

UHPLC/HPLC Sample Filtration

Phenex™ Syringe Filters

- Rapid Filtration of UHPLC/HPLC Samples Prior to Analysis
- Particulate, PVC, and Extractable-free Filters
- More Consistent, Reliable Performance

SELECTING YOUR PHENEX FILTER

STEP 1.

Choose Filter Diameter Based on Sample Volume



4 mm Diameter	15 mm Diameter	25-28 mm Diameter
≤ 2 mL Sample Volume	2 - 10 mL Sample Volume	10 - 100 mL Sample Volume

Why Select 0.20 µm Syringe Filters?

For columns packed with ≤ 3 µm chromatographic media, a syringe filter with 0.20 µm filter membrane is recommended. Phenex 0.20 µm syringe filters provide an effective barrier against unwanted particulates from entering the system flow path. This reduces column plugging leading to longer column lifetimes and increased system up time.

Phenex Syringe Filter Ordering Information

Membrane Type/Size	4 mm Diameter for ≤ 2 mL sample volumes		15 mm Diameter for 2 - 10 mL sample volumes		25 - 28 mm Diameter for 10 - 100 mL sample volumes	
	Part No.	Unit	Part No.	Unit	Part No.	Unit
0.20 µm						
Phenex-RC (Regenerated Cellulose)	AF0-3203-12	100/Pk	AF0-2203-12	100/Pk	AF0-8203-12 ³	100/Pk
	AF0-3203-52	500/Pk	AF0-2203-52	500/Pk	AF0-8203-52 ³	500/Pk
Phenex-PES ² (Polyethersulfone)	—	—	—	—	AF0-8208-12 ⁵	100/Pk
	—	—	—	—	AF0-8208-52 ⁵	500/Pk
Phenex-PTFE ⁴ (Polytetrafluoroethylene)	AF0-3202-12	100/Pk	AF0-2202-12	100/Pk	AF0-1202-12	100/Pk
	AF0-3202-52	500/Pk	AF0-2202-52	500/Pk	AF0-1202-52	500/Pk
Phenex-NY (Nylon)	AF3-3207-12	100/Pk	AF0-2207-12	100/Pk	AF0-1207-12	100/Pk
	AF3-3207-52	500/Pk	AF0-2207-52	500/Pk	AF0-1207-52	500/Pk
Phenex-GF/NY (Glass Fiber/Nylon)	—	—	—	—	AF0-1A47-12	100/Pk
	—	—	—	—	AF0-1A47-52	500/Pk

1.20 µm						
Phenex-GF ^{1,2} (Glass Fiber)	Pre-filtration of heavily contaminated or highly viscous samples. When used in-line preceding a 0.20 µm membrane filter, clogging of the membrane filter is prevented and sample clean up is optimized. Outlet connection is luer lock.				AF0-8515-12 ⁵	100/Pk
					AF0-8515-52 ⁵	500/Pk

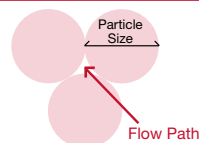
Above syringe filters are non-sterile. Housing is made of medical-grade polypropylene (PP) and offer luer lock inlet/slip outlet connections, unless otherwise indicated.

STEP 2.

Choose Filter Membrane According to the Characteristics of Your Sample and Filtering Objective

Membrane Type / Recommended Uses
RC Regenerated Cellulose(RC) - Hydrophilic Regenerated Cellulose filter membranes are compatible with a very broad range of aqueous and mixed-organic solutions, making them one of the most universal filter materials prior to chromatography. Phenex-RC filters also exhibit fast-flow and ultra-low protein and non-specific binding characteristics. Due to the beneficial material characteristics, Phenex-RC membranes are broadly recommended as an excellent general purpose/high-performance sample filter for most applications.
PTFE Polytetrafluoroethylene(PTFE) - Phenex-PTFE membranes are inherently hydrophobic and excellent for filtration of 100 % organic or highly acidic or basic samples.
PES Polyethersulfone(PES) - Polyethersulfone membranes exhibit very fast-flow and ultra-low protein binding characteristics and are ideally suited for use in many life science clarification applications. Phenex-PES membranes typically offer better chemical resistance than cellulose acetate membranes and are broadly recommended for filtering critical biological samples, tissue culture media, additives and buffers.
NY Nylon(NY) - Nylon has inherent hydrophilic characteristics and works well for filtration of many aqueous and mixed-organic sample types. For applications that require low protein or non-specific binding characteristics, Phenomenex recommends Phenex-RC Regenerated Cellulose filters.
GF Glass Fiber(GF) - Phenex-GF Glass Fiber filters are made of inert borosilicate glass and have a nominal 1.2 µm pore size. They are commonly used with highly viscous samples or samples that contain high concentrations of particulate matter (e.g. food analysis, biological samples, soil samples, fermentation broth samples, removal of yeasts, molds, etc.). Can be used alone or in series with other Phenex filter membranes such as the 0.20 µm pore Phenex-RC filter to reduce clogging of the membrane and optimize flow.

Particle Size(µm)	Flow Path (µm)	Effective Filter Pore Size (µm)
5	0.72	0.45
3	0.43	0.20
2.6	0.38	0.20
1.7	0.25	0.20



FOOTNOTES:

1. Glass fiber filters are 28 mm diameter and made of borosilicate. They will remove 90 % of all particles >1.2 µm.
2. Housing material is methacrylate butadiene styrene (MBS) polymerisate. Also known as Cyrolite®.
3. 26 mm diameter.
4. Hydrophobic membrane. Can be made hydrophilic by pre-wetting with IPA.
5. 28 mm diameter.
6. Additional dimensions and membrane types are available. Please contact your local Phenomenex technical consultant or distributor for availability or assistance.
7. Larger quantity purchases at significant savings are available.

Re-Ordering Information



SecurityGuard™ ULTRA Cartridge Holder

Part No.	Description	Unit
AJO-9000	SecurityGuard ULTRA GUARD Cartridge Holder	1/pk

SecurityGuard™ ULTRA Guard Cartridges (3/pk)



Material	Description	pH Stability	Column ID (mm)		
			2.1	3.0	4.6
Cartridges for General Purpose/ Pharmaceutical			/3pk	/3pk	/3pk
C18	(ODS, Octadecyl)	1.5 – 8.5*	AJO-8782	AJO-8775	AJO-8768
C8	(MOS, Octyl)	1.5 – 8.5*	AJO-8784	AJO-8777	AJO-8770
PFP	(Pentafluorophenyl)	1.5 - 8.5*	AJO-8787	AJO-8780	AJO-8773
HILIC	HILIC	2.0 - 7.5	AJO-8786	AJO-8779	AJO-8772
Phenyl	(Phenylhexyl)	1.5 – 8.5*	AJO-8788	AJO-8781	AJO-8774
Cartridges for Protein and Peptide Reversed Phase			/3pk	/3pk	/3pk
Widepore C18	(ODS, Octadecyl)	1.5 – 8.5*	AJO-8783	—	AJO-8769
Widepore C8	(MOS, Octyl)	1.5 – 8.5*	AJO-8785	—	AJO-8771
Widepore C4	(Butyl)	1.5 – 8.5*	AJO-8899	—	AJO-8901
Peptide C18	(ODS, Octadecyl)	1.5 – 8.5*	AJO-8948	—	AJO-8946

*pH stable 1.5 - 8.5 under gradient conditions. pH stable 1.5 - 10 under isocratic conditions.

SecurityGuard ULTRA connected to column



Protect all your columns. Visit the easy to use column protection selection tool www.phenomenex.com/GuardIt

phenomenex
...breaking with tradition™



SecurityGuard™ ULTRA Installation Manual
Guard Cartridge System for UHPLC



Phenomenex products are available worldwide.

www.phenomenex.com
support@phenomenex.com

guarantee

Extended Column Lifetime Guaranteed!

If SecurityGuard™ ULTRA cartridge protection system does not perform as well or better than your current guard cartridge system of similar phase and dimensions, return the product with comparative data within 45 days FOR A FULL REFUND.

Terms and Conditions
Subject to Phenomenex standard Terms and Conditions which may be viewed at www.Phenomenex.com/TermsAndConditions

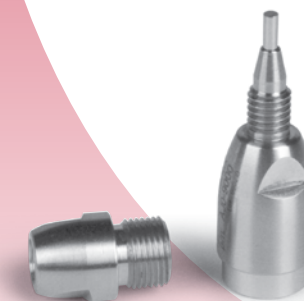
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Thank you for purchasing
SecurityGuard™ ULTRA,
the ultimate in UHPLC
column protection.

SecurityGuard ULTRA:

- Extends UHPLC/ HPLC Column Lifetime
- Virtually No Change in Chromatography
- Fits Any Manufacturer's Columns
2.1 to 4.6 mm ID
- Simple to Use

View the installation videos:
www.phenomenex.com/SecurityGuardULTRA



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SecurityGuard™ ULTRA

Protect your UHPLC / HPLC column from damaging contaminants and microparticulates.

- Extended Column Lifetime
- Virtually No Change in Chromatography
- Fits any Manufacturer's Columns 3.0 to 2.1 mm ID
- Pressure Rated to 20,000 psi (1,378 bar)



UNIVERSAL FIT

Use with virtually all UHPLC / HPLC columns 2.1 to 4.6 mm ID. The extremely low dead volume of this unique design minimizes sample peak dispersion and effectively remove microparticulates and chemical contaminants from the flow stream without contributing to system backpressure or dead volume (< 0.3 µL).

INSTALLATION INSTRUCTIONS

STEP 1.

SecurityGuard ULTRA Holder-Cartridge Assembly

Watch the product assembly video: www.phenomenex.com/SGUinstall

- Inspect holder (AJ0-9000). Do not separate the two pieces that comprise the cartridge holder (tube base and floating nut). Ensure that these two pieces of the holder are completely coupled together. The tube nib (tube end) should extend beyond the ferrule a full 4 mm (Figure 1).
- Select a guard cartridge. Match the correct cartridge phase to your column chemistry and dimension (see re-ordering information). Inspect the male end of the guard cartridge to ensure it is free of scratches, debris and particulates (Figure 2).
- Attach cartridge to holder using your hands. Screw (turn clockwise) the guard cartridge into the holder as far as possible to make the holder-cartridge assembly (Figure 3). Final wrench-tightening of the assembly will be done in Step 2.

Figure 1. Holder
Comprised of Tube Base and Floating Nut

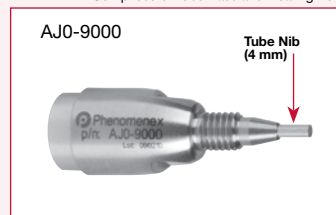


Figure 2. Guard Cartridge

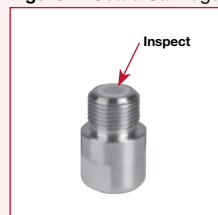


Figure 3. Holder-Cartridge Assembly



STEP 2.

Connect SecurityGuard ULTRA into Your Column

Watch the system connection video: www.phenomenex.com/SGUconnection

- Connect holder-cartridge assembly into column. Take the holder-cartridge assembly made in Step 1 and insert the tube nib (male end) straight into your column's end-fitting (Figure 4). Using your hands, in a clockwise direction, screw the holder-cartridge assembly into the column inlet end-fitting as far as it will go. The tubing will extend to the appropriate port depth of your column's end-fitting.
- Create a leak-free connection. Place one wrench on the end nut (size will vary) of the column. Place a second (5/16 in.) wrench on the flat area of the cartridge (Figure 5). In a clockwise direction, turn the wrench on the flat area of the cartridge (do not turn the wrench on the column end-fitting) to drive the entire holder-cartridge assembly into the column end. Tighten until leak-free, or about 1/4 turn. Do not over tighten. About 15 psi of torque is sufficient to seat (swage) the ferrule of the holder to the tubing nib, and provide a pressure-rating up to 20,000 psi (1,378 bar). The holder-cartridge assembly is now connected to the column (Figure 6)

Figure 4. Connect Holder-Cartridge Assembly into Column

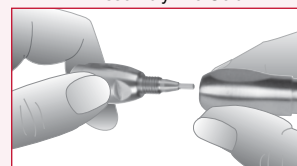


Figure 5. Create Leak-Free Connection

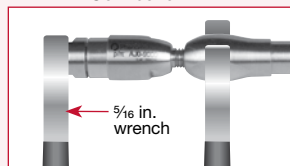
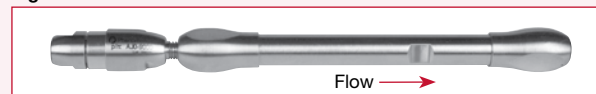


Figure 6. Holder on Column

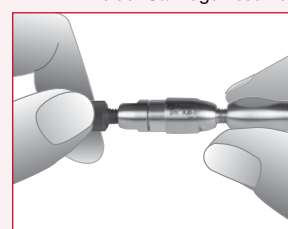


STEP 3.

Connect Tubing into the SecurityGuard ULTRA Holder-Cartridge Assembly

- Make sure the tubing from the injector is cut smooth and at a right angle (Phenomenex recommends precision pre-cut tubing).
- Slide the appropriate Parker-compatible metal or polymeric (PEEK™) nut and ferrule assembly onto the 1/16 in. tubing coming from your injector. Phenomenex recommends different fittings depending on system operating pressures. (see UHPLC/HPLC fittings panel).
- Connect the tubing all the way down into the inlet (female end) of the holder-cartridge assembly (Figure 7). The tube should be centered and pushed into the female end until it cannot go further.
- For polymeric (PEEK) fittings: In a clockwise direction, turn the fitting about 1/4 beyond the point where the ferrule first starts to grab the tubing or until it is leak-free. Phenomenex recommends a hand tightening tool (AQ0-8530) designed for high-pressure applications.
- For metal fittings: Wrench tighten the fitting into the SecurityGuard ULTRA Holder-Cartridge Assembly until leak-free (about 1/4 turn) but do not over tighten.

Figure 7. Connect Tubing into Holder-Cartridge Assembly



The metal or polymeric (PEEK) nut and ferrule assembly used to make the connection with the SecurityGuard ULTRA Cartridge must be Parker-compatible (Parker, Valco or Phenomenex-type). The assembly must be tightened and seated (swaged) to the tubing at the exact port depth of the guard cartridge. The use of pre-swaged assemblies may result in leakage, band broadening or damage to the SecurityGuard ULTRA.

CARTRIDGE REPLACEMENT

When Should I Replace My SecurityGuard ULTRA Cartridge?

Watch the cartridge replacement video: www.phenomenex.com/cartreplacement

Periodic replacement of the cartridge is required to maintain optimum column protection and chromatographic performance. Cartridge lifetime will vary depending on the application and sample matrix. If you experience any of the following symptoms, your cartridge may need replacement:

Symptoms	Criteria
Increasing system backpressure	>25 % or before system auto-shutdown
Loss of peak efficiency	Efficiency (N) decreases by >25 %
Loss of peak resolution (merging, shifting)	Resolution (R _s) decreases by 10 %
Abnormal peak shape (broadening, shortening)	Unacceptable to method
Baseline symptoms (drifting, irreproducibility)	Unacceptable to method
Retention time symptoms (drifting, shortening)	Unacceptable to method
Loss of accuracy or precision	Unacceptable to method
Routine preventive maintenance (to minimize degraded chromatography and improve column lifetime)	Depends on acceptance criteria of method >150 samples injected >1,000 analytical column volumes

STEP 1.

Select a Replacement Cartridge

Match the correct phase of the guard cartridge to your column chemistry (see re-ordering information on back). Inspect the male end of the cartridge to ensure it is free of scratches, debris and particulates (Figure 2).

STEP 2.

Changing your SecurityGuard ULTRA Cartridge

- Use two 5/16 in. wrenches. Place one wrench on the flat area of the guard cartridge and one on the flat area of the holder. Unscrew (turn counter-clockwise) the cartridge from the holder. The holder should not unscrew from the column. However, if it does happen, the connection will be automatically re-tightened during the cartridge replacement process.
- Screw (turn clockwise) the replacement cartridge into the holder as far as possible by hand. Tighten with a 5/16 in. wrench on the cartridge flat until leak-free, or about 1/4 turn. Do not over tighten. The cartridge should now be leak-free and the connection to the column re-secured.

NOTE: Failure to follow these instructions may result in misalignment of the SecurityGuard ULTRA column Protection System, resulting in damage, leaking or degraded chromatography. The holder may be swaged to virtually any brand or manufacturer's column. However, once swaged to the column, Phenomenex recommends the holder to be dedicated to that brand or manufacturer's column. Variation in end-fitting port depths and angles does exist, and moving swaged fittings from one to another may result in degraded performance.

Related UHPLC/HPLC Fittings

PEEK™

UHPLC / HPLC Sure-Lok™ High Pressure PEEK™ Male Nut Fittings

Made of a proprietary PEEK blend, these ultra-high performance polymeric fittings are perfect for all but the most extreme high-pressure applications, and best for ion- and biochromatography. For 1/16 in. diameter tubing, there are two design types. The convenient one-piece design is pressure rated to 12,000 psi (827 bar) and stable up to temperatures of 200 °C. The second type is engineered as a 3-piece unit, with a ferrule and stainless steel gripping ring, that will provide leak-free connections up to 19,000 psi (1,310 bar). For higher pressure-rated fittings use the stainless steel nut and ferrule set (AQ0-8506).

Quick Use Notes for AQ0-8504 and AQ0-8505: Slide the nut (AQ0-8504), steel ring and PEEK ferrule on the tube, in that order. Important! The side of the ring with the wider flat surface should face toward the nut, and the narrow-edged side of the ring toward the ferrule.

Ordering Information

Part No.	Description	Unit
AQ0-8503	Sure-Lok High Pressure PEEK 1-Pc Nut, 10-32, for 1/16 in. Tubing, 12,000 psi (827 bar) **	10/pk
AQ0-8504	Sure-Lok High Pressure PEEK Nut, 10-32, for 1/16 in. Tubing, 19,000 psi (1,310 bar) ***	10/pk
AQ0-8505	Sure-Lok PEEK Ferrule Assembly (2-pc), for High Pressure 2-Pc Nut (AQ0-8504)	10/pk

* Ferrule assembly (AQ0-8505) must be ordered separately.
** Sure-Lok Fitting Tightening Tool (AQ0-8530) is required for AQ0-8503 and AQ0-8504

STAINLESS STEEL

Ultra-High Performance UHPLC/HPLC Stainless Steel Nut and Ferrule Set

For ultra-high pressure connections use this specially-designed 10-32 stainless steel nut and ferrule set. The metal ferrule cuts a ring near the end of the tube to swage the fitting to the tube, and will provide a maximum operational limit of 28,000 psi (1,930 bar). Seating (swaging) the fitting usually takes only about a 1/4 turn beyond the point where the ferrule first starts to grab the tubing.



AQ0-8506
For details on proper use see STEP 3 of installation instructions



Important: To achieve the maximum pressure rating, 45 lbs of torque is required.

Ordering Information

Part No.	Description	Unit
AQ0-8506	Nut and Ferrule Set, SS, 10-32, for 1/16 in. Tubing, 28,000 psi (1,930 bar)	10/pk

High Pressure Fitting Tool

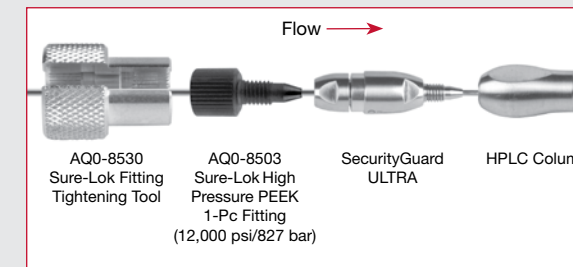
Use this handy tool to tighten any standard, short- or long-style knurl-headed (high pressure) male nut like the ones shown. The tool can also be used with many of the low-pressure nuts commonly used in the lab.



AQ0-8530

DIRECTIONS:

A wrench is used on the column to secure its movement, while the aluminum Sure-Lok™ Fitting Tightening Tool (AQ0-8530) is applied over connective tubing, onto Sure-Lok fitting, and hand-tightened for high pressure use.



Ordering Information

Part No.	Description	Unit
AQ0-8530	Sure-Lok Fitting Tightening Tool, Aluminum	ea

Ultra-High Performance UHPLC/HPLC Stainless Steel Zero Dead-Volume Union

Stainless steel construction, pressure rated to 28,000 psi (1,930 bar)

- For 1/16 in. OD tubing, with 10-32 threading
- 0.010 in. thru hole, 20 nL swept volume
- Includes 2 fittings (nuts and ferrules)

Pressure rated up to 28,000 psi (1,930 bar)



AQ0-8507

Ordering Information

Part No.	Description	Unit
AQ0-8507	Zero Dead Volume Union, SS, with Fittings, 10-32, for 1/16 in. Tubing, 28,000 psi (1,930 bar)	ea