube |                          | ISO Parallel Thread (RS) |
|-----------------|--------------------------|--------------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |
| 1/8             | 1/8                      | -CM-FL2-RS2              |
| 1/8             | 1/4                      | -CM-FL2-RS4              |
| 1/8             | 3/8                      | -CM-FL2-RS6              |
| 1/4             | 1/8                      | -CM-FL4-RS2              |
| 1/4             | 1/4                      | -CM-FL4-RS4              |
| 1/4             | 3/8                      | -CM-FL4-RS6              |
| 1/4             | 1/2                      | -CM-FL4-RS8              |
| 3/8             | 1/8                      | -CM-FL6-RS2              |
| 3/8             | 1/4                      | -CM-FL6-RS4              |
| 3/8             | 3/8                      | -CM-FL6-RS6              |
| 3/8             | 1/2                      | -CM-FL6-RS8              |
| 1/2             | 1/4                      | -CM-FL8-RS4              |
| 1/2             | 3/8                      | -CM-FL8-RS6              |
| 1/2             | 1/2                      | -CM-FL8-RS8              |
| 3/4             | 1/2                      | -CM-FL12-RS8             |
| 3/4             | 3/4                      | -CM-FL12-RS12            |
| 1               | 1/2                      | -CM-FL16-RS8             |
| 1               | 3/4                      | -CM-FL16-RS12            |
| 1               | 1                        | -CM-FL16-RS16            |

## Male Connectors



| Fractional Tube |                          | ISO Parallel Thread (RP) |
|-----------------|--------------------------|--------------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |
| 1/8             | 1/8                      | -CM-FL2-RP2              |
| 1/8             | 1/4                      | -CM-FL2-RP4              |
| 1/4             | 1/8                      | -CM-FL4-RP2              |
| 1/4             | 1/4                      | -CM-FL4-RP4              |
| 1/2             | 3/8                      | -CM-FL8-RP6              |
| 1/2             | 1/2                      | -CM-FL8-RP8              |
| 3/4             | 1/2                      | -CM-FL12-RP8             |
| 3/4             | 3/4                      | -CM-FL12-RP12            |
| 1               | 1                        | -CM-FL16-RP16            |

## Male Connectors



| Fractional Tube |                          | ISO Parallel Thread (BP) |
|-----------------|--------------------------|--------------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |
| 1/4             | 3/8                      | -CM-FL4-BP6              |
| 3/8             | 3/8                      | -CM-FL6-BP6              |

## Male Connectors



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

| Fractional Tube |                    | SAE/MS Straight Thread |
|-----------------|--------------------|------------------------|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number  |
| 1/16            | 5/16-24            | -CM-FL1-ST5            |
| 1/8             | 5/16-24            | -CM-FL2-ST5            |
| 1/8             | 7/16-20            | -CM-FL2-ST7            |
| 1/8             | 9/16-18            | -CM-FL2-ST9            |
| 3/16            | 3/8-24             | -CM-FL3-ST6            |
| 1/4             | 5/16-24            | -CM-FL4-ST5            |
| 1/4             | 7/16-20            | -CM-FL4-ST7            |
| 1/4             | 9/16-18            | -CM-FL4-ST9            |
| 1/4             | 3/4-16             | -CM-FL4-ST12           |
| 1/4             | 7/8-14             | -CM-FL4-ST14           |
| 5/16            | 1/2-20             | -CM-FL5-ST8            |
| 3/8             | 7/16-20            | -CM-FL6-ST7            |
| 3/8             | 9/16-18            | -CM-FL6-ST9            |
| 3/8             | 3/4-16             | -CM-FL6-ST12           |
| 3/8             | 7/8-14             | -CM-FL6-ST14           |
| 1/2             | 9/16-18            | -CM-FL8-ST9            |
| 1/2             | 3/4-16             | -CM-FL8-ST12           |
| 1/2             | 7/8-14             | -CM-FL8-ST14           |
| 1/2             | 1 1/16-12          | -CM-FL8-ST17           |
| 5/8             | 3/4-16             | -CM-FL10-ST12          |
| 5/8             | 7/8-14             | -CM-FL10-ST14          |
| 3/4             | 3/4-16             | -CM-FL12-ST12          |
| 3/4             | 1 1/16-12          | -CM-FL12-ST17          |
| 3/4             | 1 5/16-12          | -CM-FL12-ST21          |
| 7/8             | 1 3/16-12          | -CM-FL14-ST19          |
| 1               | 1 1/16-12          | -CM-FL16-ST17          |
| 1               | 1 5/16-12          | -CM-FL16-ST21          |
| 1 1/4           | 1 5/8-12           | -CM-FL20-ST26          |
| 1 1/2           | 1 7/8-12           | -CM-FL24-ST30          |

Male Connectors



| Fractional Tube |                    | 37° Flare (AN)        |
|-----------------|--------------------|-----------------------|
| Tube O.D. (in.) | AN Tube Flare Size | Basic Ordering Number |
| 1/16            | 1/8                | -CM-FL1-AN2           |
| 1/8             | 1/8                | -CM-FL2-AN2           |
| 1/8             | 1/4                | -CM-FL2-AN4           |
| 3/16            | 3/16               | -CM-FL3-AN3           |
| 1/4             | 1/4                | -CM-FL4-AN4           |
| 5/16            | 5/16               | -CM-FL5-AN5           |
| 3/8             | 1/4                | -CM-FL6-AN4           |
| 3/8             | 3/8                | -CM-FL6-AN6           |
| 1/2             | 1/2                | -CM-FL8-AN8           |
| 5/8             | 5/8                | -CM-FL10-AN10         |
| 3/4             | 3/4                | -CM-FL12-AN12         |
| 1               | 1                  | -CM-FL16-AN16         |

Male Connectors



| Fractional Tube |                    | O-Seal with SAE/MS Straight Thread |
|-----------------|--------------------|------------------------------------|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number              |
| 1/16            | 5/16-24            | -CM-FL1-OST5                       |
| 1/8             | 5/16-24            | -CM-FL2-OST5                       |
| 3/16            | 3/8-24             | -CM-FL3-OST6                       |
| 1/4             | 7/16-20            | -CM-FL4-OST7                       |
| 5/16            | 1/2-20             | -CM-FL5-OST8                       |
| 3/8             | 9/16-18            | -CM-FL6-OST9                       |
| 1/2             | 3/4-16             | -CM-FL8-OST12                      |
| 3/4             | 1 1/16-12          | -CM-FL12-OST17                     |
| 1               | 1 5/16-12          | -CM-FL16-OST21                     |

Male Connectors



| Fractional Tube |          | O-Seal with NPT Thread |
|-----------------|----------|------------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number  |
| 1/8             | 1/8      | -CM-FL2-ONS2           |
| 1/4             | 1/8      | -CM-FL4-ONS2           |
| 1/4             | 1/4      | -CM-FL4-ONS4           |
| 3/8             | 1/4      | -CM-FL6-ONS4           |
| 3/8             | 3/8      | -CM-FL6-ONS6           |
| 3/8             | 1/2      | -CM-FL6-ONS8           |
| 1/2             | 1/2      | -CM-FL8-ONS8           |

Male Connectors



| Fractional Tube |                    | Metric Thread (MRS)   |  |
|-----------------|--------------------|-----------------------|--|
| Tube O.D. (in.) | Metric Thread Size | Basic Ordering Number |  |
| 1/8             | M14 x 1.5          | -CM-FL2-MRS14         |  |
| 1/8             | M16 x 1.5          | -CM-FL2-MRS16         |  |
| 1/8             | M18 x 1.5          | -CM-FL2-MRS18         |  |
| 1/8             | M20 x 1.5          | -CM-FL2-MRS20         |  |
| 1/4             | M14 x 1.5          | -CM-FL4-MRS14         |  |
| 1/4             | M16 x 1.5          | -CM-FL4-MRS16         |  |
| 1/4             | M18 x 1.5          | -CM-FL4-MRS18         |  |
| 1/4             | M20 x 1.5          | -CM-FL4-MRS20         |  |
| 3/8             | M14 x 1.5          | -CM-FL6-MRS14         |  |
| 3/8             | M16 x 1.5          | -CM-FL6-MRS16         |  |
| 3/8             | M18 x 1.5          | -CM-FL6-MRS18         |  |
| 3/8             | M20 x 1.5          | -CM-FL6-MRS20         |  |
| 1/2             | M16 x 1.5          | -CM-FL8-MRS16         |  |
| 1/2             | M18 x 1.5          | -CM-FL8-MRS18         |  |
| 1/2             | M20 x 1.5          | -CM-FL8-MRS20         |  |
| 1/2             | M22 x 1.5          | -CM-FL8-MRS22         |  |

Male Connectors



Adapt to straight thread boss of ISO 6149-1.

| Fractional Tube |                    | Metric Thread (MST)   |  |
|-----------------|--------------------|-----------------------|--|
| Tube O.D. (in.) | Metric Thread Size | Basic Ordering Number |  |
| 1/4             | M14X1.5            | -CM-FL4-MST14         |  |
| 3/8             | M14X1.5            | -CM-FL6-MST14         |  |
| 3/8             | M20X1.5            | -CM-FL6-MST20         |  |
| 1/2             | M14X1.5            | -CM-FL8-MST14         |  |
| 1/2             | M20X1.5            | -CM-FL8-MST20         |  |

## Male Connectors



| Fractional Tube |                    | Metric Thread (MS)    |  |
|-----------------|--------------------|-----------------------|--|
| Tube O.D. (in.) | Metric Thread Size | Basic Ordering Number |  |
| 1/16            | M5 x 0.8           | -CM-FL1-MS5           |  |
| 1/8             | M14 x 1.5          | -CM-FL2-MS14          |  |
| 1/8             | M16 x 1.5          | -CM-FL2-MS16          |  |
| 1/8             | M18 x 1.5          | -CM-FL2-MS18          |  |
| 1/8             | M20 x 1.5          | -CM-FL2-MS20          |  |
| 1/4             | M14 x 1.5          | -CM-FL4-MS14          |  |
| 1/4             | M16 x 1.5          | -CM-FL4-MS16          |  |
| 1/4             | M18 x 1.5          | -CM-FL4-MS18          |  |
| 1/4             | M20 x 1.5          | -CM-FL4-MS20          |  |
| 3/8             | M10 x 1.0          | -CM-FL6-MS10          |  |
| 3/8             | M14 x 1.5          | -CM-FL6-MS14          |  |
| 3/8             | M16 x 1.5          | -CM-FL6-MS16          |  |
| 3/8             | M18 x 1.5          | -CM-FL6-MS18          |  |
| 3/8             | M20 x 1.5          | -CM-FL6-MS20          |  |
| 1/2             | M16 x 1.5          | -CM-FL8-MS16          |  |
| 1/2             | M18 x 1.5          | -CM-FL8-MS18          |  |
| 1/2             | M20 x 1.5          | -CM-FL8-MS20          |  |
| 1/2             | M22 x 1.5          | -CM-FL8-MS22          |  |

## Male Connectors



| Metric Tube    |          | NPT Thread            |  |
|----------------|----------|-----------------------|--|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |  |
| 2              | 1/8      | -CM-ML2-NS2           |  |
| 3              | 1/8      | -CM-ML3-NS2           |  |
| 3              | 1/4      | -CM-ML3-NS4           |  |
| 4              | 1/8      | -CM-ML4-NS2           |  |
| 4              | 1/4      | -CM-ML4-NS4           |  |
| 6              | 1/8      | -CM-ML6-NS2           |  |
| 6              | 1/4      | -CM-ML6-NS4           |  |
| 6              | 3/8      | -CM-ML6-NS6           |  |
| 6              | 1/2      | -CM-ML6-NS8           |  |
| 8              | 1/8      | -CM-ML8-NS2           |  |
| 8              | 1/4      | -CM-ML8-NS4           |  |
| 8              | 3/8      | -CM-ML8-NS6           |  |
| 8              | 1/2      | -CM-ML8-NS8           |  |
| 10             | 1/8      | -CM-ML10-NS2          |  |
| 10             | 1/4      | -CM-ML10-NS4          |  |
| 10             | 3/8      | -CM-ML10-NS6          |  |
| 10             | 1/2      | -CM-ML10-NS8          |  |
| 10             | 3/4      | -CM-ML10-NS12         |  |
| 10             | 1        | -CM-ML10-NS16         |  |
| 12             | 1/8      | -CM-ML12-NS2          |  |
| 12             | 1/4      | -CM-ML12-NS4          |  |
| 12             | 3/8      | -CM-ML12-NS6          |  |
| 12             | 1/2      | -CM-ML12-NS8          |  |
| 12             | 3/4      | -CM-ML12-NS12         |  |

## Male Connectors



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 14             | 1/8      | -CM-ML14-NS2          |
| 14             | 1/4      | -CM-ML14-NS4          |
| 14             | 3/8      | -CM-ML14-NS6          |
| 14             | 1/2      | -CM-ML14-NS8          |
| 14             | 3/4      | -CM-ML14-NS12         |
| 15             | 1/2      | -CM-ML15-NS8          |
| 15             | 3/4      | -CM-ML15-NS12         |
| 15             | 1        | -CM-ML15-NS16         |
| 16             | 1/4      | -CM-ML16-NS4          |
| 16             | 3/8      | -CM-ML16-NS6          |
| 16             | 1/2      | -CM-ML16-NS8          |
| 16             | 3/4      | -CM-ML16-NS12         |
| 18             | 3/8      | -CM-ML18-NS6          |
| 18             | 1/2      | -CM-ML18-NS8          |
| 18             | 3/4      | -CM-ML18-NS12         |
| 20             | 1/2      | -CM-ML20-NS8          |
| 20             | 3/4      | -CM-ML20-NS12         |
| 20             | 1        | -CM-ML20-NS16         |
| 22             | 1/2      | -CM-ML22-NS8          |
| 22             | 3/4      | -CM-ML22-NS12         |
| 22             | 1        | -CM-ML22-NS16         |
| 25             | 1/2      | -CM-ML25-NS8          |
| 25             | 3/4      | -CM-ML25-NS12         |
| 25             | 1        | -CM-ML25-NS16         |
| 28             | 1        | -CM-ML28-NS16         |
| 28             | 1 1/4    | -CM-ML28-NS20         |
| 30             | 1 1/4    | -CM-ML30-NS20         |
| 32             | 1 1/4    | -CM-ML32-NS20         |
| 38             | 1 1/2    | -CM-ML38-NS24         |

| Metric Tube    |                         | ISO Tapered Thread (RT) |
|----------------|-------------------------|-------------------------|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |
| 2              | 1/8                     | -CM-ML2-RT2             |
| 3              | 1/8                     | -CM-ML3-RT2             |
| 3              | 1/4                     | -CM-ML3-RT4             |
| 4              | 1/8                     | -CM-ML4-RT2             |
| 4              | 1/4                     | -CM-ML4-RT4             |
| 6              | 1/8                     | -CM-ML6-RT2             |
| 6              | 1/4                     | -CM-ML6-RT4             |
| 6              | 3/8                     | -CM-ML6-RT6             |
| 6              | 1/2                     | -CM-ML6-RT8             |
| 8              | 1/8                     | -CM-ML8-RT2             |
| 8              | 1/4                     | -CM-ML8-RT4             |
| 8              | 3/8                     | -CM-ML8-RT6             |
| 8              | 1/2                     | -CM-ML8-RT8             |
| 10             | 1/8                     | -CM-ML10-RT2            |
| 10             | 1/4                     | -CM-ML10-RT4            |
| 10             | 3/8                     | -CM-ML10-RT6            |
| 10             | 1/2                     | -CM-ML10-RT8            |
| 10             | 3/4                     | -CM-ML10-RT12           |
| 12             | 1/8                     | -CM-ML12-RT2            |
| 12             | 1/4                     | -CM-ML12-RT4            |
| 12             | 3/8                     | -CM-ML12-RT6            |
| 12             | 1/2                     | -CM-ML12-RT8            |
| 12             | 3/4                     | -CM-ML12-RT12           |

## Male Connectors



| Metric Tube    |                         | ISO Tapered Thread (RT) |  |
|----------------|-------------------------|-------------------------|--|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |  |
| 14             | 1/8                     | -CM-ML14-RT2            |  |
| 14             | 1/4                     | -CM-ML14-RT4            |  |
| 14             | 3/8                     | -CM-ML14-RT6            |  |
| 14             | 1/2                     | -CM-ML14-RT8            |  |
| 14             | 3/4                     | -CM-ML14-RT12           |  |
| 15             | 1/2                     | -CM-ML15-RT8            |  |
| 16             | 1/4                     | -CM-ML16-RT4            |  |
| 16             | 3/8                     | -CM-ML16-RT6            |  |
| 16             | 1/2                     | -CM-ML16-RT8            |  |
| 16             | 3/4                     | -CM-ML16-RT12           |  |
| 18             | 1/2                     | -CM-ML18-RT8            |  |
| 18             | 3/4                     | -CM-ML18-RT12           |  |
| 20             | 1/2                     | -CM-ML20-RT8            |  |
| 20             | 3/4                     | -CM-ML20-RT12           |  |
| 22             | 3/4                     | -CM-ML22-RT12           |  |
| 22             | 1                       | -CM-ML22-RT16           |  |
| 25             | 1/2                     | -CM-ML25-RT8            |  |
| 25             | 3/4                     | -CM-ML25-RT12           |  |
| 25             | 1                       | -CM-ML25-RT16           |  |
| 28             | 1                       | -CM-ML28-RT16           |  |
| 28             | 1 1/4                   | -CM-ML28-RT20           |  |
| 30             | 1 1/4                   | -CM-ML30-RT20           |  |
| 32             | 1 1/4                   | -CM-ML32-RT20           |  |
| 38             | 1 1/2                   | -CM-ML38-RT24           |  |

| Metric Tube    |                          | ISO Parallel Thread (RS) |  |
|----------------|--------------------------|--------------------------|--|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 2              | 1/8                      | -CM-ML2-RS2              |  |
| 3              | 1/8                      | -CM-ML3-RS2              |  |
| 3              | 1/4                      | -CM-ML3-RS4              |  |
| 4              | 1/8                      | -CM-ML4-RS2              |  |
| 4              | 1/4                      | -CM-ML4-RS4              |  |
| 6              | 1/8                      | -CM-ML6-RS2              |  |
| 6              | 1/4                      | -CM-ML6-RS4              |  |
| 6              | 3/8                      | -CM-ML6-RS6              |  |
| 6              | 1/2                      | -CM-ML6-RS8              |  |
| 8              | 1/8                      | -CM-ML8-RS2              |  |
| 8              | 1/4                      | -CM-ML8-RS4              |  |
| 8              | 3/8                      | -CM-ML8-RS6              |  |
| 8              | 1/2                      | -CM-ML8-RS8              |  |
| 8              | 3/4                      | -CM-ML8-RS12             |  |
| 10             | 1/4                      | -CM-ML10-RS4             |  |
| 10             | 3/8                      | -CM-ML10-RS6             |  |
| 10             | 1/2                      | -CM-ML10-RS8             |  |
| 12             | 1/4                      | -CM-ML12-RS4             |  |
| 12             | 3/8                      | -CM-ML12-RS6             |  |
| 12             | 1/2                      | -CM-ML12-RS8             |  |
| 12             | 3/4                      | -CM-ML12-RS12            |  |
| 14             | 1/4                      | -CM-ML14-RS4             |  |
| 14             | 3/8                      | -CM-ML14-RS6             |  |
| 14             | 1/2                      | -CM-ML14-RS8             |  |
| 14             | 3/4                      | -CM-ML14-RS12            |  |

## Male Connectors



| Metric Tube    |                          | ISO Parallel Thread (RS) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 15             | 3/8                      | -CM-ML15-RS6             |
| 15             | 1/2                      | -CM-ML15-RS8             |
| 15             | 3/4                      | -CM-ML15-RS12            |
| 16             | 3/8                      | -CM-ML16-RS6             |
| 16             | 1/2                      | -CM-ML16-RS8             |
| 16             | 3/4                      | -CM-ML16-RS12            |
| 18             | 1/2                      | -CM-ML18-RS8             |
| 18             | 3/4                      | -CM-ML18-RS12            |
| 20             | 1/2                      | -CM-ML20-RS8             |
| 20             | 3/4                      | -CM-ML20-RS12            |
| 22             | 3/4                      | -CM-ML22-RS12            |
| 22             | 1                        | -CM-ML22-RS16            |
| 25             | 3/4                      | -CM-ML25-RS12            |
| 25             | 1                        | -CM-ML25-RS16            |
| 28             | 1                        | -CM-ML28-RS16            |
| 28             | 1 1/4                    | -CM-ML28-RS20            |
| 30             | 1 1/4                    | -CM-ML30-RS20            |
| 32             | 1 1/4                    | -CM-ML32-RS20            |
| 38             | 1 1/2                    | -CM-ML38-RS24            |

| Metric Tube    |                          | ISO Parallel Thread (RP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 3              | 1/8                      | -CM-ML3-RP2              |
| 3              | 1/4                      | -CM-ML3-RP4              |
| 4              | 1/8                      | -CM-ML4-RP2              |
| 6              | 1/8                      | -CM-ML6-RP2              |
| 6              | 1/4                      | -CM-ML6-RP4              |
| 6              | 3/8                      | -CM-ML6-RP6              |
| 6              | 1/2                      | -CM-ML6-RP8              |
| 8              | 1/8                      | -CM-ML8-RP2              |
| 8              | 1/4                      | -CM-ML8-RP4              |
| 8              | 3/8                      | -CM-ML8-RP6              |
| 8              | 1/2                      | -CM-ML8-RP8              |
| 10             | 1/4                      | -CM-ML10-RP4             |
| 10             | 3/8                      | -CM-ML10-RP6             |
| 10             | 1/2                      | -CM-ML10-RP8             |
| 12             | 1/4                      | -CM-ML12-RP4             |
| 12             | 3/8                      | -CM-ML12-RP6             |
| 12             | 1/2                      | -CM-ML12-RP8             |
| 12             | 3/4                      | -CM-ML12-RP12            |
| 15             | 1/2                      | -CM-ML15-RP8             |
| 16             | 3/8                      | -CM-ML16-RP6             |
| 16             | 1/2                      | -CM-ML16-RP8             |
| 18             | 1/2                      | -CM-ML18-RP8             |
| 18             | 3/4                      | -CM-ML18-RP12            |
| 20             | 1/2                      | -CM-ML20-RP8             |
| 20             | 3/4                      | -CM-ML20-RP12            |

| Metric Tube    |                          | ISO Parallel Thread (RP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 22             | 3/4                      | -CM-ML22-RP12            |
| 22             | 1                        | -CM-ML22-RP16            |
| 25             | 3/4                      | -CM-ML25-RP12            |
| 25             | 1                        | -CM-ML25-RP16            |
| 28             | 1                        | -CM-ML28-RP16            |
| 28             | 1 1/4                    | -CM-ML28-RP20            |
| 30             | 1 1/4                    | -CM-ML30-RP20            |
| 32             | 1 1/4                    | -CM-ML32-RP20            |
| 38             | 1 1/2                    | -CM-ML38-RP24            |

Male Connectors



| Metric Tube    |                          | ISO Parallel Thread (BP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 6              | 1/4                      | -CM-ML6-BP4              |
| 6              | 3/8                      | -CM-ML6-BP6              |
| 8              | 1/8                      | -CM-ML8-BP2              |
| 8              | 1/4                      | -CM-ML8-BP4              |
| 8              | 3/8                      | -CM-ML8-BP6              |
| 8              | 1/2                      | -CM-ML8-BP8              |
| 10             | 1/4                      | -CM-ML10-BP4             |
| 10             | 1/2                      | -CM-ML10-BP8             |
| 12             | 3/8                      | -CM-ML12-BP6             |
| 12             | 1/2                      | -CM-ML12-BP8             |
| 14             | 1/4                      | -CM-ML14-BP4             |
| 16             | 3/8                      | -CM-ML16-BP6             |
| 16             | 1/2                      | -CM-ML16-BP8             |
| 18             | 1/2                      | -CM-ML18-BP8             |

Male Connectors



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

| Metric Tube    |                    | SAE/MS Straight Thread |
|----------------|--------------------|------------------------|
| Tube O.D. (mm) | SAE/MS Thread Size | Basic Ordering Number  |
| 6              | 9/16-18            | -CM-ML6-ST9            |
| 10             | 9/16-18            | -CM-ML10-ST9           |
| 10             | 3/4-16             | -CM-ML10-ST12          |
| 12             | 7/16-20            | -CM-ML12-ST7           |
| 12             | 9/16-18            | -CM-ML12-ST9           |

Male Connectors



| Metric Tube    |                    | Metric Thread (MRS)   |
|----------------|--------------------|-----------------------|
| Tube O.D. (mm) | Metric Thread Size | Basic Ordering Number |
| 6              | M8 x 1             | -CM-ML6-MRS8          |
| 6              | M10 x 1            | -CM-ML6-MRS10         |
| 6              | M12 x 1.5          | -CM-ML6-MRS12         |
| 6              | M14 x 1.5          | -CM-ML6-MRS14         |
| 8              | M8 x 1             | -CM-ML8-MRS8          |
| 8              | M10 x 1            | -CM-ML8-MRS10         |
| 8              | M12 x 1.5          | -CM-ML8-MRS12         |
| 8              | M14 x 1.5          | -CM-ML8-MRS14         |

| Metric Tube    |                    | Metric Thread (MRS)   |
|----------------|--------------------|-----------------------|
| Tube O.D. (mm) | Metric Thread Size | Basic Ordering Number |
| 12             | M16 x 1.5          | -CM-ML12-MRS16        |
| 12             | M20 x 1.5          | -CM-ML12-MRS20        |
| 12             | M22 x 1.5          | -CM-ML12-MRS22        |
| 14             | M14 x 1.5          | -CM-ML14-MRS14        |
| 14             | M20 x 1.5          | -CM-ML14-MRS20        |
| 16             | M20 x 1.5          | -CM-ML16-MRS20        |
| 18             | M20 x 1.5          | -CM-ML18-MRS20        |
| 20             | M20 x 1.5          | -CM-ML20-MRS20        |
| 22             | M24 x 1.5          | -CM-ML22-MRS24        |
| 25             | M27 x 2            | -CM-ML25-MRS27        |



Adapt to straight thread boss of ISO 6149-1.

## Male Connectors

| Metric Tube    |                    | Metric Thread (MST)   |
|----------------|--------------------|-----------------------|
| Tube O.D. (mm) | Metric Thread Size | Basic Ordering Number |
| 6              | M14 x 1.5          | -CM-ML6-MST14         |
| 10             | M14 x 1.5          | -CM-ML10-MST14        |
| 10             | M20 x 1.5          | -CM-ML10-MST20        |
| 12             | M14 x 1.5          | -CM-ML12-MST14        |
| 12             | M20 x 1.5          | -CM-ML12-MST20        |

## Male Connectors



| Metric Tube    |                    | Metric Thread (MS)    |
|----------------|--------------------|-----------------------|
| Tube O.D. (mm) | Metric Thread Size | Basic Ordering Number |
| 6              | M6 x 1             | -CM-ML6-MS6           |
| 6              | M8 x 1             | -CM-ML6-MS8           |
| 6              | M10 x 1            | -CM-ML6-MS10          |
| 6              | M12 x 1.5          | -CM-ML6-MS12          |
| 6              | M14 x 1.5          | -CM-ML6-MS14          |
| 6              | M16 x 1.5          | -CM-ML6-MS16          |
| 6              | M18 x 1.5          | -CM-ML6-MS18          |
| 6              | M20 x 1.5          | -CM-ML6-MS20          |
| 8              | M8 x 1             | -CM-ML8-MS8           |
| 8              | M10 x 1            | -CM-ML8-MS10          |
| 8              | M12 x 1.5          | -CM-ML8-MS12          |
| 8              | M14 x 1.5          | -CM-ML8-MS14          |
| 8              | M20 x 1.5          | -CM-ML8-MS20          |
| 10             | M12 x 1.5          | -CM-ML10-MS12         |
| 10             | M14 x 1.5          | -CM-ML10-MS14         |
| 10             | M20 x 1.5          | -CM-ML10-MS20         |
| 12             | M12 x 1.5          | -CM-ML12-MS12         |
| 12             | M16 x 1.5          | -CM-ML12-MS16         |
| 12             | M18 x 1.5          | -CM-ML12-MS18         |
| 12             | M20 x 1.5          | -CM-ML12-MS20         |
| 14             | M14 x 1.5          | -CM-ML14-MS14         |
| 14             | M16 x 1.5          | -CM-ML14-MS16         |
| 14             | M20 x 1.5          | -CM-ML14-MS20         |
| 16             | M20 x 1.5          | -CM-ML16-MS20         |
| 18             | M20 x 1.5          | -CM-ML18-MS20         |
| 18             | M22 x 1.5          | -CM-ML18-MS22         |
| 20             | M20 x 1.5          | -CM-ML20-MS20         |
| 22             | M24 x 1.5          | -CM-ML22-MS24         |
| 25             | M27 x 2            | -CM-ML25-MS27         |

## Bulkhead Male Connectors



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -BCM-FL1-NS1          |
| 1/16            | 1/8      | -BCM-FL1-NS2          |
| 1/8             | 1/8      | -BCM-FL2-NS2          |
| 3/16            | 1/8      | -BCM-FL3-NS2          |
| 1/4             | 1/8      | -BCM-FL4-NS2          |
| 1/4             | 1/4      | -BCM-FL4-NS4          |
| 1/4             | 3/8      | -BCM-FL4-NS6          |
| 1/4             | 1/2      | -BCM-FL4-NS8          |
| 5/16            | 1/8      | -BCM-FL5-NS2          |
| 5/16            | 1/4      | -BCM-FL5-NS4          |
| 3/8             | 1/8      | -BCM-FL6-NS2          |
| 3/8             | 1/4      | -BCM-FL6-NS4          |
| 3/8             | 3/8      | -BCM-FL6-NS6          |
| 3/8             | 1/2      | -BCM-FL6-NS8          |
| 1/2             | 1/8      | -BCM-FL8-NS2          |
| 1/2             | 1/4      | -BCM-FL8-NS4          |
| 1/2             | 3/8      | -BCM-FL8-NS6          |
| 1/2             | 1/2      | -BCM-FL8-NS8          |
| 5/8             | 3/8      | -BCM-FL10-NS6         |
| 5/8             | 1/2      | -BCM-FL10-NS8         |
| 3/4             | 1/2      | -BCM-FL12-NS8         |
| 3/4             | 3/4      | -BCM-FL12-NS12        |
| 7/8             | 3/4      | -BCM-FL14-NS12        |
| 1               | 3/4      | -BCM-FL16-NS12        |
| 1               | 1        | -BCM-FL16-NS16        |

| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -BCM-ML6-NS2          |
| 6              | 1/4      | -BCM-ML6-NS4          |
| 8              | 1/8      | -BCM-ML8-NS2          |
| 8              | 1/4      | -BCM-ML8-NS4          |
| 10             | 1/4      | -BCM-ML10-NS4         |
| 10             | 3/8      | -BCM-ML10-NS6         |
| 10             | 1/2      | -BCM-ML10-NS8         |
| 12             | 1/4      | -BCM-ML12-NS4         |
| 12             | 3/8      | -BCM-ML12-NS6         |
| 12             | 1/2      | -BCM-ML12-NS8         |

## Bulkhead Male Connectors



| Fractional Tube |                    | 37° Flare (AN)        |
|-----------------|--------------------|-----------------------|
| Tube O.D. (in.) | AN Tube Flare Size | Basic Ordering Number |
| 1/8             | 1/8                | -BCM-FL2-AN2          |
| 1/8             | 1/4                | -BCM-FL2-AN4          |
| 3/16            | 3/16               | -BCM-FL3-AN3          |
| 1/4             | 1/4                | -BCM-FL4-NS4          |
| 5/16            | 5/16               | -BCM-FL5-AN5          |
| 3/8             | 1/4                | -BCM-FL6-AN4          |
| 3/8             | 3/8                | -BCM-FL6-AN6          |
| 1/2             | 1/2                | -BCM-FL8-AN8          |
| 5/8             | 5/8                | -BCM-FL10-AN10        |
| 3/4             | 3/4                | -BCM-FL12-AN12        |
| 1               | 1                  | -BCM-FL16-AN16        |

Thermocouple  
Connectors



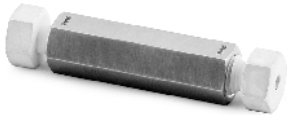
| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -TCM-FL1-NS1          |
| 1/16            | 1/8      | -TCM-FL1-NS2          |
| 1/16            | 1/4      | -TCM-FL1-NS4          |
| 1/8             | 1/16     | -TCM-FL2-NS1          |
| 1/8             | 1/8      | -TCM-FL2-NS2          |
| 1/8             | 1/4      | -TCM-FL2-NS4          |
| 3/16            | 1/8      | -TCM-FL3-NS2          |
| 3/16            | 1/4      | -TCM-FL3-NS4          |
| 1/4             | 1/8      | -TCM-FL4-NS2          |
| 1/4             | 1/4      | -TCM-FL4-NS4          |
| 1/4             | 3/8      | -TCM-FL4-NS6          |
| 1/4             | 1/2      | -TCM-FL4-NS8          |
| 5/16            | 1/4      | -TCM-FL5-NS4          |
| 3/8             | 1/4      | -TCM-FL6-NS4          |
| 3/8             | 3/8      | -TCM-FL6-NS6          |
| 3/8             | 1/2      | -TCM-FL6-NS8          |
| 3/8             | 3/4      | -TCM-FL6-NS12         |
| 1/2             | 1/2      | -TCM-FL8-NS8          |
| 1/2             | 3/4      | -TCM-FL8-NS12         |
| 5/8             | 3/4      | -TCM-FL10-NS12        |
| 3/4             | 3/4      | -TCM-FL12-NS12        |
| 1               | 1        | -TCM-FL16-NS16        |

Thermocouple  
Connectors



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 2              | 1/8      | -TCM-ML2-NS2          |
| 3              | 1/8      | -TCM-ML3-NS2          |
| 3              | 1/4      | -TCM-ML3-NS4          |
| 4              | 1/8      | -TCM-ML4-NS2          |
| 4              | 1/4      | -TCM-ML4-NS4          |
| 6              | 1/8      | -TCM-ML6-NS2          |
| 6              | 1/4      | -TCM-ML6-NS4          |
| 6              | 3/8      | -TCM-ML6-NS6          |
| 6              | 1/2      | -TCM-ML6-NS8          |
| 8              | 1/4      | -TCM-ML8-NS4          |
| 8              | 3/8      | -TCM-ML8-NS6          |
| 8              | 1/2      | -TCM-ML8-NS8          |
| 10             | 3/8      | -TCM-ML10-NS6         |
| 10             | 1/2      | -TCM-ML10-NS8         |
| 10             | 3/4      | -TCM-ML10-NS12        |
| 10             | 1        | -TCM-ML10-NS16        |
| 12             | 3/8      | -TCM-ML12-NS6         |
| 12             | 1/2      | -TCM-ML12-NS8         |
| 12             | 3/4      | -TCM-ML12-NS12        |
| 14             | 1/2      | -TCM-ML14-NS8         |
| 14             | 3/4      | -TCM-ML14-NS12        |
| 15             | 1/2      | -TCM-ML15-NS8         |
| 15             | 3/4      | -TCM-ML15-NS12        |
| 15             | 1        | -TCM-ML15-NS16        |
| 16             | 3/4      | -TCM-ML16-NS12        |
| 18             | 3/4      | -TCM-ML18-NS12        |
| 20             | 1        | -TCM-ML20-NS16        |
| 22             | 1        | -TCM-ML22-NS16        |
| 25             | 1        | -TCM-ML25-NS16        |

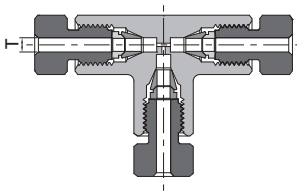
Chromatograph  
Fittings



| Fractional Tube      |                             |
|----------------------|-----------------------------|
| Tube<br>O.D<br>(in.) | Basic<br>Ordering<br>Number |

|      |         |
|------|---------|
| 1/16 | -U-NFL1 |
|------|---------|

Chromatograph  
Fittings



| Fractional Tube      |                             |
|----------------------|-----------------------------|
| Tube<br>O.D<br>(in.) | Basic<br>Ordering<br>Number |

|      |           |
|------|-----------|
| 1/16 | -TTT-NFL1 |
|------|-----------|

Female Connectors



| Fractional Tube       |             | NPT Thread                  |
|-----------------------|-------------|-----------------------------|
| Tube<br>O.D.<br>(in.) | NPT<br>Size | Basic<br>Ordering<br>Number |
| 1/16                  | 1/16        | -CF-FL1-NS1                 |
| 1/16                  | 1/8         | -CF-FL1-NS2                 |
| 1/8                   | 1/8         | -CF-FL2-NS2                 |
| 1/8                   | 1/4         | -CF-FL2-NS4                 |
| 3/16                  | 1/8         | -CF-FL3-NS2                 |
| 1/4                   | 1/8         | -CF-FL4-NS2                 |
| 1/4                   | 1/4         | -CF-FL4-NS4                 |
| 1/4                   | 3/8         | -CF-FL4-NS6                 |
| 1/4                   | 1/2         | -CF-FL4-NS8                 |
| 5/16                  | 1/8         | -CF-FL5-NS2                 |
| 5/16                  | 1/4         | -CF-FL5-NS4                 |
| 3/8                   | 1/8         | -CF-FL6-NS2                 |
| 3/8                   | 1/4         | -CF-FL6-NS4                 |
| 3/8                   | 3/8         | -CF-FL6-NS6                 |
| 3/8                   | 1/2         | -CF-FL6-NS8                 |
| 3/8                   | 3/4         | -CF-FL6-NS12                |
| 1/2                   | 1/4         | -CF-FL8-NS4                 |
| 1/2                   | 3/8         | -CF-FL8-NS6                 |
| 1/2                   | 1/2         | -CF-FL8-NS8                 |
| 1/2                   | 3/4         | -CF-FL8-NS12                |
| 5/8                   | 3/8         | -CF-FL10-NS6                |
| 5/8                   | 1/2         | -CF-FL10-NS8                |
| 3/4                   | 1/2         | -CF-FL12-NS8                |
| 3/4                   | 3/4         | -CF-FL12-NS12               |
| 7/8                   | 3/4         | -CF-FL14-NS12               |
| 1                     | 3/4         | -CF-FL16-NS12               |
| 1                     | 1           | -CF-FL16-NS16               |
| 1 1/4                 | 1 1/4       | -CF-FL20-NS20               |
| 1 1/2                 | 1 1/2       | -CF-FL24-NS24               |

| Fractional Tube |                         | ISO Tapered Thread (RT) |  |
|-----------------|-------------------------|-------------------------|--|
| Tube O.D. (in.) | ISO Tapered Thread Size | Basic Ordering Number   |  |
| 1/4             | 1/8                     | -CF-FL4-RT2             |  |
| 1/4             | 1/4                     | -CF-FL4-RT4             |  |
| 1/4             | 3/8                     | -CF-FL4-RT6             |  |
| 1/4             | 1/2                     | -CF-FL4-RT8             |  |
| 3/8             | 1/4                     | -CF-FL6-RT4             |  |
| 3/8             | 3/8                     | -CF-FL6-RT6             |  |
| 3/8             | 1/2                     | -CF-FL6-RT8             |  |
| 1/2             | 1/4                     | -CF-FL8-RT4             |  |
| 1/2             | 3/8                     | -CF-FL8-RT6             |  |
| 1/2             | 1/2                     | -CF-FL8-RT8             |  |

## Female Connectors



| Fractional Tube |                          | ISO Parallel Thread (RG) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/8             | 1/4                      | -CF-FL2-RG4              |  |
| 1/8             | 3/8                      | -CF-FL2-RG6              |  |
| 1/4             | 1/4                      | -CF-FL4-RG4              |  |
| 1/4             | 3/8                      | -CF-FL4-RG6              |  |
| 1/4             | 1/2                      | -CF-FL4-RG8              |  |
| 5/16            | 1/4                      | -CF-FL5-RG4              |  |
| 5/16            | 3/8                      | -CF-FL5-RG6              |  |
| 5/16            | 1/2                      | -CF-FL5-RG8              |  |
| 3/8             | 1/4                      | -CF-FL6-RG4              |  |
| 3/8             | 3/8                      | -CF-FL6-RG6              |  |
| 3/8             | 1/2                      | -CF-FL6-RG8              |  |
| 1/2             | 1/4                      | -CF-FL8-RG4              |  |
| 1/2             | 3/8                      | -CF-FL8-RG6              |  |
| 1/2             | 1/2                      | -CF-FL8-RG8              |  |

## Female Connectors



Adapt to Japanese gauge stud (JIS B7505)

| Fractional Tube |                          | ISO Parallel Thread (RJ) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/4             | 1/4                      | -CF-FL4-RJ4              |  |
| 1/4             | 3/8                      | -CF-FL4-RJ6              |  |
| 1/4             | 1/2                      | -CF-FL4-RJ8              |  |
| 5/16            | 1/4                      | -CF-FL5-RJ4              |  |
| 5/16            | 1/2                      | -CF-FL5-RJ8              |  |
| 3/8             | 1/4                      | -CF-FL6-RJ4              |  |
| 3/8             | 3/8                      | -CF-FL6-RJ6              |  |
| 3/8             | 1/2                      | -CF-FL6-RJ8              |  |
| 1/2             | 1/4                      | -CF-FL8-RJ4              |  |
| 1/2             | 3/8                      | -CF-FL8-RJ6              |  |
| 1/2             | 1/2                      | -CF-FL8-RJ8              |  |

## Female Connectors



| Fractional Tube |                    | Metric Thread         |
|-----------------|--------------------|-----------------------|
| Tube O.D. (in.) | Metric Thread Size | Basic Ordering Number |
| 1/8             | M14 x 1.5          | -CF-FL2-MS14          |
| 1/8             | M16 x 1.5          | -CF-FL2-MS16          |
| 1/8             | M18 x 1.5          | -CF-FL2-MS18          |
| 1/8             | M20 x 1.5          | -CF-FL2-MS20          |
| 1/4             | M16 x 1.5          | -CF-FL4-MS16          |
| 1/4             | M18 x 1.5          | -CF-FL4-MS18          |
| 1/4             | M20 x 1.5          | -CF-FL4-MS20          |
| 3/8             | M14 x 1.5          | -CF-FL6-MS14          |
| 3/8             | M16 x 1.5          | -CF-FL6-MS16          |
| 3/8             | M18 x 1.5          | -CF-FL6-MS18          |
| 3/8             | M20 x 1.5          | -CF-FL6-MS20          |
| 1/2             | M16 x 1.5          | -CF-FL8-MS16          |
| 1/2             | M18 x 1.5          | -CF-FL8-MS18          |
| 1/2             | M20 x 1.5          | -CF-FL8-MS20          |
| 1/2             | M22 x 1.5          | -CF-FL8-MS22          |

## Female Connectors



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 3              | 1/8      | -CF-ML3-NS2           |
| 3              | 1/4      | -CF-ML3-NS4           |
| 4              | 1/8      | -CF-ML4-NS2           |
| 6              | 1/8      | -CF-ML6-NS2           |
| 6              | 1/4      | -CF-ML6-NS4           |
| 6              | 3/8      | -CF-ML6-NS6           |
| 6              | 1/2      | -CF-ML6-NS8           |
| 8              | 1/8      | -CF-ML8-NS2           |
| 8              | 1/4      | -CF-ML8-NS4           |
| 8              | 3/8      | -CF-ML8-NS6           |
| 8              | 1/2      | -CF-ML8-NS8           |
| 10             | 1/8      | -CF-ML10-NS2          |
| 10             | 1/4      | -CF-ML10-NS4          |
| 10             | 3/8      | -CF-ML10-NS6          |
| 10             | 1/2      | -CF-ML10-NS8          |
| 12             | 1/4      | -CF-ML12-NS4          |
| 12             | 3/8      | -CF-ML12-NS6          |
| 12             | 1/2      | -CF-ML12-NS8          |
| 12             | 3/4      | -CF-ML12-NS12         |
| 14             | 3/4      | -CF-ML14-NS12         |
| 15             | 1/2      | -CF-ML15-NS8          |
| 16             | 3/8      | -CF-ML16-NS6          |
| 16             | 1/2      | -CF-ML16-NS8          |
| 20             | 1/2      | -CF-ML20-NS8          |
| 20             | 3/4      | -CF-ML20-NS12         |
| 22             | 3/4      | -CF-ML22-NS12         |
| 22             | 1        | -CF-ML22-NS16         |
| 25             | 3/4      | -CF-ML25-NS12         |
| 25             | 1        | -CF-ML25-NS16         |

## Female Connectors



| Metric Tube    |                         | ISO Tapered Thread (RT) |
|----------------|-------------------------|-------------------------|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |
| 3              | 1/8                     | -CF-ML3-RT2             |
| 6              | 1/8                     | -CF-ML6-RT2             |
| 6              | 1/4                     | -CF-ML6-RT4             |
| 6              | 3/8                     | -CF-ML6-RT6             |
| 6              | 1/2                     | -CF-ML6-RT8             |
| 8              | 1/8                     | -CF-ML8-RT2             |
| 8              | 1/4                     | -CF-ML8-RT4             |
| 8              | 3/8                     | -CF-ML8-RT6             |
| 8              | 1/2                     | -CF-ML8-RT8             |
| 10             | 1/8                     | -CF-ML10-RT2            |
| 10             | 1/4                     | -CF-ML10-RT4            |
| 10             | 3/8                     | -CF-ML10-RT6            |
| 10             | 1/2                     | -CF-ML10-RT8            |
| 12             | 1/8                     | -CF-ML12-RT2            |
| 12             | 1/4                     | -CF-ML12-RT4            |
| 12             | 3/8                     | -CF-ML12-RT6            |
| 12             | 1/2                     | -CF-ML12-RT8            |
| 12             | 3/4                     | -CF-ML12-RT12           |
| 15             | 1/2                     | -CF-ML15-RT8            |
| 16             | 1/2                     | -CF-ML16-RT8            |
| 16             | 3/4                     | -CF-ML16-RT12           |
| 20             | 1/2                     | -CF-ML20-RT8            |
| 20             | 3/4                     | -CF-ML20-RT12           |
| 22             | 3/4                     | -CF-ML22-RT12           |
| 22             | 1                       | -CF-ML22-RT16           |
| 25             | 3/4                     | -CF-ML25-RT12           |
| 25             | 1                       | -CF-ML25-RT16           |

## Female Connectors



| Metric Tube    |                          | ISO Parallel Thread (RP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 6              | 1/8                      | -CF-ML6-RP2              |
| 6              | 1/4                      | -CF-ML6-RP4              |
| 22             | 3/4                      | -CF-ML22-RP12            |
| 25             | 1                        | -CF-ML25-RP16            |

## Female Connectors



| Metric Tube    |                          | ISO Parallel Thread (RG) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 3              | 1/4                      | -CF-ML3-RG4              |
| 6              | 1/4                      | -CF-ML6-RG4              |
| 6              | 3/8                      | -CF-ML6-RG6              |
| 6              | 1/2                      | -CF-ML6-RG8              |
| 8              | 1/4                      | -CF-ML8-RG4              |
| 8              | 3/8                      | -CF-ML8-RG6              |
| 8              | 1/2                      | -CF-ML8-RG8              |
| 10             | 1/4                      | -CF-ML10-RG4             |
| 10             | 3/8                      | -CF-ML10-RG6             |
| 10             | 1/2                      | -CF-ML10-RG8             |
| 12             | 1/4                      | -CF-ML12-RG4             |
| 12             | 3/8                      | -CF-ML12-RG6             |
| 12             | 1/2                      | -CF-ML12-RG8             |
| 20             | 1/2                      | -CF-ML20-RG8             |
| 22             | 1/2                      | -CF-ML22-RG8             |

Female Connectors



Adapt to Japanese Gauge  
stud (JIS B7505)

| Metric Tube          |                                | ISO Parallel Thread (RJ)    |  |
|----------------------|--------------------------------|-----------------------------|--|
| Tube<br>O.D.<br>(mm) | ISO Parallel<br>Thread<br>Size | Basic<br>Ordering<br>Number |  |
| 6                    | 1/4                            | -CF-ML6-RJ4                 |  |
| 6                    | 3/8                            | -CF-ML6-RJ6                 |  |
| 6                    | 1/2                            | -CF-ML6-RJ8                 |  |
| 8                    | 1/4                            | -CF-ML8-RJ4                 |  |
| 8                    | 3/8                            | -CF-ML8-RJ6                 |  |
| 8                    | 1/2                            | -CF-ML8-RJ8                 |  |
| 10                   | 1/4                            | -CF-ML10-RJ4                |  |
| 10                   | 3/8                            | -CF-ML10-RJ6                |  |
| 10                   | 1/2                            | -CF-ML10-RJ8                |  |
| 12                   | 1/4                            | -CF-ML12-RJ4                |  |
| 12                   | 3/8                            | -CF-ML12-RJ6                |  |
| 12                   | 1/2                            | -CF-ML12-RJ8                |  |

Female Connectors



| Metric Tube          |                          | Metric Thread               |  |
|----------------------|--------------------------|-----------------------------|--|
| Tube<br>O.D.<br>(mm) | Metric<br>Thread<br>Size | Basic<br>Ordering<br>Number |  |
| 6                    | M10 x 1                  | -CF-ML6-MS10                |  |
| 6                    | M14 x 1.5                | -CF-ML6-MS14                |  |
| 6                    | M20 x 1.5                | -CF-ML6-MS20                |  |
| 8                    | M8 x 1                   | -CF-ML8-MS8                 |  |
| 8                    | M10 x 1                  | -CF-ML8-MS10                |  |
| 8                    | M14 x 1.5                | -CF-ML8-MS14                |  |
| 8                    | M20 x 1.5                | -CF-ML8-MS20                |  |
| 10                   | M16 x 1.5                | -CF-ML10-MS16               |  |
| 12                   | M20 x 1.5                | -CF-ML12-MS20               |  |
| 14                   | M10 x 1                  | -CF-ML14-MS10               |  |
| 14                   | M20 x 1.5                | -CF-ML14-MS20               |  |
| 14                   | M22 x 1.5                | -CF-ML14-MS22               |  |
| 16                   | M20 x 1.5                | -CF-ML16-MS20               |  |
| 20                   | M20 x 1.5                | -CF-ML20-MS20               |  |
| 25                   | M27 x 2                  | -CF-ML25-MS27               |  |

## Bulkhead Female Connectors



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -BCF-FL1-NS1          |
| 1/16            | 1/8      | -BCF-FL1-NS2          |
| 1/8             | 1/8      | -BCF-FL2-NS2          |
| 1/8             | 1/4      | -BCF-FL2-NS4          |
| 3/16            | 1/8      | -BCF-FL3-NS2          |
| 1/4             | 1/8      | -BCF-FL4-NS2          |
| 1/4             | 1/4      | -BCF-FL4-NS4          |
| 1/4             | 3/8      | -BCF-FL4-NS6          |
| 1/4             | 1/2      | -BCF-FL4-NS8          |
| 5/16            | 1/8      | -BCF-FL5-NS2          |
| 5/16            | 1/4      | -BCF-FL5-NS4          |
| 3/8             | 1/8      | -BCF-FL6-NS2          |
| 3/8             | 1/4      | -BCF-FL6-NS4          |
| 3/8             | 3/8      | -BCF-FL6-NS6          |
| 3/8             | 1/2      | -BCF-FL6-NS8          |
| 3/8             | 3/4      | -BCF-FL6-NS12         |
| 1/2             | 1/4      | -BCF-FL8-NS4          |
| 1/2             | 3/8      | -BCF-FL8-NS6          |
| 1/2             | 1/2      | -BCF-FL8-NS8          |
| 1/2             | 3/4      | -BCF-FL8-NS12         |
| 5/8             | 3/8      | -BCF-FL10-NS6         |
| 5/8             | 1/2      | -BCF-FL10-NS8         |
| 3/4             | 1/2      | -BCF-FL12-NS8         |
| 3/4             | 3/4      | -BCF-FL12-NS12        |
| 7/8             | 3/4      | -BCF-FL14-NS12        |
| 1               | 3/4      | -BCF-FL16-NS12        |
| 1               | 1        | -BCF-FL16-NS16        |

| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -BCF-ML6-NS2          |
| 6              | 1/4      | -BCF-ML6-NS4          |
| 8              | 1/8      | -BCF-ML8-NS2          |
| 10             | 1/4      | -BCF-ML10-NS4         |
| 12             | 3/8      | -BCF-ML12-NS6         |
| 12             | 1/2      | -BCF-ML12-NS8         |

## Unions



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -U-FL1                |
| 1/8             | -U-FL2                |
| 3/16            | -U-FL3                |
| 1/4             | -U-FL4                |
| 5/16            | -U-FL5                |
| 3/8             | -U-FL6                |
| 1/2             | -U-FL8                |
| 5/8             | -U-FL10               |
| 3/4             | -U-FL12               |
| 7/8             | -U-FL14               |
| 1               | -U-FL16               |
| 1 1/8           | -U-FL18               |
| 1 1/4           | -U-FL20               |
| 1 1/2           | -U-FL24               |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -U-ML2                |
| 3              | -U-ML3                |
| 4              | -U-ML4                |
| 6              | -U-ML6                |
| 8              | -U-ML8                |
| 10             | -U-ML10               |
| 12             | -U-ML12               |
| 14             | -U-ML14               |
| 15             | -U-ML15               |
| 16             | -U-ML16               |
| 18             | -U-ML18               |
| 20             | -U-ML20               |
| 22             | -U-ML22               |
| 25             | -U-ML25               |
| 28             | -U-ML28               |
| 30             | -U-ML30               |
| 32             | -U-ML32               |
| 38             | -U-ML38               |

## Conversion Unions



| Fractional Tube         |                         |                             | Metric Tube            |                          |                             |
|-------------------------|-------------------------|-----------------------------|------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number | T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                     | 3                       | -U-FL2-ML3                  | 4                      | 1/8                      | -U-ML4-FL2                  |
| 1/4                     | 4                       | -U-FL4-ML4                  | 6                      | 1/8                      | -U-ML6-FL2                  |
| 1/4                     | 6                       | -U-FL4-ML6                  | 8                      | 1/4                      | -U-ML8-FL4                  |
| 3/8                     | 6                       | -U-FL6-ML6                  | 10                     | 1/8                      | -U-ML10-FL2                 |
| 3/8                     | 8                       | -U-FL6-ML8                  | 10                     | 1/4                      | -U-ML10-FL4                 |
| 1/2                     | 6                       | -U-FL8-ML6                  | 10                     | 5/16                     | -U-ML10-FL5                 |
| 1/2                     | 10                      | -U-FL8-ML10                 | 10                     | 3/8                      | -U-ML10-FL6                 |
| 1/2                     | 12                      | -U-FL8-ML12                 | 12                     | 5/16                     | -U-ML12-FL5                 |
| 3/4                     | 12                      | -U-FL12-ML12                | 12                     | 3/8                      | -U-ML12-FL6                 |
| 3/4                     | 16                      | -U-FL12-ML16                | 15                     | 1/2                      | -U-ML15-FL8                 |
| 3/4                     | 18                      | -U-FL12-ML18                | 16                     | 5/8                      | -U-ML16-FL10                |
| 1                       | 25                      | -U-FL16-ML25                | 20                     | 1/2                      | -U-ML20-FL8                 |

## Reducing Unions



| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                     | 1/16                     | -U-FL2-FL1                  |
| 3/16                    | 1/16                     | -U-FL3-FL1                  |
| 3/16                    | 1/8                      | -U-FL3-FL2                  |
| 1/4                     | 1/16                     | -U-FL4-FL1                  |
| 1/4                     | 1/8                      | -U-FL4-FL2                  |
| 1/4                     | 3/16                     | -U-FL4-FL3                  |
| 5/16                    | 1/8                      | -U-FL5-FL2                  |
| 5/16                    | 1/4                      | -U-FL5-FL4                  |
| 3/8                     | 1/16                     | -U-FL6-FL1                  |
| 3/8                     | 1/8                      | -U-FL6-FL2                  |
| 3/8                     | 1/4                      | -U-FL6-FL4                  |
| 3/8                     | 5/16                     | -U-FL6-FL5                  |
| 1/2                     | 1/8                      | -U-FL8-FL2                  |
| 1/2                     | 1/4                      | -U-FL8-FL4                  |
| 1/2                     | 3/8                      | -U-FL8-FL6                  |
| 5/8                     | 3/8                      | -U-FL10-FL6                 |
| 5/8                     | 1/2                      | -U-FL10-FL8                 |
| 3/4                     | 1/4                      | -U-FL12-FL4                 |
| 3/4                     | 3/8                      | -U-FL12-FL6                 |
| 3/4                     | 1/2                      | -U-FL12-FL8                 |
| 3/4                     | 5/8                      | -U-FL12-FL10                |
| 1                       | 1/2                      | -U-FL16-FL8                 |
| 1                       | 3/4                      | -U-FL16-FL12                |

## Reducing Unions



| Metric Tube            |                         |                             |
|------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 3                      | 2                       | -U-ML3-ML2                  |
| 6                      | 2                       | -U-ML6-ML2                  |
| 6                      | 3                       | -U-ML6-ML3                  |
| 6                      | 4                       | -U-ML6-ML4                  |
| 8                      | 6                       | -U-ML8-ML6                  |
| 10                     | 6                       | -U-ML10-ML6                 |
| 10                     | 8                       | -U-ML10-ML8                 |
| 12                     | 6                       | -U-ML12-ML6                 |
| 12                     | 8                       | -U-ML12-ML8                 |
| 12                     | 10                      | -U-ML12-ML10                |
| 16                     | 10                      | -U-ML16-ML10                |
| 16                     | 12                      | -U-ML16-ML12                |
| 18                     | 12                      | -U-ML18-ML12                |
| 25                     | 18                      | -U-ML25-ML18                |
| 25                     | 20                      | -U-ML25-ML20                |
| 30                     | 18                      | -U-ML30-ML18                |
| 30                     | 20                      | -U-ML30-ML20                |
| 30                     | 25                      | -U-ML30-ML25                |
| 32                     | 18                      | -U-ML32-ML18                |
| 32                     | 20                      | -U-ML32-ML20                |
| 32                     | 25                      | -U-ML32-ML25                |
| 38                     | 20                      | -U-ML38-ML20                |
| 38                     | 25                      | -U-ML38-ML25                |
| 38                     | 30                      | -U-ML38-ML30                |

Column End  
Fittings

| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                     | 1/16                     | -U-TFL2SN7-FL1              |
| 1/4                     | 1/16                     | -U-TFL4SN7-FL1              |
| 3/8                     | 1/16                     | -U-TFL6SN7-FL1              |

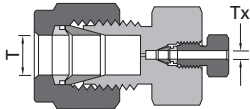
SN7 Stainless steel sinter nominal pore size of 7  $\mu$ m, can provide other nominal pore size, stainless steel sinters are loosely installed to facilitate removal and replacement.

Column End  
Fittings

| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                     | 1/16                     | -U-TFL2SN7-TFL1             |
| 1/4                     | 1/16                     | -U-TFL4SN7-TFL1             |
| 3/8                     | 1/16                     | -U-TFL6SN7-TFL1             |
| 1/2                     | 1/16                     | -U-TFL8SN7-TFL1             |

SN7 Stainless steel sinter nominal pore size of 7  $\mu$ m, can provide other nominal pore size, stainless steel sinters are loosely installed to facilitate removal and replacement.

Column End Fittings



| Fractional Tube   |                    |                       |
|-------------------|--------------------|-----------------------|
| T-Tube O.D. (in.) | Tx-Tube O.D. (in.) | Basic Ordering Number |
| 1/4               | 1/16               | -U-FL4-NFL1           |
| 3/8               | 1/16               | -U-FL6-NFL1           |

Bulkhead Unions



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -BU-FL1               |
| 1/8             | -BU-FL2               |
| 3/16            | -BU-FL3               |
| 1/4             | -BU-FL4               |
| 5/16            | -BU-FL5               |
| 3/8             | -BU-FL6               |
| 1/2             | -BU-FL8               |
| 5/8             | -BU-FL10              |
| 3/4             | -BU-FL12              |
| 7/8             | -BU-FL14              |
| 1               | -BU-FL16              |
| 1 1/4           | -BU-FL20              |
| 1 1/2           | -BU-FL24              |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 3              | -BU-ML3               |
| 4              | -BU-ML4               |
| 6              | -BU-ML6               |
| 8              | -BU-ML8               |
| 10             | -BU-ML10              |
| 12             | -BU-ML12              |
| 14             | -BU-ML14              |
| 15             | -BU-ML15              |
| 16             | -BU-ML16              |
| 18             | -BU-ML18              |
| 20             | -BU-ML20              |
| 25             | -BU-ML25              |
| 30             | -BU-ML30              |
| 32             | -BU-ML32              |
| 38             | -BU-ML38              |

Bulkhead Reducing Unions



| Fractional Tube   |                    |                       |
|-------------------|--------------------|-----------------------|
| T-Tube O.D. (in.) | Tx-Tube O.D. (in.) | Basic Ordering Number |
| 1/4               | 1/8                | -BU-FL4-FL2           |
| 3/8               | 1/4                | -BU-FL6-FL4           |
| 1/2               | 1/4                | -BU-FL8-FL4           |

| Metric Tube      |                   |                       |
|------------------|-------------------|-----------------------|
| T-Tube O.D. (mm) | Tx-Tube O.D. (mm) | Basic Ordering Number |
| 6                | 3                 | -BU-ML6-ML3           |
| 8                | 6                 | -BU-ML8-ML6           |
| 12               | 8                 | -BU-ML12-ML8          |

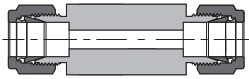
Bulkhead Conversion Unions



| Fractional Tube   |                   | Metric Tube           |
|-------------------|-------------------|-----------------------|
| T-Tube O.D. (in.) | Tx-Tube O.D. (mm) | Basic Ordering Number |
| 1/4               | 6                 | -BU-FL4-ML6           |

| Metric Tube      |                    | Fractional Tube       |
|------------------|--------------------|-----------------------|
| T-Tube O.D. (mm) | Tx-Tube O.D. (in.) | Basic Ordering Number |
| 6                | 1/8                | -BU-ML6-FL2           |
| 6                | 1/4                | -BU-ML6-FL4           |

Weld Bulkhead  
Unions



| Fractional Tube          |                             |
|--------------------------|-----------------------------|
| Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                      | -BU-FL2-OD12                |
| 3/16                     | -BU-FL3-OD12                |
| 1/4                      | -BU-FL4-OD14                |
| 5/16                     | -BU-FL5-OD16                |
| 3/8                      | -BU-FL6-OD19                |
| 1/2                      | -BU-FL8-OD23                |
| 5/8                      | -BU-FL10-OD28               |
| 3/4                      | -BU-FL12-OD32               |
| 7/8                      | -BU-FL14-OD32               |
| 1                        | -BU-FL16-OD35               |
| 1 1/4                    | -BU-FL20-OD50               |
| 1 1/2                    | -BU-FL24-OD55               |
| 2                        | -BU-FL32-OD80               |

| Metric Tube             |                             |
|-------------------------|-----------------------------|
| Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 3                       | -BU-ML3-OD12                |
| 4                       | -BU-ML4-OD12                |
| 6                       | -BU-ML6-OD12                |
| 8                       | -BU-ML8-OD16                |
| 10                      | -BU-ML10-OD19               |
| 12                      | -BU-ML12-OD23               |
| 15                      | -BU-ML15-OD25               |
| 16                      | -BU-ML16-OD28               |
| 18                      | -BU-ML18-OD28               |
| 20                      | -BU-ML20-OD32               |
| 22                      | -BU-ML22-OD32               |
| 25                      | -BU-ML25-OD38               |
| 28                      | -BU-ML28-OD45               |
| 32                      | -BU-ML32-OD50               |
| 38                      | -BU-ML38-OD60               |

For specified length, add "-\*\*\*"  
(metric length) as a suffix to  
the basic ordering number.  
Example: SS-BU-ML12-OD23-100

Bulkhead Locknuts



| Fractional Tube       |                             |
|-----------------------|-----------------------------|
| Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/16                  | -BN-FL1                     |
| 1/8                   | -BN-FL2                     |
| 3/16                  | -BN-FL3                     |
| 1/4                   | -BN-FL4                     |
| 5/16                  | -BN-FL5                     |
| 3/8                   | -BN-FL6                     |
| 1/2                   | -BN-FL8                     |
| 5/8                   | -BN-FL10                    |
| 3/4                   | -BN-FL12                    |
| 7/8                   | -BN-FL14                    |
| 1                     | -BN-FL16                    |
| 1 1/4                 | -BN-FL20                    |
| 1 1/2                 | -BN-FL24                    |

| Metric Tube          |                             |
|----------------------|-----------------------------|
| Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 3                    | -BN-ML3                     |
| 4                    | -BN-ML4                     |
| 6                    | -BN-ML6                     |
| 8                    | -BN-ML8                     |
| 10                   | -BN-ML10                    |
| 12                   | -BN-ML12                    |
| 14                   | -BN-ML14                    |
| 18                   | -BN-ML18                    |
| 20                   | -BN-ML20                    |
| 22                   | -BN-ML22                    |
| 25                   | -BN-ML25                    |
| 28                   | -BN-ML28                    |
| 30                   | -BN-ML30                    |
| 32                   | -BN-ML32                    |
| 38                   | -BN-ML38                    |

## Male Elbows



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -LM-FL1-NS1           |
| 1/16            | 1/8      | -LM-FL1-NS2           |
| 1/8             | 1/16     | -LM-FL2-NS1           |
| 1/8             | 1/8      | -LM-FL2-NS2           |
| 1/8             | 1/4      | -LM-FL2-NS4           |
| 3/16            | 1/8      | -LM-FL3-NS2           |
| 3/16            | 1/4      | -LM-FL3-NS4           |
| 1/4             | 1/16     | -LM-FL4-NS1           |
| 1/4             | 1/8      | -LM-FL4-NS2           |
| 1/4             | 1/4      | -LM-FL4-NS4           |
| 1/4             | 3/8      | -LM-FL4-NS6           |
| 1/4             | 1/2      | -LM-FL4-NS8           |
| 5/16            | 1/8      | -LM-FL5-NS2           |
| 5/16            | 1/4      | -LM-FL5-NS4           |
| 5/16            | 3/8      | -LM-FL5-NS6           |
| 3/8             | 1/8      | -LM-FL6-NS2           |
| 3/8             | 1/4      | -LM-FL6-NS4           |
| 3/8             | 3/8      | -LM-FL6-NS6           |
| 3/8             | 1/2      | -LM-FL6-NS8           |
| 3/8             | 3/4      | -LM-FL6-NS12          |
| 1/2             | 1/4      | -LM-FL8-NS4           |
| 1/2             | 3/8      | -LM-FL8-NS6           |
| 1/2             | 1/2      | -LM-FL8-NS8           |
| 1/2             | 3/4      | -LM-FL8-NS12          |

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 5/8             | 3/8      | -LM-FL10-NS6          |
| 5/8             | 1/2      | -LM-FL10-NS8          |
| 5/8             | 3/4      | -LM-FL10-NS12         |
| 3/4             | 1/2      | -LM-FL12-NS8          |
| 3/4             | 3/4      | -LM-FL12-NS12         |
| 7/8             | 3/4      | -LM-FL14-NS12         |
| 1               | 3/4      | -LM-FL16-NS12         |
| 1               | 1        | -LM-FL16-NS16         |
| 1 1/4           | 1 1/4    | -LM-FL20-NS20         |
| 1 1/2           | 1 1/2    | -LM-FL24-NS24         |

| Fractional Tube |                         | ISO Tapered Thread (RT) |
|-----------------|-------------------------|-------------------------|
| Tube O.D. (in.) | ISO Tapered Thread Size | Basic Ordering Number   |
| 1/8             | 1/8                     | -LM-FL2-RT2             |
| 1/8             | 1/4                     | -LM-FL2-RT4             |
| 1/4             | 1/8                     | -LM-FL4-RT2             |
| 1/4             | 1/4                     | -LM-FL4-RT4             |
| 1/4             | 3/8                     | -LM-FL4-RT6             |
| 1/4             | 1/2                     | -LM-FL4-RT8             |
| 5/16            | 1/4                     | -LM-FL5-RT4             |
| 3/8             | 1/8                     | -LM-FL6-RT2             |
| 3/8             | 1/4                     | -LM-FL6-RT4             |
| 3/8             | 3/8                     | -LM-FL6-RT6             |
| 1/2             | 3/8                     | -LM-FL8-RT6             |
| 1/2             | 1/2                     | -LM-FL8-RT8             |
| 3/4             | 1/2                     | -LM-FL12-RT8            |
| 1               | 1                       | -LM-FL16-RT16           |

## Male Elbows



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 3              | 1/8      | -LM-ML3-NS2           |
| 3              | 1/4      | -LM-ML3-NS4           |
| 4              | 1/8      | -LM-ML4-NS2           |
| 4              | 1/4      | -LM-ML4-NS4           |
| 6              | 1/8      | -LM-ML6-NS2           |
| 6              | 1/4      | -LM-ML6-NS4           |
| 6              | 3/8      | -LM-ML6-NS6           |
| 6              | 1/2      | -LM-ML6-NS8           |
| 8              | 1/8      | -LM-ML8-NS2           |
| 8              | 1/4      | -LM-ML8-NS4           |
| 8              | 3/8      | -LM-ML8-NS6           |
| 8              | 1/2      | -LM-ML8-NS8           |
| 10             | 1/8      | -LM-ML10-NS2          |
| 10             | 1/4      | -LM-ML10-NS4          |
| 10             | 3/8      | -LM-ML10-NS6          |
| 10             | 1/2      | -LM-ML10-NS8          |
| 12             | 1/8      | -LM-ML12-NS2          |
| 12             | 1/4      | -LM-ML12-NS4          |
| 12             | 3/8      | -LM-ML12-NS6          |
| 12             | 1/2      | -LM-ML12-NS8          |
| 12             | 3/4      | -LM-ML12-NS12         |
| 15             | 1/2      | -LM-ML15-NS8          |
| 16             | 1/4      | -LM-ML16-NS4          |
| 16             | 3/8      | -LM-ML16-NS6          |
| 16             | 1/2      | -LM-ML16-NS8          |

| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 16             | 3/4      | -LM-ML16-NS12         |
| 18             | 1/2      | -LM-ML18-NS8          |
| 18             | 3/4      | -LM-ML18-NS12         |
| 20             | 1/2      | -LM-ML20-NS8          |
| 20             | 3/4      | -LM-ML20-NS12         |
| 22             | 3/4      | -LM-ML22-NS12         |
| 22             | 1        | -LM-ML22-NS16         |
| 25             | 3/4      | -LM-ML25-NS12         |
| 25             | 1        | -LM-ML25-NS16         |
| 30             | 1 1/4    | -LM-ML30-NS20         |
| 32             | 1 1/4    | -LM-ML32-NS20         |
| 38             | 1 1/2    | -LM-ML38-NS24         |

## Male Elbows



| Metric Tube    |                         | ISO Tapered Thread (RT) |
|----------------|-------------------------|-------------------------|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |
| 3              | 1/8                     | -LM-ML3-RT2             |
| 3              | 1/4                     | -LM-ML3-RT4             |
| 4              | 1/8                     | -LM-ML4-RT2             |
| 4              | 1/4                     | -LM-ML4-RT4             |
| 6              | 1/8                     | -LM-ML6-RT2             |
| 6              | 1/4                     | -LM-ML6-RT4             |

| Metric Tube    |                         | ISO Tapered Thread (RT) |  |
|----------------|-------------------------|-------------------------|--|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |  |
| 6              | 3/8                     | -LM-ML6-RT6             |  |
| 6              | 1/2                     | -LM-ML6-RT8             |  |
| 8              | 1/8                     | -LM-ML8-RT2             |  |
| 8              | 1/4                     | -LM-ML8-RT4             |  |
| 8              | 3/8                     | -LM-ML8-RT6             |  |
| 8              | 1/2                     | -LM-ML8-RT8             |  |
| 10             | 1/8                     | -LM-ML10-RT2            |  |
| 10             | 1/4                     | -LM-ML10-RT4            |  |
| 10             | 3/8                     | -LM-ML10-RT6            |  |
| 10             | 1/2                     | -LM-ML10-RT8            |  |
| 12             | 1/8                     | -LM-ML12-RT2            |  |
| 12             | 1/4                     | -LM-ML12-RT4            |  |
| 12             | 3/8                     | -LM-ML12-RT6            |  |
| 12             | 1/2                     | -LM-ML12-RT8            |  |
| 12             | 3/4                     | -LM-ML12-RT12           |  |
| 14             | 1/2                     | -LM-ML14-RT8            |  |
| 15             | 1/2                     | -LM-ML15-RT8            |  |
| 16             | 1/4                     | -LM-ML16-RT4            |  |
| 16             | 3/8                     | -LM-ML16-RT6            |  |
| 16             | 1/2                     | -LM-ML16-RT8            |  |
| 16             | 3/4                     | -LM-ML16-RT12           |  |
| 18             | 1/2                     | -LM-ML18-RT8            |  |
| 18             | 3/4                     | -LM-ML18-RT12           |  |
| 20             | 1/2                     | -LM-ML20-RT8            |  |
| 20             | 3/4                     | -LM-ML20-RT12           |  |
| 22             | 3/4                     | -LM-ML22-RT12           |  |
| 22             | 1                       | -LM-ML22-RT16           |  |
| 25             | 3/4                     | -LM-ML25-RT12           |  |
| 25             | 1                       | -LM-ML25-RT16           |  |
| 28             | 1                       | -LM-ML28-RT16           |  |

## 45° Male Elbows



| Fractional Tube |          | NPT Thread            |  |
|-----------------|----------|-----------------------|--|
| Tube O.D (in.)  | NPT Size | Basic Ordering Number |  |
| 1/16            | 1/16     | -VM-FL1-NS1           |  |
| 1/8             | 1/8      | -VM-FL2-NS2           |  |
| 3/16            | 1/8      | -VM-FL3-NS2           |  |
| 1/4             | 1/8      | -VM-FL4-NS2           |  |
| 1/4             | 1/4      | -VM-FL4-NS4           |  |
| 5/16            | 1/8      | -VM-FL5-NS2           |  |
| 3/8             | 1/8      | -VM-FL6-NS2           |  |
| 3/8             | 1/4      | -VM-FL6-NS4           |  |
| 3/8             | 3/8      | -VM-FL6-NS6           |  |
| 1/2             | 3/8      | -VM-FL8-NS6           |  |
| 5/8             | 1/2      | -VM-FL10-NS8          |  |
| 3/4             | 3/4      | -VM-FL12-NS12         |  |
| 7/8             | 3/4      | -VM-FL14-NS12         |  |
| 1               | 1        | -VM-FL16-NS16         |  |

| Metric Tube    |          | NPT Thread            |  |
|----------------|----------|-----------------------|--|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |  |
| 6              | 1/8      | -VM-ML6-NS2           |  |
| 6              | 1/4      | -VM-ML6-NS4           |  |
| 8              | 1/8      | -VM-ML8-NS2           |  |
| 10             | 1/4      | -VM-ML10-NS4          |  |
| 12             | 3/8      | -VM-ML12-NS6          |  |
| 12             | 1/2      | -VM-ML12-NS8          |  |
| 16             | 1/2      | -VM-ML16-NS8          |  |

## Adjustable Male Elbows

### SAE/MS Straight Thread



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

| Fractional Tube |                    | SAE/MS Straight Thread |
|-----------------|--------------------|------------------------|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number  |
| 1/4             | 7/16-20            | -LP-FL4-ST7            |
| 1/4             | 9/16-18            | -LP-FL4-ST9            |
| 5/16            | 1/2-20             | -LP-FL5-ST8            |
| 3/8             | 7/16-20            | -LP-FL6-ST7            |
| 3/8             | 9/16-18            | -LP-FL6-ST9            |
| 3/8             | 3/4-16             | -LP-FL6-ST12           |
| 1/2             | 9/16-18            | -LP-FL8-ST9            |
| 1/2             | 3/4-16             | -LP-FL8-ST12           |
| 5/8             | 7/8-14             | -LP-FL10-ST14          |
| 3/4             | 1 1/16-12          | -LP-FL12-ST17          |
| 7/8             | 1 3/16-12          | -LP-FL14-ST19          |
| 1               | 1 5/16-12          | -LP-FL16-ST21          |
| 1 1/4           | 1 5/8-12           | -LP-FL20-ST26          |
| 1 1/2           | 1 7/8-12           | -LP-FL24-ST30          |

## Adjustable Male Elbows

### ISO Parallel Thread



| Fractional Tube | ISO Parallel Thread (PP) |                       |
|-----------------|--------------------------|-----------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number |
| 1/4             | 1/8                      | -LP-FL4-PP2           |
| 1/4             | 1/4                      | -LP-FL4-PP4           |
| 3/8             | 1/4                      | -LP-FL6-PP4           |
| 3/8             | 3/8                      | -LP-FL6-PP6           |
| 1/2             | 1/4                      | -LP-FL8-PP4           |
| 1/2             | 3/8                      | -LP-FL8-PP6           |
| 1/2             | 1/2                      | -LP-FL8-PP8           |
| 5/8             | 1/2                      | -LP-FL10-PP8          |
| 3/4             | 1/2                      | -LP-FL12-PP8          |
| 3/4             | 3/4                      | -LP-FL12-PP12         |
| 1               | 3/4                      | -LP-FL16-PP12         |
| 1               | 1                        | -LP-FL16-PP16         |

| Metric Tube    | ISO Parallel Thread (PP) |                       |
|----------------|--------------------------|-----------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number |
| 6              | 1/8                      | -LP-ML6-PP2           |
| 6              | 1/4                      | -LP-ML6-PP4           |
| 8              | 1/8                      | -LP-ML8-PP2           |
| 8              | 1/4                      | -LP-ML8-PP4           |
| 10             | 1/4                      | -LP-ML10-PP4          |
| 10             | 3/8                      | -LP-ML10-PP6          |
| 12             | 1/4                      | -LP-ML12-PP4          |
| 12             | 3/8                      | -LP-ML12-PP6          |
| 12             | 1/2                      | -LP-ML12-PP8          |
| 12             | 3/4                      | -LP-ML12-PP12         |

## 45° Adjustable Male Elbows

SAE/MS Straight Thread



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

| Fractional Tube |                    | SAE/MS Straight Thread |
|-----------------|--------------------|------------------------|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number  |
| 1/4             | 7/16-20            | -VP-FL4-ST7            |
| 3/8             | 9/16-18            | -VP-FL6-ST9            |
| 1/2             | 3/4-16             | -VP-FL8-ST12           |
| 3/4             | 1 1/16-12          | -VP-FL12-ST17          |
| 1               | 1 5/16-12          | -VP-FL16-ST21          |

## Female Elbows



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/16     | -LF-FL1-NS1           |
| 1/16            | 1/8      | -LF-FL1-NS2           |
| 1/8             | 1/8      | -LF-FL2-NS2           |
| 1/8             | 1/4      | -LF-FL2-NS4           |
| 3/16            | 1/8      | -LF-FL3-NS2           |
| 1/4             | 1/8      | -LF-FL4-NS2           |
| 1/4             | 1/4      | -LF-FL4-NS4           |
| 1/4             | 3/8      | -LF-FL4-NS6           |
| 1/4             | 1/2      | -LF-FL4-NS8           |
| 5/16            | 1/8      | -LF-FL5-NS2           |
| 5/16            | 1/4      | -LF-FL5-NS4           |
| 3/8             | 1/8      | -LF-FL6-NS2           |
| 3/8             | 1/4      | -LF-FL6-NS4           |
| 3/8             | 3/8      | -LF-FL6-NS6           |
| 3/8             | 1/2      | -LF-FL6-NS8           |
| 1/2             | 1/4      | -LF-FL8-NS4           |
| 1/2             | 3/8      | -LF-FL8-NS6           |
| 1/2             | 1/2      | -LF-FL8-NS8           |
| 5/8             | 3/8      | -LF-FL10-NS6          |
| 5/8             | 1/2      | -LF-FL10-NS8          |
| 3/4             | 1/2      | -LF-FL12-NS8          |
| 3/4             | 3/4      | -LF-FL12-NS12         |
| 7/8             | 3/4      | -LF-FL14-NS12         |
| 1               | 3/4      | -LF-FL16-NS12         |
| 1               | 1        | -LF-FL16-NS16         |

## Female Elbows



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -LF-ML6-NS2           |
| 6              | 1/4      | -LF-ML6-NS4           |
| 8              | 1/8      | -LF-ML8-NS2           |
| 8              | 1/4      | -LF-ML8-NS4           |
| 10             | 1/4      | -LF-ML10-NS4          |
| 10             | 3/8      | -LF-ML10-NS6          |
| 10             | 1/2      | -LF-ML10-NS8          |
| 12             | 1/4      | -LF-ML12-NS4          |
| 12             | 3/8      | -LF-ML12-NS6          |
| 12             | 1/2      | -LF-ML12-NS8          |
| 16             | 3/8      | -LF-ML16-NS6          |
| 16             | 1/2      | -LF-ML16-NS8          |

## Union Elbows



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -LU-FL1               |
| 1/8             | -LU-FL2               |
| 3/16            | -LU-FL3               |
| 1/4             | -LU-FL4               |
| 5/16            | -LU-FL5               |
| 3/8             | -LU-FL6               |
| 1/2             | -LU-FL8               |
| 5/8             | -LU-FL10              |
| 3/4             | -LU-FL12              |
| 7/8             | -LU-FL14              |
| 1               | -LU-FL16              |
| 1 1/8           | -LU-FL18              |
| 1 1/8           | -LU-FL20              |
| 1 1/2           | -LU-FL24              |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 3              | -LU-ML3               |
| 4              | -LU-ML4               |
| 6              | -LU-ML6               |
| 8              | -LU-ML8               |
| 10             | -LU-ML10              |
| 12             | -LU-ML12              |
| 14             | -LU-ML14              |
| 15             | -LU-ML15              |
| 16             | -LU-ML16              |
| 18             | -LU-ML18              |
| 20             | -LU-ML20              |
| 22             | -LU-ML22              |
| 25             | -LU-ML25              |
| 28             | -LU-ML28              |
| 30             | -LU-ML30              |
| 32             | -LU-ML32              |
| 38             | -LU-ML38              |

## Union Reducing Elbows



| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 3/16                    | 1/8                      | -LU-FL3-FL2                 |
| 1/4                     | 1/8                      | -LU-FL4-FL2                 |
| 5/16                    | 1/8                      | -LU-FL5-FL2                 |
| 5/16                    | 1/4                      | -LU-FL5-FL4                 |
| 3/8                     | 1/8                      | -LU-FL6-FL2                 |
| 3/8                     | 1/4                      | -LU-FL6-FL4                 |
| 3/8                     | 5/16                     | -LU-FL6-FL5                 |
| 1/2                     | 1/4                      | -LU-FL8-FL4                 |
| 1/2                     | 5/16                     | -LU-FL8-FL5                 |
| 1/2                     | 3/8                      | -LU-FL8-FL6                 |
| 5/8                     | 3/8                      | -LU-FL10-FL6                |
| 5/8                     | 1/2                      | -LU-FL10-FL8                |
| 3/4                     | 1/4                      | -LU-FL12-FL4                |
| 3/4                     | 3/8                      | -LU-FL12-FL6                |
| 3/4                     | 1/2                      | -LU-FL12-FL8                |
| 7/8                     | 1/4                      | -LU-FL14-FL4                |
| 1                       | 1/2                      | -LU-FL16-FL8                |
| 1                       | 3/4                      | -LU-FL16-FL12               |

| Metric Tube            |                         |                             |
|------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 8                      | 6                       | -LU-ML8-ML6                 |
| 10                     | 8                       | -LU-ML10-ML8                |
| 12                     | 8                       | -LU-ML12-ML8                |
| 14                     | 8                       | -LU-ML14-ML8                |
| 14                     | 10                      | -LU-ML14-ML10               |

## Male Branch Tees



| Fractional Tube       |             | NPT Thread                  |
|-----------------------|-------------|-----------------------------|
| Tube<br>O.D.<br>(in.) | NPT<br>Size | Basic<br>Ordering<br>Number |
| 1/8                   | 1/8         | -TTM-FL2-NS2                |
| 1/8                   | 1/4         | -TTM-FL2-NS4                |
| 3/16                  | 1/8         | -TTM-FL3-NS2                |
| 1/4                   | 1/8         | -TTM-FL4-NS2                |
| 1/4                   | 1/4         | -TTM-FL4-NS4                |
| 5/16                  | 1/8         | -TTM-FL5-NS2                |
| 5/16                  | 1/4         | -TTM-FL5-NS4                |
| 3/8                   | 1/4         | -TTM-FL6-NS4                |
| 3/8                   | 3/8         | -TTM-FL6-NS6                |
| 1/2                   | 3/8         | -TTM-FL8-NS6                |
| 1/2                   | 1/2         | -TTM-FL8-NS8                |
| 5/8                   | 1/2         | -TTM-FL10-NS8               |
| 3/4                   | 3/4         | -TTM-FL12-NS12              |
| 7/8                   | 3/4         | -TTM-FL14-NS12              |
| 1                     | 3/4         | -TTM-FL16-NS12              |
| 1                     | 1           | -TTM-FL16-NS16              |

Male Branch Tees



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -TTM-ML6-NS2          |
| 6              | 1/4      | -TTM-ML6-NS4          |
| 8              | 1/8      | -TTM-ML8-NS2          |
| 8              | 1/4      | -TTM-ML8-NS4          |
| 10             | 1/4      | -TTM-ML10-NS4         |
| 10             | 3/8      | -TTM-ML10-NS6         |
| 12             | 1/4      | -TTM-ML12-NS4         |
| 12             | 3/8      | -TTM-ML12-NS6         |
| 12             | 1/2      | -TTM-ML12-NS8         |
| 16             | 1/2      | -TTM-ML16-NS8         |

Male Run Tees



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/8             | 1/8      | -TMT-FL2-NS2          |
| 1/8             | 1/4      | -TMT-FL2-NS4          |
| 3/16            | 1/8      | -TMT-FL3-NS2          |
| 1/4             | 1/8      | -TMT-FL4-NS2          |
| 1/4             | 1/4      | -TMT-FL4-NS4          |
| 5/16            | 1/8      | -TMT-FL5-NS2          |
| 5/16            | 1/4      | -TMT-FL5-NS4          |
| 3/8             | 1/4      | -TMT-FL6-NS4          |
| 3/8             | 3/8      | -TMT-FL6-NS6          |
| 1/2             | 3/8      | -TMT-FL8-NS6          |
| 1/2             | 1/2      | -TMT-FL8-NS8          |
| 5/8             | 1/2      | -TMT-FL10-NS8         |
| 3/4             | 3/4      | -TMT-FL12-NS12        |
| 7/8             | 3/4      | -TMT-FL14-NS12        |
| 1               | 3/4      | -TMT-FL16-NS12        |
| 1               | 1        | -TMT-FL16-NS16        |

| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -TMT-ML6-NS2          |
| 6              | 1/4      | -TMT-ML6-NS4          |
| 8              | 1/8      | -TMT-ML8-NS2          |
| 8              | 1/4      | -TMT-ML8-NS4          |
| 10             | 1/4      | -TMT-ML10-NS4         |
| 10             | 1/2      | -TMT-ML10-NS8         |
| 12             | 1/4      | -TMT-ML12-NS4         |
| 12             | 3/8      | -TMT-ML12-NS6         |
| 12             | 1/2      | -TMT-ML12-NS8         |
| 16             | 1/2      | -TMT-ML16-NS8         |

## Adjustable Male Branch Tees

### SAE/MS Straight Thread

Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.



| Fractional Tube | SAE/MS Straight Thread |                       |
|-----------------|------------------------|-----------------------|
| Tube O.D. (in.) | SAE/MS Thread Size     | Basic Ordering Number |
| 1/4             | 7/16-20                | -TTP-FL4-ST7          |
| 3/8             | 9/16-18                | -TTP-FL6-ST9          |
| 1/2             | 3/4-16                 | -TTP-FL8-ST12         |
| 3/4             | 1 1/16-12              | -TTP-FL12-ST17        |
| 1               | 1 5/16-12              | -TTP-FL16-ST21        |
| 1 1/4           | 1 5/8-12               | -TTP-FL20-ST26        |
| 1 1/2           | 1 7/8-12               | -TTP-FL24-ST30        |

## Adjustable Male Branch Tees

### ISO Parallel Thread



| Fractional Tube | ISO Parallel Thread (PP) |                       |
|-----------------|--------------------------|-----------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number |
| 1/4             | 1/8                      | -TTP-FL4-PP2          |
| 1/4             | 1/4                      | -TTP-FL4-PP4          |
| 3/8             | 1/4                      | -TTP-FL6-PP4          |
| 1/2             | 3/8                      | -TTP-FL8-PP6          |
| 1/2             | 1/2                      | -TTP-FL8-PP8          |
| 5/8             | 1/2                      | -TTP-FL10-PP8         |
| 3/4             | 1/2                      | -TTP-FL12-PP8         |
| 3/4             | 3/4                      | -TTP-FL12-PP12        |
| 1               | 1                        | -TTP-FL16-PP16        |

| Metric Tube    | ISO Parallel Thread (PP) |                       |
|----------------|--------------------------|-----------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number |
| 6              | 1/8                      | -TTP-ML6-PP2          |
| 6              | 1/4                      | -TTP-ML6-PP4          |
| 8              | 1/8                      | -TTP-ML8-PP2          |
| 8              | 1/4                      | -TTP-ML8-PP4          |
| 10             | 1/4                      | -TTP-ML10-PP4         |
| 12             | 3/8                      | -TTP-ML12-PP6         |
| 12             | 1/2                      | -TTP-ML12-PP8         |

Adjustable Male  
Run Tees

SAE/MS Straight Thread



Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

| Fractional Tube |                    | SAE/MS Straight Thread |
|-----------------|--------------------|------------------------|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number  |
| 1/4             | 7/16-20            | -TPT-FL4-ST7           |
| 3/8             | 9/16-18            | -TPT-FL6-ST9           |
| 1/2             | 3/4-16             | -TPT-FL8-ST12          |
| 3/4             | 1 1/16-12          | -TPT-FL12-ST17         |
| 1               | 1 5/16-12          | -TPT-FL16-ST21         |
| 1 1/4           | 1 5/8-12           | -TPT-FL20-ST26         |
| 1 1/2           | 1 7/8-12           | -TPT-FL24-ST30         |

Adjustable Male  
Run Tees

ISO Parallel Thread



| Fractional Tube |                          | ISO Parallel Thread (PP) |
|-----------------|--------------------------|--------------------------|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |
| 1/4             | 1/8                      | -TPT-FL4-PP2             |
| 1/4             | 1/4                      | -TPT-FL4-PP4             |
| 3/8             | 1/4                      | -TPT-FL6-PP4             |
| 1/2             | 3/8                      | -TPT-FL8-PP6             |
| 1/2             | 1/2                      | -TPT-FL8-PP8             |
| 5/8             | 1/2                      | -TPT-FL10-PP8            |
| 3/4             | 1/2                      | -TPT-FL12-PP8            |
| 3/4             | 3/4                      | -TPT-FL12-PP12           |
| 1               | 1                        | -TPT-FL16-PP16           |

| Metric Tube    |                          | ISO Parallel Thread (PP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 6              | 1/8                      | -TPT-ML6-PP2             |
| 6              | 1/4                      | -TPT-ML6-PP4             |
| 8              | 1/8                      | -TPT-ML8-PP2             |
| 8              | 1/4                      | -TPT-ML8-PP4             |
| 10             | 1/4                      | -TPT-ML10-PP4            |
| 12             | 3/8                      | -TPT-ML12-PP6            |
| 12             | 1/2                      | -TPT-ML12-PP8            |

Female Branch  
Tees



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/8             | 1/8      | -TTF-FL2-NS2          |
| 3/16            | 1/8      | -TTF-FL3-NS2          |
| 1/4             | 1/8      | -TTF-FL4-NS2          |
| 1/4             | 1/4      | -TTF-FL4-NS4          |
| 5/16            | 1/8      | -TTF-FL5-NS2          |
| 3/8             | 1/4      | -TTF-FL6-NS4          |
| 3/8             | 3/8      | -TTF-FL6-NS6          |
| 3/8             | 1/2      | -TTF-FL6-NS8          |
| 1/2             | 1/4      | -TTF-FL8-NS4          |
| 1/2             | 3/8      | -TTF-FL8-NS6          |
| 1/2             | 1/2      | -TTF-FL8-NS8          |
| 5/8             | 1/2      | -TTF-FL10-NS8         |
| 3/4             | 3/4      | -TTF-FL12-NS12        |
| 7/8             | 3/4      | -TTF-FL14-NS12        |
| 1               | 3/4      | -TTF-FL16-NS12        |
| 1               | 1        | -TTF-FL16-NS16        |

Female Branch  
Tees



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -TTF-ML6-NS2          |
| 6              | 1/4      | -TTF-ML6-NS4          |
| 8              | 1/8      | -TTF-ML8-NS2          |
| 8              | 1/4      | -TTF-ML8-NS4          |
| 10             | 1/4      | -TTF-ML10-NS4         |
| 12             | 1/8      | -TTF-ML12-NS2         |
| 12             | 1/4      | -TTF-ML12-NS4         |
| 12             | 3/8      | -TTF-ML12-NS6         |
| 12             | 1/2      | -TTF-ML12-NS8         |
| 16             | 1/2      | -TTF-ML16-NS8         |

## Female Run Tees



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/8             | 1/8      | -TFT-FL2-NS2          |
| 3/16            | 1/8      | -TFT-FL3-NS2          |
| 1/4             | 1/8      | -TFT-FL4-NS2          |
| 1/4             | 1/4      | -TFT-FL4-NS4          |
| 5/16            | 1/8      | -TFT-FL5-NS2          |
| 3/8             | 1/4      | -TFT-FL6-NS4          |
| 1/2             | 1/4      | -TFT-FL8-NS4          |
| 1/2             | 3/8      | -TFT-FL8-NS6          |
| 1/2             | 1/2      | -TFT-FL8-NS8          |
| 5/8             | 1/2      | -TFT-FL10-NS8         |
| 3/4             | 3/4      | -TFT-FL12-NS12        |
| 7/8             | 1/2      | -TFT-FL14-NS8         |
| 7/8             | 3/4      | -TFT-FL14-NS12        |
| 1               | 3/4      | -TFT-FL16-NS12        |
| 1               | 1        | -TFT-FL16-NS16        |

| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 6              | 1/8      | -TFT-ML6-NS2          |
| 6              | 1/4      | -TFT-ML6-NS4          |
| 8              | 1/8      | -TFT-ML8-NS2          |
| 8              | 1/4      | -TFT-ML8-NS4          |
| 10             | 1/4      | -TFT-ML10-NS4         |
| 12             | 1/4      | -TFT-ML12-NS4         |
| 12             | 3/8      | -TFT-ML12-NS6         |
| 12             | 1/2      | -TFT-ML12-NS8         |
| 16             | 1/2      | -TFT-ML16-NS8         |

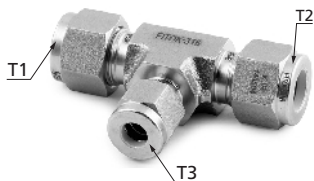
## Union Tees



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -TTT-FL1              |
| 1/8             | -TTT-FL2              |
| 3/16            | -TTT-FL3              |
| 1/4             | -TTT-FL4              |
| 5/16            | -TTT-FL5              |
| 3/8             | -TTT-FL6              |
| 1/2             | -TTT-FL8              |
| 5/8             | -TTT-FL10             |
| 3/4             | -TTT-FL12             |
| 7/8             | -TTT-FL14             |
| 1               | -TTT-FL16             |
| 1 1/8           | -TTT-FL18             |
| 1 1/4           | -TTT-FL20             |
| 1 1/2           | -TTT-FL24             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -TTT-ML2              |
| 3              | -TTT-ML3              |
| 4              | -TTT-ML4              |
| 6              | -TTT-ML6              |
| 8              | -TTT-ML8              |
| 10             | -TTT-ML10             |
| 12             | -TTT-ML12             |
| 14             | -TTT-ML14             |
| 15             | -TTT-ML15             |
| 16             | -TTT-ML16             |
| 18             | -TTT-ML18             |
| 20             | -TTT-ML20             |
| 22             | -TTT-ML22             |
| 25             | -TTT-ML25             |
| 28             | -TTT-ML28             |
| 30             | -TTT-ML30             |
| 32             | -TTT-ML32             |
| 38             | -TTT-ML38             |

## Reducing Union Tees



| Fractional Tube          |                          |                          |                             |
|--------------------------|--------------------------|--------------------------|-----------------------------|
| T1-Tube<br>O.D.<br>(in.) | T2-Tube<br>O.D.<br>(in.) | T3-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/4                      | 1/4                      | 1/8                      | -TTT-FL4-FL4-FL2            |
| 3/8                      | 1/4                      | 1/4                      | -TTT-FL6-FL4-FL4            |
| 3/8                      | 1/4                      | 3/8                      | -TTT-FL6-FL4-FL6            |
| 3/8                      | 3/8                      | 1/4                      | -TTT-FL6-FL6-FL4            |
| 1/2                      | 1/4                      | 1/4                      | -TTT-FL8-FL4-FL4            |
| 1/2                      | 1/4                      | 1/2                      | -TTT-FL8-FL4-FL8            |
| 1/2                      | 3/8                      | 3/8                      | -TTT-FL8-FL6-FL6            |
| 1/2                      | 3/8                      | 1/2                      | -TTT-FL8-FL6-FL8            |
| 1/2                      | 1/2                      | 1/4                      | -TTT-FL8-FL8-FL4            |
| 1/2                      | 1/2                      | 3/8                      | -TTT-FL8-FL8-FL6            |
| 5/8                      | 3/8                      | 3/8                      | -TTT-FL10-FL6-FL6           |
| 5/8                      | 3/8                      | 1/2                      | -TTT-FL10-FL6-FL8           |
| 5/8                      | 1/2                      | 3/8                      | -TTT-FL10-FL8-FL6           |
| 5/8                      | 1/2                      | 1/2                      | -TTT-FL10-FL8-FL8           |
| 5/8                      | 5/8                      | 3/8                      | -TTT-FL10-FL10-FL6          |
| 5/8                      | 5/8                      | 1/2                      | -TTT-FL10-FL10-FL8          |
| 3/4                      | 3/8                      | 3/8                      | -TTT-FL12-FL6-FL6           |
| 3/4                      | 1/2                      | 3/8                      | -TTT-FL12-FL8-FL6           |
| 3/4                      | 1/2                      | 1/2                      | -TTT-FL12-FL8-FL8           |
| 3/4                      | 5/8                      | 3/8                      | -TTT-FL12-FL10-FL6          |
| 3/4                      | 5/8                      | 1/2                      | -TTT-FL12-FL10-FL8          |
| 3/4                      | 5/8                      | 5/8                      | -TTT-FL12-FL10-FL10         |
| 3/4                      | 3/4                      | 1/4                      | -TTT-FL12-FL12-FL4          |
| 3/4                      | 3/4                      | 3/8                      | -TTT-FL12-FL12-FL6          |
| 3/4                      | 3/4                      | 1/2                      | -TTT-FL12-FL12-FL8          |
| 3/4                      | 3/4                      | 5/8                      | -TTT-FL12-FL12-FL10         |

| Fractional Tube          |                          |                          |                             |
|--------------------------|--------------------------|--------------------------|-----------------------------|
| T1-Tube<br>O.D.<br>(in.) | T2-Tube<br>O.D.<br>(in.) | T3-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 7/8                      | 1/2                      | 3/4                      | -TTT-FL14-FL8-FL12          |
| 7/8                      | 5/8                      | 3/8                      | -TTT-FL14-FL10-FL6          |
| 7/8                      | 3/4                      | 3/8                      | -TTT-FL14-FL12-FL6          |
| 7/8                      | 3/4                      | 1/2                      | -TTT-FL14-FL12-FL8          |
| 7/8                      | 3/4                      | 3/4                      | -TTT-FL14-FL12-FL12         |
| 7/8                      | 7/8                      | 1/4                      | -TTT-FL14-FL14-FL4          |
| 7/8                      | 7/8                      | 3/8                      | -TTT-FL14-FL14-FL6          |
| 1                        | 3/8                      | 3/8                      | -TTT-FL16-FL6-FL6           |
| 1                        | 1/2                      | 1/4                      | -TTT-FL16-FL8-FL4           |
| 1                        | 1/2                      | 3/8                      | -TTT-FL16-FL8-FL6           |
| 1                        | 1/2                      | 1/2                      | -TTT-FL16-FL8-FL8           |
| 1                        | 1/2                      | 1                        | -TTT-FL16-FL8-FL16          |
| 1                        | 5/8                      | 3/8                      | -TTT-FL16-FL10-FL6          |
| 1                        | 3/4                      | 3/8                      | -TTT-FL16-FL12-FL6          |
| 1                        | 3/4                      | 1/2                      | -TTT-FL16-FL12-FL8          |
| 1                        | 3/4                      | 5/8                      | -TTT-FL16-FL12-FL10         |
| 1                        | 3/4                      | 1                        | -TTT-FL16-FL12-FL16         |
| 1                        | 7/8                      | 1/4                      | -TTT-FL16-FL14-FL4          |
| 1                        | 7/8                      | 3/8                      | -TTT-FL16-FL14-FL6          |
| 1                        | 7/8                      | 1/2                      | -TTT-FL16-FL14-FL8          |
| 1                        | 7/8                      | 3/4                      | -TTT-FL16-FL14-FL12         |
| 1                        | 7/8                      | 7/8                      | -TTT-FL16-FL14-FL14         |
| 1                        | 1                        | 1/4                      | -TTT-FL16-FL16-FL4          |
| 1                        | 1                        | 3/8                      | -TTT-FL16-FL16-FL6          |
| 1                        | 1                        | 1/2                      | -TTT-FL16-FL16-FL8          |
| 1                        | 1                        | 5/8                      | -TTT-FL16-FL16-FL10         |
| 1                        | 1                        | 3/4                      | -TTT-FL16-FL16-FL12         |
| 1                        | 1                        | 7/8                      | -TTT-FL16-FL16-FL14         |
| 1 1/4                    | 1 1/4                    | 1                        | -TTT-FL20-FL20-FL16         |
| 1 1/2                    | 1 1/2                    | 1                        | -TTT-FL24-FL24-FL16         |

## Reducing Union Tees



### Metric Tube

| T1-Tube<br>O.D.<br>(mm) | T2-Tube<br>O.D.<br>(mm) | T3-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
|-------------------------|-------------------------|-------------------------|-----------------------------|
| 3                       | 3                       | 6                       | -TTT-ML3-ML3-ML6            |
| 6                       | 6                       | 3                       | -TTT-ML6-ML6-ML3            |
| 6                       | 6                       | 8                       | -TTT-ML6-ML6-ML8            |
| 8                       | 8                       | 6                       | -TTT-ML8-ML8-ML6            |
| 8                       | 8                       | 12                      | -TTT-ML8-ML8-ML12           |
| 10                      | 10                      | 6                       | -TTT-ML10-ML10-ML6          |
| 10                      | 10                      | 8                       | -TTT-ML10-ML10-ML8          |
| 12                      | 12                      | 6                       | -TTT-ML12-ML12-ML6          |
| 12                      | 12                      | 8                       | -TTT-ML12-ML12-ML8          |
| 12                      | 12                      | 14                      | -TTT-ML12-ML12-ML14         |
| 12                      | 12                      | 18                      | -TTT-ML12-ML12-ML18         |
| 14                      | 14                      | 8                       | -TTT-ML14-ML14-ML8          |
| 14                      | 14                      | 10                      | -TTT-ML14-ML14-ML10         |
| 15                      | 15                      | 12                      | -TTT-ML15-ML15-ML12         |
| 16                      | 8                       | 16                      | -TTT-ML16-ML8-ML16          |
| 16                      | 16                      | 12                      | -TTT-ML16-ML16-ML12         |
| 18                      | 18                      | 8                       | -TTT-ML18-ML18-ML8          |
| 18                      | 18                      | 10                      | -TTT-ML18-ML18-ML10         |
| 18                      | 18                      | 12                      | -TTT-ML18-ML18-ML12         |
| 18                      | 18                      | 14                      | -TTT-ML18-ML18-ML14         |
| 20                      | 20                      | 14                      | -TTT-ML20-ML20-ML14         |
| 22                      | 22                      | 12                      | -TTT-ML22-ML22-ML12         |
| 25                      | 25                      | 12                      | -TTT-ML25-ML25-ML12         |

## Union Crosses



### Fractional Tube

| Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
|-----------------------|-----------------------------|
| 1/8                   | -C-FL2                      |
| 3/16                  | -C-FL3                      |
| 1/4                   | -C-FL4                      |
| 5/16                  | -C-FL5                      |
| 3/8                   | -C-FL6                      |
| 1/2                   | -C-FL8                      |
| 5/8                   | -C-FL10                     |
| 3/4                   | -C-FL12                     |
| 7/8                   | -C-FL14                     |
| 1                     | -C-FL16                     |

### Metric Tube

| Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
|----------------------|-----------------------------|
| 3                    | -C-ML3                      |
| 4                    | -C-ML4                      |
| 6                    | -C-ML6                      |
| 8                    | -C-ML8                      |
| 10                   | -C-ML10                     |
| 12                   | -C-ML12                     |
| 16                   | -C-ML16                     |
| 18                   | -C-ML18                     |
| 20                   | -C-ML20                     |
| 22                   | -C-ML22                     |
| 25                   | -C-ML25                     |

Caps



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -TC-FL1               |
| 1/8             | -TC-FL2               |
| 3/16            | -TC-FL3               |
| 1/4             | -TC-FL4               |
| 5/16            | -TC-FL5               |
| 3/8             | -TC-FL6               |
| 1/2             | -TC-FL8               |
| 5/8             | -TC-FL10              |
| 3/4             | -TC-FL12              |
| 7/8             | -TC-FL14              |
| 1               | -TC-FL16              |
| 1 1/8           | -TC-FL18              |
| 1 1/4           | -TC-FL20              |
| 1 1/2           | -TC-FL24              |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -TC-ML2               |
| 3              | -TC-ML3               |
| 4              | -TC-ML4               |
| 6              | -TC-ML6               |
| 8              | -TC-ML8               |
| 10             | -TC-ML10              |
| 12             | -TC-ML12              |
| 14             | -TC-ML14              |
| 15             | -TC-ML15              |
| 16             | -TC-ML16              |
| 18             | -TC-ML18              |
| 20             | -TC-ML20              |
| 22             | -TC-ML22              |
| 25             | -TC-ML25              |
| 28             | -TC-ML28              |
| 30             | -TC-ML30              |
| 32             | -TC-ML32              |
| 38             | -TC-ML38              |

Plugs



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -TP-FL1               |
| 1/8             | -TP-FL2               |
| 3/16            | -TP-FL3               |
| 1/4             | -TP-FL4               |
| 5/16            | -TP-FL5               |
| 3/8             | -TP-FL6               |
| 1/2             | -TP-FL8               |
| 5/8             | -TP-FL10              |
| 3/4             | -TP-FL12              |
| 7/8             | -TP-FL14              |
| 1               | -TP-FL16              |
| 1 1/4           | -TP-FL20              |
| 1 1/2           | -TP-FL24              |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -TP-ML2               |
| 3              | -TP-ML3               |
| 4              | -TP-ML4               |
| 6              | -TP-ML6               |
| 8              | -TP-ML8               |
| 10             | -TP-ML10              |
| 12             | -TP-ML12              |
| 14             | -TP-ML14              |
| 15             | -TP-ML15              |
| 16             | -TP-ML16              |
| 18             | -TP-ML18              |
| 20             | -TP-ML20              |
| 22             | -TP-ML22              |
| 25             | -TP-ML25              |
| 28             | -TP-ML28              |
| 30             | -TP-ML30              |
| 32             | -TP-ML32              |
| 38             | -TP-ML38              |

Vent Protectors



40 mesh stainless steel wire screen assembly

| NPT Thread |                 |
|------------|-----------------|
| NPT Size   | Ordering Number |
| 1/8        | SS-VPF-NS2      |
| 1/4        | SS-VPF-NS4      |
| 3/8        | SS-VPF-NS6      |
| 1/2        | SS-VPF-NS8      |
| 3/4        | SS-VPF-NS12     |
| 1          | SS-VPF-NS16     |

To order brass, replace SS in the ordering number with B  
Example: **B**-VPF-NS2

Lapped Flange Connectors



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/4             | -LFC-FL4A             |
| 1/4             | -LFC-FL4B             |
| 3/8             | -LFC-FL6A             |
| 3/8             | -LFC-FL6B             |
| 1/2             | -LFC-FL8A             |
| 1/2             | -LFC-FL8B             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 10             | -LFC-ML10A            |
| 10             | -LFC-ML10B            |

- ⦿ Standard material is 316 or Monel.
- ⦿ The flange ends are used with NPS 1/2 lap joint pipe flanges.
- ⦿ The flange ends are dimensioned to meet "ANSI B16.5 Class 2500" flange specifications.
- ⦿ The Flange Seal A means surface finish Ra 3.2-6.3 μm.  
The flange Seal B means Ra 6.3-12.5 μm.

Male Nuts



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -MN-FL1               |
| 1/8             | -MN-FL2               |
| 1/4             | -MN-FL4               |
| 1/2             | -MN-FL8               |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 3              | -MN-ML3               |
| 6              | -MN-ML6               |
| 10             | -MN-ML10              |
| 12             | -MN-ML12              |

Nuts



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -N-FL1                |
| 1/8             | -N-FL2                |
| 3/16            | -N-FL3                |
| 1/4             | -N-FL4                |
| 5/16            | -N-FL5                |
| 3/8             | -N-FL6                |
| 1/2             | -N-FL8                |
| 5/8             | -N-FL10               |
| 3/4             | -N-FL12               |
| 7/8             | -N-FL14               |
| 1               | -N-FL16               |
| 1 1/8           | -N-FL18               |
| 1 1/4           | -N-FL20               |
| 1 1/2           | -N-FL24               |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -N-ML2                |
| 3              | -N-ML3                |
| 4              | -N-ML4                |
| 6              | -N-ML6                |
| 8              | -N-ML8                |
| 10             | -N-ML10               |
| 12             | -N-ML12               |
| 14             | -N-ML14               |
| 15             | -N-ML15               |
| 16             | -N-ML16               |
| 18             | -N-ML18               |
| 20             | -N-ML20               |
| 22             | -N-ML22               |
| 25             | -N-ML25               |
| 28             | -N-ML28               |
| 30             | -N-ML30               |
| 32             | -N-ML32               |
| 38             | -N-ML38               |

Knurled Nuts



To order a knurled nut add K to the nut ordering number.  
Exemple: B-KN-FL4

Front Ferrules



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -FF-FL1               |
| 1/8             | -FF-FL2               |
| 3/16            | -FF-FL3               |
| 1/4             | -FF-FL4               |
| 5/16            | -FF-FL5               |
| 3/8             | -FF-FL6               |
| 1/2             | -FF-FL8               |
| 5/8             | -FF-FL10              |
| 3/4             | -FF-FL12              |
| 7/8             | -FF-FL14              |
| 1               | -FF-FL16              |
| 1 1/8           | -FF-FL18*             |
| 1 1/4           | -FF-FL20*             |
| 1 1/2           | -FF-FL24*             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -FF-ML2               |
| 3              | -FF-ML3               |
| 4              | -FF-ML4               |
| 6              | -FF-ML6               |
| 8              | -FF-ML8               |
| 10             | -FF-ML10              |
| 12             | -FF-ML12              |
| 14             | -FF-ML14              |
| 15             | -FF-ML15              |
| 16             | -FF-ML16              |
| 18             | -FF-ML18              |
| 20             | -FF-ML20              |
| 22             | -FF-ML22              |
| 25             | -FF-ML25              |
| 28             | -FF-ML28*             |
| 30             | -FF-ML30*             |
| 32             | -FF-ML32*             |
| 38             | -FF-ML38*             |

\* Stainless steel front ferrules over 1 in. or 25 mm are electro-silvered.

Rear Ferrules



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -RF-FL1               |
| 1/8             | -RF-FL2               |
| 3/16            | -RF-FL3               |
| 1/4             | -RF-FL4               |
| 5/16            | -RF-FL5               |
| 3/8             | -RF-FL6               |
| 1/2             | -RF-FL8               |
| 5/8             | -RF-FL10              |
| 3/4             | -RF-FL12              |
| 7/8             | -RF-FL14              |
| 1               | -RF-FL16              |
| 1 1/8           | -RF-FL18*             |
| 1 1/4           | -RF-FL20*             |
| 1 1/2           | -RF-FL24*             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -RF-ML2               |
| 3              | -RF-ML3               |
| 4              | -RF-ML4               |
| 6              | -RF-ML6               |
| 8              | -RF-ML8               |
| 10             | -RF-ML10              |
| 12             | -RF-ML12              |
| 14             | -RF-ML14              |
| 15             | -RF-ML15              |
| 16             | -RF-ML16              |
| 18             | -RF-ML18              |
| 20             | -RF-ML20              |
| 22             | -RF-ML22              |
| 25             | -RF-ML25              |
| 28             | -RF-ML28*             |
| 30             | -RF-ML30*             |
| 32             | -RF-ML32*             |
| 38             | -RF-ML38*             |

Nuts+Ferrules



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -NFR-FL1              |
| 1/8             | -NFR-FL2              |
| 3/16            | -NFR-FL3              |
| 1/4             | -NFR-FL4              |
| 5/16            | -NFR-FL5              |
| 3/8             | -NFR-FL6              |
| 1/2             | -NFR-FL8              |
| 5/8             | -NFR-FL10             |
| 3/4             | -NFR-FL12             |
| 7/8             | -NFR-FL14             |
| 1               | -NFR-FL16             |
| 1 1/8           | -NFR-FL18             |
| 1 1/4           | -NFR-FL20             |
| 1 1/2           | -NFR-FL24             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -NFR-ML2              |
| 3              | -NFR-ML3              |
| 4              | -NFR-ML4              |
| 6              | -NFR-ML6              |
| 8              | -NFR-ML8              |
| 10             | -NFR-ML10             |
| 12             | -NFR-ML12             |
| 14             | -NFR-ML14             |
| 15             | -NFR-ML15             |
| 16             | -NFR-ML16             |
| 18             | -NFR-ML18             |
| 20             | -NFR-ML20             |
| 22             | -NFR-ML22             |
| 25             | -NFR-ML25             |
| 28             | -NFR-ML28             |
| 30             | -NFR-ML30             |
| 32             | -NFR-ML32             |
| 38             | -NFR-ML38             |

Nut-Ferrule Sets



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -NFS-FL1              |
| 1/8             | -NFS-FL2              |
| 3/16            | -NFS-FL3              |
| 1/4             | -NFS-FL4              |
| 5/16            | -NFS-FL5              |
| 3/8             | -NFS-FL6              |
| 1/2             | -NFS-FL8              |
| 5/8             | -NFS-FL10             |
| 3/4             | -NFS-FL12             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -NFS-ML2              |
| 3              | -NFS-ML3              |
| 4              | -NFS-ML4              |
| 6              | -NFS-ML6              |
| 8              | -NFS-ML8              |
| 10             | -NFS-ML10             |
| 12             | -NFS-ML12             |
| 14             | -NFS-ML14             |
| 15             | -NFS-ML15             |
| 16             | -NFS-ML16             |
| 18             | -NFS-ML18             |

Each Nut-Ferrule Set contains 5 nuts, 5 front ferrules and 5 rear ferrules.

Ferrule Sets

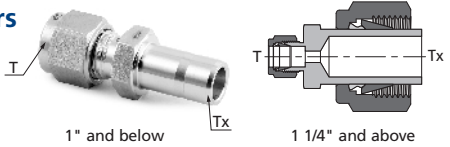


| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -FRS-FL1              |
| 1/8             | -FRS-FL2              |
| 3/16            | -FRS-FL3              |
| 1/4             | -FRS-FL4              |
| 5/16            | -FRS-FL5              |
| 3/8             | -FRS-FL6              |
| 1/2             | -FRS-FL8              |
| 5/8             | -FRS-FL10             |
| 3/4             | -FRS-FL12             |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 2              | -FRS-ML2              |
| 3              | -FRS-ML3              |
| 4              | -FRS-ML4              |
| 6              | -FRS-ML6              |
| 8              | -FRS-ML8              |
| 10             | -FRS-ML10             |
| 12             | -FRS-ML12             |
| 14             | -FRS-ML14             |
| 15             | -FRS-ML15             |
| 16             | -FRS-ML16             |
| 18             | -FRS-ML18             |

Each Ferrule Set contains 10 front ferrules and 10 rear ferrules.

Reducers



1" and below

1 1/4" and above

| Fractional Tube   |                    |                       |
|-------------------|--------------------|-----------------------|
| T-Tube O.D. (in.) | Tx-Tube O.D. (in.) | Basic Ordering Number |
| 1/16              | 1/8                | -R-FL1-FT2            |
| 1/16              | 3/16               | -R-FL1-FT3            |
| 1/16              | 1/4                | -R-FL1-FT4            |
| 1/8               | 1/16               | -R-FL2-FT1            |
| 1/8               | 1/8                | -R-FL2-FT2            |
| 1/8               | 3/16               | -R-FL2-FT3            |
| 1/8               | 1/4                | -R-FL2-FT4            |
| 1/8               | 3/8                | -R-FL2-FT6            |
| 1/8               | 1/2                | -R-FL2-FT8            |
| 3/16              | 1/8                | -R-FL3-FT2            |
| 3/16              | 1/4                | -R-FL3-FT4            |
| 1/4               | 1/8                | -R-FL4-FT2            |
| 1/4               | 3/16               | -R-FL4-FT3            |
| 1/4               | 1/4                | -R-FL4-FT4            |
| 1/4               | 5/16               | -R-FL4-FT5            |
| 1/4               | 3/8                | -R-FL4-FT6            |
| 1/4               | 1/2                | -R-FL4-FT8            |
| 1/4               | 5/8                | -R-FL4-FT10           |
| 1/4               | 3/4                | -R-FL4-FT12           |
| 5/16              | 3/8                | -R-FL5-FT6            |
| 5/16              | 1/2                | -R-FL5-FT8            |
| 3/8               | 1/4                | -R-FL6-FT4            |
| 3/8               | 3/8                | -R-FL6-FT6            |
| 3/8               | 1/2                | -R-FL6-FT8            |
| 3/8               | 5/8                | -R-FL6-FT10           |
| 3/8               | 3/4                | -R-FL6-FT12           |
| 1/2               | 1/4                | -R-FL8-FT4            |
| 1/2               | 3/8                | -R-FL8-FT6            |

| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/2                     | 1/2                      | -R-FL8-FT8                  |
| 1/2                     | 5/8                      | -R-FL8-FT10                 |
| 1/2                     | 3/4                      | -R-FL8-FT12                 |
| 1/2                     | 1                        | -R-FL8-FT16                 |
| 5/8                     | 3/4                      | -R-FL10-FT12                |
| 5/8                     | 7/8                      | -R-FL10-FT14                |
| 5/8                     | 1                        | -R-FL10-FT16                |
| 3/4                     | 3/4                      | -R-FL12-FT12                |
| 3/4                     | 1                        | -R-FL12-FT16                |
| 1                       | 1 1/4                    | -R-FL16-FT20                |
| 1                       | 1 1/2                    | -R-FL16-FT24                |
| 1                       | 2                        | -R-FL16-FT32                |
| 1 1/4                   | 1 1/2                    | -R-FL20-FT24                |

## Reducers



| Metric Tube            |                         |                             |
|------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 2                      | 3                       | -R-ML2-MT3                  |
| 3                      | 4                       | -R-ML3-MT4                  |
| 3                      | 6                       | -R-ML3-MT6                  |
| 3                      | 10                      | -R-ML3-MT10                 |
| 4                      | 6                       | -R-ML4-MT6                  |
| 6                      | 3                       | -R-ML6-MT3                  |
| 6                      | 8                       | -R-ML6-MT8                  |
| 6                      | 10                      | -R-ML6-MT10                 |

| Metric Tube            |                         |                             |
|------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 6                      | 12                      | -R-ML6-MT12                 |
| 6                      | 18                      | -R-ML6-MT18                 |
| 8                      | 6                       | -R-ML8-MT6                  |
| 8                      | 10                      | -R-ML8-MT10                 |
| 8                      | 12                      | -R-ML8-MT12                 |
| 10                     | 6                       | -R-ML10-MT6                 |
| 10                     | 8                       | -R-ML10-MT8                 |
| 10                     | 12                      | -R-ML10-MT12                |
| 10                     | 15                      | -R-ML10-MT15                |
| 10                     | 18                      | -R-ML10-MT18                |
| 12                     | 6                       | -R-ML12-MT6                 |
| 12                     | 8                       | -R-ML12-MT8                 |
| 12                     | 10                      | -R-ML12-MT10                |
| 12                     | 16                      | -R-ML12-MT16                |
| 12                     | 18                      | -R-ML12-MT18                |
| 12                     | 20                      | -R-ML12-MT20                |
| 12                     | 22                      | -R-ML12-MT22                |
| 12                     | 25                      | -R-ML12-MT25                |
| 16                     | 12                      | -R-ML16-MT12                |
| 18                     | 12                      | -R-ML18-MT12                |
| 18                     | 16                      | -R-ML18-MT16                |
| 18                     | 20                      | -R-ML18-MT20                |
| 18                     | 22                      | -R-ML18-MT22                |
| 18                     | 25                      | -R-ML18-MT25                |
| 20                     | 16                      | -R-ML20-MT16                |
| 20                     | 18                      | -R-ML20-MT18                |
| 20                     | 22                      | -R-ML20-MT22                |
| 20                     | 25                      | -R-ML20-MT25                |
| 22                     | 18                      | -R-ML22-MT18                |
| 22                     | 20                      | -R-ML22-MT20                |
| 22                     | 25                      | -R-ML22-MT25                |
| 25                     | 18                      | -R-ML25-MT18                |
| 25                     | 20                      | -R-ML25-MT20                |

## Reducers



| Metric Tube            |                          | Fractional Tube             |
|------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 2                      | 1/8                      | -R-ML2-FT2                  |
| 3                      | 1/8                      | -R-ML3-FT2                  |
| 3                      | 1/4                      | -R-ML3-FT4                  |
| 4                      | 1/4                      | -R-ML4-FT4                  |
| 6                      | 1/8                      | -R-ML6-FT2                  |
| 6                      | 1/4                      | -R-ML6-FT4                  |
| 6                      | 5/16                     | -R-ML6-FT5                  |
| 6                      | 3/8                      | -R-ML6-FT6                  |
| 6                      | 1/2                      | -R-ML6-FT8                  |
| 8                      | 1/4                      | -R-ML8-FT4                  |
| 8                      | 3/8                      | -R-ML8-FT6                  |
| 8                      | 1/2                      | -R-ML8-FT8                  |
| 10                     | 3/8                      | -R-ML10-FT6                 |
| 10                     | 1/2                      | -R-ML10-FT8                 |
| 12                     | 1/2                      | -R-ML12-FT8                 |
| 12                     | 3/4                      | -R-ML12-FT12                |
| 18                     | 3/4                      | -R-ML18-FT12                |
| 18                     | 1                        | -R-ML18-FT16                |
| 25                     | 1                        | -R-ML25-FT16                |

| Fractional Tube         |                         | Metric Tube                 |
|-------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 1/8                     | 6                       | -R-FL2-MT6                  |

## Bulkhead Reducers



| Fractional Tube         |                          |                             |
|-------------------------|--------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
| 1/8                     | 1/8                      | -BR-FL2-FT2                 |
| 1/4                     | 1/4                      | -BR-FL4-FT4                 |
| 3/8                     | 3/8                      | -BR-FL6-FT6                 |
| 1/2                     | 1/2                      | -BR-FL8-FT8                 |
| 5/8                     | 5/8                      | -BR-FL10-FT10               |
| 3/4                     | 3/4                      | -BR-FL12-FT12               |
| 1                       | 1                        | -BR-FL16-FT16               |

## Reducer Elbows



| Metric Tube            |                         |                             |
|------------------------|-------------------------|-----------------------------|
| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
| 6                      | 6                       | -LR-ML6-MT6                 |
| 12                     | 12                      | -LR-ML12-MT12               |

Insert for Soft Plastic Tubings



| Fractional Tube   |                    |                       |
|-------------------|--------------------|-----------------------|
| T-Tube O.D. (in.) | Tx-Tube I.D. (in.) | Basic Ordering Number |
| 3/16              | 1/8                | -IN-3-2               |
| 1/4               | 1/8                | -IN-4-2               |
| 1/4               | 0.17               | -IN-4-017             |
| 1/4               | 3/16               | -IN-4-3               |
| 5/16              | 1/8                | -IN-5-2               |
| 5/16              | 3/16               | -IN-5-3               |
| 5/16              | 1/4                | -IN-5-4               |
| 3/8               | 3/16               | -IN-6-3               |
| 3/8               | 1/4                | -IN-6-4               |
| 1/2               | 1/4                | -IN-8-4               |
| 1/2               | 3/8                | -IN-8-6               |
| 5/8               | 3/8                | -IN-10-6              |
| 5/8               | 1/2                | -IN-10-8              |
| 3/4               | 1/2                | -IN-12-8              |
| 3/4               | 5/8                | -IN-12-10             |
| 1                 | 3/4                | -IN-16-12             |

| Metric Tube      |                   |                       |
|------------------|-------------------|-----------------------|
| T-Tube O.D. (mm) | Tx-Tube I.D. (mm) | Basic Ordering Number |
| 6                | 4                 | -IN-6M-4M             |
| 8                | 6                 | -IN-8M-6M             |
| 10               | 8                 | -IN-10M-8M            |
| 12               | 8                 | -IN-12M-8M            |
| 12               | 10                | -IN-12M-10M           |

Port Connectors



1" /25 mm and below

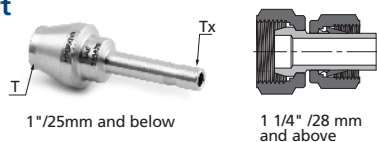


1 1/4" /28 mm and above

| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/16            | -P-FL1                |
| 1/8             | -P-FL2                |
| 1/4             | -P-FL4                |
| 5/16            | -P-FL5                |
| 3/8             | -P-FL6                |
| 1/2             | -P-FL8                |
| 5/8             | -P-FL10               |
| 3/4             | -P-FL12               |
| 1               | -P-FL16               |
| 1 1/4           | -P-FL20               |
| 1 1/2           | -P-FL24               |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 3              | -P-ML3                |
| 6              | -P-ML6                |
| 8              | -P-ML8                |
| 10             | -P-ML10               |
| 12             | -P-ML12               |
| 15             | -P-ML15               |
| 16             | -P-ML16               |
| 18             | -P-ML18               |
| 20             | -P-ML20               |
| 25             | -P-ML25               |
| 28             | -P-ML28               |
| 30             | -P-ML30               |
| 32             | -P-ML32               |
| 38             | -P-ML38               |

## Reducing Port Connectors



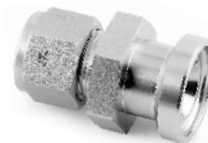
Fractional Tube

| T-Tube<br>O.D.<br>(in.) | Tx-Tube<br>O.D.<br>(in.) | Basic<br>Ordering<br>Number |
|-------------------------|--------------------------|-----------------------------|
| 1/8                     | 1/16                     | -P-FL2-FL1                  |
| 1/4                     | 1/16                     | -P-FL4-FL1                  |
| 1/4                     | 1/8                      | -P-FL4-FL2                  |
| 3/8                     | 1/8                      | -P-FL6-FL2                  |
| 3/8                     | 1/4                      | -P-FL6-FL4                  |
| 1/2                     | 1/4                      | -P-FL8-FL4                  |
| 1/2                     | 3/8                      | -P-FL8-FL6                  |
| 3/4                     | 1/2                      | -P-FL12-FL8                 |
| 1                       | 1/2                      | -P-FL16-FL8                 |
| 1                       | 3/4                      | -P-FL16-FL12                |

Metric Tube

| T-Tube<br>O.D.<br>(mm) | Tx-Tube<br>O.D.<br>(mm) | Basic<br>Ordering<br>Number |
|------------------------|-------------------------|-----------------------------|
| 6                      | 3                       | -P-ML6-ML3                  |
| 8                      | 6                       | -P-ML8-ML6                  |
| 10                     | 6                       | -P-ML10-ML6                 |
| 10                     | 8                       | -P-ML10-ML8                 |
| 12                     | 6                       | -P-ML12-ML6                 |
| 12                     | 8                       | -P-ML12-ML8                 |
| 12                     | 10                      | -P-ML12-ML10                |
| 16                     | 12                      | -P-ML16-ML12                |
| 28                     | 25                      | -P-ML28-ML25                |
| 32                     | 25                      | -P-ML32-ML25                |
| 38                     | 25                      | -P-ML38-ML25                |

## Sanitary Flange Fittings



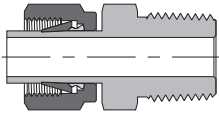
Fractional Tube

| Tube<br>O.D.<br>(in.) | Flange<br>Size<br>(in.) | Basic<br>Ordering<br>Number |
|-----------------------|-------------------------|-----------------------------|
| 1/4                   | 1/2                     | -SFF-FL4-SC8                |
| 1/4                   | 3/4                     | -SFF-FL4-SC12               |
| 1/4                   | 1                       | -SFF-FL4-SC16               |
| 1/4                   | 1 1/2                   | -SFF-FL4-SC24               |
| 3/8                   | 1/2                     | -SFF-FL6-SC8                |
| 3/8                   | 3/4                     | -SFF-FL6-SC12               |
| 3/8                   | 1                       | -SFF-FL6-SC16               |
| 3/8                   | 1 1/2                   | -SFF-FL6-SC24               |
| 1/2                   | 1/2                     | -SFF-FL8-SC8                |
| 1/2                   | 3/4                     | -SFF-FL8-SC12               |
| 1/2                   | 1                       | -SFF-FL8-SC16               |
| 1/2                   | 1 1/2                   | -SFF-FL8-SC24               |
| 1                     | 1                       | -SFF-FL16-SC16              |
| 1                     | 2                       | -SFF-FL16-SC32              |

Male Adapters



1" and below



1 1/4" and above

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/8      | -AM-FT1-NS2           |
| 1/8             | 1/8      | -AM-FT2-NS2           |
| 1/8             | 1/4      | -AM-FT2-NS4           |
| 3/16            | 1/8      | -AM-FT3-NS2           |
| 3/16            | 1/4      | -AM-FT3-NS4           |
| 1/4             | 1/8      | -AM-FT4-NS2           |
| 1/4             | 1/4      | -AM-FT4-NS4           |
| 1/4             | 3/8      | -AM-FT4-NS6           |
| 1/4             | 1/2      | -AM-FT4-NS8           |
| 5/16            | 1/8      | -AM-FT5-NS2           |
| 5/16            | 1/4      | -AM-FT5-NS4           |
| 5/16            | 3/8      | -AM-FT5-NS6           |
| 5/16            | 1/2      | -AM-FT5-NS8           |
| 3/8             | 1/8      | -AM-FT6-NS2           |
| 3/8             | 1/4      | -AM-FT6-NS4           |
| 3/8             | 3/8      | -AM-FT6-NS6           |
| 3/8             | 1/2      | -AM-FT6-NS8           |
| 1/2             | 1/4      | -AM-FT8-NS4           |
| 1/2             | 3/8      | -AM-FT8-NS6           |
| 1/2             | 1/2      | -AM-FT8-NS8           |
| 5/8             | 1/2      | -AM-FT10-NS8          |

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 3/4             | 1/2      | -AM-FT12-NS8          |
| 3/4             | 3/4      | -AM-FT12-NS12         |
| 3/4             | 1        | -AM-FT12-NS16         |
| 1               | 3/4      | -AM-FT16-NS12         |
| 1               | 1        | -AM-FT16-NS16         |
| 1 1/4           | 1 1/4    | -AM-FT20-NS20         |
| 1 1/2           | 1 1/2    | -AM-FT24-NS24         |

| Fractional Tube |                         | ISO Tapered Thread (RT) |
|-----------------|-------------------------|-------------------------|
| Tube O.D. (in.) | ISO Tapered Thread Size | Basic Ordering Number   |
| 1/8             | 1/8                     | -AM-FT2-RT2             |
| 1/8             | 1/4                     | -AM-FT2-RT4             |
| 1/4             | 1/8                     | -AM-FT4-RT2             |
| 1/4             | 1/4                     | -AM-FT4-RT4             |
| 1/4             | 3/8                     | -AM-FT4-RT6             |
| 1/4             | 1/2                     | -AM-FT4-RT8             |
| 5/16            | 1/8                     | -AM-FT5-RT2             |
| 5/16            | 1/4                     | -AM-FT5-RT4             |
| 3/8             | 1/4                     | -AM-FT6-RT4             |
| 3/8             | 3/8                     | -AM-FT6-RT6             |
| 3/8             | 1/2                     | -AM-FT6-RT8             |
| 1/2             | 1/4                     | -AM-FT8-RT4             |
| 1/2             | 3/8                     | -AM-FT8-RT6             |
| 1/2             | 1/2                     | -AM-FT8-RT8             |
| 5/8             | 3/8                     | -AM-FT10-RT6            |
| 5/8             | 1/2                     | -AM-FT10-RT8            |
| 3/4             | 3/4                     | -AM-FT12-RT12           |
| 1               | 1                       | -AM-FT16-RT16           |

Male Adapters



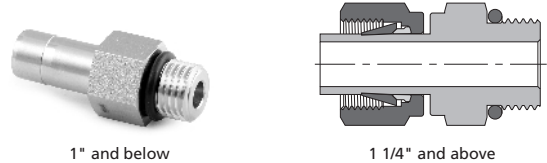
| Fractional Tube |                          | ISO Parallel Thread (RS) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/8             | 1/8                      | -AM-FT2-RS2              |  |
| 1/8             | 1/4                      | -AM-FT2-RS4              |  |
| 1/4             | 1/8                      | -AM-FT4-RS2              |  |
| 1/4             | 1/4                      | -AM-FT4-RS4              |  |
| 3/8             | 1/8                      | -AM-FT6-RS2              |  |
| 3/8             | 1/4                      | -AM-FT6-RS4              |  |
| 3/8             | 3/8                      | -AM-FT6-RS6              |  |
| 3/8             | 1/2                      | -AM-FT6-RS8              |  |
| 1/2             | 1/4                      | -AM-FT8-RS4              |  |
| 1/2             | 3/8                      | -AM-FT8-RS6              |  |
| 1/2             | 1/2                      | -AM-FT8-RS8              |  |
| 5/8             | 1/2                      | -AM-FT10-RS8             |  |
| 3/4             | 3/4                      | -AM-FT12-RS12            |  |
| 1               | 1                        | -AM-FT16-RS16            |  |

Male Adapters



| Fractional Tube |                          | ISO Parallel Thread (RP) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/8             | 1/8                      | -AM-FT2-RP2              |  |
| 1/8             | 1/4                      | -AM-FT2-RP4              |  |
| 1/4             | 1/8                      | -AM-FT4-RP2              |  |
| 1/4             | 1/4                      | -AM-FT4-RP4              |  |
| 3/8             | 1/8                      | -AM-FT6-RP2              |  |
| 3/8             | 1/4                      | -AM-FT6-RP4              |  |
| 3/8             | 3/8                      | -AM-FT6-RP6              |  |
| 3/8             | 1/2                      | -AM-FT6-RP8              |  |
| 1/2             | 1/4                      | -AM-FT8-RP4              |  |
| 1/2             | 3/8                      | -AM-FT8-RP6              |  |
| 1/2             | 1/2                      | -AM-FT8-RP8              |  |
| 5/8             | 1/2                      | -AM-FT10-RP8             |  |
| 3/4             | 3/4                      | -AM-FT12-RP12            |  |
| 1               | 1                        | -AM-FT16-RP16            |  |

Male Adapters



| Fractional Tube |                    | SAE/MS Straight Thread |  |
|-----------------|--------------------|------------------------|--|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number  |  |
| 1/8             | 5/16-24            | -AM-FT2-ST5            |  |
| 1/4             | 7/16-20            | -AM-FT4-ST7            |  |
| 3/8             | 7/16-20            | -AM-FT6-ST7            |  |
| 3/8             | 9/16-18            | -AM-FT6-ST9            |  |
| 3/8             | 3/4-16             | -AM-FT6-ST12           |  |
| 1/2             | 9/16-18            | -AM-FT8-ST9            |  |
| 1/2             | 3/4-16             | -AM-FT8-ST12           |  |
| 5/8             | 7/8-14             | -AM-FT10-ST14          |  |
| 3/4             | 1 1/16-12          | -AM-FT12-ST17          |  |
| 1               | 1 5/16-12          | -AM-FT16-ST21          |  |
| 1 1/4           | 1 5/8-12           | -AM-FT20-ST26          |  |
| 1 1/2           | 1 7/8-12           | -AM-FT24-ST30          |  |

Adapt to straight thread boss of SAE J1926-1, ISO 11926-1 and MS 16142.

Male Adapters



| Fractional Tube |                    | 37°Flare (AN)         |  |
|-----------------|--------------------|-----------------------|--|
| Tube O.D. (in.) | AN Tube Flare Size | Basic Ordering Number |  |
| 1/4             | 1/4                | -AM-FT4-AN4           |  |
| 3/8             | 1/4                | -AM-FT6-AN4           |  |
| 3/8             | 3/8                | -AM-FT6-AN6           |  |
| 1/2             | 1/2                | -AM-FT8-AN8           |  |
| 3/4             | 3/4                | -AM-FT12-AN12         |  |
| 1               | 1                  | -AM-FT16-AN16         |  |

Male Adapters

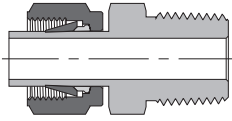


| Fractional Tube |                    | O-Seal with SAE/MS Straight Thread |  |
|-----------------|--------------------|------------------------------------|--|
| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number              |  |
| 1/8             | 5/16-24            | -AM-FT2-OST5                       |  |
| 3/16            | 3/8-24             | -AM-FT3-OST6                       |  |
| 1/4             | 7/16-20            | -AM-FT4-OST7                       |  |
| 5/16            | 1/2-20             | -AM-FT5-OST8                       |  |
| 3/8             | 9/16-18            | -AM-FT6-OST9                       |  |
| 1/2             | 3/4-16             | -AM-FT8-OST12                      |  |

Male Adapters



25 mm and below



28 mm and above

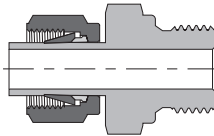
| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 3              | 1/8      | -AM-MT3-NS2           |
| 4              | 1/8      | -AM-MT4-NS2           |
| 6              | 1/8      | -AM-MT6-NS2           |
| 6              | 1/4      | -AM-MT6-NS4           |
| 6              | 3/8      | -AM-MT6-NS6           |
| 6              | 1/2      | -AM-MT6-NS8           |
| 8              | 1/4      | -AM-MT8-NS4           |
| 8              | 3/8      | -AM-MT8-NS6           |
| 10             | 1/4      | -AM-MT10-NS4          |
| 10             | 3/8      | -AM-MT10-NS6          |
| 10             | 1/2      | -AM-MT10-NS8          |
| 12             | 1/4      | -AM-MT12-NS4          |
| 12             | 3/8      | -AM-MT12-NS6          |
| 12             | 1/2      | -AM-MT12-NS8          |
| 16             | 1/2      | -AM-MT16-NS8          |
| 16             | 3/4      | -AM-MT16-NS12         |
| 18             | 1/2      | -AM-MT18-NS8          |
| 18             | 3/4      | -AM-MT18-NS12         |
| 20             | 1/2      | -AM-MT20-NS8          |
| 20             | 3/4      | -AM-MT20-NS12         |
| 25             | 1        | -AM-MT25-NS16         |
| 28             | 1        | -AM-MT28-NS16         |
| 28             | 1 1/4    | -AM-MT28-NS20         |
| 30             | 1        | -AM-MT30-NS16         |
| 30             | 1 1/4    | -AM-MT30-NS20         |
| 32             | 1 1/4    | -AM-MT32-NS20         |
| 38             | 1 1/2    | -AM-MT38-NS24         |

| Metric Tube    |                         | ISO Tapered Thread (RT) |
|----------------|-------------------------|-------------------------|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |
| 3              | 1/8                     | -AM-MT3-RT2             |
| 4              | 1/8                     | -AM-MT4-RT2             |
| 6              | 1/8                     | -AM-MT6-RT2             |
| 6              | 1/4                     | -AM-MT6-RT4             |
| 8              | 1/4                     | -AM-MT8-RT4             |
| 8              | 3/8                     | -AM-MT8-RT6             |
| 10             | 1/4                     | -AM-MT10-RT4            |
| 10             | 3/8                     | -AM-MT10-RT6            |
| 10             | 1/2                     | -AM-MT10-RT8            |
| 12             | 1/4                     | -AM-MT12-RT4            |
| 12             | 3/8                     | -AM-MT12-RT6            |
| 12             | 1/2                     | -AM-MT12-RT8            |
| 16             | 1/2                     | -AM-MT16-RT8            |
| 18             | 3/4                     | -AM-MT18-RT12           |
| 20             | 3/4                     | -AM-MT20-RT12           |
| 25             | 1                       | -AM-MT25-RT16           |
| 28             | 1                       | -AM-MT28-RT16           |
| 28             | 1 1/4                   | -AM-MT28-RT20           |
| 30             | 1 1/4                   | -AM-MT30-RT20           |
| 32             | 1 1/4                   | -AM-MT32-RT20           |
| 38             | 1 1/2                   | -AM-MT38-RT24           |

Male Adapters



25 mm and below



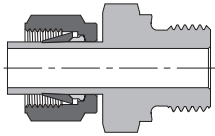
28 mm and above

| Metric Tube    |                          | ISO Parallel Thread (RS) |  |
|----------------|--------------------------|--------------------------|--|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 3              | 1/8                      | -AM-MT3-RS2              |  |
| 4              | 1/8                      | -AM-MT4-RS2              |  |
| 6              | 1/8                      | -AM-MT6-RS2              |  |
| 6              | 1/4                      | -AM-MT6-RS4              |  |
| 8              | 1/4                      | -AM-MT8-RS4              |  |
| 10             | 1/4                      | -AM-MT10-RS4             |  |
| 10             | 3/8                      | -AM-MT10-RS6             |  |
| 10             | 1/2                      | -AM-MT10-RS8             |  |
| 12             | 1/4                      | -AM-MT12-RS4             |  |
| 12             | 3/8                      | -AM-MT12-RS6             |  |
| 12             | 1/2                      | -AM-MT12-RS8             |  |
| 16             | 1/2                      | -AM-MT16-RS8             |  |
| 18             | 3/4                      | -AM-MT18-RS12            |  |
| 20             | 3/4                      | -AM-MT20-RS12            |  |
| 25             | 1                        | -AM-MT25-RS16            |  |
| 28             | 1                        | -AM-MT28-RS16            |  |
| 28             | 1 1/4                    | -AM-MT28-RS20            |  |
| 30             | 1 1/4                    | -AM-MT30-RS20            |  |
| 32             | 1 1/4                    | -AM-MT32-RS20            |  |
| 38             | 1 1/2                    | -AM-MT38-RS24            |  |

Male Adapters



25 mm and below



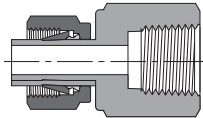
28 mm and above

| Metric Tube    |                          | ISO Parallel Thread (RP) |  |
|----------------|--------------------------|--------------------------|--|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 3              | 1/8                      | -AM-MT3-RP2              |  |
| 4              | 1/8                      | -AM-MT4-RP2              |  |
| 6              | 1/8                      | -AM-MT6-RP2              |  |
| 6              | 1/4                      | -AM-MT6-RP4              |  |
| 8              | 1/4                      | -AM-MT8-RP4              |  |
| 10             | 1/4                      | -AM-MT10-RP4             |  |
| 10             | 3/8                      | -AM-MT10-RP6             |  |
| 10             | 1/2                      | -AM-MT10-RP8             |  |
| 12             | 1/4                      | -AM-MT12-RP4             |  |
| 12             | 3/8                      | -AM-MT12-RP6             |  |
| 12             | 1/2                      | -AM-MT12-RP8             |  |
| 16             | 1/2                      | -AM-MT16-RP8             |  |
| 18             | 3/4                      | -AM-MT18-RP12            |  |
| 20             | 3/4                      | -AM-MT20-RP12            |  |
| 25             | 1                        | -AM-MT25-RP16            |  |
| 28             | 1                        | -AM-MT28-RP16            |  |
| 28             | 1 1/4                    | -AM-MT28-RP20            |  |
| 30             | 1 1/4                    | -AM-MT30-RP20            |  |
| 32             | 1 1/4                    | -AM-MT32-RP20            |  |
| 38             | 1 1/2                    | -AM-MT38-RP24            |  |

Female Adapters



1" and below



1 1/4" and above

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 1/16            | 1/8      | -AF-FT1-NS2           |
| 1/8             | 1/8      | -AF-FT2-NS2           |
| 1/8             | 1/4      | -AF-FT2-NS4           |
| 3/16            | 1/8      | -AF-FT3-NS2           |
| 3/16            | 1/4      | -AF-FT3-NS4           |
| 1/4             | 1/8      | -AF-FT4-NS2           |
| 1/4             | 1/4      | -AF-FT4-NS4           |
| 1/4             | 3/8      | -AF-FT4-NS6           |
| 1/4             | 1/2      | -AF-FT4-NS8           |
| 5/16            | 1/8      | -AF-FT5-NS2           |
| 5/16            | 1/4      | -AF-FT5-NS4           |
| 5/16            | 3/8      | -AF-FT5-NS6           |
| 3/8             | 1/8      | -AF-FT6-NS2           |
| 3/8             | 1/4      | -AF-FT6-NS4           |
| 3/8             | 3/8      | -AF-FT6-NS6           |
| 3/8             | 1/2      | -AF-FT6-NS8           |
| 1/2             | 1/4      | -AF-FT8-NS4           |
| 1/2             | 3/8      | -AF-FT8-NS6           |
| 1/2             | 1/2      | -AF-FT8-NS8           |
| 5/8             | 3/8      | -AF-FT10-NS6          |
| 5/8             | 1/2      | -AF-FT10-NS8          |

| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 3/4             | 1/2      | -AF-FT12-NS8          |
| 3/4             | 3/4      | -AF-FT12-NS12         |
| 3/4             | 1        | -AF-FT12-NS16         |
| 7/8             | 3/4      | -AF-FT14-NS12         |
| 1               | 3/4      | -AF-FT16-NS12         |
| 1               | 1        | -AF-FT16-NS16         |
| 1 1/4           | 1 1/4    | -AF-FT20-NS20         |
| 1 1/2           | 1 1/2    | -AF-FT24-NS24         |

| Fractional Tube | ISO Tapered Thread (RT) |                       |
|-----------------|-------------------------|-----------------------|
| Tube O.D. (in.) | ISO Tapered Thread Size | Basic Ordering Number |
| 1/4             | 1/8                     | -AF-FT4-RT2           |
| 1/4             | 1/4                     | -AF-FT4-RT4           |
| 3/8             | 1/4                     | -AF-FT6-RT4           |
| 3/8             | 3/8                     | -AF-FT6-RT6           |
| 1/2             | 1/4                     | -AF-FT8-RT4           |
| 1/2             | 3/8                     | -AF-FT8-RT6           |
| 1/2             | 1/2                     | -AF-FT8-RT8           |

Female Adapters



| Fractional Tube |                          | ISO Parallel Thread (RP) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/8             | 1/8                      | -AF-FT2-RP2              |  |
| 1/4             | 1/8                      | -AF-FT4-RP2              |  |
| 1/4             | 1/4                      | -AF-FT4-RP4              |  |
| 3/8             | 1/4                      | -AF-FT6-RP4              |  |
| 3/8             | 3/8                      | -AF-FT6-RP6              |  |
| 1/2             | 3/8                      | -AF-FT8-RP6              |  |
| 1/2             | 1/2                      | -AF-FT8-RP8              |  |

Female Adapters



| Fractional Tube |                          | ISO Parallel Thread (RG) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/4             | 1/4                      | -AF-FT4-RG4              |  |
| 3/8             | 3/8                      | -AF-FT6-RG6              |  |
| 1/2             | 1/2                      | -AF-FT8-RG8              |  |

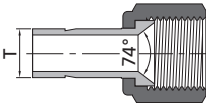
Female Adapters



Adapt to Japanese gauge stud.

| Fractional Tube |                          | ISO Parallel Thread (RJ) |  |
|-----------------|--------------------------|--------------------------|--|
| Tube O.D. (in.) | ISO Parallel Thread Size | Basic Ordering Number    |  |
| 1/4             | 1/4                      | -AF-FT4-RJ4              |  |
| 3/8             | 3/8                      | -AF-FT6-RJ6              |  |
| 1/2             | 1/2                      | -AF-FT8-RJ8              |  |

Female Adapters



| Fractional Tube |                         | AN Thread             |  |
|-----------------|-------------------------|-----------------------|--|
| Tube O.D. (in.) | AN Tube Flare Size(in.) | Basic Ordering Number |  |
| 1/8             | 1/8                     | -AF-FT2-AN2           |  |
| 1/8             | 1/4                     | -AF-FT2-AN4           |  |
| 1/4             | 1/4                     | -AF-FT4-AN4           |  |
| 3/8             | 3/8                     | -AF-FT6-AN6           |  |
| 1/2             | 1/2                     | -AF-FT8-AN8           |  |
| 3/4             | 3/4                     | -AF-FT12-AN12         |  |

Female Adapters



| Metric Tube    |          | NPT Thread            |
|----------------|----------|-----------------------|
| Tube O.D. (mm) | NPT Size | Basic Ordering Number |
| 3              | 1/8      | -AF-MT3-NS2           |
| 4              | 1/8      | -AF-MT4-NS2           |
| 6              | 1/8      | -AF-MT6-NS2           |
| 6              | 1/4      | -AF-MT6-NS4           |
| 8              | 1/8      | -AF-MT8-NS2           |
| 8              | 1/4      | -AF-MT8-NS4           |
| 8              | 3/8      | -AF-MT8-NS6           |
| 10             | 1/4      | -AF-MT10-NS4          |
| 10             | 3/8      | -AF-MT10-NS6          |
| 10             | 1/2      | -AF-MT10-NS8          |
| 12             | 1/4      | -AF-MT12-NS4          |
| 12             | 3/8      | -AF-MT12-NS6          |
| 12             | 1/2      | -AF-MT12-NS8          |
| 16             | 1/2      | -AF-MT16-NS8          |
| 18             | 3/4      | -AF-MT18-NS12         |
| 20             | 1/2      | -AF-MT20-NS8          |
| 20             | 3/4      | -AF-MT20-NS12         |
| 25             | 1        | -AF-MT25-NS16         |

| Metric Tube    |                         | ISO Tapered Thread (RT) |
|----------------|-------------------------|-------------------------|
| Tube O.D. (mm) | ISO Tapered Thread Size | Basic Ordering Number   |
| 3              | 1/8                     | -AF-MT3-RT2             |
| 4              | 1/8                     | -AF-MT4-RT2             |
| 6              | 1/8                     | -AF-MT6-RT2             |
| 8              | 1/4                     | -AF-MT8-RT4             |
| 10             | 1/4                     | -AF-MT10-RT4            |
| 10             | 3/8                     | -AF-MT10-RT6            |
| 10             | 1/2                     | -AF-MT10-RT8            |
| 12             | 1/4                     | -AF-MT12-RT4            |
| 12             | 3/8                     | -AF-MT12-RT6            |
| 12             | 1/2                     | -AF-MT12-RT8            |
| 16             | 1/2                     | -AF-MT16-RT8            |
| 18             | 3/4                     | -AF-MT18-RT12           |
| 20             | 3/4                     | -AF-MT20-RT12           |
| 25             | 1                       | -AF-MT25-RT16           |

Female Adapters



| Metric Tube    |                          | ISO Parallel Thread (RP) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 6              | 1/8                      | -AF-MT6-RP2              |
| 6              | 1/4                      | -AF-MT6-RP4              |
| 12             | 1/2                      | -AF-MT12-RP8             |

Female Adapters



| Metric Tube    |                          | ISO Parallel Thread (RG) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 3              | 1/8                      | -AF-MT3-RG2              |
| 3              | 1/4                      | -AF-MT3-RG4              |
| 4              | 1/8                      | -AF-MT4-RG2              |
| 6              | 1/8                      | -AF-MT6-RG2              |
| 6              | 1/4                      | -AF-MT6-RG4              |
| 6              | 3/8                      | -AF-MT6-RG6              |
| 6              | 1/2                      | -AF-MT6-RG8              |
| 8              | 1/4                      | -AF-MT8-RG4              |
| 8              | 3/8                      | -AF-MT8-RG6              |
| 8              | 1/2                      | -AF-MT8-RG8              |
| 10             | 1/4                      | -AF-MT10-RG4             |
| 10             | 3/8                      | -AF-MT10-RG6             |
| 10             | 1/2                      | -AF-MT10-RG8             |
| 12             | 1/4                      | -AF-MT12-RG4             |
| 12             | 3/8                      | -AF-MT12-RG6             |
| 12             | 1/2                      | -AF-MT12-RG8             |
| 16             | 1/2                      | -AF-MT16-RG8             |
| 18             | 1/2                      | -AF-MT18-RG8             |

Female Adapters



Adapt to Japanese gauge stud.

| Metric Tube    |                          | ISO Parallel Thread (RJ) |
|----------------|--------------------------|--------------------------|
| Tube O.D. (mm) | ISO Parallel Thread Size | Basic Ordering Number    |
| 6              | 1/4                      | -AF-MT6-RJ4              |
| 6              | 3/8                      | -AF-MT6-RJ6              |
| 6              | 1/2                      | -AF-MT6-RJ8              |
| 8              | 1/4                      | -AF-MT8-RJ4              |
| 8              | 3/8                      | -AF-MT8-RJ6              |
| 8              | 1/2                      | -AF-MT8-RJ8              |
| 10             | 1/4                      | -AF-MT10-RJ4             |
| 10             | 3/8                      | -AF-MT10-RJ6             |
| 10             | 1/2                      | -AF-MT10-RJ8             |
| 12             | 1/4                      | -AF-MT12-RJ4             |
| 12             | 3/8                      | -AF-MT12-RJ6             |
| 12             | 1/2                      | -AF-MT12-RJ8             |

## Weld Adapters



| Fractional Tube |                | Pipe Weld             |
|-----------------|----------------|-----------------------|
| Tube O.D. (in.) | Pipe Weld Size | Basic Ordering Number |
| 1/4             | 1/4            | -AW-FT4-PB4           |
| 3/8             | 1/2            | -AW-FT6-PB8           |
| 1/2             | 1/2            | -AW-FT8-PB8           |
| 1/2             | 3/4            | -AW-FT8-PB12          |
| 3/4             | 3/4            | -AW-FT12-PB12         |

## Flange Adapters

- Integrally forged body.
- ASME flanges comply with ASME B16.5.
- DIN flanges comply with DIN 2501/2526.
- GB flanges comply with GB/T 9123.1.
- EN flanges comply with EN 1092-1.
- JIS flanges comply with JIS B 2220.



| ASME Flanges    |                 |       |                                          |
|-----------------|-----------------|-------|------------------------------------------|
| Tube O.D. (in.) | ASME Flange NPS | Class | Basic Ordering Number Raised Face Flange |
| 1/4             | 1/2             | 150   | -FA-FL4-F8-150                           |
| 3/8             | 1/2             | 300   | -FA-FL6-F8-300                           |
| 1/2             | 1/2             | 150   | -FA-FL8-F8-150                           |
| 1/2             | 1               | 150   | -FA-FL8-F16-150                          |
| 1/2             | 2               | 150   | -FA-FL8-F32-150                          |
| 3/4             | 1               | 150   | -FA-FL12-F16-150                         |
| 1               | 1               | 150   | -FA-FL16-F16-150                         |

### DIN/GB Flanges, Pressure Class PN 40

| Tube O.D. (mm) | DIN Flange Size DN | Basic Ordering Number Raised Face Flange |
|----------------|--------------------|------------------------------------------|
| 6              | 25                 | -FA-ML6-F25-40B1                         |
| 12             | 15                 | -FA-ML12-F15-40B1                        |
| 12             | 25                 | -FA-ML12-F25-40B1                        |
| 12             | 50                 | -FA-ML12-F50-40B1                        |
| 18             | 15                 | -FA-ML18-F15-40B1                        |
| 18             | 25                 | -FA-ML18-F25-40B1                        |
| 25             | 25                 | -FA-ML25-F25-40B1                        |

### EN Flanges, Pressure Class PN 40

| Tube O.D. (mm) | EN Flange Size DN | Basic Ordering Number Raised Face Flange |
|----------------|-------------------|------------------------------------------|
| 6              | 25                | -FA-ML6-F25E-40B1                        |
| 12             | 15                | -FA-ML12-F15E-40B1                       |
| 12             | 25                | -FA-ML12-F25E-40B1                       |
| 12             | 50                | -FA-ML12-F50E-40B1                       |
| 18             | 15                | -FA-ML18-F15E-40B1                       |
| 18             | 25                | -FA-ML18-F25E-40B1                       |
| 25             | 25                | -FA-ML25-F25E-40B1                       |

### JIS Flanges, Pressure Class 10K

| Tube O.D. | JIS Flange Size DN | Basic Ordering Number Raised Face Flange |
|-----------|--------------------|------------------------------------------|
| 1/4"      | 15                 | -FA-FL4-F15-10KRF                        |
| 3/8"      | 15                 | -FA-FL6-F15-10KRF                        |
| 1/2"      | 15                 | -FA-FL8-F15-10KRF                        |
| 3/4"      | 15                 | -FA-FL12-F15-10KRF                       |
| 1"        | 25                 | -FA-FL16-F25-10KRF                       |
| 12 mm     | 15                 | -FA-ML12-F15-10KRF                       |
| 18 mm     | 15                 | -FA-ML18-F15-10KRF                       |
| 25 mm     | 25                 | -FA-ML25-F25-10KRF                       |

## Weld Connectors



| Fractional Tube |                        | Tube Socket Weld      |
|-----------------|------------------------|-----------------------|
| Tube O.D. (in.) | Tube Socket Weld (in.) | Basic Ordering Number |
| 1/8             | 1/8                    | -CW-FL2-TS2           |
| 3/16            | 3/16                   | -CW-FL3-TS3           |
| 1/4             | 1/4                    | -CW-FL4-TS4           |
| 3/8             | 3/8                    | -CW-FL6-TS6           |
| 1/2             | 1/2                    | -CW-FL8-TS8           |
| 5/8             | 5/8                    | -CW-FL10-TS10         |
| 3/4             | 3/4                    | -CW-FL12-TS12         |
| 1               | 1                      | -CW-FL16-TS16         |

## Weld Connectors



| Fractional Tube |                | Pipe Butt Weld        |
|-----------------|----------------|-----------------------|
| Tube O.D. (in.) | Pipe Weld Size | Basic Ordering Number |
| 1/8             | 1/8            | -CW-FL2-PB2           |
| 3/16            | 1/8            | -CW-FL3-PB2           |
| 1/4             | 1/8            | -CW-FL4-PB2           |
| 1/4             | 1/4            | -CW-FL4-PB4           |
| 5/16            | 1/8            | -CW-FL5-PB2           |
| 5/16            | 1/4            | -CW-FL5-PB4           |

| Fractional Tube |                | Pipe Butt Weld        |
|-----------------|----------------|-----------------------|
| Tube O.D. (in.) | Pipe Weld Size | Basic Ordering Number |
| 3/8             | 1/4            | -CW-FL6-PB4           |
| 3/8             | 3/8            | -CW-FL6-PB6           |
| 3/8             | 1/2            | -CW-FL6-PB8           |
| 3/8             | 3/4            | -CW-FL6-PB12          |
| 1/2             | 3/8            | -CW-FL8-PB6           |
| 1/2             | 1/2            | -CW-FL8-PB8           |
| 1/2             | 3/4            | -CW-FL8-PB12          |
| 5/8             | 1/2            | -CW-FL10-PB8          |
| 3/4             | 1/2            | -CW-FL12-PB8          |
| 3/4             | 3/4            | -CW-FL12-PB12         |
| 1               | 1              | -CW-FL16-PB16         |
| 1 1/4           | 1 1/4          | -CW-FL20-PB20         |
| 1 1/2           | 1 1/2          | -CW-FL24-PB24         |

| Metric Tube    |                | Pipe Butt Weld        |
|----------------|----------------|-----------------------|
| Tube O.D. (mm) | Pipe Weld Size | Basic Ordering Number |
| 3              | 1/8            | -CW-ML3-PB2           |
| 4              | 1/8            | -CW-ML4-PB2           |
| 6              | 1/8            | -CW-ML6-PB2           |
| 6              | 1/4            | -CW-ML6-PB4           |
| 8              | 1/8            | -CW-ML8-PB2           |
| 8              | 1/4            | -CW-ML8-PB4           |
| 8              | 1/2            | -CW-ML8-PB8           |
| 10             | 1/4            | -CW-ML10-PB4          |
| 10             | 3/8            | -CW-ML10-PB6          |
| 10             | 1/2            | -CW-ML10-PB8          |
| 12             | 1/4            | -CW-ML12-PB4          |
| 12             | 3/8            | -CW-ML12-PB6          |
| 12             | 1/2            | -CW-ML12-PB8          |

| Metric Tube    |                | Pipe Butt Weld        |
|----------------|----------------|-----------------------|
| Tube O.D. (mm) | Pipe Weld Size | Basic Ordering Number |
| 14             | 3/8            | -CW-ML14-PB6          |
| 15             | 1/2            | -CW-ML15-PB8          |
| 16             | 1/2            | -CW-ML16-PB8          |
| 18             | 1/2            | -CW-ML18-PB8          |
| 30             | 1 1/4          | -CW-ML30-PB20         |
| 32             | 1 1/4          | -CW-ML32-PB20         |
| 38             | 1 1/2          | -CW-ML38-PB24         |

## Weld Elbows



| Fractional Tube |                        | Tube Socket Weld      |
|-----------------|------------------------|-----------------------|
| Tube O.D. (in.) | Tube Socket Weld (in.) | Basic Ordering Number |
| 1/8             | 1/8                    | -LW-FL2-TS2           |
| 3/16            | 3/16                   | -LW-FL3-TS3           |
| 1/4             | 1/4                    | -LW-FL4-TS4           |
| 3/8             | 3/8                    | -LW-FL6-TS6           |
| 1/2             | 1/2                    | -LW-FL8-TS8           |
| 5/8             | 5/8                    | -LW-FL10-TS10         |
| 3/4             | 3/4                    | -LW-FL12-TS12         |
| 1               | 1                      | -LW-FL16-TS16         |

## Weld Elbows



| Fractional Tube |                | Pipe Butt Weld        |
|-----------------|----------------|-----------------------|
| Tube O.D. (in.) | Pipe Weld Size | Basic Ordering Number |
| 1/8             | 1/8            | -LW-FL2-PB2           |
| 3/16            | 1/8            | -LW-FL3-PB2           |
| 1/4             | 1/8            | -LW-FL4-PB2           |
| 1/4             | 1/4            | -LW-FL4-PB4           |
| 3/8             | 1/4            | -LW-FL6-PB4           |
| 1/2             | 3/8            | -LW-FL8-PB6           |
| 1/2             | 1/2            | -LW-FL8-PB8           |
| 5/8             | 1/2            | -LW-FL10-PB8          |
| 3/4             | 3/4            | -LW-FL12-PB12         |
| 1               | 3/4            | -LW-FL16-PB12         |
| 1               | 1              | -LW-FL16-PB16         |

## Calibration Fittings



| Tube O.D. (in.) | SAE/MS Thread Size | Basic Ordering Number |
|-----------------|--------------------|-----------------------|
| 1/4             | 1/4-28             | -FC-FL4-1428          |
| 1/4             | 5/16-24            | -FC-FL4-51624         |

- ⦿ The calibration fittings can be connected directly with the bleed port of the transmitter so that the calibration process can be simplified.
- ⦿ Two types are available to fit the bleed ports of the transmitters.

Dielectric Fittings

| Materials   |                  |
|-------------|------------------|
| Component   | Material         |
| Insulators  | Polyamide-imide  |
| O-ring      | 70 durometer FKM |
| Backup Ring | Virgin PTFE      |

Technical Data

- Electrical Resistance of Insulators: 10×10<sup>6</sup>Ω @10 V D.C at 70°F (21°C)
- Maximum working pressure: 5000 psig (344 bar ) at 70°F (21°C)
- Temperature range: -4°F (-20°C) to 200°F (93°C)

Dielectric Fittings



| Fractional Tube |                       |
|-----------------|-----------------------|
| Tube O.D. (in.) | Basic Ordering Number |
| 1/4             | -DF-FL4               |
| 3/8             | -DF-FL6               |
| 1/2             | -DF-FL8               |

| Metric Tube    |                       |
|----------------|-----------------------|
| Tube O.D. (mm) | Basic Ordering Number |
| 12             | -DF-ML12              |

Dielectric Fittings



| Fractional Tube |          | NPT Thread            |
|-----------------|----------|-----------------------|
| Tube O.D. (in.) | NPT Size | Basic Ordering Number |
| 3/8             | 1/4      | -DF-FL6-NS4           |

RS, RSD Gaskets



| ISO Parallel Thread Size | Basic Ordering Number |
|--------------------------|-----------------------|
| 1/8                      | -RS-2                 |
| 1/4                      | -RS-4                 |
| 3/8                      | -RS-6                 |
| 1/2                      | -RS-8                 |
| 3/4                      | -RS-12                |
| 1                        | -RS-16                |

| ISO Parallel Thread Size | Basic Ordering Number |
|--------------------------|-----------------------|
| 1/8                      | -RSD-2                |
| 1/4                      | -RSD-4                |
| 3/8                      | -RSD-6                |
| 1/2                      | -RSD-8                |
| 3/4                      | -RSD-12               |
| 1                        | -RSD-16               |

| Metric Thread Size | Basic Ordering Number |
|--------------------|-----------------------|
| M8 x 1             | -RS-M8                |
| M10 x 1            | -RS-M10               |
| M12 x 1.5          | -RS-M12               |
| M14 x 1.5          | -RS-M14               |
| M16 x 1.5          | -RS-M16               |
| M18 x 1.5          | -RS-M18               |
| M20 x 1.5          | -RS-M20               |
| M22 x 1.5          | -RS-M22               |
| M24 x 1.5          | -RS-M24               |
| M27 x 2            | -RS-M27               |
| M30 x 2            | -RS-M30               |
| M33 x 2            | -RS-M33               |
| M36 x 2            | -RS-M36               |
| M39 x 2            | -RS-M39               |
| M42 x 2            | -RS-M42               |
| M45 x 2            | -RS-M45               |
| M48 x 2            | -RS-M48               |

The RS gasket provides a seal with male ISO parallel threads. The gasket consists of a fluorocarbon FKM or Buna inner ring bonded to a carbon steel or stainless steel outer ring.

## RP Gaskets



| ISO Parallel Thread Size | Basic Ordering Number |
|--------------------------|-----------------------|
| 1/8                      | -RP-2                 |
| 1/4                      | -RP-4                 |
| 3/8                      | -RP-6                 |
| 1/2                      | -RP-8                 |
| 3/4                      | -RP-12                |
| 1                        | -RP-16                |

| Metric Thread Size | Basic Ordering Number |
|--------------------|-----------------------|
| M8 x 1             | -RP-M8                |
| M10 x 1            | -RP-M10               |
| M12 x 1.5          | -RP-M12               |
| M14 x 1.5          | -RP-M14               |
| M16 x 1.5          | -RP-M16               |
| M18 x 1.5          | -RP-M18               |
| M20 x 1.5          | -RP-M20               |
| M22 x 1.5          | -RP-M22               |
| M24 x 1.5          | -RP-M24               |
| M27 x 2            | -RP-M27               |
| M30 x 2            | -RP-M30               |
| M33 x 2            | -RP-M33               |
| M36 x 2            | -RP-M36               |
| M39 x 2            | -RP-M39               |
| M42 x 2            | -RP-M42               |
| M45 x 2            | -RP-M45               |
| M48 x 2            | -RP-M48               |

The RP gasket provides a seal with male ISO parallel threads.  
The RP gasket may be used with a RS fitting.

## RG Gaskets



The RG gasket provides a seal on pressure gauges equipped with male ISO parallel threads.

| ISO Parallel Thread Size | Basic Ordering Number |
|--------------------------|-----------------------|
| 1/4                      | -RG-4                 |
| 3/8                      | -RG-6                 |
| 1/2                      | -RG-8                 |

| Metric Thread Size | Basic Ordering Number |
|--------------------|-----------------------|
| M10 x 1            | -RG-M10               |
| M12 x 1.5          | -RG-M12               |
| M14 x 1.5          | -RG-M14               |
| M16 x 1.5          | -RG-M16               |
| M18 x 1.5          | -RG-M18               |
| M20 x 1.5          | -RG-M20               |
| M22 x 1.5          | -RG-M22               |
| M24 x 1.5          | -RG-M24               |
| M27 x 2            | -RG-M27               |
| M30 x 2            | -RG-M30               |
| M33 x 2            | -RG-M33               |
| M36 x 2            | -RG-M36               |
| M39 x 2            | -RG-M39               |
| M42 x 2            | -RG-M42               |
| M45 x 2            | -RG-M45               |
| M48 x 2            | -RG-M48               |

## RJ Gaskets



The RJ gasket provides a seal on Japanese pressure gauges equipped with male ISO parallel threads.

| ISO Parallel Thread Size | Basic Ordering Number |
|--------------------------|-----------------------|
| 1/4                      | -RJ-4                 |
| 3/8                      | -RJ-6                 |
| 1/2                      | -RJ-8                 |

O-Rings



O-Rings for Fittings with SAE/MS Straight Threads

| SAE/MS Thread Size | Ordering Number |
|--------------------|-----------------|
| 5/16-24            | VI9-902         |
| 3/8-24             | VI9-903         |
| 7/16-20            | VI9-904         |
| 1/2-20             | VI9-905         |
| 9/16-18            | VI9-906         |
| 3/4-16             | VI9-908         |
| 7/8-14             | VI9-910         |
| 1 1/16-12          | VI9-912         |
| 1 3/16-12          | VI9-914         |
| 1 5/16-12          | VI9-916         |
| 1 5/8-12           | VI9-920         |
| 1 7/8-12           | VI9-924         |

O-Rings for Fittings with O-Seal Straight Threads

| SAE/MS Thread Size | Ordering Number |
|--------------------|-----------------|
| 5/16-24            | BN7-011         |
| 3/8-24             | BN7-012         |
| 7/16-20            | BN7-013         |
| 1/2-20             | BN7-112         |
| 9/16-18            | BN7-113         |
| 3/4-16             | BN7-116         |
| 1 1/16-12          | BN7-121         |
| 1 5/16-12          | BN7-125         |

O-Rings for Adjustable Fittings with ISO Parallel Threads

| ISO Parallel Thread Size | Ordering Number |
|--------------------------|-----------------|
| 1/8                      | VI9-502         |
| 1/4                      | VI9-111         |
| 3/8                      | VI9-113         |
| 1/2                      | VI9-508         |
| 3/4                      | VI9-119         |
| 1                        | VI9-217         |

O-Rings for Fittings with O-Seal Pipe Threads

| NPT/ISO Thread Size | Ordering Number |
|---------------------|-----------------|
| 1/8                 | BN7-013         |
| 1/4                 | BN7-113         |
| 3/8                 | BN7-116         |
| 1/2                 | BN7-118         |

O-Rings for Fittings with Metric Threads

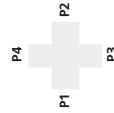
| Metric Thread Size | Ordering Number |
|--------------------|-----------------|
| M14 x 1.5          | BN9-M14         |
| M20 x 1.5          | BN9-M20         |

SS - CM - ML12 - NS 8 - □ - □ - □ - □

| Material | Fitting Type                  | P1 Type               | P1 Size                                                                                                                                          | P2 Type                                                                                                                                                                                                                                                                                                                                                                                      | P2 Size                                                                                                                                                                                                                                          | P3 and P4                         | Special Application                                                       | Cleaning and Packaging |
|----------|-------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------------------|------------------------|
| SS       | CM Male Connector             | ML Metric Ferrule     | 1 1/16" or 2 1/8" or 3 1/8" or 4 1/4" or 5 5/16" or 6 3/8" or 8 1/2" or 10 5/8" or 12 1/2" or 14 7/8" or 15 15 mm or 16 1" or 18 1 1/8" or 18 mm | Except the same as the P1, the other type follows:<br>NS NPT Thread<br>ONS O-ring with NPT Thread<br>RT ISO Tapered Thread<br>RS ISO Parallel Thread (For RS)<br>RP ISO Parallel Thread (For RP)<br>RG ISO Parallel Thread (Gauge)<br>RJ ISO Parallel Thread (Japanese Gauge)<br>PP Positionable, ISO Parallel Thread<br>ST SAE/MS Straight Thread<br>OST O-ring with SAE/MS Straight Thread | Except the same as the P1, the other size follows:<br>5 M5 x 0.8 or 5/16-24<br>6 M6 x 1 or 3/8-24<br>7 M8 x 1 or 1/2-20<br>8 M8 x 1 or 9/16-18<br>10 M10 x 1<br>12 M12 x 1.5 or 3/4-16<br>14 M14 x 1.5 or 7/8-14<br>16 M16 x 1.5<br>17 1 1/16-12 | Specify in the same way as the P2 | None<br>EC79 EC79 Certification<br>SI SilcoNert® 2000 (Sufflert®) Coating | FC-01<br>F2 FC-02      |
| S4       | BCM Bulkhead Male Connector   | FL Fractional Ferrule |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| S1       | TCM Thermocouple Connector    |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| 904L     | CF Female Connector           |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| 904L     | BCF Bulkhead Female Connector |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| Ti       | U Union                       |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| D5       | BU Bulkhead Union             |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| D7       | LM Male Elbow                 |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| A20      | VM 45° Male Elbow             |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| M        | VP 45° Adjustable Male Elbow  |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| INC      | LP Positionable Male Elbow    |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| AL65     | LF Female Elbow               |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| AL65     | LU Union Elbow                |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |
| AL65     | TMT Male Run Tee              |                       |                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                  |                                   |                                                                           |                        |

## Part Number Description

| Material | Fitting Type                     | P1 Type            | P1 Size               | P2 Type                        | P2 Size      | P3 and P4                         | Special Application                    | Cleaning and Packaging |
|----------|----------------------------------|--------------------|-----------------------|--------------------------------|--------------|-----------------------------------|----------------------------------------|------------------------|
| HC       | TTM Male Branch Tee              | MT Metric Tube     | 20 1 1/4" or 20 20 mm | AN 37° Flare                   | 18 M18 x 1.5 | Specify in the same way as the P2 | None                                   | FC-01                  |
| CS       | TPT Positionable Male Run Tee    | FT Fractional Tube | 22 22 mm              | MS Male Metric Thread          | 19 1 3/16-12 |                                   | EC79 EC79 Certification                | F2 FC-02               |
| B        | TPT Positionable Male Branch Tee |                    | 24 1 1/2" or 24 24 mm | TS Fractional Tube Socket Weld | 20 M20 x 1.5 |                                   |                                        |                        |
| PA       | TTF Female Run Tee               |                    | 25 25 mm              | PB Pipe Butt Weld              | 21 1 5/16-12 |                                   | SI SilcoNert® 2000 (Sufflert®) Coating |                        |
| T        | TTF Female Branch Tee            |                    | 28 28 mm              |                                | 22 M22 x 1.5 |                                   |                                        |                        |
|          | TTT Union Tee                    |                    | 30 30 mm              |                                | 24 M24 x 1.5 |                                   |                                        |                        |
|          | C Union Cross                    |                    | 32 2" or 32 32 mm     |                                | 26 1 5/8-12  |                                   |                                        |                        |
|          | TC Cap                           |                    | 38 38 mm              |                                | 27 M27 x 2   |                                   |                                        |                        |
|          | TP Plug                          |                    | 50 50 mm              |                                | 30 1 7/8-12  |                                   |                                        |                        |
|          | R Reducer                        |                    |                       |                                |              |                                   |                                        |                        |
| P        | P Port Connector                 |                    |                       |                                |              |                                   |                                        |                        |
| AM       | AM Male Adapter                  |                    |                       |                                |              |                                   |                                        |                        |
| AF       | AF Female Adapter                |                    |                       |                                |              |                                   |                                        |                        |
| CW       | CW Weld Connector                |                    |                       |                                |              |                                   |                                        |                        |
| LW       | LW Weld Elbow                    |                    |                       |                                |              |                                   |                                        |                        |
| DF       | DF Dielectric Fitting            |                    |                       |                                |              |                                   |                                        |                        |



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

P1, P2, P3 and P4 shall be described in the following orders:  
 ● Ferrule - Tube - NPT Thread - ISO Tapered Thread - ISO Parallel Thread - SAE/MS Straight Thread - 37° Flare - Pipe Butt Weld - Fractional Tube Socket Weld - Others  
 ● Describe in descending order as per size if the end connection types are the same  
 ● Describe the end of P1 if all end connections are the same  
 Cleaning and Packaging:  
 FC-01: Standard cleaning and packaging for general industrial procedures  
 FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleanliness requirement as stated in ASTM G93 Level C  
 In Application:  
 Wetted metal components SilcoNert® 2000 (Sufflert®) coated.

Tools and Accessories

Hand Tube Benders

HTB Series

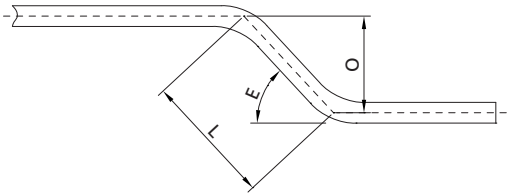
- For bending stainless steel and copper tubing from 1/4" to 1/2" and 6 mm to 16 mm outside diameter
- Roll dies reduce bending force and tube ovality, as compared to conventional slide block design
- 1° to 180° bending range



Ordering Information

| Ordering Number | Tube O.D. | Bend Radius |
|-----------------|-----------|-------------|
| HTB-4S          | 1/4"      | 0.56"       |
| HTB-4           | 1/4"      | 0.75"       |
| HTB-5           | 5/16"     | 0.94"       |
| HTB-6           | 3/8"      |             |
| HTB-8           | 1/2"      | 1.5"        |
| HTB-6M          | 6 mm      | 15 mm       |
| HTB-8M          | 8 mm      | 24 mm       |
| HTB-10M         | 10 mm     |             |
| HTB-12M         | 12 mm     | 38 mm       |
| HTB-14M-L       | 14 mm     | 56 mm       |
| HTB-16M-L       | 16 mm     |             |

Offset Bending Formula



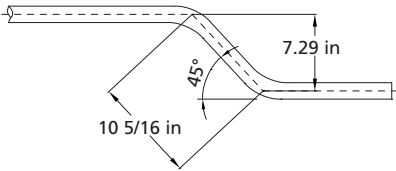
In order to change the center line of the fluid, typically to avoid an obstruction, we choose an offset bend. To determine the length of offset bend, select the offset angle (E) first. Then, multiply the offset dimension (O) by the offset bend allowance (A).

$L=O \times A$

| Offset Angle (E) | Offset Bend Allowance (A) |
|------------------|---------------------------|
| 22 1/2°          | 2.263                     |
| 30°              | 2.000                     |
| 45°              | 1.414                     |
| 60°              | 1.154                     |

Example:  
Offset angle (E)                      45°  
Offset dimension (O)                7.29 in.

$7.29 \times 1.414 = 10.31 \text{ in.}$ , or approximately 10 5/16 in.

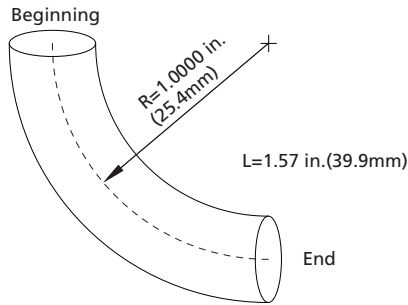


## Adjustment (Gain) Calculations

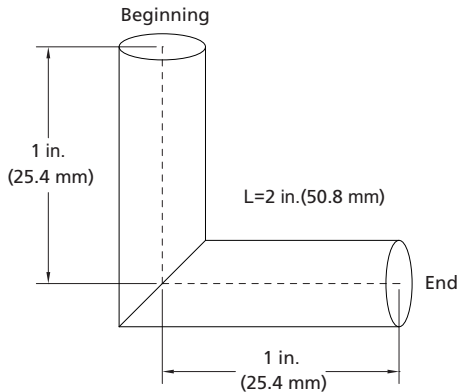
Adjustment (gain) is another available method to get the desired bend.

Adjustment is the difference between the length of tubing used in the radiused bend and that in sharp bend, when measured from the beginning to the end of the bend.

### Radiused Bend

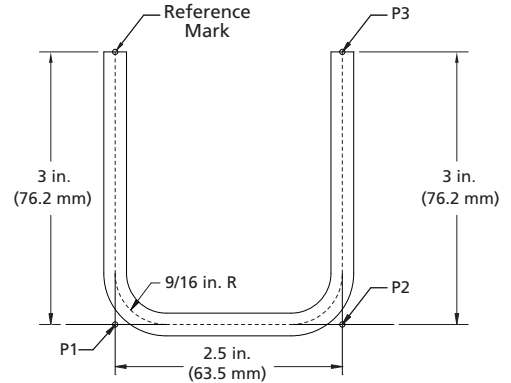


### Sharp Bend



## Example of the Method

1/4 in. tubing using a 1/4 in. bender with a 9/16 in. bend radius.



In order to get the desired bend, mark the tubing as follows:  
 $P1 = 3 \text{ in.}$

To confirm the location of the bend mark, add the new section length to the previous bend mark position, then minus the adjustment (gain) of the previous bend.

$$P2 = P1 + 2.5 \text{ in.} - 5/16 \text{ in. (adjustment)} = 5 \frac{3}{16} \text{ in.}$$

$$P3 = P2 + 3 \text{ in.} - 5/16 \text{ in. (adjustment)} = 7 \frac{7}{8} \text{ in.}$$

7 7/8 in. is the total length of the tube.

$$90^\circ \text{ adjustment} = 5/16 \text{ in.}$$

Bend the tube as described in FITOK Hand Tube Bender Manual

Fractional Adjustment Calculations

| Bend Angle | Tube O.D., in.  |      |       |       |       |
|------------|-----------------|------|-------|-------|-------|
|            | 1/4             | 1/4  | 5/16  | 3/8   | 1/2   |
|            | Bend Radius, in |      |       |       |       |
|            | 9/16            | 3/4  | 15/16 | 15/16 | 1 1/2 |
| 30°        | 0               | 0    | 0     | 0     | 1/16  |
| 45°        | 1/16            | 1/16 | 1/16  | 1/16  | 1/16  |
| 50°        | 1/16            | 1/16 | 1/16  | 1/16  | 1/8   |
| 55°        | 1/16            | 1/16 | 1/8   | 1/8   | 1/8   |
| 60°        | 1/8             | 1/16 | 1/8   | 1/8   | 3/16  |
| 65°        | 1/8             | 1/8  | 3/16  | 3/16  | 1/4   |
| 70°        | 1/8             | 1/8  | 3/16  | 3/16  | 5/16  |
| 75°        | 3/16            | 3/16 | 1/4   | 1/4   | 3/8   |
| 80°        | 3/16            | 3/16 | 5/16  | 5/16  | 7/16  |
| 85°        | 1/4             | 1/4  | 3/8   | 3/8   | 9/16  |
| 90°        | 5/16            | 5/16 | 7/16  | 7/16  | 11/16 |

Metric Adjustment Calculations

| Bend Angle | Tube O.D., mm   |    |    |    |
|------------|-----------------|----|----|----|
|            | 6               | 8  | 10 | 12 |
|            | Bend Radius, mm |    |    |    |
|            | 15              | 24 | 24 | 38 |
| 30°        | 1               | 1  | 1  | 1  |
| 45°        | 1               | 2  | 2  | 3  |
| 50°        | 2               | 2  | 2  | 3  |
| 55°        | 2               | 3  | 3  | 4  |
| 60°        | 3               | 3  | 4  | 5  |
| 65°        | 3               | 4  | 4  | 7  |
| 70°        | 4               | 5  | 5  | 8  |
| 75°        | 5               | 6  | 7  | 10 |
| 80°        | 6               | 8  | 8  | 12 |
| 85°        | 7               | 10 | 10 | 15 |
| 90°        | 8               | 12 | 12 | 18 |

Tube Cutters

FTC Series

- For cutting stainless steel, soft copper, and aluminum tubing from 3/16" to 1" and 6 to 25 mm outside diameter
- Flare-out and work hardening of tube end is reduced



Ordering Information

| Ordering Number | Tube O.D.                        | Wheel Ordering Number |
|-----------------|----------------------------------|-----------------------|
| FTC-03          | 1/8" to 1" and 3 mm to 25 mm     | FTC-03-RR             |
| FTC-04          | 1/4" to 1 3/8" and 6 mm to 35 mm | FTCW-45               |
| FTC-05          | 1/4" to 2 5/8" and 6 mm to 65 mm |                       |

## Tube Deburring Tools

### TDT Series

- ⦿ For deburring stainless steel, carbon steel, copper and aluminum tube ends
- ⦿ Steel blades for long life



### Ordering Information

| Ordering Number | Deburring Position | Size                             | Tube Material                                   |
|-----------------|--------------------|----------------------------------|-------------------------------------------------|
| TDT-01          | I.D.               | less than 6 mm                   | Stainless Steel, Carbon Steel, Copper, Aluminum |
| TDT-03          | O.D.               | 6 mm to 38 mm and 1/4" to 1 1/2" | Copper, Aluminum                                |
|                 | I.D.               |                                  |                                                 |
| TDT-05          | O.D.               | 6 mm to 36 mm and 1/4" to 1 1/4" | Stainless Steel, Carbon Steel                   |
|                 | I.D.               |                                  |                                                 |

## Hydraulic Presetting Tools

### HPT Series

- ⦿ To preset ferrules onto tubing
- ⦿ For installing 1/2" to 2" and 12 mm to 50 mm carbon steel, stainless steel, and alloy steel tube fittings
- ⦿ Manually operated hydraulic pump, without requirement for power or compressed air
- ⦿ Made of high grade alloy steel for more durable and firmer usage
- ⦿ Flexible hose connection between the pump and jig to assure easy and comfortable operation
- ⦿ Reduce assembly and installation time and operator error
- ⦿ Fit neatly in a rugged plastic carrying case
- ⦿ Figure dimensions (L x W x H): 12.6 in. x 9.8 in. x 5.9 in. (the height of handle excluded)



## Ordering Information

### HPT-03 Series

| Ordering Number | Tube O.D.                                              |
|-----------------|--------------------------------------------------------|
| HPT-03M         | 12 mm, 14 mm, 15 mm, 16 mm, 18 mm, 20 mm, 22 mm, 25 mm |
| HPT-03F         | 1/2", 5/8", 3/4", 7/8", 1"                             |
| HPT-03-U        | Choose your needs from Die Heads for HPT-03 Series     |
| HPT-03          | Include HPT-03M and HPT-03F                            |

### Die Heads for HPT-03 Series

| Ordering Number | Tube O.D. |
|-----------------|-----------|
| HPT-ML12        | 12 mm     |
| HPT-ML14        | 14 mm     |
| HPT-ML15        | 15 mm     |
| HPT-ML16        | 16 mm     |
| HPT-ML18        | 18 mm     |
| HPT-ML20        | 20 mm     |
| HPT-ML22        | 22 mm     |
| HPT-ML25        | 25 mm     |
| HPT-FL8         | 1/2"      |
| HPT-FL10        | 5/8"      |
| HPT-FL12        | 3/4"      |
| HPT-FL14        | 7/8"      |
| HPT-FL16        | 1"        |

### HPT-05 Series

| Ordering Number | Tube O.D. (Dimensions)                             |
|-----------------|----------------------------------------------------|
| HPT-05M         | 28 mm, 30 mm, 32 mm, 38 mm, 50 mm                  |
| HPT-05F         | 1-1/4", 1-1/2", 2"                                 |
| HPT-05-U        | Choose your needs from Die Heads for HPT-05 Series |
| HPT-05          | Include HPT-05M and HPT-05F                        |

### Die Heads for HPT-05 Series

| Ordering Number | Tube O.D. |
|-----------------|-----------|
| HPT-ML28        | 28 mm     |
| HPT-ML30        | 30 mm     |
| HPT-ML32        | 32 mm     |
| HPT-ML38        | 38 mm     |
| HPT-ML50        | 50 mm     |
| HPT-ML20        | 20 mm     |
| HPT-FL20        | 1-1/4"    |
| HPT-FL24        | 1-1/2"    |
| HPT-FL32        | 2"        |

Manual Presetting Tools

MPT Series

For tube fitting installations in close quarters, the presetting tool can make installation easier and more reliable when paired with the table vice.

- For installing 1/4" to 1" and 6 mm to 25 mm carbon steel, stainless steel and alloy steel tube fittings
- High grade alloy used for clamp to make the presetting tool reliable and durable
- Easy mounting to table vice
- Wider and safer work condition



Ordering Information

| Ordering Number | Tube O.D. |
|-----------------|-----------|
| MPT-6M          | 6 mm      |
| MPT-8M          | 8 mm      |
| MPT-10M         | 10 mm     |
| MPT-12M         | 12 mm     |
| MPT-14M         | 14 mm     |
| MPT-15M         | 15 mm     |
| MPT-16M         | 16 mm     |
| MPT-18M         | 18 mm     |
| MPT-20M         | 20 mm     |
| MPT-22M         | 22 mm     |
| MPT-25M         | 25 mm     |

| Ordering Number | Tube O.D. |
|-----------------|-----------|
| MPT-4           | 1/4"      |
| MPT-6           | 3/8"      |
| MPT-8           | 1/2"      |
| MPT-10          | 5/8"      |
| MPT-12          | 3/4"      |
| MPT-14          | 7/8"      |
| MPT-16          | 1"        |

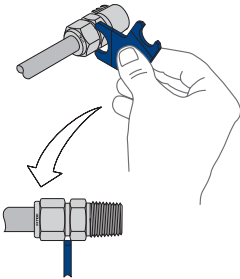
*FITOK gap inspection gauge can not be used to check the fittings preset by MPT series presetting tools.*

Gap Inspection Gauges

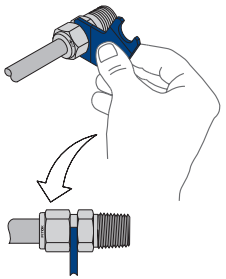
GIG Series

On initial installation, the FITOK gap inspection gauge assures the installer or inspector that a fitting has been sufficiently tightened.

- For all metal fittings, sizes from 1/16" to 1" and 2 mm to 25 mm
- Simple and consistent operation



If the gauge can not enter the gap, the fitting is sufficiently tightened.



If the gauge can enter the gap, additional tightening is required.

- The system must be decompressed before changing the tightness of the fittings.
- Do not use gauge to inspect the reinstalled fittings.
- Do not use gauge to inspect the fittings installed by hydraulic presetting tool.

Ordering Information



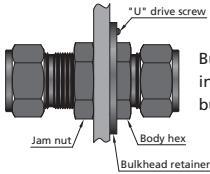
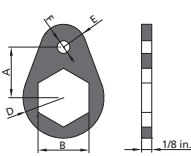
Individual Size



Multiple Sizes

| Fitting Size  |              | Ordering Number |
|---------------|--------------|-----------------|
| in.           | mm           |                 |
| 1/16          | —            | GIG-1           |
| 1/8           | 2, 3         | GIG-2           |
| 3/16          | 4            | GIG-3           |
| 1/4           | 6            | GIG-4           |
| 5/16          | 8            | GIG-5           |
| 3/8           | —            | GIG-6           |
| —             | 10           | GIG-10M         |
| 1/2           | 12           | GIG-8           |
| 5/8           | 14, 15, 16   | GIG-10          |
| 3/4           | 18           | GIG-12          |
| 7/8           | 20, 22       | GIG-14          |
| 1             | 25           | GIG-16          |
| 1/4, 3/8, 1/2 | 6, 12        | GIG-468         |
| 1/4, 1/2      | 6, 8, 10, 12 | GIG-48          |

Bulkhead Retainers



Bulkhead fitting installation utilizing bulkhead retainer

Ordering Information

| Fitting Size |          |           | Ordering Number | Dimensions, in. |        |       |      |       |        |    | Drill Hole Dia | "U" Drive Screw Size | Drill Number |
|--------------|----------|-----------|-----------------|-----------------|--------|-------|------|-------|--------|----|----------------|----------------------|--------------|
| in.          | mm       | A         |                 | B               | D      | E     | F    |       |        |    |                |                      |              |
| 1/16         | —        | SS-BR-1   | 3/8             | 5/16            | 5/16   | 5/32  | 5/32 | 0.120 | 6-3/8  | 31 |                |                      |              |
| 1/8          | —        | SS-BR-2   | 1/2             | 1/2             | 13/32  | 7/32  |      |       |        |    |                |                      |              |
| 3/16         | 3,4      | SS-BR-3   | 9/16            | 9/16            | 15/32  | 1/4   |      |       |        |    |                |                      |              |
| 1/4          | 6        | SS-BR-4   | 5/8             | 5/8             | 1/2    | 9/32  |      |       |        |    |                |                      |              |
| 5/16         | —        | SS-BR-5   | 11/16           | 11/16           | 9/16   | 5/16  |      |       |        |    |                |                      |              |
| —            | 8        | SS-BR-M8  | 11/16           | 18 mm           | 9/16   | 5/16  | 7/32 | 0.161 | 10-1/2 | 20 |                |                      |              |
| 3/8          | —        | SS-BR-6   | 3/4             | 3/4             | 5/8    | 11/32 |      |       |        |    |                |                      |              |
| —            | 10       | SS-BR-M10 | 15/16           | 22 mm           | 3/4    | 13/32 |      |       |        |    |                |                      |              |
| 1/2          | 12       | SS-BR-8   | 15/16           | 15/16           | 3/4    | 13/32 |      |       |        |    |                |                      |              |
| 5/8          | 14,15,16 | SS-BR-10  | 1               | 1-1/16          | 13/16  | 13/32 |      |       |        |    |                |                      |              |
| 3/4          | 18       | SS-BR-12  | 1-1/16          | 1-3/16          | 29/32  | 15/32 | 9/16 |       |        |    |                |                      |              |
| 7/8          | —        | SS-BR-14  | 1-1/8           | 1-5/16          | 1-1/32 | 17/32 |      |       |        |    |                |                      |              |
| 1            | 25       | SS-BR-16  | 1-9/32          | 1-5/8           | 1-5/32 | 9/16  |      |       |        |    |                |                      |              |

## General Instrumentation

### Fittings



### Valves and Filters



### Manifolds



### Hoses and Quick-connects



### Vessels and Sample Cylinders



### Tubing and Tools



## Medium & High Pressure

### Fittings



### Valves



### Filters and Quick Couplings



### Sour Service Products



### Subsea Valves



### Tubing and Tools



## High Purity & Ultra High Purity Products

### Fittings



### Valves



### Regulators



### Integrated Gas Systems

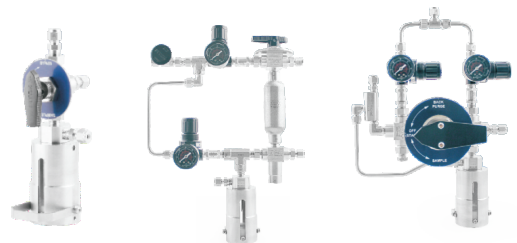


### Changeover Systems & Pressure Control Panels



## Sampling Systems

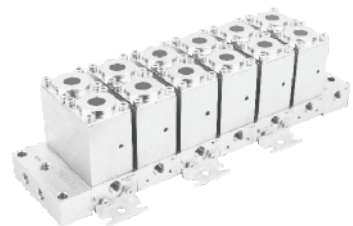
### Bottle Configuration Sampling Systems



### Cylinder Configuration Sampling Systems



### Stream Switching Systems



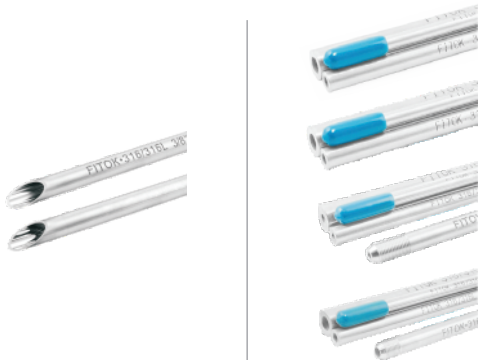
Tubing

Instrumentation Tubing



High Purity Tubing

Medium and High Pressure Tubing



Jacketed Tubing and Insulated Tubing

Heat Trace Tubing

