

# FLUIDIC & OPTICAL PRODUCTS AND INFORMATION

## FLUIDICS

TUBING  
FITTINGS  
CONNECTORS  
FILTERS & FRITS  
VALVES  
DEGASSERS  
COLUMN HARDWARE  
MARVELX  
TUBING KITS

## OPTICS

SHUTTERS  
LASERS  
OPTICAL FILTERS  
ROTOR DRIVE SHUTTERS  
DICHROIC BEAMSPLITTERS  
SINGLE-BAND FILTER SETS  
DPSS LASERS

LABORATORY SHUTTERS  
SOLENOID SHUTTERS  
MULTI-BAND FILTER SETS  
STEPPER MOTOR SHUTTERS  
HELIUM NEON LASERS

CONED FITTINGS  
FLAT BOTTOM FITTINGS  
UHPLC FITTINGS  
VHP FITTINGS  
DEBUBBLERS  
PLUGS & CAPS  
ACCESSORIES  
FLANGED FITTINGS  
SPECIALTY FITTINGS  
FITTINGS KITS  
LARGE BORE FITTINGS  
HIGH PRESSURE TUBING  
FLUOROPOLYMER  
THREADED ADAPTERS  
MICROPORT CONNECTORS  
MULTI-PORT CONNECTORS  
PEEK FRITS  
SILICA FRITS  
STAINLESS STEEL  
SILICA FRITS  
SILICA ACCESSORIES



## 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.

**97** FRITS

**102** FILTERS

**112** 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 105. 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.

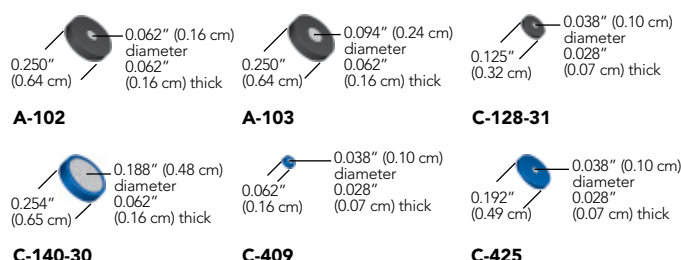


## APPLICATION NOTE

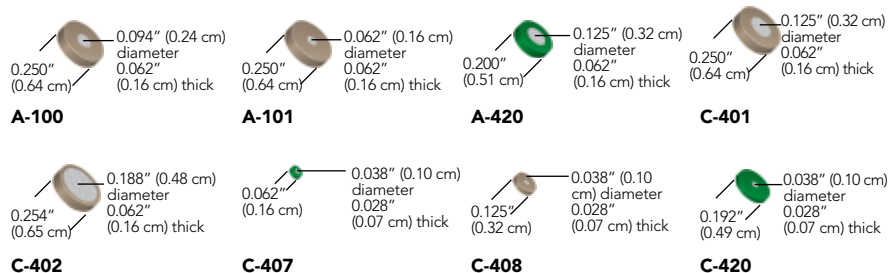
### To Clean Or Not To Clean?

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



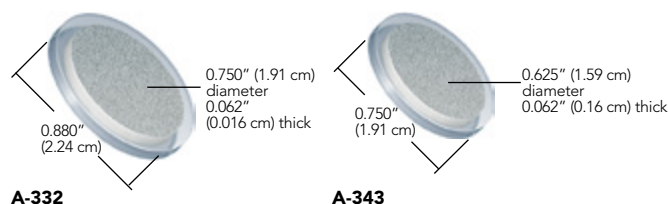
## NOTE

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

## Semi-Prep Stainless Steel Frits

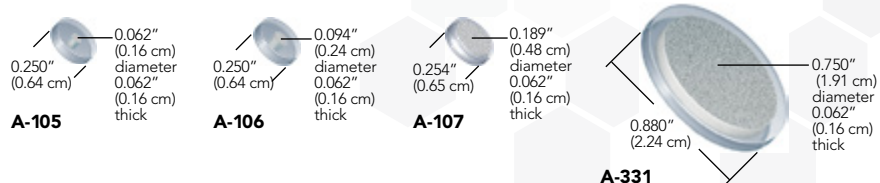
Many of these frits come complete with a PCTFE, ETFE, or PTFE sealing ring. Choose from 2  $\mu\text{m}$ , 5  $\mu\text{m}$ , 10  $\mu\text{m}$ , and 20  $\mu\text{m}$  filtration porosities and a range of diameters to match your intended flow rate and filtration requirements.

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

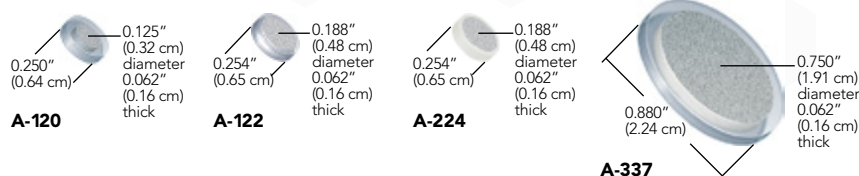


## Stainless Steel Frits (Cont.)

### 10 µm Semi-Prep Stainless Steel Frits



### 20 µm Semi-Prep Stainless Steel Frits



## Stainless Steel Frits

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



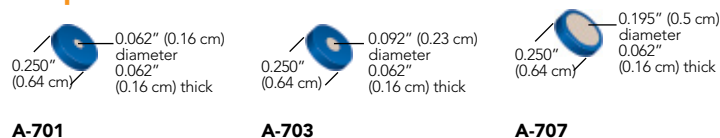
# PEEK Frits

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

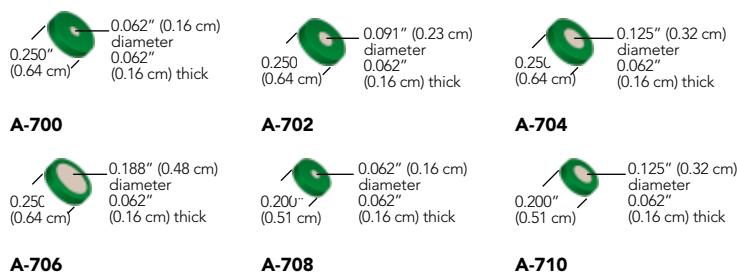
Patented IDEX Health & Science PEEK Frits offer exceptionally uniform porosity. This property ensures longer filtration life and consistent frit-to-frit swept volumes. The PEEK polymer frit discs are biocompatible and inert to most solvents, making them well-suited for bioanalytical applications. PEEK's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

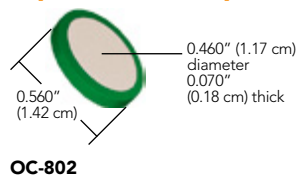
## 0.5 µm PEEK Frits



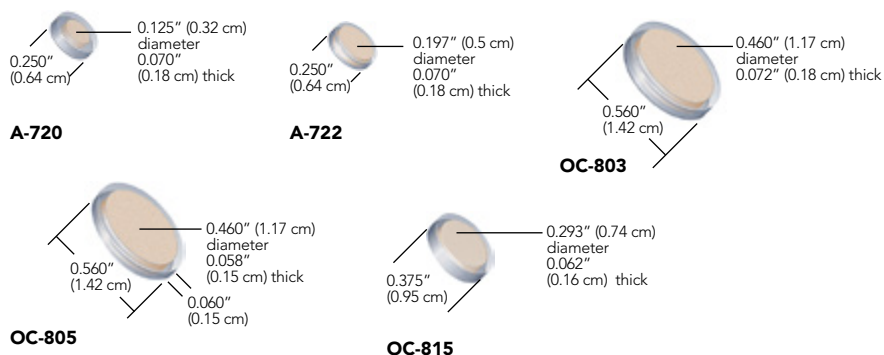
## 2 µm PEEK Frits



## 2 µm Semi-Prep PEEK Frits



## 5 µm and 10 µm PEEK Frits



## 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

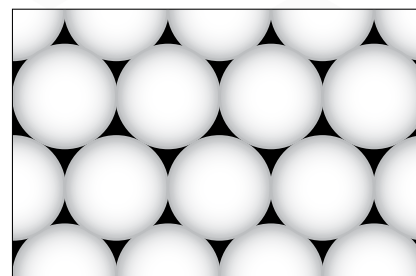
Any 0.247" to 0.254" diameter frit (including polymer ring) can be used with the Standard HPLC Inline Solvent Filters on page 104 and the Standard Precolumn Filters on page 107.

### 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.



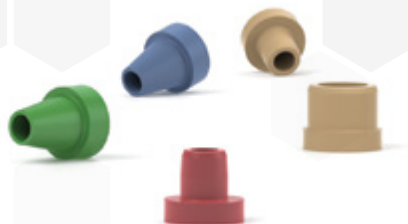
Frit volume is calculated by determining what the mass of the frit would be if it were a solid block of material of equal size. Then the solid mass of the frit is multiplied by the percentage assigned to the porosity to determine the theoretical frit volume.

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.

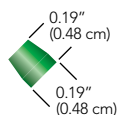


# Frit-in-a-Ferrule™

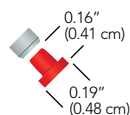
- › Seals and filters simultaneously
- › Less expensive and more convenient than traditional inline filter systems
- › Available in both Flangeless and Super Flangeless™ versions

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.

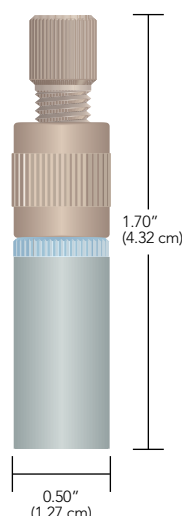
## Stainless Steel Bottom-of-the-Bottle Solvent Filters

- › 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.

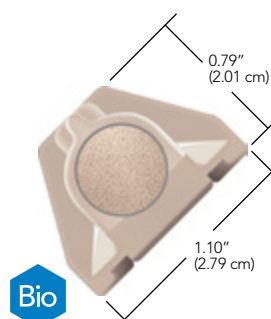
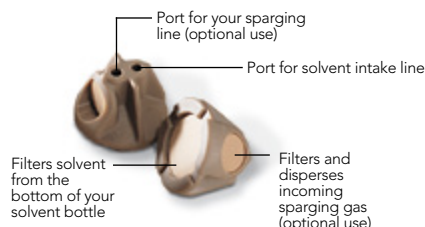


## All-PEEK Bottom-of-the-Bottle Solvent Filters

- › 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



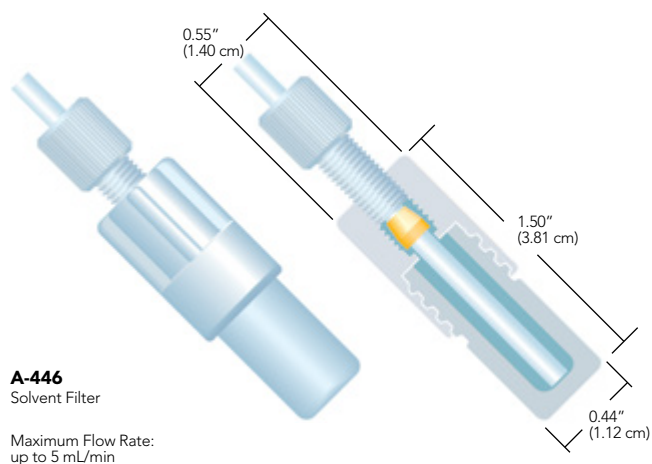
**A-438**  
Bottom-of-the-Bottle Filter  
(for small neck bottles)

## 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

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.

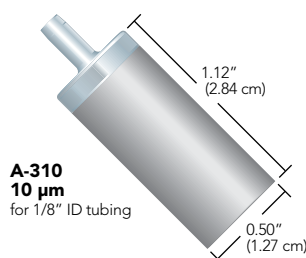
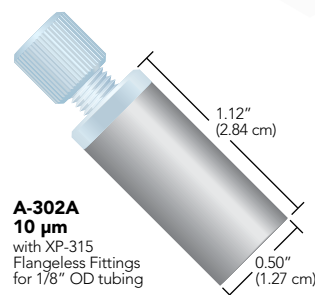
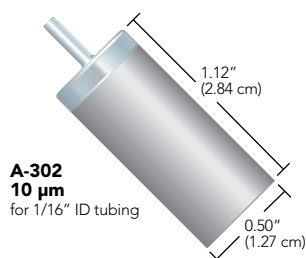


## APPLICATION NOTE

### 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.*



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

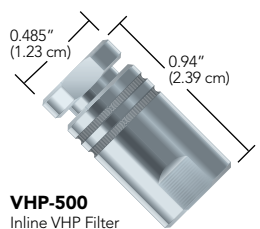
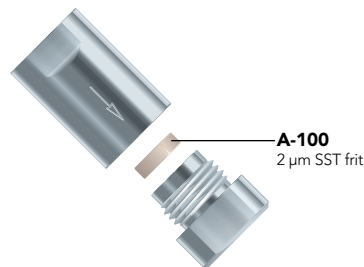
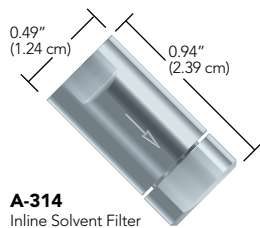
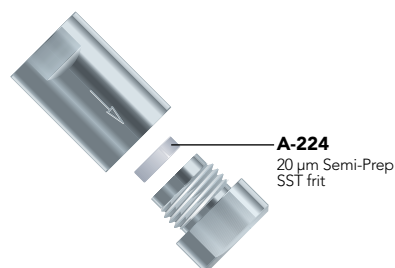
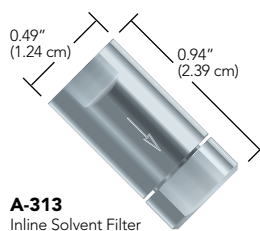
All Standard Inline Solvent Filters have 10-32 threads for 1/16" OD tubing, allowing the use of most standard chromatography high pressure fittings.

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).

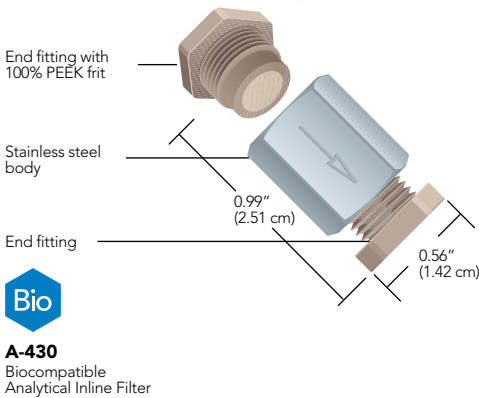


Inline Filters (Cont.)

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

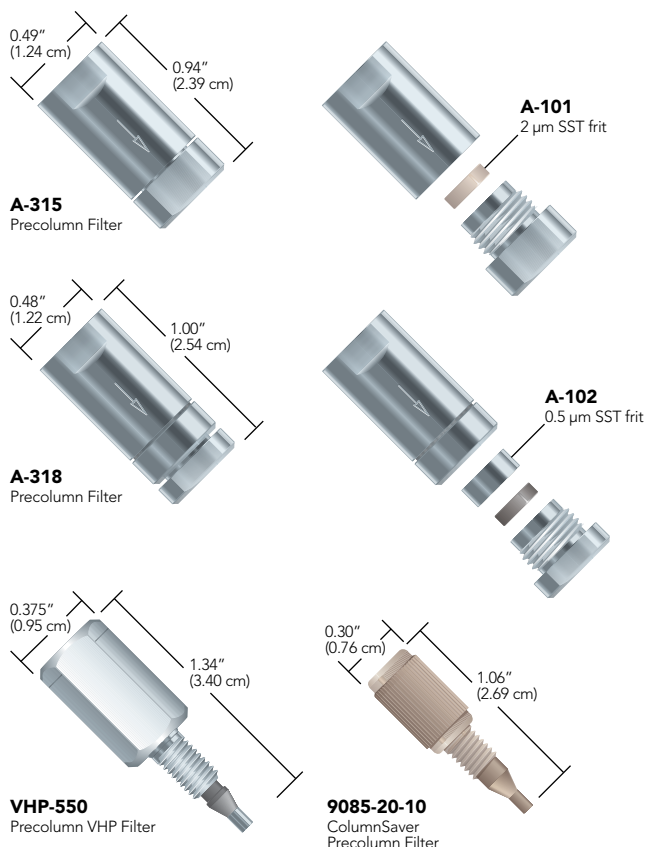
Our economical Precolumn Filters offer secure protection for analytical columns in HPLC and UHPLC. We offer traditional versions that can successfully connect tubing on both sides and our direct-connect versions attach to the inlet port of most standard columns. All versions feature a 10-32 coned ports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

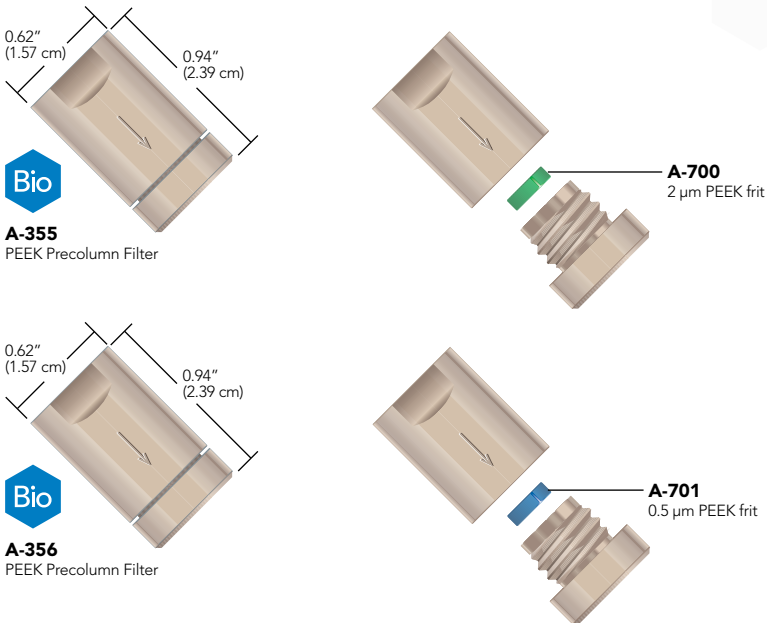


# Precolumn Filters (Cont.)

## 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.

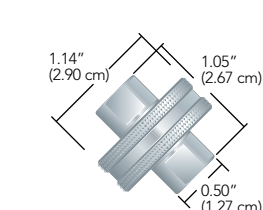
SST = Stainless Steel  
\*Swept volumes include/reflect theoretical frit volume values.

# Semi-Prep Filters

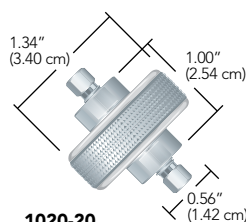
Biocompatible Semi-Prep Filters consist of a stainless steel body, two PEEK end fittings, and a separate PEEK frit. These filters are ideal for many higher flow analytical, semi-prep and preparative applications. Best of all, if the filter becomes clogged, simply unscrew the assembly, remove the frit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

## Semi-Prep Inline Filters

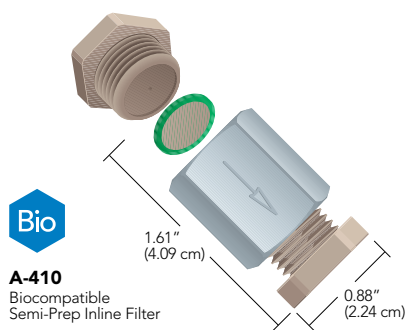
- › Designed for high-flow applications
- › Economical protection for larger columns and injections
- › SFC and HPLC compatible



**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.

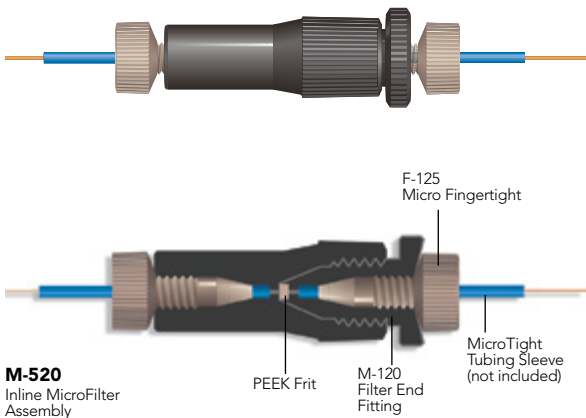
\*Swept volumes include/reflect theoretical frit volume values.



# 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 54). 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

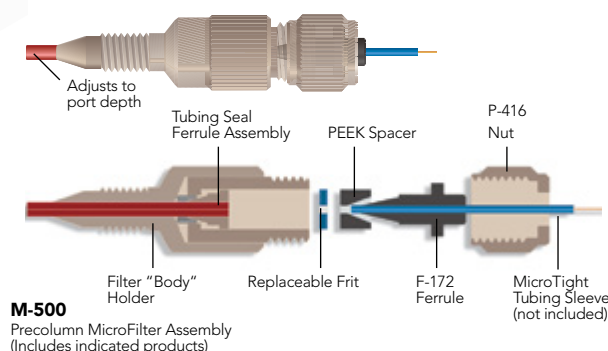
Part No.	Description	Porosity	For Tubing Size	Threads	Includes	Swept Volume	Pressure Rating	Qty.
INLINE MICROFILTERS								
M-520	Inline MicroFilter Assembly, PEEK Frit	0.5 µm	MicroTight Tubing Sleeve	MicroTight Tubing Sleeve	(5) M-120, (2) F-125	240 nL	4,000 psi (276 bar)	ea.
M-525	Inline MicroFilter 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



# Precolumn MicroFilters

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

The Precolumn MicroFilters directly connect into your microbore or analytical column. Total theoretical void volume is only 0.5  $\mu$ L (includes frit volume) and the PEEK tubing used in the assembly of these units has a 0.005" (125  $\mu$ m) 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

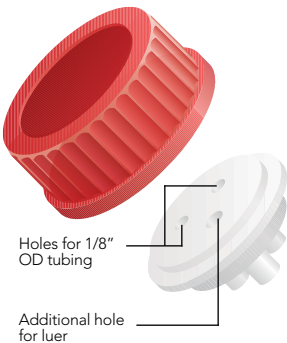
- › Extremely simple — no threaded ports or fittings
- › Manufactured from ETFE and Polypropylene

## APPLICATION NOTE

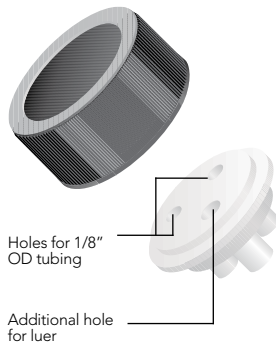
- › A self-regulating sparging system can help reduce helium consumption and improve pump performance. Set this up by pressing your tubing through the appropriate holes in your bottle cap and attaching each line to a filter. Sparge your mobile phase with an inert gas (preferably helium) for 15–20 minutes. 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 137) 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 156.
- › Please see the Quick-Stop Luer Check Valve on page 141 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 57).

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



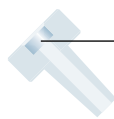
# Bottle Cap Plugs

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



20 µm stainless steel frit

**A-629**  
Filter Bottle Cap Plug

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