

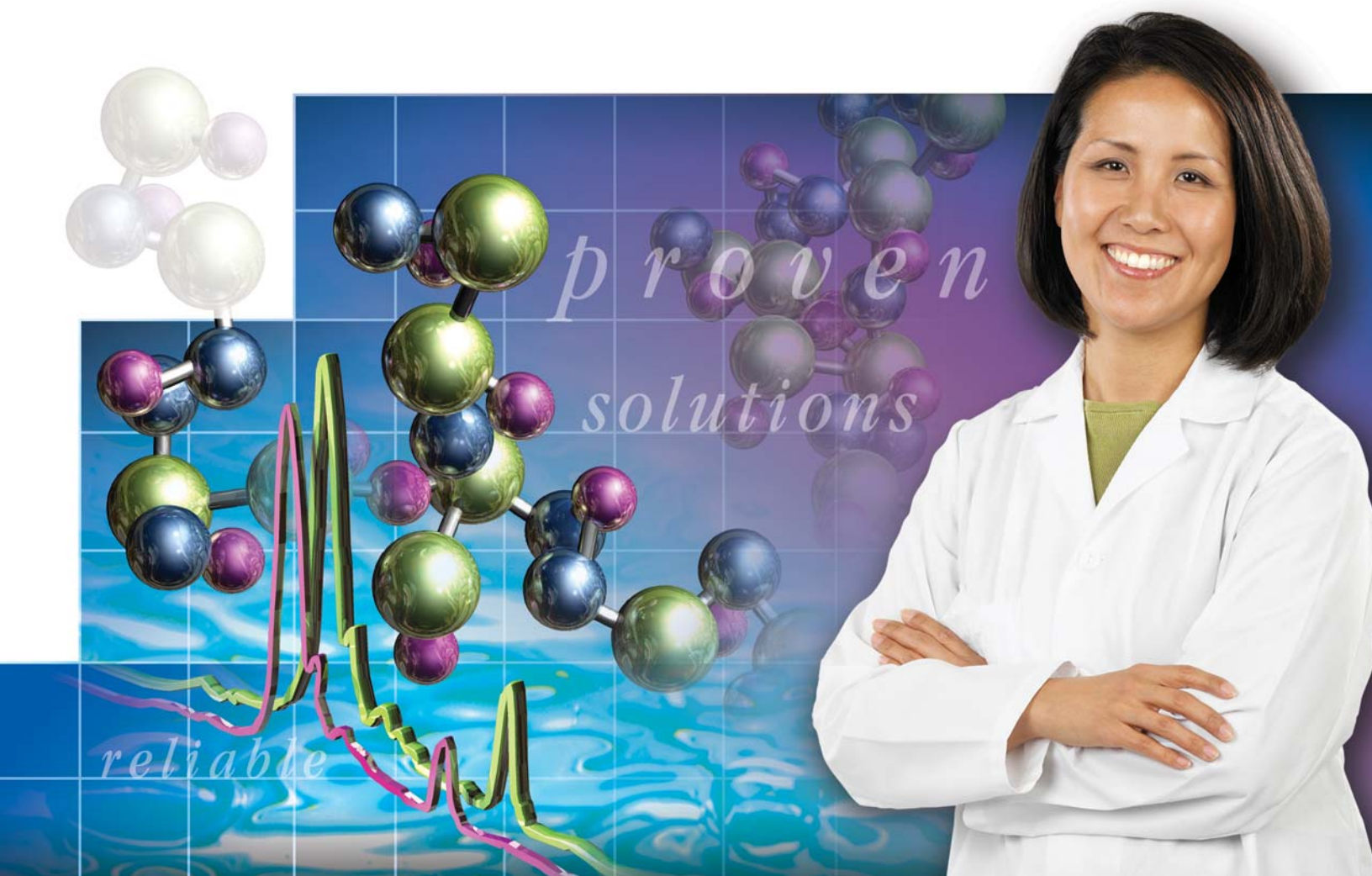


Life Sciences

www.pall.com/lab

Achieve Optimal Results

In Analytical Chemistry Sample Preparation
and Mobile Phase Filtration



Filtration. Separation. Solution.SM

Supporting the Integrity of Your Analytical Results

Whether you're processing single samples or thousands of samples at a time, you can count on our unfailing quality.



Over thirty years ago, Pall Life Sciences revolutionized sample preparation for analytical chemists with the development of the Acrodisc® syringe filter. Today, we partner with scientists around the world to develop distinctive filtration and separation products for a wide range of processing volumes.

We are constantly looking for new ways to expand our product offering to meet your needs and ease your application challenges. Our product innovations are the result of understanding your applications and valuing the amazing contributions your work can make to the quality of all our lives.

Whether you are pursuing goals in life science, pharmaceutical methods, research and development, quality control, or specialty environmental applications, we commit to not only deliver a product that works, but to look beyond what simply works and deliver a product that truly makes a difference.



Focused on producing products that give you better results for high throughput sample preparation.

Pall Life Sciences is one of the few companies to offer a variety of products made from the same materials of construction, allowing for single- or multiple-sample processing of your techniques. We bring together membranes with superior performance, outstanding housing materials, and devices designed to maximize processing accuracy and speed.

Select the device configuration most appropriate for your application, then select one of our patented membranes with the characteristics you need most... and see what a difference Pall Life Sciences can make.

Multi-sample processing

AcroPrep™ 96 Filter Plates

see pages 6-7 for more information

- ▶ Perfect for smaller sample sizes in combinatorial chemistry cleavage applications
- ▶ Makes concentration and final filtration for SPE faster
- ▶ Great for numerous samples with HPLC sample preparation/clarification
- ▶ Perform quick and accurate metabolic studies

AcroPrep 24 Filtration System

see pages 8-9 for more information

- ▶ Designed to work specifically with Waters Alliance® HPLC system
- ▶ Improves productivity in methods development
- ▶ Consistent, reproducible results for quality control
- ▶ Speeds up sample clarification



Single-sample processing *Automated applications*

- ▶ Smooth operation and worry-free performance 24 hours a day
- ▶ Acrodisc® PSF syringe filters are the only syringe filters to receive Caliper Life Sciences Automation Certified guarantee
- ▶ For unattended processing of large numbers of samples with robotic workstations

Acrodisc® PSF Syringe Filters

see pages 10-11 for more information

Manual applications

- ▶ Broad line of syringe filters for all your HPLC needs
- ▶ Wide range of device sizes for minimal sample hold-up and easy dispensing into autosampler vials

Traditional Acrodisc Syringe Filters

see pages 12-13 for more information

GHP Nanosep® MF Centrifugal Devices

see page 14 for more information

Filter Media Selection is as Easy as 1-2-3

Pall's broad selection of membrane chemistries ensures optimal performance for your application.

Pall's superior media separation technology ensures protection of your analytical instruments and supports the integrity of your analytical results. Pall's capabilities ensure:

- ▶ Accurate pore size ratings for better chromatography and instrument/column protection (see page 11)
- ▶ Uniform membrane materials (lot-to-lot) to provide consistent analytical results
- ▶ Low extractable materials for less chromatographic interference
- ▶ Materials of construction selected specifically for analytical analysis with lower extractables and lower API adsorption

1 Determine if you need hydrophobic or hydrophilic filters

Consider if filter material should be hydrophobic or hydrophilic based on the solution to be filtered.

Hydrophilic Filters

- ▶ Possess an affinity for water
- ▶ Can be pre-wet with virtually any liquid
- ▶ Are preferred for aqueous solutions

Hydrophobic Filters

- ▶ Will not allow passage of water
- ▶ Will wet in low surface tension liquids such as organic solvents

Hydrophilic or Hydrophobic Characteristics by Media Type

	GHP	Glass Fiber	Nylon	PVDF	PTFE	Supor® (PES)
Hydrophilic	●	●	●	●		●
Hydrophobic					●	

2 Consider chemical compatibility

Chemical compatibility is defined as the ability of a filter material to resist select chemicals so that the pore structure is not adversely affected by chemical exposure, and the filter material does not shed particles or fibers to add extractables. For example, nylon is not recommended for strong acidic solutions due to incompatibility. The chemical compatibility chart on the back of this brochure will help you make the right choice.

Temperature, time, concentration, applied pressure, and length of exposure also affect compatibility.

3 Choose the right pore size

Pore size is best selected by considering the instrumentation used for analysis. UV/V spectrophotometers may only require 1.0 μm filtration, where HPLC analysis may require 0.2 to 0.45 μm filtration due to the size of the beads in the column packing and internal frits. The filter material's pore size is determined by the diameter of the smallest particle that is to be retained with a defined, high degree of efficiency.

For standard liquid chromatography systems using columns with 5 μm or larger packings, the filtration industry standard is 0.45 μm for syringe filters and mobile phase membranes. For columns with packings smaller than 5 μm , microbore columns, or when concerned about microbial growth, a 0.2 μm filter is recommended.

To clarify samples or when processing difficult-to-filter solutions, 1 to 5 μm pore sizes or glass fiber filters are suggested. Prefilters generally precede smaller pore size final filters and allow the user to process larger fluid volumes before the filter plugs.

Other parameters to consider.

Extractable materials

Contaminants that elute from the filter media are best prevented by the membrane manufacturer. Pall Life Sciences specifically selects the highest grade of materials and performs rigorous extraction methods on our membrane products to reduce the occurrence of undesired artifacts. Choosing membranes that are compatible with your fluids and experimental conditions will reduce/eliminate extractables.

HPLC Certified for Low Extractables

Pall Life Sciences HPLC certification ensures that analytical results will not be compromised by extractable filter materials. To verify low levels of extractables, samples of HPLC Acrodisc® PSF syringe filters are randomly chosen and tested for compatibility with common solvents using UV detection.*

IC Certified for Low Levels of Inorganic Extractables

Pall Life Sciences certified Ion Chromatography (IC) Acrodisc PSF syringe filters have been tested using a highly sensitive IC protocol to monitor ionic extractables. 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.

Binding

Membranes may chemically interact with the sample through electrostatic, ionic, covalent, hydrogen bonding, or other interactions. Binding can be a desirable or undesirable characteristic depending on the requirements of the application. Choose GHP membrane for applications requiring low binding.

Reference material

Also available online at www.pall.com/lab.

- ▶ Technical Guide, Use of Acrodisc Syringe Filters for Analytical Sample Preparation; Including HPLC and Dissolution Testing (PN 33454)

*Does not include HT Tuffryn®, Versapor®, or Supor® membrane versions.

Media Selection

	Proteinaceous	General Aqueous	Non-aggressive Organic	Aggressive Organic
GH Polypro (GHP) Membrane – GHP is an all-purpose, hydrophilic membrane for aqueous, acidic, basic, non-aggressive organic, and aggressive organic solutions. GHP membrane offers low protein binding and low levels of UV-absorbing extractables.	●	●	●	●
PTFE Membrane – Exceptional chemical and temperature compatibility make this membrane ideal for harsh chemicals that destroy other membrane materials.	■	■	●	●
Nylon Membrane – This versatile filter for both aqueous and solvent-based sample filtration exhibits excellent chemical compatibility with esters, bases, and alcohols. Not recommended for acids > 1 N or halogenated solvents.	▲**	●	▲	■
PVDF Membrane – Compatible with many organic and non-organic solvents making it ideal for a wide range of applications. Not recommended for acetone, DMF, DMSO, or bases > 6 N.	●	●	▲	■
Glass Fiber Media – Maximize throughput for extremely particulate-laden samples.	●	●	▲	■
Supor (PES) Membrane for Ion Chromatography (IC) – Optimized to provide the most consistent results when analyzing ionic species, even for the most sensitive analyses. Certified for low levels of ionic extractables.	▲	●	▲	■
Hydrophilic Membranes for General Aqueous Samples – Widely used in dissolution testing, choose from a variety of pore sizes and membrane types for prefiltration and clarification including Supor, HT Tuffryn, and Versapor membranes.	●	●	▲	■

● Recommended ▲ Suitable ■ Not Recommended

**Dependent on protein type and concentration.



AcroPrep™ 96 Filter Plates for Sample Cleanup in Analytical Applications

As samples get smaller and more numerous, you need new methods for high throughput sample preparation. We are ready to help with high throughput screening, combinatorial chemistry, and sample cleanup in analytical or solid-phase extraction applications.



Special features

Worry-free Performance

The robotic-friendly design has a rigid, single-piece construction, designed in accordance with American National Standards Institute (ANSI) specifications.

No Crosstalk

Membranes are sealed in separate wells using a proprietary sealing technology and extended flow directors eliminate crosstalk of filtrate. Our proprietary design also eliminates weeping for aqueous solutions and drastically reduces weeping for organic solutions.

Chemically Resistant Plate Assembly

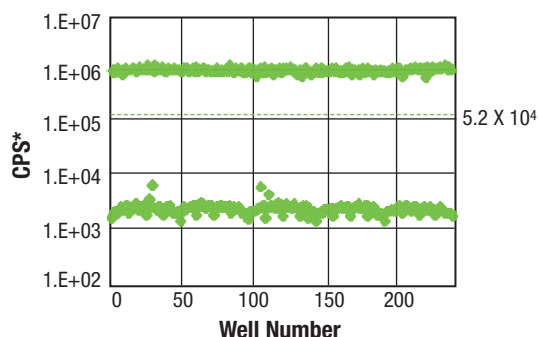
Constructed from chemically-resistant, biologically-inert polypropylene.

Serialized Barcode

Serialized barcode label allows for the use of automated tracking systems and identifies the membrane type.

Performance

Observed Crosstalk in AcroPrep 96 Filter Plate = 0%



Fluorescein dye (200 μ L of a 2 μ g/mL H_2O stock) was added to wells of AcroPrep 96 plate with GHP membrane (5 plates total) in a checkerboard pattern. Alternate wells were filled with 200 μ L of water. The fluid was evacuated from each filter plate using vacuum filtration at 30 cm Hg (12 in. Hg) for 15 seconds and the filter plate read in a PerkinElmer, Wallac VICTOR* 1420 Multilabel Counter. Wells filled with water, which show a CPS reading above the dashed line (5.2×10^4 CPS, which is = "Average" Background + 5% Signal) in the graph, constitute a crosstalk event.

*CPS = Counts Per Second

Applications by membrane type

GHP Membrane

- ▶ HPLC sample prep and clarification
- ▶ Metabolic studies
- ▶ Applications that use harsh organics
- ▶ Combinatorial chemistry library screens
- ▶ General sample preparation

PTFE Membrane

- ▶ Molecular synthesis
- ▶ Drug synthesis reactions
- ▶ Bead- and resin-based applications

Glass Fiber Media

- ▶ Gross fractionation
- ▶ Lysate clarification
- ▶ Cell-based assays
- ▶ Applications that require prefiltration

Glass Fiber over Bio-Inert® Membrane

- ▶ Clarification of cell lysates and tissue homogenates
- ▶ Preparation of proteinaceous solutions
- ▶ Applications that require prefiltration

Mustang™ Membrane

- ▶ Protein fractionation
- ▶ Protein capture
- ▶ Antibody purification



Vacuum manifold designed to perfectly fit AcroPrep™ filter plates

The multi-well plate vacuum manifold is an anodized aluminum manifold that has been designed and optimized for vacuum filtration of AcroPrep multi-well filter plates.



For more information on our full line of 96- and 384-well filter plates, visit www.pall.com/lab.

Reference material

Also available online at www.pall.com/lab.

- ▶ Mini Brochure, AcroPrep and AcroWell™ Multi-well, Membrane-bottom Plates, PN 33287
- ▶ Product Data, AcroPrep 96 Filter Plates
- ▶ Scientific and Technical Report, Automated Purification of Combinatorial Libraries Using AcroPrep 96 Filter Plate with GHP Membrane, PN 33245

AcroPrep™ 24 Filtration System Simultaneously Filters Up to 24 Samples in Seconds

Dramatically change the way sample filtration is performed.

This system eliminates the time consuming one-at-a-time syringe filter process. The AcroPrep 24 system filters directly into vials loaded in Waters Alliance 2690 sample carousel.* AcroPrep 24 filter plates are available with the same HPLC certified membranes as our trusted Acrodisc® PSF syringe filters, eliminating the need to validate the AcroPrep 24 filter plates.



Special features

Save Time and Materials

Save up to 20 minutes of labor time per carousel over the conventional syringe filter technique.

<u>Syringe Filter Technique</u>	<u>AcroPrep 24 Filtration System</u>
24 disposable syringes	24 disposable pipette tips
24 syringe filters	1 AcroPrep 24 filter plate
25 minutes	5 minutes

Easy to Use

No need to use cumbersome, individually wrapped disposable syringes. Use disposable pipette tips which are less costly, easier to use, and require less bench space.

Compatible with All 12 x 32 mm Vial Systems

Can be used with any HPLC autosampler that houses 12 x 32 mm vials: simply transfer your filtered samples from the Waters Alliance sample carousel to save time and labor.

No Cross Contamination

Each 1.9 mL well is individually sealed, ensuring your sample will accurately dispense into the Waters Alliance sample carousel with no cross contamination or splashing.

HPLC Certified

Ensures that analytical results will not be compromised by extractable filter materials.

Simple Validation

Materials of construction are identical to Pall's Acrodisc PSF syringe filters. If you are currently using Acrodisc PSF syringe filters, this will reduce the requirements for validation of the AcroPrep 24 filter plates.

**The Water's Alliance 2690 sample carousel kit (PN WAT270328) can be ordered directly from your local Waters sales office or contact Waters Corporation at 800-252-4752 (in the USA) or 508-478-2000.*

How to use

The cleanliness of the AcroPrep™ 24 filter plate results in very low levels of extractables, eliminating the need to pre-rinse the filter.

For applications that do not require a filter flushing or pre-rinsing:



1. Attach vacuum hose to the barbed connector on the base.



2. Place your Alliance sample carousel with empty, unassembled 2 mL vials into the manifold.



3. Place the filter plate onto the manifold. The filter plate has a numerically-sequenced label that matches the carousel's sample numbers.



4. Apply vacuum to ensure that all the seals are working properly. Shut off vacuum source. Once vacuum is fully relieved, pipette 1.7 mL (1700 µL) of sample into the filter wells of the AcroPrep 24 filter plate.



5. Apply vacuum. Do not exceed a vacuum level of 56.0 cm (22 in.) Hg.

6. Allow vacuum to run until all filter wells are evacuated.

7. Shut off vacuum source. Dispose of filter plate.

8. Cap sample vials and place the sample carousel into the Waters Alliance HPLC system or simply transfer the vials to any HPLC sample carousel that houses 12 x 32 mm vials.

Methodology varies slightly for applications that require filter flushing.



Applications

- ▶ Methods development
- ▶ Research and development
- ▶ Quality control
- ▶ Combinatorial chemistry synthesis

Reference material

Also available online at www.pall.com/lab.

- ▶ Product Data, AcroPrep 24 Filtration System, PN 33241

Three Powerful Benefits in One Acrodisc® PSF Syringe Filter



1 Automation certification for smooth operation and worry-free performance 24 hours a day

Only Acrodisc PSF syringe filters are specifically designed and automation certified to be fully compatible and reliable for use with the Caliper Life Sciences TPW[♦], APW[♦], and Multi-Dose[♦] Workstations. The design is also fully compatible for use with the Sotax[♦] AT70 and AT70smart dissolution systems.



Special features

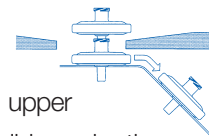
Smooth Filter-to-Filter Release

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



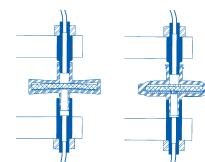
Consistent Turret Advancement

The filter's quick-releasing luers separate easily, and the slightly rounded upper shoulder allows the filter to consistently slide under the wedge. This results in trouble-free separation from the filter stack and smooth filter advancement along the workstation's track.



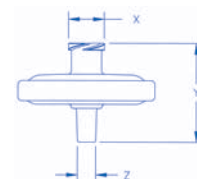
Exceptional Housing Strength

The specially designed support ribbing, thick device walls, and proprietary housing weld ensure a robust seal and a filter housing that can withstand excessive force both internally and externally.



Strict "Outside Filter Geometry"

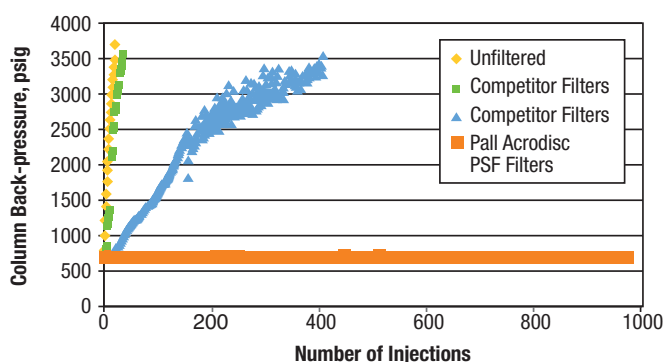
Strict dimensional specifications in height and width ensure proper alignment and smooth operation.



2 Best protection for HPLC columns—extending column life as much as 46 times

Plugging is the most frequently encountered cause of High Performance Liquid Chromatography (HPLC) column failure by analytical chemists and analysts. Injection of samples containing particulates will eventually block the column inlet, cause high column back-pressure, and shorten the normal lifetime of the column. Operations of pump components, injectors, and detectors are expected to be less troublesome when fluids are filtered. Pall Acrodisc® PSF syringe filters with GHP (hydrophilic polypropylene) membrane offer the most efficient removal of particulate and prolong the life of HPLC system components.

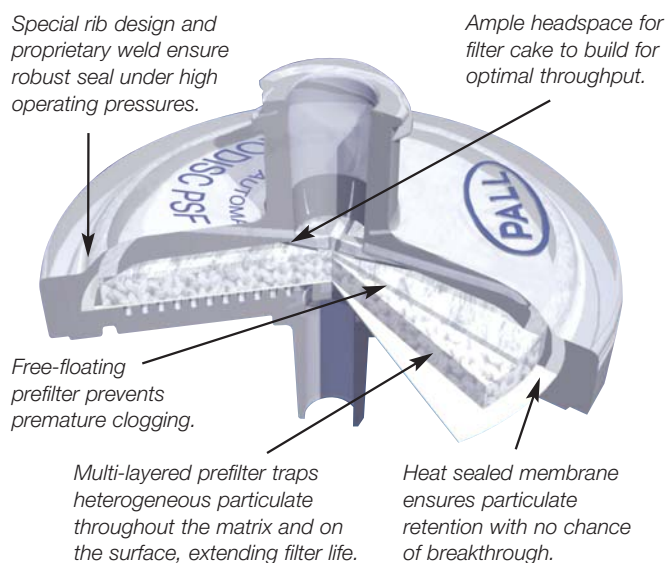
Effects of Filters on HPLC Column Life



Among 0.45 μm rated syringe filters from three manufacturers, the Pall Acrodisc PSF syringe filters with GHP membrane have the highest average retention efficiency (94.9%) of 0.45 μm latex spheres, as well as greater lot-to-lot consistency. The data demonstrates “equivalent” filters from various manufacturers with the same removal rating differ in capabilities. Using Acrodisc PSF syringe filters with GHP membrane extended the column life 46 times with no significant increase in column back-pressure. For a full technical report, order “Use of Acrodisc Syringe Filters for Analytical Sample Preparation; Including HPLC and Dissolution Testing Application Guide,” PN 33454; or visit www.pall.com/lab.

3 GxF multi-layered prefilter provides maximum throughput

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



Applications

- ▶ Sample preparation for HPLC, IC, GC
- ▶ Dissolution testing
- ▶ Automated workstations such as Caliper Life Sciences and Sotax
- ▶ Clarifying samples heavily laden with particulates
 - Environmental groundwater
 - Pulp and paper
 - Food and beverage

Reference material

Also available online at www.pall.com/lab.

- ▶ Product Data, Acrodisc PSF Syringe Filter, PN 33201
- ▶ Technical Guide, Use of Acrodisc Syringe Filters for Analytical Sample Preparation; Including HPLC and Dissolution Testing (PN 33454)

Acrodisc® Syringe Filters Ensure Complete Sample Filtration with Minimal Hold-up Volumes



Prevent spurious peaks on chromatograms.














Analytical sample prep syringe filters are HPLC certified for low levels of UV-absorbing extractables. We guarantee absolute satisfaction.

Traditional Acrodisc syringe filters are available in a wide range of membrane types, sizes, and packaging configurations to fit all applications. Acrodisc syringe filters have color-coded printing indicating membrane type and pore size on each filter. This makes them ideal for ISO-labs.

Membrane Color Code

- | | |
|--------------|---------------|
| ● GH Polypro | ● Nylon |
| ● PTFE | ● Glass Fiber |
| ● PVDF | ● PES |



Relative Throughput (EFA)	Filter Formats										
		GHF (Polypropylene, Hydrophilic)	PTFE (Hydrophobic)	Nylon (Hydrophilic)	PVDF (Hydrophilic)	Versapor® (Acrylic Copolymer, Hydrophilic)	Glass Fiber (Hydrophilic)	Supor® (Polysulfone, Hydrophilic)	HT Tuffryn® (Polysulfone, Hydrophilic)		
Acrodisc® PSF Syringe Filters											
	< 150 mL (3.9 cm ²)	25 mm Acrodisc PSF Syringe Filter: designed and automation certified to address the specific requirements of automated workstations.		●	●	●	●	●			●
	< 150 mL (3.9 cm ²)	25 mm Acrodisc PSF GxS Syringe Filter: multi-layered glass prefilter to maximize throughput and meet the requirements of automated workstations.		●	●	●	●		●	●	
	< 150 mL (3.9 cm ²)	25 mm Acrodisc PSF IC Syringe Filter: optimized to provide consistent results when analyzing ionic species.								●	
Traditional Acrodisc Syringe Filters											
	< 2 mL (0.3 cm ²)	4 mm Acrodisc Syringe Filter: ideal for filtration when sample size is minimal.			●	●		●			
	< 10 mL (1.0 cm ²)	13 mm Acrodisc Syringe Filter: multiple filter selection for both aqueous and solvent-based sample filtration.		●	●	●	●	●		●	
	< 10 mL (1.0 cm ²)	13 mm Acrodisc Syringe Filter with Minispike: minispike configuration offers lower hold-up volume and easy filtration into autosampler vials.		●	●	●	●				
	< 10 mL (1.0 cm ²)	13 mm IC Acrodisc Syringe Filter: convenient size for small sample volumes of ionic solutions.								●	
	< 100 mL (2.8 cm ²)	25 mm Acrodisc Syringe Filter: multiple membrane selections for compatibility with aqueous and organic solvents.		●	●	●	●		●	●	
	< 100 mL (EFA varies by device size)	Non-Sterile Acrodisc Syringe Filter (modified acrylic housings): for general aqueous samples, prefiltration, and clarification. Not HPLC certified.						●		●	●
	< 200 mL (7.5 cm ²)	37 mm GF Acrodisc Syringe Filter: additional filtration area for very dirty samples. Not HPLC certified.							●		

Note: All HPLC- and IC-certified Acrodisc syringe filters are made with polypropylene housings and male luer outlets; the 13 mm is also available with minispike outlets.

Nanosep[®] Centrifugal Devices are Ideal When Sample Recovery is a Concern



GHP Nanosep MF centrifugal devices are perfect for particulate removal prior to analytical sample analysis. The high g-force rating allows spinning at 14,000 x g, assuring rapid sample processing.

Special features

Rapid Processing of Samples

Centrifugal devices are simple to use and save on sample preparation time. Spin multiple samples at once.

Universal Membrane Filter

The GH Polypro hydrophilic polypropylene membrane is ideal for aqueous solutions and offers maximum chemical compatibility for aggressive solvents.

96.5% Protein Recovery

GH Polypro membrane is a low protein binding membrane. It removes unwanted particulate from samples with high recovery of critical proteins.

Low Extractables

Our HPLC-grade centrifugal devices are certified to be low in UV extractables.

Leak-free Operation

Unique sealing technology assures leak-free operation without the use of o-rings or adhesives that can add extractables.

Applications

- ▶ Sample prep—particulate removal prior to sample analysis, HPLC grade
- ▶ Removal of precipitates, including metals, polymers, and crystals
- ▶ Removal of cells from media prior to analysis
- ▶ Applications requiring maximum filtrate (or retentate) recovery from limited sample volumes



Simplify Cleanup and Degassing of Mobile Phase Solvents with a SolVac® Filter Holder

Special features

Versatile Design Fits Most HPLC Bottles, Flasks, and Containers

Eliminates the added step of transferring mobile phase solvent from flask to reservoir, which can cause contamination.

Draws Directly from HPLC Solvent Bottles

Less likely to spill aggressive solvents than glass funnels or disposable cups.

Durable Plastic Construction

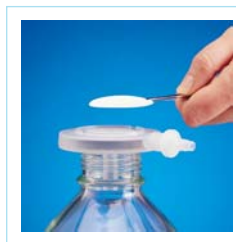
Resists breaking, unlike glass funnels, assemblies, or pick-up adapters.

Leak-proof Patented Magnetic Seal

Eliminates the possibility of membrane shifting or tearing which can occur with aluminum clamps or threaded holders.



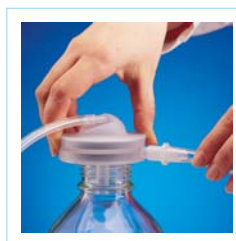
How to use



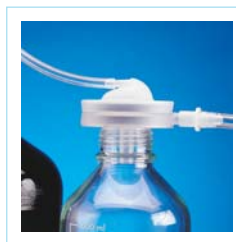
1. Place base on the receiving vessel.* Place the membrane on the clean, dry filter support.



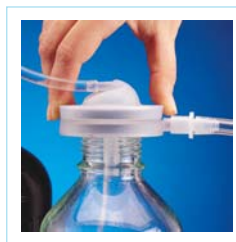
2. Attach inlet feedline tubing to the upper housing. Place upper housing onto housing base to securely seal the membrane.



3. Attach vacuum tubing from vacuum source to the vacuum port adapter on the housing base.



4. Place feedline tubing into solvent to be filtered.



5. Apply vacuum to pull liquid through the filter.

**Always use a safety-coated receiving vessel that is less than 4 L and rated for vacuum applications. Failure to do so may result in implosion of the receiving vessel and potential injury to the user.*

47 mm Glass Filter Funnels for Vacuum Filtration of Liquids and Degassing of HPLC Solvents and Mobile Phases



Special features

Resistant to Aggressive Solvents

Funnel is made of 100% borosilicate glass, assuring resistance to even the most aggressive solvents.

Filter an Entire Liter at Once

One-liter 47 mm glass funnel/support assembly permits filtration of an entire liter at once.

Unique Design

Support assembly's unique base design with integral vacuum connection prevents contamination of the vacuum line with filtrate.

Easy to Read

One-liter glass funnel is graduated from 300 to 1000 mL in 50 mL increments. 300 mL glass funnel is graduated from 100 to 250 mL in 25 mL increments. Stepped stem fits into standard one-hole stoppers (9 mm).

Mobile phase membranes

Pall membrane disc filters provide purification and degassing of mobile phase solvents used in liquid chromatography applications. The membranes are identical in composition and quality to those used in our HPLC-certified Acrodisc[®] syringe filters.

HPLC Mobile Phase Filtration Membranes

Membrane	Mobile Phase Application
TF (PTFE)	Recommended for use with all lower surface tension liquids
GHP (Polypropylene)	Recommended for use with organics and aqueous liquids
Nylaflo™ (Nylon)	Not recommended for use with certain acidic solutions
FP Vericel™ (PVDF)	Not recommended for use with certain basic solutions
Supor [®] (PES)	Not recommended for use with certain ketones

Cascada™ AN-Water Purification System for Analytical Applications

Convenient, consistent water purification with real-time quality monitoring.

Special features

Continuous Quality Monitoring

Multi-stage monitoring analyzes water throughout system to ensure water purity.

Quality Results Immediately

Get resistivity, temperature, and Total Organic Carbon (TOC) monitoring results in real time with no waste of water.

Adjustable Flow Rate

Purification system dispenses drop-by-drop or full stream.

Complete Sanitization

Entire fluid pathway is included in the automated disinfection process.

Fits Anywhere

Compact design accommodates benchtop, under bench, or wall mounting.

Applications

Cascada AN-water system offers faster, consistent water purification with real-time quality monitoring.

- ▶ Ultra-trace and trace inorganic and organic analysis
- ▶ HPLC
- ▶ GC-MS
- ▶ ICP-MS
- ▶ CF-AAS
- ▶ TOC analysis
- ▶ Ion chromatography
- ▶ Solid phase extraction
- ▶ Electrochemistry



Ordering Information

AcroPrep™ 96 Filter Plates, 1 mL

Part Number	Description	Pkg
5052	0.2 µm GHP membrane, natural	5/pkg
5054	0.45 µm GHP membrane, natural	5/pkg
5055	0.2 µm PTFE membrane, natural	5/pkg
5056	0.45 µm PTFE membrane, natural	5/pkg
5051	1.0 µm glass fiber media, natural	5/pkg
5053	3.0 µm glass fiber media/0.2 µm Bio-Inert® membrane, natural	5/pkg
5062	0.8 µm Mustang™ Q membrane, natural	5/pkg
5063	0.8 µm Mustang S membrane, natural	5/pkg
5065	1.2 µm Supor® membrane, valve mat	5/pkg
5066	3K, Omega™ membrane	5/pkg

Accessories

Part Number	Description	Pkg
5017	Multi-well plate manifold	1/pkg
5225	Adapter collar for centrifugation	2/pkg
5230	Cap mat for incubation	5/pkg
5231	Multi-well plate lids	10/pkg

For our full line of multi-well filter plates, visit www.pall.com/lab.

AcroPrep® 24 Filtration System

AcroPrep 24 Filter Plates

Part Number	Description	Pkg
186000159	0.2 µm, Nylon membrane	10/pkg
186000155	0.45 µm, Nylon membrane	10/pkg
186000158	0.2 µm, GHP membrane	10/pkg
600000158	0.45 µm, GHP membrane	2/pkg
186000154P	0.45 µm, Gx/GHP membrane	10/pkg
186000154	0.45 µm, GHP membrane	10/pkg
186000156	0.45 µm, PTFE membrane	10/pkg
186000157	0.45 µm, PVDF membrane	10/pkg

AcroPrep 24 Filtration System Manifold

Part Number	Description	Pkg
289000159	Filtration manifold	1/pkg

Spare Parts and Accessories

Part Number	Description	Pkg
700000231	Glass housing for filtration manifold	1/pkg
700000232	O-ring kit	3/pkg
700000233	Rubber feet	3/pkg
700000234	Manifold alignment post	3/pkg

Acrodisc® Syringe Filters with GHP Membrane

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4305	Gx/F/0.2 µm, AutoPack™ tubes	25/pkg, 200/cs
AP-4306	Gx/F/0.2 µm	1000/pkg
AP-4307	Gx/F/0.2 µm	50/pkg, 200/cs
AP-4557	Gx/F/0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4558	Gx/F/0.45 µm	1000/pkg
AP-4559	Gx/F/0.45 µm	50/pkg, 200/cs
AP-4364	0.2 µm, AutoPack tubes	25/pkg, 200/cs
AP-4566	0.2 µm	1000/pkg
AP-4564	0.2 µm	50/pkg, 200/cs
AP-4357	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4562	0.45 µm	1000/pkg
AP-4560	0.45 µm	50/pkg, 200/cs

Traditional Acrodisc Syringe Filters, 13 mm with Minispike Outlet

Part Number	Description	Pkg
4554	0.2 µm	100/pkg, 300/cs
4567	0.2 µm	1000/pkg
4556	0.45 µm	100/pkg, 300/cs
4563	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4564	0.2 µm	50/pkg, 200/cs
4566	0.2 µm	1000/pkg
4560	0.45 µm	50/pkg, 200/cs
4562	0.45 µm	1000/pkg
4559	GF/0.45 µm	50/pkg, 200/cs
4558	GF/0.45 µm	1000/pkg

Acrodisc Syringe Filters with PTFE Membrane

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4301	Gx/F/0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4302	Gx/F/0.45 µm	1000/pkg
AP-4303	Gx/F/0.45 µm	50/pkg, 200/cs
AP-4520	0.2 µm, AutoPack tubes	25/pkg, 200/cs
AP-4521	0.2 µm	1000/pkg
AP-4225	0.2 µm	50/pkg, 200/cs
AP-4518	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4501	0.45 µm	1000/pkg
AP-4219	0.45 µm	50/pkg, 200/cs

Traditional Acrodisc Syringe Filters, 4 mm

Part Number	Description	Pkg
4472	0.45 µm	250/pkg, 750/cs

Traditional Acrodisc Syringe Filters, 13 mm with Minispike Outlet

Part Number	Description	Pkg
4552	0.2 µm	100/pkg, 300/cs
4553	0.45 µm	100/pkg, 300/cs
4555	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 13 mm with Male Slip Luer Outlet

Part Number	Description	Pkg
4423	0.2 µm	100/pkg, 300/cs
4542	0.2 µm	1000/pkg
4422	0.45 µm	100/pkg, 300/cs
4543	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4225	0.2 µm	50/pkg, 200/cs
4521	0.2 µm	1000/pkg
4518	0.45 µm, AutoPack tubes	25/pkg, 200/cs
4219	0.45 µm	50/pkg, 200/cs
4501	0.45 µm	1000/pkg
4226	1 µm	50/pkg, 200/cs
4503	1 µm	1000/pkg

Acrodisc Syringe Filters with Nylon Membrane

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4548	Gx/F/0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4528	Gx/F/0.45 µm	1000/pkg
AP-4549	Gx/F/0.45 µm	50/pkg, 200/cs
AP-4517	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4502	0.45 µm	1000/pkg
AP-4438	0.45 µm	50/pkg, 200/cs
AP-4437	0.2 µm, AutoPack tubes	25/pkg, 200/cs
AP-4522	0.2 µm	1000/pkg
AP-4436	0.2 µm	50/pkg, 200/cs

Traditional Acrodisc Syringe Filters, 4 mm

Part Number	Description	Pkg
4484	0.45 µm	250/pkg, 750/cs

Traditional Acrodisc Syringe Filters, 13 mm with Minispike Outlet

Part Number	Description	Pkg
4550	0.2 µm	100/pkg, 300/cs
4561	0.2 µm	1000/pkg
4551	0.45 µm	100/pkg, 300/cs
4546	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 13 mm with Male Slip Luer Outlet

Part Number	Description	Pkg
4427	0.2 µm	100/pkg, 300/cs
4540	0.2 µm	1000/pkg
4426	0.45 µm	100/pkg, 300/cs
4541	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4436	0.2 µm	50/pkg, 200/cs
4522	0.2 µm	1000/pkg
4517	0.45 µm, AutoPack tubes	25/pkg, 200/cs
4438	0.45 µm	50/pkg, 200/cs
4502	0.45 µm	1000/pkg
4548	GF/0.45 µm, AutoPack tubes	25/pkg, 200/cs
4549	GF/0.45 µm	50/pkg, 200/cs
4528	GF/0.45 µm	1000/pkg

Acrodisc Syringe Filters with Glass Fiber Media

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4527	Gx/F/Glass, AutoPack tubes	25/pkg, 200/cs
AP-4523	Gx/F/Glass	50/pkg, 200/cs
AP-4529	Gx/F/Glass	1000/pkg

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4527	1 µm (nominal), AutoPack tubes	25/pkg, 200/cs
4523	1 µm (nominal)	50/pkg, 200/cs
4529	1 µm (nominal)	1000/pkg

Traditional Acrodisc Syringe Filters, 37 mm

Part Number	Description	Pkg
4524	1 µm (nominal)	15/pkg, 60/cs

Acrodisc® Syringe Filters with PVDF Membrane

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4309	GxF/0.45 µm, AutoPack™ tubes	25/pkg, 200/cs
AP-4308	GxF/0.45 µm	1000/pkg
AP-4310	GxF/0.45 µm	50/pkg, 200/cs
AP-4519	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4500	0.45 µm	1000/pkg
AP-4408	0.45 µm	50/pkg, 200/cs

Traditional Acrodisc Syringe Filters, 13 mm with Minispike Outlet

Part Number	Description	Pkg
4450	0.2 µm	100/pkg, 300/cs
4544	0.2 µm	1000/pkg
4452	0.45 µm	100/pkg, 300/cs
4545	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 13 mm with Male Slip Luer Outlet

Part Number	Description	Pkg
4455	0.2 µm	100/pkg, 300/cs
4457	0.45 µm	100/pkg, 300/cs

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4406	0.2 µm	50/pkg, 200/cs
4520	0.2 µm	1000/pkg
4519	0.45 µm, AutoPack tubes	25/pkg, 200/cs
4408	0.45 µm	50/pkg, 200/cs
4500	0.45 µm	1000/pkg

Acrodisc Syringe Filters with IC (Supor®) Membrane

Acrodisc PSF Syringe Filters, 25 mm

Part Number	Description	Pkg
AP-4587	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4785	0.45 µm	1000/pkg
AP-4585	0.45 µm	50/pkg, 200/cs

Traditional Acrodisc Syringe Filters, 13 mm with Male Slip Luer Outlet

Part Number	Description	Pkg
4483	0.2 µm	100/pkg, 300/cs
4683	0.2 µm	1000/pkg
4485	0.45 µm	100/pkg, 300/cs
4685	0.45 µm	1000/pkg

Traditional Acrodisc Syringe Filters, 25 mm

Part Number	Description	Pkg
4583	0.2 µm	50/pkg, 200/cs
4783	0.2 µm	1000/pkg
4585	0.45 µm	50/pkg, 200/cs
4785	0.45 µm	1000/pkg

Acrodisc PSF Syringe Filters for General Aqueous Samples, 25 mm

Acrodisc PSF Syringe Filters with Versapor® Membrane

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

Acrodisc PSF Syringe Filters with HT Tuffryn® Membrane

Part Number	Description	Pkg
AP-4498	0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4784	0.45 µm	1000/pkg
AP-4497	0.45 µm	50/pkg, 200/cs

Acrodisc PSF GxF Syringe Filters with Supor Membrane

Part Number	Description	Pkg
AP-4424	GxF/0.45 µm, AutoPack tubes	25/pkg, 200/cs
AP-4426	GxF/0.45 µm	1000/pkg
AP-4425	GxF/0.45 µm	50/pkg, 200/cs

Acrodisc Syringe Filters for General Aqueous Samples

Acrodisc Syringe Filters with Versapor Membrane

Part Number	Description	Pkg
4473	0.45 µm, 4 mm	250/pkg, 750/cs
4459	0.8 µm, 13 mm	100/pkg, 300/cs
4488	1.2 µm, 25 mm, modified acrylic housing	75/pkg, 300/cs
4489	5 µm, 25 mm, modified acrylic housing	75/pkg, 300/cs

Acrodisc Syringe Filters with Supor Membrane (Bulk Packaging)

Part Number	Description	Pkg
4655	0.2 µm, 32 mm, modified acrylic housing	1000/pkg
4653	0.45 µm, 32 mm, modified acrylic housing	1000/pkg
4659	0.8/0.2 µm, 32 mm, modified acrylic housing	1000/pkg
4661	1.2/0.45 µm, 32 mm, modified acrylic housing	1000/pkg
4660	1.2 µm, 32 mm, modified acrylic housing	1000/pkg
4662	5 µm, 32 mm, modified acrylic housing	1000/pkg

GHP Nanosep MF Centrifugal Devices

Part Number	Description	Pkg
ODGHPC34	0.45 µm, clear	100/pkg
ODGHPC35	0.45 µm, clear	500/pkg

SolVac® Filter Holder for Mobile Phase

Part Number	Description	Pkg
4020	SolVac holder with 61 cm (2 ft.) feedline tubing, 1/pkg thumb clamp, sinker, vacuum port adapter, 2 membrane seal gaskets, and 2 seal gaskets	
4022	122 cm (4 ft.) replacement feedline tubing	1/pkg
4023	Replacement seal gaskets	10/pkg
4025	Membrane seal gasket kit	10/pkg
4026	Sinker replacement kit	2/pkg
4028	Clamp replacement kit	2/pkg

Mobile Phase Membranes

Part Number	Description	Pkg
66557	0.2 µm, 47 mm GH Polypro (PP)	100/pkg
66628	0.2 µm, 50 mm GH Polypro (PP)	100/pkg
66548	0.45 µm, 47 mm GH Polypro (PP)	100/pkg
66625	0.45 µm, 50 mm GH Polypro (PP)	100/pkg
66143	0.2 µm, 47 mm TF (PTFE)	100/pkg
66630	0.2 µm, 50 mm TF (PTFE)	100/pkg
66149	0.45 µm, 47 mm TF (PTFE)	100/pkg
66631	0.45 µm, 50 mm TF (PTFE)	100/pkg
66477	0.2 µm, 47 mm FP Vericel™ (PVDF)	100/pkg
66480	0.45 µm, 47 mm FP Vericel (PVDF)	100/pkg
66602	0.2 µm, 47 mm Nylaflo™ (Nylon)	100/pkg
66608	0.45 µm, 47 mm Nylaflo (Nylon)	100/pkg



47 mm Glass Filter Funnels

Part Number	Description	Pkg
4011	Glass filter funnel with No. 8 stopper support base (300 mL funnel, no flask)	1/pkg
4012	Glass filter funnel with sidearm support assembly and flask (1 L funnel with 4 L flask)	1/pkg
4013	Glass filter funnel with sidearm support assembly and flask (300 mL funnel with 1 L flask)	1/pkg

Replacement Parts

47 mm Glass Filter Funnel (for PN 4011)

Part Number	Description	Pkg
4014	Upper glass funnel, 300 mL	1/pkg
4019	Fritted glass support base/No. 8 silicone stopper	1/pkg
81595	Aluminum clamp, anodized	1/pkg

47 mm Glass Funnel/Support Assembly (for PN 4012, 4013)

Part Number	Description	Pkg
4015	Glass funnel, 1 L	1/pkg
4018	Glass flask, 1L	1/pkg
4016	Glass flask, 4 L	1/pkg
4017	Fritted glass support base with sidearm	1/pkg
81595	Aluminum clamp, anodized	1/pkg

Cascade Purification Systems

Cascade AN-water Purification System

Part Number	Description	Pkg
PAL-CAXXANM2	Cascade AN-water system	1/pkg
PAL-C180*	RO feed cartridge pack	1/pkg
PAL-C181*	SDI feed cartridge pack	1/pkg
PAL-C166	0.2 µm point-of-use filter	1/pkg
PAL-A655	Wall mounting kit for Cascade unit	1/pkg

*System requires use of two cartridges. Part number dependent on feed water source.

Stainless Steel Forceps

Part Number	Description	Pkg
51147	Stainless steel forceps, black grips	1/pkg
4690	Stainless steel forceps, multi-colored grips	3/pkg

Vacuum/Pressure Pumps

Part Number	Description	Pkg
13157	Vacuum/Pressure pump, 115 V	1/pkg
13158	Vacuum/Pressure pump, 230 V	1/pkg

Chemical Compatibility Guide

	Acetone	Acetonitrile	Acetic acid, glacial	n-Butanol	Chloroform	Dioxane	Dimethyl formamide	Dimethyl sulfoxide	Ethanol	Ethyl acetate	Ethyl ether	Freon TF	Hydrochloric acid (1N)	Hexane, dry	Methanol	Methylene chloride	Methyl ethyl ketone	N-Methylpyrrolidone	Isopropanol	Sodium hydroxide (3N)	Tetrahydrofuran	Tetrahydrofuran (30/50)	Toluene	Water	
Devices with GH Polypro (GHP) membrane (hydrophilic polypropylene)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
Devices with PTFE membrane																									
4 mm	R*	R	R	R	L	R	R*	R*	R	R*	R	R	R	R	R	L	R*	R*	R	L	L	●	L	R	
13 & 25 mm, AcroPrep™	R*	R	R	R	R	R	R*	R*	R	R*	R	R	R	R	R	R	R*	R*	R	R	R	R	R	R*	R
Devices with PVDF membrane																									
	N	R	R	R	R	R	N	N	R	R*	R	R	R	R	R	R	N	N	R	N	N	●	R*	R	
Devices with Nylon membrane																									
	R*	R	N	R	R	R	R*	R*	R	R*	R	R	N	R	R	R	R*	R*	R	L	R	R	R	R*	R
Devices with Supor® PES membrane																									
	N	L	R	R	N	●	N	N	R	N	R	L	R	L	R	N	N	N	R	R	N	●	R	R	
Devices with Glass Fiber																									
	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	L	L	●	R	R
Devices with Versapor® membrane (modified acrylic housing)																									
	N	N	N	R	N	N	N	N	R	N	N	R	L	N	L*	N	N	N	R	R	N	●	N	R	
Devices with Supor membrane (modified acrylic housing)																									
	N	L	N	R	N	N	N	N	N	N	N	R*	●	L	N	N	N	L	R	N	●	N	R		
Devices with HT Tuffryn® membrane (modified acrylic housing)																									
	N	N	N	R	N	N	N	N	N	N	N	R*	N	L*	N	N	N	L	R	N	●	N	R		
Disc Filters																									
GH Polypro	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
FP Vericel™ (PVDF)	N	R	R	R	R	R	N	N	R	R	R	R	R	R	R	R	N	N	R	N	N	●	R	R	
Nyloflo™ (Nylon)	R	R	N	R	R	R	R	R	R	R	R	N	R	R	R	R	R	R	R	L	R	R	R	R	
TF (PTFE)	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	

Note:

R = RESISTANT

No significant change was observed in flow rate or bubble point of the membrane.

L = 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.

N = 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

Information not available. Trial testing is recommended.

* UV absorbance was set at 254 nm.

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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