High-Pressure Frit-Type In-Line Filter

Restek's high-pressure in-line filter is a stand-alone version of the Trident column protection system, specifically designed for ease of use, low dead-volume, and flexibility. The filter has a replaceable, PEEK™ encapsulated 316 stainless steel frit with a surface area of 12mm^2. The standard frit with 2.0µm porosity may be replaced with an optional 0.5µm porosity frit. Use of this filter can greatly extend column life, thereby reducing costs and saving maintenance time. Tubing OD $^1/_{16}$"; connectors–CPI.

Description	Porosity	qty.	cat.#
Frit-Type In-Line Filter	2.0µm	ea.	25041
Replacement Cap Frits: 4mm	0.5µm	5-pk.	25023
Replacement Cap Frits: 4mm	2.0µm	5-pk.	25022

High-Pressure Cup-Type In-Line Filter

This high-pressure cup-type filter can be used in fluid streams operating to 15,000psi (103,421kPa). The cup-shaped filter elements have a large (2.5 cm^2) surface area to give long operating lifetime. Mounted in screw-type adapters, they are easily removed for cleaning. Normally, backflushing and cleaning in an ultrasonic bath with an appropriate solvent will restore them. If they become permanently clogged, replacement elements are available.

Housings and all wetted parts are 316 stainless steel. Filters are packaged with gland nuts and ferrules. A bulkhead type fitting is available for thru-panel mounting. Tubing OD $^1/_{16}$"; connectors–CPI.

Description	Porosity	qty.	cat.#
Cup-Type In-Line Filter	0.5µm	ea.	25000
Cup-Type In-Line Filter	2.0µm	ea.	25001
Replacement Filter Elements & Seals	0.5µm	2-pk.	25002
Replacement Filter Elements & Seals	2.0µm	2-pk.	25003

Low-Pressure Slip-On Inlet Filter for Mobile Phase Reservoir

A type 316 stainless steel tip with a Tefzel® collar seals to a corrosion-resistant type 316 stainless steel filter element. The slip-on filter easily attaches to the pump inlet line, without the use of wrenches. The universal tip accommodates standard Teflon® tubing inner diameters. The cylindrical filter is standard 10µm porosity. $^1/_8$" OD. Fits Altex, ISCO, LDC, Varian, Waters, PerkinElmer, and other pumps.

Description	qty.	cat.#
Slip-on Inlet Filter	ea.	25008

Low-Pressure CPI Inlet Filter for Mobile Phase Reservoir

A 316 stainless steel knurled cap and Tefzel® CPI ferrule seal to $^1/_8$" OD Teflon® tubing when finger-tightened onto the precision-machined filter holder. The filter element is replaceable. Standard 10µm porosity protects delicate pump components from particles but introduces very little pressure drop. $^1/_8$" OD. May be used as a helium sparging diffuser.

Description	qty.	cat.#
CPI Inlet Filter	ea.	25009
Replacement Elements: 10µm filter	2-pk.	25010

also **available**

Trident Direct high-pressure filter—protection against particulate matter. See **page 338** for details.

Mobile Phase Sparge Filter; Inlet Filter

The 2µm helium sparge filter is an inexpensive way to prepare and maintain mobile phases free of dissolved gas. Both filters are made from 316 stainless steel and PEEK™ and are compatible with most solvents.

Description	qty.	cat.#
Mobile Phase Sparge Filter: 2µm	ea.	25311
Inlet Filter: 10µm	ea.	25312
Inlet Filter: 20µm	ea.	25313

Last Drop Filter

The flat filter element sits parallel to the bottom of the mobile phase reservoir, allowing the filter to draw 98% of the mobile phase without drawing air into the system. Conventional cylindrical mobile phase filters begin to draw air into the system when approximately 10% of the solvent remains in the reservoir. The Last Drop Filter allows more analyses per batch of mobile phase and helps reduce hazardous waste. 22.1mm OD.

Description	qty.	cat.#
Last Drop Filter: 2µm	ea.	25314
Last Drop Filter: 10µm	ea.	25315

Membrane Microfiltration Glassware

47mm filtration apparatus with fritted glass support is recommended for routine filtration of corrosive liquids and removal of particles from HPLC solvents. The ground joint connection eliminates phthalate contamination that can occur when using silicone or neoprene stoppers. The support base has a coarse porosity glass frit and an integral vacuum connection, located above the drip tip to prevent contamination of the vacuum line with filtrate droplets. Each apparatus includes a funnel, an anodized aluminum clamp, a 47mm fritted glass support base, and a filtration flask.

All-Glass Microfiltration Apparatus	qty.	cat.#
300mL Funnel, 1000mL Flask	ea.	KT953825-0000
500mL Funnel, 2000mL Flask	ea.	KT953835-0000
1000mL Funnel, 4000mL Flask	ea.	KT953845-0000
Replacement Parts for Microfiltration Apparatus	**qty.**	**cat.#**
40/35 PTFE Joint Sleeve	6-pk.	KT676001-4035
Flask Cap, 40/35 Outer Joint	ea.	KT953830-0000
Fritted Glass Support, 47mm, 40/35 Joint	ea.	KT953826-0000
Glass Funnel, 47mm, 100mL	ea.	KT953761-0000
Glass Funnel, 47mm, 300mL	ea.	KT953751-0000
Glass Funnel, 47mm, 500mL	ea.	KT953771-0000
Glass Funnel, 47mm, 1000mL	ea.	KT953781-0000
Flask, 1000mL, 40/35 Joint	ea.	KT953827-0000
Flask, 2000mL, 40/35 Joint	ea.	KT953828-0000
Flask, 4000mL, 40/35 Joint	ea.	KT953829-0000
Aluminum Clamp, 47mm	ea.	KT953753-0000
Membrane Filters	**qty.**	**cat.#**
Polyproylene Membrane Filters, 47mm, 0.45µm	100-pk.	26396
Polyproylene Membrane Filters, 47mm, 0.22µm	100-pk.	26397
Nylon Membrane Filters, 47mm, 0.45µm	100-pk.	26398
Nylon Membrane Filters, 47mm, 0.22µm	100-pk.	26399

new!

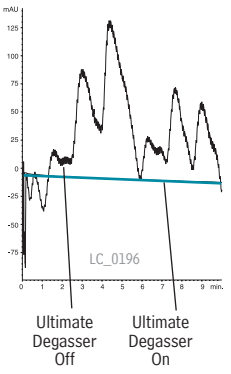
Polypropylene Membrane Filters

tech tip

Mobile Phase Additives

Mobile phase additives such as triethylamine, trifluoroacetic acid, and ion-pairing reagents can compete with sample ions, decreasing sensitivity and, in some cases, reducing sample ion intake into the MS. To obtain symmetric peaks and/or sufficient retention, use base deactivated, state-of-the-art Type B silica packings that minimize the need for additives.

Degasys Ultimate Degasser provides highly stable baselines



Mobile Phase: water:methanol 50:50
Flow: 1.0 mL/min.
Det.: UV @ 210nm

Mobile Phase Degasser

Dissolved oxygen can cause flow rate instability and increased baseline noise. Also, it has a quenching effect on fluorescence detection and increases the background of UV detectors. Dissolved gases can out-gas in the HPLC system, forming bubbles in check valves, at connections, or in detector flow cells.

In-line vacuum degassing is more effective at removing dissolved gas from mobile phases than sonication or helium sparging. In-line degassers work by withdrawing gas across a gas-permeable membrane encased in a sealed chamber. Traditionally, the membrane has been made of PTFE tubing, but the Degasys Ultimate Degasser uses tubing composed of an amorphous fluoropolymer that is 200 to 300 times more gas permeable than PTFE. This translates into the ability to use shorter tubing for removing dissolved gas. This new material also has better tubular burst strength than PTFE. To prevent cross contamination, each channel on this Degasys unit is individually encased within its own vacuum chamber.

Specifications:

Residual Oxygen[1]	Pressure Loss[1]	Internal Volume	Wetted Parts	Max Flow Rate
0.9ppm	0.24psi (1.65kPa)	500µL	Teflon® AF, PTFE, ETFE, PPS	7mL/min./channel

[1]At a flow rate of 1mL/min.

Description	qty.	cat.#
110V Mobile Phase Degasser (4 Channel, 7mL/min./channel)	ea.	25189
220V Mobile Phase Degasser (4 Channel, 7mL/min./channel)	ea.	25194

Do not use the Degasys system with solutions containing TFA at concentrations greater than 5%.

Solvent Debubbler

Bubbles in an HPLC system can cause check valve malfunctions and pump cavitation, seriously affecting pump performance. The debubbler removes bubbles from the fluid stream before it enters the pump.

Special geometry at the base of the housing allows bubbles entrained in the inlet fluid stream to rise and be trapped in the reservoir. The gas/liquid interface is easily visible through the translucent wall of the device. Loosening the airtight cap releases the trapped gas. The debubbler is fitted with a bracket and universal connecting tips.

Description	qty.	cat.#
Solvent Debubbler with Bracket	ea.	25014

Sonic Debubbler

CE

- Fast.
- Easy to use.
- Less solvent waste; less clean-up.

Just touch the Sonic Debubbler to the inlet line or check valve — sonic vibrations will quickly dislodge or redissolve trapped air bubbles. Reduces downtime or conversion time from one mobile phase to another.

Description	qty.	cat.#
Sonic Debubbler (110V)	ea.	20444
Sonic Debubbler (220V)	ea.	25098

Opti-Cap™ Bottle Top

The most economical way to helium-sparge and deliver HPLC mobile phases. The Opti-Cap™ top fits all standard GL45 bottles and has two 1/8-inch holes and one 1/16-inch hole for tubing.

Description	qty.	cat.#
Opti-Cap™ (Cap and PEEK™ Plug)	ea.	25300
Opti-Cap™ Kit (Opti-Cap™, 3 meters of tubing, sparging filters)	kit	25301
Opti-Cap™ Kit with 1L Bottle	kit	25302
Opti-Cap™ Kit with 2L Bottle	kit	25303
Related items and replacement parts	**qty.**	**cat.#**
SS Mobile Phase Mobile Phase Sparge Filter: 2µm	ea.	25311
Mobile Phase Inlet Filter: 10µm	ea.	25312
Teflon® Tubing, 1/8" OD x 0.094" ID x 3m (2.4mm ID)	3m	25307
Teflon® Tubing, 1/8" OD x 0.063" ID x 3m (1.6mm ID)	3m	25306
PEEK™ Plug, 1/4"-28 threads	3-pk.	25319
1L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25304
2L Graduated Safety-Coated Bottle – GL-45 threads	ea.	25305

Opti-Cap™ Kit with bottle

Eco-Cap Bottle Top, PTFE

Fits all standard GL-45 bottles; has two 1/8-inch holes and one 1/16-inch hole for tubing.

Description	qty.	cat.#
Eco-Cap Bottle Top, includes 1 Male Luer Plug	ea.	25395

also **available**

See **page 352** for Hub-Cap bottle tops, adapters, and filter kits.

Technical Service Specialists

Al Carusone, Tom Bloom, Jonathan Keim, Tim Herring, Alan Sensue, Terry Reid

Hub-Cap (assembly of the bottle cap and plug)

Hub-Cap 4 Liter Bottle Tops

Most bottles use a GL45 cap. New Hub-Cap bottle tops are a great way to neatly keep your mobile phase lines where they belong. Use instead of parafilm, aluminum foil, or tape on your mobile phase reservoirs.

Description	qty.	cat.#
Hub-Cap (assembly of the bottle cap and plug)	kit	26541
Hub-Cap Multi-pack	3-pk.	26542

Hub-Cap Adapter

Hub-Cap Adapter and Opti-Cap™

Hub-Cap Adapters

Allow the use of the Opti-Cap™ with 4-liter solvent bottles.

Description	qty.	cat.#
Hub-Cap Adapter	ea.	26538
Hub-Cap Adapter Multi-pack	3-pk.	26539
Hub-Cap Adapter and Opti-Cap™	kit	26540

new!

Transfer and filter mobile phase in a single step!

Hub-Cap Filter Kit

Kit includes: bottle adapter, bottle adapter nut, filter inlet cap, grid support, vacuum hose barb, tube compression fitting, 47mm grid, 47mm .22µm filter membrane, 47mm .45µm filter membrane, 1/4" OD x 1/8" ID ultra chemical resistant, Teflon® FEP lined Tygon® tubing (3'), 6" x 6" box with shrink wrap insert

Hub-Cap Filter Kit

Unscrew and lift off top.

Place membrane filter on top of grid.

Reattach top.

Connect vacuum line to side port.

Polypropylene Membrane Filters

Description	qty.	cat.#
Hub-Cap Filter Kit	kit	26395
Replacement Membrane Filters	**qty.**	**cat.#**
Polyproylene Membrane Filters, 47mm, 0.45µm	100-pk.	26396
Polyproylene Membrane Filters, 47mm, 0.22µm	100-pk.	26397
Nylon Membrane Filters, 47mm, 0.45µm	100-pk.	26398
Nylon Membrane Filters, 47mm, 0.22µm	100-pk.	26399

Sidewinder Column Heater

- Easy to set up!
- Operation range: 5°C above ambient to 85°C, ±1°C.
- Lightweight, compact design fits in small spaces.
- Column holder can be placed in any orientation.

Sidewinder temperature control module

This unique design completely encloses any HPLC analytical column up to 25cm in length. Two lengths of heater jackets are available: the short column holder accommodates columns up to 10cm in length, while the long column holder holds columns up to 25cm in length. The control module provides optimum heating performance, accuracy to within 1°C, and stability to within 0.1°C. The new Sidewinder controller has fast 10Hz sampling for improved responsiveness. Power requirements: 24V control unit for maximum stability; RS232 control allows external programming.

Description	qty.	cat.#
Temperature Control Module and Long Column Holder (25cm)	ea.	26516
Temperature Control Module and Short Column Holder (10cm)	ea.	26517

Sidewinder Heater/Cooler Temperature Control Module

- Operation range: 5-55°C, ±0.2°C.
- Ability to program multiple temperature points.
- Accommodates columns up to 30cm in length and 7.8mm ID.
- Compact design.

The Sidewinder heater/cooler unit has a doubly insulated cover to maintain the programmed temperature to within 0.2°C. The 24V control unit provides maximum stability and rapid equilibration times; RS232 control allows external programming.

Description	qty.	cat.#
Sidewinder Heater/Cooler Temperature Control Module	ea.	26518

Mobile Phase Pre-heater

- Heats mobile phase before it enters a heated column.
- Minimizes temperature changes, to help keep analyte peaks sharp.

Description	qty.	cat.#
Mobile Phase Pre-heater	ea.	22484

Super-Clean™ Gas Trapping System for LC/MS

- Changing filters is quick and easy.
- Up to 20L of hydrocarbon-free nitrogen per minute.

2-Position Base Plate

The Super-Clean™ Gas Trapping System is the latest technology in cartridge-style gas filtration for purifying nitrogen, and is ideal for use in LC/MS systems. The two-position base plate (installed in the gas line) allows cartridges to be exchanged without introducing oxygen into the system. Spring-loaded check valves seal when a cartridge is removed and open only when a new cartridge has been locked in place. There is no need for loosening and tightening fittings every time you change cartridges, and your system cannot become contaminated during the changing process.

To meet the high flow needs of the LC/MS system, the activated charcoal-filled cartridges are positioned and connected in parallel. The incoming gas stream is split equally between the cartridges, and the two streams are rejoined after purification but before the gas exits the base plate. This approach allows longer contact between the nitrogen and the adsorbent, ensuring higher gas purity and eliminating a potential source of contaminants to your analyses.

A handy date wheel, included with the system, indicates the cartridge installation date and the recommended replacement date.

Description	qty.	cat.#
Super-Clean™ Gas-Trapping System (2-position base plate, 2 charcoal filters)	ea.	22062
2-Position Base Plate (¼" Fittings) for use with hydrocarbon filters (cat.# 22061)	ea.	22060
Replacement Hydrocarbon (Charcoal) Filters	2-pk.	22061

it's a **fact**

A Super-Clean™ quick-change cartridge system efficiently removes hydrocarbons from nitrogen!

Charcoal Filters