



# Fluidic Connections

IDEX Health & Science has developed a comprehensive line of standard and custom tubing, connectors, fittings, and flow control devices that meet the increasingly demanding requirements of today's high performance analytical fluidic systems. We feature specialty, high-performance polymers and distinct materials designed to work with your system needs. We offer unique products such as biocompatible PEEK-lined stainless steel tubing as well as an assortment of high pressure and fluoropolymer tubing. All of our fittings, filters and frits and connectors come in a variety of materials and styles. We can provide micro and nano-scale dimensions and well as custom forming, assembly and kitting. We also offer our RI detector that provide high resolution and low dispersion detection for HPLC applications.

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TUBING

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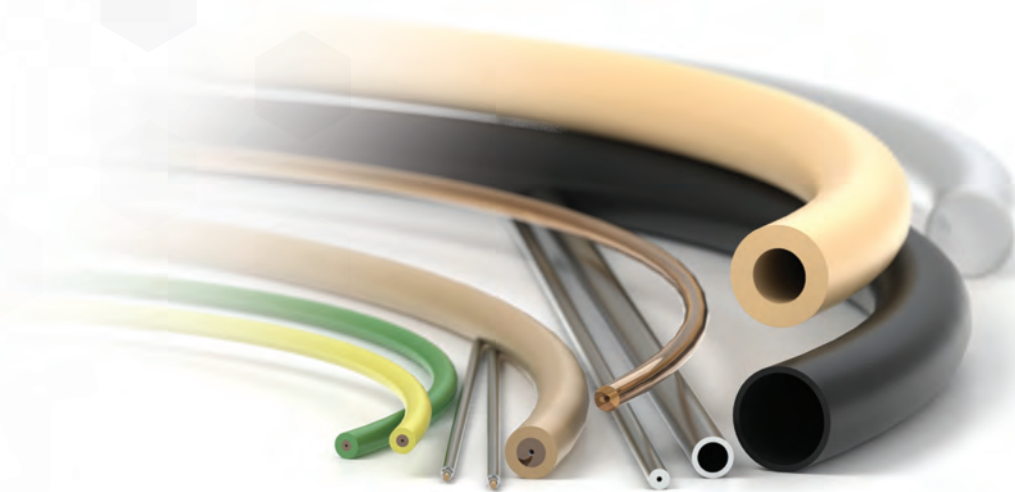
FITTINGS

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CONNECTORS

94

FILTERS &amp; FRITS



## TUBING

Our high quality, versatile tubing is offered in a variety of materials and styles to meet your system requirements. Our high pressure tubing includes biocompatible PEEK selections and well as seamless, pre-cut stainless steel. Our fluoropolymer tubing is constructed with genuine Teflon™ FEP and PFA resin, and our unique High Purity PFA. Many of our tubing options are color coded for easy detection and some are translucent making it easy to view the fluid pathway. Our tubing is manufactured to precise tight tolerances to ensure dependable product consistency.

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# TUBING OVERVIEW & FUNCTIONS

## HIGH PRESSURE TUBING



| TUBING:     | PEEK                                                                                                                                                                                                                                                                                                                                                                            | Capillary PEEK                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Fused Silica                                                                                                                                                                                                                                                                                                                                                                          | Stainless Steel                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PEEKsil™                                                                                                                                                                                                                                                                                                                                                                                              |
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| Description | <p>Biocompatible, chemically inert to most commonly used solvents, PEEK tubing is flexible, offers a very smooth internal surface, and can be easily cut to desired lengths.</p> <ul style="list-style-type: none"> <li>Great alternative for stainless steel tubing in high pressure applications</li> <li>Many sizes available in color scheme to help identify ID</li> </ul> | <p>All the benefits of larger sized PEEK tubing, while serving as an excellent alternative to more traditional fused silica and stainless steel capillary tubing. Capillary PEEK tubing is available in a wide range of micro and nano-scale inner diameters.</p> <ul style="list-style-type: none"> <li>Available in common capillary tubing sizes with tight tolerances on OD and ID</li> <li>Tubing sleeves available for capillary tubing connections</li> </ul> | <p>Because of the tight tolerances of fused silica's inner diameters, this tubing is used for micro-scale analyses such as micro and nano-HPLC and capillary electrophoresis.</p> <ul style="list-style-type: none"> <li>Most commonly used OD and ID sizes available</li> <li>High quality, polyimide-clad fused silica</li> <li>Offered in convenient, two meter lengths</li> </ul> | <p>Seamless, pre-cut 316 stainless steel tubing meets the exacting requirements of today's analyses. Thorough preparation guarantees that the tubing is truly ready-to-use, with flat-burr-free ends and a clean finish.</p> <ul style="list-style-type: none"> <li>Wide selection of outside and inside diameters and lengths</li> <li>Pre-cut to ensure burr-free, flat connections</li> <li>Many sizes feature a color-coded band for easy ID identification</li> </ul> | <p>PEEKsil is mechanically strong and has ideal characteristics for sealing with metal or polymer fittings.</p> <ul style="list-style-type: none"> <li>Comprised of high quality fused silica sheathed by PEEK tubing</li> <li>Excellent chemical compatibility</li> <li>Very tight manufacturing tolerances</li> <li>Good replacement for stainless steel, PEEK, or standard fused silica</li> </ul> |

### HIGH PRESSURE TUBING SPECIFICATIONS

| OD<br>(outside diameter)      | 1/32" (785 µm),<br>1/16" (1.55 mm),<br>1/8" (3.2 mm)                             | 0.0145" (360 µm),<br>1/32" (785 µm),<br>0.020" (0.5 mm) | 0.0145" (360 µm)                   | 1/32" (785 µm),<br>1/16" (1.55 mm),<br>1/8" (3.2 mm)                             | 0.0145" (360 µm),<br>1/32" (785 µm),<br>1/16" (1.55 mm) |
|-------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------|
| ID<br>(inside diameter)       | 0.001" (25 µm)–<br>0.080" (2.0 mm)                                               | 0.001" (25 µm)–<br>0.020" (0.50 mm)                     | 0.0008" (20 µm)–0.006"<br>(150 µm) | 0.004" (100 µm)–<br>0.080" (2.0 mm)                                              | 0.001" (25 µm)–<br>0.012" (300 µm)                      |
| Operating Temp                | -51 to 100 °C                                                                    | -51 to 100 °C                                           | -51 to 100 °C                      | -51 to 289 °C                                                                    | -51 to 100 °C                                           |
| Pressure Rating               | 500–10,000 psi<br>(34–690 bar)                                                   | 2,000–5,000 psi<br>(138–345 bar)                        | N/A*                               | N/A*                                                                             | 10,000 psi (690 bar)                                    |
| Typical Tolerances            | ±0.001" (25 µm)<br>for 1/16" OD tubing;<br>±0.003" (75 µm)<br>for 1/8" OD tubing | ±0.0005" (12.5 µm)                                      | ±0.0004" (10 µm)                   | ±0.001" (25 µm)<br>for 1/16" OD tubing;<br>±0.003" (75 µm)<br>for 1/8" OD tubing | ±0.0004" (10 µm)                                        |
| Refractive Index<br>(Clarity) | Opaque                                                                           | Opaque                                                  | 1.78                               | Opaque                                                                           | Opaque                                                  |
| pH Range                      | 0–14                                                                             | 0–14                                                    | 0–10                               | 1–14                                                                             | 0–10                                                    |
| Sterilization Techniques      | Gamma irradiation;<br>ethylene oxide; thermal                                    | Gamma irradiation;<br>ethylene oxide; thermal           | Ethylene oxide; thermal            | Gamma irradiation;<br>ethylene oxide; thermal                                    | Ethylene oxide; thermal                                 |
| Autoclavable?                 | Y                                                                                | Y                                                       | Y                                  | Y                                                                                | Y                                                       |

\*The manufacturer of this tubing or material does not publish this specification.

## TUBING OD SIZES

Please use this table as a reference tool to help quickly locate within this chapter the appropriate OD size tubing for your application.

1 mm  
OD



Page(s)  
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2 mm  
OD



Page(s)  
26

3 mm  
OD



Page(s)  
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## FLUOROPOLYMER TUBING



| TUBING:     | PFA                                                                                                                                                                                                                                                                                                                                                               | High Purity PFA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 360 µm High Purity PFA                                                                                                                                                                                                                                                                                                                                                                                                                         | FEP                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ETFE                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Page        | 24                                                                                                                                                                                                                                                                                                                                                                | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 24                                                                                                                                                                                                                                                                                                                                                                                                                                             | 26                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 27                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description | <p>Offers excellent chemical compatibility, plus due to its inner surface smoothness, PFA tubing tends to be more translucent than PTFE tubing.</p> <ul style="list-style-type: none"> <li>• Offers higher purity and enhanced translucence when compared with other fluoropolymer tubes</li> <li>• Great for more critical, low pressure applications</li> </ul> | <p>This polymer tubing is manufactured from a premium grade of PFA — one of the most contaminant-free polymers on the market.</p> <ul style="list-style-type: none"> <li>• Offers chemical stability, mechanical strength, and purity for applications such as medical, diagnostic, pharmaceutical, biotechnology, and semiconductor</li> <li>• Excellent replacement for PTFE where gas permeability and surface texture are issues</li> <li>• Clarity of tubing makes PFA an excellent choice for monitoring fluid movement</li> </ul> | <p>This tubing offers excellent chemical compatibility, transparency, very low contaminant levels and is available in the most commonly-used outside diameter for capillary tubing applications.</p> <ul style="list-style-type: none"> <li>• Replacement for capillary tubing in low pressure applications where excellent chemical compatibility is required</li> <li>• Tubing sleeves available for capillary tubing connections</li> </ul> | <p>FEP tubing is a great alternative to traditional PTFE tubing, desirable for use because it is chemically inert to most solvents, easy to cut, and translucent for easy monitoring of solutions passing through.</p> <ul style="list-style-type: none"> <li>• Great for general, low pressure applications</li> <li>• Many sizes available in multiple colors for easy identification</li> <li>• Tight manufacturing tolerances to ensure product consistency</li> </ul> | <p>ETFE is chemically inert and more suitable for higher pressure applications (when using aqueous mobile phases) than PTFE, FEP, and PFA. Additionally, because ETFE is more rigid than PTFE, FEP, and PFA, this tubing better resists inner diameter collapse.</p> <ul style="list-style-type: none"> <li>• Excellent solvent resistance</li> <li>• More durable and less gas permeable than PTFE, FEP, and PFA</li> <li>• Operating temperatures up to 80 °C</li> </ul> |

### FLUOROPOLYMER TUBING SPECIFICATIONS

| OD (outside diameter)      | 1/16" (1.55 mm), 1/8" (3.2 mm)                                          | 1/16" (1.55 mm), 1/8" (3.2 mm), 3/16" (4.8 mm), 1/4" (6.35 mm) | 0.0145" (360 µm)                           | 1/16" (1.55 mm), 0.080" (2.0 mm), 0.118" (3.0 mm), 1/8" (3.2 mm), 0.157" (4.0 mm), 3/16" (4.8 mm), 1/4" (6.35 mm), 5/16" (7.94 mm) | 1/16" (1.6 mm), 1/8" (3.2 mm), 1/4" (6.35 mm)                           |
|----------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| ID (inside diameter)       | 0.020" (0.50 mm)–0.062" (1.55 mm)                                       | 0.020" (0.50 mm)–0.188" (4.80 mm)                              | 0.002" (50 µm)–0.006" (150 µm)             | 0.003" (0.075 mm) – 0.250" (6.35 mm)                                                                                               | 0.010" (0.25 mm)–0.188" (4.80 mm)                                       |
| Operating Temp             | -51 to 80 °C                                                            | -51 to 80 °C                                                   | -51 to 80 °C                               | -51 to 50 °C                                                                                                                       | -51 to 80 °C                                                            |
| Pressure Rating            | 500–2,000 psi (34–138 bar)                                              | 250–2,000 psi (17–138 bar)                                     | 1,750–3,500 psi (121–241 bar)              | 2,500–4,000 psi (172–276 bar)                                                                                                      | 250–4,000 psi (17–276 bar)                                              |
| Typical Tolerances         | ±0.001" (25 µm) for 1/16" OD tubing; ±0.003" (75 µm) for 1/8" OD tubing | ±0.001" (25 µm) or 1/16" OD tubing                             | ±0.0005" (12.5 µm)                         | ±0.001" (25 µm) for 1/16" OD tubing; ±0.003" (75 µm) for 1/8" OD tubing                                                            | ±0.001" (25 µm) for 1/16" OD tubing; ±0.003" (75 µm) for 1/8" OD tubing |
| Refractive Index (Clarity) | 1.34                                                                    | 1.34                                                           | 1.34                                       | 1.338                                                                                                                              | 1.4                                                                     |
| pH Range                   | 0–14                                                                    | 0–14                                                           | 0–14                                       | 0–14                                                                                                                               | 0–14                                                                    |
| Sterilization Techniques   | Ethylene oxide; thermal                                                 | Gamma irradiation; ethylene oxide; thermal                     | Gamma irradiation; ethylene oxide; thermal | Ethylene oxide; thermal                                                                                                            | Ethylene oxide                                                          |
| Autoclavable?              | Y                                                                       | Y                                                              | Y                                          | Y                                                                                                                                  | Y                                                                       |

360 µm  
OD

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1/32"  
OD

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1/16"  
OD

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1/8"  
OD

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3/16"  
OD

Page(s)  
26

1/4"  
OD

Page(s)  
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5/16"  
OD

Page(s)  
26





# PEEK Tubing

- › 1/16" or 1/8" outside diameter available
- › Biocompatible, inert, and easily cut
- › Great for high pressure applications
- › Maximum continuous use temperature: 100 °C

Our PEEK (polyetheretherketone) polymer tubing is biocompatible, chemically inert to most solvents, and can be used to replace stainless steel tubing in most liquid analytical systems. Unlike stainless steel tubing, PEEK tubing is flexible and can be easily cut to desired lengths.

PEEK tubing has a very smooth internal surface, which causes less turbulence than similarly sized metal tubing, contributing to improved resolution of sample bands. Of all our polymer tubing materials, PEEK is the least permeable to gas (see material properties on our website: [www.idex-hs.com](http://www.idex-hs.com)).

In addition, much of our 1/16" OD tubing is color-coded so different IDs are easily identified. Our proprietary extrusion process ensures color permanence in our tubing.

Our 5' length tubing is rough cut to approximately 5'1". A trim cut should be made before use, especially for smaller ID tubing. PEEK tubing can be cut easily with a razor blade. However for an improved cut, try our Tubing Cutters on page 28.



## Capillary PEEK Tubing

- › 360 µm or 1/32" outside diameter available
- › IDs as small as 25 µm (0.001")

Capillary PEEK tubing offers all the benefits of larger sized PEEK tubing, while serving as an excellent alternative to more traditional fused silica and stainless steel capillary tubing (see Application Note, right). The capillary tubing can be coupled to many of the products in the Connectors chapter (starting on page 62) and to some of the valves in the Valves chapter (starting on page 114).



## Fused Silica Tubing

- › Five inner diameters with most common capillary outside diameter, 360 µm
- › Cut in convenient lengths, up to 2 m

These products are manufactured from synthetic fused silica with a polyimide coating.

## NOTE

Because the thru-hole of our 25 µm ID PEEK tubing is very small, it is possible for some fittings to cause the ID to become occluded. Please use caution, especially with wrench-tightened fittings. For more information, please contact IDEX Health & Science or your local Distributor directly.

## APPLICATION NOTE

### What Size PEEK Tubing Should I Use?

- › It is usually safe to use 1/16" OD x 0.010" ID tubing throughout an analytical HPLC system. With a 0.010" ID, the pressure drop across most tubing lengths is negligible, and the ID is small enough to minimize band broadening.
- › High pressure semi-prep LC systems will most likely use 1/8" OD tubing.
- › Use our 1/32" OD tubing for the high pressure flow path of some microbore HPLC systems.
- › Choose 360 µm OD tubing for most capillary systems.
- › PEEK tubing is also available by the inch. Contact your local Distributor or IDEX Health & Science directly for pricing information.

## APPLICATION NOTE

- › An independent study conducted by a major pharmaceutical company indicated LC-MS chromatographic performance could be improved in some cases by switching the post-column transfer line from fused silica to PEEK polymer tubing. The switch dramatically reduced peak tailing and eliminated the degradation of peak symmetry as injection volume was reduced. For more information, please contact us or order the "Improved LC-MS Results Study" from the "Literature Request" section of our website at [www.idex-hs.com](http://www.idex-hs.com).
- › To straighten PEEK polymer tubing, first choose a piece of stainless steel tubing with an inner diameter slightly larger than the OD of your tubing and with an appropriate length for the PEEK tubing you wish to straighten. For instance, for 1/16" OD PEEK tubing with a length of 10", choose our U-825 tubing (stainless steel, 1/8" OD x 0.080" ID x 25 cm long, page 19). Slip your PEEK tubing into the stainless steel tubing. Place this "sleeved" tubing into an oven and bake at 425 °F (218 °C) for 30 minutes or 350 °F (177 °C) for 60 minutes. Allow the sleeved tubing to return to room temperature naturally (i.e., do not quench it with water). Once cooled, remove the PEEK tubing from the stainless steel sleeve and inspect it for straightness. If needed, repeat the process until the desired straightness is achieved.

## SPECIFICATIONS & DETAILS

| Tubing OD                                   | Tubing ID                           | OD Tolerance       | ID Tolerance       |
|---------------------------------------------|-------------------------------------|--------------------|--------------------|
| <b>PEEK TUBING SPECIFICATIONS</b>           |                                     |                    |                    |
| 1/16"                                       | 25 µm                               | ±0.001" (25 µm)    | ±0.0005" (12.5 µm) |
| 1/8"                                        | All                                 | ±0.003" (75 µm)    | ±0.003" (75 µm)    |
| <b>CAPILLARY PEEK TUBING SPECIFICATIONS</b> |                                     |                    |                    |
| 360 µm                                      | All                                 | ±0.0005" (12.5 µm) | ±0.0005" (12.5 µm) |
| 1/32"                                       | All                                 | ±0.0005" (12.5 µm) | ±0.0005" (12.5 µm) |
| <b>FUSED SILICA TUBING, 360 µm OD</b>       |                                     |                    |                    |
| 360 µm                                      | 20 µm (0.0008")                     | ±0.0004" (10 µm)   | ±0.00008" (2 µm)   |
| 360 µm                                      | 50 µm (0.002") and 75 µm (0.003")   | ±0.0004" (10 µm)   | ±0.00012" (3 µm)   |
| 360 µm                                      | 100 µm (0.004") and 150 µm (0.006") | ±0.0004" (10 µm)   | ±0.00016" (4 µm)   |

# PEEK Tubing (Cont.)

## PEEK Tubing

| Part No.                                | ID                                    | Color   | Max. Pressure        | Qty. |
|-----------------------------------------|---------------------------------------|---------|----------------------|------|
| <b>PEEK TUBING, 1/16" OD</b>            |                                       |         |                      |      |
| <b>1560</b>                             | 0.0025" (65 µm) ID x 5' (1.5 m)       | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1560L</b>                            | 0.0025" (65 µm) ID x 50' (15 m)       | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1560XL</b>                           | 0.0025" (65 µm) ID x 100' (30 m)      | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1560M</b>                            | 0.0025" (65 µm) ID x 1,000' (304 m)   | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1561</b>                             | 0.004" (0.10 mm) ID x 5' (1.5 m)      | Black   | 7,000 psi (483 bar)  | ea.  |
| <b>1561L</b>                            | 0.004" (0.10 mm) ID x 50' (15 m)      | Black   | 7,000 psi (483 bar)  | ea.  |
| <b>1561XL</b>                           | 0.004" (0.10 mm) ID x 100' (30 m)     | Black   | 7,000 psi (483 bar)  | ea.  |
| <b>1561M</b>                            | 0.004" (0.10 mm) ID x 1,000' (304 m)  | Black   | 7,000 psi (483 bar)  | ea.  |
| <b>1535</b>                             | 0.005" (0.125 mm) ID x 5' (1.5 m)     | Red     | 7,000 psi (483 bar)  | ea.  |
| <b>1535L</b>                            | 0.005" (0.125 mm) ID x 50' (15 m)     | Red     | 7,000 psi (483 bar)  | ea.  |
| <b>1535XL</b>                           | 0.005" (0.125 mm) ID x 100' (30 m)    | Red     | 7,000 psi (483 bar)  | ea.  |
| <b>1535M</b>                            | 0.005" (0.125 mm) ID x 1,000' (304 m) | Red     | 7,000 psi (483 bar)  | ea.  |
| <b>1536</b>                             | 0.007" (0.175 mm) ID x 5' (1.5 m)     | Yellow  | 7,000 psi (483 bar)  | ea.  |
| <b>1536L</b>                            | 0.007" (0.175 mm) ID x 50' (15 m)     | Yellow  | 7,000 psi (483 bar)  | ea.  |
| <b>1536XL</b>                           | 0.007" (0.175 mm) ID x 100' (30 m)    | Yellow  | 7,000 psi (483 bar)  | ea.  |
| <b>1536M</b>                            | 0.007" (0.175 mm) ID x 1,000' (304 m) | Yellow  | 7,000 psi (483 bar)  | ea.  |
| <b>1531</b>                             | 0.010" (0.25 mm) ID x 5' (1.5 m)      | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1531L</b>                            | 0.010" (0.25 mm) ID x 50' (15 m)      | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1531XL</b>                           | 0.010" (0.25 mm) ID x 100' (30 m)     | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1531M</b>                            | 0.010" (0.25 mm) ID x 1,000' (304 m)  | Natural | 7,000 psi (483 bar)  | ea.  |
| <b>1531B</b>                            | 0.010" (0.25 mm) ID x 5' (1.5 m)      | Blue    | 7,000 psi (483 bar)  | ea.  |
| <b>1531BL</b>                           | 0.010" (0.25 mm) ID x 50' (15 m)      | Blue    | 7,000 psi (483 bar)  | ea.  |
| <b>1531BXL</b>                          | 0.010" (0.25 mm) ID x 100' (30 m)     | Blue    | 7,000 psi (483 bar)  | ea.  |
| <b>1531BM</b>                           | 0.010" (0.25 mm) ID x 1,000' (304 m)  | Blue    | 7,000 psi (483 bar)  | ea.  |
| <b>1532</b>                             | 0.020" (0.50 mm) ID x 5' (1.5 m)      | Orange  | 6,000 psi (414 bar)  | ea.  |
| <b>1532L</b>                            | 0.020" (0.50 mm) ID x 50' (15 m)      | Orange  | 6,000 psi (414 bar)  | ea.  |
| <b>1532XL</b>                           | 0.020" (0.50 mm) ID x 100' (30 m)     | Orange  | 6,000 psi (414 bar)  | ea.  |
| <b>1532M</b>                            | 0.020" (0.50 mm) ID x 1,000' (304 m)  | Orange  | 6,000 psi (414 bar)  | ea.  |
| <b>1533</b>                             | 0.030" (0.75 mm) ID x 5' (1.5 m)      | Green   | 4,000 psi (276 bar)  | ea.  |
| <b>1533L</b>                            | 0.030" (0.75 mm) ID x 50' (15 m)      | Green   | 4,000 psi (276 bar)  | ea.  |
| <b>1533XL</b>                           | 0.030" (0.75 mm) ID x 100' (30 m)     | Green   | 4,000 psi (276 bar)  | ea.  |
| <b>1533M</b>                            | 0.030" (0.75 mm) ID x 1,000' (304 m)  | Green   | 4,000 psi (276 bar)  | ea.  |
| <b>1538</b>                             | 0.040" (1.00 mm) ID x 5' (1.5 m)      | Natural | 3,000 psi (207 bar)  | ea.  |
| <b>1538L</b>                            | 0.040" (1.00 mm) ID x 50' (15 m)      | Natural | 3,000 psi (207 bar)  | ea.  |
| <b>1538XL</b>                           | 0.040" (1.00 mm) ID x 100' (30 m)     | Natural | 3,000 psi (207 bar)  | ea.  |
| <b>1538M</b>                            | 0.040" (1.00 mm) ID x 1,000' (304 m)  | Natural | 3,000 psi (207 bar)  | ea.  |
| <b>PEEK TUBING, 1/8" OD</b>             |                                       |         |                      |      |
| <b>1534</b>                             | 0.062" (1.55 mm) ID x 5' (1.5 m)      | Natural | 4,000 psi (276 bar)  | ea.  |
| <b>1544</b>                             | 0.080" (2.00 mm) ID x 5' (1.5 m)      | Natural | 3,000 psi (207 bar)  | ea.  |
| <b>CAPILLARY PEEK TUBING, 360 µm OD</b> |                                       |         |                      |      |
| <b>1574</b>                             | 25 µm (0.001") ID x 5' (1.5 m)        | Natural | 5,000 psi (345 bar)  | ea.  |
| <b>1570</b>                             | 50 µm (0.002") ID x 5' (1.5 m)        | Natural | 2,000 psi (138 bar)  | ea.  |
| <b>1571</b>                             | 100 µm (0.004") ID x 5' (1.5 m)       | Red     | 2,000 psi (138 bar)  | ea.  |
| <b>1572</b>                             | 150 µm (0.006") ID x 5' (1.5 m)       | Yellow  | 2,000 psi (138 bar)  | ea.  |
| <b>CAPILLARY PEEK TUBING, 1/32" OD</b>  |                                       |         |                      |      |
| <b>1576</b>                             | 0.005" (0.125 mm) ID x 5' (1.5 m)     | Red     | 5,000 psi (345 bar)  | ea.  |
| <b>1576L</b>                            | 0.005" (0.125 mm) ID x 50' (15 m)     | Red     | 5,000 psi (345 bar)  | ea.  |
| <b>1576XL</b>                           | 0.005" (0.125 mm) ID x 100' (30 m)    | Red     | 5,000 psi (345 bar)  | ea.  |
| <b>1576M</b>                            | 0.005" (0.125 mm) ID x 1,000' (304 m) | Red     | 5,000 psi (345 bar)  | ea.  |
| <b>1577</b>                             | 0.007" (0.175 mm) ID x 5' (1.5 m)     | Yellow  | 5,000 psi (345 bar)  | ea.  |
| <b>1577L</b>                            | 0.007" (0.175 mm) ID x 50' (15 m)     | Yellow  | 5,000 psi (345 bar)  | ea.  |
| <b>1577XL</b>                           | 0.007" (0.175 mm) ID x 100' (30 m)    | Yellow  | 5,000 psi (345 bar)  | ea.  |
| <b>1577M</b>                            | 0.007" (0.175 mm) ID x 1,000' (304 m) | Yellow  | 5,000 psi (345 bar)  | ea.  |
| <b>1581</b>                             | 0.010" (0.25 mm) ID x 5' (1.5 m)      | Blue    | 5,000 psi (345 bar)  | ea.  |
| <b>1581L</b>                            | 0.010" (0.25 mm) ID x 50' (15 m)      | Blue    | 5,000 psi (345 bar)  | ea.  |
| <b>1581XL</b>                           | 0.010" (0.25 mm) ID x 100' (30 m)     | Blue    | 5,000 psi (345 bar)  | ea.  |
| <b>1581M</b>                            | 0.010" (0.25 mm) ID x 1,000' (304 m)  | Blue    | 5,000 psi (345 bar)  | ea.  |
| <b>1568</b>                             | 0.015" (0.40 mm) ID x 5' (1.5 m)      | Natural | 4,000 psi (276 bar)  | ea.  |
| <b>1568L</b>                            | 0.015" (0.40 mm) ID x 50' (15 m)      | Natural | 4,000 psi (276 bar)  | ea.  |
| <b>1568XL</b>                           | 0.015" (0.40 mm) ID x 100' (30 m)     | Natural | 4,000 psi (276 bar)  | ea.  |
| <b>1568M</b>                            | 0.015" (0.40 mm) ID x 1,000' (304 m)  | Natural | 4,000 psi (276 bar)  | ea.  |
| <b>1569</b>                             | 0.020" (0.50 mm) ID x 5' (1.5 m)      | Orange  | 3,000 psi (207 bar)  | ea.  |
| <b>1569L</b>                            | 0.020" (0.50 mm) ID x 50' (15 m)      | Orange  | 3,000 psi (207 bar)  | ea.  |
| <b>1569XL</b>                           | 0.020" (0.50 mm) ID x 100' (30 m)     | Orange  | 3,000 psi (207 bar)  | ea.  |
| <b>1569M</b>                            | 0.020" (0.50 mm) ID x 1,000' (304 m)  | Orange  | 3,000 psi (207 bar)  | ea.  |
| <b>FUSED SILICA TUBING, 360 µm OD</b>   |                                       |         |                      |      |
| <b>FS-120</b>                           | 20 µm (0.0008") ID x 6.4' (2 m)       | Natural | 10,000 psi (690 bar) | ea.  |
| <b>FS-150</b>                           | 50 µm (0.002") ID x 6.4' (2 m)        | Natural | 10,000 psi (690 bar) | ea.  |
| <b>FS-175</b>                           | 75 µm (0.003") ID x 6.4' (2 m)        | Natural | 10,000 psi (690 bar) | ea.  |
| <b>FS-110</b>                           | 100 µm (0.004") ID x 6.4' (2 m)       | Natural | 10,000 psi (690 bar) | ea.  |
| <b>FS-115</b>                           | 150 µm (0.006") ID x 6.4' (2 m)       | Natural | 10,000 psi (690 bar) | ea.  |

# Stainless Steel Tubing

- » Precut 316 stainless steel
- » Available ODs include 1/32", 1/16", and 1/8"
- » Color-coded banding for easy identification of the inner diameter

IDEX Health & Science seamless, precut stainless steel tubing is designed to meet the exacting requirements of today's analyses. We machine cut and polish each end, deburr the inside and outside edges, and passivate the tubing (please see the passivation information on this page). Finally, we flush reagent-grade isopropanol through each piece.

Our thorough preparation and cleaning procedure guarantees tubing that is truly ready-to-use, with flat, burr-free ends and a clean finish. This care is important in achieving zero-dead-volume connections and good chromatographic results.

We offer a variety of precut lengths as well as longer lengths (5' and 25') of some sizes. Cutting the tubing disturbs and roughens the tubing's end surface, so we recommend using our precut tubing whenever possible. If you need to cut tubing to custom lengths, we suggest you then passivate the tubing.



## APPLICATION NOTE

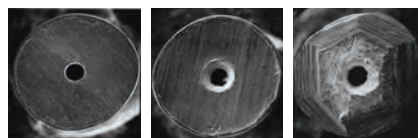
- » Our 1/32" OD tubing is designed for enhanced flexibility in high pressure applications.
- » Standard 1/16" and 1/8" OD stainless steel tubing is suited for most analytical applications.



## NOTE

PEEK polymer tubing can be used to replace stainless steel tubing in most liquid analytical systems. Unlike stainless steel tubing, PEEK tubing is biocompatible, flexible, and can easily be cut to desired lengths. See page 16. All Stainless Steel tubing longer than 1 m is coiled.

### The Beauty of Precut Tubing



Precut tubing

Tubing cut by a commercially available tubing cutter

File cut tubing

### Stainless Steel Tubing Passivation

Stainless steel is naturally self-passivating, forming an oxidized layer on newly created surfaces. IDEX Health & Science takes extra steps to ensure the chemical resistance of our stainless steel tubing by manually passivating before and after the tubing is cut into specified lengths (except in a few cases where size is prohibitive). In the precut stage, the internal wall is acid passivated and flushed. After the tubing is cut, deburred and polished, it is completely submerged in an acid passivation bath and again flushed clean. The table below summarizes the manual passivation steps performed for each size of our stainless steel tubing:

| Tubing OD | Precut Passivation | Postcut Passivation      |
|-----------|--------------------|--------------------------|
| 1/32"     | All                | All                      |
| 1/16"     | All                | All, ex. 25' lengths     |
| 1/8"      | None               | All, ex. 3 & 5 m lengths |

## Stainless Steel Tubing (Cont.)



### SPECIFICATIONS & DETAILS

- › Maximum Recommended Operating Temperature: 750 °F (399 °C).
- › Rockwell Hardness (B): Maximum of 95.
- › Meets ASTM A269 and A213.

| Tubing OD | OD Tolerance                   | Tubing ID                    | ID Tolerance                   |
|-----------|--------------------------------|------------------------------|--------------------------------|
| 1/32"     | +0.002"/-0.000" (+50 µm/-0 µm) | All, except 0.004" (0.10 mm) | +0.000"/-0.002" (+0 µm/-50 µm) |
| 1/32"     | +0.002"/-0.000" (+50 µm/-0 µm) | 0.004" (0.10 mm)             | +0.002"/-0.000" (+50 µm/-0 µm) |
| 1/16"     | +0.002"/-0.000" (+50 µm/-0 µm) | All                          | ±0.001" (25 µm)                |
| 1/8"      | ±0.003" (75 µm)                | All                          | ±0.003" (75 µm)                |



### RELATED PRODUCTS

- › PEEK polymer tubing is available in all of these sizes, starting on page 16.



### NOTE

#### Understanding the Maximum Pressure Value of Stainless Steel Tubing

Stainless steel is unique as a material. The Maximum Pressure value listed for each part number is the safe, continuous working pressure limit that IDEX Health & Science has assigned for the tubing. It reflects a safety margin before the tubing begins to "yield" — which is well below the tubing's "burst" pressure. For more information, contact IDEX Health & Science or your authorized Distributor.

## Stainless Steel Tubing

| Part No.                         | ID               | Length      | Color  | Maximum Pressure       | Qty. |
|----------------------------------|------------------|-------------|--------|------------------------|------|
| <b>STAINLESS STEEL, 1/32" OD</b> |                  |             |        |                        |      |
| <b>U-1114</b>                    | 0.004" (0.10 mm) | 2" (5 cm)   | Red    | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1115</b>                    | 0.004" (0.10 mm) | 4" (10 cm)  | Red    | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1116</b>                    | 0.004" (0.10 mm) | 8" (20 cm)  | Red    | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1117</b>                    | 0.004" (0.10 mm) | 12" (30 cm) | Red    | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1120</b>                    | 0.006" (0.15 mm) | 2" (5 cm)   | Yellow | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1122</b>                    | 0.006" (0.15 mm) | 8" (20 cm)  | Yellow | 19,300 psi (1,331 bar) | ea.  |
| <b>U-1125</b>                    | 0.008" (0.20 mm) | 2" (5 cm)   | Clear  | 17,800 psi (1,227 bar) | ea.  |
| <b>U-1126</b>                    | 0.008" (0.20 mm) | 4" (10 cm)  | Clear  | 17,800 psi (1,227 bar) | ea.  |
| <b>U-1128</b>                    | 0.008" (0.20 mm) | 12" (30 cm) | Clear  | 17,800 psi (1,227 bar) | ea.  |
| <b>U-1130</b>                    | 0.010" (0.25 mm) | 2" (5 cm)   | Blue   | 16,200 psi (1,117 bar) | ea.  |
| <b>U-1131</b>                    | 0.010" (0.25 mm) | 4" (10 cm)  | Blue   | 16,200 psi (1,117 bar) | ea.  |
| <b>U-1132</b>                    | 0.010" (0.25 mm) | 8" (20 cm)  | Blue   | 16,200 psi (1,117 bar) | ea.  |
| <b>U-1133</b>                    | 0.010" (0.25 mm) | 12" (30 cm) | Blue   | 16,200 psi (1,117 bar) | ea.  |
| <b>U-1140</b>                    | 0.015" (0.40 mm) | 2" (5 cm)   | Green  | 12,300 psi (848 bar)   | ea.  |
| <b>U-1141</b>                    | 0.015" (0.40 mm) | 4" (10 cm)  | Green  | 12,300 psi (848 bar)   | ea.  |
| <b>U-1142</b>                    | 0.015" (0.40 mm) | 8" (20 cm)  | Green  | 12,300 psi (848 bar)   | ea.  |
| <b>U-1143</b>                    | 0.015" (0.40 mm) | 12" (30 cm) | Green  | 12,300 psi (848 bar)   | ea.  |
| <b>U-1145</b>                    | 0.018" (0.45 mm) | 2" (5 cm)   | Black  | 10,000 psi (689 bar)   | ea.  |
| <b>U-1146</b>                    | 0.018" (0.45 mm) | 4" (10 cm)  | Black  | 10,000 psi (689 bar)   | ea.  |
| <b>U-1148</b>                    | 0.018" (0.45 mm) | 12" (30 cm) | Black  | 10,000 psi (689 bar)   | ea.  |

## Stainless Steel Tubing (Cont.)

| Part No.                         | ID                | Length       | Color  | Maximum Pressure       | Qty. |
|----------------------------------|-------------------|--------------|--------|------------------------|------|
| <b>STAINLESS STEEL, 1/16" OD</b> |                   |              |        |                        |      |
| U-152                            | 0.005" (0.125 mm) | 2" (5 cm)    | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-153                            | 0.005" (0.125 mm) | 4" (10 cm)   | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-154                            | 0.005" (0.125 mm) | 8" (20 cm)   | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-155                            | 0.005" (0.125 mm) | 12" (30 cm)  | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-156                            | 0.005" (0.125 mm) | 1.6' (0.5 m) | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-157                            | 0.005" (0.125 mm) | 3.2' (1 m)   | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-158                            | 0.005" (0.125 mm) | 5' (1.5 m)   | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-160                            | 0.005" (0.125 mm) | 25' (7.6 m)  | Red    | 21,600 psi (1,489 bar) | ea.  |
| U-126                            | 0.007" (0.175 mm) | 2" (5 cm)    | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-127                            | 0.007" (0.175 mm) | 4" (10 cm)   | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-128                            | 0.007" (0.175 mm) | 8" (20 cm)   | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-129                            | 0.007" (0.175 mm) | 12" (30 cm)  | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-130                            | 0.007" (0.175 mm) | 1.6' (0.5 m) | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-131                            | 0.007" (0.175 mm) | 3.2' (1 m)   | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-108                            | 0.007" (0.175 mm) | 5' (1.5 m)   | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-161                            | 0.007" (0.175 mm) | 25' (7.6 m)  | Black  | 20,900 psi (1,441 bar) | ea.  |
| U-111                            | 0.010" (0.25 mm)  | 2" (5 cm)    | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-112                            | 0.010" (0.25 mm)  | 4" (10 cm)   | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-113                            | 0.010" (0.25 mm)  | 8" (20 cm)   | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-114                            | 0.010" (0.25 mm)  | 12" (30 cm)  | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-132                            | 0.010" (0.25 mm)  | 1.6' (0.5 m) | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-133                            | 0.010" (0.25 mm)  | 3.2' (1 m)   | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-106                            | 0.010" (0.25 mm)  | 5' (1.5 m)   | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-162                            | 0.010" (0.25 mm)  | 25' (7.6 m)  | Blue   | 19,700 psi (1,358 bar) | ea.  |
| U-101                            | 0.020" (0.5 mm)   | 2" (5 cm)    | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-102                            | 0.020" (0.5 mm)   | 4" (10 cm)   | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-103                            | 0.020" (0.5 mm)   | 8" (20 cm)   | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-104                            | 0.020" (0.5 mm)   | 12" (30 cm)  | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-134                            | 0.020" (0.5 mm)   | 1.6' (0.5 m) | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-135                            | 0.020" (0.5 mm)   | 3.2' (1 m)   | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-105                            | 0.020" (0.5 mm)   | 5' (1.5 m)   | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-163                            | 0.020" (0.5 mm)   | 25' (7.6 m)  | Yellow | 15,800 psi (1,089 bar) | ea.  |
| U-115                            | 0.030" (0.75 mm)  | 2" (5 cm)    | White  | 12,000 psi (827 bar)   | ea.  |
| U-116                            | 0.030" (0.75 mm)  | 4" (10 cm)   | White  | 12,000 psi (827 bar)   | ea.  |
| U-117                            | 0.030" (0.75 mm)  | 8" (20 cm)   | White  | 12,000 psi (827 bar)   | ea.  |
| U-118                            | 0.030" (0.75 mm)  | 12" (30 cm)  | White  | 12,000 psi (827 bar)   | ea.  |
| U-136                            | 0.030" (0.75 mm)  | 1.6' (0.5 m) | White  | 12,000 psi (827 bar)   | ea.  |
| U-137                            | 0.030" (0.75 mm)  | 3.2' (1 m)   | White  | 12,000 psi (827 bar)   | ea.  |
| U-107                            | 0.030" (0.75 mm)  | 5' (1.5 m)   | White  | 12,000 psi (827 bar)   | ea.  |
| U-164                            | 0.030" (0.75 mm)  | 25' (7.6 m)  | White  | 12,000 psi (827 bar)   | ea.  |
| U-138                            | 0.040" (1.0 mm)   | 2" (5 cm)    | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-139                            | 0.040" (1.0 mm)   | 4" (10 cm)   | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-140                            | 0.040" (1.0 mm)   | 8" (20 cm)   | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-141                            | 0.040" (1.0 mm)   | 12" (30 cm)  | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-142                            | 0.040" (1.0 mm)   | 1.6' (0.5 m) | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-143                            | 0.040" (1.0 mm)   | 3.2' (1 m)   | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-144                            | 0.040" (1.0 mm)   | 5' (1.5 m)   | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-165                            | 0.040" (1.0 mm)   | 25' (7.6 m)  | N/A    | 8,100 psi (558 bar)    | ea.  |
| U-145                            | 0.046" (1.15 mm)  | 2" (5 cm)    | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-146                            | 0.046" (1.15 mm)  | 4" (10 cm)   | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-147                            | 0.046" (1.15 mm)  | 8" (20 cm)   | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-148                            | 0.046" (1.15 mm)  | 12" (30 cm)  | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-149                            | 0.046" (1.15 mm)  | 1.6' (0.5 m) | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-150                            | 0.046" (1.15 mm)  | 3.2' (1 m)   | N/A    | 5,800 psi (400 bar)    | ea.  |
| U-151                            | 0.046" (1.15 mm)  | 5' (1.5 m)   | N/A    | 5,800 psi (400 bar)    | ea.  |
| <b>STAINLESS STEEL, 1/8" OD</b>  |                   |              |        |                        |      |
| U-825                            | 0.080" (2.0 mm)   | 10" (25 cm)  | N/A    | 7,600 psi (524 bar)    | ea.  |
| U-800                            | 0.080" (2.0 mm)   | 3.2' (1 m)   | N/A    | 7,600 psi (524 bar)    | ea.  |
| U-803                            | 0.080" (2.0 mm)   | 9.8' (3 m)   | N/A    | 7,600 psi (524 bar)    | ea.  |
| U-805                            | 0.080" (2.0 mm)   | 16' (5 m)    | N/A    | 7,600 psi (524 bar)    | ea.  |



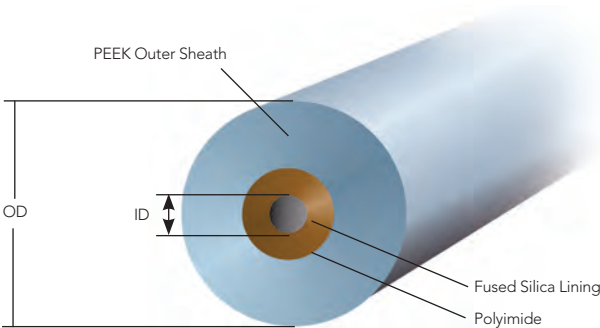
# PEEKsil™ Tubing

- › PEEK covered fused silica
- › 1/32" and 1/16" outside diameters with a wide variety of inside diameters
- › Precut to numerous standard lengths

PEEKsil's sheathing is mechanically strong and has ideal characteristics for sealing with many styles of fittings. The fused silica core provides a consistent and rigid fluid pathway with very tight tolerances and industry-accepted chemical properties. Together, this makes PEEKsil tubing ideal for numerous applications. In fact, PEEKsil can be used as a direct replacement for conventional stainless steel or PEEK tubing in many analytical systems.

Like traditional fused silica tubing, PEEKsil has excellent chemical compatibility and extremely low adsorption characteristics, especially when compared with stainless steel.

*Please Note: **Do not cut this tubing.** It should be used at its precut lengths because of permanent damage caused by conventional cutters.*



## SPECIFICATIONS & DETAILS

| Tubing OD | OD Tolerance     | Tubing ID    | ID Tolerance     |
|-----------|------------------|--------------|------------------|
|           |                  | 25 µm        | ±0.00004" (1 µm) |
| 1/32"     | ±0.0008" (20 µm) | 50–100 µm    | ±0.00012" (3 µm) |
| 1/16"     | ±0.0012" (30 µm) | 0.15–0.30 mm | ±0.0002" (5 µm)  |

## SPECIFICATIONS & DETAILS

Because PEEKsil tubing has fused silica tubing at its core, the pressure rating for this tubing is determined by the inner diameter of the tubing. The following chart highlights the Maximum Pressure values for this tubing, as determined by SGE International Pty., Ltd., the manufacturer of this tubing:

| Tubing ID  | Maximum Pressure       |
|------------|------------------------|
| 25 µm      | 25,000 psi (1,723 bar) |
| 50 µm      | 20,000 psi (1,379 bar) |
| 75–100 µm  | 15,000 psi (1,034 bar) |
| 150–175 µm | 8,500 psi (586 bar)    |
| 200–300 µm | 6,000 psi (414 bar)    |

*The pressure ratings provided are indicative of the performance capabilities of the tubing. The actual pressure limits achievable will depend upon the fittings used, the quality of the receiving port, and other factors. Contact IDEX Health & Science or your authorized Distributor for more information.*



## PEEKsil™ Tubing

| 4" (10 cm)                      | ID              | Length       | Color   | Qty. |
|---------------------------------|-----------------|--------------|---------|------|
| <b>PEEKsil TUBING, 1/32" OD</b> |                 |              |         |      |
| <b>3255</b>                     | 0.001" (25 µm)  | 2" (5 cm)    | Orange  | 2-pk |
| <b>32510</b>                    | 0.001" (25 µm)  | 4" (10 cm)   | Orange  | 2-pk |
| <b>32515</b>                    | 0.001" (25 µm)  | 6" (15 cm)   | Orange  | 2-pk |
| <b>32520</b>                    | 0.001" (25 µm)  | 8" (20 cm)   | Orange  | 2-pk |
| <b>32550</b>                    | 0.001" (25 µm)  | 1.6' (50 cm) | Orange  | 2-pk |
| <b>3505</b>                     | 0.002" (50 µm)  | 2" (5 cm)    | Natural | 2-pk |
| <b>35010</b>                    | 0.002" (50 µm)  | 4" (10 cm)   | Natural | 2-pk |
| <b>35015</b>                    | 0.002" (50 µm)  | 6" (15 cm)   | Natural | 2-pk |
| <b>35020</b>                    | 0.002" (50 µm)  | 8" (20 cm)   | Natural | 2-pk |
| <b>PEEKsil TUBING, 1/32" OD</b> |                 |              |         |      |
| <b>35050</b>                    | 0.002" (50 µm)  | 1.6' (50 cm) | Natural | 2-pk |
| <b>3755</b>                     | 0.003" (75 µm)  | 2" (5 cm)    | Black   | 2-pk |
| <b>37510</b>                    | 0.003" (75 µm)  | 4" (10 cm)   | Black   | 2-pk |
| <b>37515</b>                    | 0.003" (75 µm)  | 6" (15 cm)   | Black   | 2-pk |
| <b>37520</b>                    | 0.003" (75 µm)  | 8" (20 cm)   | Black   | 2-pk |
| <b>37550</b>                    | 0.003" (75 µm)  | 1.6' (50 cm) | Black   | 2-pk |
| <b>31005</b>                    | 0.004" (100 µm) | 2" (5 cm)    | Red     | 2-pk |
| <b>310010</b>                   | 0.004" (100 µm) | 4" (10 cm)   | Red     | 2-pk |
| <b>310015</b>                   | 0.004" (100 µm) | 6" (15 cm)   | Red     | 2-pk |
| <b>310020</b>                   | 0.004" (100 µm) | 8" (20 cm)   | Red     | 2-pk |
| <b>310050</b>                   | 0.004" (100 µm) | 1.6' (50 cm) | Red     | 2-pk |
| <b>31505</b>                    | 0.006" (150 µm) | 2" (5 cm)    | Purple  | 2-pk |
| <b>315010</b>                   | 0.006" (150 µm) | 4" (10 cm)   | Purple  | 2-pk |
| <b>315015</b>                   | 0.006" (150 µm) | 6" (15 cm)   | Purple  | 2-pk |
| <b>315020</b>                   | 0.006" (150 µm) | 8" (20 cm)   | Purple  | 2-pk |
| <b>315050</b>                   | 0.006" (150 µm) | 1.6' (50 cm) | Purple  | 2-pk |
| <b>PEEKsil TUBING, 1/16" OD</b> |                 |              |         |      |
| <b>6255</b>                     | 0.001" (25 µm)  | 2" (5 cm)    | Orange  | 5-pk |
| <b>62510</b>                    | 0.001" (25 µm)  | 4" (10 cm)   | Orange  | 5-pk |
| <b>62515</b>                    | 0.001" (25 µm)  | 6" (15 cm)   | Orange  | 5-pk |
| <b>62520</b>                    | 0.001" (25 µm)  | 8" (20 cm)   | Orange  | 5-pk |
| <b>62550</b>                    | 0.001" (25 µm)  | 1.6' (50 cm) | Orange  | 2-pk |
| <b>6505</b>                     | 0.002" (50 µm)  | 2" (5 cm)    | Natural | 5-pk |
| <b>65010</b>                    | 0.002" (50 µm)  | 4" (10 cm)   | Natural | 5-pk |
| <b>65015</b>                    | 0.002" (50 µm)  | 6" (15 cm)   | Natural | 5-pk |
| <b>65020</b>                    | 0.002" (50 µm)  | 8" (20 cm)   | Natural | 5-pk |
| <b>65050</b>                    | 0.002" (50 µm)  | 1.6' (50 cm) | Natural | 2-pk |
| <b>6755</b>                     | 0.003" (75 µm)  | 2" (5 cm)    | Black   | 5-pk |
| <b>67510</b>                    | 0.003" (75 µm)  | 4" (10 cm)   | Black   | 5-pk |
| <b>67515</b>                    | 0.003" (75 µm)  | 6" (15 cm)   | Black   | 5-pk |
| <b>67520</b>                    | 0.003" (75 µm)  | 8" (20 cm)   | Black   | 5-pk |
| <b>67550</b>                    | 0.003" (75 µm)  | 1.6' (50 cm) | Black   | 2-pk |
| <b>61005</b>                    | 0.004" (100 µm) | 2" (5 cm)    | Red     | 5-pk |
| <b>610010</b>                   | 0.004" (100 µm) | 4" (10 cm)   | Red     | 5-pk |
| <b>610015</b>                   | 0.004" (100 µm) | 6" (15 cm)   | Red     | 5-pk |
| <b>610020</b>                   | 0.004" (100 µm) | 8" (20 cm)   | Red     | 5-pk |
| <b>610050</b>                   | 0.004" (100 µm) | 1.6' (50 cm) | Red     | 2-pk |
| <b>61505</b>                    | 0.006" (150 µm) | 2" (5 cm)    | Purple  | 5-pk |
| <b>615010</b>                   | 0.006" (150 µm) | 4" (10 cm)   | Purple  | 5-pk |
| <b>615015</b>                   | 0.006" (150 µm) | 6" (15 cm)   | Purple  | 5-pk |
| <b>615020</b>                   | 0.006" (150 µm) | 8" (20 cm)   | Purple  | 5-pk |
| <b>615050</b>                   | 0.006" (150 µm) | 1.6' (50 cm) | Purple  | 2-pk |
| <b>617515</b>                   | 0.007" (175 µm) | 6" (15 cm)   | Yellow  | 5-pk |
| <b>617520</b>                   | 0.007" (175 µm) | 8" (20 cm)   | Yellow  | 5-pk |
| <b>617550</b>                   | 0.007" (175 µm) | 1.6' (50 cm) | Yellow  | 2-pk |
| <b>62005</b>                    | 0.008" (200 µm) | 2" (5 cm)    | Blue    | 5-pk |
| <b>620015</b>                   | 0.008" (200 µm) | 6" (15 cm)   | Blue    | 5-pk |
| <b>620020</b>                   | 0.008" (200 µm) | 8" (20 cm)   | Blue    | 5-pk |
| <b>620050</b>                   | 0.008" (200 µm) | 1.6' (50 cm) | Blue    | 2-pk |
| <b>63005</b>                    | 0.012" (300 µm) | 2" (5 cm)    | Gray    | 5-pk |
| <b>630010</b>                   | 0.012" (300 µm) | 4" (10 cm)   | Gray    | 5-pk |
| <b>630015</b>                   | 0.012" (300 µm) | 6" (15 cm)   | Gray    | 5-pk |
| <b>630020</b>                   | 0.012" (300 µm) | 8" (20 cm)   | Gray    | 5-pk |
| <b>630050</b>                   | 0.012" (300 µm) | 1.6' (50 cm) | Gray    | 2-pk |

# PFA Tubing

## PFA Tubing

- › 1/16" and 1/8" ODs available
- › Excellent solvent resistance and low gas permeability
- › Constructed with genuine Teflon™ PFA resin

PFA (perfluoroalkoxyalkane) tubing offers excellent solvent resistance (virtually identical to FEP and PTFE) while adding several advantages. These include smoother surface texture, higher continuous service temperature and superior polymer purity. The recommended maximum operating temperature for our PFA tubing is 80 °C.

## High Purity PFA Tubing

- › 360 µm, 1/16", 1/8", 3/16", and 1/4" outside diameters available
- › PFA HP and PFA HP Plus Grades available
- › Virtually contaminant free
- › Constructed with genuine Teflon™ High Purity PFA resin

PFA High Purity (HP) tubing offers all of the benefits of standard PFA tubing, with the additional benefit of being manufactured from a premium grade of PFA that is one of the most contaminant-free polymers available. In PFA HP, we offer tubing with the following outer diameters: 1/16", 1/8", 3/16", and 1/4".

PFA High Purity (HP) Plus tubing carries all of the benefits of PFA HP tubing, with the additional benefits of increased ability to withstand repeated flexing; improved resistance to stress cracking when exposed to aggressive fluorosurfactants; and smoother, clearer walls. In PFA HP Plus, we offer tubing with the following outer diameters: 360 µm, 1/16", and 1/8".

*(Please Note: Due to the physical nature of the 360 µm OD tubing, we recommend using our A-350 Polymer Tubing Cutter from page 28 when cutting this tubing to length. Additionally, extra care should be taken to ensure fittings are not overtightened and to ensure the tubing is not stretched once secured in place, to ensure the dimensional stability of the tubing.)*



## SPECIFICATIONS & DETAILS

| Tubing OD                                     | OD Tolerances      | Tubing ID | ID Tolerance       |
|-----------------------------------------------|--------------------|-----------|--------------------|
| <b>PFA TUBING SPECIFICATIONS</b>              |                    |           |                    |
| <b>1/16"</b>                                  | ±0.001" (25 µm)    | All       | ±0.001" (25 µm)    |
| <b>1/8"</b>                                   | ±0.003" (75 µm)    | All       | ±0.003" (75 µm)    |
| <b>HIGH PURITY PFA TUBING SPECIFICATIONS</b>  |                    |           |                    |
| <b>1/16"</b>                                  | ±0.001" (25 µm)    | All       | ±0.001" (25 µm)    |
| <b>1/8"</b>                                   | ±0.003" (75 µm)    | All       | ±0.003" (75 µm)    |
| <b>3/16"</b>                                  | ±0.003" (75 µm)    | All       | ±0.003" (75 µm)    |
| <b>1/4"</b>                                   | ±0.004" (100 µm)   | All       | ±0.004" (100 µm)   |
| <b>360 µM OD PFA HP TUBING SPECIFICATIONS</b> |                    |           |                    |
| <b>360 µm</b>                                 | ±0.0005" (12.5 µm) | All       | ±0.0005" (12.5 µm) |

## PFA Tubing

| Part No.                            | ID               | Length         | Color   | Max. Pressure       | Qty. |
|-------------------------------------|------------------|----------------|---------|---------------------|------|
| <b>PFA TUBING, 1/16" OD</b>         |                  |                |         |                     |      |
| <b>1500</b>                         | 0.020" (0.50 mm) | 5' (1.5 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1512L</b>                        | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1512M</b>                        | 0.020" (0.50 mm) | 1,000' (304 m) | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1502</b>                         | 0.030" (0.75 mm) | 5' (1.5 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1514L</b>                        | 0.030" (0.75 mm) | 50' (15 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1514M</b>                        | 0.030" (0.75 mm) | 1,000' (304 m) | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1503</b>                         | 0.040" (1.0 mm)  | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1507L</b>                        | 0.040" (1.0 mm)  | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1507M</b>                        | 0.040" (1.0 mm)  | 1,000' (304 m) | Natural | 500 psi (34 bar)    | ea.  |
| <b>PFA TUBING, 1/8" OD</b>          |                  |                |         |                     |      |
| <b>1509-5</b>                       | 0.062" (1.55 mm) | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1509L</b>                        | 0.062" (1.55 mm) | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>PFA HP TUBING, 1/16" OD</b>      |                  |                |         |                     |      |
| <b>1622-5</b>                       | 0.020" (0.50 mm) | 5' (1.5 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1622L</b>                        | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1622M</b>                        | 0.020" (0.50 mm) | 1,000' (304 m) | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1632-5</b>                       | 0.030" (0.75 mm) | 5' (1.5 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1632L</b>                        | 0.030" (0.75 mm) | 50' (15 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1632M</b>                        | 0.030" (0.75 mm) | 1,000' (304 m) | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>PFA HP TUBING, 1/8" OD</b>       |                  |                |         |                     |      |
| <b>1641-5</b>                       | 0.062" (1.55 mm) | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1641L</b>                        | 0.062" (1.55 mm) | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>PFA HP PLUS TUBING, 1/16" OD</b> |                  |                |         |                     |      |
| <b>1902-5</b>                       | 0.010 (0.25 mm)  | 5' (1.5 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1902L</b>                        | 0.010 (0.25 mm)  | 50' (15 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1902M</b>                        | 0.010 (0.25 mm)  | 1,000' (304 m) | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1907-5</b>                       | 0.020" (0.50 mm) | 5' (1.5 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1907L</b>                        | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1907M</b>                        | 0.020" (0.50 mm) | 1,000' (304 m) | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1912-5</b>                       | 0.030" (0.75 mm) | 5' (1.5 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1912L</b>                        | 0.030" (0.75 mm) | 50' (15 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1912M</b>                        | 0.030" (0.75 mm) | 1,000' (304 m) | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>PFA HP PLUS TUBING, 1/8" OD</b>  |                  |                |         |                     |      |
| <b>1921-5</b>                       | 0.062" (1.55 mm) | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1921L</b>                        | 0.062" (1.55 mm) | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |



# FEP Tubing

- › Great for moderate-to-low pressure applications
- › 1/16", 1/8", 3/16", 1/4", or 5/16" outside diameter available
- › 1 mm, 2 mm, or 3 mm outside diameter available
- › Maximum continuous use temperature: 50 °C
- › Constructed with genuine Teflon™ FEP resin

With virtually identical chemical resistance to PFA at a lower price, FEP tubing is great for general, low pressure applications. Compared to PTFE, FEP (fluorinated ethylene propylene) tubing is held to tighter tolerances and has lower gas permeability (see material properties on our website: [www.idex-hs.com](http://www.idex-hs.com)).

Much of our FEP Tubing — even the color-tinted options — is translucent, making it possible to watch fluid flow. Using different colored tubing can help identify transfer lines in multisolvent systems. Color coding also allows easy identification of the tubing thru-hole size. Black FEP tubing is available for light-sensitive applications (such as enzymatic and chemi-luminescent reactions) and entering/exiting flow cells.



## SPECIFICATIONS & DETAILS

| Tubing Size     | OD Tolerances     | ID Tolerances     |
|-----------------|-------------------|-------------------|
| <b>1/16" OD</b> | ±0.001" (25 µm)   | ±0.001" (25 µm)   |
| <b>1/8" OD</b>  | ±0.003" (75 µm)   | ±0.003" (75 µm)   |
| <b>3/16" OD</b> | ±0.004" (0.10 mm) | ±0.004" (0.10 mm) |
| <b>5/16" OD</b> | ±0.004" (0.10 mm) | ±0.004" (0.10 mm) |
| <b>1 mm OD</b>  | ±0.001" (25 µm)   | ±0.001" (25 µm)   |
| <b>2 mm OD</b>  | ±0.003" (75 µm)   | ±0.003" (75 µm)   |
| <b>3 mm OD</b>  | ±0.003" (75 µm)   | ±0.003" (75 µm)   |

| Part No.                     | ID               | Length         | Color   | Max. Pressure       | Qty. |
|------------------------------|------------------|----------------|---------|---------------------|------|
| <b>FEP TUBING, 1/16" OD</b>  |                  |                |         |                     |      |
| <b>1527-5</b>                | 0.010" (0.25 mm) | 5' (1.5 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1527L</b>                 | 0.010" (0.25 mm) | 50' (15 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1527XL</b>                | 0.010" (0.25 mm) | 100' (30 m)    | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1527M</b>                 | 0.010" (0.25 mm) | 1,000' (304 m) | Natural | 3,000 psi (207 bar) | ea.  |
| <b>1548-5</b>                | 0.020" (0.50 mm) | 5' (1.5 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1548L</b>                 | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1548XL</b>                | 0.020" (0.50 mm) | 100' (30 m)    | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1548M</b>                 | 0.020" (0.50 mm) | 1,000' (304 m) | Natural | 2,000 psi (138 bar) | ea.  |
| <b>1520-5</b>                | 0.030" (0.75 mm) | 5' (1.5 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1520L</b>                 | 0.030" (0.75 mm) | 50' (15 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1520XL</b>                | 0.030" (0.75 mm) | 100' (30 m)    | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>1520M</b>                 | 0.030" (0.75 mm) | 1,000' (304 m) | Natural | 1,000 psi (69 bar)  | ea.  |
| <b>FEP TUBING, 1/8" OD</b>   |                  |                |         |                     |      |
| <b>1521-5</b>                | 0.062" (1.55 mm) | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1521L</b>                 | 0.062" (1.55 mm) | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1521XL</b>                | 0.062" (1.55 mm) | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |
| <b>FEP TUBING, 3/16" OD</b>  |                  |                |         |                     |      |
| <b>1524L</b>                 | 0.125" (3.2 mm)  | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1524XL</b>                | 0.125" (3.2 mm)  | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |
| <b>FEP TUBING, 1/4" OD</b>   |                  |                |         |                     |      |
| <b>1650L</b>                 | 0.188" (4.8 mm)  | 50' (15 m)     | Natural | 250 psi (17 bar)    | ea.  |
| <b>1650XL</b>                | 0.188" (4.8 mm)  | 100' (30 m)    | Natural | 250 psi (17 bar)    | ea.  |
| <b>FEP TUBING, 1.0 MM OD</b> |                  |                |         |                     |      |
| <b>1671L</b>                 | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1671XL</b>                | 0.020" (0.50 mm) | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |
| <b>FEP TUBING, 2.0 MM OD</b> |                  |                |         |                     |      |
| <b>1673L</b>                 | 0.40" (1.0 mm)   | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1673XL</b>                | 0.40" (1.0 mm)   | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |
| <b>FEP TUBING, 3.0 MM OD</b> |                  |                |         |                     |      |
| <b>1677L</b>                 | 0.080" (2.0 mm)  | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| <b>1677XL</b>                | 0.080" (2.0 mm)  | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |

# ETFE Tubing

- › Excellent chemical resistance
- › Constructed with genuine Tefzel™ resin
- › Holds pressure up to 4,000 psi (276 bar)
- › 1/16" or 1/8" outside diameter available
- › Maximum continuous operating temperature: 80 °C

ETFE (ethylene-tetrafluoroethylene) tubing is an excellent fluoropolymer product that offers several benefits over tubing manufactured from PTFE, FEP, or PFA. These benefits include enhanced pressure holding capabilities, increased mechanical stability and lower gas permeability.



## APPLICATION NOTE

ETFE tubing is an ideal choice for the fluid pathway between the vacuum degasser and the system's pump. Its low gas permeability will help ensure the mobile phase solvents do not regas while in transit.



## RELATED PRODUCTS

Other tubing materials and dimensions may be available. Please contact IDEX Health & Science or your local representative directly.



## SPECIFICATIONS & DETAILS

| Tubing OD | Tubing ID                                            | OD/ID Tolerances |
|-----------|------------------------------------------------------|------------------|
| 1/16" OD  | 0.010" (0.25 mm), 0.020" (0.50 mm), 0.030" (0.75 mm) | ±0.001" (25 µm)  |
| 1/16" OD  | 0.040" (1.0 mm)                                      | ±0.002" (50 µm)  |
| 1/8" OD   | All                                                  | ±0.003" (75 µm)  |

| Part No.                     | ID               | Length         | Color   | Max. Pressure       | Qty. |
|------------------------------|------------------|----------------|---------|---------------------|------|
| <b>ETFE TUBING, 1/16" OD</b> |                  |                |         |                     |      |
| 1529                         | 0.010 (0.25 mm)  | 5' (1.5 m)     | Natural | 4,000 psi (276 bar) | ea.  |
| 1529L                        | 0.010 (0.25 mm)  | 50' (15 m)     | Natural | 4,000 psi (276 bar) | ea.  |
| 1529XL                       | 0.010 (0.25 mm)  | 100' (30 m)    | Natural | 4,000 psi (276 bar) | ea.  |
| 1529M                        | 0.010 (0.25 mm)  | 1,000' (304 m) | Natural | 4,000 psi (276 bar) | ea.  |
| 1516                         | 0.020" (0.50 mm) | 5' (1.5 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| 1516L                        | 0.020" (0.50 mm) | 50' (15 m)     | Natural | 3,000 psi (207 bar) | ea.  |
| 1516XL                       | 0.020" (0.50 mm) | 100' (30 m)    | Natural | 3,000 psi (207 bar) | ea.  |
| 1516M                        | 0.020" (0.50 mm) | 1,000' (304 m) | Natural | 3,000 psi (207 bar) | ea.  |
| 1528                         | 0.030" (0.75 mm) | 5' (1.5 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| 1528L                        | 0.030" (0.75 mm) | 50' (15 m)     | Natural | 2,000 psi (138 bar) | ea.  |
| 1528XL                       | 0.030" (0.75 mm) | 100' (30 m)    | Natural | 2,000 psi (138 bar) | ea.  |
| 1528M                        | 0.030" (0.75 mm) | 1,000' (304 m) | Natural | 2,000 psi (138 bar) | ea.  |
| 1517                         | 0.040" (1.0 mm)  | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| 1517L                        | 0.040" (1.0 mm)  | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| 1517XL                       | 0.040" (1.0 mm)  | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |
| 1517M                        | 0.040" (1.0 mm)  | 1,000' (304 m) | Natural | 500 psi (34 bar)    | ea.  |
| <b>ETFE TUBING, 1/8" OD</b>  |                  |                |         |                     |      |
| 1530                         | 0.062" (1.55 mm) | 5' (1.5 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| 1530L                        | 0.062" (1.55 mm) | 50' (15 m)     | Natural | 1,000 psi (69 bar)  | ea.  |
| 1530XL                       | 0.062" (1.55 mm) | 100' (30 m)    | Natural | 1,000 psi (69 bar)  | ea.  |
| 1648                         | 0.093" (2.4 mm)  | 5' (1.5 m)     | Natural | 500 psi (34 bar)    | ea.  |
| 1648L                        | 0.093" (2.4 mm)  | 50' (15 m)     | Natural | 500 psi (34 bar)    | ea.  |
| 1648XL                       | 0.093" (2.4 mm)  | 100' (30 m)    | Natural | 500 psi (34 bar)    | ea.  |



# Tools



## Fused Silica Tubing Cutters

We offer a precision cutter for fused silica tubing — SGT's Shortix™ Cutter (FS-315). This cutter ensures clean, trouble-free cutting of fused silica tubing, providing better cuts than any other product on the market. It also includes a built-in magnifying glass to examine the cut tubing ends. Order the FS-315-02 Maintenance Kit, as needed, to replace a worn or damaged cutting wheel.

When using traditional fused silica tubing cutters, only a small part of the tubing wall is scratched, then the tubing is snapped or pulled in two, often resulting in a jagged, uneven cut. With a Shortix Cutter, a clean cut is made every time, regardless of skill or experience, as the cut is made by rotating a diamond blade around the entire circumference of the tubing.

*Please Note: The FS-315 Fused Silica Tubing Cutters are designed to cut only tubing with ODs of 350  $\mu$ m–780  $\mu$ m and IDs of 100  $\mu$ m–350  $\mu$ m.*



## Polymer Tubing Cutters

» For 1/16", 1/8", 3/16", 1/4", and 5/16" OD tubing

A flat, 90°, burr-free cut is difficult to obtain with most commercial polymer tubing cutters. Our experts have designed several tubing cutters specifically to cut polymer tubing. This line of tubing cutters includes a standard cutter for 1/16" and 1/8" OD tubing (A-327), and another for large bore tubing (A-329). Each has guide holes to ensure precise cutting. These cutters are durable, reliable, and easy to operate. Five replacement blades are included with each tool.



## Capillary Polymer Tubing Cutters

Our A-350 Cutter is designed to cut capillary-sized polymer tubing. The cutter makes clean, perpendicular cuts without collapsing thin capillary walls. A set of ten tubing sleeves, required for cutting, are included with each cutter, along with five replacement blades. The included tubing sleeves are for cutting 360  $\mu$ m OD polymer capillary tubing. Alternative sleeves are available for cutting 1/32" OD tubing. All tubing sleeves are 2" long and constructed with genuine Teflon™ FEP resin.

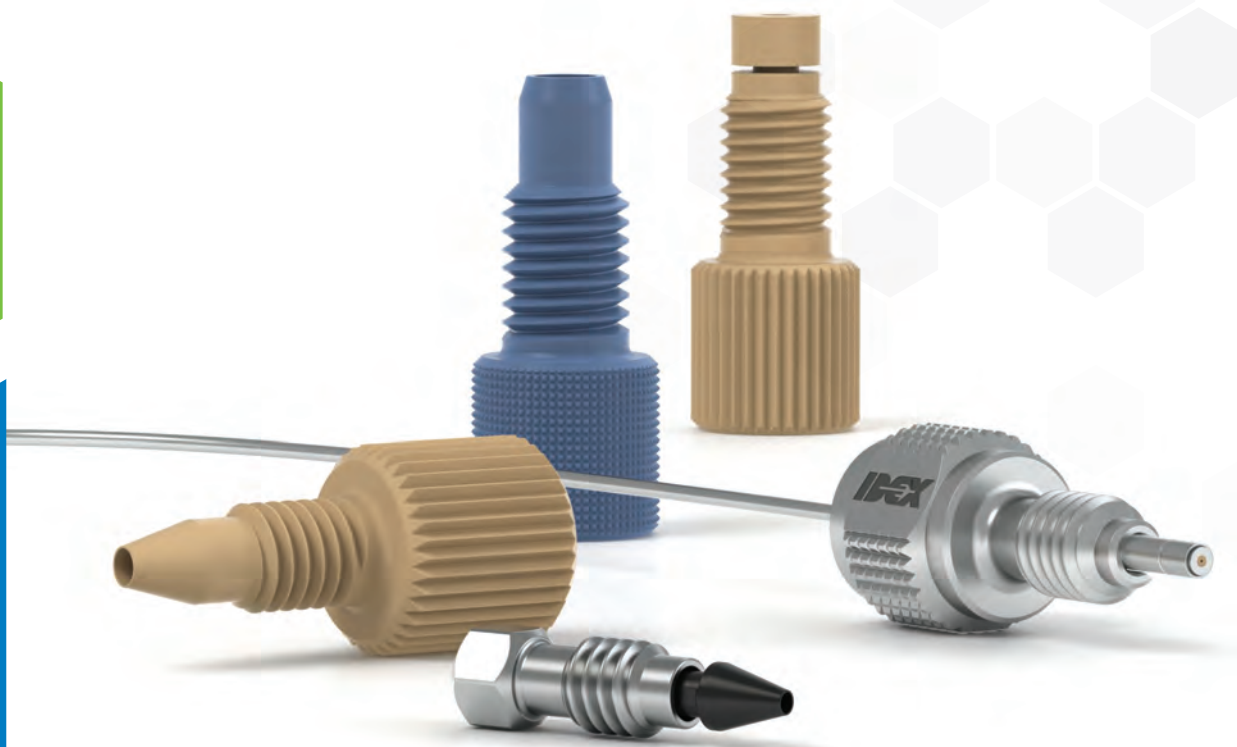
## NOTE

- » The A-350 Capillary Polymer Tubing Cutter can be used to cut tubing OD sizes other than 360  $\mu$ m and 1/32". Simply use the proper NanoTight™ Tubing Sleeve found on page 52. Please note, however, that these sleeves are shorter than those listed on this page, and therefore will last through fewer cuts.
- » Our tubing cutters are material specific: the A-327, A-329, and A-350 should only be used to cut polymer tubing, where as the FS-315 should only be used to cut fused silica tubing.

| Part No.                                           | Description                                                                                                                        | Qty.  |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------|
| <b>FUSED SILICA TUBING CUTTERS</b>                 |                                                                                                                                    |       |
| <b>FS-315</b>                                      | Shortix Fused Silica Tubing Cutter                                                                                                 | ea.   |
| <b>CAPILLARY POLYMER TUBING CUTTER</b>             |                                                                                                                                    |       |
| <b>A-350</b>                                       | Capillary Polymer Tubing Cutter* for 360 $\mu$ m–1/32" OD tubing<br>Includes (1) F-262x 10-pack of sleeves and (1) M-438-03 wrench | ea.   |
| <b>F-262x</b>                                      | Replacement Sleeves for A-350, 0.0155" ID, Green, for cutting 360 $\mu$ m OD tubing                                                | 10-pk |
| <b>A-327</b>                                       | Standard Polymer Tubing Cutter* for 1/16" and 1/8" OD tubing                                                                       | ea.   |
| <b>A-329</b>                                       | Large Bore Polymer Tubing Cutter* for 3/16"– 5/16" OD tubing                                                                       | ea.   |
| <b>A-328</b>                                       | Replacement Blades for A-350, A-327, and A-329                                                                                     | 5-pk  |
| * Includes (1) A-328 5-pack of replacement blades. |                                                                                                                                    |       |







## FITTINGS

We offer a wide and diverse selection of fittings to meet your system requirements. A “fitting” refers to a complete product ready to assemble and connect tubing into a part. This could be a one-piece connector or a nut and ferrule packaged together. A “Nut” indicates the male or female threaded product sold separately, and a “Ferrule” is sold separately when indicated in the description. For your convenience we ship most Fittings and Ferrules in 10-packs. We are dedicated to providing the most reliable, proven products on the market. We have implemented more stringent testing protocols and a generous safety margin to our ratings to ensure your safety.

**32** CONED FITTINGS

**39** FLAT-BOTTOM FITTINGS

**48** MARVELX™

**50** FITTINGS TOOLS

**56** LARGE BORE FITTINGS

**57** VHP FITTINGS

**61** FITTINGS KITS



## NOTE

All testing is performed with water at room temperature unless otherwise specified. Please contact IDEX Health & Science directly for further details. Results may vary depending on the material of the receiving port and tubing, actual tubing diameters (with stated tolerances), temperature and solvents used. If a pressure range is listed for a product's specification, the pressure rating depends on the tubing material used. The lower end of the range will represent testing performed on softer tubing such as FEP, and the higher end of the range will represent testing performed on harder tubing such as Stainless Steel. For more detail, please see the product specification sheets on our website, [www.idex-hs.com](http://www.idex-hs.com), or contact us directly.



## APPLICATION NOTE

## What Threads Do I Have?

Hold your fitting over the thread silhouettes below to identify the threads.

## U.S. CUSTOMARY THREADS

6-40



6-32



10-32



1/4-28



5/16-24



1/2-20



## METRIC THREADS

M4 x 0.7



M6 x 1





# One-Piece Fingertight Fittings

- › The original One-Piece Fingertight Fitting
- › All polymer construction
- › Versions available for 1/16", 1/32" or 1/8" OD tubing
- › Convenient and easy to use
- › Reusable

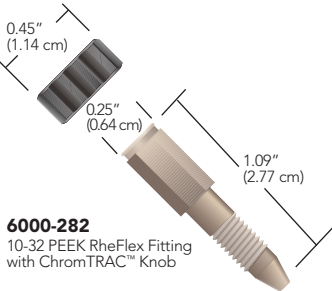
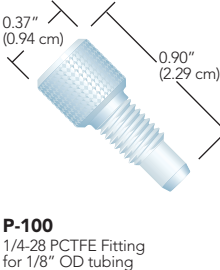
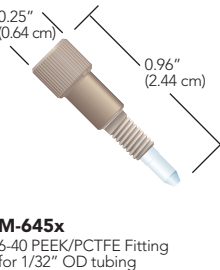
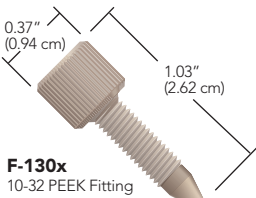
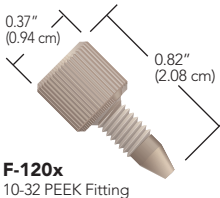
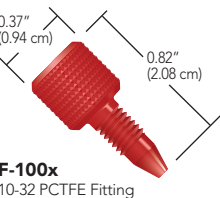
## NOTE

- › Some of the fittings on this page are available in additional colors. Please contact your distributor or us for more information.
- › Fingertight is generally equal to 3–4 in-lbs (0.34–0.45 N·m).

Our One-Piece Fingertight Fittings provide convenience and ease of use because the ferrule will not stick in a receiving port and the fitting is more easily found if dropped. The fittings for 1/16" OD tubing and 10-32 coned ports are available in a variety of colors, materials and lengths to suit virtually every application.

Beyond the standard 10-32 fittings, also featured in this product family are specialty fittings for specific applications. Our M-645 Fitting is a direct replacement for the 6-40 threaded VICI® (Valco) fitting. The P-100 can be used in 1/4-28 coned ports for 1/8" OD tubing including some of the inlet filters starting on page 102.

RheFlex® One-Piece Fittings are included in many of the manual valves, starting on page 121. The One-Piece RheFlex M4 Fittings, for use with our MX Nano-Scale Modules, are listed on page 61.



| Part No.                       | Description                                   | Port         | Pressure Rating               | Head Style     | Material                     | Qty.  |
|--------------------------------|-----------------------------------------------|--------------|-------------------------------|----------------|------------------------------|-------|
| ONE-PIECE FINGERTIGHT FITTINGS |                                               |              |                               |                |                              |       |
| 6000-282                       | Fingertight Fitting for 1/16" OD Tubing       | 10-32 Coned  | 5,000 psi (345 bar)           | ChromTRAC knob | PEEK, Natural                | 10-pk |
| F-100x                         | Fingertight Fitting for 1/16" OD Tubing       | 10-32 Coned  | 4,000 psi (276 bar)           | Diamond Knurl  | PCTFE, Red                   | 10-pk |
| F-120x                         | Fingertight Fitting for 1/16" OD Tubing       | 10-32 Coned  | 5,000 psi (345 bar)           | Standard Knurl | PEEK, Natural                | 10-pk |
| F-130x                         | Fingertight Fitting for 1/16" OD Tubing, Long | 10-32 Coned  | 5,000 psi (345 bar)           | Standard Knurl | PEEK, Natural                | 10-pk |
| M-645x                         | Fingertight Fitting for 1/32" OD Tubing       | 6-40 Coned   | 1,750–3,250 psi (121–224 bar) | Headless Knurl | PEEK, Natural/PCTFE, Natural | 10-pk |
| P-100                          | Fingertight Fitting for 1/8" OD Tubing        | 1/4-28 Coned | 1,000 psi (69 bar)            | Diamond Knurl  | PCTFE, Natural               | ea.   |



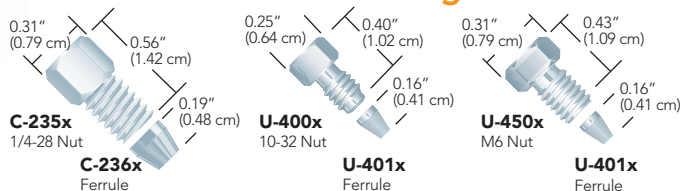
# Stainless Steel Fittings

## NOTE

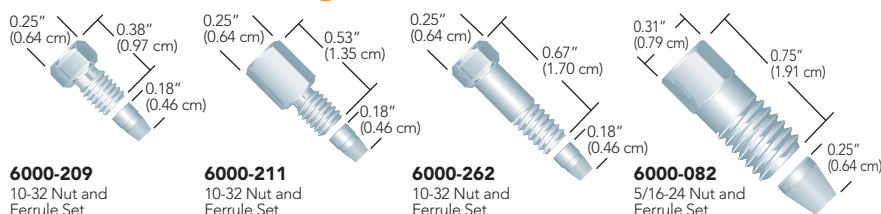
- Do not use metal fittings in plastic ports, as this can damage the port.
- The recommended torque to tighten these fittings is 20 in-lbs (2.25 N·m).

These 316 Stainless Steel Fittings are rated to 20,000 psi (1,380 bar) when wrench tightened. Choose IDEX Health & Science standard fittings, or select from the Common Valve Fittings or other manufacturer-compatible offerings.

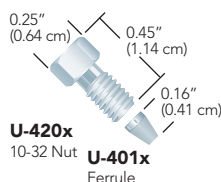
## Standard Stainless Steel Fittings



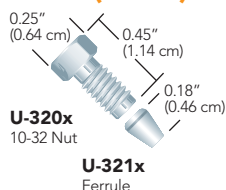
## Common Valve Fittings



## Beckman® Compatible Fittings



## VICI® (Valco) Compatible Fittings



| Part No.                                 | Description                                        | Port              | Pressure Rating        | Head Style | Material | Qty.  |
|------------------------------------------|----------------------------------------------------|-------------------|------------------------|------------|----------|-------|
| <b>STANDARD STAINLESS STEEL FITTINGS</b> |                                                    |                   |                        |            |          |       |
| C-235x                                   | Nut for 1/8" OD Tubing                             | 1/4-28 Coned      | 20,000 psi (1,380 bar) | 5/16" Hex  | SST      | 10-pk |
| C-236x                                   | Ferrule for 1/8" OD Tubing                         | 1/4-28 Coned      | 20,000 psi (1,380 bar) | —          | SST      | 10-pk |
| U-400x                                   | Nut for 1/16" OD Tubing                            | 10-32 Coned       | 20,000 psi (1,380 bar) | 1/4" Hex   | SST      | 10-pk |
| U-401x                                   | Ferrule for 1/16" OD Tubing                        | 10-32 or M6 Coned | 20,000 psi (1,380 bar) | —          | SST      | 10-pk |
| U-450x                                   | Nut for 1/16" OD Tubing                            | M6 Coned          | 20,000 psi (1,380 bar) | 5/16" Hex  | SST      | 10-pk |
| <b>COMMON VALVE FITTINGS</b>             |                                                    |                   |                        |            |          |       |
| 6000-082                                 | Fitting for 1/8" OD Tubing                         | 5/16-24 Coned     | 20,000 psi (1,380 bar) | 5/16" Hex  | SST      | ea.   |
| 6000-083                                 | Ferrule for 1/8" OD Tubing                         | 5/16-24 Coned     | 20,000 psi (1,380 bar) | —          | SST      | 5-pk  |
| 6000-209                                 | Fitting for 1/16" OD Tubing                        | 10-32 Coned       | 20,000 psi (1,380 bar) | 1/4" Hex   | SST      | 10-pk |
| 6000-210                                 | Ferrule for 1/16" OD Tubing                        | 10-32 Coned       | 20,000 psi (1,380 bar) | —          | SST      | 10-pk |
| 6000-211                                 | Fitting for 1/16" OD Tubing, Long                  | 10-32 Coned       | 20,000 psi (1,380 bar) | 1/4" Hex   | SST      | 10-pk |
| 6000-262                                 | Fitting for 1/16" OD Tubing, Extra Long            | 10-32 Coned       | 20,000 psi (1,380 bar) | 1/4" Hex   | SST      | 10-pk |
| <b>MANUFACTURER COMPATIBLE FITTINGS</b>  |                                                    |                   |                        |            |          |       |
| U-320x                                   | Nuts for 1/16" OD Tubing, Valco/VICI Compatible    | 10-32 Coned       | 20,000 psi (1,380 bar) | 1/4" Hex   | SST      | 10-pk |
| U-321x                                   | Ferrule for 1/16" OD Tubing, Valco/VICI Compatible | 10-32 Coned       | 20,000 psi (1,380 bar) | —          | SST      | 10-pk |
| U-410x                                   | Nuts for 1/16" OD Tubing, Waters Compatible        | 10-32 Coned       | 20,000 psi (1,380 bar) | 5/16" Hex  | SST      | 10-pk |



# MicroTight® Fittings

► Comprehensive Fitting System for Connecting Capillary Tubing

► Made from PEEK Polymer

MicroTight® One-Piece Fittings are designed for use with the NanoPort™ and MicroTight Unions, Adapters and Inline MicroFilters. Specifically made for 360 µm OD tubing, 1/32" OD tubing, or our MicroTight Tubing Sleeves (see page 52), these fittings make superior fingertight connections with capillary tubing. MicroTight Fittings withstand temperatures up to 125 °C.

The MicroTight family also includes a female nut matched with one of five dedicated ferrules for connecting specific tubing ODs.

Use the P-277 Extender Tool to tighten standard micro knurl 6-32 fittings in hard-to-reach places. Tighten micro headless 6-32 fittings with our N-290 Tool. See page 50 for more information.



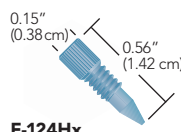
## NOTE

### MicroTight fittings and MicroFerrules

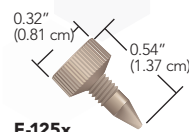
While the MicroTight Female Nuts may be used with any of the separate MicroFerrules, the MicroFerrules themselves are port-specific and are thus not interchangeable. Additionally, the one-piece MicroTight fittings are also port-specific and should not be exchanged.



**F-124Sx**  
Standard Head Fitting  
for use with  
360 µm OD tubing



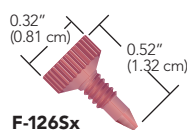
**F-124Hx**  
Headless Fitting  
for use with  
360 µm OD tubing



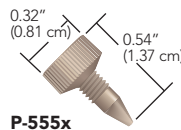
**F-125x**  
Standard Head Fitting  
for use with  
MicroTight Sleeves



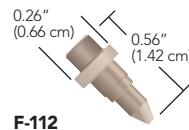
**F-125Hx**  
Headless Fitting  
for use with  
MicroTight Sleeves



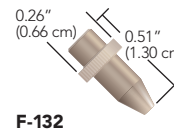
**F-126Sx**  
Standard Head Fitting for  
use with 1/32" OD tubing



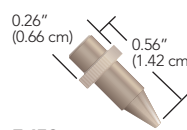
**P-555x**  
Standard Head Plug



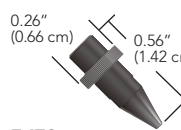
**F-112**  
MicroFerrule for  
1/32" OD tubing



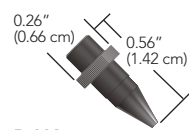
**F-132**  
MicroFerrule for  
1/16" OD tubing



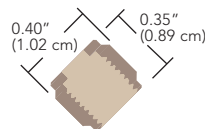
**F-152**  
MicroFerrule for  
360 µm OD tubing



**F-172**  
MicroFerrule for  
0.025" OD tubing



**P-116**  
MicroFerrule Plug



**P-416**  
Female Nut  
5/16-24 internal threads



**P-416BLK**  
Female Nut  
5/16-24 internal threads



**P-416G**  
Female Nut  
5/16-24 internal threads



## RELATED PRODUCTS

► Connectors for Capillary Tubing can be found on page 75.

► Very High Pressure fittings for capillary tubing can be found on page 58.

► Capillary tubing is featured on page 16.

| Part No.                             | Description                                      | Port          | Pressure Rating               | Head Style           | Material     | Qty.  |
|--------------------------------------|--------------------------------------------------|---------------|-------------------------------|----------------------|--------------|-------|
| <b>MICROTIGHT FITTINGS</b>           |                                                  |               |                               |                      |              |       |
| <b>F-124Hx</b>                       | MicroTight Fitting for 360 µm OD Tubing          | 6-32 Coned    | 5,000 psi (345 bar)           | Micro Headless Knurl | PEEK Blue    | 10-pk |
| <b>F-124Sx</b>                       | MicroTight Fitting for 360 µm OD Tubing          | 6-32 Coned    | 5,000 psi (345 bar)           | Standard Micro Knurl | PEEK Blue    | 10-pk |
| <b>F-125Hx</b>                       | MicroTight Fitting for MicroTight Tubing Sleeves | 6-32 Coned    | 4,000 psi (276 bar)           | Micro Headless Knurl | PEEK Natural | 10-pk |
| <b>F-125x</b>                        | MicroTight Fitting for MicroTight Tubing Sleeves | 6-32 Coned    | 4,000 psi (276 bar)           | Standard Micro Knurl | PEEK Natural | 10-pk |
| <b>F-126Sx</b>                       | MicroTight Fitting for 1/32" OD Tubing           | 6-32 Coned    | 5,000 psi (345 bar)           | Standard Micro Knurl | PEEK Red     | 10-pk |
| <b>P-555x</b>                        | MicroTight Plug                                  | 6-32 Coned    | 5,000 psi (345 bar)           | Standard Micro Knurl | PEEK Natural | 10-pk |
| <b>MICROFERRULES AND FEMALE NUTS</b> |                                                  |               |                               |                      |              |       |
| <b>F-112</b>                         | MicroFerrule for 1/32" OD Tubing                 | 5/16-24 Coned | 5,000 psi (345 bar)           | —                    | PEEK Natural | ea.   |
| <b>F-132</b>                         | MicroFerrule for 1/16" OD Tubing                 | 5/16-24 Coned | 5,000 psi (345 bar)           | —                    | PEEK Natural | ea.   |
| <b>F-152</b>                         | MicroFerrule for 360 µm OD Tubing                | 5/16-24 Coned | 5,000 psi (345 bar)           | —                    | PEEK Natural | ea.   |
| <b>F-152BLK</b>                      | MicroFerrule for 360 µm OD Tubing                | 5/16-24 Coned | 5,000 psi (345 bar)           | —                    | PEEK Black   | ea.   |
| <b>F-172</b>                         | MicroFerrule for MicroTight Tubing Sleeves       | 5/16-24 Coned | 4,000 psi (276 bar)           | —                    | PEEK Black   | ea.   |
| <b>P-116</b>                         | MicroFerrule Plug                                | 5/16-24 Coned | 5,000 psi (345 bar)           | —                    | PEEK Black   | ea.   |
| <b>P-416</b>                         | MicroTight Female Nut                            | 5/16-24 Coned | 4,000–5,000 psi (276–345 bar) | Female Knurl         | PEEK Natural | ea.   |
| <b>P-416BLK</b>                      | MicroTight Female Nut                            | 5/16-24 Coned | 4,000–5,000 psi (276–345 bar) | Female Knurl         | PEEK Black   | ea.   |
| <b>P-416G</b>                        | MicroTight Female Nut                            | 5/16-24 Coned | 4,000–5,000 psi (276–345 bar) | Female Knurl         | PEEK Green   | ea.   |



# Two-Piece Fingertight Fittings

- › Designed to connect tubing to 10-32 coned ports
- › Ferrules available for directly connecting 1/16", 1/32", 360 µm, or 190 µm OD tubing
- › Economical, replace only the ferrule



## APPLICATION NOTE

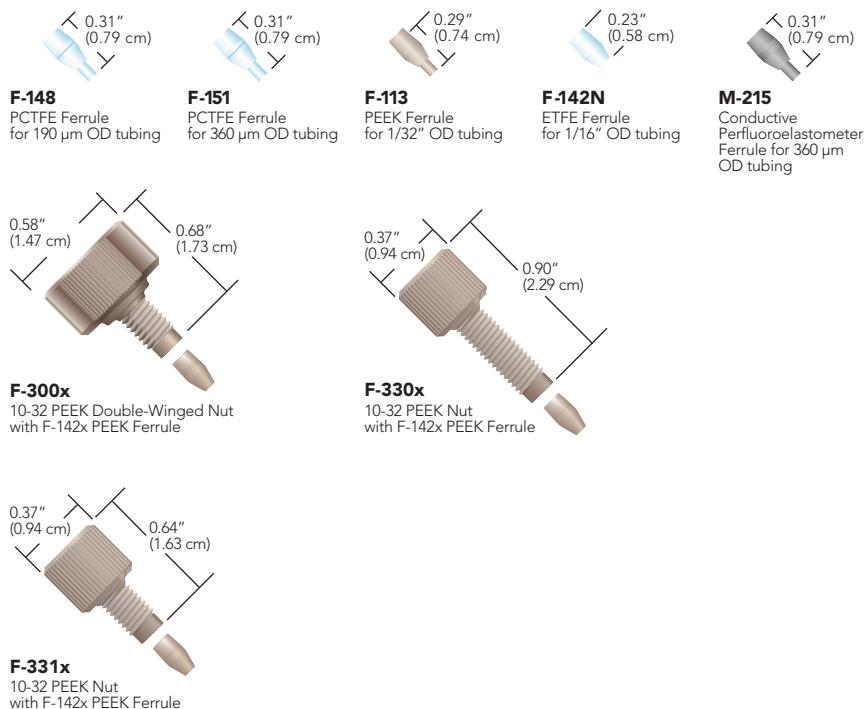
Some Fingertight Nuts feature wings in addition to a knurled head, which provide more leverage when tightening the fitting into a receiving port. Choose our single or double-winged design.

*Please Note: customers can use the standard knurl head fittings with our tightening tools found on page 50.*



Two-Piece Fingertight Fittings feature a separate ferrule. Use a standard knurled head fitting for traditional fingertight applications, or use a fitting with wings built into the head for extra tightening leverage. A stainless steel hex headed fitting can be used for applications where a wrench may be needed for added tightening torque.

The M-215 Conductive Perfluoroelastomer Ferrule is designed for mass spectrometer electrospray applications. Unlike most graphite ferrules, the elastomeric properties of this ferrule let you use it through many tightening/retightening cycles. It also eliminates any possibility of graphite contamination in your system. Like graphite ferrules, you can apply voltage through a metallic port block or metallic nut, allowing voltage to translate to the flow path through the ferrule.



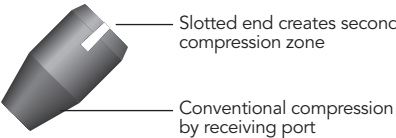
| Part No.                                                        | Description                                   | Port        | Pressure Rating     | Head Style     | Material                      | Qty.  |
|-----------------------------------------------------------------|-----------------------------------------------|-------------|---------------------|----------------|-------------------------------|-------|
| <b>TWO-PIECE FINGERTIGHT FITTINGS (INCLUDES F-142 FERRULES)</b> |                                               |             |                     |                |                               |       |
| <b>F-300x</b>                                                   | Fingertight Fitting for 1/16" OD Tubing       | 10-32 Coned | 6,000 psi (414 bar) | Double Wing    | PEEK Natural                  | 10-pk |
| <b>F-330x</b>                                                   | Fingertight Fitting for 1/16" OD Tubing, Long | 10-32 Coned | 6,000 psi (414 bar) | Standard Knurl | PEEK Natural                  | 10-pk |
| <b>F-331x</b>                                                   | Fingertight Fitting for 1/16" OD Tubing       | 10-32 Coned | 6,000 psi (414 bar) | Standard Knurl | PEEK Natural                  | 10-pk |
| <b>REPLACEMENT FERRULES</b>                                     |                                               |             |                     |                |                               |       |
| <b>F-113</b>                                                    | Ferrule for 1/32" OD Tubing                   | 10-32 Coned | 6,000 psi (414 bar) | —              | PEEK Natural                  | ea.   |
| <b>F-142</b>                                                    | Ferrule for 1/16" OD Tubing                   | 10-32 Coned | 6,000 psi (414 bar) | —              | PEEK Natural                  | ea.   |
| <b>F-142N</b>                                                   | Ferrule for 1/16" OD Tubing                   | 10-32 Coned | 4,000 psi (276 bar) | —              | ETFE Natural                  | ea.   |
| <b>F-148</b>                                                    | Ferrule for 190 µm OD tubing                  | 10-32 Coned | 6,000 psi (414 bar) | —              | PCTFE Natural                 | ea.   |
| <b>F-151</b>                                                    | Ferrule for 360 µm OD Tubing                  | 10-32 Coned | 6,000 psi (414 bar) | —              | PCTFE Natural                 | ea.   |
| <b>M-215</b>                                                    | Conductive Ferrule for 360 µm OD tubing       | 10-32 Coned | 1,500 psi (103 bar) | —              | Conductive Perfluoroelastomer | ea.   |





# Two-Piece SealTight<sup>™</sup> Fingertight Fittings

- › Several nut lengths and head styles to fit into a variety of applications
- › Designed to connect 1/16" OD tubing to 10-32 coned ports
- › Hold up to 9,000 psi (620 bar)



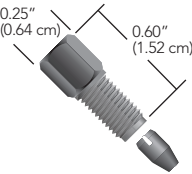
The dual compression created by the specially designed nut and ferrule enables our SealTight<sup>™</sup> Fittings system to outperform standard finger tightened fittings. The forward cone of the SealTight Ferrule provides gripping power and a leak-free seal via conventional compression by the receiving port. The slotted end creates the second compression zone in conjunction with a SealTight Nut. All SealTight Nuts are for use with 1/16" OD tubing and are designed to be used with the F-192x Ferrule. A wide variety of fitting head styles are available for various space constraints.

## NOTE

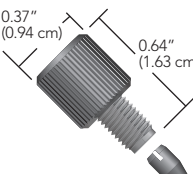
Overtightening these fittings on fluoropolymer (e.g., FEP, PFA, and ETFE) tubing can cause the ID of your tubing to collapse.

## RELATED PRODUCTS

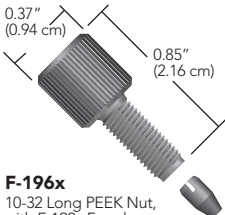
- › Find tightening tools for these fittings on page 50.
- › Try the F-350x FlushNut<sup>™</sup> for the ultimate streamline design.



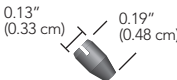
**F-193x**  
10-32 Short PEEK Hex Head Nut, with F-192x Ferrule



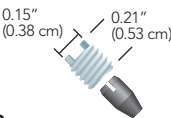
**F-195x**  
10-32 Short PEEK Nut, with F-192x Ferrule



**F-196x**  
10-32 Long PEEK Nut, with F-192x Ferrule



**F-192x**  
SealTight Ferrule, for 1/16" OD tubing



**F-350x**  
10-32 Stainless Steel FlushNut, with F-192x Ferrule

| Part No.                                               | Description                                     | Port              | Pressure Rating               | Head Style     | Material   | Qty.  |
|--------------------------------------------------------|-------------------------------------------------|-------------------|-------------------------------|----------------|------------|-------|
| SEALTIGHT TWO-PIECE FITTINGS (INCLUDES F-192 FERRULES) |                                                 |                   |                               |                |            |       |
| F-193x                                                 | SealTight Fitting for 1/16" OD Tubing, Short    | 10-32 Coned       | 7,000–9,000 psi (483–620 bar) | 1/4" Hex       | PEEK Black | 10-pk |
| F-195x                                                 | SealTight Fitting for 1/16" OD Tubing, Short    | 10-32 Coned       | 7,000–9,000 psi (483–620 bar) | Standard Knurl | PEEK Black | 10-pk |
| F-196x                                                 | SealTight Fitting for 1/16" OD Tubing, Long     | 10-32 Coned       | 7,000–9,000 psi (483–620 bar) | Standard Knurl | PEEK Black | 10-pk |
| F-287x                                                 | SealTight Fitting for 1/16" OD Tubing, Long     | 10-32 Coned       | 7,000–9,000 psi (483–620 bar) | Knurl-1/4" Hex | PEEK Black | 10-pk |
| F-350x                                                 | SealTight Fitting for 1/16" OD Tubing, FlushNut | 10-32 Coned       | 7,000–9,000 psi (483–620 bar) | FlushNut       | SST        | 10-pk |
| REPLACEMENT FERRULES                                   |                                                 |                   |                               |                |            |       |
| F-192x                                                 | SealTight Ferrule for 1/16" OD Tubing           | 10-32 or M6 Coned | 7,000–9,000 (483–620 bar)     | —              | PEEK/Black | 10-pk |



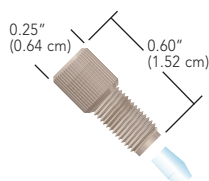
# NanoTight™ Fittings & Sleeves

- › For connecting 1/16" OD or capillary tubing using tubing sleeves to standard 10-32 coned ports
- › Multiple nut styles available
- › Nuts manufactured from PEEK polymer, ferrules manufactured from ETFE



## RELATED PRODUCTS

- › Find tightening tools for these head styles on page 50.
- › NanoTight Tubing sleeves start on page 52.



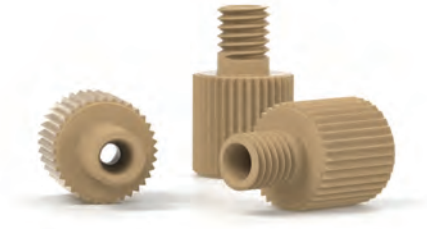
**F-333Nx**  
Short Headless Nut  
with F-142Nx Ferrule

NanoTight™ Fittings and Sleeves are designed to connect 70 µm–1 mm OD capillary tubing to any standard 10-32 coned port normally intended for 1/16" OD tubing using the NanoTight Tubing Sleeves on page 52. The fittings can also be used to connect any 1/16" OD tubing. The ETFE ferrule material is softer than PEEK, making it a good candidate for connecting thin walled semi-rigid tubing such as FEP and ETFE into 10-32 ports with minimal constricting to the inner diameter.

Select from our expansive line of PEEK NanoTight Fittings, featuring several head style and length options. Each 10-pack of nuts includes ten ETFE F-142Nx ferrules.

| Part No.                                             | Description                                                        | Port        | Pressure Rating     | Head Style     | Material (Nut/Ferrule)    | Qty.  |
|------------------------------------------------------|--------------------------------------------------------------------|-------------|---------------------|----------------|---------------------------|-------|
| <b>NANOTIGHT FITTINGS (INCLUDES F-142N FERRULES)</b> |                                                                    |             |                     |                |                           |       |
| <b>F-333Nx</b>                                       | NanoTight Fitting for 1/16" OD Tubing and NanoTight Sleeves, Short | 10-32 Coned | 4,000 psi (276 bar) | Headless Knurl | PEEK Natural/ETFE Natural | 10-pk |
| <b>REPLACEMENT FERRULES</b>                          |                                                                    |             |                     |                |                           |       |
| <b>F-142Nx</b>                                       | NanoTight Ferrule for 1/16" OD Tubing and NanoTight Sleeves        | 10-32 Coned | 4,000 psi (276 bar) | —              | ETFE Natural              | 10-pk |

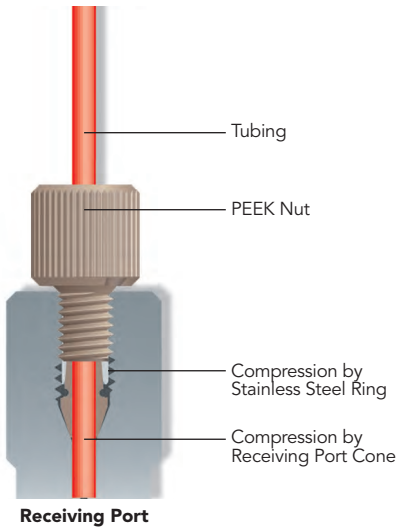




# LiteTouch<sup>®</sup> Fittings

- ▶ Helps prevent twisting of polymer tubing
- ▶ High pressure with fingertight convenience
- ▶ Options available for 1/32", 1/16", or 1/8" OD tubing

## LITETOUCH FITTINGS SYSTEMS



The LiteTouch<sup>®</sup> Fittings System grips tubing at two compression points (see diagram), holding to high pressures with Fingertight convenience. It also prevents polymer tubing from twisting, a potential problem when using standard Fingertight fittings. LiteTouch Fittings are available for use with 1/32", 1/16", or 1/8" OD tubing sizes, and for 10-32 or 1/4-28 coned ports.

For those space-limited applications where nut heads interfere with each other, try the FlushNut<sup>™</sup> Fittings. (FlushNut Fittings require a tightening tool. Please see page 50 for more information about these products.)

To avoid collapsing the ID of your tubing, the LiteTouch system can be used on hard tubing only, such as stainless steel and PEEK polymer tubing. The LiteTouch Ferrule System is not recommended for repeated use in plastic ports.

## RELATED PRODUCTS

- ▶ The stainless steel nuts on page 59 can also be used with the LiteTouch ferrules on this page.

| Part No.           | Description                                          | Port         | Pressure Rating     | Head Style     | Material         | Qty.  |
|--------------------|------------------------------------------------------|--------------|---------------------|----------------|------------------|-------|
| LITETOUCH NUTS     |                                                      |              |                     |                |                  |       |
| C-235x             | LiteTouch Nut for 1/8" OD Tubing                     | 1/4-28 Coned | 4,500 psi (310 bar) | 5/16" Hex      | SST              | 10-pk |
| F-354x             | LiteTouch Nut for 1/16" or 1/32" OD Tubing, FlushNut | 10-32 Coned  | 5,000 psi (345 bar) | FlushNut       | SST              | 10-pk |
| F-364x             | LiteTouch Nut for 1/8" OD Tubing, FlushNut           | 1/4-28 Coned | 4,500 psi (310 bar) | FlushNut       | SST              | 10-pk |
| LT-110x            | LiteTouch Nut for 1/16" or 1/32" OD Tubing           | 10-32 Coned  | 5,000 psi (345 bar) | Standard Knurl | PEEK Natural     | 10-pk |
| LT-210x            | LiteTouch Nut for 1/8" OD Tubing                     | 1/4-28 Coned | 4,500 psi (310 bar) | Double Wing    | PEEK Natural     | 10-pk |
| LITETOUCH FERRULES |                                                      |              |                     |                |                  |       |
| LT-100x            | LiteTouch Ferrule for 1/16" OD Tubing                | 10-32 Coned  | 5,000 psi (345 bar) | —              | PEEK Natural/SST | 10-pk |
| LT-132x            | LiteTouch Ferrule for 1/32" OD Tubing                | 10-32 Coned  | 5,000 psi (345 bar) | —              | PEEK Natural/SST | 10-pk |
| LT-200x            | LiteTouch Ferrule for 1/8" OD Tubing                 | 1/4-28 Coned | 4,500 psi (310 bar) | —              | PEEK Natural/SST | 10-pk |

\* When used with a stainless steel 10-32 nut from page 59.



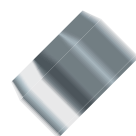
# Super Flangeless™ Fittings

- ▶ Highest pressure holding flat-bottom fitting system we offer
- ▶ Eliminates loosening of fittings due to tubing twist
- ▶ Excellent for Tubing Assemblies
- ▶ Holds tight even through vibration



## ASSEMBLY HINT

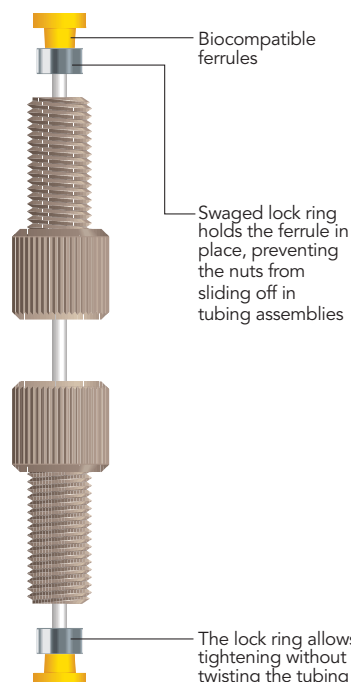
Make sure the locking ring is oriented correctly! The flattened end of the ring should face towards the nut with the narrow end of the ferrule towards the ring.



Enlarged to show detail

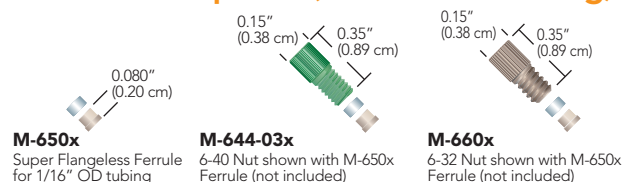


## SUPER FLANGELESS FITTINGS SYSTEM

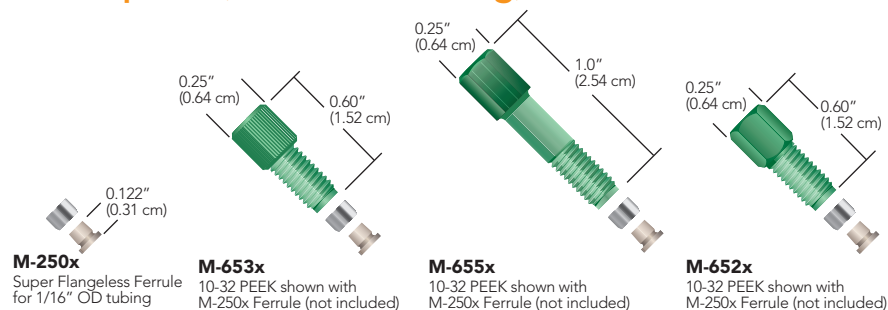


Our Super Flangeless™ Fittings provide the highest pressure holding capability in a flat-bottom fitting system that we offer. Our unique design eliminates loosening of fittings due to tubing twist and holds tight even through vibration. Our high pressure fittings are excellent for tubing assemblies and those times when connections need to be broken frequently.

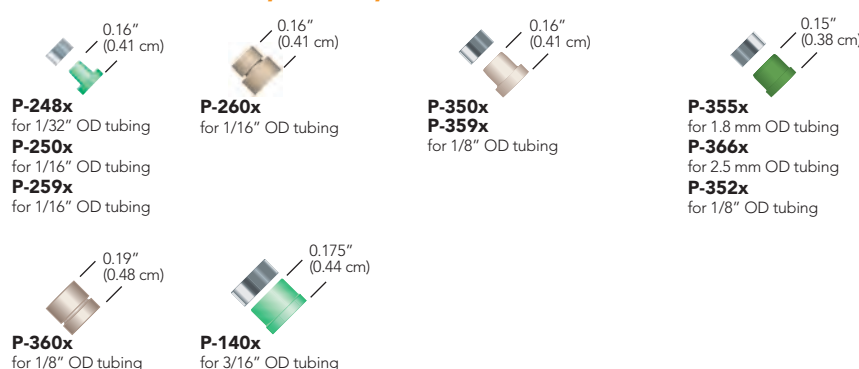
### 6-40 & 6-32 options (for 1-16" OD tubing)



### 10-32 options (for 1-16" OD tubing)



### Ferrules for M6x1, 1/4-28, 5/16-24



## Super Flangeless™ Fittings (Cont.)

### M6x1, 1/4-28, 5/16-24 Options for 1/32"–3/16" OD Tubing

0.20"  
(0.51 cm) 0.30"  
(0.76 cm)

**F-356x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**F-364x**  
(1/4-28, > 1/16" OD Tubing)

0.31"  
(0.79 cm) 0.53"  
(1.35 cm)

**LT-105x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**C-235x**  
(1/4-28, > 1/16" OD Tubing)

0.25"  
(0.64 cm) 0.61"  
(1.55 cm)

**P-213x**  
(M6X1, ≤ 1/16" OD Tubing)  
**P-337x**  
(M6X1, > 1/16" OD Tubing)  
**P-232x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**P-336x**  
(1/4-28, > 1/16" OD Tubing)

0.25"  
(0.64 cm) 0.87"  
(2.21 cm)

**P-287x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**P-387x**  
(1/4-28, > 1/16" OD Tubing)

0.37"  
(0.94 cm) 0.61"  
(1.55 cm)

**P-219x**  
(M6X1, ≤ 1/16" OD Tubing)  
**P-319x**  
(M6X1, > 1/16" OD Tubing)  
**LT-115x**  
(1/4-28, ≤ 1/16" OD Tubing)

0.37"  
(0.94 cm) 0.87"  
(2.21 cm)

**P-217x**  
(M6X1, ≤ 1/16" OD Tubing)  
**P-317x**  
(M6X1, > 1/16" OD Tubing)  
**P-246x, P-255x, P-281x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**P-331x, P-381x**  
(1/4-28, > 1/16" OD Tubing)

0.58"  
(1.47 cm) 0.68"  
(1.73 cm)

**LT-210x**  
(1/4-28, > 1/16" OD Tubing)

0.40"  
(1.02 cm) 0.51"  
(1.30 cm)

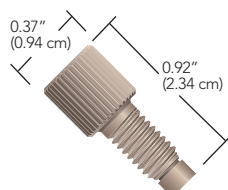
**P-420x**  
(1/4-28, ≤ 1/16" OD Tubing)  
**F-156x**  
(1/4-28, > 1/16" OD Tubing)

0.32"  
(0.81 cm) 0.88"  
(2.24 cm)

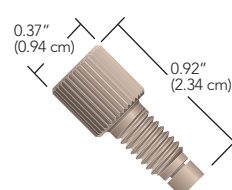
**P-141x**  
(5/16-24, ≤ 1/16" OD Tubing)  
**P-137x**  
(5/16-24, 3/16" OD Tubing)

### One-Piece Super Flangeless™ Fittings

- ▶ All-PEEK construction
- ▶ For 1/16" OD and 1/8" OD tubing
- ▶ M6x1 and 1/4-28 options
- ▶ Finger tight (2–3 in-lbs / 0.23–0.34 N·m)
- ▶ Extremely easy to use
- ▶ Reusable one piece design that requires no swaging



**P-329x**  
M6X1, for 1/8" OD Tubing  
**P-249x**  
1/4-28, for 1/16" OD Tubing  
**P-349x**  
1/4-28, for 1/8" OD Tubing



**P-229x**  
M6X1, for 1/16" OD Tubing

Super Flangeless Tubing OD / Thread Comparison

|         | 1/32" | 1/16" | 1.8 MM | 2.5 MM | 1/8" | 3/16" |
|---------|-------|-------|--------|--------|------|-------|
| 6-40    |       | ✓     |        |        |      |       |
| 6-32    |       | ✓     |        |        |      |       |
| 10-32   |       | ✓     |        |        |      |       |
| M6x1    | ✓     | ✓     | ✓      | ✓      | ✓    |       |
| 1/4-28  | ✓     | ✓     | ✓      | ✓      | ✓    |       |
| 5/16-24 |       |       |        |        |      | ✓     |

## Super Flangeless™ and One-Piece Super Flangeless Fittings

| Part No.                                                                            | Description                                                 | Port                     | Pressure Rating              | Head Style     | Material                | Qty.  |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------|------------------------------|----------------|-------------------------|-------|
| <b>SUPER FLANGELESS FERRULES FOR 1/32", 1/16", 1/8", 3/16", 1.8MM, 2.0MM, 2.5MM</b> |                                                             |                          |                              |                |                         |       |
| <b>M-250x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 10-32 Flat-Bottom        | 1,000–5,000 psi (69–345 bar) | —              | PEEK Natural/SST        | 10-pk |
| <b>M-650x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 6-32 or 6-40 Flat Bottom | 750–3,750 psi (52–259 bar)   | —              | PEEK Natural/SST        | 10-pk |
| <b>P-248x</b>                                                                       | Super Flangeless Ferrule for 1/32" OD Tubing                | 10-32 Flat-Bottom        | 2,500 psi (172 bar)          | —              | ETFE Green/SST          | 10-pk |
| <b>P-250x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 1/4-28 or M6 Flat Bottom | 2,500 psi (172 bar)          | —              | PEEK Natural/SST        | 10-pk |
| <b>P-259x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 1/4-28 or M6 Flat Bottom | 1,350 psi (93 bar)           | —              | ETFE Yellow/SST         | 10-pk |
| <b>P-260x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 1/4-28 or M6 Flat Bottom | 1,850 psi (128 bar)          | —              | PEEK Natural/SST        | 10-pk |
| <b>P-350x</b>                                                                       | Super Flangeless Ferrule for 1/8" OD Tubing                 | 1/4-28 Flat Bottom       | 2,500 psi (172 bar)          | —              | PEEK Natural/SST        | 10-pk |
| <b>P-352x</b>                                                                       | Super Flangeless Ferrule for 1/16" OD Tubing                | 1/4-28 or M6 Flat Bottom | 2,500 psi (172 bar)          | —              | PEEK Black/SST          | 10-pk |
| <b>P-355x</b>                                                                       | Super Flangeless Ferrule for 1.8 mm OD Tubing               | 1/4-28 or M6 Flat Bottom | 2,500 psi (172 bar)          | —              | PCTFE Green/SST         | 10-pk |
| <b>P-357-2x</b>                                                                     | Super Flangeless Ferrule for 2.0 mm OD Tubing               | M6 Flat Bottom           | 5,000 psi (345 bar)          | —              | PEEK Natural/SST        | 10-pk |
| <b>P-359x</b>                                                                       | Super Flangeless Ferrule for 1/8" OD Tubing                 | 1/4-28 Flat Bottom       | 1,000 psi (69 bar)           | —              | ETFE Yellow/SST         | 10-pk |
| <b>P-360x</b>                                                                       | Super Flangeless Ferrule for 1/8" OD Tubing                 | 1/4-28 Flat Bottom       | 1,500 psi (102 bar)          | —              | PEEK Natural/SST        | 10-pk |
| <b>P-366x</b>                                                                       | Super Flangeless Ferrule for 2.5" OD Tubing                 | 1/4-28 Flat Bottom       | 1,000 psi (69 bar)           | —              | PEEK Natural/SST        | 10-pk |
| <b>P-140x</b>                                                                       | Super Flangeless Ferrule for 3/16" OD Tubing                | 5/16-24 Flat Bottom      | 500 psi (34 bar)             | —              | ETFE Green/SST          | 10-pk |
| <b>6-40 AND 6-32 FITTINGS FOR 1/16" OD TUBING</b>                                   |                                                             |                          |                              |                |                         |       |
| <b>M-660x</b>                                                                       | Super Flangeless Nut for 1/16" OD Tubing                    | 6-32 Flat Bottom         | 750–3,750 psi (52–259 bar)   | Micro Headless | PEEK Natural            | 10-pk |
| <b>M-644-03x</b>                                                                    | Super Flangeless Nut for 1/16" OD Tubing                    | 6-40 Flat Bottom         | 750–3,750 psi (52–259 bar)   | Micro Headless | PEEK Green              | 10-pk |
| <b>10-32 FITTINGS FOR 1/16" OD TUBING</b>                                           |                                                             |                          |                              |                |                         |       |
| <b>M-652x</b>                                                                       | Super Flangeless Nut for 1/16" OD Tubing                    | 10-32 Flat Bottom        | 1,000–5,000 psi (69–345 bar) | 1/4" Hex       | PEEK Green              | 10-pk |
| <b>M-653x</b>                                                                       | Super Flangeless Nut for 1/16" OD Tubing                    | 10-32 Flat Bottom        | 1,000–5,000 psi (69–345 bar) | Headless Knurl | PEEK Green              | 10-pk |
| <b>M-655x</b>                                                                       | Super Flangeless Nut for 1/16" OD Tubing, Long              | 10-32 Flat Bottom        | 1,000–5,000 psi (69–345 bar) | 1/4" Hex       | PEEK Green              | 10-pk |
| <b>M6X1 FITTINGS FOR 1/16" AND 1/32" OD TUBING</b>                                  |                                                             |                          |                              |                |                         |       |
| <b>P-213x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Short    | M6 Flat Bottom           | *                            | Headless Knurl | PEEK Black              | 10-pk |
| <b>P-217x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing           | M6 Flat Bottom           | *                            | Standard Knurl | PPS Black               | 10-pk |
| <b>P-219x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Short    | M6 Flat Bottom           | *                            | Standard Knurl | PEEK Black              | 10-pk |
| <b>M6X1 FITTINGS FOR 1.8 MM, 2.0 MM, 2.5 MM, 1/8" OD TUBING</b>                     |                                                             |                          |                              |                |                         |       |
| <b>P-317x</b>                                                                       | Super Flangeless For >1/16"–≤ 1/8" OD Tubing                | M6 Flat Bottom           | *                            | Standard Knurl | PPS Black               | 10-pk |
| <b>P-319x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing, Short              | M6 Flat Bottom           | *                            | Standard Knurl | PEEK Black              | 10-pk |
| <b>P-337x</b>                                                                       | Super Flangeless For >1/16"–≤ 1/8" OD Tubing, Short         | M6 Flat Bottom           | *                            | Headless Knurl | PEEK Black              | 10-pk |
| <b>P-357x</b>                                                                       | Super Flangeless Fitting for 2.0 mm OD Tubing               | M6 Flat Bottom           | *                            | Standard Knurl | PEEK Black, Natural/SST | 10-pk |
| <b>1/4-28 FITTINGS FOR 1/16" AND 1/32" OD TUBING</b>                                |                                                             |                          |                              |                |                         |       |
| <b>F-356x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, FlushNut | 1/4-28 Flat Bottom       | *                            | FlushNut       | SST                     | 10-pk |
| <b>LT-105x</b>                                                                      | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Short    | 1/4-28 Flat Bottom       | *                            | 1/4" Hex       | SST                     | 10-pk |
| <b>LT-115x</b>                                                                      | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Short    | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PEEK Natural            | 10-pk |
| <b>P-232x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Short    | 1/4-28 Flat Bottom       | *                            | Headless Knurl | PEEK Natural            | 10-pk |
| <b>P-246x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing           | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PFA Natural             | 10-pk |
| <b>P-255x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing           | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PEEK Natural            | 10-pk |
| <b>P-281x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing           | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PPS Natural             | 10-pk |
| <b>P-287x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing           | 1/4-28 Flat Bottom       | *                            | Headless Knurl | PPS Natural             | 10-pk |
| <b>P-420x</b>                                                                       | Super Flangeless Nut for 1/16" or 1/32" OD Tubing, Female   | 1/4-28 Flat Bottom       | *                            | Female Knurl   | PEEK Natural            | 10-pk |
| <b>1/4-28 FITTINGS FOR 1.8MM, 2.5 MM, 1/8" OD TUBING</b>                            |                                                             |                          |                              |                |                         |       |
| <b>C-235x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing                     | 1/4-28 Flat Bottom       | *                            | 1/4" Hex       | SST                     | 10-pk |
| <b>F-156x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing, Female             | 1/4-28 Flat Bottom       | *                            | Female Knurl   | PEEK Black              | 10-pk |
| <b>F-364x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing, FlushNut™          | 1/4-28 Flat Bottom       | *                            | FlushNut       | SST                     | 10-pk |
| <b>LT-210x</b>                                                                      | Super Flangeless Nut for 1/8" OD Tubing                     | 1/4-28 Flat Bottom       | *                            | Double Wings   | PEEK Natural            | 10-pk |
| <b>P-331x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing                     | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PEEK Natural            | 10-pk |
| <b>P-336x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing, Short              | 1/4-28 Flat Bottom       | *                            | Headless Knurl | PEEK Natural            | 10-pk |
| <b>P-381x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing                     | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PPS Natural             | 10-pk |
| <b>P-387x</b>                                                                       | Super Flangeless Nut for 1/8" OD Tubing                     | 1/4-28 Flat Bottom       | *                            | Standard Knurl | PPS Natural             | 10-pk |
| <b>5/16-24 FITTINGS FOR 1/16", 1/8", 3/16" OD TUBING</b>                            |                                                             |                          |                              |                |                         |       |
| <b>P-137x</b>                                                                       | Super Flangeless Fitting for 3/16" OD Tubing                | 5/16-24 Flat Bottom      | *                            | Standard Knurl | PEEK Black              | 10-pk |
| <b>P-141x</b>                                                                       | Super Flangeless Fitting for 1/16" OD Tubing                | 5/16-24 Flat Bottom      | *                            | Standard Knurl | PEEK Natural            | 10-pk |
| <b>ONE-PIECE SUPER FLANGELESS FITTINGS FOR 1/16" AND 1/8" OD TUBING</b>             |                                                             |                          |                              |                |                         |       |
| <b>P-229x</b>                                                                       | One Piece Super Flangeless Fitting for 1/16" OD Tubing      | M6 Flat Bottom           | 1,000 psi (69 bar)           | Standard Knurl | PEEK                    | 10-pk |
| <b>P-249x</b>                                                                       | One Piece Super Flangeless Fitting for 1/16" OD Tubing      | 1/4-28 Flat Bottom       | 1,000 psi (69 bar)           | Standard Knurl | PEEK                    | 10-pk |
| <b>P-329x</b>                                                                       | One Piece Super Flangeless Fitting for 1/16" OD Tubing      | M6 Flat Bottom           | 1,000 psi (69 bar)           | Standard Knurl | PEEK                    | 10-pk |
| <b>P-349x</b>                                                                       | One Piece Super Flangeless Fitting for 1/16" OD Tubing      | 1/4-28 Flat Bottom       | 1,000 psi (69 bar)           | Standard Knurl | PEEK                    | 10-pk |

\* Pressure rating of nut depends on the ferrule used.



# VacuTight™ Fittings

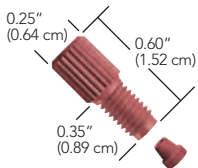
- › For 1/16" or 1/8" OD tubing connections into 10-32, 1/4-28, or M6 flat-bottom ports
- › Vacuum Rated to 25 in-Hg (84 kPa)
- › Improve transfer volume consistency

VacuTight Fittings are designed to provide airtight, dependable connections under vacuum and low pressure conditions. Many of the VacuTight Nuts have streamlined profiles for use in systems requiring a large number of connections in a small area. Furthermore, the VacuTight Ferrule's small size ensures sufficient nut/thread engagement, even in shallow ports. These features make VacuTight Fittings ideal for "combichem" high throughput screening, clinical diagnostic, and other automated liquid handling applications.

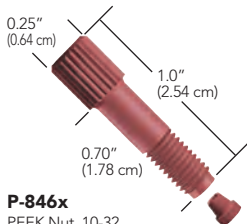
The configuration of the VacuTight flat-bottom ferrules prevents overcompression and tubing ID reduction that can occur with many coned fittings. The result is more consistent aspirating and dispensing volumes across all system connections.

The VacuTight fittings can also work well in some positive pressure applications. The pressure range for each fitting is listed below and depends upon the tubing used for the connection. Please contact your distributor or IDEX Health & Science for more information. Additionally, please note that some of the VacuTight fittings have changed in color from red to black; however, this color change does not affect product performance.

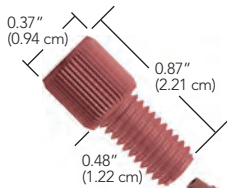
All VacuTight Nuts must be used exclusively with VacuTight Ferrules.



**P-844x**  
PEEK Nut, 10-32  
with P-840 Ferrule



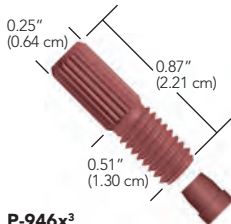
**P-846x**  
PEEK Nut, 10-32  
with P-840 Ferrule



**P-930x<sup>1</sup>**  
Delrin® Nut, 1/4-28  
with P-840 Ferrule



**P-945x<sup>2</sup>**  
Delrin Nut, M6  
with P-940 Ferrule



**P-946x<sup>3</sup>**  
Delrin Nut, 1/4-28  
with P-940 Ferrule

<sup>1</sup> The dimensions shown apply to P-930x, P-931x, P-938x, P-942x, and P-948x.  
<sup>2</sup> The dimensions shown apply to P-945x.  
<sup>3</sup> The dimensions shown apply to P-946x.

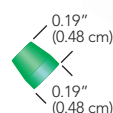
| Part No.                                              | Description                                  | Port                     | Pressure Rating           | Head Style     | Material     | Qty.  |
|-------------------------------------------------------|----------------------------------------------|--------------------------|---------------------------|----------------|--------------|-------|
| VACUTIGHT FITTINGS (INCLUDES P-840 OR P-940 FERRULES) |                                              |                          |                           |                |              |       |
| P-842x                                                | VacuTight Fitting for 1/16" OD Tubing, Short | 10-32 Flat-Bottom        | 400–800 psi (27–55 bar)   | 1/4" Hex       | PEEK Red     | 10-pk |
| P-844x                                                | VacuTight Fitting for 1/16" OD Tubing, Short | 10-32 Flat-Bottom        | 400–800 psi (27–55 bar)   | Headless Knurl | PEEK Red     | 10-pk |
| P-846x                                                | VacuTight Fitting for 1/16" OD Tubing, Long  | 10-32 Flat-Bottom        | 400–800 psi (27–55 bar)   | Headless Knurl | PEEK Red     | 10-pk |
| P-930x                                                | VacuTight Fitting for 1/16" OD Tubing        | 1/4-28 Flat-Bottom       | 400–800 psi (27–55 bar)   | Standard Knurl | Delrin Red   | 10-pk |
| P-931x                                                | VacuTight Fitting for 1/16" OD Tubing        | M6 Flat-Bottom           | 400–800 psi (27–55 bar)   | Standard Knurl | Delrin Red   | 10-pk |
| P-938x                                                | VacuTight Fitting for 1/16" OD Tubing        | 1/4-28 Flat-Bottom       | 400–800 psi (27–55 bar)   | Standard Knurl | PEEK Natural | 10-pk |
| P-942x                                                | VacuTight Fitting for 1/8" OD Tubing         | 1/4-28 Flat-Bottom       | 500–1,000 psi (34–69 bar) | Standard Knurl | Delrin Red   | 10-pk |
| P-945x                                                | VacuTight Fitting for 1/8" OD Tubing, Short  | M6 Flat-Bottom           | 500–1,000 psi (34–69 bar) | Standard Knurl | Delrin Black | 10-pk |
| P-946x                                                | VacuTight Fitting for 1/8" OD Tubing         | 1/4-28 Flat-Bottom       | 500–1,000 psi (34–69 bar) | Headless Knurl | Delrin Red   | 10-pk |
| P-948x                                                | VacuTight Fitting for 1/8" OD Tubing         | 1/4-28 Flat-Bottom       | 500–1,000 psi (34–69 bar) | Standard Knurl | PEEK Natural | 10-pk |
| REPLACEMENT FERRULES                                  |                                              |                          |                           |                |              |       |
| P-840                                                 | VacuTight Ferrule for 1/16" OD Tubing        | M6 or 1/4-28 Flat-Bottom | 400–800 psi (27–55 bar)   | —              | ETFE Red     | ea.   |
| P-940x                                                | VacuTight Ferrule for 1/8" OD Tubing         | M6 or 1/4-28 Flat-Bottom | 500–1,000 psi (34–69 bar) | —              | ETFE Red     | 10-pk |



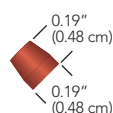


# Metric Flangeless Fittings

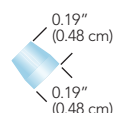
- For 1/16", 1.8 mm, 2.0 mm, 2.5 mm, 3.0 mm, 4.0 mm, or 1/8" OD tubing
- Convenience of flangeless fittings for metric tubing sizes and M6 flat-bottom ports



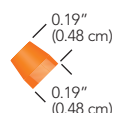
**P-342x**  
ETFE Ferrule  
for 1.8 OD tubing



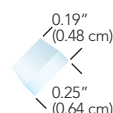
**P-363Rx**  
ETFE Ferrule  
for 2.0 mm OD tubing



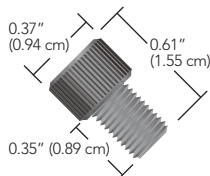
**P-353x**  
ETFE Ferrule  
for 2.5 mm OD tubing



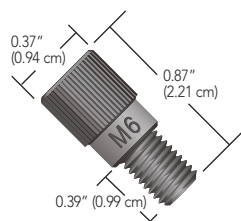
**P-343x**  
ETFE Ferrule  
for 3.0 mm OD tubing



**P-344x**  
ETFE Ferrule  
for 4.0 mm OD tubing



**P-347x**  
PEEK Nut  
for 1.8, 2.0, 3.0 mm or  
1/8" OD tubing



**P-207x**  
Delrin® Nut  
for 1/16" OD tubing

Metric Flangeless Ferrules are designed to connect 1.8, 2.0, 2.5, 3.0, or 4.0 mm OD tubing to flat-bottom ports when paired with the appropriate M6, 1/4-28, or 5/16-24 Flangeless Nuts. We also offer M6-threaded nuts to connect 1/16" or 1/8" OD tubing, plus a tubing sleeve to facilitate 1.0 mm OD tubing connections. Please refer to the "Metric Connections" chart on this page for information regarding which nuts and ferrules to use with your tubing.



## METRIC CONNECTIONS

Use this chart to determine the low pressure fittings needed to connect metric and English-sized tubing into the indicated ports.

| Tubing Size   | Port         | Ferrules                                                                       | Nuts                                                                       |
|---------------|--------------|--------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>1.0 mm</b> | M6<br>1/4-28 | P-200x (w/F-252 sleeve, not included)<br>P-200x (w/F-252 sleeve, not included) | P-207x, P-207Sx, P-247x<br>Any 1/4-28 nut for 1/16" OD tubing from page 47 |
| <b>1.8 mm</b> | M6<br>1/4-28 | P-342x<br>P-342x                                                               | P-307x, P-307Sx, P-347x<br>Any 1/4-28 nut for 1/8" OD tubing from page 47  |
| <b>2.0 mm</b> | M6<br>1/4-28 | P-363Rx<br>P-363Rx                                                             | P-307x, P-307Sx, P-347x<br>Any 1/4-28 nut for 1/8" OD tubing from page 47  |
| <b>2.5 mm</b> | M6<br>1/4-28 | P-353x<br>P-353x                                                               | P-307x, P-307Sx, P-347x<br>Any 1/4-28 nut for 1/8" OD tubing from page 47  |
| <b>3.0 mm</b> | M6<br>1/4-28 | P-343x<br>P-343x                                                               | P-307x, P-307Sx, P-347x<br>Any 1/4-28 nut for 1/8" OD tubing from page 47  |
| <b>4.0 mm</b> | 5/16-24      | P-344x                                                                         | XP-132x from page 56                                                       |
| <b>1/16"</b>  | M6<br>M6     | P-200x<br>P-840                                                                | P-207x, P-207Sx, P-247x, P-931, page 42                                    |
| <b>1/8"</b>   | M6<br>M6     | P-300x<br>P-940x                                                               | P-307x, P-307Sx, P-347x, P-945x, page 42                                   |



## RELATED PRODUCTS

|                                        | Page |                                                        | Page |
|----------------------------------------|------|--------------------------------------------------------|------|
| MORE METRIC-SIZED PRODUCTS             |      |                                                        |      |
| High Pressure Polymer Fittings         | 58   | Low Pressure Unions                                    | 84   |
| High Pressure Stainless Steel Fittings | 59   | Bulkhead Unions                                        | 82   |
| Luer Adapters                          | 87   | PEEK (1.8 mm OD and Capillary) and Fused Silica Tubing | 16   |
| Metric Threaded Adapters               | 65   | PEEKsil™ Tubing                                        | 22   |
| External NPT Adapters                  | 66   | FEP Tubing (1.0–4.0 mm OD) and PFA Capillary Tubing    | 26   |
| VacuTight™ Fittings                    | 42   | Frit-In-A-Ferrule™                                     | 99   |
| Plugs and Caps                         | 55   |                                                        |      |

In addition, many of our 1/4-28 threaded Filters, Valves and Flow Control Accessories can be converted to accept 1.8, 2.0, 2.5 and 3.0 mm tubing, using the ferrules listed for 1/4-28 ports in the "Metric Connections" table, this page.

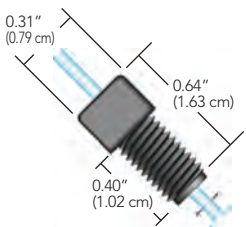
| Part No.                      | Description                                               | Port                     | Pressure Rating     | Head Style     | Material     | Qty.  |
|-------------------------------|-----------------------------------------------------------|--------------------------|---------------------|----------------|--------------|-------|
| <b>METRIC FLANGELESS NUTS</b> |                                                           |                          |                     |                |              |       |
| <b>P-207x</b>                 | Flangeless Nut for 1/16" OD Tubing                        | M6 Flat-Bottom           | 2,000 psi (138 bar) | Standard Knurl | Delrin Black | 10-pk |
| <b>P-207Sx</b>                | Flangeless Nut for 1/16" OD Tubing, Short                 | M6 Flat-Bottom           | 2,000 psi (138 bar) | Standard Knurl | Delrin Black | 10-pk |
| <b>P-247x</b>                 | Flangeless Nut for 1/16" OD Tubing, Short                 | M6 Flat-Bottom           | 2,000 psi (138 bar) | Standard Knurl | PEEK Black   | 10-pk |
| <b>P-307x</b>                 | Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing | M6 Flat-Bottom           | 500 psi (34 bar)    | Standard Knurl | Delrin Black | 10-pk |
| <b>P-307Sx</b>                | Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing | M6 Flat-Bottom           | 500 psi (34 bar)    | Standard Knurl | Delrin Black | 10-pk |
| <b>P-347x</b>                 | Flangeless Nut for 1.8 mm, 2.0 mm, 3.0 mm, 1/8" OD Tubing | M6 Flat-Bottom           | 500 psi (34 bar)    | Standard Knurl | PEEK Black   | 10-pk |
| <b>FLANGELESS FERRULES</b>    |                                                           |                          |                     |                |              |       |
| <b>F-252x</b>                 | 1/16" OD Tubing Sleeve for 1.0 mm ID Tubing               | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | FEP Purple   | 10-pk |
| <b>P-200x</b>                 | Flangeless Ferrule for 1/16" OD Tubing                    | M6 or 1/4-28 Flat-Bottom | 2,000 psi (138 bar) | —              | ETFE Blue    | 10-pk |
| <b>P-300x</b>                 | Flangeless Ferrule for 1/8" OD Tubing                     | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Yellow  | 10-pk |
| <b>P-342x</b>                 | Flangeless Ferrule for 1.8 mm OD Tubing                   | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Green   | 10-pk |
| <b>P-343x</b>                 | Flangeless Ferrule for 3.0 mm OD Tubing                   | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Orange  | 10-pk |
| <b>P-344x</b>                 | Flangeless Ferrule for 4.0 mm OD Tubing                   | 5/16-24                  | 250 psi (17 bar)    | —              | ETFE Natural | 10-pk |
| <b>P-353x</b>                 | Flangeless Ferrule for 2.5 mm OD Tubing                   | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Natural | 10-pk |
| <b>P-363Rx</b>                | Flangeless Ferrule for 2.0 mm OD Tubing                   | M6 or 1/4-28 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Red     | 10-pk |



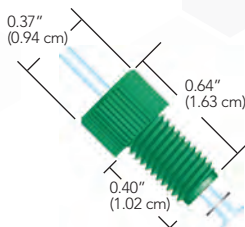
# Flanged Fittings

- › Fittings for 1/16" or 1/8" OD tubing, supplied with nut and 316 stainless steel washer
- › Multiple head styles and materials available; contact IDEX Health & Science for more information
- › For 1/4-28 and M6 flat-bottom ports
- › Some color options available; call for more information

Flanged Fittings are compatible with most standard 1/4-28 or M6 Flat-Bottom flanged fittings. The Delrin® (acetal resin) nut resists cross threading or loosening during use.



**P-401x<sup>1</sup>**  
Flanged Fitting for 1/16" OD tubing\*  
<sup>1</sup> The dimensions shown apply to all square-head Flanged Fittings  
\* Flanged tubing not included



**P-482G<sup>3</sup>**  
Flanged Fitting for 1/16" OD tubing\*  
<sup>3</sup> The dimensions shown apply to all knurled-head Flanged Fittings  
\* Flanged tubing not included

## RELATED PRODUCTS

- › For an alternative to flanging tubing, we highly recommend the Flangeless Fittings found on page 45, the Super Flangeless™ Fittings found on page 39, or the VacuTight™ Fittings on page 42.

| Part No.                                            | Description                         | Port Geometry      | Head Style     | Material (Nut/Washer) | Qty.  |
|-----------------------------------------------------|-------------------------------------|--------------------|----------------|-----------------------|-------|
| FLANGED FITTINGS (INCLUDES STAINLESS STEEL WASHERS) |                                     |                    |                |                       |       |
| P-401x                                              | Flanged Fitting for 1/16" OD Tubing | 1/4-28 Flat-Bottom | 5/16" Square   | Delrin Black/SST      | 10-pk |
| P-482BLK                                            | Flanged Fitting for 1/16" OD Tubing | 1/4-28 Flat-Bottom | Standard Knurl | Delrin Black/SST      | ea.   |
| P-501x                                              | Flanged Fitting for 1/8" OD Tubing  | 1/4-28 Flat-Bottom | 5/16" Square   | Delrin Black/SST      | 10-pk |
| P-982BLKx                                           | Flanged Fitting for 1/16" OD Tubing | M6 Flat-Bottom     | Standard Knurl | Delrin Black/SST      | 10-pk |
| P-1082BLKx                                          | Flanged Fitting for 1/8" OD Tubing  | M6 Flat-Bottom     | Standard Knurl | Delrin Black/SST      | 10-pk |
| REPLACEMENT WASHERS                                 |                                     |                    |                |                       |       |
| P-407x                                              | Washer for 1/16" OD Tubing          | 1/4-28 Flat-Bottom | —              | SST                   | 10-pk |
| P-507x                                              | Washer for 1/8" OD Tubing           | 1/4-28 Flat-Bottom | —              | SST                   | 10-pk |
| P-1087x                                             | Washer for 1/8" OD Tubing           | M6 Flat-Bottom     | —              | SST                   | 10-pk |





# Flangeless Fittings



## THE CONVENIENCE OF FLANGELESS FITTINGS



Our Flangeless Nuts provide fingertight convenience — no wrenches required.

Our Flangeless Ferrules provide a leak-proof seal. There is no need to spend time flanging tubing.

Flangeless Fittings eliminate the need to flange tubing. This removable and reusable system provides several benefits:

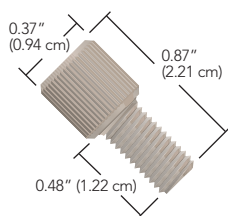
**Convenience:** Flangeless Fittings are easy to use. Just slip the nut and ferrule over the tubing and finger tighten the assembly into your receiving port. In tests, it is shown that the ideal amount of torque to achieve expected part performance should be approximately 3–4 in-lbs (0.34–0.45 N·m). Check out the line of special tightening tools designed to adapt to many standard torque wrenches, on page 50 and the adjustable torque driver, VHP-4000 on page 51.

**Minimal Down-Time:** Component replacement is quick, taking only a few seconds — unlike the significant time required to flange tubing.

**Cost-Effectiveness:** Repairing a flanged tubing assembly requires a costly flanging tool or the purchase of a complete replacement assembly, including a new length of tubing and a set of fittings. The Flangeless Fittings system typically requires only one new ferrule at minimal cost when repairing a connection.

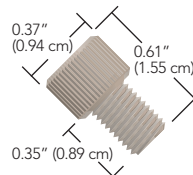
The 1/4-28 and M6 Flangeless Fittings for 1/16", 1/8", and metric sized OD tubing are summarized on the following page and listed on page 47.

## 1/4-28 Flangeless Fittings – Nuts



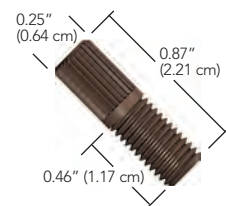
### Standard

XP-201x  
XP-202x  
XP-220x  
XP-230x  
XP-238x  
XP-245x  
XP-301x – XP-305x  
XP-330x



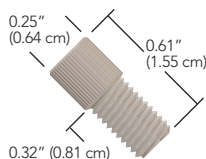
### Short

XP-218x  
XP-235x  
XP-308x  
XP-335x  
P-207Sx  
P-247x  
P-307Sx  
P-347x



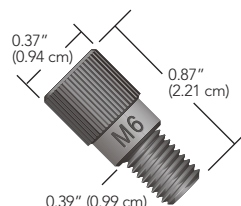
### Headless

XP-286x



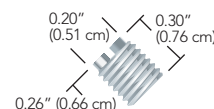
### Short Headless

XP-283x



### Standard Metric

P-207x  
P-307x



### FlushNut™

XF-358x  
XF-368x

## Flangeless Fittings (Cont.)

### NOTE

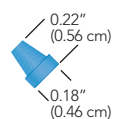
- › The XP-340x ferrule is designed for use with shallow receiving ports, such as those used on some low pressure valves.



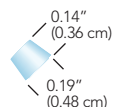
**XP-340x**  
ETFE Small Valve Ferrule

- › The XF-368x FlushNut is an excellent choice for applications where port-to-port spacing is limited; see page 31 for more information on this innovative product line. As an alternative, consider one of the "headless" fittings shown on this page.

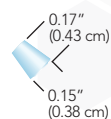
### Ferrules



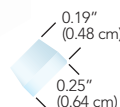
**Standard 1/16"**  
P-200x  
XP-200Nx



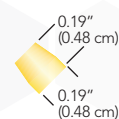
**Small Valve 1/8"**  
XP-340x



**Small Valve 1/16"**  
XP-240x



**Standard 4.0 mm**  
P-344x



**Standard 1/8"  
and Metric Ferrules**  
XP-300x  
XP-300Nx  
P-342x  
P-353x  
P-363Rx  
P-343x

### RELATED PRODUCTS

- › For the Large Bore Flangeless Fittings, please refer to page 56.
- › Nuts for M6 threaded ports are on page 43; nuts for 5/16-24 threaded ports are on page 56.

### Flangeless Fittings for 1/16" and 1/8" OD Tubing

- › Wide variety of materials and geometries to fit most applications
- › Excellent replacement for flanged fittings
- › Convenient and easy to use
- › Fittings and ferrules packaged together for easy ordering convenience

Flangeless Fittings for 1/16" OD Tubing, and for 1/8" OD Tubing are available in a variety of materials. The replacement ferrules are manufactured from inert ETFE, and are sold in a colored version or ETFE's natural color as the N option. The smaller ferrules, XP-240x and XP-340x are designed for shallow ports.

The fittings shown on this page are packaged together with the ferrules in convenient 10-packs. The 1/16" version include the XP-200x ferrule, and the 1/8" version include the XP-300x ferrule. Please visit our website, [www.idex-hs.com](http://www.idex-hs.com), for single packaging options.

For higher pressure and temperature applications consider our Super Flangeless™ found on page 39.

### Lock Nut

The XP-312x Lock Nut is for use with any 1/4-28 male Flangeless Fitting. Use this product in applications where vibrations can loosen fittings.

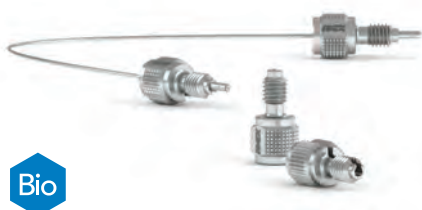
**To Use:** Thread the lock nut onto the male fitting. When the male fitting is firmly seated into the receiving port, tighten the lock nut down against the receiving port to securely hold the male fitting in place.



**XP-312x**  
Lock Nut White Delrin

## Flangeless Fittings

| Part No.                                                                | Description                                         | Port                        | Pressure Rating     | Head Style     | Material      | Qty.  |
|-------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------|---------------------|----------------|---------------|-------|
| <b>FLANGELESS FITTINGS FOR 1/16" OD TUBING</b>                          |                                                     |                             |                     |                |               |       |
| <b>XF-358x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing, FlushNut    | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | FlushNut       | SST           | 10-pk |
| <b>XLT-111x</b>                                                         | Flangeless Fitting for 1/16" OD Tubing              | 10-32 Flat-Bottom           | 2,500 psi (172 bar) | Standard Knurl | PEEK Natural  | 10-pk |
| <b>XP-201x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | Delrin Black  | 10-pk |
| <b>XP-202x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | Delrin Red    | 10-pk |
| <b>XP-218x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | ETFE Natural  | 10-pk |
| <b>XP-230x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | PEEK Natural  | 10-pk |
| <b>XP-235x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing, Short       | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | PEEK Natural  | 10-pk |
| <b>XP-238x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | Delrin Purple | 10-pk |
| <b>XP-245x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Standard Knurl | PFA Natural   | 10-pk |
| <b>XP-286x</b>                                                          | Flangeless Fitting for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | Headless Knurl | PPS Natural   | 10-pk |
| <b>REPLACEMENT FERRULES FOR 1/16" OD TUBING</b>                         |                                                     |                             |                     |                |               |       |
| <b>XP-200x</b>                                                          | Flangeless Ferrule for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | —              | ETFE Blue     | 10-pk |
| <b>XP-200Nx</b>                                                         | Flangeless Ferrule for 1/16" OD Tubing              | 1/4-28 Flat-Bottom          | 2,000 psi (138 bar) | —              | ETFE Natural  | 10-pk |
| <b>XP-240x</b>                                                          | Flangeless Ferrule for 1/16" OD Tubing, Small Valve | 1/4-28 or 10-32 Flat-Bottom | 2,500 psi (172 bar) | —              | ETFE Natural  | 10-pk |
| <b>FLANGELESS FITTINGS FOR 1/8" OD TUBING (INCLUDES P-300 FERRULES)</b> |                                                     |                             |                     |                |               |       |
| <b>XF-368x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing, FlushNut     | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | FlushNut       | SST           | 10-pk |
| <b>XP-301x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | Delrin Black  | 10-pk |
| <b>XP-302x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | Delrin Red    | 10-pk |
| <b>XP-305x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | Delrin Green  | 10-pk |
| <b>XP-308x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing, Short        | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | Delrin Black  | 10-pk |
| <b>XP-315x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | ETFE Natural  | 10-pk |
| <b>XP-330x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | PEEK Natural  | 10-pk |
| <b>XP-335x</b>                                                          | Flangeless Fitting for 1/8" OD Tubing, Short        | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | Standard Knurl | PEEK Natural  | 10-pk |
| <b>REPLACEMENT FERRULES FOR 1/8" OD TUBING</b>                          |                                                     |                             |                     |                |               |       |
| <b>XP-300x</b>                                                          | Flangeless Ferrule for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | —              | ETFE Yellow   | 10-pk |
| <b>XP-300Nx</b>                                                         | Flangeless Ferrule for 1/8" OD Tubing               | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | —              | ETFE Natural  | 10-pk |
| <b>XP-340x</b>                                                          | Flangeless Ferrule for 1/8" OD Tubing, Small Valve  | 1/4-28 Flat-Bottom          | 500 psi (34 bar)    | —              | ETFE Natural  | 10-pk |
| <b>XP-312x</b>                                                          | Lock Nut for Flangeless Nuts                        | 1/4-28 Flat-Bottom          | —                   | —              | Delrin White  | 10-pk |



Bio

- › Finger-tight to 19,000 psi
- › Reusable up to 200 times
- › Zero Dead Volume
- › Biocompatible
- › Limit Wear
- › Increase Product Life
- › Many IDs and Lengths Available



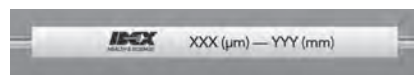
## LEARN MORE

Learn more about MarvelX Next Generation UHPLC Fittings at [www.idex-hs.com/MarvelX](http://www.idex-hs.com/MarvelX)



## NOTE

- › MarvelX tubing includes a sleeve that assists in product identification, with ID, length and part number information:

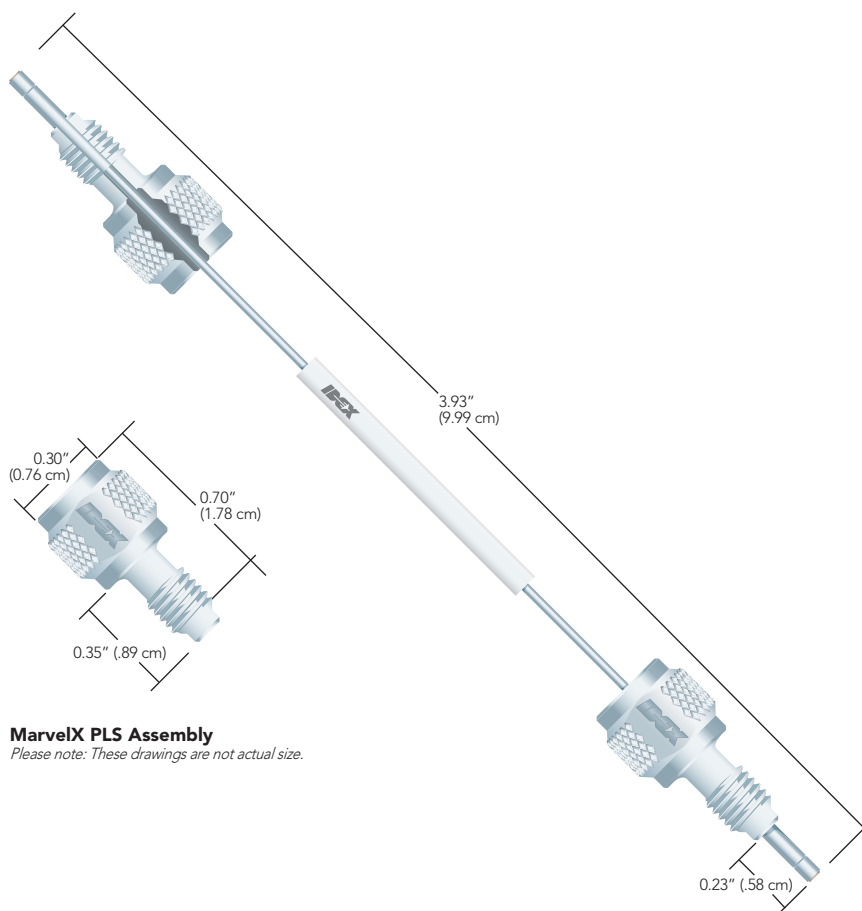


- › Minimum recommended bend-radius with MarvelX tubing is 1/4" (~6.35 mm).

MarvelX™

## MarvelX™ Next Generation UHPLC Fittings

MarvelX UHPLC Connection Systems have been expertly designed for easy routing throughout your instrument, while providing consistent performance and superior re-usability. Built with convenient, removable stainless steel fittings and changeable, precision-cut flexible tubing, MarvelX can be used up to 200 times! The connection system is compatible with 10-32 coned receiving ports and is absolutely finger-tight — no tool required. MarvelX utilizes our unique next-generation patent-pending technology to auto-adjust to various port depths. This ensures zero dead volume and delivers better chromatography results with sleek, simple, and reliable functionality. In addition to our powerful Stainless Steel version, MarvelX offers a truly biocompatible option in PEEK-Lined Stainless Steel.



**MarvelX PLS Assembly**  
Please note: These drawings are not actual size.



## SPECIFICATIONS &amp; DETAILS

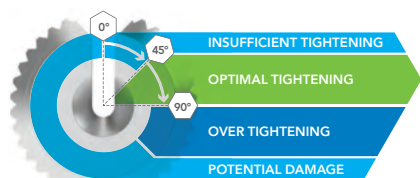
|                                |                                                                                                                                                                       |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Pressure Capability</b>     | 19,000 psi (~1,310 bar) for routine use; up to 23,000 psi max over pressure for PEEK-Lined versions; up to 29,000 psi max over pressure for Stainless Steel versions. |
| <b>Installation Method</b>     | Finger-tight, 1/8 – 1/4 turn after initial resistance (~2 in-lbs)                                                                                                     |
| <b>Tubing Type</b>             | 1/32" OD flexible 316 Stainless Steel with 1/16" OD rigid tube ends                                                                                                   |
| <b>Fitting Type</b>            | 10-32 threaded, removable 316 Stainless Steel                                                                                                                         |
| <b>Wetted Materials</b>        | PEEK-Lined versions: PEEK   Stainless Steel versions: PEEK and 316 Stainless Steel                                                                                    |
| <b>Maximum Use Temperature</b> | 120 °C                                                                                                                                                                |

NOTE: The above performance specifications apply to use with appropriately-designed receiving ports under optimal conditions, using water at up to 120 °C for the testing process. If different conditions are used, the expected pressure threshold will be different.



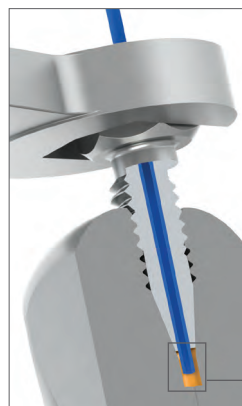
## INSTRUCTIONS FOR TIGHTENING

- 1 Route tubing to the target port.
- 2 Slide fitting onto the tubing end via slot.
- 3 Slowly finger-tighten to first resistance; continue tightening 1/8-turn minimum, to 1/4-turn maximum.



## MARVELX™ UHPLC FITTINGS VS. CONVENTIONAL CONED FITTINGS

**Conventional coned fittings** require a ferrule in conjunction with a fitting for proper sealing. They depend on complex techniques, including tools, to improve sealing performance, which significantly increases probability of extra internal volume and poor chromatography results. The excessive force needed for tightening increases wear of expensive components and the likelihood of replacement, adding to overall costs.



**MarvelX UHPLC fittings** do not depend on ferrules. They seal at the bottom of the port, without complex techniques, which significantly reduces required torque and enables many more connects and disconnects. Furthermore, they are virtually impossible to over-tighten by hand, limiting wear and increasing product life. An enhanced proprietary tip design also ensures zero dead volume (ZDV) and better chromatography results.



## MarvelX

| Length                                        | 070 MM<br>Part No. | 150 MM<br>Part No. | 250 MM<br>Part No. | 350 MM<br>Part No. | 500 MM<br>Part No. | 600 MM<br>Part No. |
|-----------------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| <b>PEEK-LINED STAINLESS STEEL ASSEMBLIES*</b> |                    |                    |                    |                    |                    |                    |
| 25 µm ID                                      | UPFP-6025070       | UPFP-6025150       | UPFP-6025250       | UPFP-6025350       | UPFP-6025500       | UPFP-6025600       |
| 50 µm ID                                      | UPFP-6050070       | UPFP-6050150       | UPFP-6050250       | UPFP-6050350       | UPFP-6050500       | UPFP-6050600       |
| 75 µm ID                                      | UPFP-6075070       | UPFP-6075150       | UPFP-6075250       | UPFP-6075350       | UPFP-6075500       | UPFP-6075600       |
| 100 µm ID                                     | UPFP-6100070       | UPFP-6100150       | UPFP-6100250       | UPFP-6100350       | UPFP-6100500       | UPFP-6100600       |
| 150 µm ID                                     | UPFP-6150070       | UPFP-6150150       | UPFP-6150250       | UPFP-6150350       | UPFP-6150500       | UPFP-6150600       |
| 300 µm ID                                     | UPFP-6300070       | UPFP-6300150       | UPFP-6300250       | UPFP-6300350       | UPFP-6300500       | UPFP-6300600       |
| <b>STAINLESS STEEL ASSEMBLIES*</b>            |                    |                    |                    |                    |                    |                    |
| 100 µm ID                                     | UPFS-6100070       | UPFS-6100150       | UPFS-6100250       | UPFS-6100350       | UPFS-6100500       | UPFS-6100600       |
| 125 µm ID                                     | UPFS-6125070       | UPFS-6125150       | UPFS-6125250       | UPFS-6125350       | UPFS-6125500       | UPFS-6125600       |
| 254 µm ID                                     | UPFS-6254070       | UPFS-6254150       | UPFS-6254250       | UPFS-6254350       | UPFS-6254500       | UPFS-6254600       |
| <b>REPLACEMENT PARTS*</b>                     |                    |                    |                    |                    |                    |                    |

Replacement Tubing To order Replacement Tubing, simply add the letter "T" to the end of any of the part numbers listed above.  
Example: UPFP-6020570T is the replacement tubing for UPFP-6020570.

Replacement Fittings UPN-61032 – Includes 3 replacement fittings.

\*Product availability and lead times may vary depending on the configuration. Contact Customer Service at +1 800 426 0191 or email [CustomerService.hs@idexcorp.com](mailto:CustomerService.hs@idexcorp.com) for details.



# Fittings Tools

## Tightening Tools for VHP & Other Fittings

- › Configured for the optimum torque to provide assurance of a strong connection
- › Prolongs the lifetime of reusable fittings by not overtightening
- › Available for multiple fitting head styles

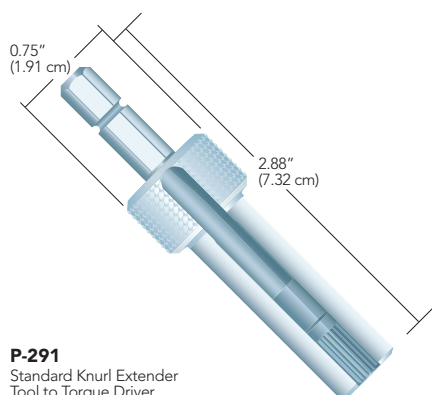
This new line of tightening tools is designed for the VHP fittings and can also be used with any fitting in this chapter described to have a corresponding head style to the tool listed below. There are three styles of tightening tools available for various applications. The Torque Tools (VHP-1000 and VHP-2000) are breakaway torque wrenches designed to deliver a precise amount of torque to the fitting system. These torque wrenches come calibrated according to ISO 6789:2003 ( $\pm 6\%$  of setting) and have been tested extensively with the reusable VHP fittings on page 60. Choose the appropriate torque delivered and the proper head style to work with the VHP fittings, increasing the ease of use with these fittings.

The VHP-4000 Torque Driver couples with the specially designed Extender Tools listed below and provides an externally adjustable torque setting. This tool along with the appropriate Extender Tools will tighten any IDEX Health & Science knurled polymer fitting in your system. Reference the head style found in the tables at the bottom of each page for information on the proper Extender Tool to select.

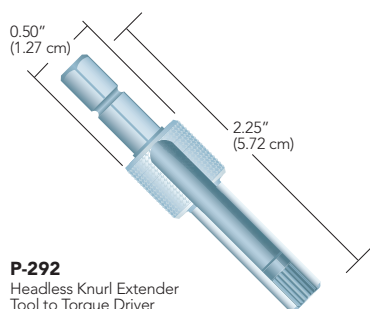
Because of the small hex-head on the M4 fittings (VHP-900 and VHP-920), a custom wrench, the VHP-9000, is available in the table at the bottom of the page 51.



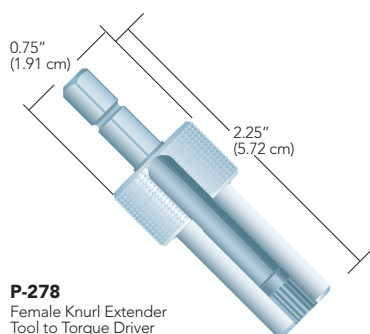
**VHP-1000**  
VHP Wrench  
1/4 in Hex 10 in-lbs (1.13 N-m)



**P-291**  
Standard Knurl Extender  
Tool to Torque Driver



**P-292**  
Headless Knurl Extender  
Tool to Torque Driver



**P-278**  
Female Knurl Extender  
Tool to Torque Driver

## Extender Tools

These tools can be used to tighten most of our knurled nuts in hard to reach places. See the application note on this page for knurl size and corresponding extender tool.

For precise tightening, the extender tools listed with 1/4" hex drives are designed to adapt to any torque wrench with a female 1/4" socket, such as the VHP-4000 Torque Driver on page 51. The tools featured on this page also include the FlushNut™ wrenches, used to tighten the FlushNuts found throughout this chapter and described in detail on page 51.



## APPLICATION NOTE

The drawings represent actual size of the various knurled head designs of the IDEX Health & Science nuts featured in this chapter. Select the appropriate extender tool for the knurl pattern of the nut you've selected.

| FEMALE KNURL         | STANDARD KNURL       | HEADLESS KNURL |
|----------------------|----------------------|----------------|
|                      |                      |                |
| STANDARD MICRO KNURL | MICRO HEADLESS KNURL |                |
|                      |                      |                |



## Removal Tool

Use the LT-300 Removal Tool to detach LiteTouch® and Super Flangeless™ Ferrules from tubing. Simply slide the appropriate tool blade slot between the lock ring and the ferrule body. With a slight twist, the ring will pop off, releasing the ferrule from the tubing. *Please Note: This Removal Tool will not work with the LT-135x Ferrule System.*



## Wrenches

For your convenience, we offer wrenches in three standard sizes. You will need two A-304 wrenches to tighten most nuts into unions found on page 36 (for union 1593, you need one A-304 and one A-320 wrench).

The IDEX Wrench is slotted to fit over 1/16" and 1/8" OD tubing, and has 1/4" and 5/16" internal hex ends, to engage with the heads of the hex-head fittings most commonly used with IDEX Health & Science valves and the stainless steel fittings listed on page 59.

## Fittings Tools

| Part No.             | Description                                                | Use With Head Style      | Torque Delivered                               | Qty. |
|----------------------|------------------------------------------------------------|--------------------------|------------------------------------------------|------|
| VHP TIGHTENING TOOLS |                                                            |                          |                                                |      |
| F-347                | Extender Tool to Torque Driver                             | FlushNut (1/4-28)        | —                                              | ea.  |
| N-291                | Extender Tool to Torque Driver                             | Micro Headless           | —                                              | ea.  |
| P-268                | Extender Tool to Torque Driver                             | 1/4" Hex                 | —                                              | ea.  |
| P-278                | Extender Tool to Torque Driver                             | Female Nut Knurl         | —                                              | ea.  |
| P-279                | Extender Tool to Torque Driver                             | Micro Nut Knurl          | —                                              | ea.  |
| P-291                | Extender Tool to Torque Driver                             | Standard Nut Knurl       | —                                              | ea.  |
| P-292                | Extender Tool to Torque Driver                             | Headless Nut Knurl       | —                                              | ea.  |
| P-1000               | Standard Knurl Torque Tool                                 | Standard Knurl           | 4 in-lbs (0.45 N-m)                            | ea.  |
| VHP-1000             | VHP Torque Tool                                            | 1/4" Hex                 | 10 in-lbs (1.13 N-m)                           | ea.  |
| VHP-2000             | VHP Torque Tool                                            | 1/4" Hex                 | 14 in-lbs (1.58 N-m)                           | ea.  |
| VHP-4000             | VHP Torque Driver                                          | Extender Tool 1/4" Drive | Adjustable between 2–12 in-lbs (0.23–1.35 N-m) | ea.  |
| VHP-9000             | 4 mm Wrench                                                | 4 mm Hex                 | —                                              | ea.  |
| EXTENDER TOOLS       |                                                            |                          |                                                |      |
| Part No.             | Description                                                | Material                 | Qty.                                           |      |
| P-291                | Extender Tool for Standard Head Nuts, with 1/4" Hex Drive  | Aluminum                 | ea.                                            |      |
| P-298                | Extender Tool for Standard Head Nuts                       | Delrin®                  | ea.                                            |      |
| P-299                | Extender Tool for Standard Head Nuts                       | Aluminum                 | ea.                                            |      |
| P-399                | Extender Tool for Standard Head Nuts, Short                | Aluminum                 | ea.                                            |      |
| P-297                | Extender Tool for Headless Nuts                            | Aluminum                 | ea.                                            |      |
| P-292                | Extender Tool for Headless Nuts, with 1/4" Hex Drive       | Aluminum                 | ea.                                            |      |
| P-277                | Extender Tool for Standard Micro Nuts                      | Aluminum                 | ea.                                            |      |
| N-290                | Extender Tool for Micro Headless Nuts                      | Aluminum                 | ea.                                            |      |
| P-278                | Extender Tool for Female Nuts, with 1/4" Hex Drive         | Aluminum                 | ea.                                            |      |
| MISCELLANEOUS TOOLS  |                                                            |                          |                                                |      |
| A-304                | Wrench, 1/4" x 5/16"                                       | Steel                    | ea.                                            |      |
| A-305                | Wrench, 1/2" x 9/16"                                       | Steel                    | ea.                                            |      |
| A-320                | Wrench, 3/8" x 7/16"                                       | Steel                    | ea.                                            |      |
| 6810                 | IDEX Wrench, 1/4" x 5/16"                                  | Steel                    | ea.                                            |      |
| F-345                | FlushNut Wrench for 10-32 Threaded Fittings                | Steel/Plastic Handle     | ea.                                            |      |
| F-346                | FlushNut Wrench for 1/4-28 Threaded Fittings               | Steel/Plastic Handle     | ea.                                            |      |
| LT-300               | Removal Tool for LiteTouch and Super Flangeless Ferrules   | Steel/Plastic Handle     | ea.                                            |      |
| M-150                | Swaging Tool for TinyTight Fittings, for 6–40 MINSTAC Port | SST                      | ea.                                            |      |





# Tubing Sleeves

## MicroTight® Tubing Sleeves

- › Manufactured from PEEK polymer
- › Pressure rated to 4,000 psi (276 bar)
- › Color-coded for easy inner diameter identification

IDEX Health & Science MicroTight Tubing Sleeves feature an outer diameter of 0.025" and offer a wide assortment of inner diameters to help facilitate capillary tubing connections with our MicroTight accessories. Because the sleeves are manufactured from PEEK polymer, they carry an upper temperature threshold of 125 °C.

To use these sleeves properly, choose a sleeve with an inner diameter 0.001"–0.002" (25–50 µm) larger than the outer diameter of your capillary tubing. Then, slip the sleeve over your flow path tubing, such that your tubing extends all the way through the sleeve, but not beyond the end of the sleeve. Choose the correct fitting that corresponds with your receiving port, slide it over the sleeved flow path tubing and connect as normal.

## NanoTight™ Tubing Sleeves

- › Manufactured from FEP fluoropolymer
- › Pressure rated to 4,000 psi (276 bar)
- › Outer diameter of 1/16" — the most popular size used on most instrumentation

NanoTight Tubing Sleeves are manufactured using FEP fluoropolymer and precisely cut to a 1.6" length. A wide assortment of sleeves is available, ensuring the availability of a NanoTight sleeve for most applications. Many of the sleeves feature a light color tint that can help more easily identify the inner diameter for future orders. Because FEP is the base polymer for these sleeves, there is a maximum recommended continuous operating temperature of 50 °C.

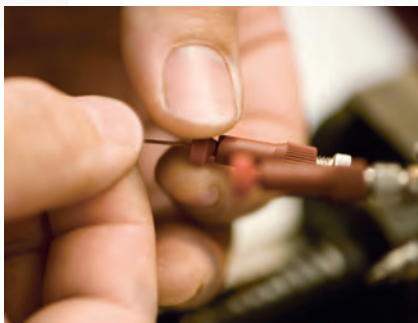
Our NanoTight sleeves were designed primarily for use with the NanoTight fittings, found on page 37 and also work well with the Super Flangeless™ fittings for 1/16" OD tubing on page 39. For tubing sleeves that can be used effectively with stainless steel fittings and at higher temperatures, consider using the PEEK Tubing Sleeves, found below.

## 1/16" OD PEEK Tubing Sleeves

- › For connecting capillary tubing to standard 10-32 ports
- › Require the use of wrench tightened stainless steel nuts
- › Pressure rated to 6,000 psi (414 bar)

Like the NanoTight™ FEP Sleeves on the previous page, these PEEK Tubing Sleeves are designed to be used with 1/16" OD, 10-32 threaded fittings to adapt capillary tubing to standard coned ports. Made of PEEK polymer, these 1.3" long sleeves can be used up to 125 °C.

These sleeves require a wrench tightened nut to achieve proper sealing. We recommend our SealTight™ fittings on page 36. Many researchers also use a stainless steel nut and ferrule with these sleeves, such as our U-400 and U-401 (page 33).



### 1/32" OD PEEK Tubing Sleeves

These 1.6" long 1/32" OD PEEK Tubing Sleeves can be used with any fitting designed for 1/32" OD tubing when smaller tubing must be connected. Select the appropriate sleeve from the product listing for your capillary tubing OD size. The 1/32" OD PEEK Tubing Sleeves have a maximum recommended temperature of 125 °C and have a pressure rating of 5,000 psi (345 bar).



### 1/32" OD FEP Tubing Sleeves

These 1.6" long sleeves facilitate connecting capillary tubing into ports designed for 1/32" OD tubing. Please refer to the product listing below to select the appropriate sleeve for your capillary OD size. These sleeves can be used at up to 50 °C and have a pressure rating of 1,750 psi (121 bar).

Clockwise, starting at top:

- › 1/16" OD PEEK Tubing Sleeves, use with U-400 and U-401 (not shown)
- › 1/32" OD FEP Tubing Sleeves, shown with F-126Sx Fitting
- › Fittings and tubing only shown to highlight how sleeves are designed to be used; they are not included with the sleeves



## APPLICATION NOTE

### Why use Sleeves?

Because most capillary tubing connections are made into coned receiving ports, where the port is not designed to be used with capillary tubing directly, special care must be used to ensure a good connection. While custom ferrules can help make these connections, they only offer a fixed-length nose — and because most tubing pockets will vary slightly in length, this can lead to leaking or dead volume.

To help save overall expense while maintaining a concentric connection with minimal dead volume, IDEX Health & Science recommends the use of sleeves. Because sleeves are not permanently attached to a ferrule, they can easily adapt to varying tubing pocket depths. Additionally, because they are manufactured using extruded polymer tubing, you are assured of the concentricity of the resultant connection.

## Tubing Sleeves (Cont.)



### RELATED PRODUCTS

Use 1/32" OD PEEK or FEP Sleeves to connect capillary tubing with the following:

- › The F-113 Ferrule and Two-Piece Fingertight Fittings for 10-32 ports (page 35).
- › The F-112 and P-416BLK MicroTight® Fittings (page 34) — 1/32" OD PEEK Tubing Sleeves only.
- › The 1/32" OD MicroTight Fittings on page 34.
- › The RheFlex M4 Fitting (page 61) for MX Module applications; the M-645 Valco®-Compatible Fitting (page 33) for Valco Nanovolume® valve applications.

## Tubing Sleeves

| Part No.                                           | ID                                                                                                                                                           |  | For Tubing OD Size | Color   | Qty. |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------|---------|------|
| MICROTIGHT PEEK TUBING SLEEVES AND KITS, 0.025" OD |                                                                                                                                                              |  |                    |         |      |
| F-180                                              | 125 μm (0.005")                                                                                                                                              |  | 70–110 μm          | Red     | ea.  |
| F-181                                              | 180 μm (0.007")                                                                                                                                              |  | 125–165 μm         | Yellow  | ea.  |
| F-182                                              | 230 μm (0.009")                                                                                                                                              |  | 175–215 μm         | Natural | ea.  |
| F-183                                              | 280 μm (0.011")                                                                                                                                              |  | 225–265 μm         | Blue    | ea.  |
| F-184                                              | 330 μm (0.013")                                                                                                                                              |  | 275–315 μm         | Orange  | ea.  |
| F-185                                              | 395 μm (0.0155")                                                                                                                                             |  | 340–380 μm         | Green   | ea.  |
| F-186                                              | 455 μm (0.018")                                                                                                                                              |  | 400–440 μm         | Black   | ea.  |
| F-187                                              | 535 μm (0.021")                                                                                                                                              |  | 480–520 μm         | Natural | ea.  |
| F-188                                              | 152 μm (0.006")                                                                                                                                              |  | 95–135 μm          | Purple  | ea.  |
| 1328                                               | MicroTight Tubing Sleeve Kit, contains (6) each of the sleeve sizes listed above                                                                             |  | —                  | —       | ea.  |
| 1356                                               | MicroTight Connector Kit, contains: a 10-pack of each MicroTight Tubing Sleeve (F-180–F-187); (2) P-770 MicroTight Adapters; and (2) MicroTight P-720 Unions |  | —                  | —       | ea.  |
| NANOTIGHT FEP TUBING SLEEVES, 1/16" OD             |                                                                                                                                                              |  |                    |         |      |
| F-237                                              | 125 μm (0.005")                                                                                                                                              |  | 70–110 μm          | Red     | ea.  |
| F-238                                              | 180 μm (0.007")                                                                                                                                              |  | 125–165 μm         | Yellow  | ea.  |
| F-239                                              | 215 μm (0.0085")                                                                                                                                             |  | 160–200 μm         | Natural | ea.  |
| F-240                                              | 280 μm (0.011")                                                                                                                                              |  | 225–265 μm         | Blue    | ea.  |
| F-241                                              | 330 μm (0.013")                                                                                                                                              |  | 275–315 μm         | Orange  | ea.  |
| F-242                                              | 395 μm (0.0155")                                                                                                                                             |  | 340–380 μm         | Green   | ea.  |
| F-243                                              | 455 μm (0.018")                                                                                                                                              |  | 400–440 μm         | Black   | ea.  |
| F-244                                              | 535 μm (0.021")                                                                                                                                              |  | 480–520 μm         | Natural | ea.  |
| F-245                                              | 610 μm (0.024")                                                                                                                                              |  | 555–595 μm         | Red     | ea.  |
| F-246                                              | 685 μm (0.027")                                                                                                                                              |  | 630–670 μm         | Yellow  | ea.  |
| F-247                                              | 840 μm (0.033")                                                                                                                                              |  | 785–825 μm         | Green   | ea.  |
| F-252                                              | 1.07 mm (0.042")                                                                                                                                             |  | 1 mm               | Purple  | ea.  |
| PEEK TUBING SLEEVES FOR 1/16" OD FITTINGS          |                                                                                                                                                              |  |                    |         |      |
| F-225                                              | 125 μm (0.005")                                                                                                                                              |  | 70–110 μm          | Red     | ea.  |
| F-226                                              | 180 μm (0.007")                                                                                                                                              |  | 125–165 μm         | Yellow  | ea.  |
| F-227                                              | 230 μm (0.009")                                                                                                                                              |  | 175–215 μm         | Yellow  | ea.  |
| F-228                                              | 250 μm (0.011")                                                                                                                                              |  | 225–265 μm         | Blue    | ea.  |
| F-229                                              | 330 μm (0.013")                                                                                                                                              |  | 275–315 μm         | Natural | ea.  |
| F-230                                              | 405 μm (0.016")                                                                                                                                              |  | 350–390 μm         | Orange  | ea.  |
| F-231                                              | 560 μm (0.022")                                                                                                                                              |  | 505–545 μm         | Natural | ea.  |
| F-232                                              | 785 μm (0.031")                                                                                                                                              |  | 730–770 μm         | Natural | ea.  |
| F-233                                              | 865 μm (0.034")                                                                                                                                              |  | 785–825 μm         | Blue    | ea.  |
| F-234                                              | 685 μm (0.027")                                                                                                                                              |  | 630–670 μm         | Yellow  | ea.  |
| PEEK TUBING SLEEVES FOR 1/32" OD FITTINGS          |                                                                                                                                                              |  |                    |         |      |
| F-381                                              | 180 μm (0.007")                                                                                                                                              |  | 125–165 μm         | Yellow  | ea.  |
| F-382                                              | 205 μm (0.008")                                                                                                                                              |  | 150–190 μm         | Natural | ea.  |
| F-384                                              | 255 μm (0.010")                                                                                                                                              |  | 200–240 μm         | Blue    | ea.  |
| F-385                                              | 380 μm (0.015")                                                                                                                                              |  | 325–365 μm         | Natural | ea.  |
| F-386                                              | 510 μm (0.020")                                                                                                                                              |  | 455–495 μm         | Orange  | ea.  |
| F-387                                              | 250 μm (0.011")                                                                                                                                              |  | 225–265 μm         | Red     | ea.  |
| F-388                                              | 330 μm (0.013")                                                                                                                                              |  | 275–315 μm         | Black   | ea.  |
| FEP TUBING SLEEVES FOR 1/32" OD FITTINGS           |                                                                                                                                                              |  |                    |         |      |
| F-374                                              | 280 μm (0.011")                                                                                                                                              |  | 225–265 μm         | Blue    | ea.  |
| F-375                                              | 330 μm (0.013")                                                                                                                                              |  | 275–315 μm         | Orange  | ea.  |
| F-376                                              | 395 μm (0.0155")                                                                                                                                             |  | 340–380 μm         | Green   | ea.  |

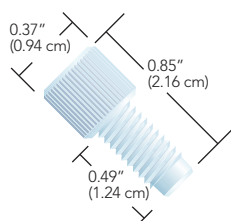


# Plugs & Caps

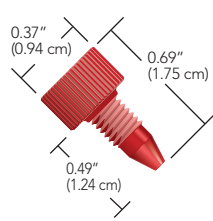
► Seal 6-32, 6-40, 10-32, 1/4-28, M6, or 5/16-24 threaded ports or fittings

Use our plugs to close off unused ports in valves and multi-port connectors. Our color-coded 10-32 threaded plugs are perfect for identifying stored columns that have different packing materials, or in which different mobile phases have been utilized. Cap off tubing with one of the PEEK or ETFE caps presented on this page and the appropriate fittings from this chapter.

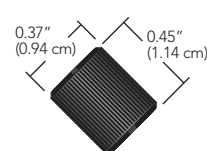
To help determine which plug or cap is best suited for your application, please visit [www.idex-hs.com](http://www.idex-hs.com) for detailed chemical compatibility data.



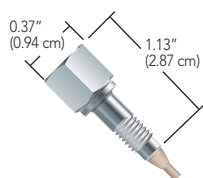
**P-316**  
PFA Plug  
for 1/4-28 flat-bottom ports



**U-467R**  
Delrin® Column Plug  
for 10-32 coned ports



**P-755**  
ETFE Cap  
for 1/4-28 flat-bottom fittings



**VHP-600**  
VHP Plug  
for 10-32 coned ports

| Part No.       | Description                                    | Head Style           | Material      | Qty. |
|----------------|------------------------------------------------|----------------------|---------------|------|
| <b>PLUGS</b>   |                                                |                      |               |      |
| <b>P-120</b>   | Plug for 1/4-28 Coned Ports for 1/8" OD Tubing | Standard Knurl       | PCTFE Natural | ea.  |
| <b>P-123</b>   | Plug for 1/4-28 Flat-Bottom Ports              | 5/16" Hex            | ETFE Natural  | ea.  |
| <b>P-309</b>   | Plug for 1/4-28 Flat-Bottom Ports              | Standard Knurl       | Delrin Black  | ea.  |
| <b>P-311</b>   | Plug for 1/4-28 Flat-Bottom Ports              | Standard Knurl       | ETFE Natural  | ea.  |
| <b>P-314</b>   | Plug for M6 Flat-Bottom Ports                  | Standard Knurl       | ETFE Black    | ea.  |
| <b>P-316</b>   | Plug for 1/4-28 Flat-Bottom Ports              | Standard Knurl       | PFA Natural   | ea.  |
| <b>P-321</b>   | Plug for 1/4-28 Flat-Bottom Ports, FlushNut™   | FlushNut             | PEEK Natural  | ea.  |
| <b>P-520</b>   | Plug for 10-32 Coned Ports                     | 5/16" Hex            | SST           | ea.  |
| <b>P-550</b>   | Plug for 10-32 Coned Ports, Extra Long         | Standard Knurl       | PEEK Natural  | ea.  |
| <b>P-551</b>   | Plug for 10-32 Coned Ports                     | Standard Knurl       | PEEK Natural  | ea.  |
| <b>P-555</b>   | Plug for 6-32 Coned Ports                      | Standard Micro Knurl | PEEK Natural  | ea.  |
| <b>P-556</b>   | Plug for 5/16-24 Flat-Bottom Ports             | Standard Knurl       | PEEK Natural  | ea.  |
| <b>P-558</b>   | Plug for 6-40 Flat-Bottom Ports                | Micro Headless Knurl | PEEK Green    | ea.  |
| <b>P-849</b>   | Plug for 10-32 Flat-Bottom Ports               | Standard Knurl       | Delrin Black  | ea.  |
| <b>U-467R</b>  | Plug for 10-32 Coned Ports                     | Standard Knurl       | Delrin Red    | ea.  |
| <b>VHP-600</b> | VHP Plug for 10-32 Coned Ports                 | 3/8" Hex             | PK-SST        | ea.  |
| <b>CAPS</b>    |                                                |                      |               |      |
| <b>P-754</b>   | Cap for 10-32 Coned Ports                      | Standard Knurl       | ETFE Yellow   | ea.  |
| <b>P-755</b>   | Cap for 1/4-28 Flat-Bottom Ports               | Standard Knurl       | ETFE Black    | ea.  |
| <b>P-756</b>   | Cap for M6 Flat-Bottom Ports                   | Standard Knurl       | ETFE Blue     | ea.  |

# Large Bore Fittings

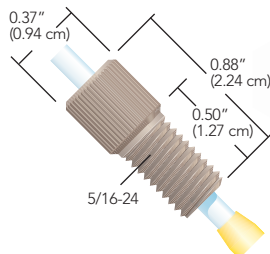
- 5/16-24 or 1/2-20 threads
- For use with 1/16", 1/8", 3/16", 1/4", 5/16", 3.0 mm, or 4.0 mm OD tubing

## NOTE

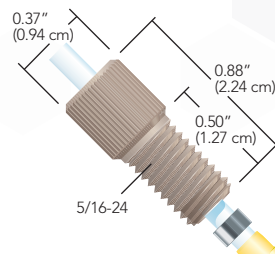
Each of the Large Bore Fittings shown on this page comes in a convenient 10-pack and is packaged with the most popularly chosen Ferrule option. The Fittings can be ordered separately by removing the preceding letter "X" from the part number. Additionally, to connect metric-sized tubing with outer diameters less than 4.0 mm to 5/16-24 threaded ports, reference the chart on page 43 to choose the correct nut/ferrule combination.

## RELATED PRODUCTS

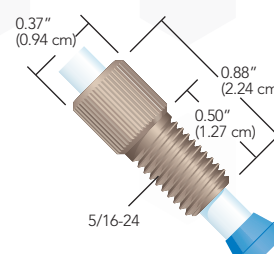
|                                 | Page    |
|---------------------------------|---------|
| <b>MORE LARGE BORE PRODUCTS</b> |         |
| <b>5/16-24 Coned Fittings</b>   | 41      |
| <b>Barbed Adapters</b>          | 90      |
| <b>Threaded Adapters</b>        | 63      |
| <b>Plugs</b>                    | 55, 112 |
| <b>Y Connector</b>              | 90      |
| <b>ETFE Tubing</b>              | 27      |
| <b>FEP, PFA Tubing</b>          | 26, 24  |
| <b>Tubing Cutter</b>            | 28      |
| <b>Pressure Relief Valve</b>    | 148     |
| <b>Solvent Inlet Filters</b>    | 102     |
| <b>Bottle Caps</b>              | 55      |
| <b>Semi-Prep Inline Filters</b> | 107     |



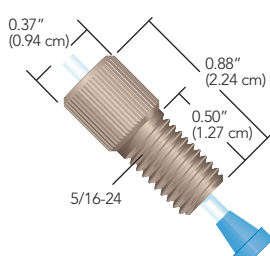
**XP-130x**  
PEEK Nut,  
for 1/8" OD tubing  
shown with P-300 Flangeless Ferrule  
(page 43)



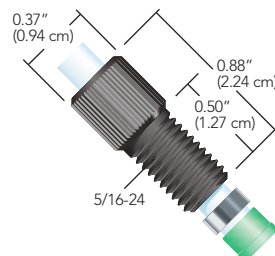
**XP-131x**  
PEEK Nut,  
for 1/8" OD tubing  
shown with P-359 Super Flangeless™  
Ferrule (included and found on page 41)



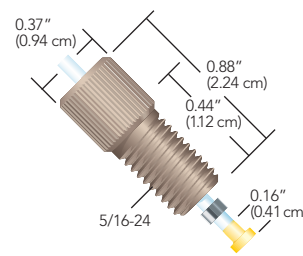
**XP-132x**  
PEEK Nut, for 3/16" and  
4.0 mm OD tubing  
shown with P-133 Flangeless Ferrule  
(included and found on this page)



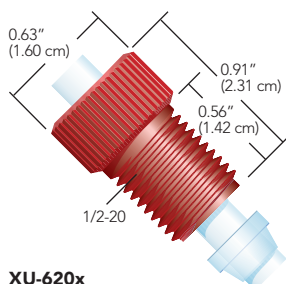
**XP-136x**  
PEEK Nut,  
for 1/16" OD tubing  
shown with P-200 Flangeless Ferrule  
(included and found on page 43)



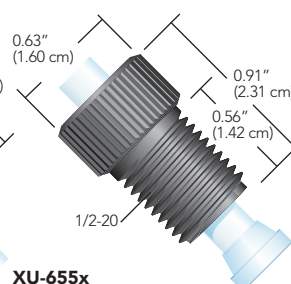
**XP-137x**  
PEEK Nut,  
for 3/16" OD tubing  
shown with P-140 Super Flangeless Ferrule  
(included and found on page 56)



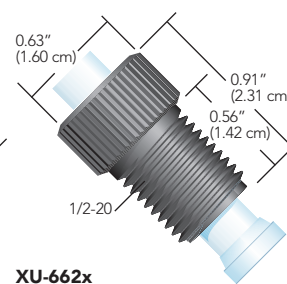
**XP-141x**  
PEEK Nut,  
for 1/16" OD tubing  
shown with P-259 Super Flangeless Ferrule  
(included and found on page 41)



**XU-620x**  
PEEK Nut,  
for 1/4" OD tubing  
shown with inverted U-650 Flangeless  
Ferrule for coned ports  
(included and found on this page)



**XU-655x**  
PEEK Nut,  
for 1/4" OD tubing  
shown with U-650 Flangeless Ferrule  
(included and found on this page)



**XU-662x**  
PEEK Nut,  
for 5/16" OD tubing  
shown with U-660 Flangeless Ferrule  
(included and found on this page)

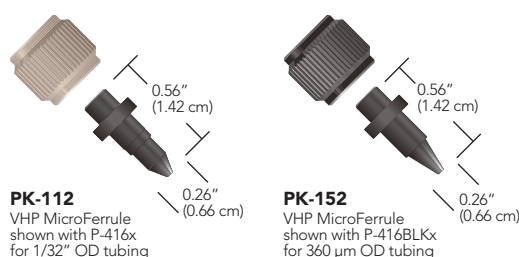
| Part No.                    | Description                                  | Port                | Pressure Rating     | Head Style     | Material (Nut/Washer)        | Qty.  |
|-----------------------------|----------------------------------------------|---------------------|---------------------|----------------|------------------------------|-------|
| <b>LARGE BORE FITTINGS</b>  |                                              |                     |                     |                |                              |       |
| <b>XP-130x</b>              | Flangeless Fitting for 1/8" OD tubing        | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | Standard Knurl | PEEK Natural/ETFE Yellow     | 10-pk |
| <b>XP-131x</b>              | Super Flangeless Fitting for 1/8" OD tubing  | 5/16-24 Flat-Bottom | 1,000 psi (69 bar)  | Standard Knurl | PEEK Natural/ETFE Yellow/SST | 10-pk |
| <b>XP-132x</b>              | Flangeless Fitting for 3/16" OD tubing       | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | Standard Knurl | PEEK Natural/ETFE Blue       | 10-pk |
| <b>XP-136x</b>              | Flangeless Fitting for 1/16" OD tubing       | 5/16-24 Flat-Bottom | 2,000 psi (138 bar) | Standard Knurl | PEEK Natural/ETFE Blue       | 10-pk |
| <b>XP-137x</b>              | Super Flangeless Fitting for 3/16" OD tubing | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | Standard Knurl | PEEK Black/ETFE Green/SST    | 10-pk |
| <b>XP-141x</b>              | Super Flangeless Fitting for 1/16" OD tubing | 5/16-24 Flat-Bottom | 1,350 psi (93 bar)  | Standard Knurl | PEEK Natural/ETFE Yellow/SST | 10-pk |
| <b>XU-620x</b>              | Flangeless Fitting for 1/4" OD tubing        | 1/2-20 Coned        | 250 psi (17 bar)    | Large Knurl    | PEEK Red/ETFE Natural        | 10-pk |
| <b>XU-655x</b>              | Flangeless Fitting for 1/4" OD tubing        | 1/2-20 Flat-Bottom  | 250 psi (17 bar)    | Large Knurl    | PEEK Black/ETFE Natural      | 10-pk |
| <b>XU-662x</b>              | Flangeless Fitting for 5/16" OD tubing       | 1/2-20 Flat-Bottom  | 250 psi (17 bar)    | Large Knurl    | PEEK Black/ETFE Natural      | 10-pk |
| <b>REPLACEMENT FERRULES</b> |                                              |                     |                     |                |                              |       |
| <b>P-133x</b>               | Flangeless Ferrule for 3/16" OD tubing       | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Blue                    | 10-pk |
| <b>P-133Nx</b>              | Flangeless Ferrule for 3/16" OD tubing       | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Natural                 | 10-pk |
| <b>P-140x</b>               | Super Flangeless Ferrule for 3/16" OD tubing | 5/16-24 Flat-Bottom | 500 psi (34 bar)    | —              | ETFE Green                   | 10-pk |
| <b>U-650x</b>               | Flangeless Ferrule for 1/4" OD tubing        | 1/2-20 Flat-Bottom  | 250 psi (17 bar)    | —              | ETFE Natural                 | 10-pk |
| <b>U-660x</b>               | Flangeless Ferrule for 5/16" OD tubing       | 1/2-20 Flat-Bottom  | 250 psi (17 bar)    | —              | ETFE Natural                 | 10-pk |



# VHP Micro Fittings

Micro Fittings are specifically designed for use with microferrules. They are manufactured from a proprietary PEEK blend (PK) which allow them to be used at higher temperatures (up to 200° C) and higher pressures ideal for UHPLC applications.

VHP MicroFerrules and Fittings are made from a proprietary high performance PEEK polymer blend, a material which is unique in its ability to enable the use of capillary tubing in UHPLC environments. The new high pressure MicroFerrules are available for use with 1/32" or 360 µm OD tubing, and they are incorporated into several of our VHP products for capillary tubing.



## APPLICATION NOTE

Caution: While the proprietary blend of the PK fittings will allow a fitting to attain a higher pressure and minimal cold flow properties relative to pure PEEK, some fittings molded of PK are known to be conductive. Use caution when employing PK fittings in high voltage applications.



## NOTE

### MicroTight fittings and MicroFerrules

While the MicroTight Female Nuts may be used with any of the separate MicroFerrules, the MicroFerrules themselves are port-specific and are thus not interchangeable. Additionally, the one-piece MicroTight fittings are also port-specific and should not be exchanged.

| Part No.                                 | Description                           | Port          | Pressure Rating        | Required Torque       | Head Style   | Material      | Qty. |
|------------------------------------------|---------------------------------------|---------------|------------------------|-----------------------|--------------|---------------|------|
| <b>PK MICRO FERRULES AND FEMALE NUTS</b> |                                       |               |                        |                       |              |               |      |
| <b>P-416</b>                             | Female Nut for Microferrule           | 5/16-24 Coned | 15,000 psi (1,035 bar) | 4.0 in-lbs (0.45 N·m) | Female Knurl | PEEK, Natural | ea.  |
| <b>P-416BLK</b>                          | Female Nut for Microferrule           | 5/16-24 Coned | 15,000 psi (1,035 bar) | 4.0 in-lbs (0.45 N·m) | Female Knurl | PEEK, Black   | ea.  |
| <b>PK-112</b>                            | VHP MicroFerrule for 1/32" OD Tubing  | 5/16-24 Coned | 15,000 psi (1,035 bar) | —                     | —            | PK            | ea.  |
| <b>PK-152</b>                            | VHP MicroFerrule for 360 µm OD Tubing | 5/16-24 Coned | 15,000 psi (1,035 bar) | —                     | —            | PK            | ea.  |





# VHP PK Fittings



## RELATED PRODUCTS

» Find unions, tees and crosses for VHP applications on page 75, and 74.

Ultra High Performance fittings are manufactured from a proprietary PEEK blend (PK) which allow them to be used at higher temperatures (up to 200 °C) and higher pressures.

The VHP PK One-Piece fittings are available for 10-32 coned, 6-32 coned, or M4 coned ports, and Two-Piece fittings are available to connect either 1/16" or 1/32" OD tubing into 10-32 coned ports in multiple styles.



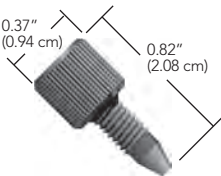
**PK-110x**  
10-32 PK Fitting  
shown with PK-100x for  
1/16" OD tubing



**PK-110x**  
10-32 PK Fitting  
shown with PK-132x for  
1/32" OD tubing



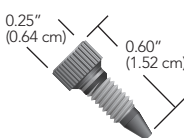
**PK-126x**  
6-32 PK MicroTight® Fitting  
for 1/32" OD tubing



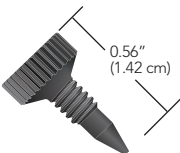
**PK-120BLKx**  
10-32 PK Fitting  
for 1/16" OD tubing



**PK-126Hx**  
6-32 PK MicroTight® Fitting  
for 1/32" OD tubing



**UH-904x**  
M4, 1/32" Fitting  
for IDEX Health & Science  
MX valves



**PK-124x**  
6-32 PK MicroTight® Fitting  
for 1/32" OD tubing

| Part No.                                                              | Description                                       | Port        | Pressure Rating        | Required Torque       | Head Style           | Material | Qty.  |
|-----------------------------------------------------------------------|---------------------------------------------------|-------------|------------------------|-----------------------|----------------------|----------|-------|
| PK VHP ONE-PIECE FITTINGS                                             |                                                   |             |                        |                       |                      |          |       |
| PK-120BLKx                                                            | PK One-Piece Fitting for 1/16" OD Tubing          | 10-32 Coned | 12,000 psi (827 bar)   | 8.0 in-lbs (0.90 N-m) | Standard Knurl       | PK       | 10-pk |
| PK-126Hx                                                              | PK One-Piece Headless Fitting for 1/32" OD Tubing | 6-32 Coned  | 15,000 psi (1,035 bar) | 3.0 in-lbs (0.34 N-m) | Headless Micro Knurl | PK       | 10-pk |
| PK-126x                                                               | PK One-Piece Fitting for 1/32" OD Tubing          | 6-32 Coned  | 15,000 psi (1,035 bar) | 3.0 in-lbs (0.34 N-m) | Standard Micro Knurl | PK       | 10-pk |
| UH-904x                                                               | PK One-Piece Fitting for 1/32" OD Tubing          | M4 Coned    | 15,000 psi (1,035 bar) | 4.0 in-lbs (0.45 N-m) | Headless Knurl       | PK       | 10-pk |
| PK VHP FITTINGS (LITETOUCH® STYLE, NUTS AND FERRULES SOLD SEPARATELY) |                                                   |             |                        |                       |                      |          |       |
| PK-100x                                                               | PK Ferrule for 1/16" OD Tubing                    | 10-32 Coned | 16,500 psi (1,140 bar) | —                     | —                    | PK       | 10-pk |
| PK-110x                                                               | PK Nut for 1/16" OD Tubing                        | 10-32 Coned | 16,500 psi (1,140 bar) | 8.0 in-lbs (0.90 N-m) | Standard Knurl       | PK       | 10-pk |
| PK-132x                                                               | PK Ferrule for 1/32" OD Tubing                    | 10-32 Coned | 16,500 psi (1,140 bar) | —                     | —                    | PK       | 10-pk |





# Stainless Steel VHP Fittings

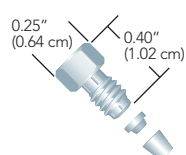
- ▶ Pressure rated to 30,000 psi (2,070 bar)
- ▶ Double compression ferrule design
- ▶ Available with 10-32 threads for 1/16" OD tubing and M4 threads for 1/32" OD tubing

The all Stainless-Steel VHP Fittings include a unique ferrule system with two compression points to provide twice the grip of a standard ferrule. This design also allows the bite on the tubing to be less concentrated and does not restrict the inner diameter, as discussed in the Application Note. The ferrules for 1/16" OD tubing and 10-32 coned ports are two pieces, while the grooved ferrule for 1/32" OD tubing and M4 coned ports is a one-piece design for easier handling, but it will act as two pieces with double compression on the tubing as it is tightened down.

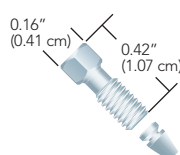


## APPLICATION NOTE

In order to seal up to the stated pressure rating, the VHP-200-01 ferrule requires 20 in-lbs (2.25 N·m) of torque. Similar ferrules on the market require tightening torque of at least 30 in-lbs (3.3 N·m), which can result in a restricted tubing passage, as shown in the picture below. This restriction can increase turbulence and add a 'throttling' effect to the fluid pathway, resulting in mixing and other potential chromatographic problems.



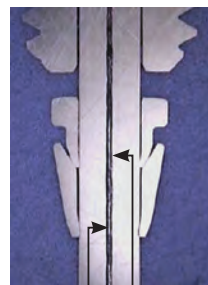
**VHP-200x**  
VHP 10-32 Fitting  
for 1/16" OD tubing



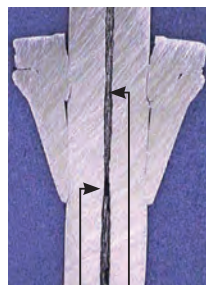
**VHP-700x**  
VHP 6-40 Fitting  
for 1/32" OD tubing

**IDEX Health & Science  
VHP-200**

**Conventional Two  
Piece Ferrule Design**



Uniform  
Tubing Passage



Constricted  
Tubing Passage

| Part No.                                                       | Description              | Port        | Pressure Rating        | Required Torque      | Head Style | Material | Qty.  |
|----------------------------------------------------------------|--------------------------|-------------|------------------------|----------------------|------------|----------|-------|
| <b>STAINLESS STEEL VHP FITTINGS (INCLUDES NUT AND FERRULE)</b> |                          |             |                        |                      |            |          |       |
| <b>VHP-200x</b>                                                | VHP Fitting for 1/16" OD | 10-32 Coned | 30,000 psi (2,070 bar) | 20 in-lbs (2.25 N·m) | 1/4" Hex   | SST      | 10-pk |
| <b>VHP-700x</b>                                                | VHP Fitting for 1/32" OD | 6-40 Coned  | 30,000 psi (2,070 bar) | 20 in-lbs (2.25 N·m) | 4 mm Hex   | SST      | 10-pk |
| <b>STAINLESS STEEL VHP FERRULES</b>                            |                          |             |                        |                      |            |          |       |
| <b>VHP-200-01x</b>                                             | VHP Ferrule for 1/16" OD | 10-32 Coned | 30,000 psi (2,070 bar) | 20 in-lbs (2.25 N·m) | —          | SST      | 10-pk |



# Reusable VHP Fittings

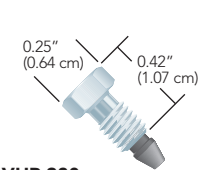
- › Pressure rated up to 25,000 psi (1,720 bar)
- › Patented innovative design
- › Capable of up to ten repeat assembly cycles with no impact on pressure holding ability or carry-over
- › Available in 10-32 threads for 1/16" OD tubing and M4 threads for 1/32" OD tubing
- › Materials of construction: stainless steel and proprietary PEEK polymer blend (PK)
- › Quick component replacement, minimal downtime

## RELATED PRODUCTS

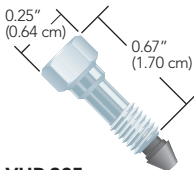
- › Find tightening tools on page 50 designed to deliver the torque necessary for these fittings.

IDEX Health & Science introduces an innovative line of Very High Pressure (VHP) fittings, designed to withstand extreme pressures. This patented line of ground-breaking fitting systems is perfect for use within the increasingly demanding requirements of today's high performance analytical systems.

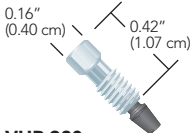
The Reusable VHP fittings can be reused when following the tightening torque specification listed below. With a polymer front ferrule, there is no damage to the tubing or receiving port, also increasing the life of these components.



**VHP-320x**  
10-32 VHP Fitting  
for 1/16" OD tubing



**VHP-325x**  
10-32 VHP Fitting, Long  
for 1/16" OD tubing



**VHP-920x**  
M4 VHP Fitting  
for 1/32" OD tubing



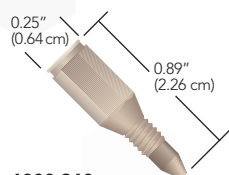
**VHP-3200x**  
10-32 VHP Fitting  
for 1/16" OD tubing



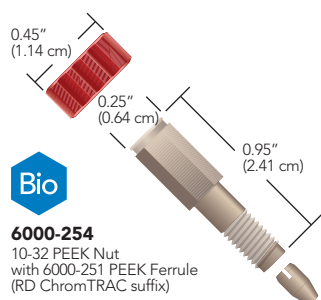
**VHP-1001**  
VHP Fingertight  
1/4" Hex Tool

| Part No.              | Description                    | Port        | Pressure Rating        | Required Torque       | Head Style | Material | Qty.  |
|-----------------------|--------------------------------|-------------|------------------------|-----------------------|------------|----------|-------|
| REUSABLE VHP FITTINGS |                                |             |                        |                       |            |          |       |
| VHP-320x              | VHP Fitting for 1/16" OD       | 10-32 Coned | 25,000 psi (1,720 bar) | 10 in-lbs (1.10 N-m)  | 1/4" Hex   | SST/PK   | 10-pk |
| VHP-325x              | VHP Fitting for 1/16" OD, Long | 10-32 Coned | 25,000 psi (1,720 bar) | 10 in-lbs (1.10 N-m)  | 1/4" Hex   | SST/PK   | 10-pk |
| VHP-920x              | VHP Fitting for 1/32" OD       | M4 Coned    | 25,000 psi (1,720 bar) | 8 in-lbs (0.90 N-m)   | 4 mm Hex   | SST/PK   | 10-pk |
| VHP-3200x             | VHP Fitting for 1/16" OD       | 10-32 Coned | 11,000 psi (760 bar)   | 3.5 in-lbs (0.40 N-m) | 1/2" Knurl | SST/PK   | 10-pk |
| VHP-1001              | VHP Fingertight 1/4" Hex Tool  | —           | —                      | —                     | —          | PPS      | ea.   |

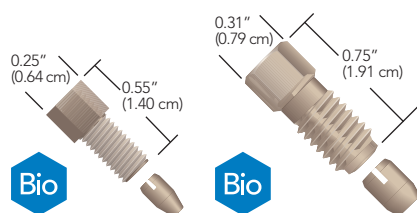
# Assorted Fittings Kits



**6000-360**  
M4 Fitting  
M4 threads  
for 1/32" OD tubing



**6000-254**  
10-32 PEEK Nut  
with 6000-251 PEEK Ferrule  
(RD ChromTRAC suffix)



**6000-255**  
10-32 PEEK Nut  
with 6000-251 PEEK Ferrule

**6000-078**  
5/16-24 PEEK Nut  
with 6000-079 PEEK Ferrule

## RheFlex® M4 Fittings

- › Incorporates M4 coned threads for 1/32" OD tubing
- › Pressure rated to 5,000 psi (345 bar)

Our RheFlex M4 Fitting is designed to connect 1/32" OD tubing in MX Series II™ valves (see Actuated Valves, starting on page 119). This PEEK fitting has a one piece design, which eliminates the need for a separate nut and ferrule. The M4 Fitting design provides dependable zero dead volume connections for micro and nano applications. Due to the unique RheFlex gripping design, the M4 Fitting will hold to 5,000 psi (345 bar) on PEEK or with a PEEK tubing sleeve on fused silica tubing. A PEEK M4 Plug is also available.

Use ChromTRAC™ knobs with the RheFlex M4 Fitting for fingertight convenience and to color-code connections.

## Two-Piece RheFlex Fingertight Fittings

The RheFlex Precision Two-Piece PEEK Fittings sets provide inert, biocompatible connections for instrumentation. These fittings have a reliable, time-tested design. Each 1/16" fittings set contains a 10-32 threaded nut and a specially-designed PEEK ferrule. Three lengths of the 1/16" nut are available: Standard, Short, and Extra Long. RheFlex Fingertight Fittings are rated for use up to 7,000 psi (483 bar). Also offered in this product line is the 6000-078 fitting, designed to connect 1/8" OD tubing into our manual preparative-scale injection valves. (See page 115 for more information on these valves.) View the online product bulletin at: [www.idex-hs.com](http://www.idex-hs.com).

## ChromTRAC™

- › Brightly colored knobs to easily track inlets and outlets of valves, columns, and detectors

All ChromTRAC-compatible RheFlex fittings offer the ChromTRAC knob option. Specify the ChromTRAC two letter suffix for the color choice when ordering. Please see the ChromTRAC Suffix Codes table below. For example, to order red ChromTRAC knobs with the RheFlex One-Piece Fitting on this page, specify 6000-282RD. No suffix indicates black knobs. View the online product bulletin for RheFlex fittings at: [www.idex-hs.com](http://www.idex-hs.com).

### ChromTRAC Suffix Codes

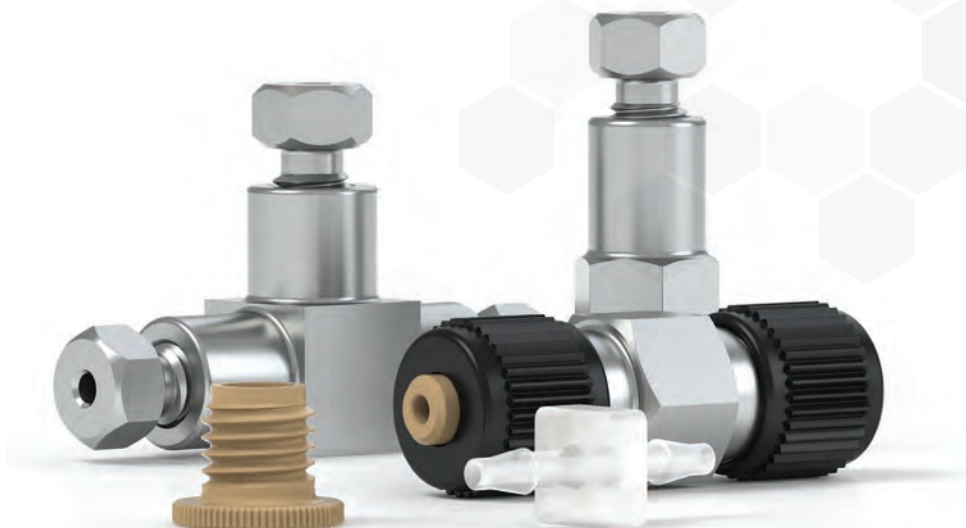
| CODE | COLOR | CODE | COLOR                                                        |
|------|-------|------|--------------------------------------------------------------|
| BL   | Blue  | WH   | White                                                        |
| GN   | Green | YL   | Yellow                                                       |
| GY   | Gray  | MC   | Multi-color (two each of blue, green, gray, red, and yellow) |
| RD   | Red   |      |                                                              |

Add these letter suffixes to the end of the seven-digit part numbers of the 10-32 and M4 threaded RheFlex Fittings listed below.

## RELATED PRODUCTS

- › For PEEK tubing sleeves that can be used with these M4 RheFlex fittings, see page 52.
- › For reusable fittings that both work in UHPLC applications and can help ensure the tubing is fully inserted into the receiving port, see page 60.

| Part No.                                              | Description                                | Port          | Pressure Rating     | Head Style     | Material      | Qty.  |
|-------------------------------------------------------|--------------------------------------------|---------------|---------------------|----------------|---------------|-------|
| <b>RHEFLEX ONE-PIECE FITTINGS</b>                     |                                            |               |                     |                |               |       |
| <b>6000-360</b>                                       | RheFlex Fitting for 1/32" OD Tubing        | M4 Coned      | 5,000 (345 bar)     | 1/4" Hex       | PEEK, Natural | 10-pk |
| <b>RHEFLEX TWO-PIECE FITTINGS (INCLUDES FERRULES)</b> |                                            |               |                     |                |               |       |
| <b>6000-078</b>                                       | RheFlex Fitting for 1/8" OD Tubing         | 5/16-24 Coned | 5,000 psi (345 bar) | 5/16" Hex      | PEEK, Natural | ea.   |
| <b>6000-254</b>                                       | RheFlex Fitting for 1/16" OD Tubing        | 10-32 Coned   | 7,000 psi (483 bar) | ChromTRAC knob | PEEK, Natural | 10-pk |
| <b>6000-255</b>                                       | RheFlex Fitting for 1/16" OD Tubing, Short | 10-32 Coned   | 7,000 psi (483 bar) | 1/4" Hex       | PEEK, Natural | 10-pk |
| <b>REPLACEMENT FERRULES</b>                           |                                            |               |                     |                |               |       |
| <b>6000-079</b>                                       | RheFlex Ferrule for 1/8" OD Tubing         | 5/16-24 Coned | 7,000 psi (483 bar) | ChromTRAC knob | PEEK, Natural | 5-pk  |
| <b>6000-251</b>                                       | RheFlex Ferrule for 1/16" OD Tubing        | 10-32 Coned   | 7,000 psi (483 bar) | ChromTRAC knob | PEEK, Natural | 10-pk |



## CONNECTORS

Connectors are designed to securely join tubing together or to facilitate the joining of tubing to other fluid pathway components. We offer multiport connectors with different thread and port configurations to meet your system requirements and connection needs. Some of our connectors feature a True ZDV (Zero Dead Volume) internal configuration that helps minimize the formation of dead volume in your fluidic pathway. Our versatile adapters help bring two connectors with different configurations together. Connectors are manufactured from 316 stainless steel or from inert polymers to ensure chemical compatibility with the fluid passing through. Peristaltic tube connectors are ideal for making connections with soft-walled, peristaltic tubing. Our extensive line of connectors includes tees, crosses, Luer Adapters, barbed and threaded adapters, and a variety of other options.

|           |                                                |           |                                         |
|-----------|------------------------------------------------|-----------|-----------------------------------------|
| <b>63</b> | THREADED ADAPTERS                              | <b>79</b> | ACCESSORIES                             |
| <b>67</b> | HIGH PRESSURE<br>MULTIPORT<br>CONNECTORS       | <b>80</b> | NANOPORT<br>ASSEMBLIES                  |
| <b>72</b> | ULTRA HIGH<br>PRESSURE MULTIPORT<br>CONNECTORS | <b>81</b> | LOW PRESSURE<br>MULTIPORT<br>CONNECTORS |
| <b>77</b> | MICROTIGHT®<br>ADAPTERS                        | <b>90</b> | LUER ADAPTERS                           |
|           |                                                | <b>91</b> | PERISTALTIC TUBE<br>CONNECTORS          |



# Threaded Adapters

- » Threaded adapters in a variety of configurations
- » English, Metric, and NPT threaded adapters offered
- » Bring together connectors with different threads
- » Manufactured from inert polymers — PEEK, PCTFE, ETFE, and PTFE

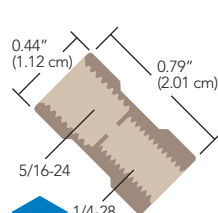
Two of the many challenges researchers face regularly, are trying to use one style of fitting for all connections, or trying to join two different sizes of tubing. To assist in overcoming these challenges we have engineered one of the most extensive threaded adapter lines available.

Threaded Adapters come in a wide variety of configurations to meet your system requirements. They are designed to effectively bring together connectors with different threads. We offer them in English, Metric, and NPT versions. Manufactured from inert polymers and stainless steel they deliver excellent chemical resistance.

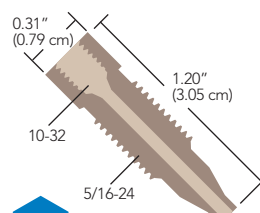


## English Threaded Adapters

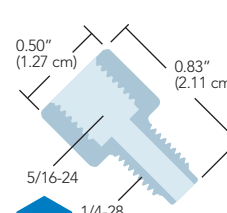
Our versatile English Threaded Adapters are used specifically to securely attach connectors with different threads. We designed these adapters to work with English to English threaded geometries. Manufactured from Stainless Steel, PEEK, or Tefzel™ (ETFE), they deliver excellent solvent resistance.



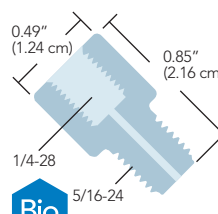
**P-135**  
0.080" (2.05 mm) thru-hole



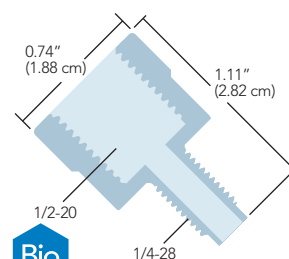
**6000-076**  
0.066" (1.70 mm) thru-hole



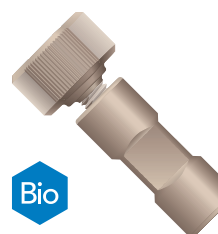
**P-681**  
0.125" (3.20 mm) thru-hole



**P-718**  
0.040" (1.00 mm) thru-hole



**P-684**  
0.130" (3.30 mm) thru-hole



**P-627**  
0.020" (0.50 mm) thru-hole  
Includes (1) F-300 for 1/16" OD tubing

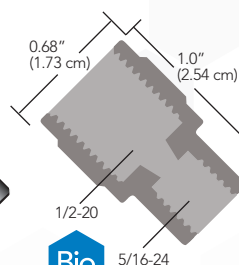
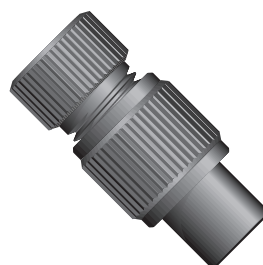
## Threaded Adapters (Cont.)

### NOTE

- When using an adapter with male (external) threads, we recommend you first attach the adapter body into the receiving port, and then connect your tubing and fitting into the head of the adapter body.

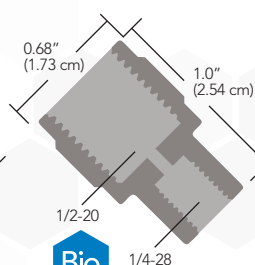
### RELATED PRODUCTS

- Use the 6000-076 Adapter to connect 1/16" OD tubing to the Preparative-Scale Injector Valve (page 66).
- You may not need an adapter to connect 1/16" OD tubing into your flat-bottom port. A less expensive alternative is to use a Flangeless Nut and Ferrule starting on page 45 or a Super Flangeless™ Nut and Ferrule starting on page 39.



#### U-659

Tapered thru-hole  
Includes (1) U-650/U-655  
for 1/4" OD tubing



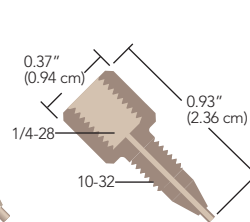
#### U-665

0.063" (1.60 mm) thru-hole  
Includes (1) U-650/U-655  
for 1/4" OD tubing



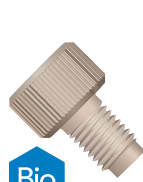
#### P-652

0.030" (0.75 mm) thru-hole  
(Note the new knurled design)



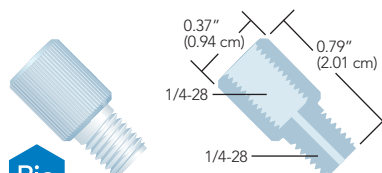
#### P-654

Extra Long, 0.030"  
(0.76 mm) thru-hole



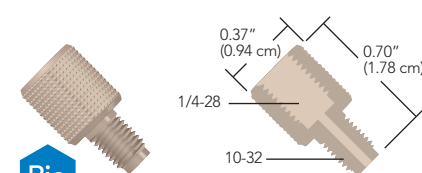
#### P-669-01

0.040" (1.00 mm) thru-hole



#### P-671

0.040" (1.00 mm) thru-hole



#### P-672

0.050" (1.25 mm) thru-hole



### APPLICATION NOTE

Here are application ideas using two of our popular adapters:

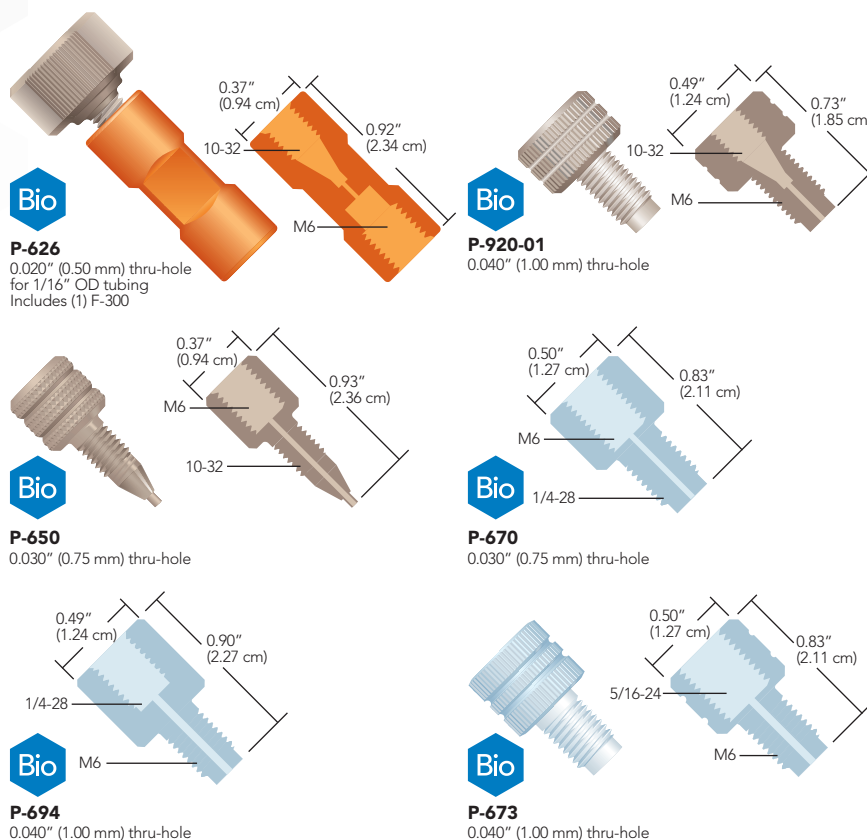
- Many injection valves used in HPLC systems have 10-32 coned ports designed to accept 1/16" OD tubing. However, this may be a problem if large injection volumes are required (in excess of 10 mL). The most popular loops for large volume samples are made from 1/8" OD tubing, making it impossible to connect these larger volume loops to your injection valve. The solution: use our P-654 Adapter and the appropriate fittings for your sample loop. This set-up allows connection of 1/8" OD sample loop leads to your injection valve.
- Another potential application is connecting tubing to low-pressure solenoid valves with 1/4-28 flat-bottom ports. Most low-pressure valves of this type have very shallow threaded ports, which typically preclude the use of our Flangeless Fittings. However, by first threading our P-671 Adapter into the valve port(s), you can effectively use standard 1/4-28 fittings to connect your tubing into the backside of the adapter body. This also saves "wear and tear" on the threads in the valve ports.





## Metric Threaded Adapters

Our versatile Metric Threaded Adapters are used specifically to effectively attach connectors with different threads. We designed these adapters to work with English to Metric threaded geometries. Manufactured from Stainless Steel, PEEK or Tefzel™ (ETFE) they deliver excellent solvent resistance.



## RELATED PRODUCTS

- › For an alternative to the Female M6 Adapters presented above, try a P-602 or P-622 Low Pressure Metric Union from page 84, along with the appropriate Metric Flangeless Fittings on page 43.
- › To direct connect your tubing into a flat-bottom port, find the appropriate Flangeless or Super Flangeless™ Fittings on page 45 and page 39 respectively.
- › Need metric fittings for your connections? See page 43.



## Threaded Adapters (Cont.)



### National Pipe Thread Adapters

These adapters make connections to female 1/8" and 1/4" National Pipe Thread (NPT) ports.

Manufactured from PEEK polymer, our NPT Adapters are durable and chemically resistant. We provide versions with either 1/4-28 or 5/16-24 flat-bottom threads, suitable for most low pressure applications.

Please Note: Wrap the threads on the NPT side of these adapters with thread seal tape (plumber's tape) to ensure a leak-free seal.

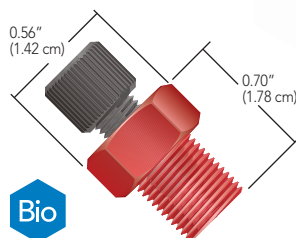


### RELATED PRODUCTS

Replacement fittings for these adapters are located on the pages indicated below:

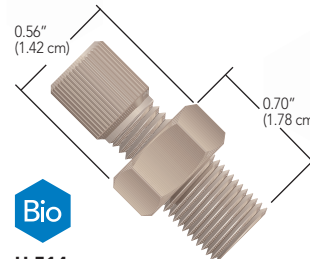
|                             | Page(s) |
|-----------------------------|---------|
| 1/4-28 for 1/8" OD tubing   | 41      |
| 5/16-24 for 1/8" OD tubing  | 41, 56  |
| 5/16-24 for 3/16" OD tubing | 41      |

Other tubing/fitting combinations are available. For more information, please contact your local Distributor or IDEX Health & Science directly.



#### U-510

1/8" NPT to 1/4-28 Flat-Bottom Female Adapter for 1/8" OD tubing Includes (1) XP-308 Fitting



#### U-514

1/8" NPT to 5/16-24 Flat-Bottom Female Adapter for 3/16" OD tubing Includes (1) XP-132 Fitting



### APPLICATION NOTE

Our U-500 and U-510 NPT Adapters are great for attaching 1/8" OD fluoropolymer sparging lines to sparging gas tank regulating valves. Simply thread the appropriately-sized NPT Adapter into the valve's receiving port and then attach your sparging tubing to the adapter body using the fittings provided.

## Threaded Adapters

| Part No.                                | Description                                          | Includes   | Thru-hole        | Swept Volume | Pressure Rating     | Qty.         |                  |      |
|-----------------------------------------|------------------------------------------------------|------------|------------------|--------------|---------------------|--------------|------------------|------|
| ENGLISH THREADED ADAPTERS               |                                                      |            |                  |              |                     |              |                  |      |
| 6000-076                                | PEEK Adapter, 5/16-24 C, M to 10-32 C, F             | N/A        | 0.066" (1.70 mm) | 49.8 µL      | 3,000 psi (207 bar) | ea.          |                  |      |
| P-135                                   | PEEK Adapter, 5/16-24 FB, F to 1/4-28 F              | N/A        | 0.080" (2.05 mm) | 4.1 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-627                                   | PEEK Adapter, 10-32 C, F to 1/4-28 FB, F             | (1) F-300  | 0.020" (0.50 mm) | 0.30 µL      | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-681                                   | PCTFE Adapter, 5/16-24 FB, F to 1/4-28 FB, M         | N/A        | 0.125" (3.20 mm) | 96.6 µL      | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-684                                   | PCTFE Adapter, 1/2-20 FB, F to 1/4-28 FB, M          | N/A        | 0.130" (3.30 mm) | 121.7 µL     | 250 psi (17 bar)    | ea.          |                  |      |
| P-718                                   | PCTFE Adapter, 5/16-24 FB, M to 1/4-28 FB, F         | N/A        | 0.040" (1.00 mm) | 10.3 µL      | 1,000 psi (69 bar)  | ea.          |                  |      |
| U-659                                   | PEEK Adapter, 5/16-24 FB, F to 1/2-20 FB, F          | (1) XU-655 | Tapered**        | 42.0 µL      | 250 psi (17 bar)    | ea.          |                  |      |
| U-665                                   | PEEK Adapter, 1/2-20 FB, F to 1/4-28 FB, F           | (1) XU-655 | 0.063" (1.60 mm) | 6.6 µL       | 250 psi (17 bar)    | ea.          |                  |      |
| P-652                                   | PEEK Adapter, 1/4-28 FB, F to 10-32 C, M             | N/A        | 0.030" (0.75 mm) | 6.7 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-654                                   | PEEK Adapter, 1/4-28 FB, F to 10-32 C, M, Extra Long | N/A        | 0.030" (0.75 mm) | 9.5 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-669-01                                | PEEK Adapter, 10-32 C, F to 1/4-28 FB, M             | N/A        | 0.040" (1.00 mm) | 6.6 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-671                                   | PTFE Adapter, 1/4-28 FB, F to 1/4-28 FB, M           | N/A        | 0.040" (1.00 mm) | 8.0 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-672                                   | PEEK Adapter, 1/4-28 FB, F to 10-32 FB, M            | N/A        | 0.050" (1.25 mm) | 11.4 µL      | 1,000 psi (69 bar)  | ea.          |                  |      |
| METRIC M6 THREADED ADAPTERS             |                                                      |            |                  |              |                     |              |                  |      |
| P-626                                   | PEEK Adapter, 10-32 C, F to M6 FB, F                 | (1) F-300  | 0.020" (0.50 mm) | 0.3 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-650                                   | PEEK Adapter, M6 FB, F to 10-32 C, M Standard        | N/A        | 0.030" (0.75 mm) | 6.7 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-670                                   | PCTFE Adapter, M6 FB, F to 1/4-28 FB, M              | N/A        | 0.030" (0.75 mm) | 2.6 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-673                                   | PCTFE Adapter, 5/16-24 FB, F to M6 FB, M             | N/A        | 0.040" (1.00 mm) | 9.9 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-694                                   | PCTFE Adapter, 1/4-28 FB, F to M6 FB, M              | N/A        | 0.040" (1.00 mm) | 11.3 µL      | 1,000 psi (69 bar)  | ea.          |                  |      |
| P-920-01                                | PEEK Adapter, 10-32 C, F to M6 FB, M                 | N/A        | 0.040" (1.00 mm) | 8.0 µL       | 1,000 psi (69 bar)  | ea.          |                  |      |
| 1/8" MALE NATIONAL PIPE THREAD ADAPTERS |                                                      |            |                  |              |                     |              |                  |      |
| Part No.                                | Description                                          | Color      | Tubing OD        | Includes     | Thru-hole           | Swept Volume | Pressure Rating  | Qty. |
| U-510                                   | PEEK 1/8" NPT, M to 1/4-28 FB, F Adapter             | Red        | 1/8"             | (1) XP-308   | 0.062" (1.60 mm)    | 17.3 µL      | 500 psi (34 bar) | ea.  |
| U-514                                   | PEEK 1/8" NPT, M to 5/16-24 FB, F Adapter            | Natural    | 3/16"            | (1) XP-132   | 0.125" (3.2 mm)     | 70.4 µL      | 500 psi (34 bar) | ea.  |
| 1/4" MALE NATIONAL PIPE THREAD ADAPTERS |                                                      |            |                  |              |                     |              |                  |      |
| U-500                                   | PEEK 1/4" NPT, M to 1/4-28 FB, F Adapter             | Red        | 1/8"             | (1) XP-308   | 0.062" (1.60 mm)    | 17.3 µL      | 500 psi (34 bar) | ea.  |
| U-504                                   | PEEK 1/4" NPT, M to 5/16-24 FB, F Adapter            | Natural    | 3/16"            | (1) XP-132   | 0.125" (3.2 mm)     | 70.4 µL      | 500 psi (34 bar) | ea.  |

F = Female (internal) threads; M = Male (external) threads; XL = extra long; C = Coned; FB = Flat-Bottom

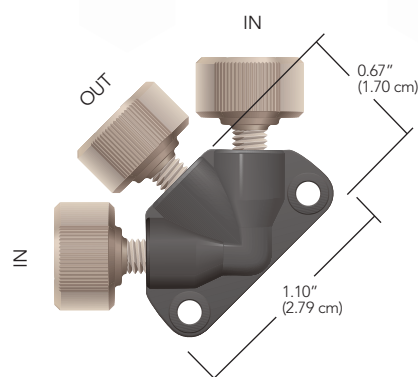
\* The pressure rating of this adapter exceeds the pressure holding ability of the fittings and tubing used with it.

\*\* Thru-hole tapers from 0.188" (4.80 mm) to 0.125" (3.20 mm).



# High Pressure Mixing Tees

Mixing Tees utilize a specifically engineered internal geometry to efficiently mix two fluid streams into one combined stream. Mixing Tees are ideal for microbore or analytical gradient HPLC. These mixing tees are specifically designed for high pressure applications.



**U-466 and U-466S**  
Static Mixing Tees with F-300 Fingertight Fittings for 1/16" OD tubing

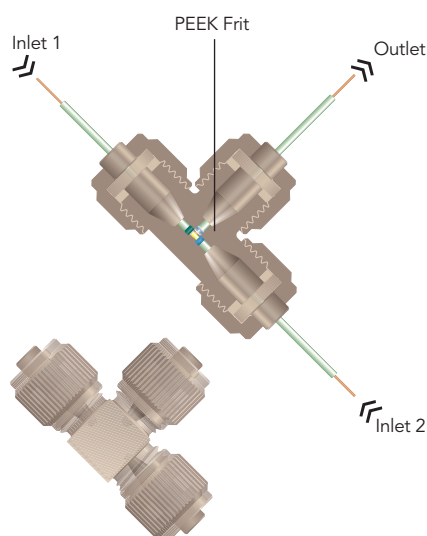
## Static Mixing Tees

- › PEEK body with two-piece fingertight fittings
- › Low swept volume

Static Mixing Tees are ideal for microbore or analytical gradient HPLC. They have a low swept volume of 2.2  $\mu\text{L}$  (includes frit volume) and are designed for flow rates of 0.5 to 3 mL/min and a maximum pressure of 5,000 psi (345 bar). The back pressure caused by the tee is typically only 10 to 20 psi (0.7 to 1.4 bar) at these flow rates. The thru-holes are 0.020" (0.50 mm) and the center port features a 10  $\mu\text{m}$  UHMWPE or stainless steel frit that aids mixing.

## NOTE

- › Turbulent mixing of solvents often increases outgassing. To maintain a bubble-free fluid pathway, we recommend solvent degassing when using this product.
- › The frit incorporated into our U-466 and U-466S Static Mixing Tees is not replaceable. If it becomes clogged, the Mixing Tee must be replaced.



**M-540**  
Micro Static Mixing Tee 0.010" thru-hole with fittings included (tubing and tubing sleeves not included)

## Micro Static Mixing Tee

- › Constructed of inert PEEK and PCTFE
- › Low swept volume of 0.95  $\mu\text{L}$
- › Designed for flow rates of 20–250  $\mu\text{L}/\text{min}$

Our Micro Static Mixing Tee utilizes a specifically engineered internal geometry to efficiently mix two fluid streams into one combined stream. The center port also features a 0.5  $\mu\text{m}$  porosity PEEK polymer frit to aid in mixing. This frit adds a maximum of 20 psi (1.4 bar) back pressure to most systems (within the stated flow rate range). The Mixing Tee handles a maximum pressure of 5,000 psi (345 bar) when directly connecting 1/16" OD tubing, or up to 4,000 psi (276 bar) with capillary tubing when using our NanoTight™ Fittings and Tubing Sleeves (page 37).

## RELATED PRODUCTS

- › See our Vacuum Degassing Systems on page 154.
- › Our standard Static Mixing Tees are designed for flow rates from 0.5 mL/min to 3 mL/min.

## High Pressure Mixing Tees (Cont.)



### APPLICATION NOTE

Several researchers use our PEEK MicroTee to introduce ionizing voltage to their fluid stream just prior to a Mass Spectrometer<sup>1</sup>. MicroTees are well suited for this application due to advantageous internal geometry and PEEK polymer's electrical resistance. The materials required for this setup are as follows: one gold or platinum conducting wire, one P-775 or P-875 MicroTee (this page), one MicroTight Tubing Sleeve (page 52) for the conducting wire (as needed to accommodate wire diameter), and at least two more MicroTight Tubing Sleeves (page 52) to connect your capillary tubing.

To set up a similar connection, first thread your wire through the appropriate tubing sleeve, if necessary, with the wire extending beyond both ends of the sleeve. Slip the female nut included with the MicroTee over the wire or sleeved wire, followed by the ferrule — ensuring the wire (and its sleeve) extends well past the end of the ferrule tip. Align the tip of the wire with the thru-hole of the MicroTee and gently insert the wire until it bottoms out. Now finger tighten the female nut into place. Attach your flow path tubing to the MicroTee's two other available ports, following the instructions provided with the MicroTee.

Begin fluid flow through the tee and apply voltage to the conducting wire lead. This setup typically provides effective electrospray ionization in applications having a flow rate of 100 µL/min or greater.

<sup>1</sup> One such paper describing pioneering electrospray work: *Protein Identification at the Low Femtomole Level from Silver-Stained Gels Using a New Fritless Electrospray Interface for Liquid Chromatography-Microspray and Nanospray Mass Spectrometry*. Christine L. Gatlin, Gerd R. Kleemann, Lara G. Hays, Andrew J. Link, John R. Yates III (1998) *Analytical Biochemistry* 263, 93-101.

## MicroTee & Cross for Capillary Tubing

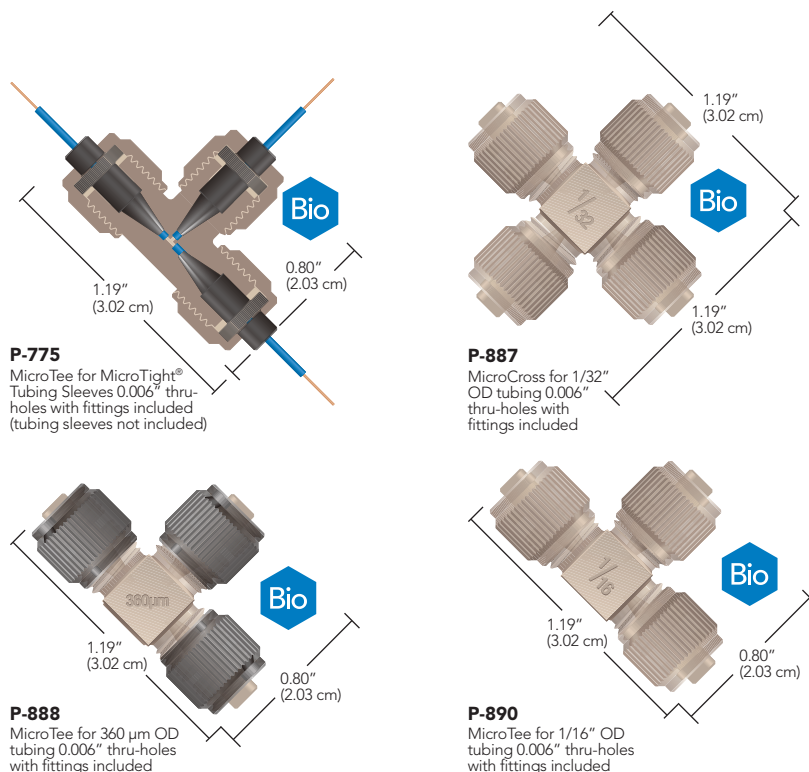
- › Direct connect 1/16", 1/32", 360 µm OD tubing, plus other capillary tubing
- › Low swept volume

Use our MicroTees and MicroCrosses to join capillary tubing. All of these products are made entirely of PEEK and have 0.006" (0.150 mm) thru-holes, with resulting swept volumes ranging from 29 to 81 nL.



### NOTE

- › Use only the ferrules supplied with each connector — they are not interchangeable. Replacement ferrules and female nuts are available on page 35. For MicroUnions, MicroTees, and MicroCrosses for UHPLC applications, see page 72.



## High Pressure Mixing Tees

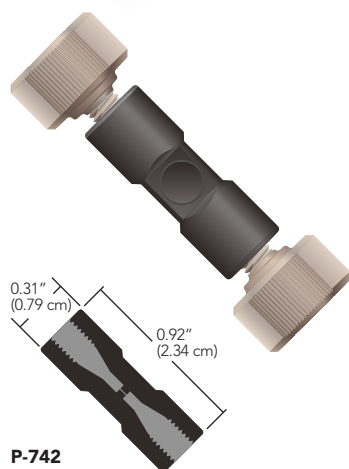
| Part No.                                   | Description                                                   | Threads       | Includes                | Thru-hole         | Swept Volume | Pressure Rating     | Qty. |
|--------------------------------------------|---------------------------------------------------------------|---------------|-------------------------|-------------------|--------------|---------------------|------|
| <b>STATIC MIXING TEE</b>                   |                                                               |               |                         |                   |              |                     |      |
| <b>U-466</b>                               | PEEK Static Mixing Tee for 1/16" OD Tubing, 10 µm UHMWPE Frit | 10-32 Coned   | (3) F-300               | 0.020" (0.50 mm)  | 2.2 µL       | 5,000 psi (345 bar) | ea.  |
| <b>U-466S</b>                              | PEEK Static Mixing Tee for 1/16" OD Tubing, 10 µm SST Frit    | 10-32 Coned   | (3) F-300               | 0.020" (0.50 mm)  | 2.2 µL       | 5,000 psi (345 bar) | ea.  |
| <b>MICRO STATIC MIXING TEE</b>             |                                                               |               |                         |                   |              |                     |      |
| <b>M-540</b>                               | PEEK Micro Static Mixing Tee, for 1/16" OD Tubing             | 5/16-24 Coned | (3) F-132/P-416         | 0.010" (0.250 mm) | 0.95 µL      | 5,000 psi (345 bar) | ea.  |
| <b>MICROTEE, MICROCROSS AND MICROELBOW</b> |                                                               |               |                         |                   |              |                     |      |
| <b>P-775</b>                               | PEEK MicroTee for MicroTight Sleeves                          | 5/16-24 Coned | (3) F-172, (3) P-416    | 0.006" (0.150 mm) | 29 nL        | 4,000 psi (276 bar) | ea.  |
| <b>P-777</b>                               | PEEK MicroCross for MicroTight Sleeves                        | 5/16-24 Coned | (4) F-172, (4) P-416    | 0.006" (0.150 mm) | 38 nL        | 4,000 psi (276 bar) | ea.  |
| <b>P-875</b>                               | PEEK MicroTee with Mounting Hole, for MicroTight Sleeves      | 5/16-24 Coned | (3) F-172, (3) P-416    | 0.006" (0.150 mm) | 29 nL        | 4,000 psi (276 bar) | ea.  |
| <b>P-885</b>                               | PEEK MicroTee for 1/32" OD Tubing                             | 5/16-24 Coned | (3) F-112, (3) P-416    | 0.006" (0.150 mm) | 29 nL        | 5,000 psi (345 bar) | ea.  |
| <b>P-887</b>                               | PEEK MicroCross for 1/32" OD Tubing                           | 5/16-24 Coned | (4) F-112, (4) P-416    | 0.006" (0.150 mm) | 38 nL        | 5,000 psi (345 bar) | ea.  |
| <b>P-888</b>                               | PEEK MicroTee for 360 µm OD Tubing                            | 5/16-24 Coned | (3) F-152, (3) P-416BLK | 0.006" (0.150 mm) | 29 nL        | 5,000 psi (345 bar) | ea.  |
| <b>P-889</b>                               | PEEK MicroCross for 360 µm OD Tubing                          | 5/16-24 Coned | (4) F-152, (4) P-416BLK | 0.006" (0.150 mm) | 38 nL        | 5,000 psi (345 bar) | ea.  |
| <b>P-890</b>                               | PEEK MicroTee for 1/16" OD Tubing                             | 5/16-24 Coned | (3) F-132, (3) P-416    | 0.006" (0.150 mm) | 58 nL        | 5,000 psi (345 bar) | ea.  |
| <b>P-891</b>                               | PEEK MicroCross for 1/16" OD Tubing                           | 5/16-24 Coned | (4) F-132, (4) P-416    | 0.006" (0.150 mm) | 81 nL        | 5,000 psi (345 bar) | ea.  |



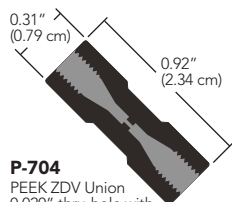
# High Pressure Unions

## PEEK ZDV Unions

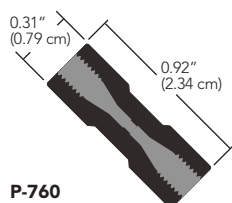
Our PEEK zero-dead-volume (ZDV) Unions come complete with two F-300 Fingertight Fittings for 1/16" OD tubing and are pressure rated to 5,000 psi (344 bar).



**P-742**  
PEEK ZDV Union  
0.010" thru-hole with  
F-300 Fittings



**P-704**  
PEEK ZDV Union  
0.020" thru-hole with  
F-300 Fittings



**P-760**  
PEEK ZDV Union  
0.050" thru-hole with  
F-300 Fittings

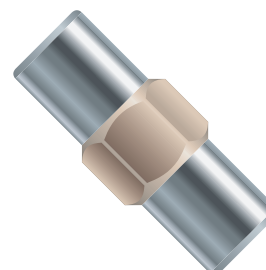
## Bio-Inert UHPLC Unions

- › Unique, Patent-Pending Process allows a fully-PEEK fluid contact area combined with the strength of stainless steel
- › Pressure rated to 17,400 psi (1,200 bar)
- › Two inner diameters available: 0.008" and 0.016"

These unions are specifically engineered for Bio-Inert UHPLC applications. Combining the physical strength of 316 stainless steel with the inertness and biocompatibility of an all-PEEK fluid pathway, these unions will work well in applications where pressures reach up to 17,400 psi (1,200 bar) — without allowing metal contact by the fluid.

Neither union comes with fittings, but can be paired successfully with any 10-32 coned fitting that uses a polymer nose or ferrule.

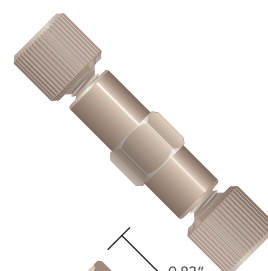
*Note: All-stainless steel fittings should NOT be used with these unions, as they will damage the internal conical seat.*



**UP-700**  
Bio-Inert UHPLC Union 0.008" thru-hole for 1/16" OD tubing

## NanoTight™ Union

NanoTight Unions improve capillary tubing connections in several ways. The internal design of the union greatly reduces the incidence of tubing misalignment. When using 1/16" OD tubing sleeves (found on page 52) to connect capillary tubing, the webbed thru-hole minimizes breaking of fused silica while adding only miniscule swept volume. The results are fewer blockages, fewer flow rate reductions and fewer back pressure problems.



**P-779**  
NanoTight Union  
0.005" thru-hole with  
F-331N Fittings

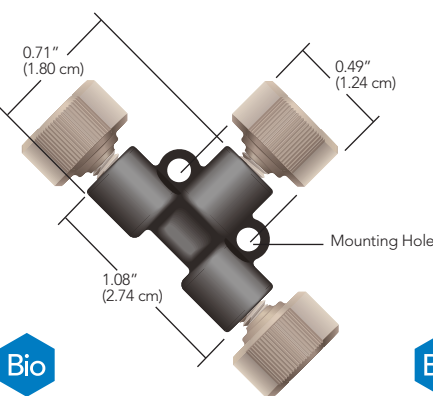
| Part No.                      | Description                                                 | Threads     | Includes   | Thru-hole        | Swept Volume | Pressure Rating        | Qty. |
|-------------------------------|-------------------------------------------------------------|-------------|------------|------------------|--------------|------------------------|------|
| <b>BIO-INERT UHPLC UNIONS</b> |                                                             |             |            |                  |              |                        |      |
| <b>UP-700</b>                 | Bio-Inert UHPLC Union for 1/16" OD Tubing, Natural (Tan)    | 10-32 Coned | N/A        | 0.008" (0.20 mm) | 0.05 µL      | 17,400 psi (1,200 bar) | ea.  |
| <b>PEEK ZDV UNIONS</b>        |                                                             |             |            |                  |              |                        |      |
| <b>P-704</b>                  | PEEK Union for 1/16" OD Tubing                              | 10-32 Coned | (2) F-300  | 0.020" (0.50 mm) | 0.28 µL      | 5,000 psi (344 bar)    | ea.  |
| <b>P-742</b>                  | PEEK Union for 1/16" OD Tubing                              | 10-32 Coned | (2) F-300  | 0.010" (0.25 mm) | 0.07 µL      | 5,000 psi (344 bar)    | ea.  |
| <b>P-760</b>                  | PEEK Union for 1/16" OD Tubing                              | 10-32 Coned | (2) F-300  | 0.050" (1.25 mm) | 1.2 µL       | 5,000 psi (344 bar)    | ea.  |
| <b>NANOTIGHT UNION</b>        |                                                             |             |            |                  |              |                        |      |
| <b>P-779</b>                  | PEEK NanoTight Union for 1/16" OD Tubing and Tubing Sleeves | 10-32 Coned | (2) F-331N | 0.005" (125 µm)  | 8 nL         | 5,000 psi (344 bar)    | ea.  |



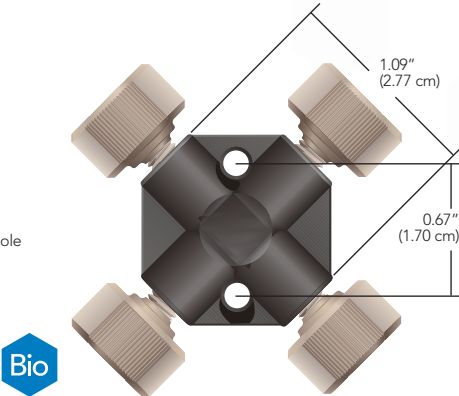
# High Pressure PEEK Tees & Crosses

- › Highest pressure holding flat-bottom fitting system we offer
- › Eliminates loosening of fittings due to tubing twist
- › Excellent for Tubing Assemblies
- › Holds tight even through vibration

Our PEEK Tees and Crosses include high pressure F-300 PEEK Fingertight Fittings — allowing maximum operating pressures to 3,500 psi (241 bar) when used with 1/16" OD PEEK or stainless steel tubing.



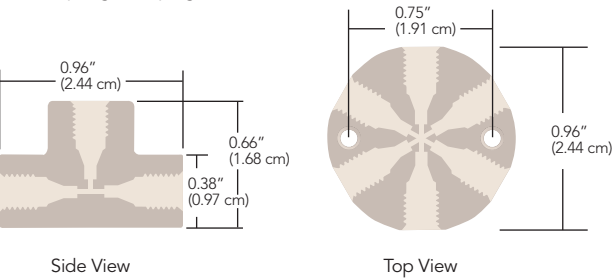
**P-727 PEEK Tee**  
0.020" thru-hole with F-300 Fittings



**P-729 PEEK Cross**  
0.020" thru-hole with F-300 Fittings

## PEEK 7-Port Manifold

Combine several streams into one or split one fluid stream into several. This PEEK 7-Port Manifold comes complete with F-331 Fingertight Fittings for 1/16" OD tubing and offers a pressure rating of 5,000 psi (345 bar). Seal unused ports with any of our polymer 10-32 coned plugs on page 55.



**P-170**  
PEEK 7-Port Manifold 0.020" thru-holes with F-331 Fittings

| Part No.              | Description                              | Threads     | Includes  | Thru-hole        | Swept Volume | Pressure Rating     | Qty. |
|-----------------------|------------------------------------------|-------------|-----------|------------------|--------------|---------------------|------|
| PEEK TEES AND CROSSES |                                          |             |           |                  |              |                     |      |
| P-727                 | PEEK Tee for 1/16" OD Tubing             | 10-32 Coned | (3) F-300 | 0.020" (0.50 mm) | 0.57 µL      | 3,500 psi (241 bar) | ea.  |
| P-728                 | PEEK Tee for 1/16" OD Tubing             | 10-32 Coned | (3) F-300 | 0.050" (1.25 mm) | 3.0 µL       | 3,500 psi (241 bar) | ea.  |
| P-729                 | PEEK Cross for 1/16" OD Tubing           | 10-32 Coned | (4) F-300 | 0.020" (0.50 mm) | 0.72 µL      | 3,500 psi (241 bar) | ea.  |
| PEEK MANIFOLD         |                                          |             |           |                  |              |                     |      |
| P-170                 | PEEK 7-Port Manifold for 1/16" OD Tubing | 10-32 Coned | (7) F-331 | 0.020" (0.50 mm) | 2.2 µL       | 5,000 psi (345 bar) | ea.  |

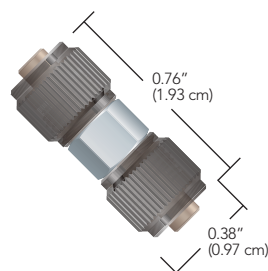




# High Pressure MicroTight® Unions

## Conductive MicroTight Union

The Conductive MicroTight Union manufactured by IDEX Health & Science provides an excellent opportunity to introduce voltage into an electrospray or capillary electrophoresis system. With an extremely low internal volume of 16 nL, this union can be placed inline with 360 µm OD capillary tubing. Mount and apply voltage to these unions using our Insulating Mounting Bracket below.



**M-572**  
Conductive MicroTight Union for 360 µm OD tubing with fittings and Capsule Union included

## APPLICATION NOTE

For an example of using a Conductive MicroTight Union in a pressure driven ion preconcentration application see: "Self-Sealed Vertical Polymeric Nanoporous Junctions for High Throughput Nanofluidic Applications."

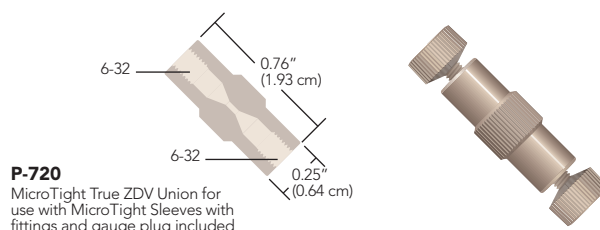
*Sun Jae Kim and Jong Yoon Han. Analytical Chem. 2008, 80: 3507-3511.*

## RELATED PRODUCTS

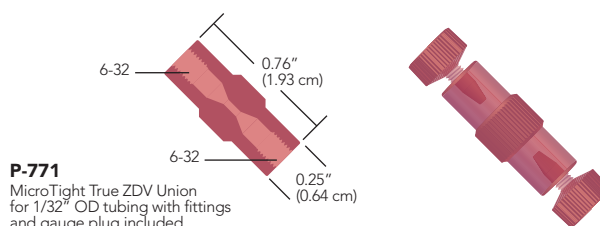
- Easily integrate the Conductive MicroTight Union into your system with our Insulating Mounting Bracket, shown on page 79.

## MicroTight® Connectors for Capillary Tubing

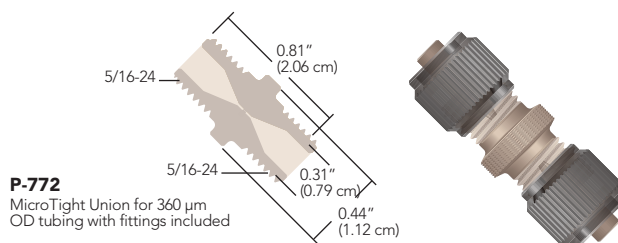
Connect two pieces of capillary tubing with our PEEK MicroTight Connectors. The True ZDV Unions allow two pieces of tubing to connect directly to each other — using the included gauge plug to ensure proper alignment. The standard union and elbow both feature a 0.006" (0.150 mm) thru-hole, adding only a small amount of additional flow-path volume to help ensure proper chromatographic results.



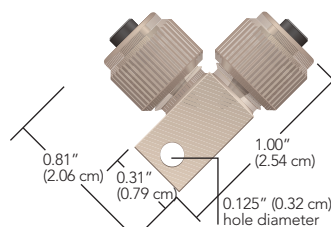
**P-720**  
MicroTight True ZDV Union for use with MicroTight Sleeves with fittings and gauge plug included



**P-771**  
MicroTight True ZDV Union for 1/32" OD tubing with fittings and gauge plug included



**P-772**  
MicroTight Union for 360 µm OD tubing with fittings included



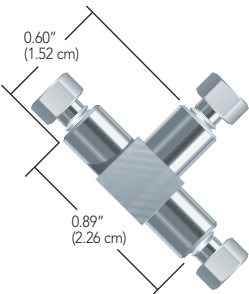
**P-874**  
MicroElbow for MicroTight Tubing Sleeves with fittings included

| Part No.                                                                                         | Description                                     | Threads       | Includes                             | Thru-hole         | Swept Volume | Pressure Rating     | Qty. |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------|---------------|--------------------------------------|-------------------|--------------|---------------------|------|
| <b>MICROTIGHT UNIONS</b>                                                                         |                                                 |               |                                      |                   |              |                     |      |
| <b>P-720</b>                                                                                     | PEEK True ZDV Union for MicroTight Sleeves      | 6-32 Coned    | (2) F-125, (1) P-553                 | N/A               | N/A          | 4,000 psi (276 bar) | ea.  |
| <b>P-771</b>                                                                                     | PEEK True ZDV Union for 1/32" OD Tubing         | 6-32 Coned    | (2) F-126S, (1) P-553                | N/A               | N/A          | 5,000 psi (345 bar) | ea.  |
| <b>P-772</b>                                                                                     | PEEK Union for 360 µm OD Tubing                 | 5/16-24 Coned | (2) F-152, (2) P-416BLK              | 0.006" (0.150 mm) | 5 nL         | 5,000 psi (345 bar) | ea.  |
| <b>P-874</b>                                                                                     | PEEK MicroElbow for MicroTight Sleeves          | 5/16-24 Coned | (2) F-172, (2) P-416                 | 0.006" (0.150 mm) | 20 nL        | 4,000 psi (276 bar) | ea.  |
| <b>REPLACEMENT GAUGE PLUGS (TO ACHIEVE TRUE ZDV CONNECTIONS WITH OUR P-720 AND P-771 UNIONS)</b> |                                                 |               |                                      |                   |              |                     |      |
| <b>P-553</b>                                                                                     | Gauge Plug, Delrin®                             | 6-32 Coned    | N/A                                  | N/A               | N/A          | N/A                 | ea.  |
| <b>CONDUCTIVE MICROTIGHT UNIONS</b>                                                              |                                                 |               |                                      |                   |              |                     |      |
| <b>M-572</b>                                                                                     | Conductive Union for 360 µm OD Tubing, PEEK/SST | 5/16-24 Coned | (2) F-152, (2) P-416BLK, (1) M-128NF | 0.011" (0.279 mm) | 16 nL        | 5,000 psi (345 bar) | ea.  |

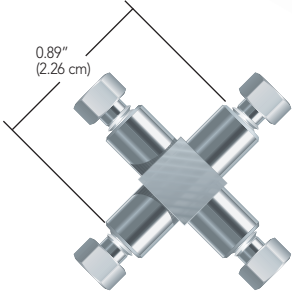


# High Pressure Stainless Steel Tees & Crosses

These 316 stainless steel connectors come complete with 10-32 stainless steel fittings for use with 1/16" OD tubing and are rated to 20,000 psi (1,380 bar). They are compatible with any 10-32 coned threaded fittings.



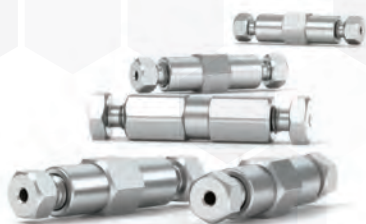
**U-428 Stainless Steel Tee**  
0.020" thru-hole with U-400 and U-401 Fittings



**U-430 Stainless Steel Cross**  
0.020" thru-hole with U-400 and U-401 Fittings

| Part No.                    | Description                               | Threads     | Includes             | Thru-hole        | Swept Volume | Pressure Rating        | Qty. |
|-----------------------------|-------------------------------------------|-------------|----------------------|------------------|--------------|------------------------|------|
| VHP TEE FOR 1/16" OD TUBING |                                           |             |                      |                  |              |                        |      |
| U-428                       | Stainless Steel Tee for 1/16" OD Tubing   | 10-32 Coned | (3) U-400, (3) U-401 | 0.020" (0.50 mm) | 0.57 µL      | 20,000 psi (1,380 bar) | ea.  |
| U-429                       | Stainless Steel Tee for 1/16" OD Tubing   | 10-32 Coned | (3) U-400, (3) U-401 | 0.040" (1.00 mm) | 2.1 µL       | 20,000 psi (1,380 bar) | ea.  |
| U-430                       | Stainless Steel Cross for 1/16" OD Tubing | 10-32 Coned | (4) U-400, (4) U-401 | 0.020" (0.50 mm) | 0.72 µL      | 20,000 psi (1,380 bar) | ea.  |
| U-431                       | Stainless Steel Cross for 1/16" OD tubing | 10-32 Coned | (4) U-400, (4) U-401 | 0.040" (1.00 mm) | 2.5 µL       | 20,000 psi (1,380 bar) | ea.  |





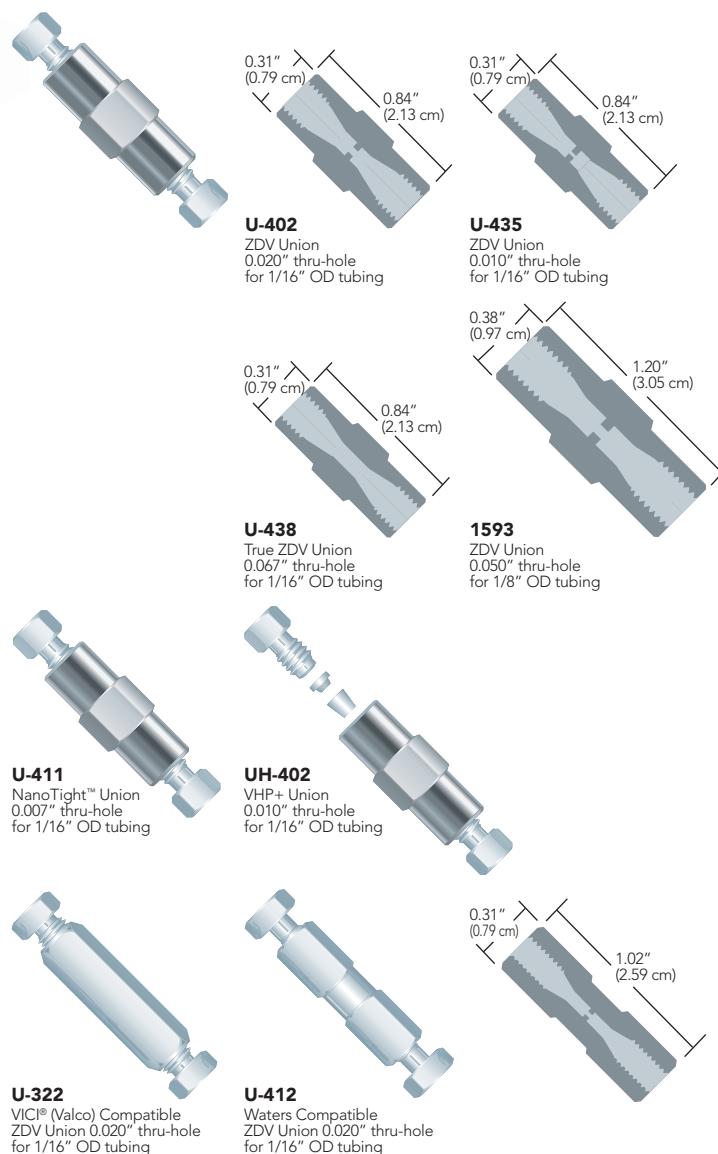
# VHP Stainless Steel ZDV Unions

- › Supplied with fittings for 1/16" OD or 1/8" OD tubing
- › Manufactured from 316 stainless steel
- › All union assemblies rated to 20,000 psi (1,380 bar) or higher

## NOTE

It is possible to order the products on this page without the fittings. Simply use a -01 at the end of the product number to order the union body without fittings.

Our high pressure, zero-dead-volume (ZDV) unions are precision machined from 316 stainless steel, carefully passivated, then thoroughly rinsed. Each comes complete with stainless steel nuts and ferrules.



| Part No.                                  | Description                                    | Threads      | Includes                              | Thru-hole        | Swept Volume | Pressure Rating        | Qty. |
|-------------------------------------------|------------------------------------------------|--------------|---------------------------------------|------------------|--------------|------------------------|------|
| <b>VHP STAINLESS STEEL ZDV UNIONS</b>     |                                                |              |                                       |                  |              |                        |      |
| <b>1593</b>                               | Stainless Steel Union for 1/8" OD Tubing       | 1/4-28 Coned | (2) C-235/C-236                       | 0.050" (1.25 mm) | 1.48 µL      | 20,000 psi (1,380 bar) | ea.  |
| <b>U-402</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-400/U-401                       | 0.020" (0.50 mm) | 0.13 µL      | 20,000 psi (1,380 bar) | ea.  |
| <b>U-411</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-400/U-401                       | 0.007" (178 µm)  | 13 nL        | 20,000 psi (1,380 bar) | ea.  |
| <b>U-435</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-400/U-401                       | 0.010" (0.25 mm) | 20 nL        | 20,000 psi (1,380 bar) | ea.  |
| <b>U-438</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-400/U-401, (1) P-554 Gauge Plug | 0.067" (1.70 mm) | Near 0 µL    | 20,000 psi (1,380 bar) | ea.  |
| <b>UH-402</b>                             | VHP+ Stainless Steel Union for 1/16" OD Tubing | 10-32 Coned  | (2) VHP-200                           | 0.010" (0.25 mm) | 20 nL        | 30,000 psi (2,070 bar) | ea.  |
| <b>VICI® (VALCO) COMPATIBLE ZDV UNION</b> |                                                |              |                                       |                  |              |                        |      |
| <b>U-322</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-320/U-321                       | 0.020" (0.50 mm) | 0.15 µL      | 20,000 psi (1,380 bar) | ea.  |
| <b>WATERS® COMPATIBLE ZDV UNION</b>       |                                                |              |                                       |                  |              |                        |      |
| <b>U-412</b>                              | Stainless Steel Union for 1/16" OD Tubing      | 10-32 Coned  | (2) U-410/U-401                       | 0.020" (0.50 mm) | 0.10 µL      | 20,000 psi (1,380 bar) | ea.  |



# VHP Tees & Crosses

Our VHP Stainless Steel Tees and Crosses are precision machined from durable stainless steel. It is mechanically designed for bringing together three or four pieces of tubing. Our VHP Tees & Crosses have an extremely high pressure rating of 30,000 psi (2070 bar).

## VHP Tees & Crosses for Capillary Tubing

- › Direct-connect either 360  $\mu$ m or 1/32" OD tubing — no sleeves required!
- › Available in both tee and cross configurations
- › Pressure rated to 15,000 psi (1,034 bar)

To help facilitate multi-port connections in UHPLC applications, our experts have developed a line of MicroTees and MicroCrosses, manufactured from stainless steel and featuring small thru-holes and very low internal volume. Additionally, the stainless steel construction allows these products to be used in applications where electrical conductivity is desired.

Included with the MicroTees and MicroCrosses are the VHP MicroFerrules found on page 59. The P-278 Extender Tool on page 33 can be used to tighten the female nuts that are included with these connectors.

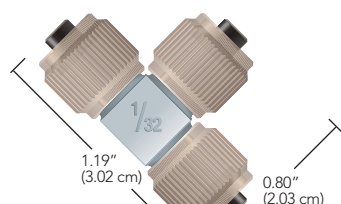
## APPLICATION NOTE

### Why 1/32" OD Tubing and 360 $\mu$ m OD Tubing?

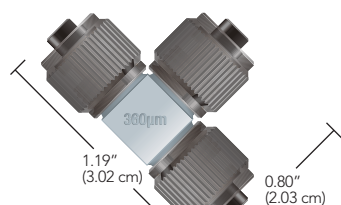
IDEX Health & Science has focused strongly on the development of a variety of connectors and accessories for 1/32" OD tubing and 360  $\mu$ m OD tubing. We have focused on these specific sizes due to their overwhelming popularity in analytical instruments, especially where micro and nano-scale analyses are being performed. By creating products designed for these popular sizes, the overall connection is easier to make and generally holds to increased pressures over connections where tubing sleeves are involved.

## VHP Tee for 1/16" OD Tubing

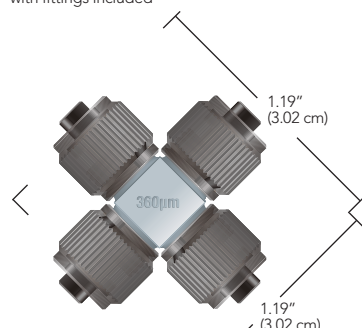
IDEX Health & Science offers this Very High Pressure (VHP) Tee Connector, designed to bring three pieces of tubing together. The all-316 stainless steel connector is designed for 1/16" OD tubing and is pressure rated to 30,000 psi (2,070 bar).



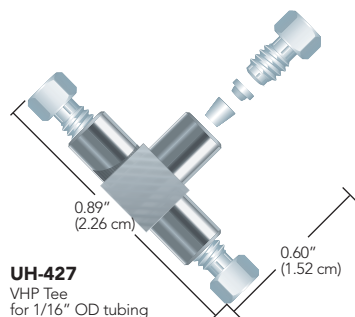
**UH-700**  
VHP MicroTee  
for 1/32" OD tubing  
with fittings included



**UH-750**  
VHP MicroTee  
for 360  $\mu$ m OD tubing  
with fittings included



**UH-752**  
VHP MicroCross  
for 360  $\mu$ m OD tubing  
with fittings included



**UH-427**  
VHP Tee  
for 1/16" OD tubing  
with fittings included

| Part No.                                           | Description                                        | Threads       | Includes                 | Thru-hole        | Swept Volume | Pressure Rating        | Qty. |
|----------------------------------------------------|----------------------------------------------------|---------------|--------------------------|------------------|--------------|------------------------|------|
| <b>VHP TEE FOR 1/16" OD TUBING</b>                 |                                                    |               |                          |                  |              |                        |      |
| <b>UH-427</b>                                      | VHP Tee for 1/16" OD Tubing, SST                   | 10-32 Coned   | (3) VHP-200              | 0.020" (0.50 mm) | 0.57 $\mu$ L | 30,000 psi (2,070 bar) | ea.  |
| <b>VHP TEES &amp; CROSSES FOR CAPILLARY TUBING</b> |                                                    |               |                          |                  |              |                        |      |
| <b>UH-700</b>                                      | VHP MicroTee for 1/32" OD Tubing, PEEK/SST         | 5/16-24 Coned | (3) PK-112, (3) P-416    | 0.010" (0.25 mm) | 84 nL        | 15,000 psi (1,034 bar) | ea.  |
| <b>UH-750</b>                                      | VHP MicroTee for 360 $\mu$ m OD Tubing, PEEK/SST   | 5/16-24 Coned | (3) PK-152, (3) P-416BLK | 0.010" (0.25 mm) | 84 nL        | 15,000 psi (1,034 bar) | ea.  |
| <b>UH-752</b>                                      | VHP MicroCross for 360 $\mu$ m OD Tubing, PEEK/SST | 5/16-24 Coned | (4) PK-152, (4) P-416BLK | 0.010" (0.25 mm) | 101 nL       | 15,000 psi (1,034 bar) | ea.  |



- › Featuring stainless steel bodies and PK/PEEK fittings
- › Pressure rated up to 15,000 psi (1,034 bar)
- › Options to direct-connect both 1/32" OD tubing and 360 µm OD tubing

# VHP MicroTight® Unions

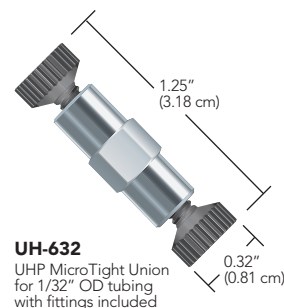
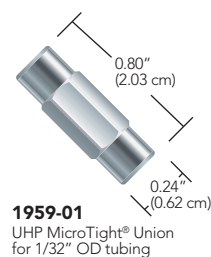
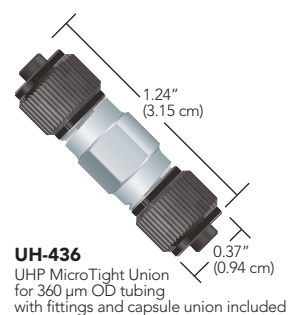
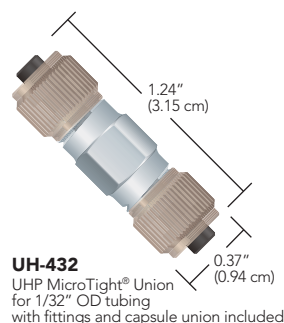
## VHP Unions for Capillary Tubing

IDEX Health & Science has expanded its line of specialized fittings and connectors for UHPLC applications to include several innovative unions and adapters.

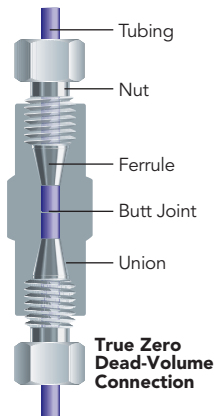
Two of these products — the UH-432 and UH-436 — follow the design of our popular Mini MicroFilters (see page 109) and allow a convenient union between either 1/32" OD tubing or 360 µm OD tubing. Each features a stainless steel union body and a unique stainless steel union capsule, enabling both excellent chemical compatibility as well as conductivity, making these a great choice for electrical interfacing in certain LC-MS applications. Each is also coupled with direct-connect ferrules made from our proprietary PEEK polymer blend (PK), allowing tubing connections up to 15,000 psi (1,034 bar). *(Please Note: While these connectors can be used at elevated pressures, they are not recommended for applications above 100 °C.)*

The UH-632 is a more traditionally designed connector, incorporating internally threaded ports. The union (UH-632) features a true ZDV (zero dead volume) connection between both tubes. This unique product is coupled with our one-piece Ultra-High Performance Fingertight fittings manufactured from our proprietary PEEK polymer blend, allowing them to be used in high temperature applications (up to 200 °C) at pressures up to 6,000 psi (414 bar) — or use these connectors at room temperature up to 15,000 psi (1,034 bar)!

The 1959-01 is a new VHP union designed to accept the popular M4x0.7 threaded fittings for 1/32" OD tubing. These unions will work nicely with both the VHP-900 fittings (found on page 59) as well as the reusable VHP-920 (found on page 60).



# VHP MicroTight® Unions (Cont.)



## APPLICATION NOTE

### What is a True ZDV Union?

True zero dead volume (ZDV) unions are designed so that the two joined pieces of tubing butt perfectly together as shown in the image to the right. These products have no swept volume contained within the union body. The fluid moves directly from one tube into another in this type of connector.

When using true ZDV unions, it is important to take care to ensure connecting tubing has burr-free 90 degree ends. Find tubing cutters on page 28 to assist with cleanly cutting polymer and fused silica tubing. Gauge plugs are supplied with True ZDV Unions to assist with assembly. With the gauge plug inserted into one side of the union, a hard stop is created for the tubing to bottom out against as it is connected to the opposite port. The gauge plug is removed and then the second piece of tubing is connected, using the first piece of tubing to bottom out against resulting in the two tubes joined together in the center of the union.

## RELATED PRODUCTS

- › Find replacement VHP fittings on page 59.
- › Find Fused Silica tubing on page 16.
- › Find 1/32" OD Stainless Steel tubing on page 19.
- › To achieve 15,000 psi (1,034 bar) with the female threaded fittings used with some of these products, use the P-278 extender tool found on page 50.

## VHP MicroTight Unions

| Part No.                        | Description                                      | Threads       | Includes                                  | Thru-hole         | Swept Volume | Pressure Rating        | Qty. |
|---------------------------------|--------------------------------------------------|---------------|-------------------------------------------|-------------------|--------------|------------------------|------|
| VHP UNIONS FOR CAPILLARY TUBING |                                                  |               |                                           |                   |              |                        |      |
| UH-432                          | VHP Union for 1/32" OD Tubing, PEEK/SST          | 5/16-24 Coned | (2) PK-112, (2) P-416                     | 0.006" (0.150 mm) | 5 nL         | 15,000 psi (1,034 bar) | ea.  |
| UH-436                          | VHP Union for 360 µm OD Tubing, PEEK/SST         | 5/16-24 Coned | (2) PK-152, (2) P-416BLK                  | 0.006" (0.150 mm) | 5 nL         | 15,000 psi (1,034 bar) | ea.  |
| UH-632                          | VHP True ZDV Union for 1/32" OD Tubing, PEEK/SST | 6-32 Coned    | (2) PK-126, (1) P-553 Gauge Plug          | N/A               | N/A          | 15,000 psi (1,034 bar) | ea.  |
| 1959-01                         | VHP Union for 1/32" OD Tubing, SST               | M4x0.7        | N/A (Fittings must be ordered separately) | 0.007" (178 µm)   | 16 nL        | 30,000 psi (2,070 bar) | ea.  |



# MicroTight<sup>®</sup> Adapters

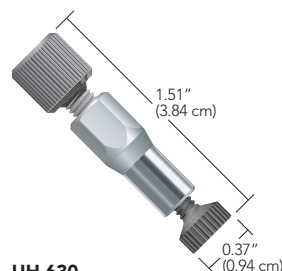
- › Convenient adapters for common 1/16" OD to capillary tubing
- › Direct connect to 1/32" OD or 360 µm OD tubing options available
- › VHP adapters pressure rated to 12,000 psi (828 bar)

## NOTE

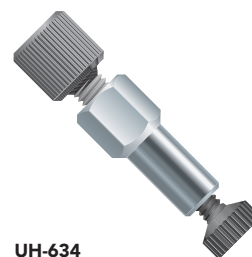
While many 10-32 coned fittings are interchangeable, coned fittings using different threads are generally not interchangeable. As such, IDEX Health & Science recommends that only the style of coned fittings that accompanies these connectors be used for replacements.

Create a true zero dead volume (ZDV) connection between 1/16" OD tubing and capillary tubing with our MicroTight Adapters.

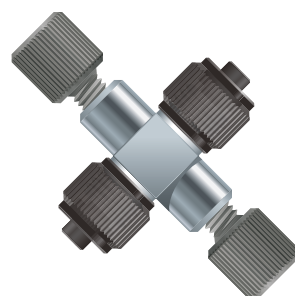
For Very High Pressure applications the UH-630 will connect 1/16" OD to 1/32" OD tubing in an inline true ZDV connection with the ability to withstand 12,000 psi (828 bar)! The materials of construction also allow this product to be used up to 200 °C, which reduces the pressure rating to 8,000 psi (552 bar). For more information on the fittings used with the VHP adapter, please see page 59.



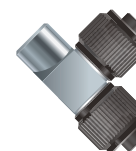
**UH-630**  
VHP MicroTight Adapter for 1/16" and 1/32" OD tubing with fittings included



**UH-634**  
VHP MicroTight Adapter for 1/16" and 360 µm OD tubing with fittings included



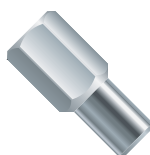
**UH-906**  
VHP MicroTight Adapting Cross 10-32 Coned for 1/16" OD tubing and 5/16-24 Coned for 360 µm OD tubing



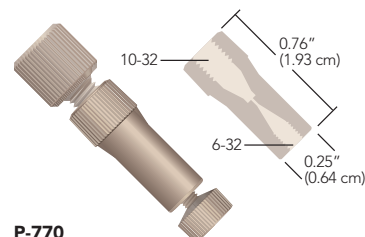
**UH-753**  
VHP MicroTight Adapting Tee 360 µm (2 ports) to 10-32 C for 1/16" OD tubing (1 port)



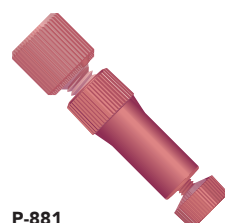
**UH-631-01**  
VHP MicroTight Adapter 10-32 Coned for 1/16" OD tubing and 6-40 Coned for 1/32" OD tubing fittings not included



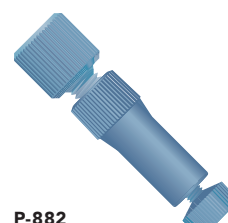
**1958-01**  
VHP MicroTight Adapter 10-32 Coned for 1/16" OD tubing and M4x0.7 for 1/32" OD tubing



**P-770**  
MicroTight ZDV Adapter for 1/16" OD to MicroTight Sleeves with fittings included



**P-881**  
MicroTight ZDV Adapter for 1/16" to 1/32" OD tubing with fittings included



**P-882**  
MicroTight ZDV Adapter for 1/16" to 360 µm OD tubing with fittings included

# MicroTight® Adapters (Cont.)



## RELATED PRODUCTS

- › Replacement 6-32 fittings are on page 34.
- › Replacement F-120 style nuts are on page 32 (when ordering, replace the “x” with an “R” or “B” to order either red or blue fittings).
- › Use this list to find micro flow products outside this chapter.

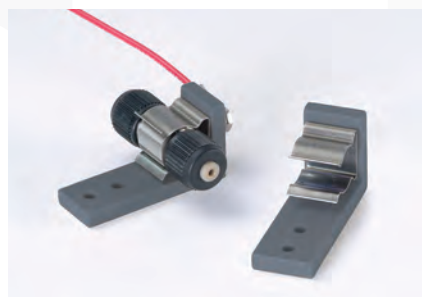
|                                                     | Page |
|-----------------------------------------------------|------|
| 360 µm, 510 µm (0.020”), and 1/32” OD PEEK Tubing   | 16   |
| 360 µm OD Fused Silica Tubing                       | 16   |
| 1/16” and 1/32” OD PEEKsil™ Tubing                  | 22   |
| 1/32” OD FEP Tubing                                 | 26   |
| 360 µm OD High Purity PFA Tubing                    | 24   |
| 510 µm (0.020”) and 1/32” OD Stainless Steel Tubing | 19   |
| Polymer Capillary and Fused Silica Tubing Cutters   | 28   |
| MX Series II™ Injection and Switching Valves        | 119  |
| Manual Injection Valves                             | 121  |
| Micro Injection Port Adapters                       | 132  |
| Micro-Splitter Valves                               | 140  |
| Micro-Metering Valves                               | 141  |
| Microbore Guard Column                              | 158  |
| Ultra-Low Volume Back-Pressure Regulators           | 144  |
| Nonmetallic 10-32 Micro-Volume Inline Check Valve   | 137  |

## MicroTight® Adapters

| Part No.                                                                                 | Description                                                                   | Threads              | Includes                                | Color     | Swept Volume | Pressure Rating         | Qty. |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|----------------------|-----------------------------------------|-----------|--------------|-------------------------|------|
| <b>MICROTIGHT ADAPTERS</b>                                                               |                                                                               |                      |                                         |           |              |                         |      |
| <b>P-770</b>                                                                             | PEEK Micro Adapter, True ZDV, for 1/16” OD Tubing to MicroTight Tubing Sleeve | 10-32 C to 6-32 C    | (1) F-120, (1) F-125, (1) P-554         | Natural   | N/A          | 4,000 psi (276 bar)     | ea.  |
| <b>P-881</b>                                                                             | PEEK Micro Adapter, True ZDV, for 1/16” to 1/32” OD Tubing                    | 10-32 C to 6-32 C    | (1) F-120R, (1) F-126S, (1) P-554       | Red       | N/A          | 5,000 psi (345 bar)     | ea.  |
| <b>P-882</b>                                                                             | PEEK Micro Adapter, True ZDV, for 1/16” to 360 µm OD Tubing                   | 10-32 C to 6-32 C    | (1) F-120B, (1) F-124S, (1) P-554       | Blue      | N/A          | 5,000 psi (345 bar)     | ea.  |
| <b>UH-630</b>                                                                            | Stainless Steel VHP Micro Adapter, for 1/16” to 1/32” OD Tubing               | 10-32 C to 6-32 C    | (1) PK-120BLK, (1) PK-126, (1) P-554    | SST/Black | N/A          | 12,000 psi (827 bar)    | ea.  |
| <b>UH-634</b>                                                                            | Stainless Steel VHP Micro Adapter, for 1/16” to 360 µm OD Tubing              | 10-32 C to 6-32 C    | (1) PK-120BLK, (1) PK-124, (1) P-554    | SST/Black | N/A          | 12,000 psi (827 bar)    | ea.  |
| <b>UH-753</b>                                                                            | Stainless Steel VHP Micro Adapting Tee, for 1/16” to 360 µm OD Tubing         | 10-32 C to 5/16-24 C | (2) P-416BLK, (2) PK-152                | SST/Black | 152 nL       | 15,000 psi (1,035 bar)* | ea.  |
| <b>1958-01</b>                                                                           | Stainless Steel VHP Micro Adapter, for 1/16” to 1/32” OD Tubing               | 10-32 C to M4x0.7 C  | N/A                                     | SST       | 16 nL        | 30,000 psi (2,070 bar)* | ea.  |
| <b>UH-631-01</b>                                                                         | Stainless Steel VHP Micro Adapter, for 1/16” to 1/32” OD Tubing               | 10-32 C to 6-40 C    | N/A                                     | SST       | 13 nL        | 30,000 psi (2,070 bar)* | ea.  |
| <b>UH-906</b>                                                                            | Stainless Steel VHP Micro Adapting Cross, for 1/16” to 360 µm OD Tubing       | 10-32 C to 5/16-24 C | (2) PK-120BLK, (2) P-416BLK, (2) PK-152 | SST/Black | 0.11 µL      | 15,000 psi (1,035 bar)* | ea.  |
| <b>REPLACEMENT GAUGE PLUGS (TO ACHIEVE TRUE ZDV CONNECTIONS WITH THE ABOVE ADAPTERS)</b> |                                                                               |                      |                                         |           |              |                         |      |
| <b>P-554</b>                                                                             | Delrin® Gauge Plug                                                            | 10-32 C              |                                         | White     | N/A          | N/A                     | ea.  |
| C = Coned                                                                                |                                                                               |                      |                                         |           |              |                         |      |
| * Pressure rating depends upon the fitting used.                                         |                                                                               |                      |                                         |           |              |                         |      |



# Accessories



*Insulating Mounting Bracket, shown with lead wire and Conductive MicroTight Union, not included.*

## Insulating Mounting Bracket

Use our Insulating Mounting Bracket to easily integrate the Conductive MicroTight Union (shown on page 71) or our Conductive Mini MicroFilters (on page 109) into your system or lab.

The product snaps into place. Voltage from your lead wire is conducted through the attaching stainless steel nut and screw (included), then onto the mounted product via the stainless steel clip.

The bracket's base includes two holes (#2 screw clearance) for easy mounting onto any lab surface. Dimensions are 1.25" L x 0.45" W x 0.63" H.

| Part No.                           | Description                 | Threads | Includes | Thru-hole | Swept Volume | Pressure Rating | Qty. |
|------------------------------------|-----------------------------|---------|----------|-----------|--------------|-----------------|------|
| <b>INSULATING MOUNTING BRACKET</b> |                             |         |          |           |              |                 |      |
| <b>M-447</b>                       | Insulating Mounting Bracket | N/A     | N/A      | N/A       | N/A          | N/A             | ea.  |



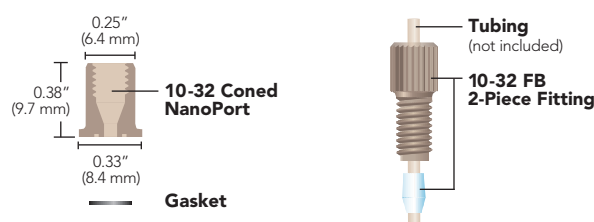


# NanoPort Assemblies

- › For lab-on-a-chip applications
- › Options to connect 1/16" OD Tubing directly, or 360µm and 1/32" OD Tubing with tubing sleeves
- › **Wetted materials:**  
PEEK and perfluoroelastomer

NanoPort Assemblies provide consistent fluid connections for chip-based analyses. NanoPort connections will bond to a variety of substrate materials with the use of Loctite.™

All NanoPort components are made of inert, biocompatible PEEK polymer (nuts and ports), Perlast® perfluoroelastomer (gaskets), and ETFE (ferrules). Their unique design also prevents adhesive contamination of the fluid path. And NanoPort connections add no additional volume to the fluid path, virtually eliminating dead volume traditionally associated with chip-based fluid connections.



## NOTE

Our NanoPort Assembly will readily connect 1/16" OD tubing with the included fittings. To connect 1/32" OD or 360µm OD, tubing sleeves for each size are included in each assembly.

Adhesive is not included in the N-333 NanoPort Assembly. Please contact IDEX Health & Science for bonding information or use common bonding adhesives such as Loctite.

| Part No.                             | Description                                             | Threads | For Chip Hole         | Tubing OD | Qty.  |
|--------------------------------------|---------------------------------------------------------|---------|-----------------------|-----------|-------|
| <b>NANOPORT ASSEMBLIES</b>           |                                                         |         |                       |           |       |
| <b>10-32 Coned NanoPort Assembly</b> |                                                         |         |                       |           |       |
| <b>N-333</b>                         | F-333N                                                  | F-142N  | Up to 0.063" (1.6 mm) | 1/16"     | ea.   |
| <b>NANOPORT REPLACEMENT PARTS</b>    |                                                         |         |                       |           |       |
| <b>F-333Nx</b>                       | Headless Fittings                                       | 10-32 C | Up to 0.063" (1.6 mm) | 1/16"     | 10-pk |
| <b>F-142Nx</b>                       | Ferrules                                                | 10-32 C | Up to 0.063" (1.6 mm) | 1/16"     | 10-pk |
| <b>Gaskets</b>                       |                                                         |         |                       |           |       |
| <b>N-123-02</b>                      | Gasket, For all assemblies except 6-32 Coned Assemblies |         | N/A                   | N/A       | ea.   |

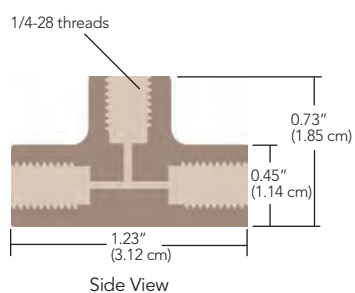


# Low Pressure Manifolds

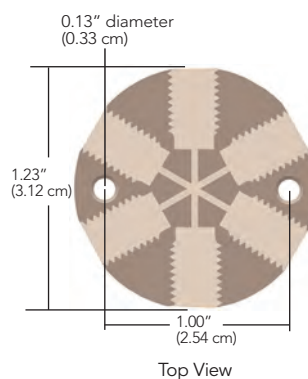
Choose a 5, 7, or 9 Port Manifold to combine several streams into one, or split one fluid stream into several. Each PEEK manifold comes complete with 1/4-28 Super Flangeless™ Fittings for either 1/16" or 1/8" OD tubing, with pressure ratings of 2,000 psi (138 bar) and 500 psi (34 bar), respectively.

A few useful applications include:

- › Multiport mixing chamber
- › Gas sparging splitting union
- › Sample injection onto multi-well plates or a multiple direction flow path union



**P-150**  
PEEK 7-Port Manifold  
comes with Super Flangeless Fittings



| Part No.         | Description                              | Threads   | Includes             | Thru-hole        | Swept Volume | Pressure Rating    | Qty. |
|------------------|------------------------------------------|-----------|----------------------|------------------|--------------|--------------------|------|
| <b>MANIFOLDS</b> |                                          |           |                      |                  |              |                    |      |
| <b>Standard</b>  |                                          |           |                      |                  |              |                    |      |
| <b>P-150</b>     | PEEK 7-Port Manifold for 1/16" OD Tubing | 1/4-28 FB | (7) P-255, (7) P-250 | 0.040" (1.00 mm) | 42.0 µL      | 1,000 psi (69 bar) | ea.  |
| <b>P-154</b>     | PEEK 5-Port Manifold for 1/16" OD Tubing | 1/4-28 FB | (5) P-255, (5) P-250 | 0.040" (1.00 mm) | 22.3 µL      | 1,000 psi (69 bar) | ea.  |
| <b>P-155</b>     | PEEK 5-Port Manifold for 1/8" OD Tubing  | 1/4-28 FB | (5) P-331, (5) P-359 | 0.062" (1.60 mm) | 53.8 µL      | 500 psi (34 bar)   | ea.  |
| <b>P-190</b>     | PEEK 9-Port Manifold for 1/8" OD Tubing  | 1/4-28 FB | (9) P-331, (9) P-359 | 0.062" (1.60 mm) | 160 µL       | 500 psi (34 bar)   | ea.  |
| <b>P-191</b>     | PEEK 9-Port Manifold for 1/16" OD Tubing | 1/4-28 FB | (9) P-255, (9) P-250 | 0.040" (1.00 mm) | 139 µL       | 1,000 psi (69 bar) | ea.  |

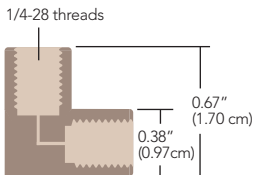
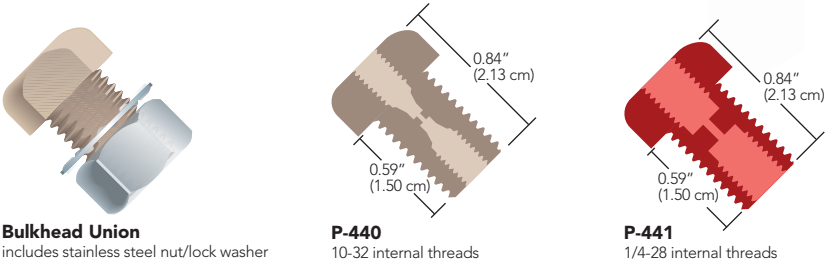
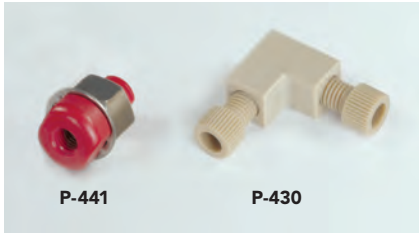
FB = Flat Bottom



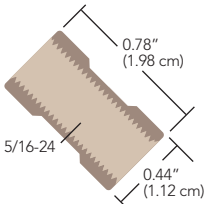
# Low Pressure Bulkhead Unions

- › Designed for plumbing tubing through equipment housing
- › For use with standard 10-32 coned or 1/4-28 flat-bottom threaded fittings

Thread PEEK Bulkhead Unions directly through your equipment housing to connect internal tubing to the outside. Each union has unique 3/8-24 external threads and comes complete with a stainless steel nut and lock washer to hold it in place. Requires a 3/8" hole to mount. The recommended torque limit for these unions is 15 in.-lbs (1.7 N-m).



**P-430**  
PEEK Elbow comes with Flangeless Fittings



**P-134**  
PEEK ZDV Union

## Elbow Connectors

Use these Elbow Connectors to easily navigate tight corners. One Elbow is designed for use with 1/16" OD tubing and has a 0.020" (0.50 mm) thru-hole. Use 1/8" OD tubing with the other Elbow, which has a 0.062" (1.6 mm) thru-hole. Both come complete with 1/4-28 PEEK nuts and ETFE ferrules, and are pressure rated to 1,000 psi (69 bar).

## Large Bore Union

- › 5/16-24 flat-bottom threads

Use any of the 5/16-24 fittings on page 55 and the appropriate ferrule to create a true zero dead volume (ZDV) connection with the P-134 Union.

## RELATED PRODUCTS

- › Stainless Steel Bulkhead Unions are also available. Please contact us for more information.
- › To use Elbows in higher pressure applications, simply replace the provided fittings with Super Flangeless™ Nuts and Ferrules, found on page 39.

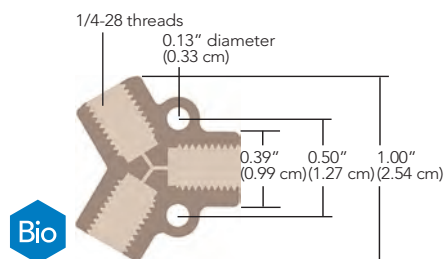
| Part No.         | Description                    | Threads             | Color   | Includes           | Thru-hole        | Swept Volume | Qty. |
|------------------|--------------------------------|---------------------|---------|--------------------|------------------|--------------|------|
| BULKHEAD UNIONS  |                                |                     |         |                    |                  |              |      |
| P-440            | PEEK Bulkhead Union            | 10-32 Coned         | Natural | (1) SST Nut/Washer | 0.020" (0.50 mm) | 1.9 µL       | ea.  |
| P-441            | PEEK Bulkhead Union            | 1/4-28 Flat-Bottom  | Red     | (1) SST Nut/Washer | 0.040" (1.00 mm) | 2.9 µL       | ea.  |
| P-441N           | PEEK Bulkhead Union            | 1/4-28 Flat-Bottom  | Natural | (1) SST Nut/Washer | 0.040" (1.00 mm) | 2.9 µL       | ea.  |
| ELBOW CONNECTORS |                                |                     |         |                    |                  |              |      |
| P-430            | PEEK Elbow for 1/16" OD Tubing | 1/4-28 Flat-Bottom  | Natural | (2) XP-235         | 0.020" (0.50 mm) | 1.4 µL       | ea.  |
| P-432            | PEEK Elbow for 1/8" OD Tubing  | 1/4-28 Flat-Bottom  | Natural | (2) XP-335         | 0.062" (1.60 mm) | 13.6 µL      | ea.  |
| LARGE BORE UNION |                                |                     |         |                    |                  |              |      |
| P-134            | PEEK True ZDV Union            | 5/16-24 Flat-Bottom | Natural | N/A                | N/A              | N/A          | ea.  |



# Low Pressure Y Connectors

PEEK Y Connectors are designed to split a stream or join two streams together, just like a tee. However, the configuration of a tee can lead to turbulent flow and solvent outgassing, which increases baseline noise and reduces sensitivity. The geometry of a Y connector creates less turbulence and thus can improve analytical results.

All of these Y Connectors use 1/4-28 Flangeless fittings, except P-515 which uses 5/16-24 fittings (to accommodate larger tubing).



**P-512**  
PEEK Y comes with Flangeless Fittings

| Part No.            | Description                | Threads    | Includes   | Thru-hole        | Swept Volume | Pressure Rating    | Qty. |
|---------------------|----------------------------|------------|------------|------------------|--------------|--------------------|------|
| <b>Y CONNECTORS</b> |                            |            |            |                  |              |                    |      |
| <b>P-512</b>        | PEEK Y for 1/16" OD Tubing | 1/4-28 FB  | (3) XP-235 | 0.020" (0.50 mm) | 1.7 $\mu$ L  | 1,000 psi (69 bar) | ea.  |
| <b>P-513</b>        | PEEK Y for 1/8" OD Tubing  | 1/4-28 FB  | (3) XP-335 | 0.040" (1.00 mm) | 6.0 $\mu$ L  | 500 psi (34 bar)   | ea.  |
| <b>P-514</b>        | PEEK Y for 1/8" OD Tubing  | 1/4-28 FB  | (3) XP-335 | 0.060" (1.50 mm) | 13.6 $\mu$ L | 500 psi (34 bar)   | ea.  |
| <b>P-515</b>        | PEEK Y for 3/16" OD Tubing | 5/16-24 FB | (3) XP-132 | 0.125" (3.20 mm) | 47.7 $\mu$ L | 500 psi (34 bar)   | ea.  |

FB = Flat-Bottom

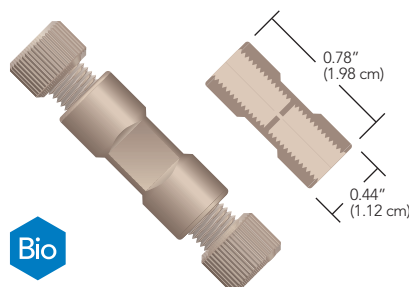


- › Manufactured from PEEK, ETFE, Delrin®, polypropylene, or PCTFE
- › Available with 1/4-28, M6, or 10-32 flat-bottom threads

# Low Pressure Unions

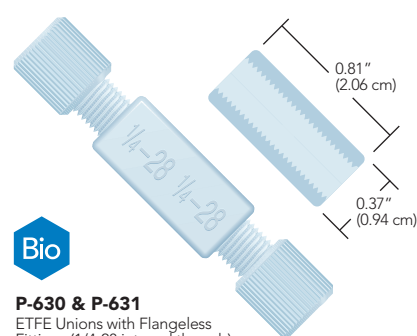
Our Low Pressure Unions are available in a variety of polymers, providing several low-cost and chemically-resistant options. The union assemblies below include fittings as shown in the table. The unions in the right column do not include fittings, allowing for customizing the fitting selection. In some cases, a union can be configured to connect two different tubing sizes—for example, if 1/4-28 Flangeless fittings for 1/16" and 1/8" OD tubing were selected from page 45 they can be used with the P-603 union to connect the two different tubing sizes.

## Low Pressure PEEK Union Assemblies

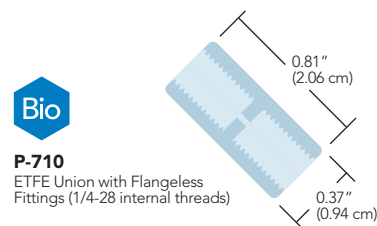


**P-702 & P-703**  
PEEK Unions with Flangeless Fittings  
(1/4-28 internal threads)

## Low Pressure ETFE Union Assemblies

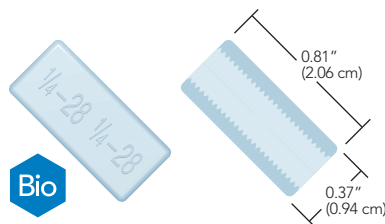


**P-630 & P-631**  
ETFE Unions with Flangeless Fittings  
(1/4-28 internal threads)



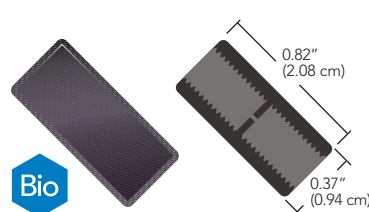
**P-710**  
ETFE Union with Flangeless Fittings  
(1/4-28 internal threads)

## Low Pressure Standard Unions



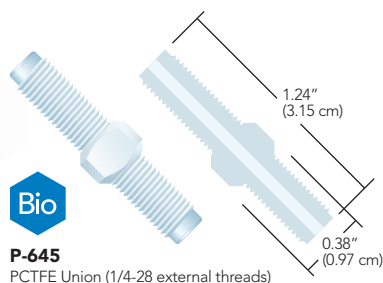
**P-603, P-620 & P-623**  
Standard Unions (1/4-28 internal threads)

## Low Pressure Metric Unions

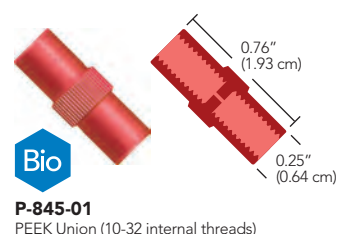


**P-602 & P-622**  
Metric Unions (M6 internal threads)

## Low Pressure Male Union



## VacuTight™ Union



## RELATED PRODUCTS

- › To use connectors in higher pressure applications, simply replace the provided fittings with Super Flangeless™ Nuts and Ferrules, found on page 39.
- › Use any of the 10-32 flat-bottom fittings on 39 and 42 to make an inline connection with our VacuTight Union. This product is designed for use with 1/16" OD tubing.

## Low Pressure Unions

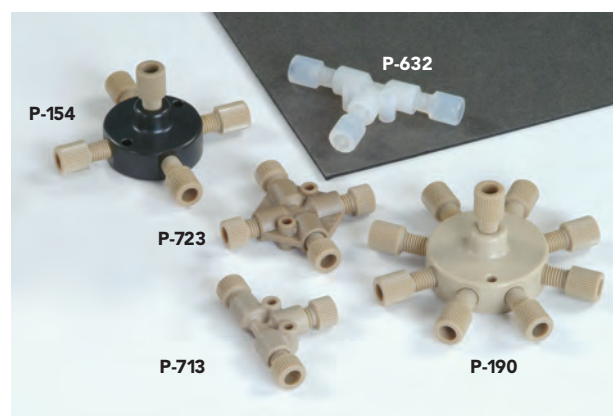
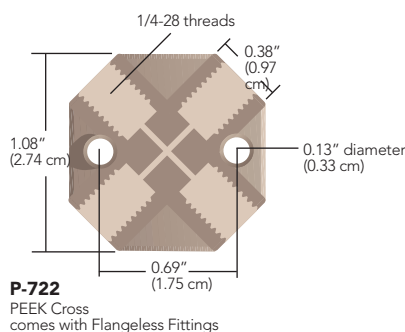
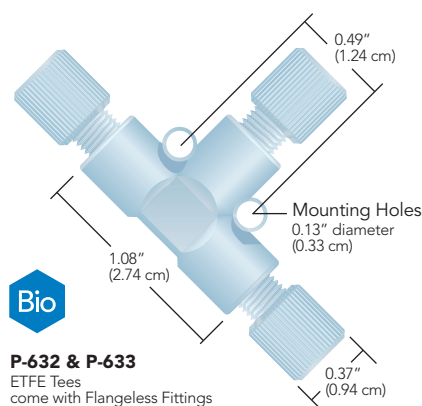
| Part No.                     | Description                             | Color   | Threads   | Includes         | Thru-hole        | Swept Volume | Pressure Rating    | Qty. |
|------------------------------|-----------------------------------------|---------|-----------|------------------|------------------|--------------|--------------------|------|
| <b>PEEK UNION ASSEMBLIES</b> |                                         |         |           |                  |                  |              |                    |      |
| <b>P-702</b>                 | PEEK Union for 1/16" OD Tubing          | Natural | 1/4-28 FB | (2) XP-235       | 0.020" (0.50 mm) | 0.41 µL      | 1,000 psi (69 bar) | ea.  |
| <b>P-703</b>                 | PEEK Union for 1/8" OD Tubing           | Natural | 1/4-28 FB | (2) XP-335       | 0.050" (1.25 mm) | 2.57 µL      | 1,000 psi (69 bar) | ea.  |
| <b>ETFE UNION ASSEMBLIES</b> |                                         |         |           |                  |                  |              |                    |      |
| <b>P-630</b>                 | ETFE True ZDV Union for 1/16" OD Tubing | Natural | 1/4-28 FB | (2) P-200N/P-245 | N/A              | N/A          | 1,000 psi (69 bar) | ea.  |
| <b>P-631</b>                 | ETFE True ZDV Union for 1/8" OD Tubing  | Natural | 1/4-28 FB | (2) P-300N/P-345 | N/A              | N/A          | 1,000 psi (69 bar) | ea.  |
| <b>P-710</b>                 | ETFE Union for 1/16" OD Tubing          | Natural | 1/4-28 FB | (2) XP-245       | 0.030" (0.75 mm) | 0.93 µL      | 1,000 psi (69 bar) | ea.  |
| <b>STANDARD UNIONS</b>       |                                         |         |           |                  |                  |              |                    |      |
| <b>P-603</b>                 | Delrin True ZDV Standard Union          | Natural | 1/4-28 FB | N/A              | N/A              | N/A          | N/A*               | ea.  |
| <b>P-620</b>                 | Polypropylene True ZDV Standard Union   | Natural | 1/4-28 FB | N/A              | N/A              | N/A          | N/A*               | ea.  |
| <b>P-623</b>                 | ETFE True ZDV Standard Union            | Natural | 1/4-28 FB | N/A              | N/A              | N/A          | N/A*               | ea.  |
| <b>METRIC UNIONS</b>         |                                         |         |           |                  |                  |              |                    |      |
| <b>P-602</b>                 | Delrin Metric Union                     | Black   | M6 FB     | N/A              | 0.020" (0.50 mm) | 0.41 µL      | N/A*               | ea.  |
| <b>P-622</b>                 | ETFE Metric Union                       | Blue    | M6 FB     | N/A              | 0.020" (0.50 mm) | 0.41 µL      | N/A*               | ea.  |
| <b>MALE UNION</b>            |                                         |         |           |                  |                  |              |                    |      |
| <b>P-645</b>                 | PCTFE Male Union                        | Natural | 1/4-28 FB | N/A              | 0.062" (1.60 mm) | 61.3 µL      | 500 psi (34 bar)   | ea.  |
| <b>VACUTIGHT UNION</b>       |                                         |         |           |                  |                  |              |                    |      |
| <b>P-845-01</b>              | PEEK Union for 1/16" OD Tubing          | Red     | 10-32 FB  | N/A              | 0.020" (0.50 mm) | 0.20 µL      | N/A*               | ea.  |

\* Pressure Rating depends on Fittings selected. See pressure rating for fittings on appropriate page.  
FB = Flat-Bottom



# Low Pressure Tees & Crosses

Our Low Pressure Tees and Crosses are available in two inert polymers and can handle pressures to 500 psi (34 bar) or 1,000 psi (69 bar), depending upon the configuration of the products. Each is designed with handy mounting holes. All ETFE Tees and Crosses ship complete with 1/4-28 PFA Flangeless nuts and ETFE ferrules, while their PEEK polymer counterparts ship with 1/4-28 PEEK nuts and ETFE ferrules. Replacement fittings are located on page 47.



## RELATED PRODUCTS

- › Seal off unused ports with any of our 1/4-28 flat-bottom plugs found on page 55.
- › To use the PEEK polymer versions of our Tees and Crosses in higher pressure applications, simply replace the provided fittings with Super Flangeless™ Nuts and Ferrules, found on page 39.
- › High Pressure Tees, Crosses, and a 7-Port Manifold (all with 10-32 threaded ports) are on page 74.

## NOTE

- › To order just the body of one of our tees and crosses without fittings, simply add a '-01' to the part number — e.g., P-632-01.

| Part No.                             | Description                    | Threads            | Includes              | Thru-hole        | Swept Volume | Pressure Rating    | Qty. |
|--------------------------------------|--------------------------------|--------------------|-----------------------|------------------|--------------|--------------------|------|
| <b>LOW PRESSURE TEES AND CROSSES</b> |                                |                    |                       |                  |              |                    |      |
| <b>P-632</b>                         | ETFE Tee for 1/16" OD Tubing   | 1/4-28 Flat-Bottom | (3) P-245, (3) P-200N | 0.020" (0.50 mm) | 2.9 µL       | 1,000 psi (69 bar) | ea.  |
| <b>P-633</b>                         | ETFE Tee for 1/8" OD Tubing    | 1/4-28 Flat-Bottom | (3) P-345, (3) P-300N | 0.050" (1.25 mm) | 17.5 µL      | 500 psi (34 bar)   | ea.  |
| <b>P-634</b>                         | ETFE Cross for 1/16" OD Tubing | 1/4-28 Flat-Bottom | (4) P-245, (4) P-200N | 0.020" (0.50 mm) | 3.8 µL       | 1,000 psi (69 bar) | ea.  |
| <b>P-635</b>                         | ETFE Cross for 1/8" OD Tubing  | 1/4-28 Flat-Bottom | (4) P-345, (4) P-300N | 0.050" (1.25 mm) | 22.8 µL      | 500 psi (34 bar)   | ea.  |
| <b>P-712</b>                         | PEEK Tee for 1/16" OD Tubing   | 1/4-28 Flat-Bottom | (3) XP-235            | 0.020" (0.50 mm) | 2.9 µL       | 1,000 psi (69 bar) | ea.  |
| <b>P-713</b>                         | PEEK Tee for 1/8" OD Tubing    | 1/4-28 Flat-Bottom | (3) XP-335            | 0.050" (1.25 mm) | 17.5 µL      | 500 psi (34 bar)   | ea.  |
| <b>P-714</b>                         | PEEK Tee for 1/16" OD Tubing   | 1/4-28 Flat-Bottom | (3) XP-235            | 0.040" (1.00 mm) | 11.4 µL      | 1,000 psi (69 bar) | ea.  |
| <b>P-722</b>                         | PEEK Cross for 1/16" OD Tubing | 1/4-28 Flat-Bottom | (4) XP-235            | 0.020" (0.50 mm) | 3.8 µL       | 1,000 psi (69 bar) | ea.  |
| <b>P-723</b>                         | PEEK Cross for 1/8" OD Tubing  | 1/4-28 Flat-Bottom | (4) XP-335            | 0.050" (1.25 mm) | 22.8 µL      | 500 psi (34 bar)   | ea.  |





# Quick Connect Luer Adapters

- › Delrin®, polypropylene, ETFE, or PEEK Versions
- › Adapts luers to 1/4-28, 10-32, 5/16-24, or M6 threaded ports

These luer adapters were designed to work in a variety of applications. By connecting any male luer to any female luer, you can create your own quick connect union or adapter. Each Quick Connect Luer Adapter conforms to ISO requirements for medical luer taper configuration and performance (45 psi/3.1 bar).

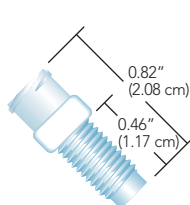
Find fittings to connect tubing to the threaded ports of these adapters in the Fittings chapter, starting on page 30.

*Please Note: Our Female Quick Connect Luer Adapters can be used with any of the Male Luers on this page, i.e., those with and without lock hubs.*

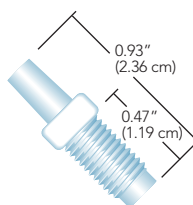


## APPLICATION NOTE

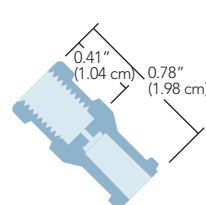
- › Our A-626 Bottle Cap Plug (page 55) can be used to plug any of the female luer adapters on this page.
- › To prevent a chemical spill when disconnecting your solvent reservoir tubing from the pump, try our Quick-Stop Luer Check Valve on page 139.
- › To economically prime an HPLC pump, simply remove the 10-32 fitting on the outlet check valve (standard on most models), insert a P-642 luer adapter, attach a syringe (such as our B-310) and draw the mobile phase through the pump head.



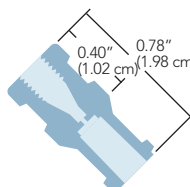
**P-604, P-618, P-624**  
Female Luer to 1/4-28 Male  
(luer end of P-604 different than shown)



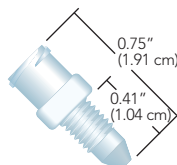
**P-619, P-625**  
Male Luer to 1/4-28 Male



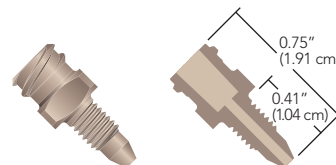
**P-628**  
Female Luer to 1/4-28 Female



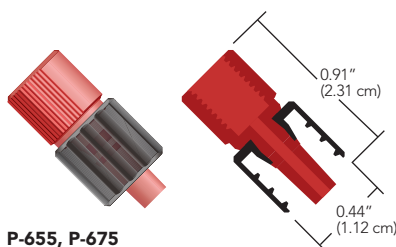
**P-629**  
Female Luer to 10-32 Female



**P-642**  
Female Luer to 10-32 Male



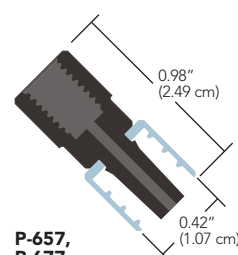
**P-719**  
Female Luer to 10-32 Male



**P-655, P-675**  
Male Luer to 1/4-28 Female



**P-656**  
Male Luer to 10-32 Female



**P-657, P-677**  
Male Luer to M6 Female

# Quick Connect Luer Adapters (Cont.)

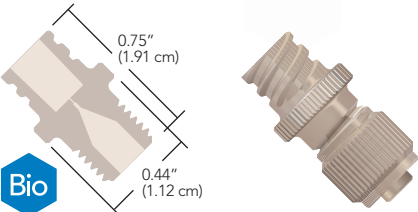
## Luer-To-MicroTight® Adapter

» Easily connect 360 µm OD tubing to a syringe



P-662 Luer-to-MicroTight Adapter, shown with a B-310 Syringe (see table below) and PEEK capillary tubing (page 16), not included.

The Luer-to-MicroTight Adapter is ideal for infusing sample into lab-on-a-chip devices. This product is made entirely of biocompatible PEEK polymer and introduces only 14 nL of additional volume to the flow path. Use it to directly connect a luer-tip syringe or other product that terminates with a standard male luer to 360 µm OD capillary tubing without tubing sleeves (see photo). MicroTight Fittings are included.



**P-662**  
Luer-To-MicroTight Adapter for Luer to 360 µm OD tubing with fittings included

## Quick Connect Luer Adapters

| Part No.                                                                                                                                                                       | Description                                                              | Body Material        | Lock Hub Material | Thru-hole        | Qty. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------|-------------------|------------------|------|
| QUICK CONNECT LUER ADAPTERS                                                                                                                                                    |                                                                          |                      |                   |                  |      |
| P-604                                                                                                                                                                          | F Luer to 1/4-28 FB, M                                                   | Nat. Delrin          | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-618                                                                                                                                                                          | F Luer to 1/4-28 FB, M                                                   | Nat. PP              | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-619                                                                                                                                                                          | M Luer to 1/4-28 FB, M                                                   | Nat. PP              | None *            | 0.05" (1.3 mm)   | ea.  |
| P-624                                                                                                                                                                          | F Luer to 1/4-28 FB, M                                                   | Nat. ETFE            | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-625                                                                                                                                                                          | M Luer to 1/4-28 FB, M                                                   | Nat. ETFE            | None *            | 0.04" (1.0 mm)   | ea.  |
| P-628                                                                                                                                                                          | F Luer to 1/4-28 FB, F                                                   | Nat. ETFE            | N/A               | 0.04" (1.0 mm)   | ea.  |
| P-629                                                                                                                                                                          | F Luer to 10-32 C, F                                                     | Nat. ETFE            | N/A               | 0.04" (1.0 mm)   | ea.  |
| P-642                                                                                                                                                                          | F Luer to 10-32 C, M                                                     | Nat. ETFE            | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-655                                                                                                                                                                          | M Luer to 1/4-28 FB, F                                                   | Red PEEK             | Black PEEK        | 0.04" (1.3 mm)   | ea.  |
| P-656                                                                                                                                                                          | M Luer to 10-32 C, F                                                     | Nat. PEEK            | Black PEEK        | 0.05" (1.3 mm)   | ea.  |
| P-657                                                                                                                                                                          | M Luer to M6 FB, F                                                       | Black PEEK           | Black PEEK        | 0.05" (1.3 mm)   | ea.  |
| P-658                                                                                                                                                                          | F Luer to 1/4-28 FB, F                                                   | Red PEEK             | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-659                                                                                                                                                                          | F Luer to 10-32 C, F                                                     | Nat. PEEK            | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-660                                                                                                                                                                          | F Luer to M6 FB, F                                                       | Black PEEK           | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-661                                                                                                                                                                          | F Luer to 5/16-24 FB, M                                                  | Nat. ETFE            | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-675                                                                                                                                                                          | M Luer to 1/4-28 FB, F                                                   | Red ETFE             | Natural PP        | 0.05" (1.3 mm)   | ea.  |
| P-677                                                                                                                                                                          | M Luer to M6 FB, F                                                       | Black ETFE           | Natural PP        | 0.05" (1.3 mm)   | ea.  |
| P-678                                                                                                                                                                          | F Luer to 1/4-28 FB, F                                                   | Red ETFE             | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-680                                                                                                                                                                          | F Luer to M6 FB, F                                                       | Black ETFE           | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-683                                                                                                                                                                          | M Luer to 1/4-28 FB, M                                                   | Nat. PEEK            | Black PEEK        | 0.04" (1.0 mm)   | ea.  |
| P-686                                                                                                                                                                          | F Luer to M6 FB, M                                                       | Black ETFE           | N/A               | 0.05" (1.3 mm)   | ea.  |
| P-719                                                                                                                                                                          | F Luer to 10-32 C, M                                                     | Nat. PEEK            | N/A               | 0.05" (1.3 mm)   | ea.  |
| SYRINGE WITH MALE LUER LOCK                                                                                                                                                    |                                                                          |                      |                   |                  |      |
| B-310                                                                                                                                                                          | 10 cc Disposable Luer-Lock Syringe. For use with any Female Luer Adapter |                      |                   | 0.05" (1.3 mm)   | ea.  |
| LUER-TO-MICROTIGHT ADAPTER                                                                                                                                                     |                                                                          |                      |                   |                  |      |
| P-662                                                                                                                                                                          | Luer-to-MicroTight Adapter                                               | (1) F-152, (1) P-416 | 0.006" (0.150 mm) | 45 psi (2.4 bar) | ea.  |
| F = Female (internal) threads; M = Male (external) threads; Nat. = Natural; N/A = Not Applicable;<br>PP = Polypropylene; FB = Flat-Bottom; C = Coned<br>* Slip-type male luer. |                                                                          |                      |                   |                  |      |

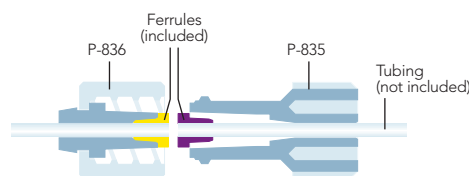


# LuerTight<sup>™</sup> Fittings

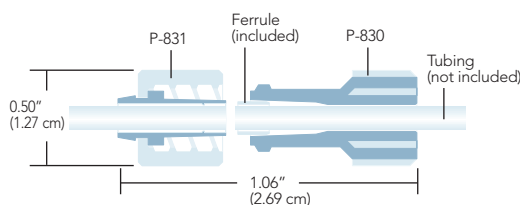
- › Luer fittings for fluoropolymer tubing
- › Quick disconnect and barbless
- › For 1/16" and 1/8" OD tubing

Our LuerTight fittings are specifically designed to connect fluoropolymer tubing without barbs or nuts! By integrating ferrules into the luer bodies, LuerTights will reliably hold your tubing in place while giving you the convenience of a luer connection. An inline set of LuerTight fittings provides a quick and easy disconnection option. LuerTight connections are also less bulky and more economical than nut-to-luer style fittings.

The bodies of these products are manufactured from polypropylene and the ferrules, where used, are made of ETFE.



**P-837**  
LuerTight Fittings System for 1/16" OD tubing



**P-838**  
LuerTight Fittings System for 1/8" OD tubing



## NOTE

LuerTight fittings are designed to be used exclusively within the LuerTight family. Combining LuerTight fittings with non-LuerTight luer products may result in a poor connection.

| Part No.                            | Description                                     | Includes                         | Thru-hole | Pressure Rating | Qty. |
|-------------------------------------|-------------------------------------------------|----------------------------------|-----------|-----------------|------|
| <b>LUERTIGHT FITTINGS SYSTEMS</b>   |                                                 |                                  |           |                 |      |
| <b>P-837</b>                        | LuerTight System for 1/16" OD Tubing            | (1) P-835, (1) P-836, (1) P-830T | N/A       | 100 psi (7 bar) | ea.  |
| <b>P-838</b>                        | LuerTight System for 1/8" OD Tubing             | (1) P-830, (1) P-831, (1) P-830T | N/A       | 100 psi (7 bar) | ea.  |
| <b>LUERTIGHT FITTING COMPONENTS</b> |                                                 |                                  |           |                 |      |
| <b>P-830</b>                        | Female Fitting for 1/8" OD Tubing               | (1) Ferrule                      | N/A       | N/A             | ea.  |
| <b>P-830T</b>                       | Set Plug to swage Ferrules into P-835 and P-830 | N/A                              | N/A       | N/A             | ea.  |
| <b>P-831</b>                        | Male Fitting for 1/8" OD Tubing                 | No Ferrule Required              | N/A       | N/A             | ea.  |
| <b>P-835</b>                        | Female Fitting for 1/16" OD Tubing              | (1) Ferrule                      | N/A       | N/A             | ea.  |
| <b>P-836</b>                        | Male Fitting for 1/16" OD Tubing                | (1) Ferrule                      | N/A       | N/A             | ea.  |

Female = internal receiving luer pocket; Male = external luer nose (surrounded by internally-threaded locking ring)



# Barbed Connectors

Our Type 1 Barbed Unions have been engineered to effectively join two pieces of soft-walled tubing together. This type of connector is typically the connector of choice for joining two peristaltic tubes with similar inner diameters together. Our unions are manufactured from either polypropylene or nylon.

## Barbed to Barbed Adapters

- › Adapters on this page feature various luer to barb adaptations
- › Adapters on the next page feature a variety of barb-to-barb connectors

Use these barbed adapters to connect peristaltic-type flexible tubing for general, low pressure applications. The polypropylene used to manufacture the majority of these products is a Class VI material. Due to the low melt point of polypropylene (PP), these adapters are not autoclavable, however, they can be sterilized via gamma radiation. There are also Barb to Female Luer-Lock connectors available from ETFE, which has superior solvent resistance and a higher temperature rating (80 °C).

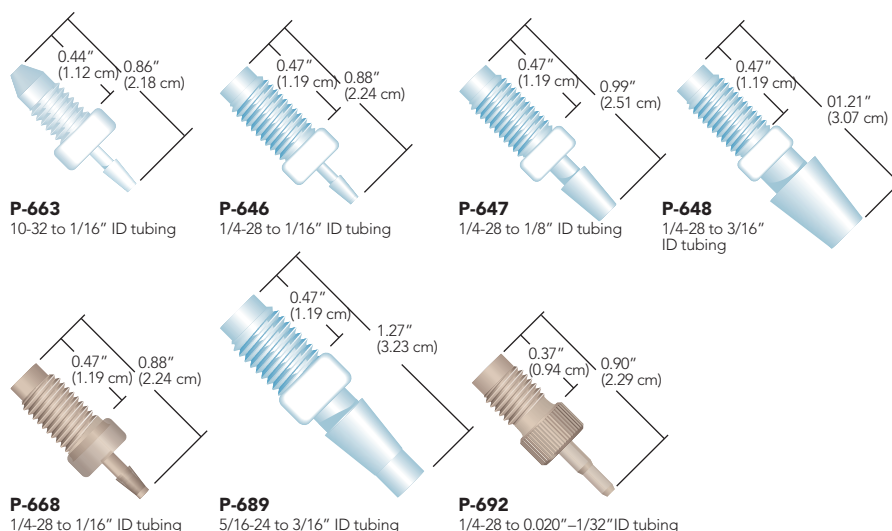
## Barbed "Y" Adapters

Our Barbed "Y" Adapters, manufactured from polypropylene, are engineered to effectively join three pieces of soft-walled tubing together in a Y configuration, offering less turbulence and gentler mixing of fluids than a traditional Tee Connector. This type of connector works well for joining three peristaltic tubes with similar inner diameters together.

## Thread to Barbed Adapters

- › Three barb sizes, for 1/16", 1/8", and 3/16" ID flexible tubing
- › Adapt to 1/4-28 flat-bottom, 5/16-24 flat-bottom, or 10-32 coned receiving ports

These adapters make it easy to connect flexible tubing to any standard 1/4-28 flat-bottom or 10-32 coned receiving port. Simply thread the adapter into a receiving port and slip tubing over the barbed stem to create a reliable low pressure connection.





## Swivel Barb Adapters

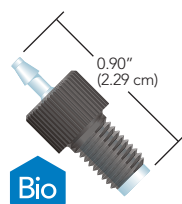
- › Barb connection spins freely from the nut to prevent twist during installation
- › Manufactured from polypropylene

The Swivel Barb Adapters from IDEX Health & Science are made up of two captive pieces acting as a one-piece fitting for ease of use. Manufactured from polypropylene and available in three barb sizes, the Swivel Barb will facilitate connection between flexible tubing to a 1/4-28 flat-bottom port. The barbed insert spins freely from the threaded nut in order to prevent the tubing from twisting during installation.

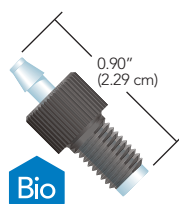


### RELATED PRODUCTS

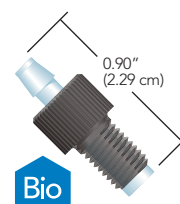
- › To connect low pressure fluoropolymer tubing, try the LuerTight™ Adapters on page 89.
- › To connect peristaltic tubing to low pressure fluoropolymer tubing, see page 92.
- › For peristaltic tubing, see page 15.



**D-646**  
1/4-28 to 1/16" ID tubing



**D-647**  
1/4-28 to 3/32" ID tubing

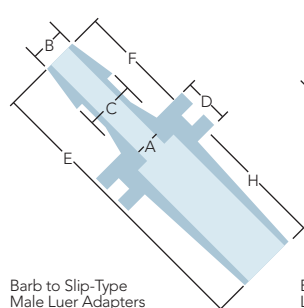


**D-648**  
1/4-28 to 1/8" ID tubing

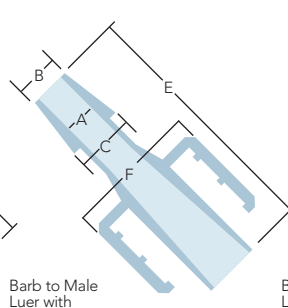


## Luer to Barbed Adapters

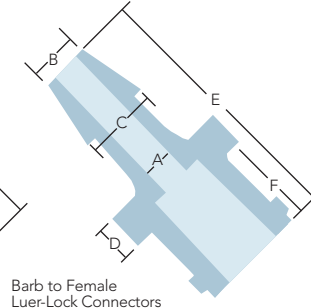
Our Luer to Barbed Adapters are an excellent choice when connecting between soft-walled tubing and luer-based products, such as a syringe or a low-pressure filter, for example. We offer several different configurations, allowing you to connect various sizes of soft-walled tubing to receiving ports that accept a male luer "slip" style connection; a male luer "lock" style connection; and a female-luer style of connector.



Barb to Slip-Type  
Male Luer Adapters



Barb to Male  
Luer with  
Lock Ring Adapters



Barb to Female  
Luer-Lock Connectors

## Barbed Connectors (Cont.)



### Conical Adapters

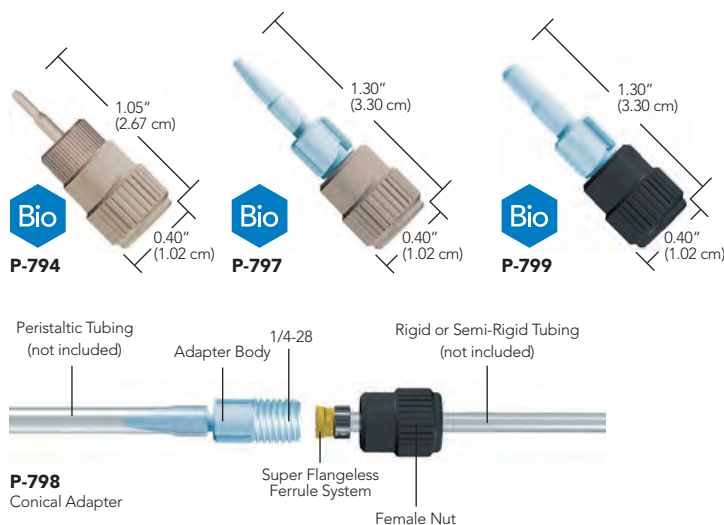
- › Direct connect 1/16" and 1/8" OD rigid and semi-rigid tubing to peristaltic tubing
- › Accept 0.020"–1/8" (0.50–3.2 mm) ID peristaltic tubing
- › Biocompatible flow path with excellent chemical compatibility

Conical Adapters provide a reliable connection between rigid/semi-rigid tubing and peristaltic-type flexible tubing, such as Tygon® and PharMed®. These adapters are composed of a PEEK polymer female nut, our Super Flangeless™ ferrule system and an ETFE or PEEK conical adapter body. The narrow coned end of the adapter body allows peristaltic tubing to slide on more easily than it does onto conventional barbed adapters. Peristaltic tubing is also easier to remove from our Conical Adapters, since no cutting or excessive pulling is required.



### APPLICATION NOTE

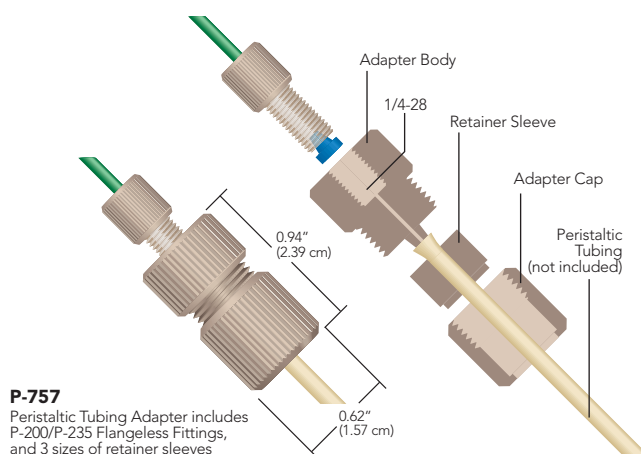
To help secure peristaltic tubing more firmly to the Conical Adapters, simply attach a cable tie to the outside of the peristaltic tubing once it has been placed onto the Adapter body.



### Peristaltic Tubing Adapters

These unique adapters connect peristaltic tubing to standard 1/16" or 1/8" OD tubing. A specially-designed nose allows the peristaltic tubing to simply press fit over the nose and then be held tightly in place by the retainer sleeve. Your 1/16" OD tubing may then be connected with the Flangeless Fittings supplied with the adapter. To connect your peristaltic tubing to tubing with a different OD, simply replace the supplied fittings with your choice of Flangeless Fittings from page 45.

One popular application for these adapters is to use them as "stops" for your peristaltic pump. By doing so, you can reduce the amount of peristaltic tubing required for your flow path, thus reducing cost.



## Barbed Connectors

| Part No.                                                                                             | Tubing ID                                                                                                                       | Material                      | Qty.                            |                  |      |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------|------------------|------|
| BARBED TO BARBED ADAPTERS                                                                            |                                                                                                                                 |                               |                                 |                  |      |
| P-801                                                                                                | 0.06" (1.5 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| P-802                                                                                                | 0.12" (3.0 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| BARBED "Y" CONNECTORS                                                                                |                                                                                                                                 |                               |                                 |                  |      |
| P-860                                                                                                | 0.06" (1.5 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| P-861                                                                                                | 0.10" (2.5 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| P-862                                                                                                | 0.12" (3.0 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| P-863                                                                                                | 0.18" (4.8 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| P-864                                                                                                | 0.25" (6.4 mm)                                                                                                                  | Polypropylene                 | ea.                             |                  |      |
| THREAD TO BARBED ADAPTERS                                                                            |                                                                                                                                 |                               |                                 |                  |      |
| Part No.                                                                                             | Description                                                                                                                     | Material                      | Threads                         | Thru-hole        | Qty. |
| P-663                                                                                                | Barb Adapter, 1/16" (1.55 mm) ID Tubing                                                                                         | ETFE                          | 10-32 Coned                     | 0.04" (1.0 mm)   | ea.  |
| P-646                                                                                                | Barb Adapter, 1/16" (1.55 mm) ID Tubing                                                                                         | ETFE                          | 1/4-28 Flat-Bottom              | 0.04" (1.0 mm)   | ea.  |
| P-647                                                                                                | Barb Adapter, 1/8" (3.20 mm) ID Tubing                                                                                          | ETFE                          | 1/4-28 Flat-Bottom              | 0.08" (2.0 mm)   | ea.  |
| P-648                                                                                                | Barb Adapter, 3/16" (4.75 mm) ID Tubing                                                                                         | ETFE                          | 1/4-28 Flat-Bottom              | 0.10" (2.5 mm)   | ea.  |
| P-668                                                                                                | Barb Adapter, 1/16" (1.55 mm) ID Tubing                                                                                         | PEEK                          | 1/4-28 Flat-Bottom              | 0.04" (1.0 mm)   | ea.  |
| P-689                                                                                                | Barb Adapter, 3/16" (4.75 mm) ID Tubing                                                                                         | ETFE                          | 5/16-24 Flat-Bottom             | 0.10" (2.5 mm)   | ea.  |
| P-692                                                                                                | Barb Adapter, 0.020" to 1/32" (0.50 to 0.80 mm) ID Tubing                                                                       | PEEK                          | 1/4-28 Flat-Bottom              | 0.02" (0.5 mm)   | ea.  |
| SWIVEL BARB ADAPTERS                                                                                 |                                                                                                                                 |                               |                                 |                  |      |
| D-646                                                                                                | Swivel Barb Adapter, 1/16" (1.55 mm) ID Tubing                                                                                  | Polypropylene                 | 1/4-28 Flat-Bottom              | 0.03" (0.75 mm)  | ea.  |
| D-647                                                                                                | Swivel Barb Adapter, 3/32" (2.40 mm) ID Tubing                                                                                  | Polypropylene                 | 1/4-28 Flat-Bottom              | 0.056" (1.5 mm)  | ea.  |
| D-648                                                                                                | Swivel Barb Adapter, 1/8" (3.20 mm) ID Tubing                                                                                   | Polypropylene                 | 1/4-28 Flat-Bottom              | 0.08" (2.0 mm)   | ea.  |
| BARB TO SLIP-TYPE MALE LUER ADAPTERS                                                                 |                                                                                                                                 |                               |                                 |                  |      |
| Part No.                                                                                             | Description                                                                                                                     | Material                      | Qty.                            |                  |      |
| P-854                                                                                                | Male Luers (Slip-type) for use with 1/16" ID (1.55 mm) Tubing<br>A=0.046" B=0.064" C=0.090" D=0.129" E=0.711" F=0.198" H=0.384" | PP                            | ea.                             |                  |      |
| These slip-type male luer fittings are for use in systems for which luer lock rings are not desired. |                                                                                                                                 |                               |                                 |                  |      |
| BARB TO MALE LUER WITH LOCK RING ADAPTERS                                                            |                                                                                                                                 |                               |                                 |                  |      |
| P-850                                                                                                | Male Luers with Lock Ring for use with 1/16" ID (1.55 mm) Tubing<br>A=0.049" B=0.065" C=0.090" E=0.583" F=0.434"                | PP                            | ea.                             |                  |      |
| P-851                                                                                                | Male Luers with Lock Ring for use with 3/32" ID (2.40 mm) Tubing<br>A=0.071" B=0.100" C=0.139" E=0.681" F=0.436"                | PP                            | ea.                             |                  |      |
| P-852                                                                                                | Male Luers with Lock Ring for use with 1/8" ID (3.20 mm) Tubing<br>A=0.099" B=0.132" C=0.184" E=0.777" F=0.436"                 | PP                            | ea.                             |                  |      |
| BARB TO FEMALE LUER-LOCK CONNECTORS                                                                  |                                                                                                                                 |                               |                                 |                  |      |
| P-857                                                                                                | Female Luer Connectors for use with 1/16" ID (1.55 mm) Tubing<br>A=0.030" B=0.063" C=0.106" D=0.100" E=0.598" F=0.253"          | PP                            | ea.                             |                  |      |
| P-858                                                                                                | Female Luer Connectors for use with 3/32" ID (2.40 mm) Tubing<br>A=0.056" B=0.102" C=0.145" D=0.100" E=0.648" F=0.253"          | PP                            | ea.                             |                  |      |
| P-859                                                                                                | Female Luer Connectors for use with 1/8" ID (3.20 mm) Tubing<br>A=0.080" B=0.135" C=0.187" D=0.100" E=0.733" F=0.253"           | PP                            | ea.                             |                  |      |
| P-870                                                                                                | For use with 1/16" (1.55 mm) ID Tubing<br>A=0.030" B=0.063" C=0.106" D=0.100" E=0.598" F=0.253"                                 | ETFE                          | ea.                             |                  |      |
| P-872                                                                                                | For use with 1/8" (3.20 mm) ID Tubing<br>A=0.080" B=0.137" C=0.187" D=0.100" E=0.733" F=0.253"                                  | ETFE                          | ea.                             |                  |      |
| PERISTALTIC TUBING ADAPTERS                                                                          |                                                                                                                                 |                               |                                 |                  |      |
| Part No.                                                                                             | Description                                                                                                                     | Tubing OD                     | Peristaltic Tubing ID           | Thru-Hole        | Qty. |
| P-757                                                                                                | Standard Adapter                                                                                                                | up to 0.180" (4.55 mm)        | 0.048"–0.110" (1.20–2.80 mm)    | 0.030" (0.75 mm) | ea.  |
| P-767                                                                                                | Large Bore Adapter                                                                                                              | up to 0.250" (6.35 mm)        | 0.100"–0.150" (2.55–3.80 mm)    | 0.070" (1.78 mm) | ea.  |
| CONICAL ADAPTER ASSEMBLIES                                                                           |                                                                                                                                 |                               |                                 |                  |      |
| Part No.                                                                                             | Description                                                                                                                     | Rigid or Semi-Rigid Tubing OD | Peristaltic Tubing ID           | Thru-Hole        | Qty. |
| P-794                                                                                                | Conical Adapter                                                                                                                 | 1/16"                         | 0.020"–0.030" (0.50 mm–0.75 mm) | 0.020" (0.50 mm) | ea.  |
| P-797                                                                                                | Conical Adapter                                                                                                                 | 1/16"                         | 1/16"–3/32" (1.55 mm–2.40 mm)   | 0.040" (1.0 mm)  | ea.  |
| P-798                                                                                                | Conical Adapter                                                                                                                 | 1/8"                          | 1/16"–3/32" (1.55 mm–2.40 mm)   | 0.040" (1.0 mm)  | ea.  |
| P-799                                                                                                | Conical Adapter                                                                                                                 | 1/8"                          | 3/32"–1/8" (2.40 mm–3.20 mm)    | 0.060" (1.5 mm)  | ea.  |
| CONICAL ADAPTER REPLACEMENT PARTS                                                                    |                                                                                                                                 |                               |                                 |                  |      |
| Part No.                                                                                             | Description                                                                                                                     | For Use With                  | Material                        | Qty.             |      |
| F-156                                                                                                | Female Nut, 1/8", 1/4-28                                                                                                        | P-798, P-799                  | Black PEEK                      | ea.              |      |
| P-420                                                                                                | Female Nut, 1/16", 1/4-28                                                                                                       | P-794, P-797                  | Natural PEEK                    | ea.              |      |
| P-259                                                                                                | Super Flangeless Ferrule, 1/16"                                                                                                 | P-794, P-797                  | Yellow ETFE/SST                 | ea.              |      |
| P-359                                                                                                | Super Flangeless Ferrule, 1/8"                                                                                                  | P-798, P-799                  | Yellow ETFE/SST                 | ea.              |      |
| P-691                                                                                                | Conical Adapter Body                                                                                                            | P-799                         | Natural ETFE                    | ea.              |      |
| P-692                                                                                                | Conical Adapter Body                                                                                                            | P-794                         | Natural PEEK                    | ea.              |      |





## FILTERS & FRITS

Our Filters offer an optimal way to filter your solvents, preventing pump cavitation and system damage. We offer different style filters for specific system specifications. Our filters protect your system from particulate matter from the solvent that may otherwise damage expensive hardware.

We offer a complete line of Frits manufactured from two different materials: PEEK and stainless steel. Both materials offer a variety of sizes of frit discs, as well as being available in numerous porosities. All our frits are designed with exceptional uniform porosity and a long filtration life.

- 95** FRITS
- 100** FILTERS
- 111** BOTTLE CAPS & PLUGS



# Stainless Steel Frits

Our Analytical-scale 316 Stainless Steel Frits are available in 0.5  $\mu\text{m}$  or 2  $\mu\text{m}$  porosity—the most common HPLC filtration ratings. Each frit includes a PCTFE or PEEK polymer sealing ring.

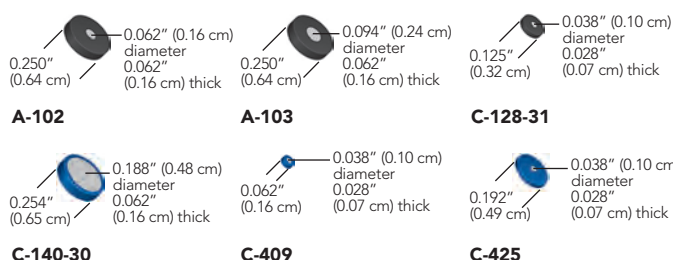
Many of the frits shown have the common 0.250" (0.64 cm) and 0.254" (0.64 cm) ODs, which allow them to be used in many of the Precolumn and Inline Filters found starting on page 103. Choose the larger diameter faces and/or larger porosity frits for faster flow rates. Choose frits with a smaller diameter face and/or smaller porosity for applications sensitive to extra flow path volume.

## APPLICATION NOTE

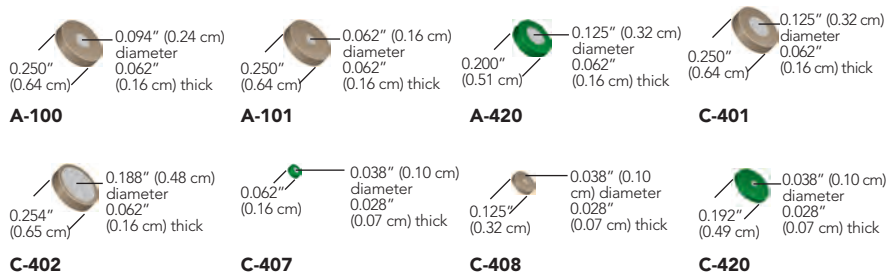
### To Clean Or Not To Clean?

It is rarely worth the time and effort to clean frits, given the relatively low cost of replacements. Furthermore, cleaning may leave some debris embedded in the frit pores. If the washed frit is accidentally returned to your instrument in a reverse orientation, any remaining debris could be flushed out and deposited further down the fluid path. If this frit is being used as a column head frit, the debris may be washed directly onto the column bed.

## 0.5 $\mu\text{m}$ Stainless Steel Frits



## 2 $\mu\text{m}$ Stainless Steel Frits



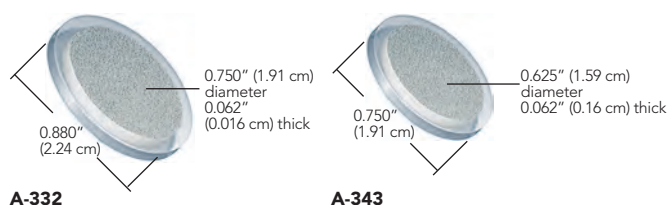
## NOTE

Frits without the polymer rings cannot be used with our standard Precolumn and Inline Filter assemblies.

## Semi-Prep Stainless Steel Frits

Many of these frits come complete with a PCTFE, ETFE, or PTFE sealing ring. Choose from 2  $\mu\text{m}$ , 5  $\mu\text{m}$ , 10  $\mu\text{m}$ , and 20  $\mu\text{m}$  filtration porosities and a range of diameters to match your intended flow rate and filtration requirements.

## 2 $\mu\text{m}$ Semi-Prep Stainless Steel Frits

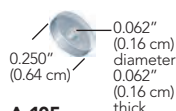
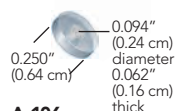


## Stainless Steel Frits (Cont.)

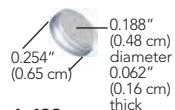
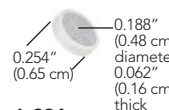
### 5 µm Semi-Prep Stainless Steel Frits

**C-417**

### 10 µm Semi-Prep Stainless Steel Frits

**A-105****A-106****A-107****A-331**

### 20 µm Semi-Prep Stainless Steel Frits

**A-120****A-122****A-224****A-337**

## Stainless Steel Frits

| Part No.                               | Porosity | Disc Diameter    | Disc Thickness   | Ring OD          | Ring Material | Frit Volume | Qty. |
|----------------------------------------|----------|------------------|------------------|------------------|---------------|-------------|------|
| <b>STAINLESS STEEL FRITS</b>           |          |                  |                  |                  |               |             |      |
| <b>A-100</b>                           | 2 µm     | 0.094" (0.24 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PEEK          | 1.7 µL      | ea.  |
| <b>A-101</b>                           | 2 µm     | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PEEK          | 0.7 µL      | ea.  |
| <b>A-102</b>                           | 0.5 µm   | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PEEK          | 0.6 µL      | ea.  |
| <b>A-103</b>                           | 0.5 µm   | 0.094" (0.24 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PEEK          | 1.4 µL      | ea.  |
| <b>A-420</b>                           | 2 µm     | 0.125" (0.32 cm) | 0.062" (0.16 cm) | 0.200" (0.51 cm) | PCTFE         | 3.0 µL      | ea.  |
| <b>C-128-31</b>                        | 0.5 µm   | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.125" (0.32 cm) | PEEK          | 0.1 µL      | ea.  |
| <b>C-140-30</b>                        | 0.5 µm   | 0.188" (0.48 cm) | 0.062" (0.16 cm) | 0.254" (0.65 cm) | PCTFE         | 6.5 µL      | ea.  |
| <b>C-401</b>                           | 2 µm     | 0.125" (0.32 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PEEK          | 3.0 µL      | ea.  |
| <b>C-402</b>                           | 2 µm     | 0.188" (0.48 cm) | 0.062" (0.16 cm) | 0.254" (0.65 cm) | PEEK          | 7.8 µL      | ea.  |
| <b>C-407</b>                           | 2 µm     | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.062" (0.16 cm) | PCTFE         | 0.1 µL      | ea.  |
| <b>C-408</b>                           | 2 µm     | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.125" (0.32 cm) | PEEK          | 0.1 µL      | ea.  |
| <b>C-409</b>                           | 0.5 µm   | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.062" (0.16 cm) | PCTFE         | 0.1 µL      | ea.  |
| <b>C-420</b>                           | 2 µm     | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.192" (0.49 cm) | PCTFE         | 0.1 µL      | ea.  |
| <b>C-425</b>                           | 0.5 µm   | 0.038" (0.10 cm) | 0.028" (0.07 cm) | 0.192" (0.49 cm) | PCTFE         | 0.1 µL      | ea.  |
| <b>SEMI-PREP STAINLESS STEEL FRITS</b> |          |                  |                  |                  |               |             |      |
| <b>A-105</b>                           | 10 µm    | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 0.9 µL      | ea.  |
| <b>A-106</b>                           | 10 µm    | 0.094" (0.24 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 2.0 µL      | ea.  |
| <b>A-107</b>                           | 10 µm    | 0.189" (0.48 cm) | 0.062" (0.16 cm) | 0.254" (0.65 cm) | PCTFE         | 9.1 µL      | ea.  |
| <b>A-120</b>                           | 20 µm    | 0.125" (0.32 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 3.7 µL      | ea.  |
| <b>A-122</b>                           | 20 µm    | 0.188" (0.48 cm) | 0.062" (0.16 cm) | 0.254" (0.65 cm) | PCTFE         | 9.7 µL      | ea.  |
| <b>A-224</b>                           | 20 µm    | 0.188" (0.48 cm) | 0.062" (0.16 cm) | 0.254" (0.65 cm) | PTFE          | 9.7 µL      | ea.  |
| <b>A-331</b>                           | 10 µm    | 0.750" (1.91 cm) | 0.062" (0.16 cm) | 0.880" (2.24 cm) | ETFE          | 141.9 µL    | ea.  |
| <b>A-332</b>                           | 2 µm     | 0.750" (1.91 cm) | 0.062" (0.16 cm) | 0.880" (2.24 cm) | ETFE          | 141.9 µL    | ea.  |
| <b>A-337</b>                           | 20 µm    | 0.750" (1.91 cm) | 0.062" (0.16 cm) | 0.880" (2.24 cm) | ETFE          | 152 µL      | ea.  |
| <b>A-343</b>                           | 2 µm     | 0.625" (1.59 cm) | 0.062" (0.16 cm) | 0.750" (1.91 cm) | PCTFE         | 112.6 µL    | ea.  |



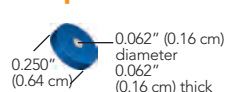
# PEEK Frits

- › Inert, biocompatible, and metal-free
- › Uniform porosity, longer filtration life
- › Sealing rings manufactured from PCTFE

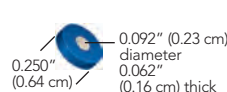
Patented IDEX Health & Science PEEK Frits offer exceptionally uniform porosity. This property ensures longer filtration life and consistent frit-to-frit swept volumes. The PEEK polymer frit discs are biocompatible and inert to most solvents, making them well-suited for bioanalytical applications. PEEK's robust properties make these products suitable for low and high pressure applications.

Disc rings, included on all PEEK frits, are made of PCTFE and are slightly thicker than the frit disc, providing enhanced sealing and excellent chemical resistance. PCTFE surrounded PEEK frits can be used up to 80 °C.

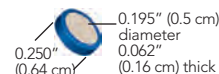
## 0.5 µm PEEK Frits



A-701

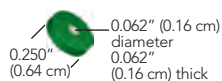


A-703

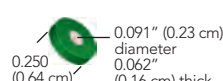


A-707

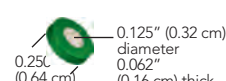
## 2 µm PEEK Frits



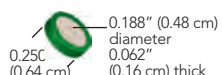
A-700



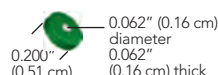
A-702



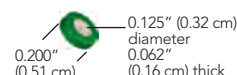
A-704



A-706

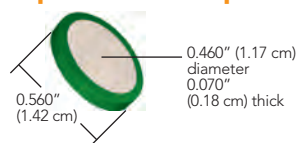


A-708



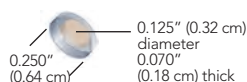
A-710

## 2 µm Semi-Prep PEEK Frits

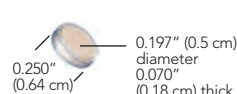


OC-802

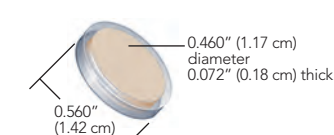
## 5 µm and 10 µm PEEK Frits



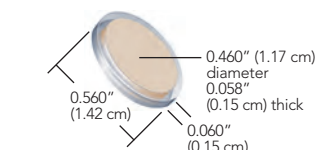
A-720



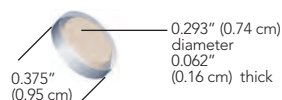
A-722



OC-803



OC-805



OC-815

## PEEK Frits (Cont.)

### NOTE

- › The thickness dimension in the part drawings and the pricing tables represents the thickness of the frit disc not the frit ring. Frit rings are often slightly thicker to ensure a proper seal. When tightened into a filter holder the ring compresses to nearly match the thickness of the frit disc.
- › The manufacturing process may cause some slight color variance in our PEEK frits. This does not affect their quality or performance. Frit dimensions are approximate. Actual batch-to-batch frit dimensions may vary slightly.

### RELATED PRODUCTS

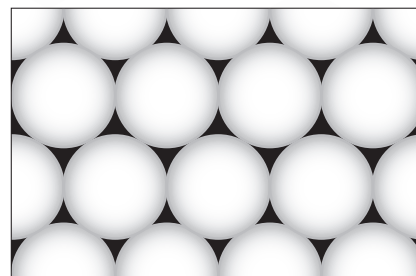
Any 0.247" to 0.254" diameter frit (including polymer ring) can be used with the Standard HPLC Inline Solvent Filters on page 102 and the Standard Precolumn Filters on page 105.

### APPLICATION NOTE

#### Frit Volume

The term "frit volume" refers to the volume of the various fluid pathways that comprise the matrix of a frit. A standard frit is a mass of small particles fused together through a controlled process of compression and heat. Because of their shape, there are gaps between the fused particles. Fluid makes its way through these gaps, creating a pathway from one side of the frit to the other (see the diagram, below, where the white circles represent frit particles, and the black area represents the void between the particles.)

Generally, when the frit particles increase in size, the frit's porosity increases as well. The larger the particles, the larger the gaps between particles. Cumulatively, these gaps comprise what is known as "frit volume." Using gravimetric determination, it has been experimentally shown that the total volume of any given frit may range from 18%–30%, depending upon the porosity of the frit.



Frit volume is calculated by determining what the mass of the frit would be if it were a solid block of material of equal size. Then the solid mass of the frit is multiplied by the percentage assigned to the porosity to determine the theoretical frit volume.

|                      |                     |                     |
|----------------------|---------------------|---------------------|
| 20% for 0.5 µm frits | 26% for 5 µm frits  | 30% for 20 µm frits |
| 24% for 2 µm frits   | 28% for 10 µm frits |                     |

From a chromatographic perspective, it's important to know the volume of the frit used in your system. It is possible for a frit to negatively impact your chromatography if the total frit volume is too large and if it is placed in an area through which the sample will pass. To avoid frit-related problems like band broadening and loss of resolution, most inline filters placed after the sample introduction point (e.g., between the injection valve and the column) are smaller in size and porosity than inline filters that are placed in areas before the sample is introduced into the flow path (e.g., between the pump and the injection valve).

## PEEK Frits

| Part No.                    | Porosity | Disc Diameter    | Disc Thickness   | Ring OD          | Ring Material | Frit Volume | Qty. |
|-----------------------------|----------|------------------|------------------|------------------|---------------|-------------|------|
| <b>PEEK FRITS</b>           |          |                  |                  |                  |               |             |      |
| <b>A-700</b>                | 2 µm     | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 0.7 µL      | ea.  |
| <b>A-701</b>                | 0.5 µm   | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 0.6 µL      | ea.  |
| <b>A-702</b>                | 2 µm     | 0.091" (0.23 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 1.7 µL      | ea.  |
| <b>A-703</b>                | 0.5 µm   | 0.092" (0.23 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 1.4 µL      | ea.  |
| <b>A-704</b>                | 2 µm     | 0.125" (0.32 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 3.0 µL      | ea.  |
| <b>A-706</b>                | 2 µm     | 0.188" (0.48 cm) | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 7.1 µL      | ea.  |
| <b>A-707</b>                | 0.5 µm   | 0.195" (0.5 cm)  | 0.062" (0.16 cm) | 0.250" (0.64 cm) | PCTFE         | 6.1 µL      | ea.  |
| <b>A-708</b>                | 2 µm     | 0.062" (0.16 cm) | 0.062" (0.16 cm) | 0.200" (0.51 cm) | PCTFE         | 0.7 µL      | ea.  |
| <b>A-710</b>                | 2 µm     | 0.125" (0.32 cm) | 0.062" (0.16 cm) | 0.200" (0.51 cm) | PCTFE         | 3.0 µL      | ea.  |
| <b>SEMI-PREP PEEK FRITS</b> |          |                  |                  |                  |               |             |      |
| <b>A-720</b>                | 10 µm    | 0.125" (0.32 cm) | 0.070" (0.18 cm) | 0.250" (0.64 cm) | PCTFE         | 4.2 µL      | ea.  |
| <b>A-722</b>                | 10 µm    | 0.197" (0.5 cm)  | 0.070" (0.18 cm) | 0.250" (0.64 cm) | PCTFE         | 9.9 µL      | ea.  |
| <b>OC-802</b>               | 2 µm     | 0.460" (1.17 cm) | 0.070" (0.18 cm) | 0.560" (1.42 cm) | PCTFE         | 46.4 µL     | ea.  |
| <b>OC-803</b>               | 10 µm    | 0.460" (1.17 cm) | 0.072" (0.18 cm) | 0.560" (1.42 cm) | PCTFE         | 57.2 µL     | ea.  |
| <b>OC-805</b>               | 5 µm     | 0.460" (1.17 cm) | 0.058" (0.15 cm) | 0.560" (1.42 cm) | PCTFE         | 41.1 µL     | ea.  |
| <b>OC-815</b>               | 5 µm     | 0.293" (0.74 cm) | 0.062" (0.16 cm) | 0.375" (0.95 cm) | PCTFE         | 17.8 µL     | ea.  |

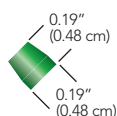


# Frit-in-a-Ferrule™

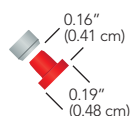
- › Seals and filters simultaneously
- › Less expensive and more convenient than traditional inline filter systems
- › Available in both Flangeless and Super Flangeless™ versions

Now you can filter at any point in your system where 1/16" or 1/8" OD tubing is used in a flat-bottom 1/4-28, M6 or 5/16-24 connection.

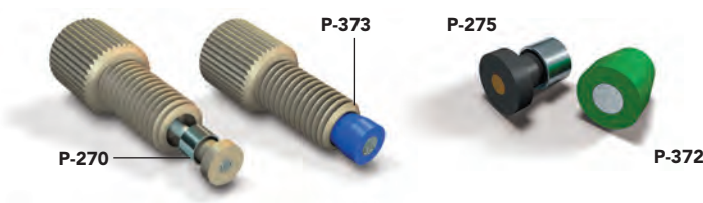
Our Frit-In-A-Ferrule product line is designed to seal and filter simultaneously by incorporating a frit into the body of a flat-bottom ferrule. This simple design allows you to eliminate traditional inline filters and reduce the number of additional connections in your system.



**P-372**  
Flangeless Frit-In-A-Ferrule  
for 1/8" OD tubing



**P-276**  
Super Flangeless Frit-In-A-Ferrule  
for 1/16" OD tubing



| Part No.                                     | Description                                                    | Porosity | Frit Material | Frit Diameter | Frit Thickness | Swept Volume | Maximum Pressure    | Qty. |
|----------------------------------------------|----------------------------------------------------------------|----------|---------------|---------------|----------------|--------------|---------------------|------|
| <b>FRIT-IN-A-FERRULE FOR 1/16" OD TUBING</b> |                                                                |          |               |               |                |              |                     |      |
| <b>P-270</b>                                 | Super Flangeless, Natural PEEK, SST lock ring                  | 2 µm     | SST           | 0.062"        | 0.062"         | 0.74 µL      | 2,500 psi (172 bar) | ea.  |
| <b>P-272</b>                                 | Flangeless, Green PCTFE                                        | 2 µm     | SST           | 0.062"        | 0.062"         | 0.74 µL      | 2,000 psi (138 bar) | ea.  |
| <b>P-273</b>                                 | Flangeless, Blue PCTFE                                         | 0.5 µm   | SST           | 0.062"        | 0.062"         | 0.61 µL      | 2,000 psi (138 bar) | ea.  |
| <b>P-274</b>                                 | Super Flangeless, Natural PEEK, SST lock ring                  | 2 µm     | PEEK          | 0.046"        | 0.030"         | 0.20 µL      | 2,500 psi (172 bar) | ea.  |
| <b>P-275</b>                                 | Super Flangeless, Black PEEK, SST lock ring                    | 0.5 µm   | PEEK          | 0.046"        | 0.030"         | 0.16 µL      | 2,500 psi (172 bar) | ea.  |
| <b>P-276</b>                                 | Super Flangeless, Stainless Steel, Natural ETFE, SST lock ring | 10 µm    | SST           | 0.062"        | 0.062"         | 0.90 µL      | 2,500 psi (172 bar) | ea.  |
| <b>FRIT-IN-A-FERRULE FOR 1/8" OD TUBING</b>  |                                                                |          |               |               |                |              |                     |      |
| <b>P-372</b>                                 | Flangeless, Green PCTFE                                        | 2 µm     | SST           | 0.094"        | 0.062"         | 1.69 µL      | 500 psi (34 bar)    | ea.  |
| <b>P-373</b>                                 | Flangeless, Blue PCTFE                                         | 0.5 µm   | SST           | 0.094"        | 0.062"         | 1.41 µL      | 500 psi (34 bar)    | ea.  |
| <b>P-374</b>                                 | Super Flangeless**, Natural PEEK, SST lock ring                | 2 µm     | PEEK          | 0.094"        | 0.042"         | 1.15 µL      | 2,500 psi (172 bar) | ea.  |

\* Swept volumes include/reflect theoretical frit volume values.

\*\* The 1/8" Super Flangeless versions cannot be used in M6 ports.



# Bottom-of-the-Bottle™ Filters

Our uniquely designed Bottom-of-the-Bottle™ Filters effectively protect your system by filtering out particulate matter that may otherwise damage expensive hardware.

## Stainless Steel Bottom-of-the-Bottle Solvent Filters

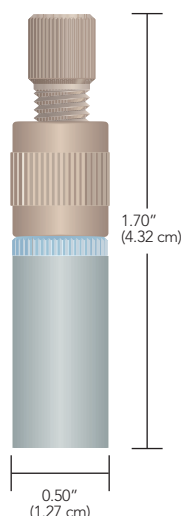
- › Draws solvent from within 1/8" of the bottom of the bottle
- › Replaceable stainless steel filter cups
- › Versions for 1/8" and 3/16" OD tubing
- › Materials of construction: PEEK, ETFE, and 316 Stainless Steel

Patented Stainless Steel Bottom-of-the-Bottle Solvent Filter Assemblies feature a 2 µm or 10 µm replaceable stainless steel filter cup and a design that allows solvent to be drawn from within 1/8" of the bottom of your solvent bottle. The filter cups are inexpensive and easy to replace, making this an economical, trouble-free choice.

### A-550

Bottom-of-the-Bottle Inlet Solvent Filter

Maximum Flow Rates:  
2 µm—up to 10 mL/min.  
10 µm—up to 40 mL/min.

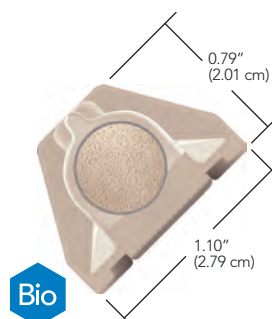
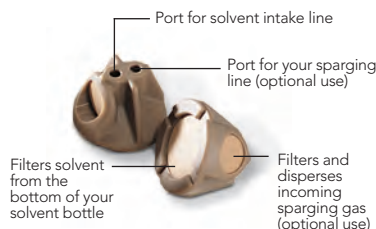


## All-PEEK Bottom-of-the-Bottle Solvent Filters

- › Most recommended filtering unit
- › 100% PEEK polymer construction
- › Easy operation — no fittings required

These biocompatible filters are made from 100% PEEK polymer, including the two built-in PEEK frits. The bottom frit (2 µm or 10 µm) will draw solvents from within 0.080" (2.0 mm) of the bottom of the solvent bottle. The 2 µm frit on the side may be used for a 1/8" OD helium sparging line.

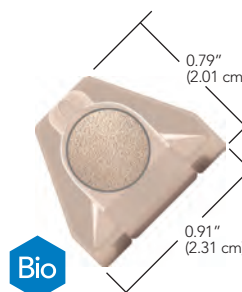
To use, simply press fit your appropriately sized fluoropolymer tubing firmly into the top holes. That's it!



### A-435

Bottom-of-the-Bottle Filter

Maximum Flow Rate: up to 30 mL/min



### A-438

Bottom-of-the-Bottle Filter  
(for small neck bottles)

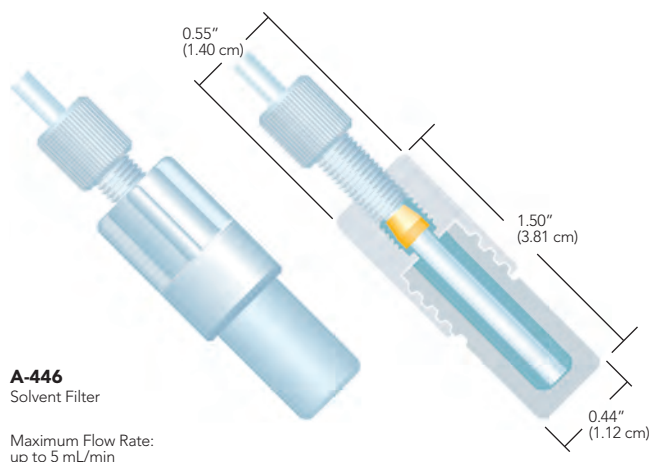


## UHMWPE Bottom-of-the-Bottle™ Solvent Filters

- › Replaceable filter cup
- › Economical
- › Materials of construction: UHMWPE, ETFE
- › Versions for 1/16" and 1/8" OD tubing

The design of the UHMWPE solvent filters allows tubing to pass through to the bottom of the filter cup, enabling the filter to draw solvent from within 0.10" (2.5 mm) of the bottom of your solvent bottle.

*Please Note: UHMWPE is a hydrophobic material. To establish proper surface wetting, you may need to prime the filter with methanol or acetonitrile.*



## Bottom-of-the-Bottle Filters

| Part No.                                                           | Description                                  | Porosity | For Tubing Size | Includes   | Qty. |
|--------------------------------------------------------------------|----------------------------------------------|----------|-----------------|------------|------|
| <b>STAINLESS STEEL BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS</b>        |                                              |          |                 |            |      |
| <b>A-550</b>                                                       | SST Filter Assembly, with A-520 filter cup   | 10 µm    | 1/8" OD         | (1) XP-130 | ea.  |
| <b>A-551</b>                                                       | SST Filter Assembly, with A-522 filter cup   | 2 µm     | 1/8" OD         | (1) XP-130 | ea.  |
| <b>A-520x</b>                                                      | SST Replacement Solvent Filter Cups, 10-pk   | 10 µm    | —               | —          | ea.  |
| <b>A-522x</b>                                                      | SST Replacement Solvent Filter Cups, 10-pk   | 2 µm     | —               | —          | ea.  |
| <b>ALL-PEEK BIOCOMPATIBLE BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS</b> |                                              |          |                 |            |      |
| <b>A-435</b>                                                       | PEEK Filter                                  | 2 µm     | 1/8" OD         | —          | ea.  |
| <b>A-437</b>                                                       | PEEK Filter, for small-neck (GL-38) bottles  | 2 µm     | 1/8" OD         | —          | ea.  |
| <b>A-438</b>                                                       | PEEK Filter, for small-neck (GL-38) bottles  | 10 µm    | 1/8" OD         | —          | ea.  |
| <b>A-440</b>                                                       | PEEK Filter                                  | 10 µm    | 1/8" OD         | —          | ea.  |
| <b>A-441</b>                                                       | PEEK Filter                                  | 10 µm    | 3/16" OD        | —          | ea.  |
| <b>A-451</b>                                                       | PEEK Filter                                  | 10 µm    | 1/16" OD        | —          | ea.  |
| <b>UHMWPE BIOCOMPATIBLE BOTTOM-OF-THE-BOTTLE SOLVENT FILTERS</b>   |                                              |          |                 |            |      |
| <b>A-445</b>                                                       | UHMWPE Filter Assembly                       | 10 µm    | 1/16" OD        | (1) XP-245 | ea.  |
| <b>A-446</b>                                                       | UHMWPE Filter Assembly                       | 10 µm    | 1/8" OD         | (1) XP-345 | ea.  |
| <b>A-427</b>                                                       | UHMWPE Replacement Solvent Filter Cups, 5-pk | 10 µm    | —               | —          | ea.  |



# Inlet Solvent Filters

- › Large surface areas prevent pump cavitation
- › Disposable
- › 2  $\mu\text{m}$ , 10  $\mu\text{m}$ , and 20  $\mu\text{m}$  pore sizes available
- › General use and prep filters for higher flow applications



## APPLICATION NOTE

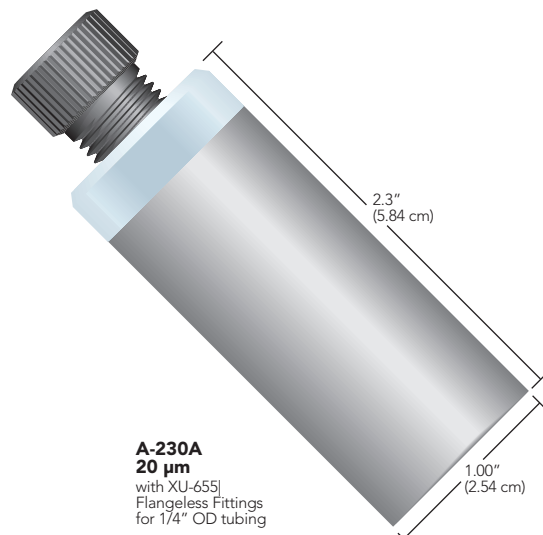
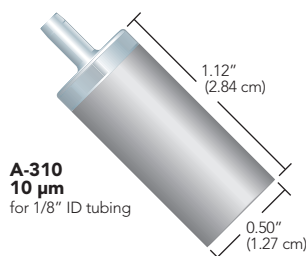
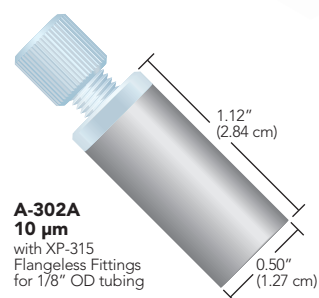
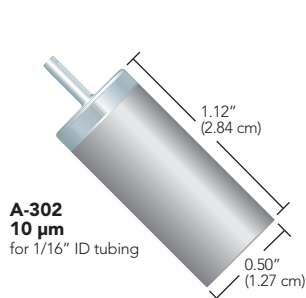
### Why Use An Inlet Solvent Filter?

- › To filter out particulate matter from the solvent that may otherwise damage expensive hardware. (Use a 10  $\mu\text{m}$  or 20  $\mu\text{m}$  version for this purpose. The A-309 and A-230A filters have an added "Bottom of the Bottle"™ feature to help draw solvent to within 1/8" of the bottom of your solvent bottle.)
- › To prevent particulates originating from the sparging system from entering the mobile phase reservoir and to help disperse the sparging gas efficiently. (Use a 2  $\mu\text{m}$  filter for this purpose.)
- › To hold your tubing in place at the bottom of the bottle. (Most stainless steel filter options work best for this purpose.)

*Note: It is usually a good idea to change the inlet filter as part of your semi-annual or annual preventative maintenance program.*

It is good practice to filter your solvents to prevent pump damage. Our 316 stainless steel filters provide that protection.

Because filters should be changed periodically, we make it easy to replace them without tools. For those filters using a plastic fitting, the tubing can be reconnected by finger tightening the fitting into the new filter. The filters with stems allow easy insertion into the inlet tubing.



| Part No.                                                  | Description                                   | Porosity         | Material   | For Tubing Size | Includes              | Max. Suggested Flow Rate* | Qty. |
|-----------------------------------------------------------|-----------------------------------------------|------------------|------------|-----------------|-----------------------|---------------------------|------|
| <b>INLET SOLVENT FILTERS FOR ANALYTICAL HPLC</b>          |                                               |                  |            |                 |                       |                           |      |
| <b>A-242</b>                                              | Inlet Solvent Filter with One-Piece Fitting   | 2 $\mu\text{m}$  | PCTFE, SST | 1/8" OD         | (1) P-100             | 10 mL/min                 | ea.  |
| <b>A-243</b>                                              | A-242, 5-pack                                 | 2 $\mu\text{m}$  | PCTFE, SST | 1/8" OD         | (5) P-100             | 10 mL/min                 | ea.  |
| <b>A-228</b>                                              | Inlet Solvent Filter with stem                | 2 $\mu\text{m}$  | SST        | 1/8" ID         | —                     | 80 mL/min                 | ea.  |
| <b>A-302</b>                                              | Inlet Solvent Filter with stem                | 10 $\mu\text{m}$ | SST        | 1/16" ID        | —                     | 40 mL/min                 | ea.  |
| <b>A-302A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 10 $\mu\text{m}$ | PCTFE, SST | 1/8" OD         | (1) XP-315            | 40 mL/min                 | ea.  |
| <b>A-309</b>                                              | Inlet Solvent Filter with stem                | 10 $\mu\text{m}$ | SST        | 1/16" ID        | —                     | 40 mL/min                 | ea.  |
| <b>A-231A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 20 $\mu\text{m}$ | PCTFE, SST | 3/16" OD        | (1) XP-132            | 100 mL/min                | ea.  |
| <b>A-310</b>                                              | Inlet Solvent Filter with stem                | 10 $\mu\text{m}$ | SST        | 1/8" ID         | —                     | 40 mL/min                 | ea.  |
| <b>INLET SOLVENT FILTERS FOR PREPARATIVE HPLC SYSTEMS</b> |                                               |                  |            |                 |                       |                           |      |
| <b>A-225</b>                                              | Inlet Solvent Filter with stem                | 20 $\mu\text{m}$ | SST        | 1/16" ID        | —                     | 100 mL/min                | ea.  |
| <b>A-225A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 20 $\mu\text{m}$ | PCTFE, SST | 1/8" OD         | (1) P-315, (1) P-300N | 100 mL/min                | ea.  |
| <b>A-227A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 10 $\mu\text{m}$ | PCTFE, SST | 1/4" OD         | (1) XU-655            | 100 mL/min                | ea.  |
| <b>A-230A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 20 $\mu\text{m}$ | PCTFE, SST | 1/4" OD         | (1) XU-655            | 100 mL/min                | ea.  |
| <b>A-311</b>                                              | Inlet Solvent Filter with stem                | 10 $\mu\text{m}$ | SST        | 1/16" ID        | —                     | 100 mL/min                | ea.  |
| <b>A-311A</b>                                             | Inlet Solvent Filter with Flangeless Fittings | 10 $\mu\text{m}$ | PCTFE, SST | 1/8" OD         | (1) XP-315            | 100 mL/min                | ea.  |

\* Maximum suggested flow rates are determined by porosity and surface area.



# Inline Filters

- › Specially engineered for inline filtration
- › Versions include Micro, Standard, and Semi-Preparative
- › Bio-inert and stainless steel options offered
- › Variety of porosities, application appropriate



## RELATED PRODUCTS

### Fittings

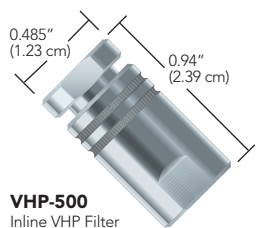
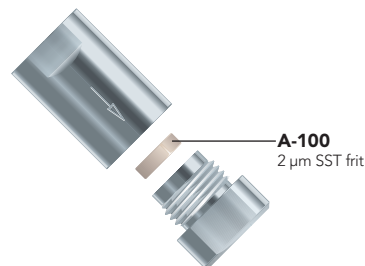
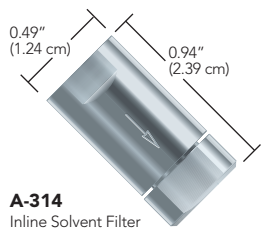
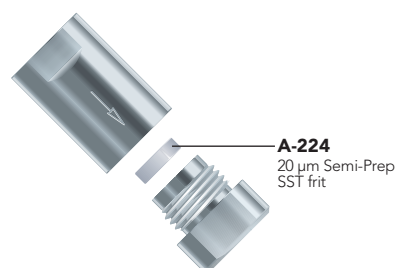
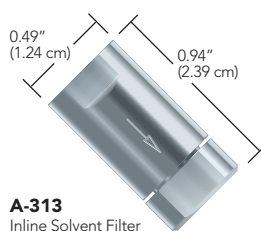
All Standard Inline Solvent Filters have 10-32 threads for 1/16" OD tubing, allowing the use of most standard chromatography high pressure fittings.

Our Inline Filters are specially engineered for inline filtration. It is specifically designed to help prevent particulate contamination from clogging sensitive equipment. It is ideally suited for placement along the flow path line between the pump and injection valve/autosampler. We offer a variety of porosities for your application.

### Standard Inline Solvent Filters

- › For 1/16" OD tubing
- › Versions for Standard HPLC (6,000 psi/414 bar) and UHPLC (25,000 psi/1,725 bar)
- › Replacement frits available Versions for Standard HPLC (6,000 psi/414 bar) and UHPLC (25,000 psi/1,725 bar)
- › Help prevent particulate contamination from clogging sensitive equipment
- › Ideally suited for placement along the flow path line between the pump and injection valve/autosampler

Inline filter assemblies that begin with the letter "A" are engineered for standard HPLC applications (up to 6,000 psi/414 bar). Inline Filter Assemblies that begin with the "VHP" prefix are suitable for use in UHPLC systems, where pressures can reach 25,000 psi (1,725 bar).

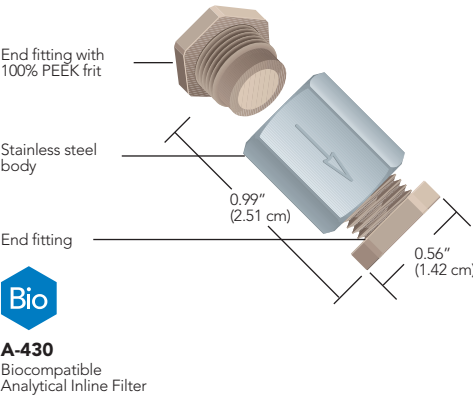


Inline Filters (Cont.)

Biocompatible Standard Inline Filters

- › 0.5 µm and 2 µm versions available
- › Features 100% PEEK flow path

Our A-430 and A-431 Inline Filters consist of a stainless steel body and two PEEK end fittings. Maximum recommended flow rate is 25 mL/min for the A-430 Filter and 10 mL/min for the A-431 Filter. And, you get the added benefit of biocompatibility since all wetted surfaces are PEEK. When you need to replace the frit, simply dispose of the end fitting that contains the frit and replace it with a new one.



Inline Filters

| Part No.                        | Description                                        | Porosity | For Tubing Size | Threads     | Includes    | Swept Volume | Pressure Rating        | Qty.  |
|---------------------------------|----------------------------------------------------|----------|-----------------|-------------|-------------|--------------|------------------------|-------|
| STANDARD INLINE SOLVENT FILTERS |                                                    |          |                 |             |             |              |                        |       |
| A-313                           | Solvent Filter Assembly                            | 20 µm    | 1/16" OD        | 10-32 Coned | (1) A-224   | 12.3 µL      | 6,000 psi (414 bar)    | ea.   |
| A-314                           | Solvent Filter Assembly                            | 2 µm     | 1/16" OD        | 10-32 Coned | (1) A-100   | 4 µL         | 6,000 psi (414 bar)    | ea.   |
| A-100                           | Replacement Frits, Stainless Steel, ea.            | 2 µm     | N/A             | —           | —           | 1.4 µL       | N/A                    | ea.   |
| A-224                           | Replacement Frits, Stainless Steel, ea.            | 20 µm    | N/A             | —           | —           | 9.7 µL       | N/A                    | ea.   |
| VHP-500                         | Inline VHP Filter                                  | 0.5 µm   | 1/16" OD        | 10-32 Coned | (5) VHP-501 | 1.2 µL       | 25,000 psi (1,725 bar) | ea.   |
| VHP-505                         | Inline VHP Filter                                  | 0.2 µm   | 1/16" OD        | 10-32 Coned | (5) VHP-506 | 1.1 µL       | 25,000 psi (1,725 bar) | ea.   |
| VHP-501                         | Replacement Inline VHP Frit                        | 0.5 µm   | N/A             | N/A         | N/A         | 0.60 µL      | N/A                    | ea.   |
| VHP-506                         | Replacement Inline VHP Frit                        | 0.2 µm   | N/A             | N/A         | N/A         | 0.54 µL      | N/A                    | ea.   |
| BIOCOMPATIBLE INLINE FILTERS    |                                                    |          |                 |             |             |              |                        |       |
| A-430                           | Biocompatible Filter Assembly                      | 2 µm     |                 | 10-32 Coned | (1) A-429   | 7.1 µL       | 6,000 psi (414 bar)    | ea.   |
| A-431                           | Biocompatible Filter Assembly                      | 0.5 µm   |                 | 10-32 Coned | (1) A-428   | 5.9 µL       | 6,000 psi (414 bar)    | ea.   |
| A-428x                          | PEEK Filter End Fittings, Black PEEK body, 10-pk   | 0.5 µm   |                 | 10-32 Coned | —           | 5.7 µL       | N/A                    | 10-pk |
| A-429x                          | PEEK Filter End Fittings, Natural PEEK body, 10-pk | 2 µm     |                 | 10-32 Coned | —           | 6.9 µL       | N/A                    | 10-pk |

\*Swept volumes include/reflect theoretical frit volume values.  
SST = Stainless Steel



# Precolumn Filters

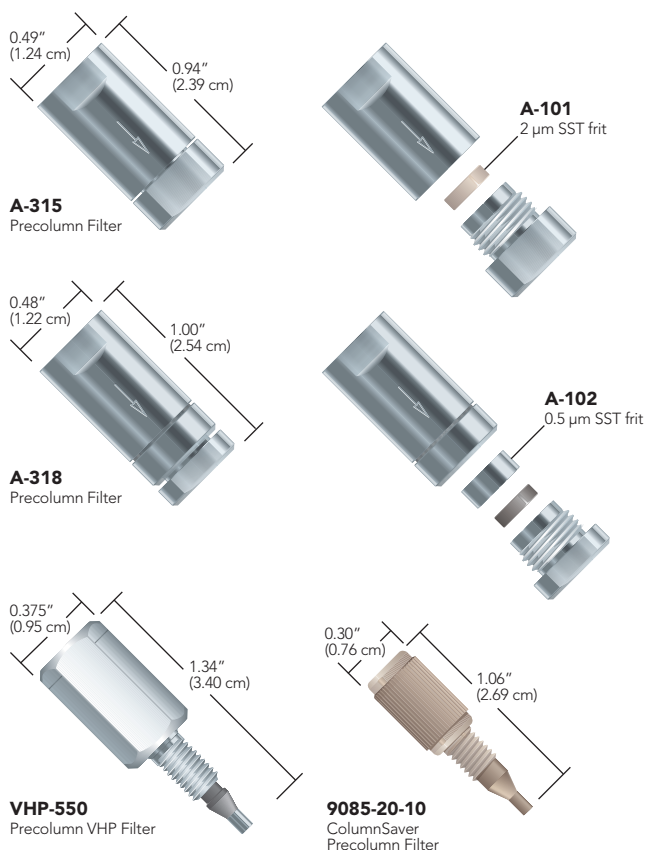
Our economical Precolumn Filters offer secure protection for analytical columns in HPLC and UHPLC. We offer traditional versions that can successfully connect tubing on both sides and our direct-connect versions attach to the inlet port of most standard columns. All versions feature a 10-32 coned ports for 1/16" OD tubing.

## Standard Precolumn Filters

- › Economical protection for larger columns and injections
- › Traditional versions connect tubing on both sides
- › Direct-connect versions attach to the inlet port of most standard columns
- › All versions feature 10-32 coned ports for 1/16" OD tubing

These are designed to protect columns by filtering out particulate matter originating from the sample or from rotor seal wear.

- › Assemblies that begin with the letter "A" are traditional versions for standard HPLC
- › Assemblies that begin with "VHP" are direct-connect versions for UHPLC applications
- › Versions that begin with "9085" are direct-connect for standard HPLC and must be used with polymer fittings

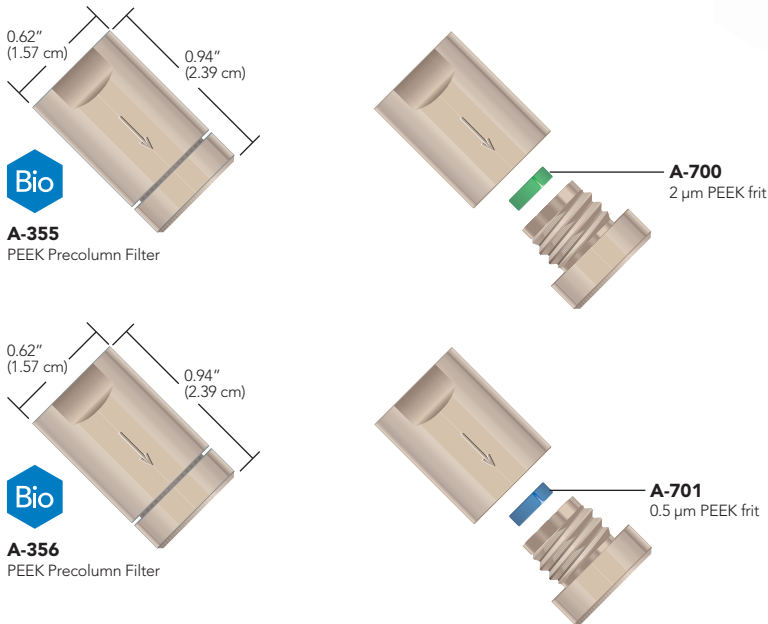


Precolumn Filters (Cont.)

Biocompatible Precolumn Filters

- › Pre-assembled with either 0.5 µm or 2 µm porosity frits
- › Great column protection
- › Feature PEEK bodies and PCTFE-surrounded PEEK frits

Biocompatible Precolumn Filters have 0.020" (0.50 mm) diameter thru-holes and 8° distribution cones for minimal band spreading and mixing. The bodies of these filters are manufactured from biocompatible PEEK polymer and are pressure rated to 5,000 psi (345 bar). These filters are designed for use with 1/16" OD tubing, which can be connected to these filters using standard Fingertight fittings.



Precolumn Filters

| Part No.                        | Description                                 | Porosity | For Tubing Size | Threads     | Includes    | Swept Volume* | Pressure Rating        | Qty.  |
|---------------------------------|---------------------------------------------|----------|-----------------|-------------|-------------|---------------|------------------------|-------|
| STANDARD PRECOLUMN FILTERS      |                                             |          |                 |             |             |               |                        |       |
| A-315                           | Solvent Filter Assembly                     | 2 µm     | 1/16" OD        | 10-32 Coned | (1) A-101   | 1.4 µL        | 6,000 psi (414 bar)    | ea.   |
| A-318                           | Solvent Filter Assembly                     | 0.5 µm   | 1/16" OD        | 10-32 Coned | (1) A-102   | 0.84 µL       | 6,000 psi (414 bar)    | ea.   |
| A-101                           | Replacement Frits, Stainless Steel, ea.     | 2 µm     | N/A             | —           | —           | 0.74 µL       | N/A                    | ea.   |
| A-102                           | Replacement Frits, Stainless Steel, ea.     | 0.5 µm   | N/A             | —           | —           | 0.61 µL       | N/A                    | ea.   |
| VHP-550                         | Precolumn VHP Filter                        | 0.5 µm   | 1/16" OD        | 10-32 Coned | (5) VHP-551 | 1.9 µL        | 20,000 psi (1,380 bar) | ea.   |
| VHP-555                         | Precolumn VHP Filter                        | 0.2 µm   | 1/16" OD        | 10-32 Coned | (5) VHP-556 | 1.8 µL        | 20,000 psi (1,380 bar) | ea.   |
| VHP-551                         | Replacement Precolumn VHP Frit Assembly     | 0.5 µm   | N/A             | N/A         | N/A         | 1.9 µL        | N/A                    | ea.   |
| VHP-556                         | Replacement Precolumn VHP Frit Assembly     | 0.2 µm   | N/A             | N/A         | N/A         | 1.8 µL        | N/A                    | ea.   |
| 9085-05-10                      | ColumnSaver Precolumn Filter, with SST frit | 0.5 µm   | 1/16" OD        | 10-32 Coned | N/A         | 3.1 µL        | 6,000 psi (414 bar)    | 10-pk |
| 9085-20-10                      | ColumnSaver Precolumn Filter, with SST frit | 2 µm     | 1/16" OD        | 10-32 Coned | N/A         | 3.1 µL        | 6,000 psi (414 bar)    | 10-pk |
| BIOCOMPATIBLE PRECOLUMN FILTERS |                                             |          |                 |             |             |               |                        |       |
| A-355                           | Solvent Filter Assembly, Biocompatible      | 2 µm     |                 | 10-32 Coned | (1) A-700   | 1.4 µL        | 5,000 psi (345 bar)    | ea.   |
| A-356                           | Solvent Filter Assembly, Biocompatible      | 0.5 µm   |                 | 10-32 Coned | (1) A-701   | 1.3 µL        | 5,000 psi (345 bar)    | ea.   |
| A-700                           | Replacement Frit, PEEK Polymer              | 2 µm     |                 | —           | —           | 0.74 µL       | N/A                    | ea.   |
| A-701                           | Replacement Frit, PEEK Polymer              | 0.5 µm   |                 | —           | —           | 0.61 µL       | N/A                    | ea.   |

SST = Stainless Steel  
\*Swept volumes include/reflect theoretical frit volume values.

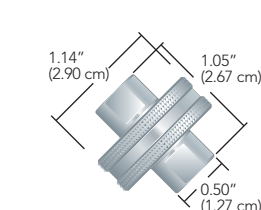


# Semi-Prep Filters

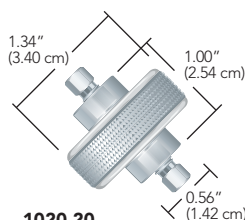
Biocompatible Semi-Prep Filters consist of a stainless steel body, two PEEK end fittings, and a separate PEEK frit. These filters are ideal for many higher flow analytical, semi-prep and preparative applications. Best of all, if the filter becomes clogged, simply unscrew the assembly, remove the frit and replace it. The frits are interchangeable.

## Semi-Prep Inline Filters

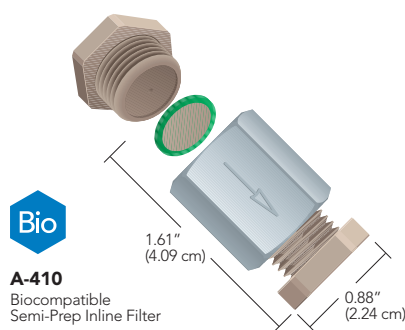
- › Designed for high-flow applications
- › Economical protection for larger columns and injections
- › SFC and HPLC compatible



**A-330**  
High Pressure Semi-Prep Inline Filter



**1020-20**  
Iso-Prep Filter  
Shown with standard 10-32 stainless steel nuts and ferrules (not included)



**A-410**  
Biocompatible  
Semi-Prep Inline Filter

## Biocompatible Semi-Prep Inline Filters

- › Versions for 1/16", 1/8", 3/16", 1/4", and 5/16" OD tubing
- › 100% PEEK flow path

Biocompatible Semi-Prep Filters consist of a stainless steel body, two PEEK end fittings, and a separate PEEK frit. These filters are ideal for many higher flow analytical, semi-prep and preparative applications. Best of all, if the filter becomes clogged, simply unscrew the assembly, remove the frit and replace it. The frits are interchangeable.

| Part No.                                      | Description                              | Porosity | Threads             | Includes    | Swept Volume* | Pressure Rating     | Qty. |
|-----------------------------------------------|------------------------------------------|----------|---------------------|-------------|---------------|---------------------|------|
| <b>SEMI-PREP INLINE FILTERS</b>               |                                          |          |                     |             |               |                     |      |
| <b>A-330</b>                                  | Semi-Prep Filter Assembly                | 10 µm    | 10-32 Coned         | (1) A-331   | 223 µL        | 7,500 psi (517 bar) | ea.  |
| <b>A-360</b>                                  | Semi-Prep Filter Assembly                | 10 µm    | 5/16-24 Flat Bottom | (1) A-331   | 235 µL        | 3,500 psi (207 bar) | ea.  |
| <b>A-331</b>                                  | Stainless Steel Frits, Natural ETFE ring | 10 µm    | N/A                 | N/A         | 142 µL        | N/A                 | ea.  |
| <b>A-332</b>                                  | Stainless Steel Frits, Natural ETFE ring | 2 µm     | N/A                 | N/A         | 122 µL        | N/A                 | ea.  |
| <b>A-337</b>                                  | Stainless Steel Frits, Natural ETFE ring | 20 µm    | N/A                 | N/A         | 152 µL        | N/A                 | ea.  |
| <b>ISO-PREP FILTERS</b>                       |                                          |          |                     |             |               |                     |      |
| <b>1020-05</b>                                | 21.2 mm Filter Holder                    | 0.5 µm   | 10-32 Coned         | (1) 7031-05 | 203 uL        | 8,000 psi (552 bar) | ea.  |
| <b>1020-20</b>                                | 21.2 mm Filter Holder                    | 2 µm     | 10-32 Coned         | (1) 7031-20 | 196 uL        | 8,000 psi (552 bar) | ea.  |
| <b>7031-05</b>                                | 21.2 mm Replacement Filter               | 0.5 µm   | N/A                 | N/A         | 122 uL        | 8,000 psi (552 bar) | ea.  |
| <b>7031-20</b>                                | 21.2 mm Replacement Filter               | 2 µm     | N/A                 | N/A         | 115 uL        | 8,000 psi (552 bar) | ea.  |
| <b>BIOCOMPATIBLE SEMI-PREP INLINE FILTERS</b> |                                          |          |                     |             |               |                     |      |
| <b>A-410</b>                                  | Biocompatible Filter Assembly            | 2 µm     | 10-32 Coned         | (1) OC-802  | 89 µL         | 6,000 psi (414 bar) | ea.  |
| <b>A-411</b>                                  | Biocompatible Filter Assembly            | 10 µm    | 10-32 Coned         | (1) OC-803  | 103 µL        | 6,000 psi (414 bar) | ea.  |
| <b>A-510</b>                                  | Biocompatible Filter Assembly            | 5 µm     | 5/16-24 Flat Bottom | (1) OC-805  | 89 µL         | 500 psi (34 bar)    | ea.  |
| <b>OC-802</b>                                 | PEEK Frit, Green PCTFE ring              | 2 µm     | N/A                 | N/A         | 46 µL         | N/A                 | ea.  |
| <b>OC-803</b>                                 | PEEK Frit, Natural PCTFE ring            | 10 µm    | N/A                 | N/A         | 57 µL         | N/A                 | ea.  |
| <b>OC-805</b>                                 | PEEK Frit, Natural PCTFE ring            | 5 µm     | N/A                 | N/A         | 50 µL         | N/A                 | ea.  |

\*Swept volumes include/reflect theoretical frit volume values.

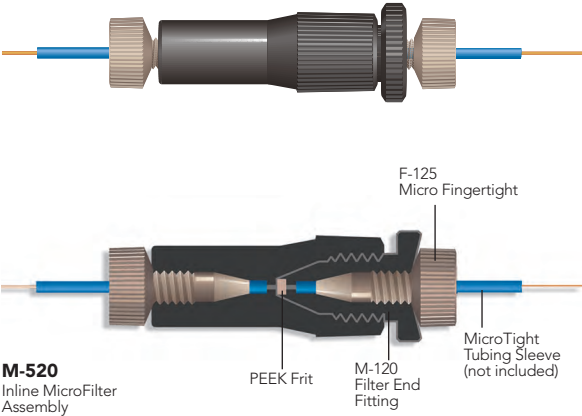




# Inline MicroFilters

- › 100% biocompatible PEEK polymer option available
- › Miniscale 240 nL void volume
- › Two versions: direct connect 1/32" OD tubing or use MicroTight® tubing sleeves for 70–520 µm OD capillary tubing

Our Inline MicroFilters protect your column from particles originating in the mobile phase or sample, or from pump seal and sample injection valve wear. These filters have a 0.006" (150 µm) thru-hole. Choose the M-520 with a 0.5 µm 100% PEEK frit to connect to capillary tubing using the MicroTight tubing sleeves (page 52). You may also directly connect 1/32" OD tubing using the M-525 which contains a 0.5 µm PEEK frit.



**M-520**  
Inline MicroFilter Assembly



**M-525**  
Inline MicroFilter Assembly

| Part No.                                    | Description                            | Porosity | For Tubing Size          | Threads                  | Includes             | Swept Volume | Pressure Rating     | Qty.  |
|---------------------------------------------|----------------------------------------|----------|--------------------------|--------------------------|----------------------|--------------|---------------------|-------|
| INLINE MICROFILTERS                         |                                        |          |                          |                          |                      |              |                     |       |
| M-520                                       | Inline MicroFilter Assembly, PEEK Frit | 0.5 µm   | MicroTight Tubing Sleeve | MicroTight Tubing Sleeve | (5) M-120, (2) F-125 | 240 nL       | 4,000 psi (276 bar) | ea.   |
| M-525                                       | Inline MicroFilter Assembly, PEEK Frit | 0.5 µm   | 1/32" OD                 | 1/32" OD                 | (5) M-140, (2) F-126 | 240 nL       | 4,000 psi (276 bar) | ea.   |
| REPLACEMENT INLINE MICROFILTER END-FITTINGS |                                        |          |                          |                          |                      |              |                     |       |
| M-120x                                      | End-Fittings, Black, with PEEK Frit    | 0.5 µm   | MicroTight Tubing Sleeve | MicroTight Tubing Sleeve | N/A                  | 216 nL       | N/A                 | 10-pk |
| M-140x                                      | End-Fittings, Natural, with PEEK Frit  | 0.5 µm   | 1/32" OD                 | 1/32" OD                 | N/A                  | 216 nL       | N/A                 | 10-pk |



# Mini MicroFilters

- › Total volume as low as 10 nL
- › Conductive version for CEC and mass spectrometry applications

Our Inline Mini MicroFilter Assemblies filter effectively with internal volumes low enough to ensure reliable chromatographic results — even at nanoliter per minute flow rates! Internal volumes of these encapsulated filters are as low as 85 nL with the micro-screen and 10 nL to 22 nL with the frit disc option.

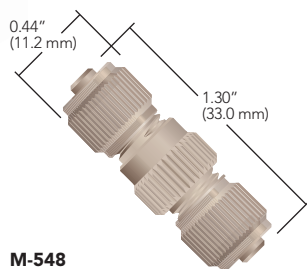


## APPLICATION NOTE

The Mini MicroFilters can be used to pack capillary tubing. Simply place one of these filters on the effluent side of the capillary tubing, then slurry pack. Once packed, place a filter at the head of the tubing. This creates a reliable capillary column without fusing the silica to make frits or pressing filter paper inside the capillary tubing.

### Increase the Life of Your Column

Why use a Precolumn Filter when there is a frit at the head of the column itself? Changing the column frit is extremely difficult to do without disturbing the column packing. A Precolumn Filter provides relatively inexpensive insurance against column damage, and changing its frit is easy. A Precolumn Filter placed between the sample injection valve and the HPLC column protects the column from particles originating in the sample and from pump and valve seal wear.



**M-548**  
Mini MicroFilter Assembly



## SPECIFICATIONS & DETAILS

Because of the size-specific nature of the ferrules included with each Mini MicroFilter assembly, please note that these ferrules are not interchangeable with other MicroFerrules for different tubing sizes.

### Filter Capsule Color Identification



**M-121**



**M-125**



**M-128**



**M-131**



**M-133**

### What's the Difference Between Precolumn & Inline Filters?

You may have noticed that the bodies of Precolumn and Inline Filters look similar, and as such, you may have wondered what the differences are. Because Precolumn Filters, by definition, are typically placed in a volume-sensitive area immediately preceding the column, these filters usually feature smaller thru-holes and smaller frit diameters. In contrast, Inline Filters are often placed where the internal volume is not as critical and where longer life and less fluid restriction is more important.

| Part No.                                     | Description                   | Porosity | Frit Type  | For use with Tubing | Includes                        | Swept Volume | Pressure Rating     | Qty. |
|----------------------------------------------|-------------------------------|----------|------------|---------------------|---------------------------------|--------------|---------------------|------|
| <b>MINI MICROFILTER ASSEMBLY</b>             |                               |          |            |                     |                                 |              |                     |      |
| <b>M-547</b>                                 | Mini MicroFilter Assembly     | 1 µm     | SST Frit   | 1/32" (790 µm) OD   | (5) M-133, (2) F-112, (2) P-416 | 22 nL        | 4,000 psi (276 bar) | ea.  |
| <b>M-548</b>                                 | Mini MicroFilter Assembly     | 1 µm     | Ti Frit    | 1/32" (790 µm) OD   | (5) M-134, (2) F-112, (2) P-416 | 22 nL        | 4,000 psi (276 bar) | ea.  |
| <b>REPLACEMENT MINI MICROFILTER CAPSULES</b> |                               |          |            |                     |                                 |              |                     |      |
| Part No.                                     | Description                   | Porosity | Frit Type  | For Use With        | Material                        | Swept Volume |                     | Qty. |
| <b>M-121</b>                                 | Filter Capsule                | 1 µm     | SST Screen | M-530 and M-531     | PEEK                            | 85 nL        |                     | 2-pk |
| <b>M-125</b>                                 | NanoFilter Capsule            | 1 µm     | SST Frit   | M-537 and M-538     | PEEK                            | 10 nL        |                     | 2-pk |
| <b>M-126</b>                                 | NanoFilter Capsule            | 1 µm     | Ti Frit    | M-537 and M-538     | PEEK                            | 10 nL        |                     | 2-pk |
| <b>M-131</b>                                 | Filter Capsule                | 1 µm     | SST Screen | M-543               | PEEK                            | 85 nL        |                     | 2-pk |
| <b>M-133</b>                                 | NanoFilter Capsule            | 1 µm     | SST Frit   | M-547 and M-548     | PEEK                            | 10 nL        |                     | 2-pk |
| <b>M-134</b>                                 | NanoFilter Capsule            | 1 µm     | Ti Frit    | M-547 and M-548     | PEEK                            | 10 nL        |                     | 2-pk |
| <b>M-128</b>                                 | Conductive NanoFilter Capsule | 1 µm     | SST Frit   | M-534               | SST/PEEK                        | 10 nL        |                     | 2-pk |

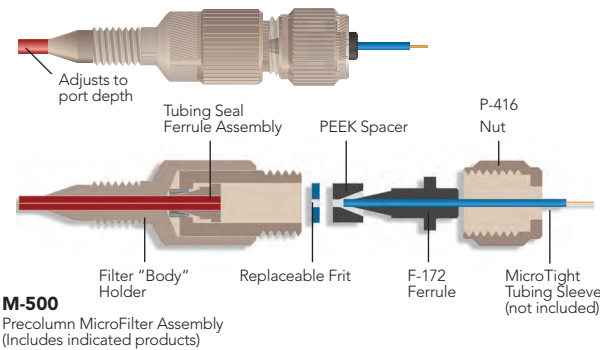
SST = Stainless Steel; Ti = Titanium



# Precolumn MicroFilters

- › Direct connects to columns with 10-32 threads
- › Total void volume of 0.5 µL
- › Two versions: direct connect 1/16" OD tubing or use MicroTight® tubing sleeves for 70–520 µm OD capillary tubing

The Precolumn MicroFilters directly connect into your microbore or analytical column. Total theoretical void volume is only 0.5 µL (includes frit volume) and the PEEK tubing used in the assembly of these units has a 0.005" (125 µm) ID, virtually eliminating any mixing of the sample with the mobile phase.



| Part No.                                                                                    | Description                               | Porosity For Tubing Size |                          | Threads     | Includes                        | Swept Volume* | Pressure Rating     | Qty. |
|---------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------|--------------------------|-------------|---------------------------------|---------------|---------------------|------|
| PRECOLUMN MICROFILTER ASSEMBLIES                                                            |                                           |                          |                          |             |                                 |               |                     |      |
| M-500                                                                                       | Precolumn MicroFilter Assembly, SST Frit  | 0.5 µm                   | MicroTight Tubing Sleeve | 10-32 Coned | (5) C-425, (1) F-172, (1) P-416 | 0.5 µL        | 4,000 psi (276 bar) | ea.  |
| M-510                                                                                       | Precolumn MicroFilter Assembly, PEEK Frit | 0.5 µm                   | MicroTight Tubing Sleeve | 10-32 Coned | (5) A-735, (1) F-172, (1) P-416 | 0.5 µL        | 4,000 psi (276 bar) | ea.  |
| M-550                                                                                       | Precolumn MicroFilter Assembly, SST Frit  | 0.5 µm                   | 1/16" OD                 | 10-32 Coned | (5) C-425, (1) F-132, (1) P-416 | 0.5 µL        | 4,000 psi (276 bar) | ea.  |
| M-560                                                                                       | Precolumn MicroFilter Assembly, PEEK Frit | 0.5 µm                   | 1/16" OD                 | 10-32 Coned | (5) A-735, (1) F-132, (1) P-416 | 0.5 µL        | 4,000 psi (276 bar) | ea.  |
| REPLACEMENT PRECOLUMN MICROFILTER FRITS (FRIT DIAMETER X FRIT THICKNESS X OVERALL DIAMETER) |                                           |                          |                          |             |                                 |               |                     |      |
| A-735                                                                                       | PEEK Frits, 0.045" x 0.031" x 0.192"      | 0.5 µm                   | N/A                      | N/A         | N/A                             | 216 nL        | N/A                 | ea.  |
| C-420                                                                                       | SST Frits, 0.038" x 0.028" x 0.192"       | 2 µm                     | N/A                      | N/A         | N/A                             | 101 nL        | N/A                 | ea.  |
| C-425                                                                                       | SST Frits, 0.038" x 0.028" x 0.192"       | 0.5 µm                   | N/A                      | N/A         | N/A                             | 101 nL        | N/A                 | ea.  |



# Bottle Caps

- › Extremely simple — no threaded ports or fittings
- › Manufactured from ETFE and Polypropylene



## APPLICATION NOTE

- › A self-regulating sparging system can help reduce helium consumption and improve pump performance. Set this up by pressing your tubing through the appropriate holes in your bottle cap and attaching each line to a filter. Sparge your mobile phase with an inert gas (preferably helium) for 15–20 minutes. Then reduce the outlet pressure of the sparging gas to a maximum of 5 psi (0.34 bar) and insert a plug (A-626 or A-628) into the remaining port of the cap. The sparging gas will shut off once the incoming pressure equals the pressure inside the reservoir. As the mobile phase is consumed and the internal pressure lowers, sparging gas will enter to keep the system pressurized and degassed. Please *Note: If gas leaks while pressurizing the bottle, try removing the sealing ring from the bottle, as it sometimes interferes with the sealing of these bottle caps.*

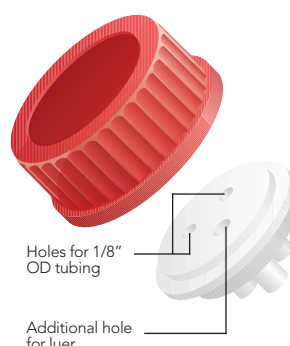
- › One concern with sparging systems is the possibility of solvent backing up the sparging inlet line. This can occur if the gas tank completely evacuates with the regulating valves open, creating a vacuum in the tubing. Solvent backup may damage sparging system components and cause cross-contamination of mobile phase reservoirs. To help prevent solvent backup, install the CV-3010 Inline Check Valve (page 135) along the tubing line that runs between the gas supply and the solvent bottle.

- › For a more efficient degassing system, please see the HPLC Vacuum Degassing Systems on page 154.

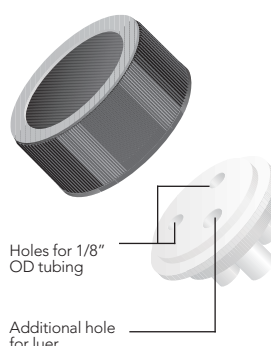
- › Please see the Quick-Stop Luer Check Valve on page 139 for another solvent inlet Application Note.

If you are looking for a bottle cap that is quick and easy to use, but still allows many connection options, we have just what you need! The Bottle Caps fit standard GL-45 (1 L) or smaller-neck GL-38 (4 L) glass bottles.

Each cap has three holes. With two of the holes you simply push your tubing straight through. The third hole, with a luer taper, can be used for a number of options. Any male luer (such as a luer-lock syringe) will fit snugly in this hole, or you can use the A-626 or A-627 Plug. Exceptions are the A-610 Bottle Caps. Please see the note below.



**A-620**  
GL-45 Bottle Cap  
for 1/8" tubing



**A-622**  
GL-38 Bottle Cap  
for 1/8" tubing



## NOTE

The A-610 Bottle Cap has a slightly different configuration than other caps. One hole accepts 3/16" OD tubing, the typical size used with some Waters® systems. The remaining two holes accept 1/8" OD tubing. Unlike the other caps, the A-610 does not have a tapered luer hole. If desired, use our A-628 Plug or A-629 Filter Plug for one of the 1/8" holes.



## RELATED PRODUCTS

To ensure a tight seal, use fluoropolymer tubing with these bottle caps (page 55).

| Part No.                                  | Description               | Qty. |
|-------------------------------------------|---------------------------|------|
| <b>BOTTLE CAPS FOR GL-45, 1 L BOTTLES</b> |                           |      |
| <b>A-610</b>                              | for 3/16" OD tubing, Red  | ea.  |
| <b>A-620</b>                              | for 1/8" OD tubing, Red   | ea.  |
| <b>A-630</b>                              | for 1/16" OD tubing, Red  | ea.  |
| <b>BOTTLE CAPS FOR GL-38, 4 L BOTTLES</b> |                           |      |
| <b>A-622</b>                              | for 1/8" OD tubing, Black | ea.  |



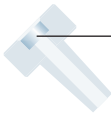
# Bottle Cap Plugs

Use the A-626 Bottle Cap Plug to seal the third “tapered” luer hole found in most IDEX Health & Science Bottle Caps. Or, use the A-628 Plug to seal any unused 1/16” or 1/8” bottle cap holes.

Alternatively, try the A-627 or A-629 Filter Bottle Cap Plug to cap an unused hole in your bottle cap. The 20 µm stainless steel frit in these products prevents foreign matter from contaminating your solvent while leaving the bottle open to the atmosphere, thus allowing fluid to be pulled out without creating a vacuum (generally not used with sparging applications). All plug bodies are manufactured from ultra-high molecular weight polyethylene (UHMWPE).



**A-626**  
Bottle Cap Plug



**A-629**  
Filter Bottle Cap Plug

20 µm stainless steel frit

| Part No.         | Description                                                                                  | Qty. |
|------------------|----------------------------------------------------------------------------------------------|------|
| BOTTLE CAP PLUGS |                                                                                              |      |
| A-626            | Bottle Cap Plug for luer hole, UHMWPE                                                        | ea.  |
| A-627            | Filter Bottle Cap Plug for luer hole, UHMWPE with 20 µm stainless steel frit                 | ea.  |
| A-628            | Bottle Cap Plug for 1/16", 1/8" or 3/16" hole, UHMWPE                                        | ea.  |
| A-629            | Filter Bottle Cap Plug for 1/16", 1/8" or 3/16" hole, UHMWPE with 20 µm stainless steel frit | ea.  |

