PALL Laboratory

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Acrodisc® PSF Syringe Filters

Ideal for HPLC and UHPLC automated sample processing and sample clarification



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- Accurate pore size rating – Acrodisc PSF syringe filters are more retentive than standard 25 mm devices and are available with single-layer membranes or multilayer glass fiber prefilters.
- Superior HPLC column protection – Better retention efficiency helps extend column life as much as 52 times.
- Quick and easy filtration – GxF multi-layer prefilter provides two to four times the throughput of standard glass fiber prefilter devices.
- Safety feature – Filter housing has been designed to withstand high operating pressure to avoid filter burst during use.
- Versatile – Available with a water wettable wwPTFE membrane for maximum chemical compatibility, fast flow rates, low protein binding and low levels of UV absorbing extractables.
- Automation certified – Designed to be fully compatible and reliable for use with automated test systems.

Certifications

Automation Certification

Pall's Acrodisc PSF syringe filters are certified to work in automated and semi automated systems. This certification is granted to syringe filters that meet stringent requirements for automated dispensing and robotic handling. Acrodisc PSF syringe filters are fully compatible with automated workstations to facilitate smooth operation and worry free performance 24 hours a day.

HPLC Certified

Pall Laboratory certifies Acrodisc PSF syringe filters with PTFE, Nylon, PVDF or wwPTFE membrane to be low in UV absorbing extractables. They have been tested for compatibility with common HPLC solvents (water, acetonitrile and methanol) using established HPLC procedures. Filtrate from a statistically significant sampling of Acrodisc PSF syringe filters was collected and run under gradient mobile phase conditions at three common wavelengths. The chromatograms of the solvent blanks and samples were compared. Samples from each production lot were also compared to a standard to determine if any extraneous peaks were present.

Ion Chromatography Certified

Pall Laboratory certifies that the following Ion Chromatography (IC) Acrodisc PSF syringe filters have been tested using a highly sensitive ion chromatography technique: AP-4785.

To monitor inorganic extractables, samples from each lot are tested. Actual background levels of filter extractables are typically less than 20 ppb for chloride, 6 ppb for nitrate, 1 ppb for phosphate and 10 ppb for sulfate.

Specifications

Materials of Construction

Filter Media: wwPTFE (hydrophilic polytetrafluoroethylene), Nylon (hydrophilic nylon), PVDF (hydrophilic polyvinylidene fluoride), PTFE (hydrophobic polytetrafluoroethylene), IC and Supor® (hydrophilic polyethersulfone) and Versapor® (hydrophilic acrylic copolymer on a non-woven support) membranes
GxF Prefilter: Borosilicate glass
Housings: Polypropylene

Effective Filtration Area

3.9 cm^2

Sample Volume

< 150 mL

Inlet/Outlet Connections

Female threaded luer inlet, male slip luer outlet

Part Number	Description	Pore Size	Typical Hold-Up Volume (w/air purge)	Maximum Operating Temperature	Maximum Operating Pressure	Typical Water Flow Rate
AP-4527 AP-4523 AP-4529	GxF/Glass	1 µm	< 125 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	795 mL/min at 1.0 bar (100 kPa, 15 psi)
AP-4786 AP-4787 AP-4788	GxF/Nylon	0.2 µm	< 150 µL	55 °C (131 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	115 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4548 AP-4549 AP-4528	GxF/Nylon	0.45 µm	< 150 µL	55 °C (131 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	215 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4789 AP-4790 AP-4791	GxF/PTFE	0.2 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	NA
AP-4301 AP-4303 AP-4302	GxF/PTFE	0.45 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	395 mL/min at 1.0 bar (100 kPa, 15 psi) (MeOH)
AP-4792 AP-4793 AP-4794	GxF/PVDF	0.2 µm	< 125 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	95 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4309 AP-4310 AP-4308	GxF/PVDF	0.45 µm	< 125 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	144 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4798 AP-4799 AP-4800	GxF/Supor	0.2 µm	≤ 200 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	190 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4424 AP-4425 AP-4426	GxF/Supor	0.45 µm	≤ 200 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	360 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4913 AP-4914 AP-4915	GxF/wwPTFE	0.2 µm	≤ 220 µL	55 °C (131 °F) at 2.1 bar 4.1 bar (410 kPa, 60 psi)	6.2 bar (620 kPa, 90 psi) at 21-24 °C (70-75 °F)	112 mL/min at 2.06 bar (30 psi)

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Specifications

Part Number	Description	Pore Size	Typical Hold-Up Volume (w/air purge)	Maximum Operating Temperature	Maximum Operating Pressure	Typical Water Flow Rate
AP-4919 AP-4920 AP-4921	GxF/wwPTFE	0.45 µm	≤ 220 µL	55 °C (131 °F) at 2.1 bar 4.1 bar (410 kPa, 60 psi)	6.2 bar (620 kPa, 90 psi) at 21-24 °C (70-75 °F)	224 mL/min at 2.06 bar (30 psi)
AP-4801 AP-4802 AP-4803	IC (PES)	0.2 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	195 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4585 AP-4785	IC (PES)	0.45 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	420 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4437 AP-4436 AP-4522	Nylon	0.2 µm	< 125 µL	55 °C (131 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	115 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4517 AP-4438 AP-4502	Nylon	0.45 µm	< 125 µL	55 °C (131 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	245 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4520 AP-4225 AP-4521	PTFE	0.2 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	245 mL/min at 1.0 bar (100 kPa,15 psi) (MeOH)
AP-4518 AP-4219 AP-4501	PTFE	0.45 µm	< 125 µL	100 °C (212 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	510 mL/min at 1.0 bar (100 kPa, 15 psi) (MeOH)
AP-4795 AP-4796 AP-4797	PVDF	0.2 µm	< 100 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	95 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4519 AP-4408 AP-4500	PVDF	0.45 µm	< 100 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	144 mL/min at 2.1 bar (210 kPa, 30 psi)
AP-4190 AP-4189 AP-4568	Versapor	0.8 µm	< 125 µL	55 °C (131 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	905 mL/min at 3.1 bar (310 kPa, 45 psi)
AP-4000 AP-4001 AP-4002	Versapor	10 µm	< 125 µL	82 °C (180 °F) at 2.1 bar (210 kPa, 30 psi)	4.1 bar (410 kPa, 60 psi) at 21-24 °C (70-75 °F)	1182 mL/min at 1.0 bar (100 kPa, 15 psi)
AP-4910 AP-4911 AP-4912	wwPTFE	0.2 µm	< 100 µL	55 °C (131 °F) at 2.1 bar 4.1 bar (410 kPa, 60 psi)	6.2 bar (620 kPa, 90 psi) at 21-24 °C (70-75 °F)	151 mL/min at 2.06 bar (30 psi)
AP-4916 AP-4917 AP-4918	wwPTFE	0.45	< 100 µL	55 °C (131 °F) at 2.1 bar 4.1 bar (410 kPa, 60 psi)	6.2 bar (620 kPa, 90 psi) at 21-24 °C (70-75 °F)	263 mL/min at 2.06 bar (30 psi)

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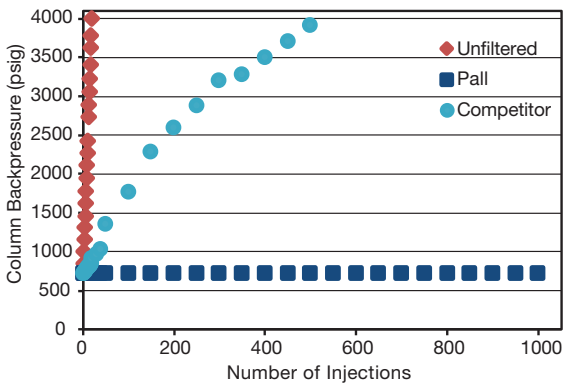
Performance

Retention Efficiency

The Acrodisc PSF filter's retention efficiency can directly increase the life of your HPLC column. More retentive filters will also remove smaller non-dissolved particles that may rest on the head of your HPLC column and affect your analytical results as they dissolve during an analysis. The graph to the right demonstrates that the life of an HPLC column can be extended up to 52 times by filtering samples prior to injection.

Figure 1

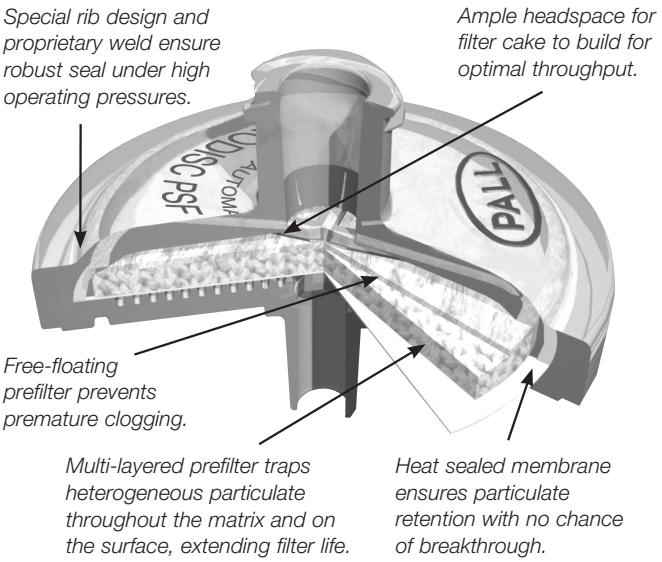
Effects of Filters on HPLC Column Life following injections of unfiltered and filtered 0.05% latex sphere suspensions (1). With unfiltered samples, the column failed due to plugging after 19 injections. Samples passed through Competitor filters plugged the columns after 500 injections. No increase in backpressure was observed after 1000 injections of samples filtered with Pall Acrodisc One™ with wwPTFE membrane.



Prefiltration

The GxF Acrodisc PSF syringe filter has a serial glass fiber prefilter to allow for maximum throughput and faster flow rates than standard glass fiber prefilter devices. The multi-layered prefilter traps particulate rated from > 40 to 1 µm.

Figure 2
The Acrodisc PSF Syringe Filter



Automation

Acrodisc PSF syringe filters are specifically designed to meet the exacting requirements of automation systems and to demonstrate critical criteria including smooth filter-to-filter release, consistent turret advancement, exceptional housing strength and a strict outside filter geometry to ensure proper alignment and consistent operation.

Pall's Acrodisc PSF syringe filters are manufactured to the critical tolerances necessary to ensure accurate and reliable performance. These filters have been engineered to specific dimensions to provide uniform housing and optimized inlet and outlet designs. Stringent adherence to such critical dimensions is vital in ensuring consistent filter delivery, positioning and operation of each and every filter that passes through your automated workstations.



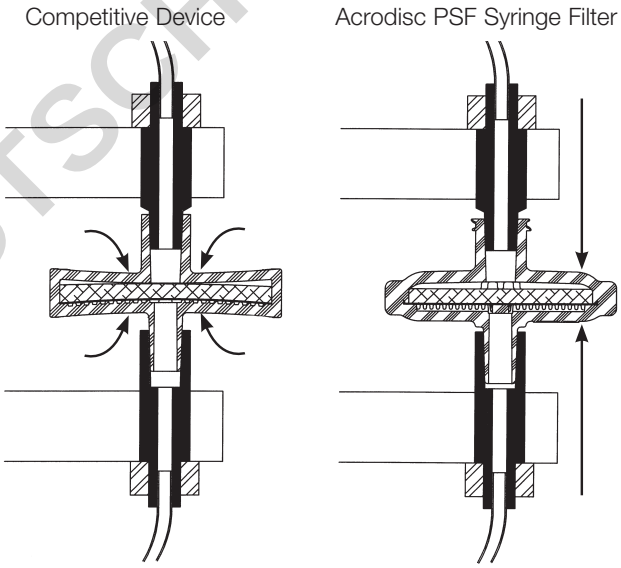
Exceptional Housing Strength

Filter flex or squeeze occurs when the workstation's filter holder compresses soft or weak filter housings. This squeezing effect reduces effective filtration area and can result in early clogging of the membrane. This clogging can potentially result in one of three situations:

1. A leak between the filter and the workstation's filter holder seal.
2. An increase in back pressure resulting in operation shutdown.
3. The filter housing bursts.

Filter squeeze is not a problem for the Acrodisc PSF syringe filter. The specially designed support ribbing, thick walls, and proprietary housing weld ensure a robust seal and a filter housing that can withstand excessive force both internally and externally.

Figure 4
Filter Squeeze, Competitive Device vs. Acrodisc PSF Syringe Filter

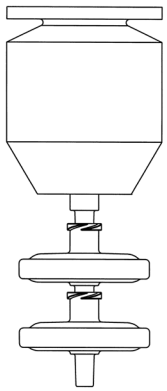


Smooth Filter-to-Filter Release

Filter sticking occurs when the filters do not easily release from one another, from the workstation's filter holder luer at the filtration station or from the filter weight. (The filter weight seats the filter in the dispenser hole). If the filter does not release from the weight or the next filter in the dispensing area, the turret will jam. The workstation's sensor will indicate that a filter has not advanced into place and the system will "error" or shutdown.

The Acrodisc PSF syringe filter has been designed so the filters cannot be forced too tightly together or to the automation components, allowing a smooth release while still meeting ANSI/ISO filter luer standards.

Figure 5
Smooth Filter-to-Filter Release



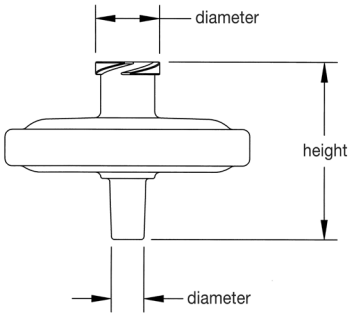
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Strict "Outside Filter Geometry"

Consistent filter dimensions are critical for smooth operation in automated equipment. The Acrodisc PSF syringe filter has strict dimensional specifications in height and width to ensure proper alignment and filter luer-to-instrument placement.

Figure 6
Consistent Filter Dimensions

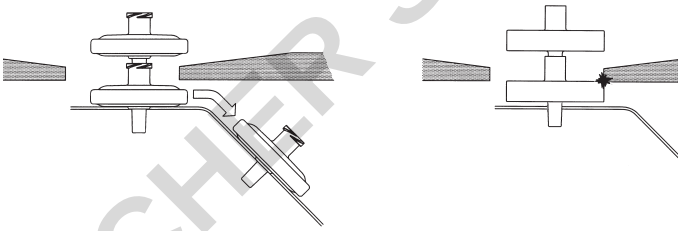
Consistent Turret Advancement



As the turret or carousel in systems turn to dispense a filter, the bottom filter on a stack drops into the filter separator area and a wedge mechanism separates the filter from the filter stack. If the filters are pressed too tightly together, the turret does not exert enough force to pull the filters apart. Occasionally when this happens, the filter stack will "jump" in the dispenser as the turret attempts to turn and the square-top shoulder on a syringe filter will snag on the edge of the separator wedge. When the turret freezes and a filter is not dispensed, the system errors and shuts down.

The Acrodisc PSF syringe filter's quick-releasing filter luers separate easily. The slightly rounded upper shoulder on the device allows the filter to consistently slide under the wedge for trouble free separation from the filter stack and smooth filter advancement along the workstation track.

Figure 7
Consistent Turret Advancement



Chemical Compatibility Guide for Acrodisc PSF Syringe Filters

Solvent	wwPTFE	PTFE	Glass	Versapor	Nylon	IC, Supor (PES)	PVDF
Acetone	R	R	R	NR	R	NR	NR
Acetonitrile	R	R	R	NR	R	R	R
Acetic Acid, glacial	R	R	R	NR	NR	R	R
n-Butanol	R	R	R	R	R	R	R
Chloroform	R	R	R	NR	R	NR	NR
Dimethyl Formamide	R	R	R	NR	R	NR	NR
Dimethyl Sulfoxide	R	R	R	NR	R	NR	R
Ethanol	R	R	R	R	R	R	R
Ethyl Acetate	R	R	R	R	R	NR	R
Ethel Ether	R	R	R	R	R	R	R
Hydrochloric Acid (1N)	R	R	R	•	NR	R	R
Hexane, dry	R	R	R	R	R	LR	R
Methanol	R	R	R	R	R	R	R
Methylene Chloride	R	R	R	NR	R	NR	R
Methyl Ethyl Ketone	R	R	R	NR	R	NR	NR
N-Methyl Pyrrolidone	R	R	R	•	NR	NR	R
Isopropanol	R	R	R	R	R	R	R
Sodium Hydroxide (3N)	R	R	R	R	R	R	NR
Tetrahydrofuran	R	R	R	NR	R	NR	NR
Tetrahydrofuran/water (50/50)	R	R	R	•	R	•	R
Toluene	R	R	R	R	R	R	R
Water	R	R	R	R	R	R	•
Ammonium Hydroxide	R	R	R	•	•	•	•

R = RESISTANT. No significant change was observed in flow rate or bubble point of the membrane.
LR = LIMITED RESISTANCE. Moderate changes in physical properties or dimension of the membrane were observed. The filter may be suitable for short term, non-critical use at room temperature.
NR = NOT RESISTANT. The membrane is basically unstable. In most cases, extensive shrinkage or swelling occurs. The filter may gradually weaken or partially dissolve after extended exposure.
• = Insufficient data. Trial testing is recommended.
Test Methods: The data presented in this chart is a compilation of testing by Pall Corporation with certain chemicals, manufacturer's data, or compatibility recommendations from the Compass Corrosion Guide, by Kenneth M. Pruett. This data is intended to provide expected results when filtration devices are exposed to chemicals under static conditions for 48 hours at 25 °C (77 °F), unless otherwise noted. This chart is intended only as a guide. Accuracy cannot be guaranteed. Users should verify chemical compatibility with a specific filter under actual use conditions. Chemical compatibility with a specific filter, under actual use conditions, is affected by many variables including temperature, pressure, concentration, and purity. Various chemical combinations prevent complete accuracy.

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Ordering Information

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4910	0.2 µm wwPTFE	200/pkg
AP-4911	0.2 µm wwPTFE, AutoPack™ tubes	200/pkg
AP-4912	0.2 µm wwPTFE	1000/pkg
AP-4913	0.2 µm GXF/wwPTFE	200/pkg
AP-4914	0.2 µm GF/wwPTFE, AutoPack tubes	200/pkg
AP-4915	0.2 µm GXF/wwPTFE	1000/pkg
AP-4916	0.45 µm wwPTFE	200/pkg
AP-4917	0.45 µm wwPTFE, AutoPack tubes	200/pkg
AP-4918	0.45 µm wwPTFE	1000/pkg
AP-4919	0.45 µm GXF/wwPTFE	200/pkg
AP-4920	0.45 µm GXF/wwPTFE, AutoPack tubes	200/pkg
AP-4921	0.45 µm GXF/wwPTFE	1000/pkg
AP-4527	GxF/Glass Fiber, AutoPack tubes	25/pkg, 200/cs
AP-4523	GxF/Glass Fiber	50/pkg, 200/cs
AP-4529	GxF/Glass Fiber	1000/pkg
AP-4786	GxF/0.2 µm with Nylon membrane, AutoPack tubes	25/pkg, 200/cs
AP-4787	GxF/0.2 µm with Nylon membrane	50/pkg, 200/cs
AP-4788	GxF/0.2 µm with Nylon membrane	1000/pkg
AP-4548	GxF/0.45 µm with Nylon membrane, AutoPack tubes	25/pkg, 200/cs
AP-4549	GxF/0.45 µm with Nylon membrane	50/pkg, 200/cs
AP-4528	GxF/0.45 µm with Nylon membrane	1000/pkg
AP-4789	GxF/0.2 µm with PTFE membrane, AutoPack tubes	25/pkg, 200/cs
AP-4790	GxF/0.2 µm with PTFE membrane	50/pkg, 200/cs
AP-4791	GxF/0.2 µm with PTFE membrane	1000/pkg
AP-4301	GxF/0.45 µm with PTFE membrane, AutoPack tubes	25/pkg, 200/cs
AP-4303	GxF/0.45 µm with PTFE membrane	50/pkg, 200/cs
AP-4302	GxF/0.45 µm with PTFE membrane	1000/pkg
AP-4792	GxF/0.2 µm with PVDF membrane, AutoPack tubes	25/pkg, 200/cs
AP-4793	GxF/0.2 µm with PVDF membrane	50/pkg, 200/cs
AP-4794	GxF/0.2 µm with PVDF membrane	1000/pkg
AP-4309	GxF/0.45 µm with PVDF membrane, AutoPack tubes	25/pkg, 200/cs
AP-4310	GxF/0.45 µm with PVDF membrane	50/pkg, 200/cs
AP-4308	GxF/0.45 µm with PVDF membrane	1000/pkg



Part Number	Description	Pkg
AP-4798	GxF/0.2 µm with Supor membrane, AutoPack tubes	25/pkg, 200/cs
AP-4799	GxF/0.2 µm with Supor membrane	50/pkg, 200/cs
AP-4800	GxF/0.2 µm with Supor membrane	1000/pkg
AP-4424	GxF/0.45 µm with Supor membrane, AutoPack tubes	25/pkg, 200/cs
AP-4425	GxF/0.45 µm with Supor membrane	50/pkg, 200/cs
AP-4426	GxF/0.45 µm with Supor membrane	1000/pkg
AP-4801	0.2 µm with IC (PES) membrane, AutoPack tubes	25/pkg, 200/cs
AP-4802	0.2 µm with IC (PES) membrane	50/pkg, 200/cs
AP-4803	0.2 µm with IC (PES) membrane	1000/pkg
AP-4587	0.45 µm with IC (PES) membrane, AutoPack tubes	25/pkg, 200/cs
AP-4585	0.45 µm with IC (PES) membrane	50/pkg, 200/cs
AP-4785	0.45 µm with IC (PES) membrane	1000/pkg
AP-4437	0.2 µm with Nylon membrane, AutoPack tubes	25/pkg, 200/cs
AP-4436	0.2 µm with Nylon membrane	50/pkg, 200/cs
AP-4522	0.2 µm with Nylon membrane	1000/pkg
AP-4517	0.45 µm with Nylon membrane, AutoPack tubes	25/pkg, 200/cs
AP-4438	0.45 µm with Nylon membrane	50/pkg, 200/cs
AP-4502	0.45 µm with Nylon membrane	1000/pkg

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Part Number	Description	Pkg
AP-4520	0.2 µm with PTFE membrane, AutoPack tubes	25/pkg, 200/cs
AP-4225	0.2 µm with PTFE membrane	50/pkg, 200/cs
AP-4521	0.2 µm with PTFE membrane	1000/pkg
AP-4518	0.45 µm with PTFE membrane, AutoPack tubes	25/pkg, 200/cs
AP-4219	0.45 µm with PTFE membrane	50/pkg, 200/cs
AP-4501	0.45 µm with PTFE membrane	1000/pkg
AP-4795	0.2 µm with PVDF membrane, AutoPack tubes	25/pkg, 200/cs
AP-4796	0.2 µm with PVDF membrane	50/pkg, 200/cs
AP-4797	0.2 µm with PVDF membrane	1000/pkg
AP-4519	0.45 µm with PVDF membrane, AutoPack tubes	25/pkg, 200/cs
AP-4408	0.45 µm with PVDF membrane	50/pkg, 200/cs
AP-4500	0.45 µm with PVDF membrane	1000/pkg

Part Number	Description	Pkg
AP-4190	0.8 µm with Versapor membrane, AutoPack tubes	25/pkg, 200/cs
AP-4189	0.8 µm with Versapor membrane	50/pkg, 200/cs
AP-4568	0.8 µm with Versapor membrane	1000/pkg
AP-4000	10 µm with Versapor membrane, AutoPack tubes	25/pkg, 200/cs
AP-4001	10 µm with Versapor membrane	50/pkg, 200/cs
AP-4002	10 µm with Versapor membrane	1000/pkg

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