



PFA Labware



Sample Introduction Systems



Custom Molding



**Ordering from Savillex is
Fast • Easy • Convenient**

Ordering Information

Savillex products are sold direct and through Savillex authorized distributors. Visit www.savillex.com to place your order, or to find the nearest authorized distributor.

- Online: www.savillex.com
- Telephone: 952.935.4100
- Email: info@savillex.com
- Fax: 952.936.2292
- Payment terms are net 30 days with established credit
- Savillex accepts Visa®, MasterCard® and American Express® credit cards
- Products not appearing in this catalog that were previously purchased may still be available. Contact Savillex for details.

Prices

Prices in the accompanying Savillex price guide are suggested list prices current at the time of printing, are in U.S. dollars, and are subject to change without notice. Prices and F.O.B. do not include any applicable shipping, duties, taxes or other fees for delivery outside the U.S.

For the best pricing and service outside the U.S., we recommend contacting your local authorized Savillex product distributor.

Product Descriptions

Savillex products are molded of 100% PFA and are sold as individual components unless otherwise stated in the product description. Savillex closures are purchased separately from vessels unless noted in the product description. Product photos may be a representation and not the actual product.

Product Specifications

Product specifications in this catalog are approximate and current at the time of printing. Detailed specifications are available from www.savillex.com or by contacting Savillex at info@savillex.com.

Technical Support

If you require technical assistance in the use, operation or maintenance of Savillex products, please contact us at 952-935-4100 or via email at info@savillex.com.

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About Savillex

Savillex Corporation has been manufacturing high-quality fluoropolymer laboratory and custom molded products for over 35 years. Our goal is to remain the worldwide leader in producing exceptional PFA labware, PFA sample introduction, and PFA custom molded products for our customers at an affordable price.

The quality and performance of our products has been demonstrated in applications requiring the highest level of purity and safety. Whenever there is a need to protect the environment from the media, or the media from the environment, an application for our products can be found.

Our PFA molded products are universally accepted in applications ranging from sample collection to analysis, and we are proud to serve thousands of customers in over 60 countries throughout the world.

We understand there are occasional needs for modified or custom products. Please contact us and we will be happy to discuss your specific application and work with you to produce a product that meets your specific requirements.

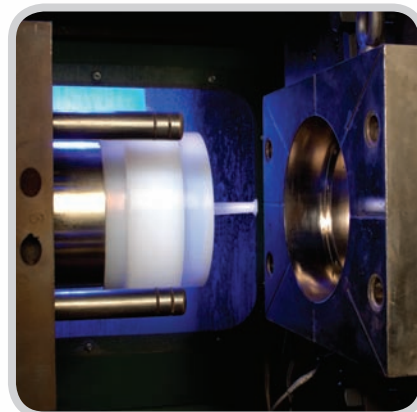


Limited Warranty

Savillex warrants its products against defects in materials and workmanship for 90 days from the time of shipment to the end-user. The warranty coverage excludes product damage which Savillex determines is due to accident, misuse, lack of responsible care or physical modification of its product.

Savillex makes no warranty, express or implied, with respect to any components, products, information or services provided by any third party.

The end-user's warranty rights are subject to Savillex being promptly notified in writing upon discovery of a warranty claim with a detailed explanation of the defect and verification of the defect by Savillex. Savillex will consider claims submitted during the warranty period and up to 30 days thereafter. Upon confirmation of defects by Savillex, the end-user's exclusive remedy shall be for Savillex, at its option, to repair or replace the defective product, or to refund the price paid by the buyer for such product. This remedy is subject to return of the defective product to Savillex or its agent, freight prepaid.



Full Terms and Conditions can be found at www.savillex.com.

Savillex PFA Bottles



- GL45 thread style
- No secondary sealing required
- Easy pour, drip-proof lip
- Use closure #600-045-46 with bottle for DST-1000 collection vessel
- Bottles include GL45 plain threaded closure

	Volume	Part Number	Includes Closure	Diameter x Height (mm)	Replacement Closure Size
A	100 ml	150-01-0100	600-045-01 GL45 plain threaded	55.9 x 56.9	GL45
B	250 ml	150-01-0250	600-045-01 GL45 plain threaded	69.8 x 146.8	GL45
C	500 ml	150-01-0500	600-045-01 GL45 plain threaded	85.3 x 160.8	GL45
D	1000 ml	150-01-1000	600-045-01 GL45 plain threaded	100.8 x 218.9	GL45

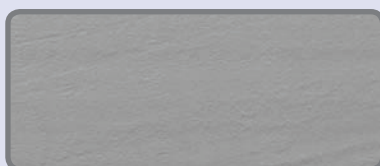
Replacement Closures for PFA Bottles



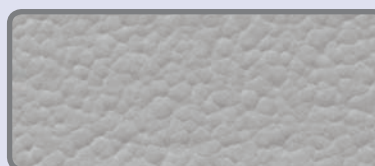
Thread	Part Number	Part Number	Part Number	Part Number
	Plain threaded	(2) 1/8" OD tube ports	(2) 1/4" OD tube ports	(2) 1/4" OD tube ports with vent nut
GL45	600-045-01	600-045-26	600-045-36	600-045-46

Scanning electron microscope images of the interior surface of the Savillex PFA bottle compared against other commercially available PFA bottles.

*Savillex PFA Bottle
250X magnification*



*Other PFA Bottle
250X magnification*



Savillex's proprietary molding process produces a smoother surface finish which significantly improves cleaning, washout and reduces carryover to subsequent processes.

Column Components

Column Component Vessels



- Vessels are interchangeable and can be used with other column components to assemble multipurpose columns
- Assembled columns are rated to 75 PSI at 100°F/38°C
- Service temperature range of PFA is -328°F/-200°C to 500°F/260°C
- Glass polypropylene wrench set is recommended for tightening



	Volume	Part Number	Side Port	Diameter x Height (mm)	Accepts Closure
A	60 ml	500-060-02	None	53.3 x 53.1	58 mm with 1-1/2" FNPT threads
B	120 ml	500-120-02	None	53.3 x 118.4	58 mm with 1-1/2" FNPT threads
C	120 ml	500-120-11	1/8" OD tube port	53.3 x 118.4	58 mm with 1-1/2" FNPT threads
	120 ml	500-120-15	1/4" OD tube port	53.3 x 118.4	58 mm with 1-1/2" FNPT threads
D	120 ml	500-120-17	1/4" FNPT port	53.3 x 118.4	58 mm with 1-1/2" FNPT threads
	120 ml	500-120-31	3/8" FNPT port	53.3 x 118.4	58 mm with 1-1/2" FNPT threads
E	375 ml	500-375-02	None	53.9 x 298.0	58 mm with 1-1/2" FNPT threads
	375 ml	500-375-06	None (Grooved Exterior)	53.9 x 298.0	58 mm with 1-1/2" FNPT threads

***CAUTION:** For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

See Closures on page 5.

Column Component Segments



- Segments are interchangeable and can be used with other column components to assemble multipurpose columns
- Assembled columns are rated to 75 PSI at 100°F/38°C
- Glass polypropylene wrench set is recommended for tightening
- Use connector (Part Number 730-0502) to connect segments



	Volume	Part Number	Side Port	Threaded for 47 mm Filter	Diameter x Height (mm)	Accepts Closure
A	100 ml	531-100-05	None	No	50.3 x 74.9	58 mm with 1-1/2" FNPT threads
B	150 ml	531-150-05	None	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
	150 ml	531-150-11	1/8" OD tube port	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
C	150 ml	531-150-15	1/4" OD tube port	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
	150 ml	531-150-17	1/4" FNPT port	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
D	150 ml	531-150-31	3/8" FNPT port	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
	150 ml	531-150-33	3/8" OD tube port	No	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
E	150 ml	531-150-40	None	Yes	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
F	150 ml	531-150-41	1/8" OD tube port	Yes	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
	150 ml	531-150-42	1/4" OD tube port	Yes	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
	150 ml	531-150-43	3/8" OD tube port	Yes	53.3 x 122.2	58 mm with 1-1/2" FNPT threads
G	375 ml	531-375-05	None	No	50.3 x 295.4	58 mm with 1-1/2" FNPT threads
	Connector	730-0502	None	No	58.2 x 49.8	NA



***CAUTION:** For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

See Closures on page 5.

Column Components

Column Component Closures



- Closures can be used with column segments or vessels
- Assembled columns are rated to 75 PSI at 100°F/38°C
- Glass polypropylene wrench set is recommended for tightening



	Style	Part Number	Ports
A	58 mm with 1-1/2" FNPT threads	600-058-06	None
B	58 mm with 1-1/2" FNPT threads	600-058-16	(1) 1/4" OD tube port
C	58 mm with 1-1/2" FNPT threads	600-058-17	(1) 1/4" FNPT port
	58 mm with 1-1/2" FNPT threads	600-058-19	(1) 3/8" OD tube port
	58 mm with 1-1/2" FNPT threads	600-058-24	(2) 1/8" OD tube ports
	58 mm with 1-1/2" FNPT threads	600-058-33	(2) 1/4" OD tube ports
D	58 mm with 1-1/2" FNPT threads	600-058-42	(2) 1/2" OD tube ports
	58 mm with 1-1/2" FNPT threads	600-058-87	Pressure relief closure with Ultem® clamp

***CAUTION:** For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

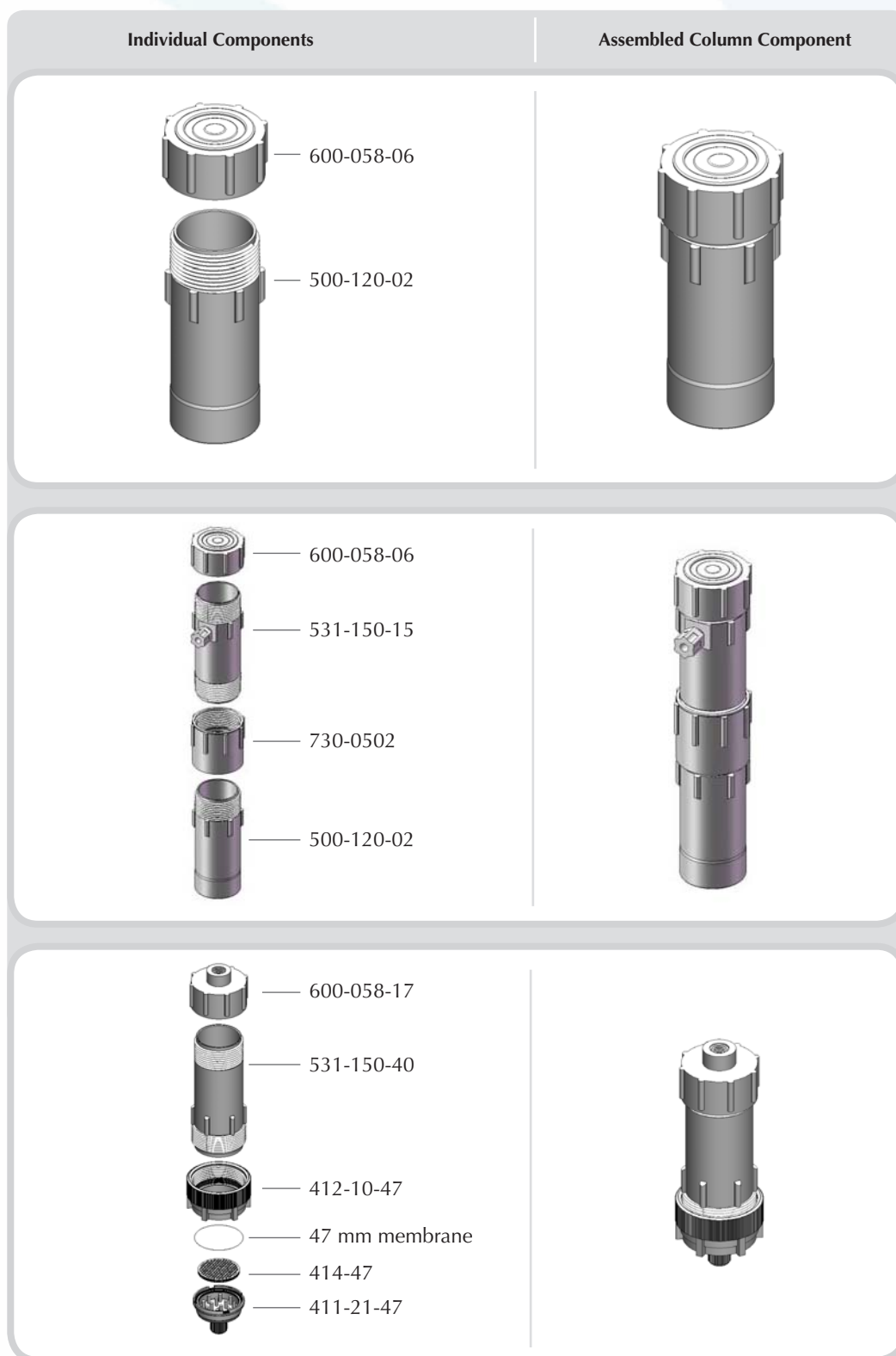
Column Component Accessories

	Part Number	Description
E	730-0055	Glass polypropylene wrench set
	730-0200	PTFE sealing tape
F	730-0590	Pressure fixture for column components. Adjustable to 18" height.
G	730-0504	Column component screen



How to Use Column Components

- Build your own column component assembly by interchanging the vessels, segments and closures.



Digestion Vessels

Digestion Vessels



- Use digestion vessels directly in a microwave, oven or on a hotplate for rapid sample dissolution
- Glass polypropylene wrench set is recommended for tightening
- For best results, always order complete sets of vessels and closures
- Closures sold separately

	Volume	Part Number	Side Ports	Interior	Diameter x Height (mm) (with plain closure)	Accepts Closure	Pressure Rating at 100°F/38°C*
A	60 ml	300-060-03	NA	—	53.9 x 62.2	58 mm buttress threaded	75 PSI
	60 ml	300-060-04	NA	V	53.9 x 69.1	58 mm buttress threaded	75 PSI
	120 ml	300-120-03	NA	—	53.6 x 124.7	58 mm buttress threaded	75 PSI
B	120 ml	300-120-04	NA	V	53.6 x 119.4	58 mm buttress threaded	75 PSI
C	120 ml	300-120-16	(1) FNPT	—	53.6 x 124.0	58 mm buttress threaded	75 PSI
	120 ml	300-120-20	(2) 1/8" tube ports	—	53.6 x 124.0	58 mm buttress threaded	75 PSI
D	120 ml	300-120-22	(2) 1/4" tube ports	—	53.6 x 124.0	58 mm buttress threaded	75 PSI



The pressurized digestion process can produce extremely high temperatures and pressures in a very short period of time, especially when performed in a microwave. Observe all instructions and safety precautions as noted in Marketing Bulletin #MB003.

V = Conical Interior — = Flat Interior

*CAUTION: For every 2°F/1°C increase above 100°F/38°C, reduce PSI rating by 1 PSI.

Digestion Vessel Closures



	Part Number	Part Number	Part Number	Part Number
	Plain Buttress Threaded	Buttress Threaded (2) 1/8" OD tube ports	Buttress Threaded (2) 1/4" OD tube ports	Buttress Threaded with Pressure Relief Valve
58 mm	600-058-04	600-058-22	600-058-31	600-058-86

Digestion Vessel Accessories

Part Number	Description
730-0055	Glass polypropylene wrench set



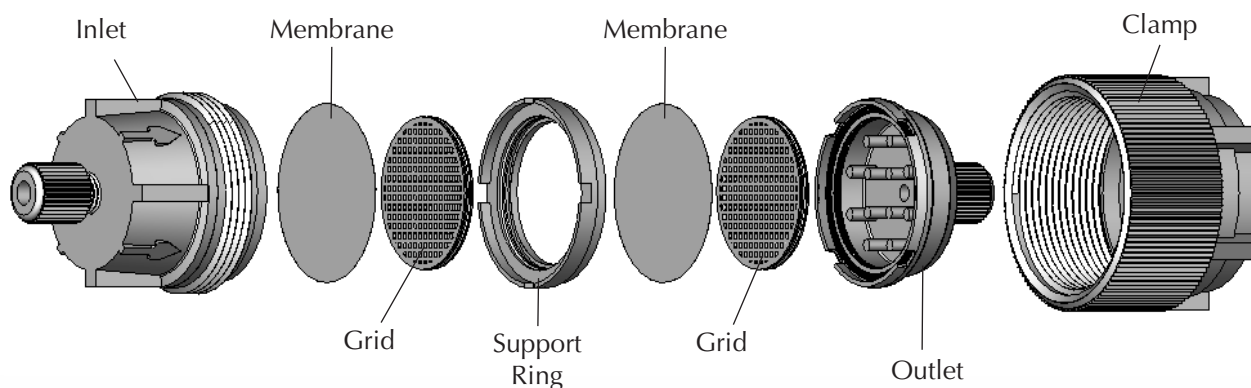
Filter Holders



Saville offers many pre-assembled filter holders for your convenience (membranes sold separately). You can also build your own application-specific filter by ordering the necessary components. The components needed to build your own filter include:

- Inlets
- Outlets
- Grids
- Support rings (47 mm multi-stage filters only)
- Clamps
- Membranes

Build Your Own Filter Holder Components



Inlets

- Available in various styles
- Glass polypropylene wrench set recommended for tightening (not required for 25 mm)



Open Style



Ferrule Nut Style



Tube Style

Outlets

- Available in various styles
- Grid must be ordered separately



MNPT Style



Ferrule Nut Style



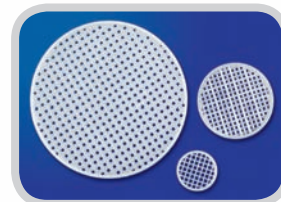
Tube Style

Filter Holders

Build Your Own Filter Holder Components, *continued*

Grids

- PFA grid snaps into support ring or outlet to hold filter membrane



Support Rings

- Support rings are required for 47 mm multi-stage filter holders only



Grid sold separately

Clamps

- Available in various sizes and materials
- Extended clamp is required for multi-stage filter holders
- Tefzel® clamps are reinforced with 25% glass fiber for use in higher pressure applications

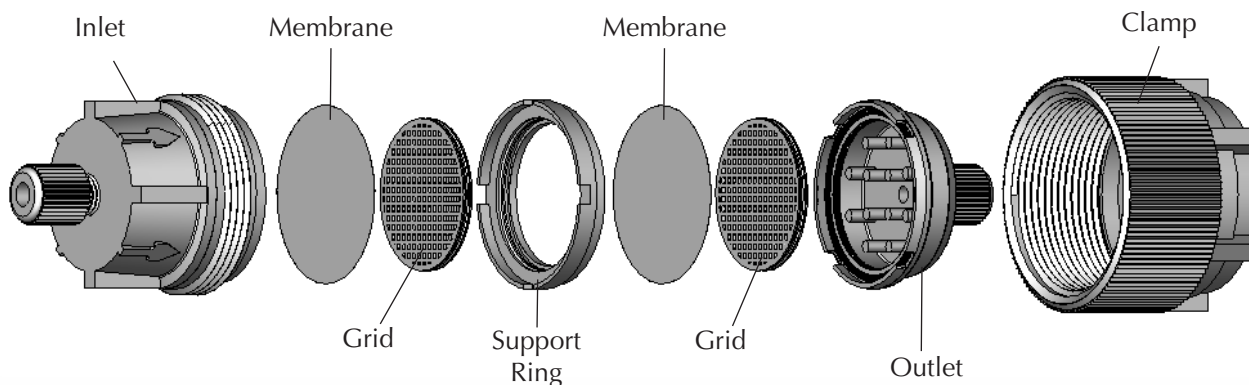


Membranes

- Produced of pure PTFE
- Chemically and biologically inert, stable up to 500°F/260°C, and will withstand most concentrated acids and bases
- Ideal for applications requiring extreme temperatures or aggressive chemicals without adding particulates to the filtrate
- Naturally hydrophobic and very useful for aerosol sampling, air venting and gas filtration
- For submicron filtering of aqueous solutions, pre-wetting with methanol, ethanol or isopropyl alcohol to establish flow with lower pressure differentials is recommended
- Sterilize with steam or bactericidal solutions
- Ten membranes per package



CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.



25 mm Filter Holders

Pre-Assembled Single Stage Filters (*membranes sold separately*)

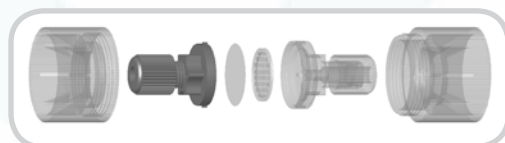
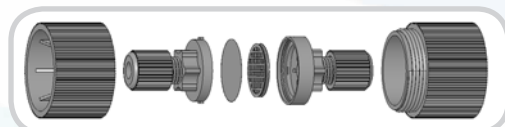
Part Number	Description	Pressure Rating
401-20-25-50-20-2	1/4" inlet x 1/4" outlet with PVDF clamp	65 PSI
401-21-25-50-21-2	1/8" inlet x 1/8" outlet with PVDF clamp	65 PSI



Build Your Own 25 mm Filter Holder

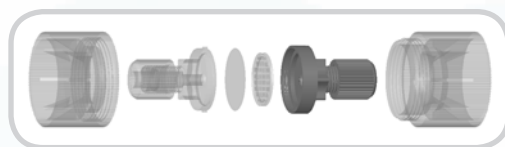
Inlets

Part Number	Description
410-11-25	2-1/2" opening
410-20-25	1/8" OD tube opening with ferrule nut
410-21-25	1/4" OD tube opening with ferrule nut
410-31-25	1/4" MNPT



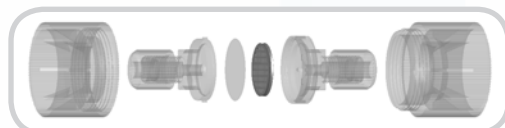
Outlets

Part Number	Description
411-20-25	1/8" OD tube opening with ferrule nut
411-21-25	1/4" OD tube opening with ferrule nut
411-31-25	1/4" MNPT



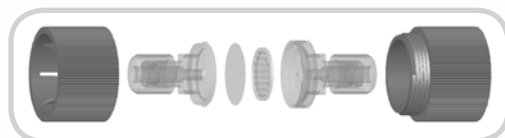
Grid

Part Number	Description
414-25	Grid for 25 mm filter membranes



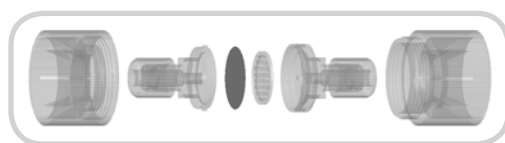
Clamps

Part Number	Description	Pressure Rating
412-50-25	PVDF clamp assembly, blue and white	65 PSI
412-51-25	PVDF clamp, white	65 PSI
412-52-25	PVDF clamp, blue	65 PSI
412-12-25	PVDF clamp, gray	65 PSI



Membranes

Part Number	Pore Size in Microns	Description
450-25-1	0.2	PTFE, 10 per pack
450-25-2	0.45	PTFE, 10 per pack
450-25-3	1-2	PTFE, 10 per pack
450-25-4	5-6	PTFE, 10 per pack
450-25-5	20-30	PTFE, 10 per pack
450-25-6	30-60	PTFE, 10 per pack



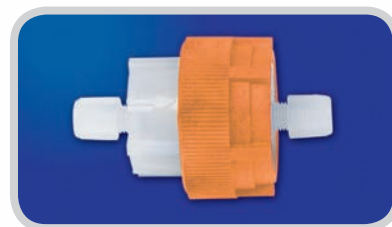
CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.

Filter Holders

47 mm Filter Holders

Pre-Assembled Single Stage Filters *(membranes sold separately)*

Part Number	Description	Pressure Rating
401-21-47-10-21-2	1/4" OD tube inlet x 1/4" OD tube outlet with PFA clamp	25 PSI
401-21-47-30-21-2	1/4" OD tube inlet x 1/4" OD tube outlet with Tefzel clamp	65 PSI
401-31-47-10-31-2	1/4" OD MNPT inlet with 1/4" OD MNPT outlet with PFA clamp	25 PSI

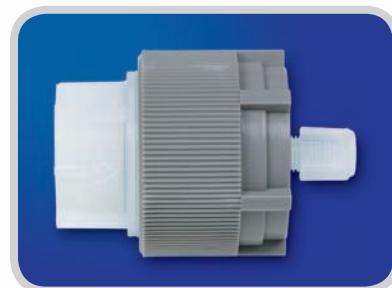


Pre-Assembled Two Stage Filters *(membranes sold separately)*

Part Number	Description	Pressure Rating
402-10-47-22-21-2	1-1/2" open inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
402-10-47-22-22-2	1-1/2" open inlet x 3/8" OD tube outlet, PFA clamp	25 PSI
402-21-47-22-21-2	1/4" OD tube inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
402-31-47-22-31-2	1/4" OD MNPT inlet x 1/4" OD MNPT outlet, PFA clamp	25 PSI
402-10-47-22-31-2	1-1/2" open inlet x 1/4" MNPT outlet, PFA clamp	25 PSI

Pre-Assembled Three Stage Filters *(membranes sold separately)*

Part Number	Description	Pressure Rating
403-10-47-22-21-2	1-1/2" open inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
403-10-47-22-22-2	1-1/2" open inlet x 3/8" OD tube outlet, PFA clamp	25 PSI
403-21-47-22-21-2	1/4" OD tube inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
403-31-47-22-31-2	1/4" OD MNPT inlet x 1/4" OD MNPT outlet, PFA clamp	25 PSI
403-10-47-22-31-2	1-1/2" open inlet x 1/4" MNPT outlet, PFA clamp	25 PSI



Pre-Assembled Four Stage Filters *(membranes sold separately)*

Part Number	Description	Pressure Rating
404-10-47-22-21-2	1-1/2" open inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
404-10-47-22-22-2	1-1/2" open inlet x 3/8" OD tube outlet, PFA clamp	25 PSI
404-21-47-22-21-2	1/4" OD tube inlet x 1/4" OD tube outlet, PFA clamp	25 PSI
404-31-47-22-31-2	1/4" OD MNPT inlet x 1/4" OD MNPT outlet, PFA clamp	25 PSI
403-10-47-22-31-2	1-1/2" open inlet x 1/4" MNPT outlet, PFA clamp	25 PSI

CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.

Build Your Own 47 mm Filter Holder

Inlets

Part Number	Description
410-43-47	1/2" OD x 1" tube
410-31-47	1/4" MNPT
410-41-47	1/4" OD x 1" tube
410-10-47	1-1/2" open
410-12-47	3-1/2" open x 1" tube
410-42-47	3/8" OD x 1" tube
410-21-47	1/4" OD with ferrule nut
410-22-47	3/8" OD with ferrule nut

Outlets

Part Number	Description
411-43-47	1/2" OD x 1" tube
411-31-47	1/4" MNPT
411-41-47	1/4" OD x 1" tube
411-42-47	3/8" OD x 1" tube
411-21-47	1/4" OD with ferrule nut
411-22-47	3/8" OD with ferrule nut

Grid

Part Number	Description
414-47	Grid for 47 or 50 mm filter membranes

Support Ring (for multi-stage only)

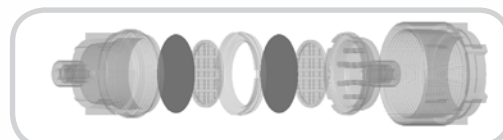
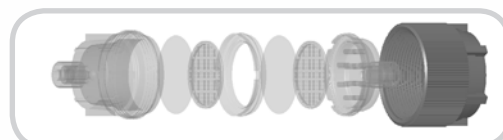
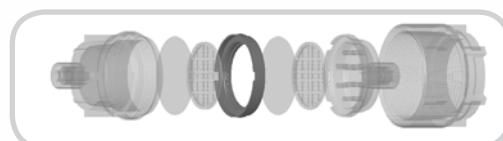
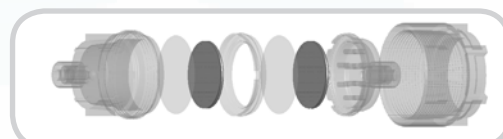
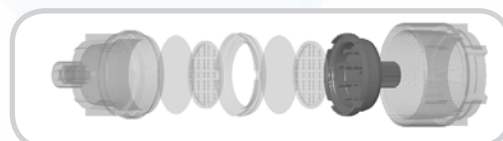
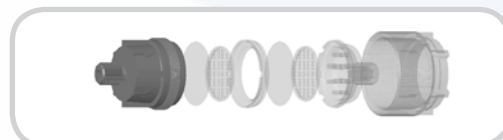
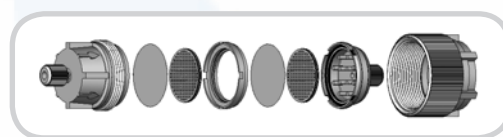
Part Number	Description
413-47	Support ring for 47 mm multi-stage filters

Clamps

Part Number	Description	Pressure Rating
412-10-47	PFA clamp, single stage, orange	25 PSI
412-30-47	Tefzel® clamp, single stage, black	65 PSI
412-22-47	PFA clamp, multi-stage, gray	25 PSI

Membranes

Part Number	Pore Size in Microns	Description
450-47-1	0.2	PTFE, 10 per pack
450-47-2	0.45	PTFE, 10 per pack
450-47-3	1-2	PTFE, 10 per pack
450-47-4	5-6	PTFE, 10 per pack
450-47-5	20-30	PTFE, 10 per pack
450-47-6	30-60	PTFE, 10 per pack



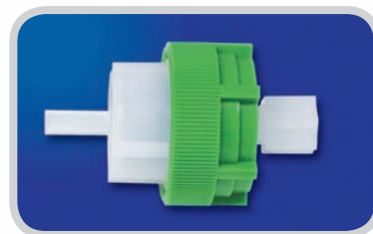
CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.

Filter Holders

50 mm Filter Holders

Pre-Assembled Single Stage Filters (*membranes sold separately*)

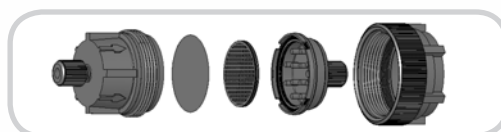
Part Number	Description	Pressure Rating
401-21-50-31-21-2	1/4" OD tube inlet x 1/4" OD tube outlet with Tefzel® clamp	65 PSI
401-21-50-11-21-2	1/4" OD tube inlet x 1/4" OD tube outlet with PFA clamp	25 PSI
401-43-50-31-43-2	1/2" OD x 1" tube inlet x 1/2" OD x 1" tube outlet with Tefzel® clamp	65 PSI
401-43-50-11-43-2	1/2" OD x 1" tube inlet x 1/2" OD x 1" tube outlet with PFA clamp	25 PSI



Build Your Own 50 mm Filter Holder

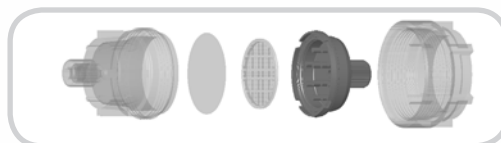
Inlets

Part Number	Description
410-43-50	1/2" OD x 1" tube
410-31-50	1/4" MNPT
410-10-50	1-1/2" open
410-42-50	3/8" OD x 1" tube
410-21-50	1/4" OD with ferrule nut
410-22-50	3/8" OD with ferrule nut



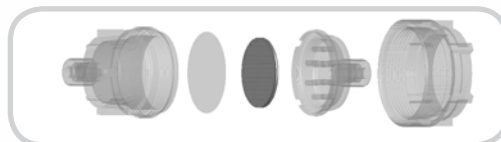
Outlets

Part Number	Description
411-43-50	1/2" OD x 1" tube
411-31-50	1/4" MNPT
411-42-50	3/8" OD x 1" tube
411-21-50	1/4" OD with ferrule nut
411-22-50	3/8" OD with ferrule nut



Grid

Part Number	Description
414-47	Grid for 47 or 50 mm filter membranes



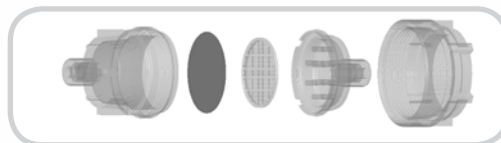
Clamps

Part Number	Description	Pressure Rating
412-11-50	PFA clamp, single stage, green	25 PSI
412-31-50	Tefzel® clamp, single stage, brown	65 PSI



Membranes

Part Number	Pore Size in Microns	Description
450-50-1	0.2	PTFE, 10 per pack
450-50-2	0.45	PTFE, 10 per pack
450-50-3	1-2	PTFE, 10 per pack
450-50-4	5-6	PTFE, 10 per pack
450-50-5	20-30	PTFE, 10 per pack
450-50-6	30-60	PTFE, 10 per pack



CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.

90 mm Filter Holders

Pre-Assembled Single Stage Filters *(membranes sold separately)*

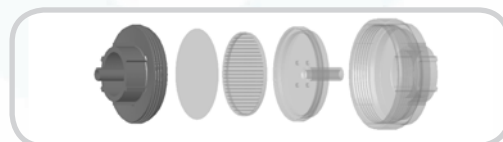
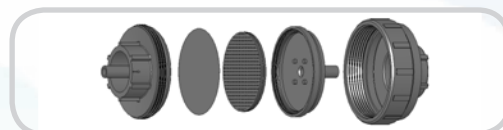
Part Number	Description	Pressure Rating
401-43-90-40-43-2	1/2" OD x 1" tube inlet x 1/2" OD x 1" tube outlet with Ultem® clamp	10 PSI
401-44-90-40-44-2	5/8" OD x 1" tube inlet x 5/8" OD x 1" tube outlet with Ultem® clamp	10 PSI



Build Your Own 90 mm Filter Holder

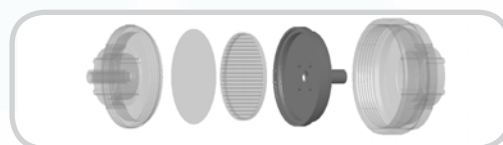
Inlets

Part Number	Description
410-43-90	1/2" OD x 1" tube
410-10-90	1-1/2" open
410-44-90	5/8" OD x 1" tube
410-23-90	1/2" OD with ferrule nut
410-25-90	3/4" OD with ferrule nut



Outlets

Part Number	Description
411-43-90	1/2" OD x 1" tube
411-44-90	5/8" OD x 1" tube
411-23-90	1/2" OD with ferrule nut
411-25-90	3/4" OD with ferrule nut



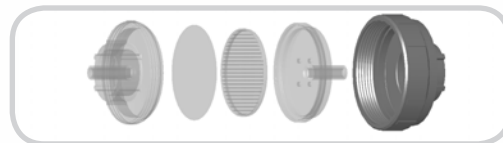
Grid

Part Number	Description
414-90	Grid for 90 mm filter membranes



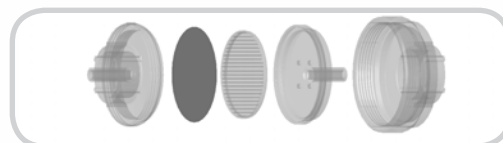
Clamps

Part Number	Description	Pressure Rating
412-40-90	Ultem® clamp, single stage, beige	10 PSI



Membranes

Part Number	Pore Size in Microns	Description
450-90-3	1-2	PTFE, 10 per pack
450-90-4	5-6	PTFE, 10 per pack
450-90-5	20-30	PTFE, 10 per pack
450-90-6	30-60	PTFE, 10 per pack

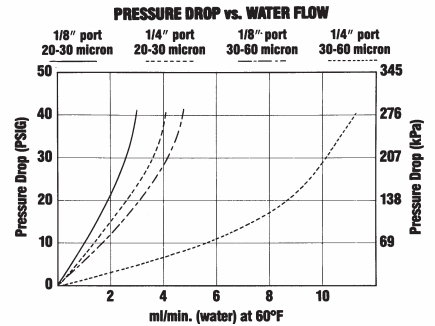
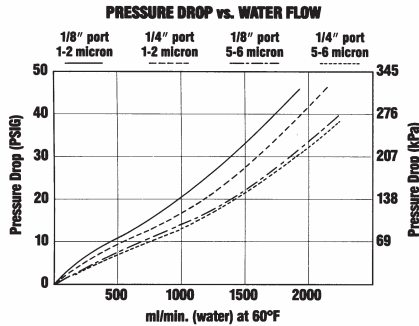
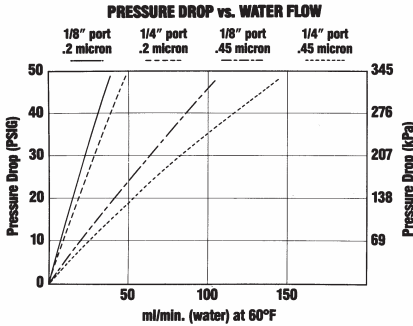


CAUTION: For every 2°F/1°C temperature rise above 150°F/66°C, decrease pressure rating by 1 PSI.

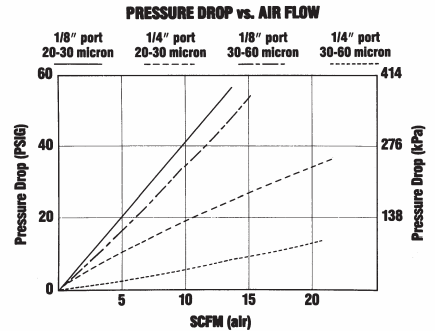
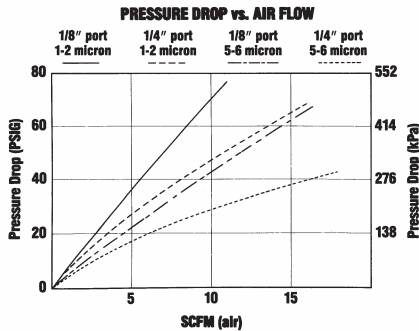
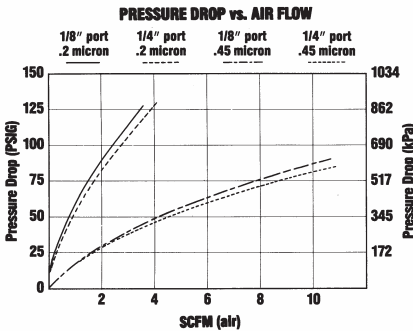
Filter Holders

Filter Flow Rates

25mm Water

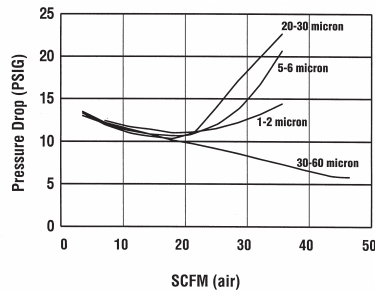


25mm Air



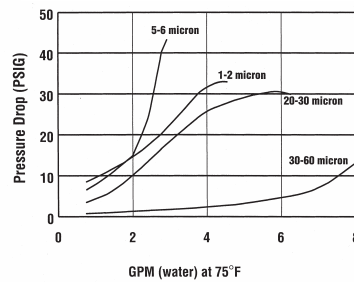
401-25-90-40-25 FILTERS

PRESSURE DROP VS. AIR FLOW



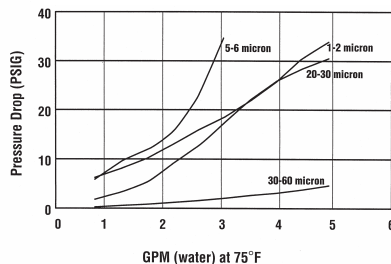
401-25-90-40-25 FILTERS

PRESSURE DROP VS. WATER FLOW



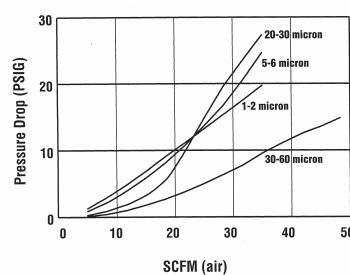
401-23-90-40-23 FILTERS

PRESSURE DROP VS. WATER FLOW



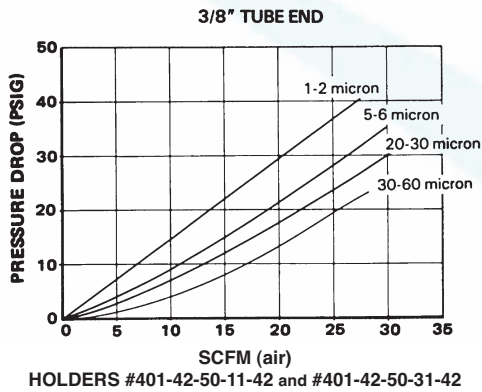
401-23-90-40-23 FILTERS

PRESSURE DROP VS. AIR FLOW

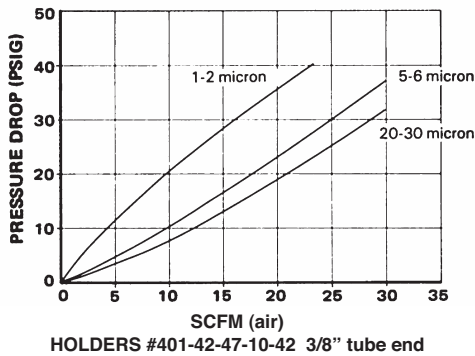
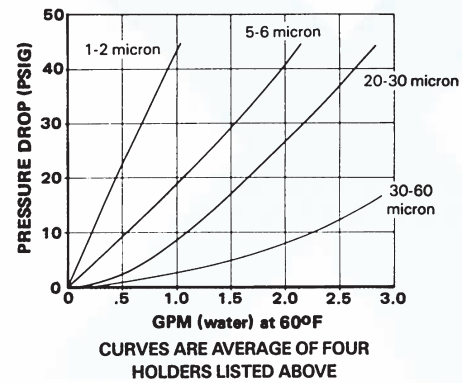
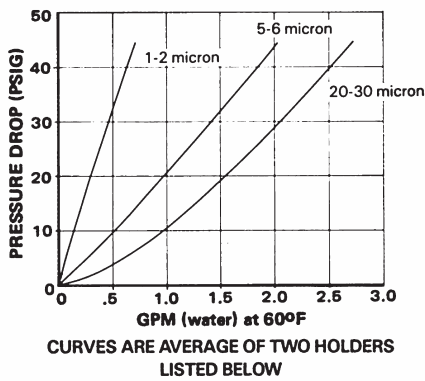
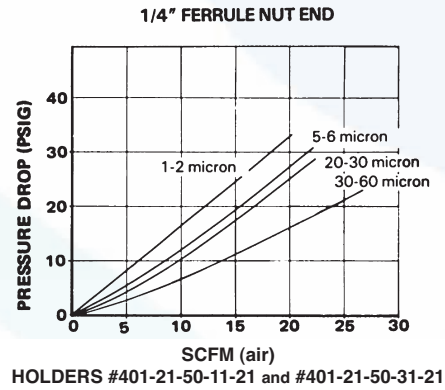


Flow rates provided are for reference only. Actual performance may vary.

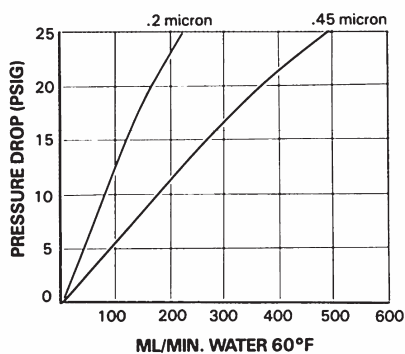
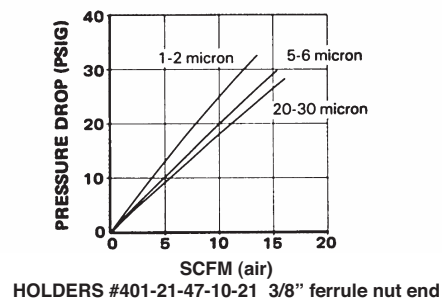
Filter Flow Rates, continued



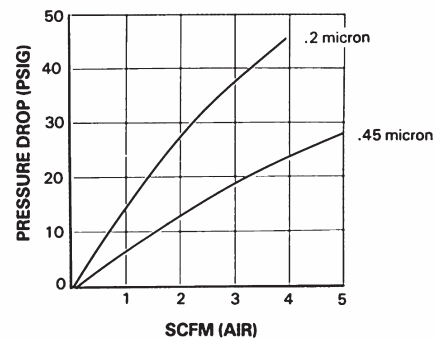
(50mm)



(47mm)



**SUBMICRON
(47 mm)**
CURVES ARE
AVERAGE OF HOLDERS
#401-42-47-10-42
and
#401-21-47-10-21



Filter Holders

Filter Holder Accessories

Wrench Set

- Glass polypropylene wrench set is used to tighten connections between PFA components

A

Part Number	Description	Use with
730-0056	Wrench set	47, 50 and 90 mm filter holders



Stopper Assembly

- For use in glass flasks
- Ferrule nut accepts 3/8" OD tube
- Straight tubing sold separately. See page 37.

B

Part Number	Description	Size
730-0066	Stopper assembly, #6 taper	30.0 mm
730-0076	Stopper assembly, #7 taper	33.3 mm
730-0086	Stopper assembly, #8 taper	37.3 mm

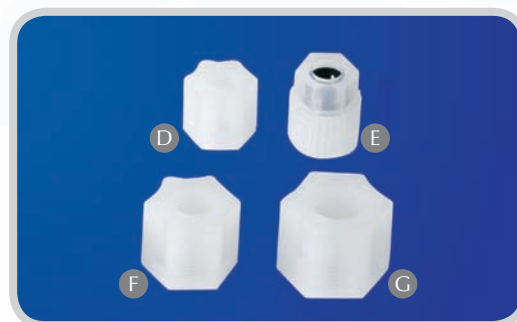


Please refer to the Savillex website for additional specialty filtration assemblies.

Ferrule Nuts

- Ferrule nuts provide for leak-free tubing connections
- Ferrule cap nuts are used to seal off tubing connections
- Vent nut accepts 9 mm filter membrane or PTFE/silicone laminated septa
- Gripper made of carbon-filled ETFE
- Tubing can be found on page 36

Tube Size	Part Number	Description
1/8" OD	A 750-FN2	Knurled Ferrule Nut
	751-FN2	Hex Ferrule Nut
	B 750-FP2	Knurled Ferrule Cap Nut
	751-FP2	Hex Ferrule Cap Nut
1/4" OD	C 750-FN4	Knurled Ferrule Nut
	D 751-FN4	Hex Ferrule Nut
	750-FP4	Knurled Ferrule Cap Nut
	751-FP4	Hex Ferrule Cap Nut
	E 751-GN4-1	Hex Ferrule Nut, Gripper Style
	750-FN4V	Knurled Vent Nut (Accepts 9mm vent membrane)
3/8" OD	750-FN6	Knurled Ferrule Nut
	751-FN6	Hex Ferrule Nut
	F 750-FP6	Knurled Ferrule Cap Nut
	751-FP6	Hex Ferrule Cap Nut
	751-GN6-1	Hex Ferrule Nut, Gripper Style
	750-FN8	Knurled Ferrule Nut
1/2" OD	751-FN8	Hex Ferrule Nut
	G 750-FP8	Knurled Ferrule Cap Nut
	H 751-FP8	Hex Ferrule Cap Nut
	750-FN10	Knurled Ferrule Nut
5/8" OD	I 750-FP10	Knurled Ferrule Cap Nut
3/4" OD	751-FN12	Hex Ferrule Nut
4 mm	830-FN4M	Knurled Ferrule Nut
	830-FP4M	Knurled Ferrule Cap Nut
6 mm	830-FN6M	Knurled Ferrule Nut



Fittings

Connector Fittings



- Male connectors may be added to vessels or closures to provide tubing connections
- Female connectors can be used with a MNPT fitting to provide tubing connections

Leg 1	Leg 2	Part Number
A 1/8" OD Tube	1/8" FNPT	751-FC2-2N
1/4" OD Tube	1/4" FNPT	751-FC4-4N
1/4" OD Tube	1/8" MNPT	751-C4-2N
B 1/4" OD Tube Knurled Ferrule Nut	1/4" MNPT	750-C4-4N
C 3/8" OD Tube	1/4" MNPT	751-C6-4N
1/2" OD Tube	3/8" MNPT	751-C8-6N
1/2" OD Tube	1/2" MNPT	751-C8-8N

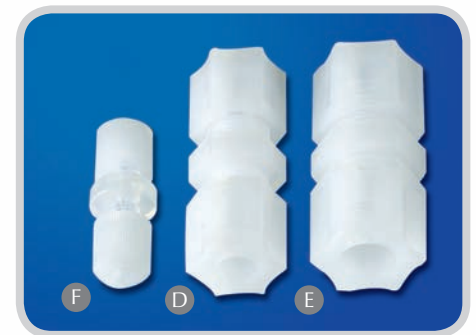


Union Fittings



- Straight unions are used to connect same size tubing

Leg 1	Leg 2	Part Number
1/8" OD Tube	1/8" OD Tube	751-SU2N
1/4" OD Tube	1/4" OD Tube	751-SU4N
1/4" OD Tube	1/4" MNPT Gripper	751-C4-4GN-1
D 3/8" OD Tube	3/8" OD Tube	751-SU6N
E 1/2" OD Tube	1/2" OD Tube	751-SU8N
F 4 mm	4 mm	750-SU4MN

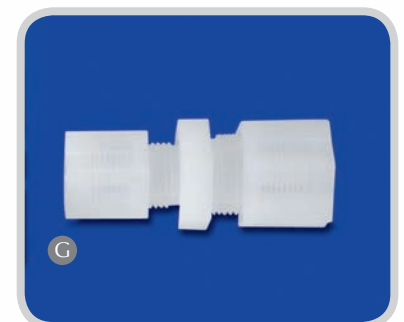


Reducer Fittings



- Straight union reducers are used to connect different size tubing

Leg 1	Leg 2	Part Number
1/4" OD Tube	1/8" OD Tube	751-SU4-2N
1/2" OD Tube	1/8" OD Tube	751-SU8-2N
3/8" OD Tube	1/4" OD Tube	751-SU6-4N
1/2" OD Tube	1/4" OD Tube	751-SU8-4N
1/2" OD Tube	1/4" OD Tube, Gripper Nut	751-SU8-4GN-1
G 1/2" OD Tube	3/8" OD Tube	751-SU8-6N
5/8" OD Tube	1/2" OD Tube	750-SU10-8N



Leg 1 Leg 2



Elbow Fittings

- Male elbow can be added to a vessel or closure to provide a tubing connection
- Union elbow can be used to connect same size tubing
- Union elbow reducer can be used to connect tubing of different sizes

A

B

Fitting Type	Leg 1	Leg 2	Part Number
Male	1/4" OD Tube, Gripper Nut	1/8" MNPT	751-E4-2GN-1
Male	3/8" OD Tube	1/4" MNPT	751-E6-4N
Union	1/4" OD Tube	1/4" OD Tube	751-UE4N
Union	3/8" OD Tube	3/8" OD Tube	751-UE6N
Union	1/2" OD Tube	1/2" OD Tube	751-UE8N
Reducer	1/4" OD Tube	1/8" OD Tube	751-UE4-2N
Reducer	3/8" OD Tube	1/4" OD Tube, Gripper Nuts	751-UE6-4GN-1
Reducer	1/2" OD Tube	1/4" OD Tube	751-UE8-4N



Leg 1 Leg 3



Leg 2

Tee Fittings

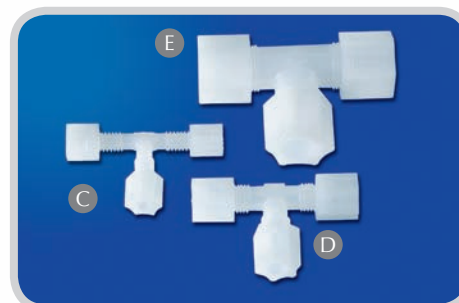
- Union tees are used to connect same size tubing

C

D

E

Leg 1	Leg 2	Leg 3	Part Number
1/8" OD Tube	1/8" OD Tube	1/8" OD Tube	751-UT2N
1/4" OD Tube	1/4" OD Tube	1/4" OD Tube	751-UT4N
1/4" OD Tube, Gripper Nut	1/4" OD Tube, Gripper Nut	1/4" OD Tube, Gripper Nut	751-UT4GN-1
3/8" OD Tube	3/8" OD Tube	3/8" OD Tube	751-UT6N
1/2" OD Tube	1/2" OD Tube	1/2" OD Tube	751-UT8N



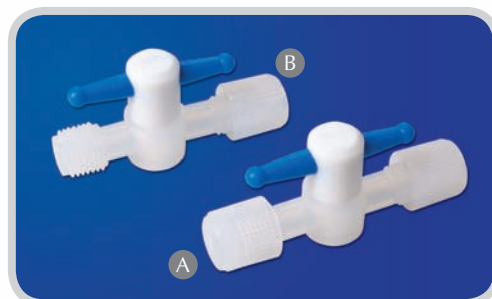
Fittings

Stopcock Valves



- Used to control fluid stream between tubing connections
- All parts in contact with the fluid stream are PFA and PTFE
- Stopcocks can be added to the side or bottom of vessels for drainage. Contact Savillex for details.
- Pressure rating: 50 PSI up to 150°F/66°C
- CAUTION: Subtract 1 PSI from 50 PSI for every 2°F/1°C rise above 150°F/66°C

Leg 1	Leg 2	Part Number
1/8" OD Tube	1/8" MNPT	751-PVT2-2-2
1/8" OD Tube	1/8" OD Tube	751-PVT2-T2-2
1/4" OD Tube	1/8" MNPT	750-PVT4-2-2
A 1/4" MNPT	1/4" MNPT	751-PV4-4-2
1/4" OD Tube	1/4" OD Tube	750-PVT4-T4-2
B 1/4" OD Tube	1/4" MNPT	750-PVT4-4-2

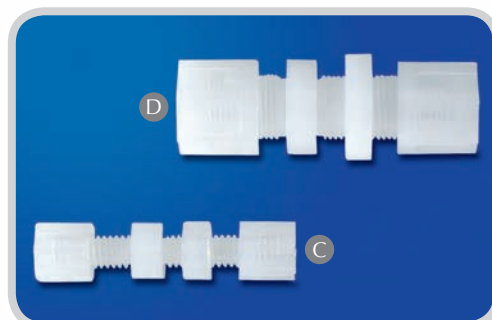


Panel Mount Fittings



- Used for attaching tubing to flat sides of closures or vessel surfaces

Leg 1	Leg 2	Part Number
C 1/8" OD Tube	1/8" OD Tube	751-PM2N
1/4" OD Tube	1/4" OD Tube	751-PM4N
D 3/8" OD Tube	3/8" OD Tube	751-PM6N
1/2" OD Tube	1/2" OD Tube	750-PM8N



Fittings Accessories

Membranes

- Porous PTFE membranes can be used with 1/4" OD vent nut, #750-FN4V (see page 18)

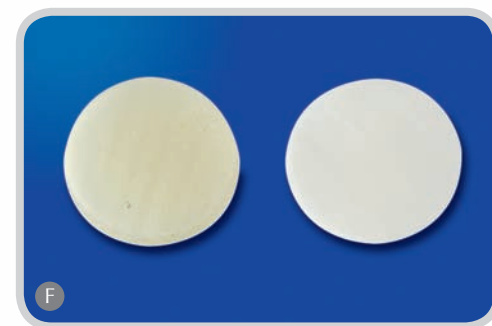
Part Number	Description
E 450-09-3	Membranes, 9 mm, 1-2 micron, 10 per pack



Laminates

- PTFE/silicone laminate can be used with 1/4" OD vent nut, #750-FN4V
- Laminate allows contents to be totally enclosed by PTFE while the resealable silicone can be pierced

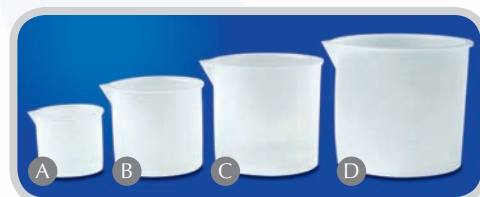
Part Number	Description	PTFE Thickness	Silicone Thickness
F 730-9909	PTFE/silicone laminate, 9 mm	.25 mm	1.3 mm



Beakers

- Griffin-style
- Flat exterior bottom aids in heat transfer

	Volume	Part Number	Description
A	50 ml	700-720	Graduated
B	125 ml	700-730	Graduated
C	250 ml	700-740	Graduated
D	500 ml	700-750	Graduated



Containers/Trays

	Part Number	Description
E	700-100	50 mm petri dish
F	700-125	100 mm petri dish
G	700-150	100 ml evaporating dish
H	700-900	Tray with cover, 1-1/2" x 3-1/4" x 3/4"
I	700-925	Tray, 1" x 4" x 3/4"
J	700-950	Tray, 6" x 4" x 2"
K	700-960	Pot, 2400 ml, 6" diameter
L	700-961	Pot cover for part number 700-960, 6" diameter



Funnels

Volume	Part Number
40 ml	700-440
80 ml	700-480



Wash Bottles

- Manufactured of FEP
- Includes Tefzel® ETFE closure, stem and drain tube

	Volume	Part Number	Description
M	500 ml	710-002-500	FEP bottle with closure
	1000 ml	710-002-1000	FEP bottle with closure



General Labware

Volumetric Flasks

- Class A tolerance rating per DIN EN ISO 1042
- Volumetric flasks include threaded PFA closure

Volume	Part Number	Description
10 ml	710-001-010	PFA flask with threaded closure
25 ml	710-001-025	PFA flask with threaded closure
50 ml	710-001-050	PFA flask with threaded closure
100 ml	710-001-100	PFA flask with threaded closure
250 ml	710-001-250	PFA flask with threaded closure
500 ml	710-001-500	PFA flask with threaded closure

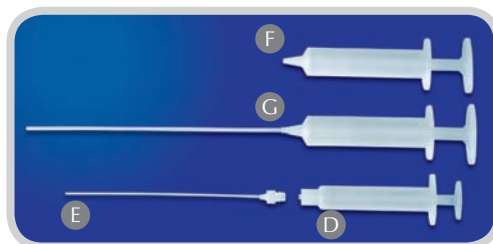


Other Labware

Part Number	Description	Volume
700-200	Sieve with 12 mm openings	-
700-225	Sieve with 1 mm openings	-
700-240	Dipper	40 ml
700-510	Syringe, with leur lock	10 ml
700-511	Syringe dispense tube for 10 ml syringe, male leur lock	-
700-520	Syringe with tube connector	20 ml
700-521	Syringe with permanent retrieve-dispense tube	20 ml
700-600	Pipette tip, 8 mm	-
700-706	Drop-in insert for 6 place well plate	-
700-712	Drop-in insert for 12 place well plate	-
700-724	Drop-in insert for 24 place well plate	-
700-850	Tongs, adjustable grip width	-



Shown with Jar
#100-0500-01



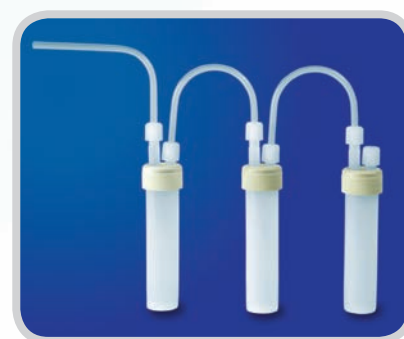
Impingers



- Top port on 60 ml impingers has through port location that allows tubing to pass through to vessel bottom
- Vertical port allows for close assembly of sampling train
- Ultem® clamp does not contact fluid stream
- 2.3 mm orifice accessory available as a push-in insert for 1/2" tube port
- Impingers include closure

	Volume	Part Number	Includes Closure	Interior	Diameter x Height (mm) (with closure)	Replacement Closure Size
A	60 ml	201-060-12-033-26	600-033-26 (2) 1/8" OD tube ports, one on top, one on side	—	30.7 x 174.0	33 mm
B	60 ml	201-060-12-033-27	600-033-27 (2) 1/8" OD tube ports, PFA insert and Ultem® clamp	—	30.7 x 177.6	33 mm
	60 ml	201-060-12-033-36	600-033-36 (2) 1/4" OD tube ports, one on top, one on side	—	30.7 x 174.0	33 mm
	60 ml	201-060-12-033-37	600-033-37 (2) 1/4" OD tube ports, PFA insert and Ultem® clamp	—	30.7 x 173.5	33 mm
C	375 ml	501-375-02-058-42	600-058-42 (2) 1/2" OD tube ports	—	58.2 x 330.0	58 mm

— = Flat Interior



Replacement Closures for Impingers

	Part Number (2) 1/8" OD tube ports, one top, one side	Part Number (2) 1/8" OD tube ports, PFA insert and Ultem® clamp	Part Number (2) 1/4" OD tube ports, one top, one side	Part Number (2) 1/4" OD tube ports, PFA insert and Ultem® clamp	Part Number (2) 1/4" OD tube ports	Part Number (2) 1/2" OD tube ports
33 mm	600-033-26	600-033-27	600-033-36	600-033-37	-	-
58 mm	-	-	-	-	600-058-33	600-058-42

Impingers

Impinger Accessories

Wrench Set

- Glass polypropylene wrench set used to tighten connections on impingers

A

Part Number	Description	Use with
730-0057	Wrench set	375 ml impingers



A

Fittings

B

Part Number	Description
730-0823	Impinger orifice, 2.3 mm ID, fits into 1/2" port



B

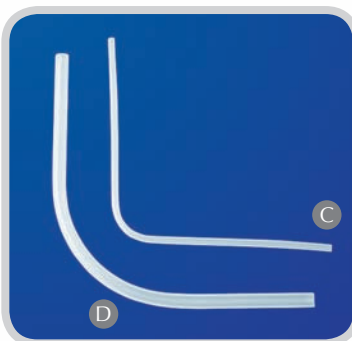
Tube Bends

- Formed from PFA
- Tube bends allow for close assembly of sampling train

C

Part Number	Description	Use with
730-2505	90° tube bend with 1/4" OD	60 ml impingers
730-2506	180° tube bend with 1/4" OD	60 ml impingers
730-5071	180° tube bend with 1/2" OD, full depth	375 ml impingers
730-5073	90° tube bend with 1/2" OD, full depth	375 ml impingers
730-5075	90° tube bend with 1/2" OD, 6" legs	375 ml impingers

D



C

D

Standard Jars



- Working temperature of -328°F/-200°C to 500°F/260°C
- Wrench available to assist with tightening
- Closures and vessels sold separately

	Volume	Part Number	Diameter x Height (mm) (with closure)	Accepts Closure	Pressure Rating at 100°F/38°C*
	60 ml	100-0060-01	50.5 x 49.5	53 mm	10 PSI
A	90 ml	100-0090-01	50.3 x 68.6	53 mm	10 PSI
	120 ml	100-0120-01	66.3 x 54.6	70 mm	3 PSI
B	180 ml	100-0180-01	66.8 x 75.7	70 mm	3 PSI
	180 ml	100-0180-02	50.5 x 127.3	53 mm	10 PSI
	240 ml	100-0240-01	66.8 x 96.8	70 mm	3 PSI
C	300 ml	100-0300-01	85.6 x 78.7	89 mm	3 PSI
	350 ml	100-0350-01	106.9 x 64.8	110 mm	3 PSI
	500 ml	100-0500-01	85.6 x 121.4	89 mm	3 PSI
D	500 ml	100-0500-03	85.6 x 121.9	89 mm	3 PSI
E	1000 ml	100-1000-01	107.7 x 152.9	110 mm	3 PSI
F	1000 ml	100-1000-03	107.7 x 154.9	110 mm	3 PSI



***CAUTION:** For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

Standard Jar Closures



Closure Size	Part Number Plain Threaded	Part Number (2) 1/8" OD tube ports	Part Number (2) 1/4" OD tube ports	Part Number Recessed for Nomex® Tabs
53 mm	600-053-01	600-053-20	600-053-28	600-053-71
70 mm	600-070-01	600-070-20	600-070-28	600-070-71
89 mm	600-089-01	600-089-20	600-089-28	600-089-71
110 mm	600-110-01	600-110-20	600-110-28	600-110-71

*Nomex® tabs sold separately

Modifications to Savillex products may be available. Contact Savillex for details.

Sealed Jars



- All sealed jars have two connecting tube ports
- 10 ml sealed jar has standard integral ferrule nuts
- Jars with volume of 125 ml or greater have ferrule gripper style nuts

Volume	Part Number	Description	Diameter x Height (mm)	Ports Accept	Pressure Rating at 100°F/38°C*
A 10 ml	102-0010-01	Sealed jar	25.9 x 77.7	(2) 1/8" OD tube	100 PSI
B 125 ml	102-0125-01	Sealed jar	50.0 x 128.5	(2) 1/4" OD tube	50 PSI
475 ml	102-0475-01	Sealed jar	85.1 x 115.6	(2) 1/4" OD tube	25 PSI
C 475 ml	102-0475-03	Sealed jar with 3/8" OD x 7/8" long drain tube molded at bottom	85.1 x 115.6	(2) 1/4" OD tube	25 PSI
D 1100 ml	102-1100-01	Sealed jar	107.2 x 168.1	(2) 1/4" OD tube	25 PSI
1100 ml	102-1100-03	Sealed jar with 1/2" OD x 7/8" long drain tube molded at bottom	107.7 x 163.8	(2) 1/4" OD tube	25 PSI



*CAUTION: For every 2°F/1°C increase above 100°F/38°C, reduce PSI rating by 1 PSI.

Jar Accessories

Support Screens

- PFA screens can be used in jars to hold solid samples in solutions or act as a coarse filter

Part Number	Description	Use with	Measurements
E 730-0046	Concave support screen	100-0060-01 100-0090-01 100-0180-01	44.5 mm OD x 21.0 mm height
700-650	PFA screen	-	82.5 mm OD x 3.5 mm thick



Jar Accessories, continued

Nomex® Tabs

- Record important data on tabs of Nomex® which can be snapped into recessed closures
- Nomex® tabs are rated to 428°F/220°C

A

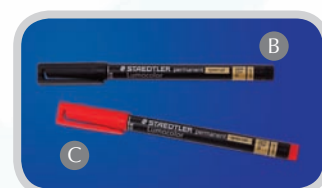
Part Number	Detail
730-0100	Packaged in bags of 100



6" Latex Rubber Gripper

- Aids in handling and securing PFA products
- Product contains Latex

Part Number	Description
730-0059	6" gripper



PFA Marking Pen

- Made by Staedtler®

B

Part Number	Description
730-0400	Black pen, 0.6 mm line width

C

730-0401	Red pen, 0.6 mm line width
----------	----------------------------

Pressure Fixture

- Pressure fixtures can be used with wide mouth jars, segmented column components and all containers under 2.5" diameter
- Fixtures have stainless steel end plates, bolts and nuts

D

Part Number	Description	Use with	Pressure Rating at 100°F*
730-1000	Pressure Fixture	500 ml and 1000 ml jar and closure	50 PSI



*CAUTION: For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

Wrench

- Polypropylene wrench provides assistance in tightening jars

E

Part Number	Description
730-0051	53 mm
730-0052	70 mm
730-0053	89 mm
730-0054	110 mm



Microcolumns

Standard Microcolumns

- Commonly used for ion exchange chromatography
- Long, narrow capillaries optimize the quality of the separation of one element from another
- Modified microcolumns can be made from most standard Savillex vials and straight tubing
- Frits not included and must be ordered separately

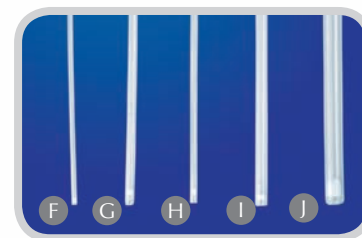
	Reservoir Volume	Part Number	Capillary Dimension	Capillary Length	Accepts Frit	Accepts Part Number	Closure Description
A	2 ml	220-002-015-032-15	1.5mm ID x 3.2mm OD	15 cm	730-0015	600-012-81	Press-on
	2 ml	220-002-024-040-15	2.4mm ID x 4.0mm OD	15 cm	730-0024	600-012-81	Press-on
B	5 ml	220-005-032-047-20	3.2mm ID x 4.7mm OD	20 cm	730-0032	600-024-01 600-024-23 600-024-71	Plain threaded (2) 1/8" push-in side ports Recessed threaded
C	6 ml	220-006-024-040-15	2.4mm ID x 4.0mm OD	15 cm	730-0024	600-023-01	Plain threaded
D	15 ml	220-015-040-063-20	4.0mm ID x 6.3mm OD	20 cm	730-0040	600-033-01 600-033-23 600-033-71	Plain threaded (2) 1/8" push-in side ports Recessed threaded
E	30 ml	220-030-064-096-25	6.4mm ID x 9.6mm OD	25 cm	730-0064	600-033-01 600-033-23 600-033-71	Plain threaded (2) 1/8" push-in side ports Recessed threaded



Microcolumn Accessories

Frits

	Part Number	Description	Thickness
F	730-0015	1.5 mm diameter frit, PTFE, 30 micron	2.5 mm
G	730-0024	2.4 mm diameter frit, PTFE, 30 micron	2.5 mm
H	730-0032	3.2 mm diameter frit, PTFE, 30 micron	2.5 mm
I	730-0040	4.0 mm diameter frit, PTFE, 30 micron	2.5 mm
J	730-0064	6.4 mm diameter frit, PTFE, 30 micron	8.4 mm
	730-0065	1 square inch PTFE frit material, 30 micron	2.5 mm
	730-0148	1 square inch PTFE frit material, 30 micron	1.6 mm



Pressure Vessels



- Heavy wall construction
- Can be used with column components
- Larger volume sizes are available. Contact Savillex for details.
- Closures sold separately

	Volume	Part Number	Pressure Rating	Accepts Closure	Diameter x Height (mm)
A	750 ml	325-0075-01	75 PSI	58 mm with 1-1/2" MNPT threads	106.7 x 164.3
	1000 ml	325-1000-01	75 PSI	58 mm with 1-1/2" MNPT threads	106.7 x 220.7
B	2000 ml	325-2000-01	75 PSI	58 mm with 1-1/2" MNPT threads	106.7 x 361.4

***CAUTION:** For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

Pressure Vessel Closures

	Style	Part Number	Ports	Diameter x Height (mm)
C	58 mm with 1-1/2" FNPT threads	600-058-06	None	58.2 x 28.7
D	58 mm with 1-1/2" FNPT threads	600-058-16	(1) 1/4" OD tube port	58.2 x 46.2
E	58 mm with 1-1/2" FNPT threads	600-058-17	(1) 1/4" FNPT port	58.2 x 39.1
	58 mm with 1-1/2" FNPT threads	600-058-19	(1) 3/8" OD tube port	58.2 x 51.8
	58 mm with 1-1/2" FNPT threads	600-058-24	(2) 1/8" OD tube ports	58.2 x 43.4
	58 mm with 1-1/2" FNPT threads	600-058-33	(2) 1/4" OD tube ports	58.2 x 46.5
F	58 mm with 1-1/2" FNPT threads	600-058-42	(2) 1/2" OD tube ports	58.2 x 43.8



Pressure Vessel Accessories

Part Number	Description
730-0055	Glass polypropylene wrench set
730-0059	6" latex rubber gripper

Sub-Boiling Distillation

DST-1000 Sub-Boiling Distillation

- Wetted parts of molded PFA
- Compact design; easy to use
- No cooling water required
- Built-in heater
- Maximum heating below boiling point of acid
- Large volume capacity
- Waste drain for easy cleaning
- Savillex PFA bottle recommended for distillate collection, see page 2

DISTILLATION RATES (ml/hr)			
Analyte	Hi	Mid	Low
HNO ₃	40	25	5
HCL	40	25	10
HF	40	25	10
H ₂ O	50	35	10

A

Voltage	Part Number	Volume
100 Volt	525-1000-100	1000 ml
115 Volt	525-1000-115	1000 ml
230 Volt	525-1000-230	1000 ml

DST-1000 Accessories

B

C

Part Number	Description
730-0525	Polypropylene tray, 10" x 20" x 1-5/8"
730-0660	Bottle bracket
450-09-3	9 mm PTFE membrane, 1-2 micron pore size



- 15 separate distillations were performed on an analytical grade HF acid (ppb level), and distilled acid was tested after the 1st, 5th, and 15th batches.
- The distilled acid was analyzed for trace metals and compared against a commercially available ultra high purity acid.
- Each batch represents a full 1 liter of acid which was distilled on the highest temperature setting of the DST-1000.

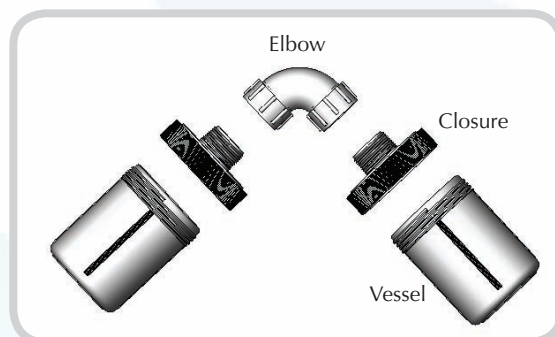
Full test report is available from Savillex upon request.

Analyte	Detection Limit (ppt)	Commercial High Purity Acid Comparison	Starting Acid	1st Distilled Batch	5th Distilled Batch	15th Distilled Batch
Li	1	< 1	< 1	< 1	< 1	< 1
Na	1	< 1	205	49	14	6
Mg	1	2	27	5	1	< 1
AL	1	8	113	205	15	6
K	1	3	35	45	5	3
Ca	1	9	39	78	7	2
Cr	1	1	41	10	1	3
Fe	1	1	120	312	7	9
Ni	1	< 1	65	7	< 1	1
Cu	1	< 1	43	9	< 1	2
Zn	1	2	19	5	1	3
W	1	< 1	21	7	5	2
Mo	1	1	2	6	4	1
Ti	1	3	67	16	6	6
Co	1	< 1	21	1	< 1	< 1
Mn	1	< 1	6	1	< 1	< 1
Zr	1	< 1	2	3	< 1	< 1
Ag	1	< 1	< 1	< 1	< 1	< 1
Cd	1	< 1	< 1	< 1	< 1	< 1
Sn	1	< 1	2	1	1	< 1
Cs	1	< 1	< 1	< 1	< 1	< 1
Ba	1	< 1	4	< 1	< 1	< 1
Pb	1	< 1	1	< 1	< 1	< 1

Sub-Boiling Distillation

Classic Sub-Boiling Still Components

- To build your own sub-boiling still using the 1000 ml jar, select the following components:
 - Jars (quantity 2)
 - Elbow
 - 110 mm closure (quantity 2)
- To build your own sub-boiling still using 120 ml or 375 ml vessels, select the following components:
 - Vessels (quantity 2)
 - Elbow
- Classic stills require external heating and cooling (not included)
- Pre-assembled classic sub-boiling still assemblies can be found on page 33



Vessels

- Two vessels can be connected using 90° elbow to form sub-boiling stills

	Part Number	Volume	Description
A	500-120-02	120 ml	Vessel only, flat interior
B	500-375-02	375 ml	Vessel only, flat interior
C	100-1000-01	1000 ml	Jar only



Closure

- Modified closure connects elbow to standard 1000 ml jars

	Part Number	Description
D	600-110-70	110 mm closure with 1 1/2" MNPT elbow adapter



Elbow

- 1-1/2" FNPT threads
- 90° elbow is used to directly connect 120 ml and 375 ml vessels to form sub-boiling stills
- Use elbow with 110 mm closure with 1-1/2" MNPT elbow adapter

	Part Number	Description
E	521-1	Classic still elbow



Condenser Coil

- 1-1/2" coil diameter fits inside standard 375 ml vessel
- 6" tubing tails allow for connection to 1/4" fitting

	Part Number	Description
F	522-1	1/4" classic still condenser coil



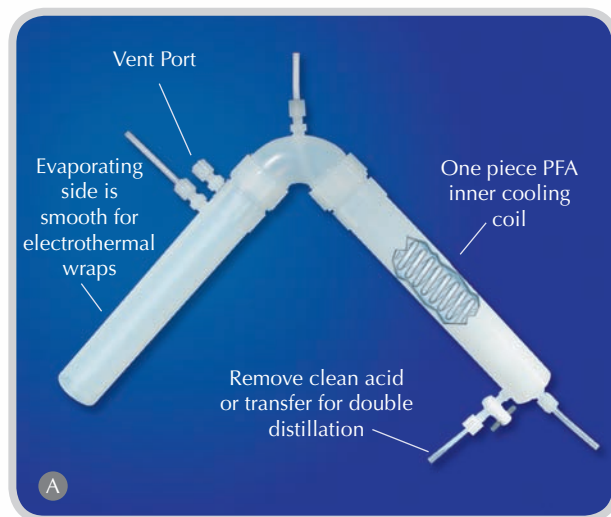
Sub-Boiling Distillation

Classic Sub-Boiling Still Assemblies

- One piece inner PFA coil inserted in cooling side
- Plain vessel has smooth surface for use with electrothermal wraps on evaporating side
- Classic assemblies require external heating and cooling (not included)

A

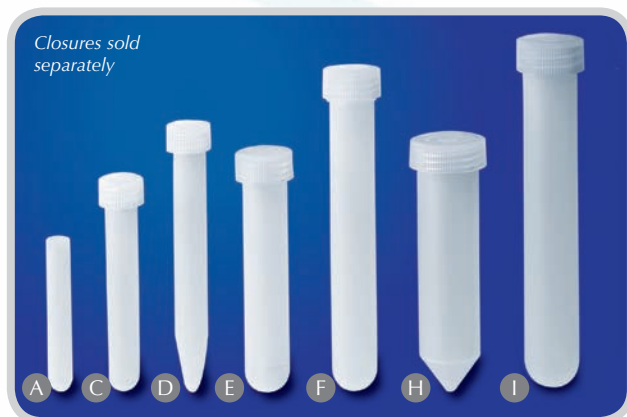
Part Number	Volume	Description
520-1-1-2	375 ml each side	Plain vessel with vent port
520-1-2-2	375 ml each side	Plain vessel with bottom stopcock and vent port
520-1-3-2	375 ml each side	Plain vessel with side stopcock and vent port



Classic Distillation Accessories

Part Number	Description
730-0057	58 mm wrench set for 375 ml assemblies
450-09-03	9 mm PTFE membrane, 1-2 micron pore size

Standard Tubes



- Service temperature range of PFA is -328°F/-200°C to 500°F/260°C
- Tubes can be autoclaved
- PFA tubes are non-breakable
- Closures sold separately

	Volume	Part Number	Top Opening	Interior	Diameter x Height (mm) (with closure)	Accepts Closure Part Number	Description
A	5 ml	210-005-21	Open	U	11.9 x 74.9	NA	-
B	14 ml	210-014-21	Open	U	16.0 x 99.8	NA	-
C	15 ml	210-015-20	Threaded	U	16.0 x 113.0	600-018-01	Plain threaded
D	15 ml	210-015-30	Threaded	V	16.0 x 129.3	600-018-01	Plain threaded
E	26 ml	210-026-20	Threaded	U	21.6 x 116.1	600-024-01 600-024-23 600-024-71	Plain threaded (2) 1/8" ports Recessed
F	32 ml	210-032-20	Threaded	U	20.1 x 153.4	600-024-01 600-024-23 600-024-71	Plain threaded (2) 1/8" ports Recessed
G	50 ml	210-050-20	Threaded	U	28.4 x 122.7	600-029-01	Plain threaded
H	50 ml	210-050-30	Threaded	V	28.4 x 119.4	600-029-01	Plain threaded
I	60 ml	210-060-20	Threaded	U	25.9 x 168.7	600-028-01	Plain threaded

V = Conical Interior U = Rounded Interior



Recessed closure with Nomex® tab (tabs sold separately)

Tubes

Block Digestion Tubes



- Service temperature range of PFA is -328°F/-200°C to 500°F/260°C
- PFA tubes designed for use in block digestion systems
- Thin wall tubes allow maximum heat transfer
- Closures sold separately

	Volume	Part Number	Top Opening	Interior	Diameter x Height (mm) (with closure)	Accepts Closure Part Number	Description
A	4 ml	210-004-20	Threaded	U	15.2 x 46.2	600-023-01	Plain threaded
B	10 ml	210-010-30	Threaded	V	26.2 x 40.6	600-033-01 600-033-23 600-033-26 600-033-71	Plain threaded (2) 1/8" push-in side ports (2) 1/8" ports, one top, one side Recessed
	17 ml	210-017-20	Threaded	U	26.2 x 40.6	600-033-01 600-033-23 600-033-26 600-033-71	Plain threaded (2) 1/8" push-in side ports (2) 1/8" ports, one top, one side Recessed
C	25 ml	210-025-30	Threaded	V	26.2 x 78.5	600-033-01 600-033-23 600-033-26 600-033-71	Plain threaded (2) 1/8" push-in side ports (2) 1/8" ports, one top, one side Recessed
D	55 ml	210-055-11	Open	—	30.2 x 109.5	-	-
E	60 ml 25 ml & 50 ml graduations	210-060-70	Threaded	—	29.5 x 132.6	600-033-01 600-033-23 600-033-26 600-033-71	Plain threaded (2) 1/8" push-in side ports (2) 1/8" ports, one top, one side Recessed
F	75 ml	210-075-11	Open	—	34.5 x 104.4	600-038-89	Push-in plug
G	150 ml	210-150-11	Open	—	38.1 x 218.4	-	-

V = Conical Interior U = Rounded Interior — = Flat Interior



Microcentrifuge Tubes

See Microcentrifuge Vials, page 40.

PFA Coiled Tubing

- Maximum service temperature for PFA is 500°F/260°C
- Coiled tubing is flexible and translucent
- Most sizes available in 5', 25', or 100' coils
- Fittings can be found on page 18

OD	ID	Part Number	Part Number	Part Number
		5' Length	25' Length	100' Length
1/8"	1/16"	760-1-062-125-005	760-1-062-125-025	760-1-062-125-100
3/16"	1/8"	760-1-125-188-005	NA	NA
1/4"	5/32"	760-1-156-250-005	760-1-156-250-025	760-1-156-250-100
3/8"	1/4"	760-1-250-375-005	760-1-250-375-025	760-1-250-375-100
1/2"	3/8"	760-1-375-500-005	760-1-375-500-025	760-1-375-500-100



FEP Coiled Tubing

- Maximum service temperature for FEP is 392°F/200°C
- Coiled tubing is flexible and translucent
- Available in 5', 25', or 100' coils
- Fittings can be found on page 18

OD	ID	Part Number	Part Number	Part Number
		5' Length	25' Length	100' Length
1/8"	1/16"	760-2-062-125-005	760-2-062-125-025	760-2-062-125-100
1/4"	5/32"	760-2-156-250-005	760-2-156-250-025	760-2-156-250-100
3/8"	1/4"	760-2-250-375-005	760-2-250-375-025	760-2-250-375-100
1/2"	3/8"	760-2-375-500-005	760-2-375-500-025	760-2-375-500-100

Tubing

PFA Straight Tubing

- PFA straight tube lengths can be used for microcolumn capillaries and rigid tubing applications
- All straight tubing sold in lengths of 24"
- Fittings can be found on page 18

OD	ID	Part Number
3/32"	1/32"	761-1-031-094
1/8"	1/32"	761-1-031-125
1/8"	1/16"	761-1-062-125
5/32"	3/32"	761-1-094-156
3/16"	1/8"	761-1-125-187
1/4"	5/32"	761-1-156-250
1/4"	3/16"	761-1-188-250
3/8"	1/4"	761-1-250-375
3/8"	5/16"	761-1-312-375
1/2"	3/8"	761-1-375-500
5/8"	1/2"	761-1-500-625



Tubing Accessories

Groove Tool

- Grooves tubing at fitting locations and prevents tubing blow-out at higher pressures

Size	Part Number
1/8"	730-0002
1/4"	730-0004
3/8"	730-0006
1/2"	730-0008



Standard Vials



- Service temperature range of PFA is -328°F/-200°C to 500°F/260°C
- Flat exterior bottom aids in heat transfer
- Square exterior vial with hex closure designed for long term sealing
- Trays for vials are available on page 41
- Closures sold separately on page 39

	Volume	Part Number	Interior	Exterior	Diameter x Height (with closure)	Accepts Closure Size	Tray Size	Pressure Rating*
A	3 ml	200-003-12	—	□	17.3 x 26.4	23 mm	21 mm	60 PSI
	3 ml	200-003-20	U	□	17.3 x 26.4	23 mm	21 mm	60 PSI
	3 ml	200-003-30	V	□	17.3 x 26.4	23 mm	21 mm	60 PSI
B	5 ml	200-005-12	—	○	22.1 x 33.3	24 mm	21 mm	25 PSI
	5 ml	200-005-20	U	○	22.1 x 33.3	24 mm	21 mm	25 PSI
	5 ml	200-005-30	V	○	22.1 x 33.3	24 mm	21 mm	25 PSI
C	6 ml	200-006-20	U	□	17.8 x 46.5	23 mm	21 mm	60 PSI
	7 ml	200-007-10	—	○	22.1 x 37.1	24 mm	21 mm	25 PSI
	7 ml	200-007-20	U	○	22.1 x 37.1	24 mm	21 mm	25 PSI
D	7 ml	200-007-30	V	○	22.1 x 37.1	24 mm	21 mm	25 PSI
	15 ml	200-015-12	—	○	30.5 x 41.1	33 mm	29 mm	10 PSI
	15 ml	200-015-20	U	○	30.5 x 41.4	33 mm	29 mm	10 PSI
E	15 ml	200-015-30	V	○	30.5 x 41.4	33 mm	29 mm	10 PSI
	22 ml	200-022-12	—	○	30.5 x 55.6	33 mm	29 mm	10 PSI
	22 ml	200-022-20	U	○	30.5 x 56.1	33 mm	29 mm	10 PSI
F	22 ml	200-022-30	V	○	30.5 x 55.6	33 mm	29 mm	10 PSI
	30 ml	200-030-12	—	○	30.5 x 69.9	33 mm	29 mm	10 PSI
	30 ml	200-030-20	U	○	30.5 x 70.1	33 mm	29 mm	10 PSI
	30 ml	200-030-30	V	○	30.5 x 79.0	33 mm	29 mm	10 PSI
	60 ml	200-060-12	—	○	30.7 x 133.9	33 mm	29 mm	10 PSI
	60 ml	200-060-20	U	○	30.7 x 132.1	33 mm	29 mm	10 PSI
	60 ml	200-060-30	V	○	30.7 x 132.1	33 mm	29 mm	10 PSI

V = Conical Interior U = Rounded Interior — = Flat Interior

○ = Round Exterior □ = Square Exterior



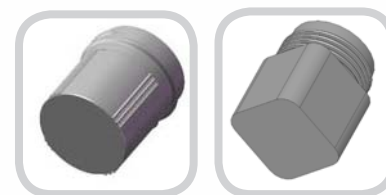
Shown with wrench set and socket cap (see page 42)



Rounded Interior

Conical Interior

Flat Interior



Round Exterior

Square Exterior

*Pressure rating at 100°F/38°C

CAUTION: For every 2°F/1°C increase above 100°F/38°C, reduce pressure rating by 1 PSI.

Vials

Standard Vial Closures

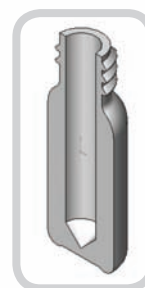
Closure Size	Part Number	Part Number	Part Number	Part Number
	Plain Hex Threaded	Plain Threaded	Recessed for Nomex® Tabs*	(2) 1/8" Push-In Side Ports
23 mm	600-023-01	-	-	-
24 mm	-	600-024-01	600-024-71	600-024-23
33 mm	-	600-033-01	600-033-71	600-033-23

*Nomex® tabs sold separately

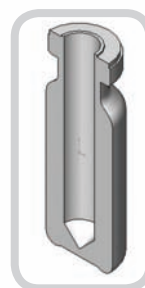
Autosampler Vials



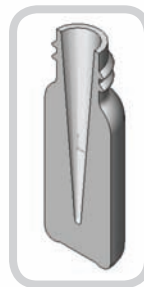
- Service temperature range of PFA is -328°F/-200°C to 500°F/260°C
- PFA autosampler vials provide low contamination and low absorption of ultratrace metals for critical analyses
- Crimp top vials accept standard 11 mm crimp caps



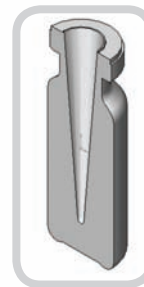
Straight Inside Threaded Top



Straight Inside Crimp Top



Conical Inside Threaded Top



Conical Inside Press On Top



Conical Inside Open Top

	Volume	Part Number	Interior	Diameter x Height (mm) (with closure)	Accepts Closure Part Number	Description
A	.2 ml	200-902-41	∇	11.5 x 32.4	crimp top	
B	.2 ml	200-902-40	∇	11.4 x 34.5	600-008-01 600-008-72 600-008-80	standard threaded septum piercable
C	.5 ml	200-905-43	∇	11.5 x 32.4	crimp top	
D	.5 ml	200-905-42	∇	11.4 x 34.3	600-008-01 600-008-72 600-008-80	standard threaded septum piercable
	1.3 ml	200-913-44	∇	12.2 x 39.4	600-013-73 600-013-85	valveless threaded threaded with knob
	1.5 ml	200-915-44	∇	12.7 x 31.5	600-012-81	press on
E	2 ml	200-002-44	∇	12.2 x 43.7	600-012-81	press on
F	4 ml	200-004-44	∇	14.2 x 60.2	600-012-81	press on
G	4 ml	200-004-13	—	15.0 x 52.3	600-018-88	snap on
H	13 ml	200-013-14	—	22.1 x 56.1	600-024-01 600-024-23 600-024-71	standard threaded (2) 1/8" push in side ports recessed
I	20 ml	200-020-13	—	26.7 x 61.5	600-031-88	snap on

∇ = Conical Interior ∇ = Straight Interior — = Flat Interior

Microcentrifuge Vials

	Volume	Part Number	Interior	Diameter x Height (mm) (with closure)	Accepts Closure
A	.50 ml	200-905-50	V	7.8 x 30.9	600-008-83
B	1.5 ml	200-915-50	V	12.7 x 42.3	600-011-83

V = Conical Interior

Closures sold separately



Specialty Vials

	Volume	Part Number	Interior	Diameter x Height (mm) (with closure)	Accepts Closure
C	.20 ml	200-902-60	U	7.9 x 18.7	600-010-82
D	.35 ml	200-904-61	—	15.6 x 30.4	600-015-84

U = Rounded Interior — = Flat Interior

Closures sold separately



Forensic Vials

- Designed for long-term storage of DNA
- Improves sample recovery over standard PP vials
- Test data available at www.savillex.com

	Volume	Part Number	Interior	Diameter x Height (mm) (with closure)	Accepts Closure	
					Part Number	Description
E	.20 ml	200-702-42	U	10.7 x 34.5	600-008-01	plain threaded
					600-008-80	pierceable
					600-008-72	septum
F	.50 ml	200-705-42	U	10.7 x 34.5	600-008-01	plain threaded
					600-008-80	pierceable
					600-008-72	septum

U = Straight Interior

Closures sold separately



Vial Accessories

Nomex® Tabs

- Record important data on tabs of Nomex® which can be snapped into recessed closures
- Nomex® is suitable for use in a wide temperature range
- Tabs must be trimmed for use with 24 mm closure

Part Number	Description	Additional Description
730-0100	Snap-in tabs	Packaged in bags of 100



PFA Marking Pen

- Made by Staedtler®

Part Number	Description
730-0400	Black pen, 0.6 mm line width
730-0401	Red pen, 0.6 mm line width



Socket Cap

- Socket-type cap is molded of Ultem® for extra strength (rated to 392°F/200°C)
- Slips over closure for additional holding in pressure applications

Part Number	Description	Use with
730-5132	Socket cap	23 mm closure



Wrench Set

- Special glass polypropylene wrench set is used to tighten square vial body and hex closure

Part Number	Description	Use with
730-5131	Wrench set	Square exterior vials



Support Screens

- PFA screens can be used in vial to hold solid samples in solutions or act as a coarse filter

Part Number	Description	Use with	Measurements
730-0026	Support Screen	15, 22, 30 and 60 ml vials	23.6 mm OD x 14.2 mm height

Trays

- Molded polypropylene trays have 10 numbered compartments and slots for two ID cards
- Trays are heat resistant to 248°F/120°C

Part Number	Description	Length x Width x Height (mm)
730-2001	Tray with 21 mm opening	174.8 x 86.7 x 17.8
730-2002	Tray with 29 mm opening	217.7 x 86.7 x 32.3



Laminates

Part Number	Description
730-9909	9 mm PTFE/Silicone laminates, 10 per pack

Vials not included

Replacement Closures

Product Category	Closure Location
Bottle Closures	Page 2
Column Component Closures	Page 5
Digestion Vessel Closures	Page 7
Impinger Closures	Page 24
Microcentrifuge Vial Closures	Page 40
Pressure Vessel Closures	Page 30
Standard Jars Closures	Page 26
Standard Microcolumn Closures	Page 29
Standard Tube Closures	Page 34
Block Digestion Tube Closures	Page 35
Standard Vial Closures	Page 39
Autosampler Vial Closures	Page 39
Specialty Vial Closures	Page 40
Forensic Vial Closures	Page 40



PFA Closures for Glass Products

Size	Part Number	Description
15 mm	600-015-73	Valveless threaded
18 mm	600-018-73	Valveless threaded
20 mm	600-020-73	Valveless threaded
38 mm	600-038-03	38-430 thread finish
38 mm	600-038-21	Transfer closure, (2) 1/8" OD tube ports, 38-430 thread finish, polypropylene clamp
38 mm	600-038-26	Transfer closure, (2) 1/8" OD tube ports, one top, one side, 38-430 thread finish
38 mm	600-038-30	Transfer closure, (2) 1/4" OD tube ports, 38-430 thread finish, polypropylene clamp
38 mm	600-038-36	Transfer closure, (2) 1/4" OD tube ports, one top, one side, 38-430 thread finish
38 mm	600-038-46	Transfer closure, (2) 1/4" OD tube ports, one top, one side, 38-430 thread finish with vent nut
38 mm	600-038-45	Transfer closure, (1) 1/8" OD tube top port, (1) 1/4" OD tube side port, 38-430 thread finish
38 mm	600-038-44	Transfer closure, (1) 1/8" OD tube side port, (1) 1/4" OD tube side port, 38-430 thread finish
89 mm	600-089-02	Plain, 400 thread finish
89 mm	600-089-29	Transfer closure, (2) 1/4" OD tube ports, 400 thread finish
95 mm	600-095-34	Transfer closure, (2) 1/4" OD tube ports, for wide-mouth mason jar



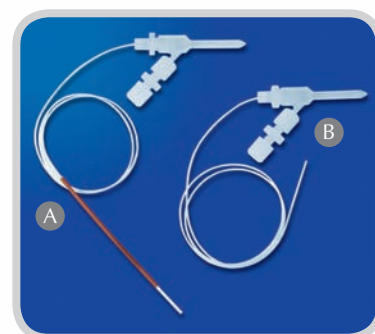
Glass bottles not available from Savillex.

Sample Introduction Systems

C-Flow Nebulizers

- All molded PFA concentric flow nebulizer
 - 6 mm body fits any standard end cap or spray chamber
 - O-ring free end cap available
- Consistently repeatable performance
- Straight capillary
- Self aspirate or pump
- One-piece 4 mm gas port
- Modified uptake tubing length available upon request
- Pre-cleaned nebulizers available upon request
- Standard uptake style has the last 6" of uptake tubing straightened and works with the Cetac ASX-100 autosampler

	Uptake Rate	Part Number	Uptake Style
A	50 µl	800-1-005-01-00	700 mm length tubing x 1.6 mm OD, standard uptake
	50 µl	800-1-005-02-00	700 mm length tubing with I-AS probe
	100 µl	800-1-010-01-00	700 mm length tubing x 1.6 mm OD, standard uptake
	100 µl	800-1-010-02-00	700 mm length tubing with I-AS probe
B	200 µl	800-1-020-01-00	700 mm length tubing x 1.6 mm OD, standard uptake
	200 µl	800-1-020-02-00	700 mm length tubing with I-AS probe



X-Flow Nebulizers

- All molded PFA cross flow nebulizer
- Self aspirate or pump
- Resistant to clogging
- O-ring free connections
- Consistently repeatable performance
- Interchangeable uptake lines
- Pre-cleaned nebulizers available upon request

	Uptake Rate	Part Number	Makeup Gas
C	100 µl	810-1-010-00-00	-
	100 µl	810-1-010-01-00	4 mm OD fitting
	400 µl	810-1-040-00-00	-
	400 µl	810-1-040-01-00	4 mm OD fitting
	1 ml	810-1-100-00-00	-
	1 ml	810-1-100-01-00	4 mm OD fitting



Sample Introduction Systems Accessories

End Caps

- O-ring free connection to standard 35 mm spray chambers

A

Part Number	Description	Use With
830-010	35 mm end cap with makeup gas port at 90°	4 mm OD and 6 mm OD knurled ferrule nuts
830-011	35 mm end cap without makeup gas	4 mm OD and 6 mm OD knurled ferrule nuts

Spray Chamber Adapter

- Adapts spray chamber connection from 47 mm to 35 mm

B

Part Number	Description	Dimensions
830-020	Spray chamber adapter	47 mm x 35 mm

Tubing

- Used for high purity argon gas line

Part Number	Description	OD	ID	Length
830-030	PTFE tubing	4 mm	2.48 mm	12'
830-031	PFA tubing	4 mm	2.0 mm	10'

Fittings

- Replacement fittings for nebulizer assemblies

Part Number	Description
830-FP4M	Knurled ferrule cap nut, 4 mm OD
750-SU4MN	Knurled straight union, 4 mm OD
830-FN4M	Knurled ferrule nut, 4 mm OD
830-FN6M	Knurled ferrule nut, 6 mm OD
750-100525	Argon adapter fitting, 4 mm OD

X-Flow Uptake Lines

- Allows for interchangeable uptake rates

Part Number	Description	Uptake Rate	OD	Length
830-040	X-Flow sample uptake line assembly	100 µl	1.6 mm	700 mm
830-041	X-Flow sample uptake line assembly	400 µl	1.6 mm	700 mm
830-042	X-Flow sample uptake line assembly	1 ml	1.6 mm	700 mm



Also Available

Inert sample introduction system components:

- Spray Chambers
- Injectors

Please call or visit us online for more information on these products.

Custom Molding

Capabilities and Competencies

As a global leader in the supply and support of PFA and fluoropolymer injection molded solutions, we have developed unique tooling technology. This allows us to provide an economical way to move to an injection molded component instead of more expensive, machined components, even on very short runs. As a vertically integrated company we offer:

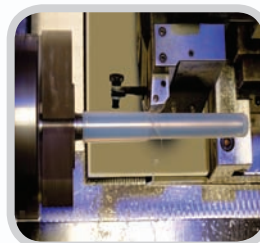
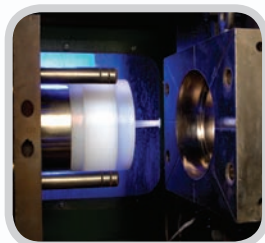
- Injection molding of very small to large sizes
- Ability to manufacture simple to complex designs
- Wide range of materials: PFA, FEP, ETFE, ECTFE, PVDF, PP
- Insert and overmolding capabilities
- In-house tooling including tool design, fabrication, and the ability to make changes and modifications quickly
- Secondary operations including machining and fusion welding
- Assembly and post-cleaning



Markets Served

Savillex is committed to partnering with you to find reliable, cost-effective solutions for your custom and contract molding needs. Demonstrated by our 35-plus years of experience, we have produced quality custom products and components that support and enable technologies in the following industries:

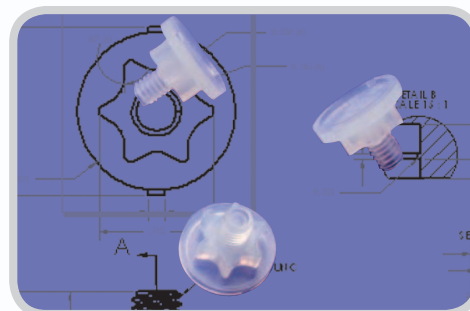
- Semiconductor
- Pharmaceutical
- Chemical Processing
- Medical Technology
- Analytical Laboratories
- Industrial



Service and Support

Savillex provides the capabilities, experience and commitment to achieve your product and application requirements every step of the way. Developing custom molded solutions is what we do best. In addition, we offer:

- Fast response and turnaround time
- Engineering and design support services
- Prototyping and product qualifications
- Low entry cost for molded solutions
- Cost-effective delivery programs to meet your needs



Submit your request online! Go to

www.savillex.com Click on ***Custom Molding***,
then ***Request a Quote***

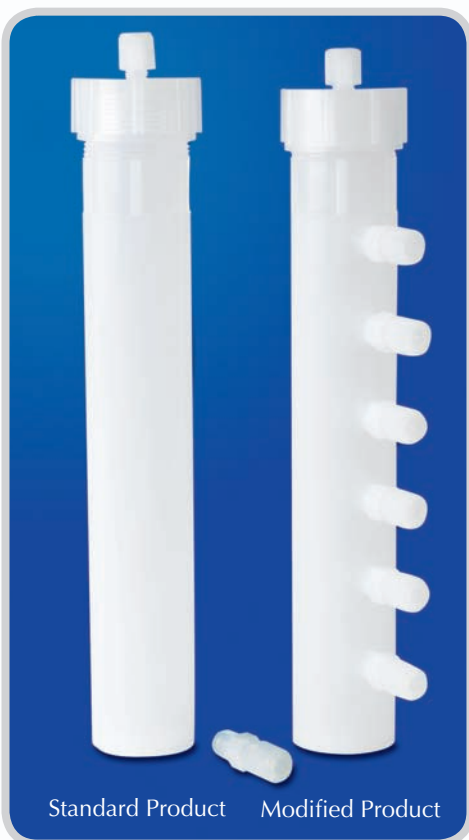
Modified Products

In addition to our standard line of PFA labware and custom molding capabilities, we are also able to offer our expertise in modifying many of our products to better suit your specific application.

Modified products can include:

- adding fittings
- machining parts to fit specific equipment
- molding in a different color
- welding parts together
- laser marking

If you do not see exactly what you need in our catalog, please contact us and we will be happy to work with you to explore modifications to our existing product line.



Standard labware products can be modified upon request.

General Technical Specifications

Working temperature

The working temperature of PFA is -328°F/-200°C to 500°F/260°C; however, this is dependent upon the specific product being used. Contact Savillex for more information.

PSI ratings

All PSI ratings are given at 100°F/38°C unless otherwise stated. For every 2°F/ 1°C increase above 100°F/ 38°C, reduce pressure rating by 1 PSI.

Wrench tightening of containers and closures

Wrench tightening is defined as utilizing a wrench to tighten a closure a specified amount beyond hand tight to achieve maximum sealing performance. Contact Savillex for specific guidelines if needed.

Sterility and cleaning

Savillex PFA products are not precleaned or sterilized prior to shipping. Please see the table on page 49 for a list of sterilization techniques and page 50 for parts cleaning protocol.

FDA and USP Class VI Compliance for PFA

Raw PFA (Perfluoroalkoxy) resin is manufactured by several companies. The most recognizable company is Dupont, which markets their PFA resin as Teflon®. Each manufacturer of PFA also has several different grades of PFA resin. Most “high purity” grades of PFA resin are compliant with both FDA and USP Class VI criteria.

Savillex uses numerous suppliers and various grades of PFA in our manufacturing processes, and there is not a specific product or group of products that we manufacture with the goal or intention of meeting USP or FDA guidelines. If you require a specific part or parts manufactured with a PFA resin that meets FDA and USP Class VI criteria, we can work with you to accommodate this request.

Please note however, that PFA resins that meet FDA or USP Class VI criteria may be significantly more expensive compared to PFA resins that do not meet these criteria. Also, USP Class VI compliance may require that the actual molded part be tested and certified as opposed to only the resin. Any testing or certification of Savillex parts are the responsibility of the end user.

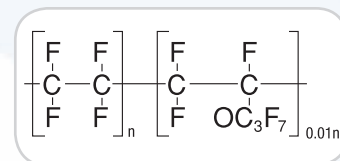
Materials

Fluoropolymers

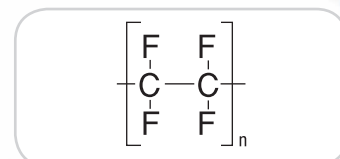
As your fluoropolymer expert, Savillex has experience in processing all of the materials listed below.

PFA (perfluoroalkoxy)

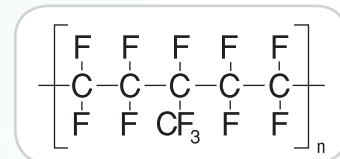
PFA is the material of choice for the majority of Savillex's products due to its superior properties. Of key importance is the purity of the material and its excellent chemical resistance, making it ideally suited for products serving the analytical, semiconductor, medical, pharmaceutical and chemical processing industries. PFA is translucent in color so you can see what is inside the product. It has the widest service temperature range of the fluorocarbons, ranging from -328°F/-200°C to 500°F/260°C. In comparison to PTFE, PFA demonstrates greater strength, stiffness and creep resistance. In addition, it has a low coefficient of friction and beneficial anti-stick properties. PFA is considered by some to be the best melt-processable fluoropolymer.



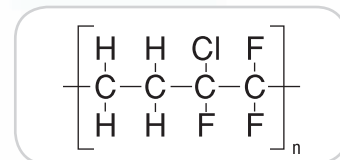
PFA



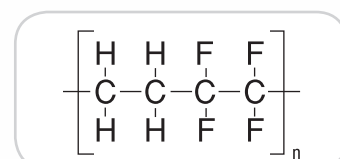
PTFE



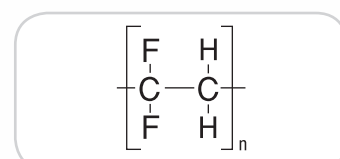
FEP



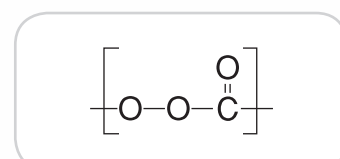
ECTFE



ETFE



PVDF



PEEK

PTFE (polytetrafluoroethylene)

An extremely low coefficient of friction makes PTFE an excellent material where surface wear might be a problem. PTFE exhibits a useful service range from below -100°F/-73°C to temperatures of over 500°F/260°C. Its resistance to solvents is excellent throughout a wide range of temperatures. Its low dielectric constant and electric resistance also remain constant throughout this range. The major disadvantage with PTFE is the very high melt viscosity that makes processing difficult by normal extrusion and injection molding methods, and its propensity to creep and cold flow. For use in the fabrication of labware products PTFE is not ideal because the material is opaque, which does not allow the user to see inside the product. Parts are typically machined into final use products.

FEP (fluorinated ethylene propylene)

FEP has similar mechanical and chemical properties to PTFE but better impact strength and is melt-processable. The material tends to be translucent in color and fairly rigid. It offers excellent chemical resistance. FEP can withstand temperatures ranging from -328°F/-200°C to 392°F/200°C and may be sterilized repeatedly.

ECTFE (ethylene-chlorotrifluoroethylene)

ECTFE is translucent white and is a melt-processable alternating copolymer of ethylene and chlorotrifluoroethylene. It has excellent electrical properties and chemical resistance. ECTFE can withstand continuous exposure to extreme temperatures while maintaining its excellent mechanical properties. In addition, it is non-burning and resistant to radiation.

ETFE (ethylene-tetrafluoroethylene)

ETFE is a partially fluorinated copolymer that is translucent white in color and has good chemical resistance. Its mechanical properties approach that of fully fluorinated polymers but has a lower maximum service temperature. ETFE is another melt-processable fluoropolymer with greater abrasion resistance and impact strength than FEP and PTFE.

PVDF (polyvinylidene fluoride)

PVDF is a partially fluorinated homopolymer and is made by polymerizing vinylidene monomer. It is opaque in color, resists UV radiation, and offers high mechanical strength and abrasion resistance. These properties, along with its chemical resistance, make PVDF a popular choice for molded automotive, electrical and chemical piping products.

PEEK (polyetheretherketone)

PEEK is a high temperature thermoplastic with excellent strength, creep and wear resistance properties, even at high temperatures. Though it is resistant to a wide range of organic and inorganic liquids, its chemical compatibility is not that of PFA and other fully fluorinated polymers.

Materials, continued

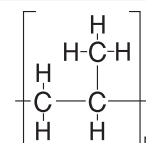
Non-Fluoropolymers

PP (polypropylene)

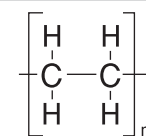
PP is translucent in color, autoclavable and is unaffected by solvents at room temperature. PP products tend to be brittle at 32°F/0°C and may crack or break if dropped. PP does offer the best stress-crack resistance of the polyolefins.

HDPE (high-density polyethylene)

HDPE is opaque in color, lightweight and provides very low moisture absorption. It has little branching, giving it stronger inter-molecular forces and tensile strength than lower density polyethylene. It can withstand temperatures ranging from -148°F/-100°C to 248°F/120°C.



PP



HDPE

Application Properties

	PFA	PTFE	FEP	ECTFE	ETFE	PVDF	PEEK	HDPE	PP
APPLICATION PROPERTIES									
Upper Service Temperature	260°C 500°F	260°C 500°F	200°C 392°F	150°C 302°F	150°C 302°F	150°C 302°F	250°C 482°F	120°C 248°F	135°C 275°F
Lower Service Temperature	-200°C -328°F	-200°C -328°F	-200°C -328°F	-100°C -148°F	-105°C -157°F	-62°C -80°F	NA NA	-100°C -148°F	0°C 32°F
Appearance	Translucent	Opaque	Translucent	Translucent (white)	Translucent (white)	Opaque	Opaque	Opaque	Translucent
Microwave Resistance	Yes	Yes	Marginal	Yes	Yes	Marginal	Yes	No	Yes
STERILIZATION PROPERTIES									
Autoclavable	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Dry Heat	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Gas (EtOH)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Chemical Disinfection	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Gamma Radiation	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
E-beam	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
MECHANICAL PROPERTIES									
Flex Resistance	Excellent	Excellent	Excellent	Poor	Good	Poor	Poor	Very Good	Good
Organic Solvent Compatibility	Excellent	Excellent	Excellent	Very Good	Very Good	Very Good	Very Good	Good	Good
Acid Resistance	Excellent	Excellent	Excellent	Very Good	Very Good	Very Good	Very Good	Good	Good
Coefficient of Friction	0.2	.05 - 0.1	.08 - 0.3	0.65	0.3 - 0.4	0.2 - 0.4	0.25	0.3	0.3 - 0.5
Water Absorption/ 24 h	<0.03%	<0.01%	<0.01%	<0.01%	<0.03%	<0.04%	<0.05%	<0.01%	<0.02%
Melting Point	302°C 576°F	320°C 608°F	275°C 527°F	242°C 467°F	265°C 509°F	141°C 286°F	343°C 649°F	125°C 257°F	160°C 320°F

PFA Parts Cleaning Protocol

Typical PFA parts cleaning protocols for low or sub parts-per-billion metals extractable analysis:

Method 1

1. Rinse four times inside and out with UHP de-ionized water.
2. Fill with acid mixture HNO₃ and HCl (7+2) or only with HNO₃ (7%) for one day or leave overnight.
3. Rinse four times with UHP de-ionized water.
4. Fill again with acid mixture HNO₃ and HCl (7+2) or only with HNO₃ (7%) for one day or leave overnight.
5. Rinse again four times with UHP de-ionized water and leave the PFA part filled with UHP de-ionized water or dry it (see 6).
6. For drying use a laminar flow clean bench. Then rinse the PFA part with the sample or process liquid before drying.

Use only ultra pure acids (purified by sub-boiling distillation), e.g. HF, HNO₃ and HCl.

Method 2

1. Fill with 1 + 1 HCl (AR grade).
2. Allow to stand one week at 80°C.
3. Empty and rinse with distilled water.
4. Fill with 1 + 1 HNO₃ (AR grade).
5. Allow to stand one week at 80°C.
6. Empty and rinse with distilled water.
7. Fill with purest available distilled water.
8. Allow to stand several weeks or until needed, changing water periodically to ensure continued cleaning.
9. Rinse with purest water and allow to dry in a particle and fume-free environment.

John R. Moody and Richard M. Lindstrom

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