Product guide

Laboratory filtration

Good filtration is an art form. It's what we specialize in.

cytiva

danaher

What's new?

Cytiva is a global provider of technologies and services that advance and accelerate the development and manufacture of therapeutics that transform human health.

Introducing

Cytiva™ Protein chromatography sample and buffer filtration kit. see page 185.

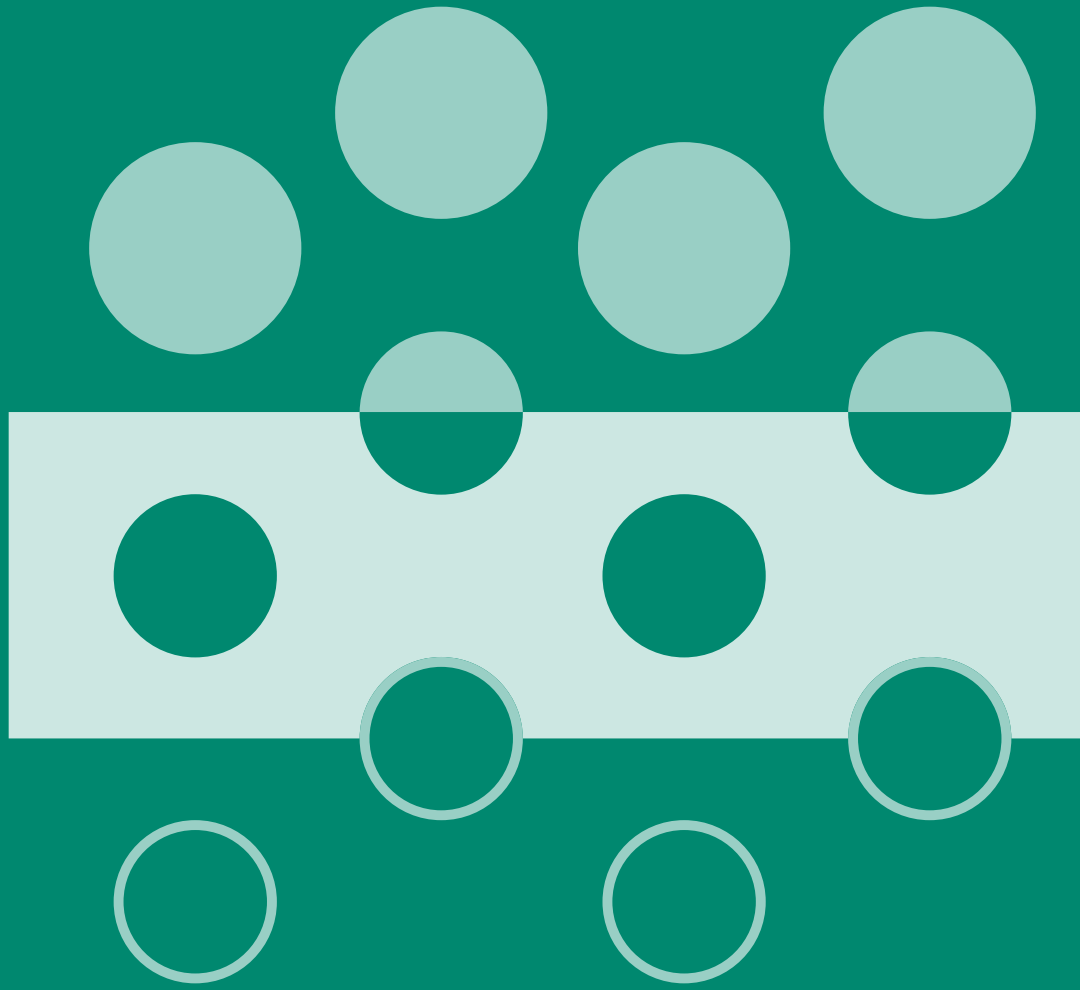
Acrodisc™ PSF syringe filters: Automation-certified,high performance syringe filters for consistent and reliable results. see page 156.

Mini-UniPrep™ syringeless filters: All-in-one environment friendly syringeless filters making sample preparation easier, faster, and efficient. see page 172.

Capsule filters : Wide range of capsule filters designed for high performance across all buffer, reagent, and media applications. See page 199.

Multiwell filter plates: AcroPrep™ filter plate portfolio offers 24-, 96-, and 384-well high performance filter plates for wide range of applications. See page 249.

Filter funnels: Wide range of filter funnels to suit all kinds of applications like pharmaceuticals, food and beverage and environmental. See page 261.



Welcome to filtration by Cytiva

Trusted by laboratories worldwide, Cytiva's filtration solutions are synonymous with quality, reliability, and intuitive design. Our commitment to simplification empowers customers to reduce costs, save time, and accelerate discovery. Engineered for consistent performance, our filtration solutions are the preferred choice for demanding applications across diverse industries.

We're wherever you need us

With a global reach and a deep understanding of laboratory needs, we deliver the right filtration and separation solutions—right when you need them. Through strong partnerships with the world's leading laboratory supply distributors, we ensure fast, reliable delivery to labs everywhere, helping you stay focused on what matters most: your research.

How to buy

1. Shop online at **Lab filtration products | Cytiva**
2. Call your local sales representative to learn more or order the product.
3. Email your customer service team.
4. Find a distributor: Details of your nearest distributor can be found at **Find a distributor | Cytiva**
5. For details of your local customer support team please visit the link below and select your country or region: **cytiva.com/contact**

Filtration in your industry

Life science research

Product range features advanced membrane filtration devices tailored for cell culture media preparation, particulate removal, sample clarification and purification. Widely used across academic institutions, biopharmaceutical companies, contract research organizations, and biotechnology laboratories, these solutions deliver consistent performance and support high-quality research outcomes.

Pharmaceutical

Broad selection of syringe filters for various sample types, including hard-to-filter solutions and automation-compatible formats. Mini-UniPrep syringeless filters simplify HPLC prep, while track-etched and Anopore™ membranes support liposome extrusion for drug delivery. Cytiva's microbiology solutions support the entire quality control workflow—from sample collection to microbial analysis—ensuring reliable contamination detection and regulatory compliance.

Basic analytical testing

In the vast and disparate world of analytical chemistry, products are used for basic laboratory processes that range from simple clarification to solvent extraction. Products range from filter papers, thimbles and Benchkote™ benchtop protectors, to membrane filters and phase separator papers.

Food and beverage

Our filter papers are used to prepare food samples prior to a wide range of analyses. Our syringe filters prevent fatty or particulate laden samples from damaging valuable equipment. Our membranes are used to test for harmful bacteria.

Environmental monitoring

Cytiva filtration products are trusted and cited in protocols from the U.S. Environmental Protection Agency (EPA), the American Society for Testing and Materials (ASTM), and ISO standards for environmental monitoring. From detecting suspended solids in water and measuring airborne particulates to assessing microbiological bioburden and supporting asbestos analysis, Cytiva filters play a critical role in ensuring accurate, reliable results. Wherever environmental safety is at stake, there's a Cytiva filter at the heart of the test.

Industrial

Filtration products can be found in analytical testing laboratories across many industries. Cytiva filters and equipment can stand up to the rigors of petrochemical, mining and cement testing, and deliver the precision required for testing microelectronics.

How to use this guide

Choose from the three paths below to find the product that meets your specific requirements. In addition to product information, we have included general quick reference material in the appendix for your convenience.

Industry application

Our application finder on the following pages allows you to easily locate products by industry or application (page 7).

Product type

If you know the type of product you're looking for, such as filter papers or membranes, you can find it quickly using the table of contents (page 9).

Alphabetical index

Look up products by name or catalog number through the indices at the back of this catalog (page 320).

Your needs, our custom solutions

Whatman™ filter papers, membranes, and devices from Cytiva can be tailored to your specific application and manufacturing needs.

Our filtration products can be customized according to configurations, pore sizes, flow rates, housing sizes, connectors, and adapters, among other options.

Why customers choose us

- **Custom media and device configurations** to match your exact needs
- **Flexible labeling and packaging** options for streamlined workflows
- **End-to-end support** including prototyping, validation, and auditing
- **Global manufacturing expertise** backed by certified quality systems

Our commitment to you

Through our expertise, gained over more than 250 years of delivering high-quality filtration products to our customers, we will help you find the right solution to your needs.

Our manufacturing sites across the globe rely on quality systems designed to meet the rigorous requirements of ISO-9001:2008 Standards at a minimum. We can also support requests under ISO 13485.

Application finder

Basic lab

Education, commercial labs

Basic laboratory filtration for educational purposes, quality control, analysis, and R&D

Environmental monitoring

Air

Analysis of air for biological and particulate contaminants

Aerosols

Microorganisms

Asbestos

Non-medical venting

Particulate detection: PM2.5, PM10, flue, gas stacks

Water

Analysis of drinking and waste water for biological and particulate contaminants

Bacterial detection

Ground water

Particulates, suspended solids

Microplastics and oceanic chemical solids

Trace organics and fat analysis

Automitive emission testing

Airport explosives detection

Equipment protection/venting

Hazardous contaminants

Nuclear radiation monitoring

Soil analysis

Hazardous contaminants

Food and beverage, feed testing

In-process filtration in the production of food and beverage products

Clarification

Final filtration

Liposome extrusion

Solvents, acids, bases

Sterilizing filters

Sterilizing filtration of air and gases

QA and QC

Microbial and contaminant detection in food and beverage products

Analysis and detection of microorganisms

HPLC sample preparation

Industrial

Chemical process industries

The analysis of chemicals, polymers, and petrochemicals

BioEthanol

Cement filtration

Mining filtration

Microelectronics

Products in process and for analysis in semiconductor production

Cigarette ignition strength testing

Pharmaceutical, biotechnology, medical research, specialty chemicals, life science research

Product development

Scale up of new products from R&D to clinical trials

Prefiltration

R&D

The discovery of new pharmaceutical, therapeutic, and biotech products for human and animal uses

Analysis and detection

Basic lab

Blotting

HPLC sample preparation

Mobile phase filtration

Prefiltration

Specialized procedures

Sterilizing filters

Buffer exchange and concentration

Specialty products

Contents

01

Filter papers

Cytiva's filter papers, including Pall and Whatman ranges, are crafted using the highest-grade raw materials and are subjected to rigorous quality control processes. This commitment makes our filters a trusted choice for laboratories and industries that demand consistent and dependable filtration performance.

Cellulose filters

Whatman™ cellulose filters are manufactured from high-quality cotton linters that are treated to achieve a minimum alpha cellulose content of 98%. These cellulose filter papers are used for general filtration and exhibit particle retention levels down to 2.5 µm. We offer a wide choice of retention and flow rate combinations to suit numerous laboratory applications.

The different groups of cellulose filters offer increasing degrees of purity, hardness, and chemical resistance.

Grade 5 qualitative filter papers

Cellulose filters, trace element composition

Typical values (µg/g paper)

Grade	1	42	542
Aluminum	3.6	2.5	3.4
Antimony	< 0.5	< 0.5	< 0.5
Arsenic	< 0.5	< 0.5	< 0.5
Barium	< 0.5	< 0.5	< 0.5
Boron	< 1.0	< 1.0	< 1.0
Calcium	27.5	8.3	14.7
Chromium	1.0	1.5	1.1
Copper	0.9	2.0	8.2
Iron	13.7	12.0	16.3
Lead	< 0.5	< 0.5	< 0.5
Magnesium	21.0	4.0	3.3
Manganese	< 0.5	< 0.5	< 0.5
Mercury	< 0.5	< 0.5	< 0.5
Potassium	6.2	2.3	3.7
Silicon	8.8	6.2	< 6.0
Sodium	32.3	16.8	17.0
Zinc	58.3	64.5	87.8

Typical values for additional grades can be found in Appendix A.

Qualitative filter papers

These cellulose filters are used in qualitative analytical techniques to determine and identify materials. Fluted qualitative filters are available, which give improved flow rate and increased loading capacity compared to equivalent flat filters.

Grade 1 (11 µm*)

The most widely used filter paper for routine applications with medium retention and flow rate. This grade covers a wide range of laboratory applications and is used for clarifying liquids. Traditionally, the grade is used in qualitative analytical separations for precipitates such as lead sulfate, calcium oxalate (hot), and calcium carbonate.

- Agriculture: Used for soil analysis and seed testing procedures.
- Food industry: Grade 1 is used for routine techniques to separate solid foodstuffs from associated liquid, or extracting liquid. They're also used in education for simple qualitative analytical separations.
- Air pollution monitoring: Atmospheric dust is collected from airflow and the stain intensity measured photometrically.
- Gas detection: The paper is impregnated with a chromogenic reagent and color formation is quantified by optical reflectance.

Available fluted as Grade 1V.

Grade 2 (8 µm*)

Slightly more retentive and absorbent than Grade 1, with a corresponding increase in filtration time (i.e., slightly slower filtration speed). The extra absorbency in Grade 2 filters can be used, to hold soil nutrient in plant growth trials and to monitor contaminants in the atmosphere.

Available fluted as Grade 2V.

Grade 3 (6 µm*)

Double the thickness of Grade 1 with finer particle retention and excellent loading capacity. More precipitate can be held without clogging.

- Extra thickness gives increased wet strength and makes this grade suitable for use in Büchner funnels.
- High absorbency for using the paper as a sample carrier.

Grade 4 (25 µm*)

Extremely fast filtering with excellent retention of coarse particles and gelatinous precipitates such as ferric hydroxide and aluminum hydroxide.

- Useful as a rapid filter for routine clean-up of biological fluids or organic extracts during analysis.
- Used when high flow rates in air pollution monitoring are required and the collection of fine particles is not critical.

Available fluted as Grade 4V.

Grade 4 qualitative filter papers

* *Particle retention rating at 98% efficiency.*

Grade 5 (2.5 µm*)

Our maximum degree of fine particle filtration in the qualitative range. Capable of retaining the fine precipitates encountered in chemical analysis. Slow flow rate.

- Excellent clarifying filter for cloudy suspensions and for water and soil analysis.

Also available fluted as Grade 5V.

Grade 6 (3 µm*)

Twice as fast as Grade 5 with similar fine particle retention. Often specified for boiler water analysis applications.

Grade 591 (7–12 µm*)

A thick filter paper with high loading capacity for fast filtration of medium to coarse precipitates. Offers high absorbency and increased wet strength.

Also available fluted as Grade 591 ½.

Grade 595 (4–7 µm*)

A popular, thin filter paper, medium-fast with medium to fine particle retention. Used for many routine analytical applications in different industries (e.g., particle separation from food extracts or filtration of solids from digested environmental samples for ICP/AAS analysis).

Also available fluted as Grade 595 ½.

Grade 597 Plus (4–7 µm)

A standard grade filter paper for a variety of routine applications in food and beverage industries.

- Well-suited for determination of fat content in food or removal of carbon dioxide and turbidity from beverages such as beer.

Available in sheets and circles.

Grade 597 (4–7 µm*)

A medium fast filter paper with medium to fine particle retention.

- Used for a variety of routine analytical applications in different industries like food testing (e.g., determination of fat content) or removal of carbon dioxide and turbidity from beverages in beer analysis.

Available fluted as Grade 597 ½.

Grade 597L (7 µm*)

A qualitative filter paper with low fat content. Suitable for nitrate determination in foodstuffs to §35 LMBG* (* LMBG = German law for food and consumer products).

Grade 597 Plus filter papers

* *Particle retention rating at 98% efficiency.*

Grade 598 (8–10 µm*)

Thick filter paper with high loading capacity. Combines medium retention with medium-fast to fast filtration speed.

Available fluted as Grade 598 ½.

Grade 602 h (< 2 µm*)

Dense filter paper for collecting small particles and removing fine precipitates.

- Used in sample preparation (e.g., in the beverage industry for residual sugar determination, acidic spectra, refractometric analysis, and HPLC).

Available fluted as Grade 602 h ½.

Grade 602 eh (2 µm*)

These cellulose filters are used in qualitative analytical techniques to determine and identify materials. A standard grade filter paper for very fine precipitates. Used for recovery of microfine ultrapure crystalline components (< 1 µm) in alkaline tests in waste analysis (e.g., soils, filter dust, ash, ore and slag waste).

Available fluted as Grade 602 eh ½.

Grade 602 eh filter papers

* *Particle retention rating at 98% efficiency.*

Technical specifications

Qualitative filter papers: Standard grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal ash content (%)[3]
1	–	11	–	13	180	87	57	0.06
2	–	8	–	20	190	97	38	0.06
3	Thick	6	–	26	390	185	28	0.06
4	–	25	37	4	210	92	247	0.06
5	–	2.5	1420	96	200	100	5	0.06
6	–	3	–	32	180	100	22	0.15
591	Medium fast, thick	7–12	45	5.9	350	161	–	–
595	Medium fast, thin	4–7	80	–	150	68	–	–
597	Medium fast	4–7	140	–	180	85	–	–
597L	Medium fast, low fat	7	170	–	180	82	–	–
597 Plus	Medium fast	4–7	300	–	190	85	–	–
598	Medium fast, thick	8–10	50	–	320	140	–	–
602 h	Slow, dense	< 2	375	–	160	84	–	–
602 eh	Very slow, very dense	2	3000	–	150	85	–	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900˚C in air*

Ordering information

Qualitative filter circles: Standard grades

	Catalog number						
Diameter (mm)	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Quantity/pack
10	1001-6508	–	–	–	–	–	500
15	1001-0155	–	–	–	–	–	500
20	1001-020	–	–	–	–	–	400
23	–	–	1003-323	–	–	–	100
25	1001-325	–	–	–	1005-325	–	100
25	1001-025	–	–	–	–	–	400
27	–	–	–	1004-027	–	–	400
30	1001-329	–	–	–	–	–	100
30	1001-030	–	–	–	–	–	400

Ordering information

Qualitative filter circles: Standard grades (continuation)

	Catalog number						
Diameter (mm)	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**	**Grade 6**	**Quantity/pack**
32	1001-032	–	–	–	–	–	100
41	–	–	–	1004-041	–	–	100
42.5	1001-042	1002-042	–	1004-042	1005-042	1006-042	100
47	1001-047	1002-047	–	1004-047	1005-047	–	100
50	–	–	–	1004-050	–	–	100
55	1001-055	1002-055	1003-055	1004-055	1005-055	–	100
60	–	–	–	–	1005-060	–	100
70	1001-070	1002-070	1003-070	1004-070	1005-070	1006-070	100
76.2	1001-10035						500
82	1001-082	–	–	–	–	–	100
85	1001-085	–	–	–	–	–	100
90	1001-090	1002-090	1003-090	1004-090	1005-090	1006-090	100
90	1001-10048	1002-10048					5000
110	1001-110	1002-110	1003-110	1004-110	1005-110	1006-110	100
125	1001-125	1002-125	1003-125	1004-125	1005-125	1006-125	100
145	1001-045	–	–	–	–	–	100
150		1002-147	–	–	–	–	100
150	1001-150	1002-150	1003-150	1004-150	1005-150	1006-150	100
185	1001-185	1002-185	1003-185	1004-185	1005-185	1006-185	100
240	1001-240	1002-240	1003-240	1004-240	1005-240	1006-240	100
270	1001-270	1002-270	–	1004-270	–	–	100
320	1001-320	1002-320	1003-320	1004-320	1005-320	–	100
385	1001-385	1002-385	–	–	–	–	100
400	1001-400	–	–	1004-400	–	–	100
500	1001-500	1002-500	–	–	–	–	100

Ordering information

Qualitative filter circles: Standard grades

	Catalog number					
Diameter (mm)	**Grade 595**	**Grade 597 Plus**	**Grade 597**	**Grade 598**	**Grade 602 h**	**Quantity/pack**
12.7	–	989410108	10311862	–	–	1000
45	–	989410101	10311804	–	–	100
55	–	98949552	10311807	–	–	100
70	–	989410102	10311808	–	–	100
90	–	98949329	10311809	10312209	10312609	100
110	10311610	989410103	10311810	–	–	100
125	10311611	989410104	10311811	–	10312611	100
150	10311612	98949613	10311812	-	10312612	100
185	10316114	989410105	10311814	–	10312614	100
240	–	989410106	10311820	–	10312620	100
320	–	989410107	10311822	–	–	100

Ordering information

Qualitative filter sheets: Standard grades

Dimensions (mm)	**Catalog number**	**Quantity/pack**
Grade 1		
26 × 31	1001-813	1000
75 × 100	1001-824	500
460 × 570	1001-917	100
460 × 570	1001-918	500
580 × 680	1001-931	100
580 × 680	1001-932	500
600 × 600	1001-929	100
Grade 2		
460 × 570	1002-917	100
580 × 680	1002-931	100
600 × 600	1002-929	100
Grade 3		
460 × 570	1003-917	100

Ordering information

Qualitative filter sheets: Standard grades (continuation)

Dimensions (mm)	Catalog number	Quantity/pack
Grade 4		
460 × 570	1004-917	100
580 × 580	1004-930	100
6 × 6 in	1004-492	100
Grade 591		
580 × 580	10311387	250
Grade 595		
580 × 580	10311687	500
Grade 597		
580 × 580	10311887	500
580 × 580	10311897	100
Grade 597 Plus		
580 × 580	989410110	100
580 × 580	989410109	500
Grade 598		
580 × 580	10312287	250

Ordering information

Qualitative filter reels: Standard grades

	Catalog number				
Dimensions	**Grade 4**	**Grade 597L**	**Grade 598**	**Grade 602 eh**	**Quantity/pack**
10 mm × 50 m	–	–	–	10312500	20
38 mm × 30 m*	1004-648	–	–	–	1
40 mm × 100 m	–	10312070		–	10
500 mm × 100 m	–	–	10312000	–	1

* *Approximate dimensions*

Quantitative filter papers: Ashless grades

Whatman quantitative filters are designed for gravimetric analysis and preparation of samples for instrument analysis. They are available in three formats.

- **Ashless:** 0.007% ash nominal for Grades 40 to 44 and a typical nominal ash content of 0.01% for the 589 Grades. These filters are very pure and suitable for a wide range of critical analytical filtration procedures.
- **Hardened low ash:** 0.015% ash nominal, treated with a strong acid to remove trace metals and produce high wet strength and chemical resistance. These filters are particularly suitable for Büchner filtration where the tough, smooth surface of the filter makes it easy to recover precipitates.
- **Hardened ashless:** 0.005% ash nominal, acid hardened to give high wet strength and chemical resistance with extremely low ash content. The tough surface makes these filters suitable for a wide range of critical filtration procedures.

Quantitative filter papers, ashless

Grade 40: (8 µm*)

The classic general purpose ashless filter paper with medium speed and retention. Typical applications include gravimetric analysis for numerous components in cements, clays, iron, and steel products; as a primary filter for separating solid matter from aqueous extracts in general soil analysis; quantitative determination of sediments in milk, and as a pure analytical grade clean-up filter for solutions prior to AA spectrometry. Also used as a high-purity filter in the collection of trace elements and radionuclides from the atmosphere.

Grade 41 (20 µm*)

The fastest ashless filter paper, recommended for analytical procedures involving coarse particles or gelatinous precipitates (e.g., iron or aluminum hydroxides). Also used in quantitative air pollution analysis as a paper tape for impregnation when determining gaseous compounds at high flow rates.

Grade 42 (2.5 µm*)

Used for critical gravimetric analysis with the finest particle retention of all cellulose filter papers. Typical analytical precipitates include barium sulfate, metastannic acid, and finely precipitated calcium carbonate.

Grade 43 (16 µm*)

Intermediate in retention between Grades 40 and 41, and twice as fast as Grade 40. Typical applications include foodstuffs analysis, soil analysis, particle collection in air pollution monitoring for subsequent analysis by XRF techniques, and inorganic analysis in the construction, mining, and steel industries.

Grade 44 (3 µm*)

Thin version of Grade 42 retaining fine particles but with lower ash weight per sample and almost twice the flow rate of Grade 42.

* *Particle retention rating at 98% efficiency.*

Grade 589/1 (12-25 µm*)

Black ribbon filter: Ashless filter paper with high flow rate. Used for quantitative standard methods, especially for gravimetric applications (e.g., determination of the ash content in foodstuffs or for the Blaine test in the cement industry).

Also available fluted as Grade 589/1 ½.

Grade 589/2 (4-12 µm*)

White ribbon filter: Ashless standard filter paper for medium fine precipitates offering medium filtration speed. Applied in a variety of routine methods in quantitative analysis, (e.g., determination of the sand content in foodstuffs, determination of the grade of flour or analysis of aqueous suspensions in the paper industry).

Also available fluted as Grade 589/2 ½.

Grade 589/3 (2 µm*)

Blue ribbon filter: Ashless standard filter paper for fine precipitates. Slow filter paper with highest efficiency for collecting very small particles. Also used for many analytical routine methods in different industries (e.g., determination of the amount of insoluble contaminants in animal and vegetable fats and oils).

* *Particle retention rating at 98% efficiency*

Ashless quantitative filter paper circles

Technical specifications

Quantitative filter papers: Ashless grades

Grade	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)
40	8	–	0.007	210	95	25	21
41	20	–	0.007	215	85	254	4
42	2.5	–	0.007	200	100	5	96
43	16	–	0.007	220	95	62	11
44	3	–	0.007	176	80	11	56
589/1	12–25	25	0.01	190	80	–	–
589/2	4–12	70	0.01	180	85	–	–
589/3	2	375	0.01	160	84	–	–

1 *Particle retention rating at 98% efficiency*
2 *For 9 cm diameter*
3 *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers: Ashless grades

	Catalog number								
Diameter (mm)	**Grade 40**	**Grade 41**	**Grade 42**	**Grade 43**	**Grade 44**	**Grade 589/1**	**Grade 589/2**	**Grade 589/3**	**Quantity/pack**
Filter circles									
12.7	1440-012	–	–	–	–	–	–	–	400
12.7	–	–	–	–	–	–	10300102	10300263	1000
25	1441-6309	1441- 6309	–	–	–	–	–	–	10000
30	1440-329	–	–	–	–	–	–	–	100
32	1440-032	–	–	–	–	–	–	–	100
40.5	–	–	–	–	–	–	10300103	–	100
42.5	1440-042	1441-042	1442-042	–	–	–	–	–	100
47	1440-047	1441-047	1442-047	–	–	–	–	–	100
50	–	1441-050	–	–	–	–	10300106	–	100
55	1440-055	1441-055	1442-055	–	–	–	10300107	–	100
60	–	1441-060	–	–	–	–	–	–	100
70	1440-070	1441-070	1442-070	–	1444-070	–	10300108	–	100
79	–	–	1442-10055	–	–	–	–	–	100
90	1440-090	1441-090	1442-090	1443-090	1444-090	10300009	10300109	–	100
110	1440-110	1441-110	1442-110	1443-110	1444-110	10300010	10300110	10300210	100
125	1440-125	1441-125	1442-125	1443-125	1444-125	10300011	10300111	10300211	100
142	–	–	–	–	–	–	–	10300213	100
150	1440-150	1441-150	1442-150	1443-150	1444-150	10300012	10300112	10300212	100
185	1440-185	1441-185	1442-185	1443-185	1444-185	10300014	10300114	10300214	100
240	1440-240	1441-240	1442-240	–	1444-240	–	10300120	–	100
320	1440-320	1441-320	1442-320	–	–	–	–		100
450	1440-6168	–	–	–	–	–	–	–	100
500	–	–	–	–	–	–	–	–	100
700	–	–	–	–	–	–	–	–	100
Filter sheets									
25.4 × 90	–	–	1442-6551	–	–	–	–	–	100
203 × 254	–	1441-866	–	–	–	–	–	–	100
460 × 570	1440-917	1441-917	1442-917	–	–	–	–	–	100
Flag shape	–	–	1442-971	–	–	–	–	–	100

Quantitative filter papers: Hardened low ash grades

The maximum ash content of these grades is intermediate between ashless and qualitative grades. They are suitable for Büchner filtrations where it is desirable to recover the precipitate from the filter surface after filtration. Other characteristics include high wet strength and chemical resistance, which are similar to the acid hardened ashless filter papers.

Grade 50 (2.7 µm*)

Retention of fine crystalline precipitates. The thinnest of all filter papers with a slow flow rate, these filters have a hardened and glazed surface, which keeps the paper free from loose surface fibers. Suitable for qualitative or quantitative filtrations requiring vacuum assistance on Büchner or 3-piece filter funnels. Strong when wet and withstands wet handling and precipitate removal by scraping. In the electronics industry, the virtual absence of fiber shedding is utilized in carriers for integrated circuits.

This grade is also available in Smear Tab format for wipe testing (e.g., testing of surfaces for radionuclide contamination).

Grade 52 (7 µm*)

The general purpose hardened filter paper with medium retention and flow rate. Very hard surface.

Grade 54 (22 µm*)

Fast filtration and high wet strength makes this grade suitable for vacuum assisted fast filtration of difficult coarse or gelatinous precipitates.

Hardened low ash quantitative filter papers

* *Particle retention rating at 98% efficiency.*

Technical specifications

Quantitative filter papers: Ashless grades

Grade	Typical particle retention in liquid (µm)[1]	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)	Nominal air flow rate (s/100 mL/in²)
50	2.7	0.015	115	96	10	144	21
52	7	0.015	175	96	66	15	–
54	22	0.015	185	90	453	3	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers: Hardened low ash grades

	Catalog number			
Dimensions (mm)	**Grade 50**	**Grade 52**	**Grade 54**	**Quantity/pack**
Filter circles				
42.5	1450-042	–	–	100
55	1450-055	–	1454-055	100
63.5	1450-063	–	–	100
70	1450-070	–	1454-070	100
90	1450-090	1452-090	1454-090	100
110	1450-110	1452-110	1454-110	100
125	1450-125	1452-125	1454-125	100
150	1450-150	1452-150	1454-150	100
185	1450-185	–	1454-185	100
240	1450-240	1452-240	1454-240	100
320	1450-320	–	1454-320	100
500	1450-500	–	1454-500	100
Smear Tab	1450-993	–	–	100
Filter sheets				
150 × 230	1450-916	–	–	100
460 × 570	1450-917	–	1454-917	100

Hardened low ash quantitative filter papers

Quantitative filter papers: Hardened ashless grades

Hardened ashless filter papers are suited for a variety of precipitate sizes. Along with general filtration Grade 540, the range includes Grade 542 for retention of fine precipitates and Grade 541 for fast filtration. All three grades are designed for use in gravimetric analysis.

These filter papers exhibit high wet strength, chemical resistance, and are acid hardened, which reduces ash to an extremely low level. Their tough surfaces make them suitable for a range of critical analytical filtration operations. Each grade offers a convenient combination of filtration speed and particle retention.

Hardened ashless quantitative filter papers, Grade 540

Grade 540 (8 µm*)

A general purpose hardened ashless filter paper with medium retention and flow rate. Pure and strong with a hard surface. High chemical resistance to strong acid and alkali. Frequently used in the gravimetric analysis of metals in acid or alkali solutions and in collecting hydroxides after precipitation by strong alkalis.

Grade 541 (22 µm*)

The general purpose hardened filter paper with medium retention and flow rate. Very hard surface.

Grade 542 (2.7 µm*)

High retention of fine particles under demanding conditions. Slow flow rate. Very hard and strong with excellent chemical resistance. Often used in gravimetric metal determinations.

* *Particle retention rating at 98% efficiency.*

Technical specifications

Quantitative filter papers: Hardened ashless grades

Grade	Typical particle retention in liquid (µm)[1]	Nominal ash content (%)[3]	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal air flow rate (s/100 mL/in²)
540	8	0.005	160	85	97	13
541	22	0.005	155	78	359	3
542	2.7	0.005	150	96	13	64

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Quantitative filter papers: Hardened ashless grades

	Catalog number			
Dimensions (mm)	**Grade 540**	**Grade 541**	**Grade 542**	**Quantity/pack**
Filter circles				
21	1540-321	–	–	100
24	1540-324	–	–	100
42.5	1540-042	1541-042	–	100
47	–	1541-047	–	100
55	1540-055	1541-055	1542-055	100
70	–	1541-070	1542-070	100
90	1540-090	1541-090	1542-090	100
110	1540-110	1541-110	1542-110	100
125	1540-125	1541-125	1542-125	100
150	1540-150	1541-150	1542-150	100
185	1540-185	1541-185	1542-185	100
240	1540-240	1541-240	1542-240	100
270	–	1541-270	–	100
320	1540-320	1541-320	–	100
400	–	1541-400	–	100
Filter sheets				
460 × 570	–	1541-917	–	100

Hardened ashless quantitative filter paper circles

Wet strengthened general purpose filter papers

Wet strengthened grades

These strong filter papers have a high wet strength due to the addition of a small quantity of chemically stable resin. Their use in normal qualitative applications will not introduce any significant impurities into the filtrate. The resins do contain nitrogen, so these grades should not be used in Kjeldahl estimations, etc. Some wet strengthened grades are available in folded (fluted) forms.

Qualitative filter papers, Grade 91

Grade 91 (10 µm*)

A general purpose creped filter for less critical routine analysis. Widely used to assay sucrose in cane sugar and within pharmaceutical laboratories for routine filtration.

Grade 93 (10 µm*)

This filter paper is intermediate in speed and retention between Grades 1 and 4. Available in a dispenser. The envelopes are released individually for easy one-at-a-time removal. Package and envelopes are clearly marked for size and content.

Grade 113 (30 µm*)

A fast, open filter paper with creped surface and high loading capacity. Use with coarse or gelatinous precipitates. Fastest flow rate of the qualitative grades.

Also available as Grade 113V.

Grade 114 (25 µm*)

Half the thickness of Grade 113 and suitable for coarse or gelatinous precipitates. Smooth surface for easy recovery of precipitates.

Also available fluted as Grade 114V.

Grade 1573 (12–25 µm*)

A fast filter paper with high wet strength. It has a smooth surface to scrape or wash off precipitate. Resistant against: Sulfuric and nitric acid solutions (up to 40% at 50°C), hydrochloric (up to 10% at 100°C, 20% at 60°C, 25% at 20°C), and alkalis (up to 10% at 20°C).

Also available fluted as Grade 1573 ½.

Grade 1574 (7–12 µm*)

A medium fast filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 (see above).

Available fluted as Grade 1574 ½.

Grade 1575 (< 2 µm*)

Slow filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 (see above).

* *Particle retention rating at 98% efficiency.*

Technical specifications

Wet strengthened grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]
91	Creped	10	–	6	205	65	274
93	Medium	10	–	7	145	65	194
113	Creped	30	–	2	420	125	774
114	–	25	–	4	190	75	333
1573	Fast, smooth	12–25	25	–	170	88	–
1574	Medium fast, very low fiber release	7–12	85	–	160	90	–
1575	Slow	< 2	700	–	140	92	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*

Ordering information

Wet strengthened grades

	Catalog number							
Dimensions (mm)	Grade 91	Grade 93	Grade 113	Grade 114	Grade 1573	Grade 1574	Grade 1575	Quantity/pack
Filter circles								
90	–	–	1113-090	1114-090	–	–	–	100
110	1091-110	–	–	–	–	–	–	4000†
110	–	1093-110	1113-110	–	–	–	–	100
110	–	1093-111*	–	–	–	–	–	1250
125	1091-125	–	–	–	–	–	–	4000†
125	–	1093-125	1113-125	1114-125	–	–	–	100
125	–	1093-126*	–	–	–	–	–	1250
150	1091-150	1093-6215**	–	–	–	–	–	1000†
150	–	–	1113-150	1114-150	10314712	–	10314915	100
165	1091-165	–	–	–	–	–	–	1000†
185	1091-185	–	–	–	–	–	–	1000†
185	–	–	1113-185	1114-185	10314714	–	10314914	100
190	1091-190	–	–	–	–	–	–	1000†

* *Packed 50 envelopes of 25 circles*
** *Packed 10 bags of 100 circles*
† *Subdivided into 100*

Ordering information

Wet strengthened grades (continuation)

	Catalog number							
Dimensions (mm)	**Grade 91**	**Grade 93**	**Grade 113**	**Grade 114**	**Grade 1573**	**Grade 1574**	**Grade 1575**	**Quantity/pack**
200	–	–	–	–	–	–	10314916	100
240	1091-240	–	–	–	–	–	–	1000†
240	–	–	1113-240	1114-240	10314720	–	–	100
290	–	–	–	–	10314726	–	-	100
320	–	–	1113-320	–	–	–	–	100
330	1091-330	–	–	–	–	–	–	100
400	–	–	–	1114-400	–	–	–	100
500	–	–	1113-500	–	–	–	–	100
685	–	–	–	–	–	10314828	–	100
Filter sheets								
580 mm × 580 mm	–	–	–	1114-930	–	–	–	100
580 mm × 580 mm	1091-930	1093-930	–	–	–	–	–	500
610 mm × 610 mm	1091-935	1093-935	–	–	–	–	–	500
460 mm × 570 mm	–	–	1113-917	–	–	–	–	100
Rolls								
25 mm × 145 m	–	–	–	–	10314769	–	–	1
25.5 mm × 210 m	–	–	–	–	10314766	–	–	1
70 mm × 80 m	–	–	–	–	10314765	–	–	1
70 mm × 100 m	–	–	–	–	–	10314871	–	1

* *Packed 50 envelopes of 25 circles*
** *Packed 10 bags of 100 circles*
† *Subdivided into 100*

General purpose filter papers

These filter papers are made from super-refined cellulose and are designed to have particular properties for each application, ranging from the filtration of beverages to the purification of electroplating baths.

Grade 520 a (15–18 µm*)
A thin paper with great wet strength and a very high flow rate. Frequently used in technical applications such as the filtration of viscous liquids and emulsions (e.g., sweetened juices, spirits and syrups, resin solutions, oils, or plant extracts).

Available fluted as Grade 520 a ½.

Grade 520 bII (15–19 µm*)
A thick paper with high wet strength offering a very high flow rate.

Grade 0858 (7–12 µm*)
Medium retention and flow rate with a grained surface. Used for the filtration of extracts, oils, beer, syrups. Also suitable for use in filter presses or for the aspiration of liquids.

Available fluted as Grade 0858 ½.

Grade 0903 (7 µm*)
A thin filter paper with smooth surface. Offers medium to slow flow rate and good retention for small particles.

Grade 0905 (12–25 µm*)
A creped paper for coarse particles, offering a very high filtration speed.

Grade 2294 (8–15 µm*)
A very thick filter card with high wet strength. Offers very high flow rate and retains medium to coarse particles.

Grade 2589 a (6–12 µm*)
A fast to medium fast filter with high wet strength offering medium retention.

Grade 2589 c (4–8 µm*)
Thick filter with medium to slow filtration speed, high wet strength, and good retention for smaller particles.

Grade 2589 d (2–6 µm*)
A very thick filter with high wet strength. Offers medium to slow flow rate and retains very fine precipitates.

Grade SharkSkin™ paper (8–12 µm*)
Creped, medium to slow filter paper. Resistant to weak acids and bases. Often used as a protective paper for filter press cloths, and processing of cocoa butter and edible oils.

Grade 2294 filter papers for technical use

* *Particle retention rating at 98% efficiency.*

Technical specifications

General purpose filter papers

Grade	Description	Typical particle retention in liquid (µm)	Filtration speed (approx) herzberg (s)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)
520 a	Very fast, creped, high wet strength	15–18	17.5	–	300	90
520 b II	Very fast, creped, wet strength, thick	15–19	15	–	500	135
0858	Medium fast, grained	7–12	55	4.9	170	75
0903	Medium to slow, smooth	7	175	–	140	65
0905	Very fast, creped	12–25	20	–	270	75
2294	Fast, wet strength, thick	8–15	27.5	4.4	1500	556
2589 a	Medium fast, wet strength	6–12	60	–	430	200
2589 c	Medium to slow, wet strength	4–8	160	–	750	400
2589 d	Medium to slow, wet strength, thick	2–6	235	–	1000	500
Shark Skin™	Medium to slow, wet strength, thin, creped	8–12	77.5	–	170	44

Ordering information

General purpose filter papers

	Catalog number						
Dimensions (mm)	Grade 0858	Grade 0903	Grade 0905	Grade 520 a	Grade 520 bII	SharkSkin™	Quantity/pack
Filter sheets							
110 × 580	10334365	–	–	–	–	–	500
390 × 390	10334383	–	–	–	–	-	500
450 × 450	10334385	10334885	–	–	–	–	500
580 × 580	–	–	10334987	–	–	–	500
580 × 580	–	–	–	10331487	10331687	–	250
300 × 250	–	–	–	–	–	10538877	100
Filter reels							
21" × 750'	–	–	–	–	–	10537138	1

Ordering information

General purpose filter papers (continuation)

	Catalog number			
Filter sheets	**Grade 2589 a**	**Grade 2589 c**	**Grade 2589 d**	**Quantity/pack**
25 × 75	–	10343876	10343976	100
580 × 580	10343687	–	–	100
Dimensions (mm)	**Grade 2294**	**Grade 2589 a**	**SharkSkin™**	**Quantity/pack**
Filter circles				
90	–	–	10347509	100
110	10342810	–	10347510	100
125	–	–	10347511	100
140	–	10343630	–	500
150	–	–	10347513	100
180	10342860[1]	–	–	100
185	–	–	10347512	100
210	10342862[2]	–	–	100
240	–	–	10347519	100
270	–	–	10347521	100
290	–	–	10347577	100
320	–	–	10347530	100
340	–	–	10347522	100
385	–	–	10347523	100
500	–	–	10347525	100

[1] *180 mm with central hole 33 mm*
[2] *210 mm with central hole 60 mm*

Folded and fluted filter papers

Ready-to-use paper solutions

Many grades of our qualitative and quantitative filter paper are available as fluted circles. We also offer a selection of prefolded cones, quadrant folded, and pyramid folded filter papers. These convenient formats eliminate time consuming manual pleating or folding, streamlining operations in busy labs.

Whatman ready-to-use folded filter papers support your application needs, save valuable time, and provide ease of use when undertaking repetitive or multiple analyses.

Folded and fluted filter papers, 113V

Fluted filter papers

This convenient format has major advantages over flat circles.

- Save time required to quadrant-fold circles to fit conical filter funnels in repetitive or multiple analyses.
- Decreased overall filtration time because of the extra surface area exposed. The slow-down of filtration speed due to the loading of particulate is postponed.
- Increased total loading capacity as more filter area is available.
- Maintained flow rate due to the reduction in filter paper contact with funnel side and the self-supporting shape of the filter itself.
- The prepleating does not significantly affect any of the technical data and the same figures may be used for flat circles.

Additional folded formats

Qualitative and quantitative grades are now available in several convenient folded formats. These ready-to-use paper filters are available in cone, pyramid, and flat quadrant folded formats, in diameters and grades to support your applications.

Pyramid, flat quadrant-folded and cone filters come in a range of media and diameters and fit conical funnels. Convenient stacking and packaging options are available.

Folded and fluted papers

Available formats and grades

Equivalent flat stock grade	Type	Fluted	Quadrant folded	Cone folded	Pyramid folded
1	Qualitative	1V	1 FF	1	1
2	Qualitative	2V	–	2	2
4	Qualitative	4V	–	–	4
5	Qualitative	5V	–	–	–
6	Qualitative	–	–	–	6
40	Ashless	–	40 FF	40	40
41	Ashless	–	41 FF	–	41
42	Ashless	–	–	–	42
113	Wet strengthened	113V	–	–	–
114	Wet strengthened	114V	–	–	–
–	Kieselguhr paper	287 ½	–	–	–
–	Qualitative	512 ½	–	–	–
520 a	General purpose	520 a ½	–	–	–
520 b II	General purpose	520 b FF	–	–	–
540	Hardened ashless	–	–	–	540
–	Qualitative	–	–	–	–
–	Qualitative	593 ½	–	–	–
–	Qualitative	594 ½	–	–	–
595	Qualitative	595 ½	–	–	–
597	Qualitative	597 ½	–	–	–
598	Qualitative	598 ½	–	–	–
602 h	Qualitative	602 h ½	–	–	–
602 eh	Qualitative	602 eh ½	–	–	–
–	Qualitative	604 ½	–	–	–
–	Qualitative	0790 ½	–	–	–
–	Qualitative	802	–	–	–
858	General purpose	0858 ½	0858 FF	–	–
–	Qualitative	0860 ½	–	–	–
1573	Wet strengthened	1573 ½	–	–	–
1574	Wet strengthened	1574 ½	–	–	–
–	Qualitative	2555 ½	–	–	–

Grade 1V and 1 FF (11 µm*)

A folded filter paper for routine applications with medium retention and flow rate. Covers a wide range of laboratory applications and is frequently used for clarifying liquids.

Grade 2V (8 µm*)

Widely used for general purpose filtration. Has excellent particle retention and a good filtration speed and loading capacity.

Grade 4V (25 µm*)

Extremely fast filtering with excellent retention of coarse particles and gelatinous precipitates such as ferric hydroxide and aluminum hydroxide.

Grade 5V (2.5 µm*)

The maximum degree of fine particle filtration in the qualitative range. Capable of retaining the fine precipitates encountered in chemical analysis. Slow flow rate. Excellent clarifying filter for cloudy suspensions and for water and soil analysis.

Grade 6

Twice as fast as Grade 5 with similar fine particle retention. Often specified for boiler water analysis applications.

Grade 40 and 40 FF

The classic general purpose ashless filter paper with medium speed and retention. Typical applications include gravimetric analysis for numerous components in cements, clays, iron, and steel products; as a primary filter for separating solid matter from aqueous extracts in general soil analysis; quantitative determination of sediments in milk, and as a pure analytical grade clean-up filter for solutions prior to AA spectrometry. Also used as a high-purity filter in the collection of trace elements and radionuclides from the atmosphere.

Grade 41 and 41 FF

The fastest ashless filter paper, recommended for analytical procedures involving coarse particles or gelatinous precipitates (e.g., iron or aluminum hydroxides). Also used in quantitative air pollution analysis as a paper tape for impregnation when determining gaseous compounds at high flow rates.

Grade 42

Used for critical gravimetric analysis with the finest particle retention of all cellulose filter papers. Typical analytical precipitates include barium sulfate, metastannic acid, and finely precipitated calcium carbonate.

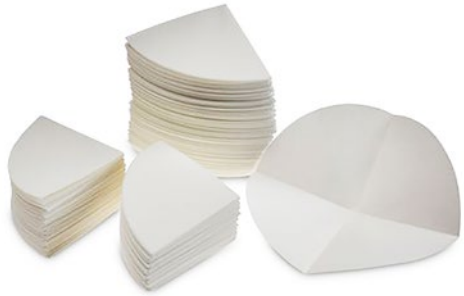
Grade 113V (30 µm*)

Thick and strong filter with creped surface for extremely high loading capacity, particularly in folded form. Fastest flow rate of any qualitative grade. Excellent for coarse particles and gelatinous precipitates.

Grade 114V (25 µm*)

Strong filter with very fast flow rate. Excellent for coarse particles and gelatinous precipitates. Smooth surface.

* *Particle retention rating at 98% efficiency.*



Quadrant flat folded filter papers

Grade 287 ½

Kieselguhr paper with a medium to slow flow rate. Additional adsorption effect (e.g., for the separation of very fine semi-colloidal turbidity, for clarifying milk serum, starch solutions, soil suspensions, or sugar-containing solutions prior to polarimetry or refractometry).

Grade 512 ½

Low phosphate papers approximately 1.5 ppm phosphate, for the filtration of calcium lactate extracts from soil samples for the determination of K and P according to Egnér, Riehm and Lederle

Grade 520 a ½ (15–18 µm*)

A thin paper with great wet strength and a very high flow rate. Frequently used in technical applications such as the filtration of viscous liquids and emulsions (e.g., sweetened juices, spirits and syrups, resin solutions, oils or plant extracts).

Grade 520 b FF

A filter paper with high wet strength offering a very high flow rate.

Pyramid folded filter papers

Grade 540

A general purpose hardened ashless filter paper with medium retention and flow rate. Pure and strong with a hard surface. High chemical resistance to strong acid and alkali. Frequently used in the gravimetric analysis of metals in acid or alkali solutions and in collecting hydroxides after precipitation by strong alkalis.

Grade 593 ½ (5 µm*)

A standard grade filter paper for fine precipitates.

Grade 594 ½ (4 µm*)

A standard grade filter paper for fine precipitates.

Grade 595 ½ (4–7 µm*)

A thin filter paper, medium-fast with medium to fine particle retention. Used for many routine analytical applications in different industries (e.g., particle separation from food extracts or filtration of solids from digested environmental samples for ICP/AAS analysis).

Grade 597 ½ (4–7 µm*)

A medium fast filter paper with medium to fine particle retention. Used for a wide variety of analytical routine applications in industries like food testing (e.g., determination of fat content) or removal of carbon dioxide and turbidity from beverages (e.g., beer analysis).

Grade 598 ½ (8–10 µm*)

A thick filter paper with high loading capacity. Combines medium retention with medium-fast to quick filtration speed.

* *Particle retention rating at 98% efficiency.*

Grade 602 h ½ (< 2 µm*)

A dense filter paper for collecting very small particles and removing fine precipitates. Used in sample preparation (e.g., in the beverage industry for residual sugar determination, acidic spectra, refractometric analysis, and HPLC).

Grade 602 eh ½ (2 µm*)

A qualitative filter paper for very fine precipitates..

Grade 604 ½ (25 µm*)

Grade 604½ qualitative filter paper for coarse precipitates.

Grade 802

A fluted filter for use with a conical filter funnel, offering fast filtration and high loading capacity for analysis involving coarse particles or gelatinous precipitates.

The filter is wet-strengthened and for normal qualitative application it will not introduce any significant impurities into the filtrate. It is not recommended for Kjeldahl nitrogen analysis.

Cone folded filter papers

Grade 0858 ½ and 858 FF (7–12 µm*)

Medium retention and flow rate with a grained surface. A universal filter paper used for the filtration of extracts, oils, beer, and syrups. Also suitable for use in filter presses or for the aspiration of liquids.

Grade 1573 ½ (12–25 µm*)

A fast filter paper with high wet strength. It has a very smooth surface to scrape or wash off precipitate. Resistant against: Sulfuric and nitric acid solutions (up to 40% at 50°C), hydrochloric (up to 10% at 100°C, 20% at 60°C, 25% at 20°C), and alkalis (up to 10% at 20°C).

Grade 1574 ½ (7–12 µm*)

A medium fast filter paper with high wet strength. This paper has the same chemical resistance characteristics as Grade 1573 ½ (see above).

Grade 2555 ½ (12 µm*)

A medium fast filter paper. Used for the filtration of the mash for the determination of the extract in malt and wort and for removing carbon dioxide from beer.

Grade 0790 ½

Acid-washed paper with ash content of approximately 0.01%, low magnesium, and phosphorus for the determination of trace elements (Mg, Mn, Co, Cu, Mo, B).

* *Particle retention rating at 98% efficiency.*

Technical specifications

Fluted grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Filtration speed (approx) herzberg (s)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Typical water flow rate (mL/min)[2]	Nominal ash content (%)[3]
1V	Medium flow	11	–	180	87	57	0.06
2V	–	8	–	190	97	38	–
4V	Very fast	25	–	210	92	247	0.06
5V	Slow	2.5	–	200	92	5	–
113V	Creped	30	–	420	125	774	–
114V	–	25	–	190	75	333	–
287 ½	Kieselguhr	–	330	360	154	–	–
520 a ½	Very fast, creped, high wet strength	15-18	17.5	300	90	–	–
520 b FF	Very fast, wet strength, extra thick	20	30	500	155	–	–
593 ½	Medium to slow	5	450	170	85	–	–
594 ½	Slow	4	800	150	75	–	–
595 ½	Medium fast, thin	4-7	80	150	68	–	–
597 ½	Medium fast	4-7	70	180	85	–	–
598 ½	Medium fast, thick	8-10	50	320	140	–	–
602 h ½	Slow, dense	< 2	375	160	84	–	–
602 eh ½	Very slow, very dense	2	3000	150	85	–	–
604 ½	Fast	25	50	190	80	–	–
802	Fast	–	–	–	73	–	–
0858 ½	Medium fast, grained	7-12	55	170	75	–	–
0860 ½	Medium fast, smooth	12	60	170	75	–	–
1573 ½	Fast, smooth	12-25	25	170	88	–	–
1574 ½	Medium fast, very low fiber release	7-12	85	160	90	–	–
2555 ½	Medium fast	12	55	170	75	–	–

[1] *Particle retention rating at 98% efficiency*
[2] *For 9 cm diameter*
[3] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Filter papers: Fluted grades

Dimensions (mm)	Catalog number								Quantity /pack
	Grade 1V	Grade 2V	Grade 4V	Grade 5V	Grade 113V	Grade 114V	Grade 287 ½	Grade 520 a ½	
110	–	–	–	1205-110	–	–	–	–	100
125	1201-125	1202-125	1204-125	–	1213-125	1214-125	–	–	100
125	–	–	–	–	–	–	10310244	–	50
150	–	–	–	–	–	–	10310245	–	50
150	1201-150	1202-150	1204-150	–	1213-150	1214-150		–	100
185	–	–	–	–	–	–	10310247	–	50
185	1201-185	1202-185	1204-0185	1205-185	1213-185	1214-185		–	100
240	1201-240	1202-240	1204-240	–	1213-240	1214-240	–	10331451	100
270	1201-270	1202-270	1204-270	–	1213-270	–	–	–	100
320	1201-320	1202-320	1204-320	–	1213-320	1214-320		–	100
385	–	1202-385	–	–	–	–	–	–	100
400	–	1202-400	–	–	–	–	–	–	100
500	–	1202-500	–	–	1213-500	–	–	10331456	100

Ordering information

Filter papers: Fluted grades

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 520 b FF	Grade 593 ½	Grade 594 ½	Grade 595 ½	Grade 597 ½	Grade 598 ½	Grade 602 h ½	
70	–	–	–	10311641	10311841	–	–	100
90	–	–	–	10311642	10311842	–	10312642	100
110	–	–	–	10311643	10311843	–	–	100
125	–	–	–	–	–	10312244	–	50
125	–	–	–	10311644	10311844	–	10312644	100
150	–	–	–	10311645	10311845	–	10312645	100
185	–	–	–	–	–	10312247	–	50
185	–	10311447	10311547	10311647	10311847		10312647	100
210	–	–	–	10311649	–	–	–	100
240	10331551	–	–	–	–	10312251	–	50
240	–	10311451	–	10311651	10311851	–	10312651	100
270	–	–	–	10311652	10311852	–	–	100
320	10331553	–	–	–	–	–	–	50
320	–	–	–	10311653	10311853	–	–	100
385	10331554	–	–	–	–	–	–	50
385	–	–	–	10311654	10311854	–	–	100
500	10331556	–	–	–	–	10312256	–	50
500	–	–	–	10311656	10311856	–	–	100
600	10331558	–	–	–	–	–	–	50

Ordering information

Filter papers: Fluted grades

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 602 eh ½	Grade 604 ½	Grade 0858 ½	Grade 0860 ½	Grade 1573 ½	Grade 1574 ½	Grade 2555 ½	
110	–	–	–	–	–	10314843	–	100
125	10312544	10312744	–	–	10314744	10314844	–	100
150	10312545	10312745	10334345	–	10314745	–	–	100
185	–	10312747	10334347	10334547	10314747	–	10313947	100
240	–	10312751	10334351	10334551	10314751	–	10313951	100
270	–	–	10334352	–	10314752	–	–	100
320	–	10312753	10334353	10334553	10314753	–	10313953	100
Sheets								
100 mm × 300 mm	–	–	–	10334500	–	–	–	500
570 mm × 870 mm	–	–	10334346	–	–	–	–	100
670 mm × 770mm	–	–	10334435	–	–	–	–	100

Ordering information

Quantitative filter papers: Ashless fluted grades

Dimensions (mm)	Catalog number		Quantity /pack
	Grade 589/1 ½	Grade 589/2 ½	
110	–	10300143	100
150	10300045	10300145	100

For further information on these grades see Quantitative Filter Papers section.

Ordering information

Filter papers: Wet strengthened fluted grades

Dimensions (mm)	Grade 589/1 ½	Grade 589/2 ½	Quantity /pack
125	Grade 802	5802-125	100
150	Grade 802	5802-150	100
185	Grade 802	5802-185	100
240	Grade 802	5802-240	100
240	Grade 802	5802-6698	1000
320	Grade 802	5802-320	100
385	Grade 802	5802-385	100

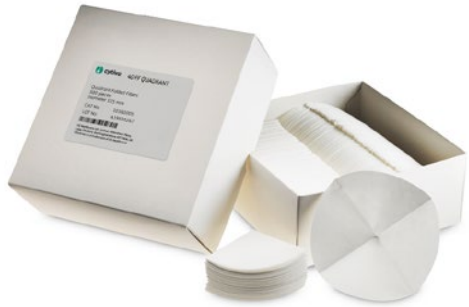
Fluted or prepleated filter papers

Ordering information

Filter papers quadrant folded

Grade	Nominal thickness (µm)	Nominal basis weight (g/m²)	Nominal ash content (%)[1]
1 FF	180	87	0.06
40 FF	210	95	0.007
41 FF	215	85	0.007
0858 FF	170	75	–

[1] *Ash is determined by ignition of the cellulose filter at 900°C in air*



Quadrant-folded flat filter papers

Ordering information

Filter papers quadrant folded

Diameter (mm)	Description	Catalog number	Quantity/pack
110	Grade 1 FF Quadrant	10380404	500
125	Grade 1 FF Quadrant	10380405	500
150	Grade 1 FF Quadrant	10380406	500
110	Grade 40 FF Quadrant	10380004	500
125	Grade 40 FF Quadrant	10380005	500
150	Grade 40 FF Quadrant	10380006	500
110	Grade 41 FF Quadrant	10380204	500
125	Grade 41 FF Quadrant	10380205	500
150	Grade 41 FF Quadrant	10380206	500
185	Grade 0858 FF Quadrant	10334348	100

Ordering information

Filter papers: Pyramid folded and cone grades

Grade	Nominal thickness (µm)	Nominal basis weight (g/m²)	Nominal ash content (%)[1]
1	180	87	0.06
4	210	92	0.06
6	180	100	0.15
40	210	95	0.007
41	215	85	0.007
42	200	100	0.007
540	160	85	0.005

[1] *Ash is determined by ignition of the cellulose filter at 900°C in air*

Ordering information

Filter papers: Pyramid folded grades

Diameter (mm)	Grade	Catalog number	Quantity/pack
90	1	1001-10218	10000
90	42	989610137	1000
90	540	1540-10123	1000
110	1	1001-10116	10000
110	2	1002-10219	10000
110	4	989810116	1000
110	41	989510116	1000
110	42	989610116	1000
110	540	1540-10124	1000
125	1	989710112	1000
125	4	989810112	1000
125	6	9891-128	1000
125	40	9892-128	1000
125	41	989510112	1000
125	42	989610112	1000

Pyramid folded filter papers

Ordering information

Filter papers: Cone folded grades

Diameter (mm)	Grade	Catalog number	Quantity/pack
110	1	990110116	1000
110	2	1002-10240	1000
110	40	990010116	1000
125	40	990010112	1000

The above table is an example of products set-up; please contact us at scientific.support@cytiva.com for a full listing of available products.

Cone folded filter papers

Application specific filter papers

Cytiva offers Whatman cellulose filter papers for use in soil analysis and the sugar industry.

Application filter papers

Grade 0048

Filter mat made from a mixture of cellulose and polyester. This mat is used for optically testing baby food (artificial milk) for textile fibers.

Grade 72

Composite cellulose and glass filter loaded with activated carbon. Used to absorb radioactive iodine in air pollution monitoring and in nuclear installations.

Grade 71

Similar to Grade 72 but has a higher level of activated carbon.

Grade 8 ruled filter paper

A white filter paper with printed green lines for optical assessment (5 mm intervals). For routine investigations of foreign substances in a variety of sample types.

Grade 1450CV

Filter paper for the identification of undissolved dyes in the textile industry.

Grade 0965

A coarse filter mat with high wet strength.

Grade 287 ½

Kieselguhr paper with a medium to slow flow rate. Additional adsorption effect (e.g., for the separation of very fine semi-colloidal turbidity, for clarifying milk serum, starch solutions, soil suspensions, or sugar-containing solutions prior to polarimetry or refractometry). Fluted.

Grade 2555 ½

A medium fast filter paper. Used for the filtration of the mash for the determination of the extract in malt and wort and for removing carbon dioxide from beer. Fluted.

Soil analysis filter papers

Grade 0790 ½

Acid-washed paper with ash content of approximately 0.01%, low magnesium, and phosphorus for the determination of trace elements (Mg, Mn, Co, Cu, Mo, B). Fluted.

Grade 512 ½

Low phosphate papers, approximately 1.5 ppm phosphate for the filtration of calcium lactate extracts from soil samples for the determination of K and P according to Egnér, Riehm and Lederle. Fluted.

Sugar and food industry filter papers

Grade 3459

A creped filter paper, Grade 3459 has good retentivity at a relatively high filtration speed. Used for the clarifying filtration of:

- Dried beet pulp extracts.
- Beet juice after the addition of lead acetate for subsequent polarimetric sugar determination.
- Grade 3459 is specifically designed for the Venema unit (lead acetate method).

Technical specifications

Application specific filters

Grade	Properties	Filtration speed (approx) herzberg (s)	Nominal thickness (µm)	Nominal basis weight (g/m²)
Soil analysis filter papers				
0790 ½	Low Mg and P	225	–	84
512 ½	Low phosphate	375	–	84
Specially for the Venema unit				
3459	Fast, creped	55	–	75
Malt and beer filter				
2555 ½	Medium fast	55	–	75
Food industry mat (cellulose and polyester)				
0048	–	–	0.86	130
Activated carbon loaded paper				
72	–	–	–	195
71	–	–	702-898	160-230
Kieselguhr paper				
287 ½	Kieselguhr	330	360	154
Filter mat				
0965	–	–	250	30
Identification of undissolved dyes				
1450CV	–	30	–	120
Routine investigations				
8	–	–	–	65

Ordering information

Application specific filters

Dimensions (mm)	Catalog number							Quantity /pack
	Grade 0048	Grade 72	Grade 71	Grade 0965	Grade 1450CV	Grade 8	Grade 3459	
Filter circles								
32	10348903	–	–	–	–	–	–	1000
45	–	–	–	–	–	10347004	–	100
47	–	1872-047	–	–	–	–	–	100
50	–	1872-050	–	–	–	–	–	100
55	–	1872-055	–	–	–	–	–	100
60	–	1872-060	–	–	–	–	–	100
70	–	–	–	–	–	10347008	–	100
75	–	–	–	–	–	10347033	–	100
90	–	–	–	–	10313209	–	–	50
90	–	–	–	–	–	10347009	–	100
110	–	–	–	10340810	–	–	–	100
230	–	–	–	–	–	–	10316619	1000

Ordering information

Application specific filters (continuation)

Diameter (mm)	Catalog number				Quantity/pack
	Grade 287 ½	Grade 512 ½	Grade 0790 ½	Grade 2555 ½	
Folded filters					
110	–	10310643	–	–	100
125	10310244	–	–	–	50
150	10310245	–	–	–	50
150	–	10310645	10301645	–	100
185	10310247	10301647	–	–	50
185	–	10310647	10301647	10313947	100
240	–	–	–	10313951	100
320	–	–	–	10313953	100
Sheets					
1060 mm × 560 mm	–	–	10390046	–	100

Seed germination testing papers

Seed testing papers are made from pure cellulose without any additives and do not contain any substances which influence the seed growth. The constant water absorption of the papers provides continuous provision of the required amount of water.

The contrast of the color seed testing papers makes evaluation easier, particularly for seeds with fine white rootlets or under artificial light. The dyes used have been thoroughly investigated and have no influence on the seed growth.

Seed testing papers are available for both the pleated paper (PP) method and the top of paper (TP) method.

Seed germination testing papers, pleated strips

Product selection

Seed germination testing papers

Grade	Description	Nominal thickness (µm)	Nominal weight (g/m²)
PP method			
3014	Pleated strips, white*	0.22	113
3236	Pleated strips, white*	0.22	110
TP method			
597	For Petri dishes or Jacobsen/Copenhagen tanks, white	0.18	85
598	For Petri dishes or Jacobsen/Copenhagen tanks, white	0.32	140
3621	Blotter, light blue	1.44	710
3633	Blotter, light blue	0.65	300
3644	Blotter, blue	1.4	720
3645	Yellow	0.35	165

* *50 double pleats*

Applications

Seed germination testing papers

Grade	Description
597, 598	Small seeds (e.g., grasses, flowers)
3014, 3236	Medium-large and coated seeds (e.g., sugar beet, fodder beet, grain, sunflower, rapeseed, mustard)
3014	Particularly sensitive seeds
3645	Seeds with small white rootlets

Ordering information

Seed germination testing papers

Dimensions (mm)	Grade	Catalog number	Color	Description	Quantity/pack
Circles					
70	597	10311808	–	Circles	100
85	3645	10342555	Yellow	Circles	100
90	597	10311809	–	Circles	100
90	598	10312209	–	Circles	100
90	181	2181-090	White	Circles	100
60	–	1872-060	–	–	–
Sheets					
100 × 100	3645	10342500	–	Sheets	1000
105 × 190	3645	10342596	Yellow	Sheets	1000
110 × 170	3645	10342583	Yellow	Sheets	100
110 × 170	3645	10342594	–	Sheets	1000
115 × 115	3645	10342595		Sheets	1000
140 × 200	3644	10342580	Blue	Sheets	1000
140 × 200	3621	10342579	White	Sheets	1000
280 × 340	3644	10342582	–	Sheets	100
420 × 594	3644	10342581	–	Sheets	50
450 × 690	3645	10342570	Yellow	Sheets	100
Pleated strips					
110 × 20	3014	10344672	White	Double pleated strips, without wrap strips	1000
110 × 20	3014	10344676	White	Double pleated strips, with wrap strips	1000
110 × 20	3236	10345572	Grey	Double pleated strips, without wrap strips	1000
110 × 20	3236	10345576	Grey	Double pleated strips, with wrap strips	1000
110 × 20	3236	10345573	Grey	Double pleated strips	500

Qualitative filter papers, Grade 597

Glass microfiber filters

Whatman glass microfiber filters are manufactured from 100% borosilicate glass and are available with or without binder. These depth filters combine fast flow rates, high loading capacity, and retention of very fine particles into the sub-micron range. Glass microfiber filters can be used at temperatures up to 550°C and are excellent for use in applications involving air filtration and gravimetric analysis of volatile materials where ignition is involved.

Glass microfiber filters have a fine capillary structure and can absorb significantly larger quantities of water than an equivalent cellulose filter, making them suitable for spot tests and liquid scintillation counting methods. The filters can also be made completely transparent for subsequent microscopic examination.

The particle loading capacity of a filtration system can be increased by using a prefilter. Glass microfiber filters such as GF/B or GF/D are recommended because of the low resistance to fluid flow and high particle loading capacity. Multigrade GMF 150 is valuable for the prefiltration of larger volumes and solutions that are normally difficult to filter.

Grade EPM 2000 air sampling filter

Glass microfiber and quartz filters: Trace element composition

Typical values (µg/g paper)

	QM-A*	EPM 2000	934-AH filter	GF/A and GF/C filters
Arsenic (As)	< 1	< 1	24	5
Beryllium (Be)	< 1	< 1	< 1	< 1
Cobalt (Co)	< 1	1	< 1	< 1
Cadmium (Cd)	< 1	< 1	< 1	< 1
Copper (Cu)	< 1	5	3	< 1
Lead (Pb)	< 1	3	9	5
Manganese (Mn)	2	20	18	6
Mercury (Hg)	< 1	< 1	< 1	< 1
Nickel (Ni)	1	1	3	1
Selenium (Se)	< 3	< 3	< 3	< 3
Silver (Ag)	< 1	< 1	< 1	< 1
Thallium (Tl)	< 1	< 1	< 1	< 1

Typical composition based on ICP-MS analysis

* *Trace element report can be downloaded from the Cytiva website for each lot of QM-A*

Standard binder-free glass microfiber filter papers

Grade GF/A (1.6 µm*)

This grade filter paper offers fine particle retention and high flow rate, as well as good loading capacity.

- Used for high-efficiency general purpose laboratory filtration, including water pollution monitoring of effluents, for filtration of water, algae and bacteria cultures, foodstuff analyses, protein filtration, and radioimmunoassay of weak ß emitters.
- Recommended for gravimetric determination of airborne particulates, stack sampling, and absorption methods of air pollution monitoring.

Grade GF/A card-mounted filters are used in static sample and personal air sampler applications. These aerosol sampling and particulate monitoring filters provide high flow rates and minimal sample interference.

Grade GF/B (1.0 µm*)

Three times thicker than GF/A with higher wet strength and significantly increased loading capacity. Combines fine particle retention with good flow rate. Particularly useful where liquid clarification or solids quantification is required for heavily-loaded, fine particulate suspensions. Can be used as a finely retentive membrane prefilter. Used in LSC techniques where high loading capacity is required.

Grade GF/C™ (1.2 µm*) filter

Combines fine particle retention with good flow rate. The standard filter in many parts of the world for the collection of suspended solids in potable water and natural and industrial wastes. Fast and efficient clarification of aqueous liquids containing low to medium levels of fine particulates. Widely used for cell harvesting, liquid scintillation counting, and binding assays where more loading capacity is required.

RTU formats available for total suspended solids (TSS) and total dissolved solids (TDS). See page 60.

Grade GF/C binder-free glass microfiber filters

Grade GF/D (2.7 µm*)

Considerably faster in flow rate and overall filtration speed than cellulose filter papers of similar particle retention. The filter is thick and consequently exhibits a high loading capacity. Designed as a membrane prefilter and available in sizes to fit most holders.

- GF/D will provide good protection for finely retentive membranes.
- Can be used in combination with GF/B to provide very efficient graded prefilter protection for membranes.

Grade GF/F (0.7 µm*)

This high-efficiency filter will retain fine particles down to 0.7 µm. Unlike membrane filters with a comparable retention value, it has a rapid flow rate and an extremely high loading capacity.

Because of the tight specification of 0.6 µm-0.8 µm particle retention and pure borosilicate glass structure, GF/F is the material upon which the EPA Method TCLP 1311 for Toxicity Characteristic Leaching Procedure was developed.

Recommended for nucleic acid binding and purification. Very effective in filtering finely precipitated proteins, GF/F can be used in conjunction with GF/D as a prefilter for the successful clarification of extremely difficult biochemical solutions and fluids, and nucleic acids.

Binder-free glass microfiber filters, Grade GF/F

** Particle retention rating at 98% efficiency.*

Grade 934-AH™ (1.5 µm*) filter

The fine particle retention of this popular grade is superior for its high retention efficiency at high flow rates and its high loading capacity. This is a smooth surface, high retention borosilicate glass microfiber filter, is pre-fired, and withstands temperatures over 550°C. Grade 934-AH filter is used for a range of laboratory applications.

- Used for determining TSS in water, removal of turbidity, and filtration of bacterial cultures.
- Recommended for water pollution monitoring, cell harvesting, liquid scintillation counting, and air pollution monitoring.

RTU formats are available for TSS, TDS and volatile suspended solids (VSS). See page 60.

Grade 934-AH filters

Grade EPM 2000

EPM 2000 has been selected by the U.S. Environmental Protection Agency (EPA) for use in high volume air sampling equipment that collects atmospheric particulates and aerosols. It is manufactured from 100% pure borosilicate glass of special purity, and pre-fired to provide detailed chemical analysis of trace pollutants with the minimum of interference or background.

** Particle retention rating at 98% efficiency.*

Grade EPM 2000 air sampling filter

A/E glass fiber

Superior grade Type A/E glass fiber filters are ideal for testing dissolved and suspended solids in wastewater and for the gravimetric analysis of air pollutants. These filters meet the requirements for suspended solids testing as described in the current edition of Standard Methods for the Examination of Water and Wastewater.

Type A/E fiber filters are specifically designed to reduce filtration costs and prevent premature clogging when handling difficult-to-filter or highly contaminated solutions. By utilizing high-capacity prefilters, they help extend the life of the filter and minimize the need for frequent final filter changes.

Technical specifications

Binder-free glass microfiber filter

Grade	Minimum retention efficiency in air (% at 0.3 µm)	Typical retention efficiency in air (% at 0.3 µm)	Typical particle retention in liquid (µm)[1]	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Maximum recommended temperature (°C)	Typical water flow rate (mL/min)[2]
GF/A	≥ 99.85	≥ 99.99	1.6	4.3	260	53	550	143
GF/B	–	–	1.0	12	675	143	550	81
GF/C	–	–	1.2	6.7	260	53	550	105
GF/D	–	–	2.7	2.6	675	121	550	681
GF/F	–	–	0.7	19	420	75	550	41
934-AH	–	–	1.5	3.7	435	64	550	341
EPM 2000	≥ 99.85	≥ 99.99	–	5.6	450	85	550	–
Grade - A/E	–	≥ 99.98	1.0	60*	30	66	550	250

[1] *Particle retention rating at 98% efficiency*
[2] *Normalized for 9 cm diameter. Measured under gravity for comparative purposes*
[3] *A/E is tested at 60 L/min/cm at 0.7 bar (70 kPa, 10 psi)*

Ordering information

Binder-free glass microfiber grades

Dimensions (mm)	Catalog number								Quantity /pack
	Grade GF/A	Grade GF/B	Grade GF/C filter	Grade GF/D	Grade GF/F	Grade 934-AH filter	EPM 2000	A/E glass fiber	
Filter circles									
7	–	–	–	1823-007	–	–	–	–	100
10	–	–	–	1823-010	–	–	–	–	100
13	1820-8013	–	–	–	–	–	–	–	100
15	–	–	–	–	1825-015	–	–	–	100
21	1820-021	1821-021	1822-021	1823-021	1825-021	1827-021	–	–	100
24	1820-024	1821-024	1822-024	1823-024	1825-024	1827-024	–	–	100
25	1820-025	1821-025	1822-025	1823-025	1825-025	1827-025	–	–	100
25	–	–	1822-6580	–	–	–	–	–	400
25	–	–	–	–	–	–	–	61630	500
28	–	–	–	–	–	1827-028	–	–	100
30	–	–	–	–	–	1827-030	–	–	100
32	18208296[4]	–	1822-320	–	–	1827-032	–	–	100
34	1820900086[4]	–	–	–	–	–	–	–	80
34	1820-10026[4]	–	–	–	–	–	–	–	100
35	–	–	–	1823-035	–	1827-035	–	–	100
37	1820-037	1821-037	1822-037	–	1825-037	1827-037	–	–	100
37	–	–	–	–	–	–	–	61652	500
42.5	1820-042	1821-042	1822-042	1823-042	1825-042	1827-042	–	–	100
47	1820-047	1821-047	1822-047	1823-047	1825-047	1827-047	1882-047	61631	100
50	1820-050	–	1822-050	–	–	–	–	61632	100
55	1820-055	1821-055	1822-055	1823-055	1825-055	1827-055	–	–	100
60	1820-061[3]	–	–	–	–	–	–	–	50
60	1820-060	1821-060	–	–	–	–	–	–	100
70	1820-070	1821-070	1822-070	1823-070	1825-070	1827-070	–	–	100
76	–	–	–	–	–	–	–	61663	100
81	1820-6537	–	–	–	–	–	–	60010	100
82	–	–	–	–	–	1827-082	–	–	100
82.5	–	–	–	–	–	–	–	60127	100
85	–		–	–		1827-085	–	–	100
90	1820-090	1821-090[1]	1822-090	1823-090[1]	1825-090[1]	1827-090	–	61664	100
100	–	–	1822-100	–	–	–	–	–	100
100	–	–	1822-9916[2]	–	–	–	–	–	100
102	–	–	–	–	–	–	–	61633	100
105	–	–	–	–	–	1827-105	–	–	100
110	1820-110	1821-110[1]	1822-110	1823-110[1]	1825-110[1]	1827-110	–	–	100
124	–	–	–	–	–	–	–	61655	100
125	1820-125	1821-125[1]	1822-125	1823-125[1]	1825-125[1]	1827-125	–	–	100
125	–	–	–	–	–	–	–	66559	25

* *Particle retention rating at 98% efficiency*

[1] *25 per box*

[2] *Individually bagged*

[3] *With reinforced rim*

[4] *Filter in holder for personal air samplers*

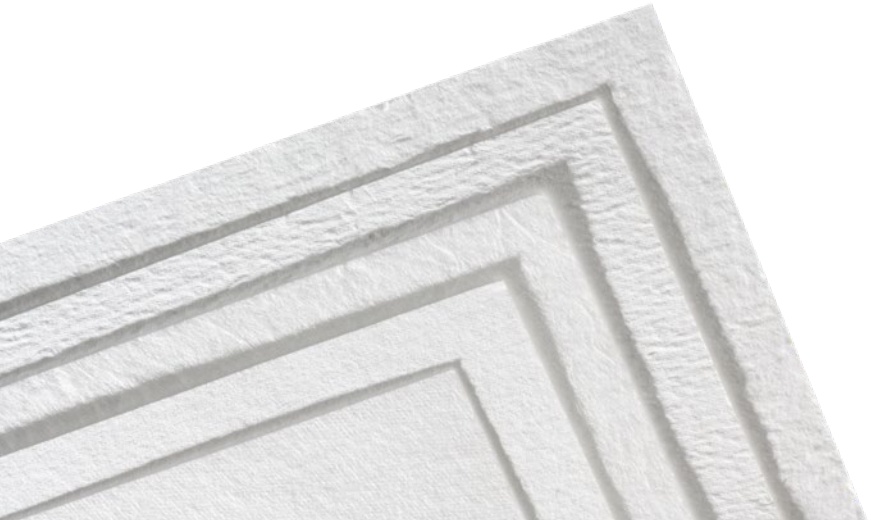
Ordering information

Binder-free glass microfiber grades (continuation)

Dimensions (mm)	Catalog number								Quantity /pack
	Grade GF/A	Grade GF/B	Grade GF/C filter	Grade GF/D	Grade GF/F	Grade 934-AH filter	EPM 2000	A/E glass fiber	
Filter sheets									
142	–	–	–	1823-142[1]	1825-142[1]	–	–	61635	100
150	1820-150	1821-150[1]	1822-150	1823-150[1]	1825-150[1]	1827-150	–	–	100
185	–	1821-185[1]	1822-185	–	–	1827-185	–	–	100
240	1820-240	–	–	–	–	1827-240	–	–	100
257	–	–	–	1823-257	1825-257	–	–	–	25
293	–	–	–	–	1825-293	–	–	–	25
293	–	–	–	–	–	–	–	61637	100
320	–	–	–	–	–	1827-320	–	–	100
102 × 254	–	–	1822-849	–	–	–	–	–	50
460 × 570	–	1821-914	–	–	–	–	–	–	5
460 × 570	1820-915	1821-915	1822-915	1823-915	1825-915	–	–	–	25
2″ × 12″	–	–	–	–	–	1827-808	–	–	100
2.25″ × 12.25″	–	1821-271	–	–	–	–	–	–	100
8″ × 10″	1820-866	–	1822-866	–	–	1827-866	–	61638	100
8″ × 10″ (pre-numbered)	–	–	–	–	–	–	1882-866	60058	100
12″ × 15″	–	–	–	–	–	1827-889	–	–	100
19″ × 28″	–	–	–	–	–	1827-957	–	–	100
50 mm × 87 mm	1820-10026	–	–	–	–	–	–	–	100
50 mm × 87 mm	1820900086	–	–	–	–	–	–	–	80

* *Particle retention rating at 98% efficiency*

[1] *25 per box*
[2] *Individually bagged*
[3] *With reinforced rim*
[4] *Filter in holder for personal air samplers*



Binder-free glass microfiber filter sheets

Multigrade GMF 150

GMF 150 is a multilayer glass microfiber filter with a coarse top layer meshed with a finer layer. Manufactured from 100% borosilicate glass microfiber, the filter is binder free. It is an excellent prefilter for higher particulate loading capacity with faster flow rates, extending the life of the filter.

Multigrade GMF 150 grades filter

Multilayer design delivers greater filtration efficiency

GMF 150 represents a new dimension in separation science leading to faster and more cost-effective filtration. In application, the GMF 150 traps larger particles in the pores or on the surface of the coarse layer while the medium sized particles are caught in the interface meshing. The smaller particles are netted in the interstices of the fine layer.

Technical specifications

Multigrade GMF 150 grades

Grade	Description	Typical particle retention in liquid (µm)[1]	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m)	Typical water flow rate (mL/min)[2]	Maximum recommended temperature (°C)
GMF 150 1 µm	Multilayer	> 1	4	730	145	222	550
GMF 150 2 µm	Multilayer	> 2	1.6	750	145	887	550

[1] *Particle retention rating at 98% efficiency*
[2] *Normalized for 9 cm diameter. Measured under gravity for comparative purposes*

Ordering information

Multigrade GMF 150 grades

	Catalog number		
Diameter (mm)	1 µm	2 µm	Quantity/pack
47	1841-047	1842-047	40
90	–	1842-090	40
90	1841-090	–	20

Whatman acid-treated low metal TCLP filter papers

Toxicity characteristic leaching procedure (TCLP) is an analytical test designed to determine the leaching potential in a landfill for hazardous organic and inorganic contaminants that could potentially migrate into groundwater, threatening drinking water sources.

Used for EPA Method 1311

The TCLP Filter is manufactured using a binder-free borosilicate glass microfiber with a particle retention rating of 0.6 to 0.8 µm.

These acid treated, low metal filters are available in a variety of diameters. The 90 mm filter is required for volatile samples and used with a Zero Headspace Extractor.

The 142 mm filter is typically used with nonvolatile samples in an approved jar.

TCLP testing filters

Technical specifications

Acid treated low metal TCLP filters

Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Maximum recommended temperature (°C)	Typical particle retention in liquid (µm)	Typical water flow rate (mL/min)
19	420	75	550	0.7	60

Ordering information

Acid treated low metal TCLP filters

Diameter (mm)	Catalog number	Quantity/pack
47	1810-047	100
90	1810-090	50
90	5925-090	100
110	1810-110	50
125	1810-125	50
142	1810-142	50
142	5925-142	100
150	1810-150	50

Glass microfiber filter papers with binder

Grade GF 6: Inorganic binder

Good retention for very fine particles. This filter is used for:

- Water pollution applications.
- Removing protein from difficult-to-filter beers.
- Determination of chlorophyll and phytoplankton residues.
- Determination of filterable substances and the residue on ignition (dry weight).
- Analysis of aggressive media (e.g., acidic gases).
- Scintillation measurements.
- Determination of the elemental iron content in the presence of iron oxides.

Grade GF 8: Inorganic binder

This glass fiber filter is used in the filtration of coarse particles. Frequently used in:

- Environmental analysis.
- Determination of PCB, DDE , DDT, furans and dioxins in the air.
- Pollution measurements in industrial, urban and populated areas, cement factories, iron and steel industry.
- Dust measurements in the workplace.
- Determination of the dust fraction in technical gases.
- Testing the effectiveness of dust collecting.

Grade GF 9: Inorganic binder

Used in similar applications to GF 8.

Grade GF 10: Organic binder

This filter with extreme mechanical stability and temperature resistance up to 180°C is used as a weighing aid for infrared weighing and as a roll filter in automatic air filtration units.

Grade GF 92: Inorganic binder

This filter is used as a membrane prefilter in applications such as:

- Determination of crop protection agent residues by GC or HPLC.
- Cold sludge determination of beer.
- Soot separation before gas analyzers.
- As roll filters in automatic air filtration units.

Grade GF 8 glass microfiber filters with binder

Grade F319-04: Organic binder

Cambridge filter pad F319-04 meets the requirements of Standard ISO3308:2012.

Grade HGF61: Organic binder

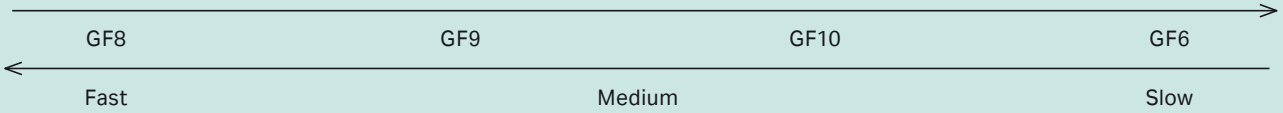
This glass fiber paper has excellent mechanical strength and can retain < 99% air particulate matter making it suitable as a filter tape in continuous air monitoring. The grade is also used as venting filter due to its water-repellent feature.

Grade HGF65: Organic binder and inorganic binder

This glass is very similar to HGF61. It can retain > 99% air particulate matter at 0.3 µm. It is mainly used as filter tape in continuous air monitoring and as venting filter in industrial applications.

Glass fiber filter with binder: Filtration speed

~ 3 µm retention capability < 1 µm



Technical specifications

Glass microfiber filter papers with binder

Grade	Nominal air flow (s/100 mL/in²)	Nominal air flow (s/100 mL/1.56 cm²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Filtration speed	Operating temperature (°C)
GF 6	40	–	350	80	Slow	< 500
GF 8	–	12	350	80	Fast	< 500
GF 9	–	27	350	70	Medium	< 500
GF 10	–	12	350	70	Medium	< 180
GF 92	–	27	350	70	Medium	< 500
HGF61	–	–	285	54	–	–
HGF65	–	–	280	54	–	–
F319-04	–	–	1300	215	–	–

HGF61 glass fiber tape

Pallflex Emfab™ filters

Borosilicate microfibers reinforced with woven glass cloth and bonded with PTFE. Flushed with DI water to remove water-soluble residue. Low moisture and low air resistance. Withstands folding for weighing and transport. Preferred filter for ambient air sampling and stack emission testing.

Technical specifications

Pallflex Emfab filters

Grade	Typical filter thickness (µm)	Typical filter weight (mg/cm²)	Typical aerosol retention (%)	Typical air flow rate (70 kPa, 10 psi)	Typical water flow rate (35 kPa, 5 psi)	Maximum operating temperature (°C)
Emfab filter	178	5.0	99.95*	68 L/min/cm² at 0.7 bar	32 mL/min/cm² at 0.35 bar	260 °C

** Following ASTM D 2986-95A 0.3 µm (DOP) at 32 L/min/100 cm² filter media*

Pallflex Emfab filter

Ordering information

Glass microfiber filter papers with binder

Dimensions (mm)	Catalog number									Quantity /pack
	GF 6	GF 8	GF 9	GF 10	GF 92	HGF61	HGF65	F319-04	Emfab filter	
Filter circles										
25	–	–	–	–	–	–	–	–	7219	100
25	10370018	–	–	–	–	–	–	–	–	200
37	–	–	–	–	–	–	–	–	7217	100
42	–	–	–	–	10421019	–	–	–	–	200
44	–	–	–	–	–	–	–	97039654	–	960
47	–	–	–	–	–	–	–	–	7221	100
47	10370019	10370119	–	10370319	10421026	–	–	–	–	200
50	10370002	–	10370202	10370302	10421030	–	–	–	–	200
55	10370003	–	–	–	–	–	–	9703900241	–	100
70	10370004	–	–	–	–	–	–	–	7222	100
85	–	–	–	–	–	–	–	–	7234	100
90	10370005	10370105	10370205	10370305	–	–	–	–	7223	100
92						–	–	97039944	–	100
100	10370020	–	–	10370320	10421043	–	–	–	–	100
110	10370006	–	10370206	–	–	–	–	–	7225	100
125	10370007	–	–	–	–	–	–	–	–	100
135	–	–	–	–	10421057	–	–	–	–	100
142	–	–	–	–	10421060	–	–	–	–	100
150	10370008	–	–	10370308	–	–	–	–	–	100
185	10370010	–	–	–	–	–	–	–	–	100
200	10370011	10370111	–	–	–	–	–	–	–	100
240	10370012	–	–	–	–	–	–	–	–	100
Filter sheets										
8 × 10	–	–	–	–	–	–	–	–	7224	100
60 × 90	–	10370172	–	–	–	–	–	–	–	100
610 × 620	10370050	–	–	–	–	–	–	–	–	100
Filter reels										
30 mm × 13 m	–	–	–	–	–	–	95039860	–	–	1
30 mm × 20 m	–	–	–	–	–	1830-6236	–	–	–	1
30 mm × 100 m	–	–	–	–	–	1830-640	–	–	–	1
40 mm × 42 m	–	–	–	10370393*	–	–	–	–	–	1
60 mm × 42 m				10370391*					–	1
600 mm × 228 m				10370434					–	1

* *Core 28 mm*

Quartz fiber filter papers

Grade QM-A filter paper circles

Grade QM-A

These high-purity quartz (SiO_2) microfiber filters are used for air sampling in acidic gases, stacks, flues, and aerosols at temperatures up to 800°C and in PM2.5 and PM10 and trace element analysis.

- Due to the low level of alkaline earth metals, artifact products of sulfates and nitrates (from SO_2 and NO_2) are virtually eliminated.
- QM-A, sequentially numbered according to EPA standards, is suitable for most applications.
- Grade QM-A filter papers are pre-fired.

Grade QM-B

QM-B is a thicker quartz fiber filter than QM-A. It has higher loading capacity and is suitable for air sampling.

Grade QM-C

QM-C is made of 100% silica microfiber without any additive or binder. It is pre-ignited and has a temperature resistance up to 1200°C. QM-C has very low trace metals (Cr, Ar, Pb, Cd, Ni, Zn) and can address critical challenges in heavy metal analysis of air particulate matter and high temperature testing.

Tissuquartz

Uniquely designed for air monitoring in high temperatures and aggressive atmospheres Binder-free pure quartz.

- Heat treated for reduction of trace organics and superior chemical purity.
- High temperature use up to 1093°C.
- High flow rate and filtration efficiency.
- Used for analysis of acidic gases and stack sampling aerosols.

Technical specifications

Quartz fiber filter grades

Grade	Minimum retention efficiency in air (% at 0.3 µm)	Typical retention efficiency in air (% at 0.3 µm)	Nominal air flow (s/100 mL/in²)	Nominal thickness (µm)	Nominal basis weight (g/m²)	Maximum recommended temperature (°C)
QM-A	≥ 99.95	≥ 99.99	6.3	475	85	800
QM-B	≥ 99.95	≥ 99.99	12	950	170	800
QM-C	≥ 99.95	≥ 99.99	19	475	85	1200
Tissuquartz	99.90	–	73 L/min/cm²* 0.7 bar	432 µm	58	1093

Ordering information

Quartz fiber filter grades

	Catalog number				
Diameter (mm)	**QM-A**	**QM-B**	**QM-C**	**Tissuequartz**	**Quantity/pack**
Filter circles					
25	1851-025	–	–	7200	100
32	1851-032	–	–	–	100
37	–	–	–	7201	25
37	–	–	–		50
37	1851-037	–	1855-037		100
40	–	1852-040	–		50
42	–	1852-042	–		50
45	–	–	1855-045	–	100
47	–	–	–	7202	25
47	–	–	–		50
47	1851-047	–	1855-047		100
50	–	–	–		50
50	1851-050	–	1855-050		100
55	1851-055	–	–		100
63.5	–	–	–	7197	25
70	–	–	1855-070		100
82	1851-082	–	1855-082		100
82.6	–	–	–	7203	25
85	1851-085	–	1855-085		100
90	–	–	–	7203	25
90	–	–	–		50
90	1851-090	–	1855-090		100
101.6	1851-101	–	–		100
102	–	–	–	7207	25
110	1851-110	–	1855-110		100
118	1851-118	–	–		100
150	1851-150	–	1855-150		100
Filter sheets					
8″ × 10″	1851-8866 (prenumbered)	–	1855-866	–	100
8″ × 10″	1851-865	–	1855-865	7204	25

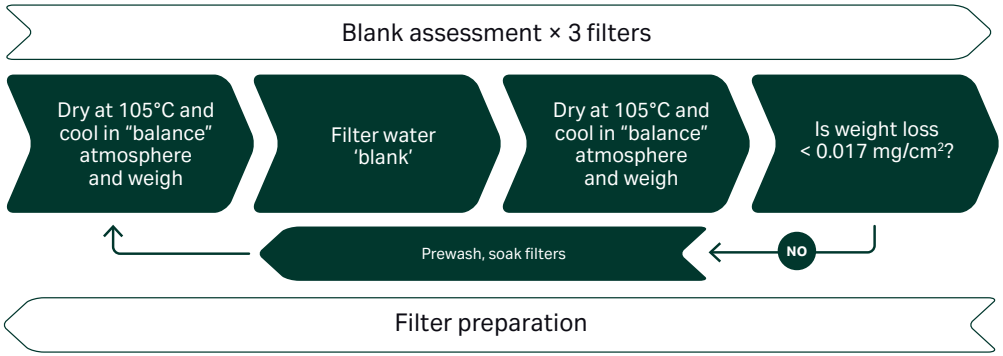
Ready-to-use (RTU) glass fiber filters for solids

Solids testing, a key measurement in water quality and wastewater analysis, includes testing for total solids (TS), total dissolved solids (TDS), total suspended solids (TSS), and volatile suspended solids (VSS). It can be challenging for a lab staff to maintain accuracy and daily productivity under time pressure. Whatman RTU filters help lab staff simplify filter preparation steps in solids measurement, streamlining workflows and saving time. The RTU series filters are pretreated (washing, drying, ignition, and weighing) for weight loss less than 4% or 0.5 mg, whichever is less. 934-AH RTU filters meet the requirements of SM2540C/D/E, and GF/C RTU filters conform to EN872. The RTU filter family includes an economy range which is washed and dried but not weighed.

934-AH RTU tray

Filter preparation workflows

EN872



Standard method 2540

Instruction for pan identification

Reading the barcode with a scanner, the weight of filter and the pan ID can be automatically loaded into an Microsoft Excel file or a lab management system.

Input Box ID “xxxxxxxx” on cytiva.com/documents/RTU, filter weights of a whole box can be downloaded in a Microsoft Excel file.

Example of filter weights of a whole box

	Pad ID	Box ID	Weight	Unit
1	B0535335	B2002404	0.4310	G
2	B0535336	B2002404	0.4353	G
3	B0535337	B2002404	0.4311	G
4	B0535338	B2002404	0.4311	G
5	B0535339	B2002404	0.4350	G
6	B0535340	B2002404	0.4295	G
7	B0535341	B2002404	0.4277	G
8	B0535342	B2002404	0.4350	G
9	B0535343	B2002404	0.4365	G
10	B0535344	B2002404	0.4321	G
11	B0535345	B2002404	0.4302	G
12	B0535346	B2002404	0.4381	G

Instruction of use 934-AH RTU filter for TSS analysis

1. Each pre-treated 934-AH RTU filter comes in an aluminum pan with the filter weight clearly noted. Open a box and take a 934-AH RTU filter out.
2. Place the 934-AH RTU filter on a 3-piece funnel or a funnel of the vacuum filtration apparatus and seal the filter to the funnel by wetting with a small amount of water. Then, filter your sample* and wash the filter with three aliquots of 10 mL reagent grade water.
3. Remove the filter, return it to the aluminum weigh pan and dry it to constant weight at 103°C to 105°C. To obtain the weight of TSS, subtract the weight of the filter indicated on the pan label from the final weight. For volatile solids analysis, filter the sample with 934-AH RTU VSS filter. After the measurement of TSS, ignite the filter at 550°C for 15 min in a muffle furnace. The weight loss is the weight of total suspended volatile solids.

Technical specifications

RTU glass fiber filters

	GF/C RTU filter	934-AH RTU filter	934-AH RTU filter for volatiles	934-AH RTU double weigh filter
Pre-washed, dried, cooled, and weighed	●	●	●	●
Barcoded aluminum pans to download filter weight	●	●	●	●
Box barcoded to download weights of all filters contained	●	●	●	●
Pre-fired at 550°C			●	
Certified filter mass loss the lesser of 0.5 mg or 4% after Standard Method 2540 parts C, D and E preparatory workflow		●	●	●
Certified mass loss of less than 0.017 mg/cm^2 after EN 872 preparatory workflow	●			
Economy option available (washed and dried without weighing or barcoding)	●	●	●	
Drying and weighing steps repeated and documented twice to conform to process in US EPA Lab Standard Method 2540 parts C and D				●

Ordering information

RTU filters

	Catalog number							
Diameter (mm)	934-AH RTU filter	934-AH RTU VSS filter	934-AH RTU VSS economy* filter	GF/C RTU filter	GF/C RTU economy** filter	934-AH RTU double weigh filter	934-AH RTU economy** filter	Quantity/pack
35	–	3827-035	4827-035	–	–	–	–	100
42.5	9907-042	3827-042	4827-042	–	–	–	–	100
47	9907-047	3827-047	4827-047	3822-047	2822-047	9927-047	2827-047	100
47	9907-9436†	–	–	–	–	–	–	100
55	9907-055	–	–	–	–	–	–	100
70	9907-070	3827-070	4827-070	3822-070	2822-070	9927-070	–	100
90	9907-090	3827-090	4827-090	3822-090	2822-090	9927-090		100

* *Pre-rinsed and ignited*
** *Pre-rinsed and dried*
† *Weigh to 5-digit place*

Lab Filtration Filter Selector

Use our online Lab Filtration Filter Selector to find the right filter for your sample and application.

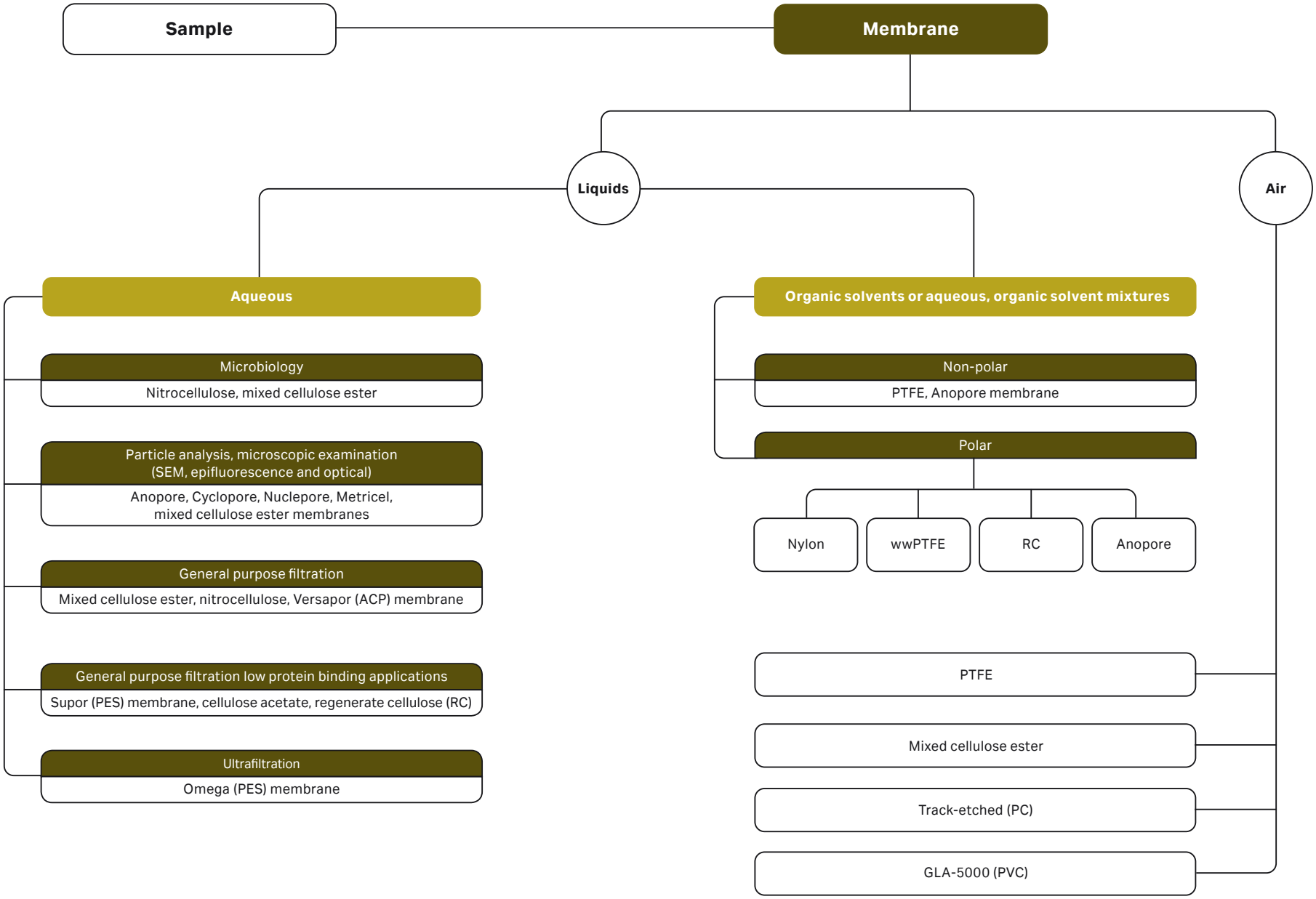
cytiva.com/whatmanfilterselector

02

Membrane filters

Our membrane filters are engineered to deliver exceptional performance for consistent and reproducible results across applications. Designed with strength and flexibility in mind, these membranes maintain structural integrity even under demanding conditions like laboratory and industrial use. Membranes are available in a range of pore sizes and formats, including sterile and autoclave packs, and colored and gridded forms for specialized applications.

Quick pick reference chart



Track-etched polycarbonate membranes

We manufacture Whatman track-etched membranes using proprietary technology to produce a precision membrane filter with closely controlled pore size distribution.

These include Cyclopore polycarbonate and Nuclepore polycarbonate membranes.

Technical specifications

Thickness	8-20 µm
Pore density	1×10^5—6×10^8 pores/cm^2
Opacity	Translucent
Autoclavable	30 minutes at 121°C
Flammability	Slow burn
Fiber releasing	No
Biological compatibility	Inert

Cyclopore™ polycarbonate membranes

Membranes are produced from a pure polymeric film and provide exceptional chemical cleanliness. They are free of contaminants, have low tare weight, minimum water adsorption, and very low levels of nonspecific protein binding.

The polycarbonate membranes are hydrophilic and are available in a choice of diameters and pore sizes.

Features and benefits

- Low affinity for stains provides higher optical contrast, making visibility under a microscope easy.
- True surface capture provides easy examination of samples and short analysis times.
- Negligible absorption and adsorption of filtrate; nonhygroscopic.
- Low tare weights.
- No particle shedding provides ultra clean filtrate.
- Biologically inert.

Cyclopore PC polycarbonate membrane filters

Typical applications

- **Air monitoring**

  Trace elements (chemicals, radioactivity) and particulate analysis (dust, pollens, and airborne particles).

- **Analytical methods**

  Gravimetric analysis, densitometry, emission spectroscopy, X-ray fluorescence, and infrared analysis.

- **Water analysis**

  Direct count of microorganisms, marine biology, and dissolved phosphates, nitrates, and ammonia analysis.

- **Blood filtration and cell analysis**

  Red blood cells (RBC) deformability, leukocyte removal, RBC filtration, chemotaxis, cytology, and cell culture.

- **General filtration**

  Particulate and bacteria removal, cross flow filtration, HPLC sample preparation, and solution filtration.

- **Microscopy**

  Electron microscopy, epifluorescence microscopy, and direct optical microscopy.

- **Microorganism analysis**

  Direct total microbial count, harvesting, concentration, fractionation, yeast, molds, *Giardia, Legionella*, coliform, and canine *microfilaria*.

- **Nucleic acid studies**

  Alkaline elution and DNA fragment fractionation.

- **Oceanographic studies**

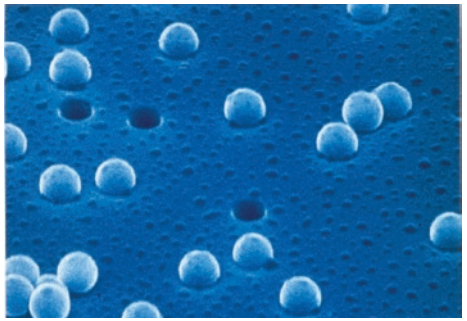
  Track etched membrane filters provide a tool for studying planktonic organisms.

- **Healthcare**

  Biosensors: As a barrier offering controlled diffusion for biological reagents and electrochemical detectors.

  Diagnostic assays: For flow control, sample preparation, blood separation, and capture of latex microparticles.

  Cell biology: For cell culture, chemotaxis, and cytological analyses (e.g., direct staining, isotopic, and fluorescence based assays).



Microscope image of the surface area of Cyclopore PC polycarbonate membrane filters

Ordering information

Cyclopore polycarbonate membrane circles

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
13	0.4	10417701	Polycarbonate	100
25	0.1	10419406	Polycarbonate	100
25	0.2	10417606	Polycarbonate	100
25	0.4	10417706	Polycarbonate	100
25	12.0	10418552	Polycarbonate	100
47	0.1	10419412	Polycarbonate	100
47	0.2	10417612	Polycarbonate	100
47	0.4	10417712	Polycarbonate	100
47	10.0	10418450	Polycarbonate	100
47	12.0	10418550	Polycarbonate	100

Other sizes and formats are available upon request.

Nuclepore™ polycarbonate membranes

Nuclepore track-etched polycarbonate membranes are manufactured from high-quality polycarbonate film and have sharply defined pore sizes, high flow rates, and excellent chemical and thermal resistance. The membranes have a smooth flat surface and exhibit very low levels of extractables.

Nuclepore polycarbonate membranes

Features and benefits

- Low protein binding and low extractables, minimizing sample contamination.
- High chemical resistance and good thermal stability for a wide range of samples.
- Low, consistent ash and tare weights.
- Smooth flat surface for good visibility of particles.
- For the analysis of cell migration toward a chemical stimulus.
- Thin and uniform; Cylindrical pores facilitate rapid cell migration.

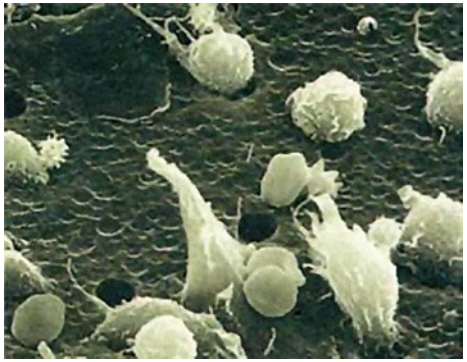
Applications

- Epifluorescence microscopy
- Environmental analysis
- Cell biology
- eDNA
- EPA testing
- Fuel testing
- Bioassays
- Parasitology
- Air analysis
- Water microbiology
- Cell culture and chemotaxis
- Liposome extrusion

Ordering information

Nuclepore polycarbonate membrane circles

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
Filter circles				
13	0.1	10419501	Polycarbonate	Polycarbonate
13	0.2	10417001	Polycarbonate	Polycarbonate
13	0.4	10417101	Polycarbonate	Polycarbonate
13	0.8	10417301	Polycarbonate	Polycarbonate
13	1.0	10418701	Polycarbonate	Polycarbonate
13	3.0	10418301	Polycarbonate	Polycarbonate



Chemotaxis membranes

Ordering information

Nuclepore polycarbonate membrane circles (continuation)

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
13	5.0	10417401	Polycarbonate	100
13	8.0	10417501	Polycarbonate	100
13	10.0	10418401	Polycarbonate	100
13	12.0	10418501	Polycarbonate	100
142	0.08	10419331	Polycarbonate	25
142	0.1	10419531	Polycarbonate	25
142	0.2	10417031	Polycarbonate	25
142	0.4	10417131	Polycarbonate	100
142	0.8	10417331	Polycarbonate	100
142	1.0	10418731	Polycarbonate	25
15	0.4	10417102	Polycarbonate	100
15	0.6	10417202	Polycarbonate	100
19	0.1	10419504	Polycarbonate	100
19	0.2	10417004	Polycarbonate	100
19	0.4	10417104	Polycarbonate	100
19	0.8	10417304	Polycarbonate	100
19	1.0	10418704	Polycarbonate	100
25	0.08	10419306	Polycarbonate	100
25	0.1	10419506	Polycarbonate	100
25	0.2	10417006	Polycarbonate	100
25	0.4	10417106	Polycarbonate	100
25	0.6	10417206	Polycarbonate	100
25	0.8	10417306	Polycarbonate	100
25	1.0	10418706	Polycarbonate	100
25	2.0	10418806	Polycarbonate	100
25	3.0	10418306	Polycarbonate	100
25	5.0	10417406	Polycarbonate	100
25	8.0	10417506	Polycarbonate	100
25	10.0	10418406	Polycarbonate	100
25	12.0	10418506	Polycarbonate	100
293	0.08	10419339	Polycarbonate	25
293	0.1	10419539	Polycarbonate	25
293	0.2	10417051	Polycarbonate	25
293	0.2	10417039	Polycarbonate	100

Ordering information

Nuclepore polycarbonate membrane circles (continuation)

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
293	0.4	10417139	Polycarbonate	25
293	1.0	10418739	Polycarbonate	25
37	0.8	10417309	Polycarbonate	100
47	0.08	10419312	Polycarbonate	100
47	0.1	10419512	Polycarbonate	100
47	0.2	10417012	Polycarbonate	100
47	0.4	10417150	Polycarbonate	100
47	0.4	10417112	Polycarbonate	100
47	0.6	10417212	Polycarbonate	100
47	0.8	10417312	Polycarbonate	100
47	1.0	10418712	Polycarbonate	100
47	2.0	10418812	Polycarbonate	100
47	3.0	10418312	Polycarbonate	100
47	5.0	10417412	Polycarbonate	100
47	8.0	10417512	Polycarbonate	100
47	10.0	10418412	Polycarbonate	100
47	12.0	10418512	Polycarbonate	100
50	0.2	10417014	Polycarbonate	100
50	0.4	10417114	Polycarbonate	100
50	5.0	10417414	Polycarbonate	100
50	12.0	10418514	Polycarbonate	100
81	0.4	10417116	Polycarbonate	25
90	0.08	10419318	Polycarbonate	25
90	0.1	10419518	Polycarbonate	25
90	0.2	10417018	Polycarbonate	25
90	0.4	10417118	Polycarbonate	25
90	1.0	10418718	Polycarbonate	25
90	2.0	10418818	Polycarbonate	25
90	3.0	10418318	Polycarbonate	25
90	12.0	10418551	Polycarbonate	100
Filter sheets				
8 × 10″	0.2	10417050	Polycarbonate	25
A4	0.8	10417551	Polycarbonate	25
25 × 80 mm	5.0	10417450	Polycarbonate	100

Other sizes and formats are available upon request.

Anopore™ inorganic membranes

The Anopore inorganic membrane, within Anodisc™ membrane filter, is an excellent choice for a wide range of laboratory filtration applications. This material has a precise, nondeformable honeycomb pore structure with no lateral crossover between individual pores. Anopore membranes filter at precisely the stated cut-off, allowing no larger sized particles to pass through the membrane. Composed of a high-purity alumina matrix that is manufactured electrochemically, the membrane exhibits low protein binding is nontoxic, and supports cellular growth.

The precise pore structure and narrow pore size distribution of the Anopore membrane provide a high level of particle removal efficiency. Microorganisms and particulate material are captured on the surface of the membrane for subsequent analysis by light or electron microscopy. When wet, the membrane is virtually transparent, so retained particles do not need to be transferred to another surface before microscopic examination.

The membrane is hydrophilic and compatible with most solvents and aqueous material. No monomers, plasticizers, adhesives, surfactants, or wetting agents are used in the manufacturing process. This removes potential sample contamination, provides low protein binding, and minimal loss of sample.

The Anopore membrane is supplied in the form of Anodisc membrane filters. Select from unsupported or peripherally bonded to an annular polypropylene ring for ease of handling (except the 13 mm diameter disc). Anopore membranes are suitable for both vacuum and pressure filtration.

Anopore is available in three nominal pore sizes: 0.02 µm, 0.1 µm and 0.2 µm, and in three diameters: 13 mm, 25 mm and 47 mm.

Features and benefits

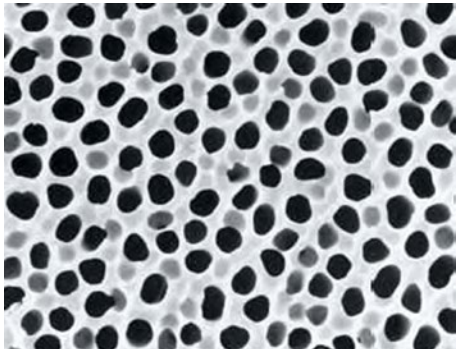
- High pore density and narrow pore size distribution.
- Wide solvent compatibility reduces the need to stock a variety of membranes in the laboratory.
- Minimized use of additives in the manufacturing process.
- Extremely low protein binding.
- Virtually transparent when wet for microscopy studies.

Applications

- HPLC mobile phase filtration and degassing
- Ultra cleaning of solvents
- Gravimetric analysis
- Liposome extrusion
- Scanning electron microscopy studies
- Bacterial analysis by epifluorescence light microscopy
- Micrometer and nanometer filtration

Anodisc circle with support ring

Anopore inorganic membranes without support ring



Anodisc membrane pore structure

Technical specifications

Anopore inorganic membranes

	Anodisc 13	Anodisc 25 supported	Anodisc 25 unsupported	Anodisc 47 supported	Anodisc 47 unsupported
Average membrane thickness (µm)	60	60	60	60	60
Membrane diameter (mm)	13	21	25	43	47
Membrane type	Anopore aluminum oxide	Anopore aluminum oxide	Anopore aluminum oxide	Anopore aluminum oxide	Anopore aluminum oxide
Support ring material	None	Polypropylene	None	Polypropylene	None
Construction process	N/A	Thermal weld	N/A	Thermal weld	N/A
Protein adsorption	Low	Low	Low	Low	Low
pH range	3.5–9.5	3.5–9.5	3.5–9.5	3.5–9.5	3.5–9.5
Maximum service temperature*	400°C*	40°C	400°C*	40°C	400°C*
Porosity (%)	25–50	25–50	25–50	25–50	25–50
Autoclavable	Yes	No	Yes	No	Yes
Refractive index	1,6	1,6	1,6	1,6	1,6

* *Polypropylene support ring limits maximum service temperature to 40°C. Supported Anodisc™ not autoclavable.*

Ordering information

Anopore inorganic membrane circles

Diameter (mm)	Membrane	Pore size (µm)	Catalog number	Hydrophilic	Protein binding	Solvent resistance	Quantity/pack
13	Anodisc 13*	0.02	6809-7003	Yes	Low	Very good	100
13	Anodisc 13*	0.1	6809-7013	Yes	Low	Very good	100
13	Anodisc 13*	0.2	6809-7023	Yes	Low	Very good	100
25	Anodisc 25	0.02	6809-6002	Yes	Low	Very good	50
25	Anodisc 25	0.1	6809-6012	Yes	Low	Very good	50
25	Anodisc 25	0.2	6809-6022	Yes	Low	Very good	50
47	Anodisc 47*	0.02	6809-5502	Yes	Low	Very good	50
47	Anodisc 47	0.02	6809-5002	Yes	Low	Very good	50
47	Anodisc 47	0.1	6809-5012	Yes	Low	Very good	50
47	Anodisc 47*	0.2	6809-5522	Yes	Low	Very good	50
47	Anodisc 47	0.2	6809-5022	Yes	Low	Very good	50

* *Without support ring*

Cellulose membranes

Regenerated cellulose membranes

Regenerated cellulose membranes are made of pure cellulose without wetting agents to provide a membrane with broad chemical compatibility that can be use with aqueous solutions or organic solvents. Combined with low extractable and low binding characteristics, regenerated cellulose membranes are well-suited for sample preparation and mobile filtration for HPLC applications and as well as proteinaceous solutions.

Regenerated cellulose membrane filter circles

Features and benefits

- Spontaneously wetting, very good wet strength
- Extremely chemically resistant, suitable for aqueous and organic solutions
- Hydrophilic
- Mechanically stable with low protein binding
- Sterilizable by all common methods
- Low extractable levels to minimize sample contamination

Technical specifications

Regenerated cellulose membranes

Membrane type	Pore size (µm)	Thickness (µm)	Water flow rate Δp = 0.9 bar (s/100 mL/12.5 cm²)	Bubble point (bar)
RC 58	0.2	80	26	4.5
RC 55	0.45	80	14	3.7
RC 60	1.0	85	3	0.8

Ordering information

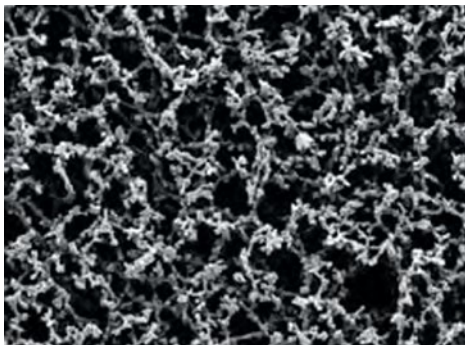
Regenerated cellulose membrane circles

Dimensions (mm)	Membrane type	Pore size (µm)	Catalog number	Quantity/pack
Filter circles				
25	RC 55	0.45	10410206	100
47	RC 55	0.45	10410212	100
50	RC 55	0.45	10410214	100
100	RC 55	0.45	10410219	25
110	RC 55	0.45	10410224	25
142	RC 55	0.45	10410229	25
47	RC 58	0.2	10410312	100
50	RC 58	0.2	10410314	100
100	RC 58	0.2	10410319	25
47	RC 60	1.0	10410012	100
50	RC 60	1.0	10410014	100
Filter sheets				
300 × 600	RC 58	0.2	10410380	5

Cellulose acetate membranes

Pure cellulose acetate membranes are suitable for biological and clinical analysis, sterility tests, and scintillation measurements.

Cellulose acetate membrane filters exhibit very low protein binding capacity. They are hydrophilic and suitable for aqueous and alcoholic media. The cellulose acetate membranes have improved solvent resistance, particularly to low molecular weight alcohols, and increased heat resistance. With high physical strength, the membrane filters can be used up to 180°C, with hot gases, and can be sterilized by all methods without sacrificing the integrity of the membrane.



Cellulose acetate membrane (type ST 68, 0.8 µm)

Technical specifications

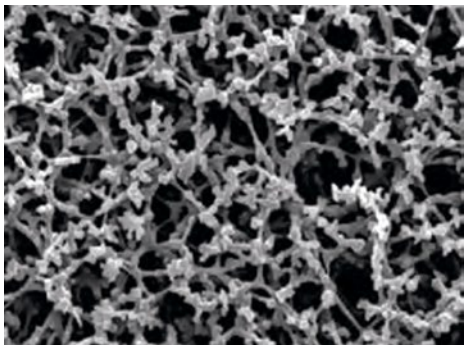
Cellulose acetate membranes

Membrane type	Pore size (µm)	Thickness (µm)	Water flow rate Δp = 0.9 bar (s/100 mL/12.5 cm²)	Bubble point (bar)
OE 66	0.2	130	26	4.3
OE 67	0.45	130	16	3.4
ST 68	0.8	140	4.2	1.5
ST 69	1.2	140	2	0.9

Ordering information

Cellulose acetate membranes

Dimensions (mm)	Membrane type	Pore size (µm)	Catalog number	Quantity/pack
Filter circles				
25	OE 66	0.2	10404106	100
47	OE 66	0.2	10404112	100
50	OE 66	0.2	10404114	100
110	OE 66	0.2	10404126	50
142	OE 66	0.2	10404131	25
293	OE 66	0.2	10404139	25
13	OE 67	0.45	10404001	100
25	OE 67	0.45	10404006	100
47	OE 67	0.45	10404012	100
50	OE 67	0.45	10404014	100
85	OE 67	0.45	10404044	50
110	OE 67	0.45	10404026	50
142	OE 67	0.45	10404031	25
47	ST 68	0.8	10403112	100
47	ST 69	1.2	10403012	100
Filter sheets				
300 × 600	OE 66	0.2	10404180	5



Cellulose acetate membrane (type ST 68, 0.8 µm)

Cellulose nitrate membranes

Recommended for routine applications, this membrane is manufactured under strictly controlled conditions. Cellulose nitrate membrane filters provide a very narrow pore size distribution, high flow rate, and low levels of extractables.

Higher strength and flexibility

Most membranes are inherently brittle and difficult to handle. It's common for filters to be damaged during loading into holders or while in use. Cellulose nitrate membrane filters have improved flexibility and are made to tolerate rough handling, loading, and autoclaving without sacrificing integrity.

Low extractable levels

The level of extractables in membrane filters has become more important with advances in filtration and adsorption techniques. pharmaceutical, immunological and biomedical tissue culture and trace analysis applications can be adversely affected by high extractable levels. Cellulose nitrate membrane filters have a low level of extractables, generally below that of other membranes of a similar type.

Narrow pore size distribution

One of the major features of membrane filters is the narrow distribution of pore sizes. The rated pore size of these membranes is closely managed due to our advanced manufacturing and control system. Additionally, the batch variation is minimized, providing more consistent laboratory results.

Increased temperature stability

Membrane filters are normally autoclaved at 121°C without loss of integrity. Cellulose nitrate membranes are supplied as circles, sheets, or reels.

Reduced shrinkage

Membranes exhibit a low shrinkage during autoclaving. Excessive shrinkage can cause problems during autoclaving and is often the cause of membranes tearing in their holders after autoclaving. It may also cause a reduction in flow rate and total throughput.

Features and benefits

- Narrow pore size distribution for improved surface capture and analysis
- Low levels of extractables to ensure sample integrity

Applications

- Sample preparation
- Microbiological studies
- Filtration of aqueous solutions

Filter types

White plain filters

This is the standard membrane filter for the majority of laboratory applications involving particles and cells in the range of 0.1 µm to 12.0 µm. The residue after filtration is found to be almost completely on the surface of the membrane and allows physical recovery of deposits and microscopic examination.

Gridded filters

Gridded filters make it easier to count particles, microorganisms, and colonies. If a gridded membrane is required, please see mixed cellulose ester membranes.

Technical specifications

Cellulose nitrate membranes

Thickness	105–150 µm
Hydrophilic	Yes

Typical applications

Cellulose nitrate membranes

Field of application	Pore size (µm)
General	
Microfiltration	0.1
Ultracleaning	0.1
Sterilizing*	0.2
Bulk bacterial removal	0.45
Analytical precipitates	0.65
Clarifying filtration	1.0
Particle removal	5.0

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Typical applications

Cellulose nitrate membranes (continuation)

Field of application	Pore size (µm)
Water microbiology and analysis	
Bacterial colony count	0.45 (gridded)—see mixed cellulose ester membranes
Sediment analysis	0.45
Suspended particles	5.0
Air pollution monitoring	
Asbestos monitoring (NIOSH)	0.8
Food and beverage QC	
E. coli and *coliforms*	0.45 (gridded)—see mixed cellulose ester membranes
Total bacteria count	0.2 (gridded)—see mixed cellulose ester membranes
Tissue culture	
Mycoplasma removal	0.1
Sterile* filtration	0.2

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Ordering information

Cellulose nitrate membranes

Dimensions (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
Filter circles				
13	0.2	7182-001	Plain (white)	100
13	0.45	7184-001	Plain (white)	100
25	0.1	7181-002	Plain (white)	100
25	0.2	7182-002	Plain (white)	100
25	0.45	10401106	Plain (white)	100
25	0.45	7184-002	Plain (white)	100
25	0.8	7188-002	Plain (white)	100
25	1.0	7190-002	Plain (white)	100
25	3.0	7193-002	Plain (white)	100
25	5.0	10400206	Plain (white)	100
25	5.0	7195-002	Plain (white)	100
25	8.0	10400106	Plain (white)	100
37	0.8	7188-003	Plain (white)	100
47	0.2	10401320	Plain (white)	50

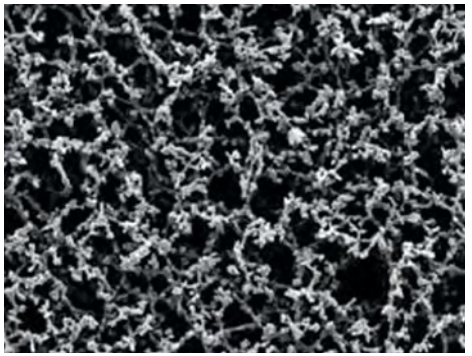
Ordering information

Cellulose nitrate membranes (continuation)

Dimensions (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
47	0.1	7181-004	Plain (white)	100
47	0.1	10402012	Plain (white)	100
47	0.2	7182-004	Plain (white)	100
47	0.2	10401312	Plain (white)	100
47	0.45	10401112	Plain (white)	100
47	0.45	10401170	Plain (white), sterile	100
47	0.45	7184-004	Plain (white)	100
47	0.65	7186-004	Plain (white)	100
47	0.8	7188-004	Plain (white)	100
47	1.0	7190-004	Plain (white)	100
47	12.0	10400012	Plain (white)	100
47	3.0	7193-004	Plain (white)	100
47	5.0	10400212	Plain (white)	100
47	5.0	7195-004	Plain (white)	100
47	8.0	10400112	Plain (white)	100
47	8.0	10405076	Plain (white), with hydrophobic rim	100
50	0.1	10402014	Plain (white)	100
50	0.2	10401314	Plain (white)	100
50	0.2	7191-005	Plain (white)	100
50	0.45	10401114	Plain (white)	100
50	0.45	7184-005	Plain (white)	100
50	12.0	10400014	Plain (white)	100
50	5.0	10400214	Plain (white)	100
50	8.0	10400114	Plain (white)	100
50	8.0	10405079	Plain (white), with hydrophobic rim	100
85	0.45	10401122	Plain (white)	50
90	0.2	7182-009	Plain (white)	25
90	0.45	7184-009	Plain (white)	25
90	0.45	10401118	Plain (white)	50
90	0.8	7188-009	Plain (white)	25
90	5.0	7195-009	Plain (white)	25
100	0.45	10401121	Plain (white)	50
110	0.45	10401126	Plain (white)	50
142	0.2	7182-014	Plain (white)	25
142	0.45	10401131	Plain (white)	25
142	0.45	7184-014	Plain (white)	25
142	1.2	7191-014	Plain (white)	25

Mixed cellulose ester membranes

Mixed cellulose ester membranes are composed of cellulose acetate and cellulose nitrate. They have a smoother, more uniform surface than pure nitrocellulose filters, and the cellulose acetate in the composition provides better handling with forceps or placing into filter funnels. Mixed cellulose ester membranes work well for particle counting, microbiological examination, and environmental monitoring applications.



Mixed cellulose ester membrane

Eased counting process

When counting microbial colonies, particulates, or fibers, select a colored membrane to provide a good contrasting background.

Plain or gridded

Mixed cellulose ester membrane is available in a variety of diameters and colors, plain or with gridlines. Many microbiological techniques use gridlines to assist in counting colonies or as a way to estimate total counts. Grid lines use a nontoxic ink in a unique broken pattern designed not to inhibit or enhance colony growth. Select plain membrane for most other environmental methods that require no gridlines or rely on the graticule in the microscope eyepiece.

Sterile filters

Mixed cellulose ester membranes are available in non-sterile and sterile packaging. Choose from individual sealed discs of membrane or dispenser pack compatible with the eButler membrane sispenser.

Features and benefits

- Sterile options available for microbiology or critical applications.
- Color selection provides contrast for easier colony or particulate counting.
- Grid lines are nontoxic and do not inhibit bacterial growth.
- Biologically inert with good thermal stability.
- Microporous structure of membrane gives high flow rates and high particulate-loading capacity.

Applications

The membrane is effective in applications requiring higher flow rates and larger volume filtration, including clarification or sterilization* of aqueous solutions, particulate analysis and removal, air monitoring, and microbial analysis. Other applications include:

- Cytology
- HPLC samples (aqueous)
- Biological assays
- Food microbiology, including enumeration of *E. coli* in foods
- Bacteriological studies
- Particle counting from liquids and aerosols
- Yeasts and molds

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

MembraClear

The MembraClear PCM filter is designed for asbestos sampling for examination by phase contrast microscopy. Asbestos sampling isolates these fibers from circulating air to determine concentrations.

Technical specifications

Mixed cellulose ester membranes

Burst strength	> 10 psi
Weight	4.3–5.0 mg/cm^2
Maximum service temperature	130°C
Porosity	74–77%
Steam autoclavable	Yes
Solvent resistance	Medium
Protein binding	Medium

Product selection

Mixed cellulose ester membranes

Membrane type	Pore size (µm)	Thickness (µm)	Water flow rate Δp = 0.9 bar (s/100 mL/12.5 cm^2)	Air flow rate Δp = 3 mbar (s/100 mL)	Bubble point (bar)
ME product range					
ME 24	0.2	135	20	–	3.7
ME 25	0.45	145	12.5	–	2.8
ME 26	0.6	135	4.8	21	1.9
ME 27	0.8	140	2.8	11.6	1.3
ME 28	1.2	140	2	9.3	0.8
ME 29	3.0	150	1.2	6.7	0.7

Product selection

MembraClear

Membrane type	Pore size (µm)	Thickness (µm)	Flow rate with water (mL/min × cm^2)	Bubble point (bar)
MembraClear	0.8	115-173	20	0.78-1.47

Ordering information

Mixed cellulose ester membranes

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
ME range: ME24				
25	0.2	10401706	Plain	100
47	0.2	10401712	Plain	100
47	0.2	10401772	Plain, sterile	100
50	0.2	10401714	Plain	100
50	0.2	10401772	Plain, sterile	100
100	0.2	10401721	Plain	50
110	0.2	10401726	Plain	50
142	0.2	10401731	Plain	25
47	0.2	10406970	White/black grid 3.1 mm, sterile	100
50	0.2	10406972	White/black grid 3.1 mm, sterile	100
ME range: ME25				
25	0.45	10401606	Plain	100
37	0.45	10401609	Plain	100
47	0.45	10401612	Plain	100
47	0.45	10401670	Plain, sterile	100
50	0.45	10401614	Plain	100
50	0.45	10401672	Plain, sterile	100
50	0.45	10401664	Plain, low C*	100
90	0.45	10401618	Plain	50
100	0.45	10401621	Plain	50
110	0.45	10401626	Plain	50
142	0.45	10401631	Plain	25
25	0.45	10406806	White/black grid 3.1 mm	100
47	0.45	10406512	White/black grid 5 mm	100
47	0.45	10406812	White/black grid 3.1 mm	100
47	0.45	10407970	White/black grid 3.1 mm, sterile	100
47	0.45	10406871	White/black grid 3.1 mm, sterile	1000
47	0.45	66191ME	White/black grid 3.1 mm, sterile	2000
47	0.45	10409770	Black/white grid 3.1 mm, sterile	100
47	0.45	10409771	Black/white grid 3.1 mm, sterile	1000
50	0.45	10406814	White/black grid 3.1 mm	100
50	0.45	10409714	Black/white grid 3.1 mm	100
50	0.45	10409414	Green/black grid 3.1 mm	100
50	0.45	10406572	White/black grid 5 mm, sterile	100
50	0.45	10409772	Black/white grid 3.1 mm	100

* *The 'Low C' indicate lower carbon compound*

Ordering information

Mixed cellulose ester membranes (continuation)

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
ME range: ME26				
25	0.6	10401506	Plain	100
47	0.6	10401512	Plain	100
50	0.6	10401514	Plain	100
50	0.6	10409814	Black/white grid 3.1 mm	100
ME rang: ME27				
25	0.8	10400906	Plain	100
37	0.8	10400909	Plain	100
47	0.8	10400912	Plain	100
50	0.8	10400914	Plain	100
100	0.8	10400921	Plain	50
47	0.8	10408970	White/black grid 3.1 mm, sterile	100
47	0.8	10409970	White/black grid 3.1 mm with pad, sterile	100
50	0.8	10405672	Green/black grid 3.1 mm, sterile	100
ME range: ME28				
25	1.2	10400806	Plain	100
47	1.2	10400812	Plain	100
50	1.2	10400814	Plain	100
100	1.2	10400821	Plain	50
47	1.2	10407512	White/black grid 3.1 mm	100
50	1.2	10408472	Green/black grid 3.1 mm, sterile	100
ME range: ME29				
25	3.0	10400706	Plain	100
47	3.0	10400712	Plain	100
50	3.0	10400714	Plain	100
50	3.0	10400772	Plain, sterile	100
MembraClear				
25	0.8	7141-025	White/green grid 3.1 mm	100
47	0.8	7141-047	White/green grid 3.1 mm	100

PTFE membranes

Polytetrafluoroethylene (PTFE) membranes are chemically stable and inert. They are suitable for applications involving aggressive organic solvents, strong acids, and alkalis. PTFE membranes are particularly suitable for preparing samples for HPLC analysis. This hydrophobic membrane is laminated onto a nonwoven polypropylene support web, providing strength and handling for venting culture vessels or delivering filtered air or gas to instrumentation. Thermal stability allows filtration or environmental sampling up to 120°C.

PTFE Membrane Filters: TE Range

Chemically stable and inert

PTFE is the membrane of choice for use with aggressive solvents, liquids, and gases that attack other membranes. It is resistant to most acids, alkalis, and solvents.

Applications

One of the major applications for the PTFE membrane is the clarification of corrosives, solvents, and aggressive fluids. With excellent chemical compatibility and low extractables, PTFE membrane is a good choice for HPLC mobile phase or sample filtration where any solid particles can cause permanent damage to the column. PTFE membrane is often used for venting, filtration of air or gas, or pump protection. Choose 1.0 and 5.0 µm pore sizes for better air flow in systems with less risk of direct fluid interface. Select 0.2 or 0.45 µm for applications where aerosol and direct fluid contact are possible, such as between fluid traps and pumps or hose vacuum. For critical applications where sterile venting is required, choose 0.2 µm pore size.

WTP and TE membrane ranges

WTP membranes use a polypropylene grid as the support material whereas the TE range uses a randomly arranged polypropylene support material.

Technical specifications

PTFE membranes

Membrane type	Nominal thickness (µm)	Nominal bubble point (bar)**	Minimum airflow Δp = 3 mbar (s/100 mL)	Maximum airflow at 10 psi vacuum (L/min/cm²)	Autoclavable at 1 bar/ 121 °C for 20 minutes (pre-wetted with H_2O).
TE range					
0.2 µm (TE 35)	280	0,65	5,0	-	Yes
0.45 µm (TE 36)	220	1,01	10,0	-	Yes
1.0 µm (TE 37)	280	0,64	24,2	-	Yes
5.0 µm (TE 38)	260	0,21	-	22,2	Yes

WTP range	Porosity (%)	Bubble point (psi)**	Air flow rate at 10 psi vacuum (L/min/cm²)	Liquid flow rate at 10 psi vacuum (mLmin/cm²)*
0,2	72	≥ 14.1	4,5	61,4
0,5	74	≥ 8.5	7,5	110
1,0	76	≥ 4.3	17	445

* *Measured with acetone*
** *Measured using 2-propanol (isopropanol)*

Ordering information

PTFE membrane circles

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
WTP range			
25	0.2	7582-002	100
25	1.0	7590-002	100
47	0.2	7582-004	100
47	0.5	7585-004	100
47	1.0	7590-004	100
TE range: TE 35			
25	0.2	10411405	50
47	0.2	10411411	50
50	0.2	10411413	50
TE range: TE 36			
25	0.45	10411305	50
47	0.45	10411311	50
50	0.45	10411313	50
TE range: TE 37			
25	1.0	10411205	50
47	1.0	10411211	50
50	1.0	10411213	50
TE range: TE 38			
37	5.0	10411108	50
47	5.0	10411111	50
50	5.0	10411113	50
90	5.0	10411116	25
150	5.0	10411130	25

wwPTFE membranes

wwPTFE (water wettable PTFE) is a versatile hydrophilic polytetrafluoroethylene (PTFE) membrane constructed of a chemically inert polymer for compatibility with aqueous solutions and aggressive solvents. wwPTFE membrane is often selected for analytical sample preparation and filtering the mobile phase buffers used in HPLC and similar analytical techniques. The broad chemical compatibility allows you to select one filter material for all your sample prep needs. In addition, wwPTFE has low binding characteristics for proteins and active pharmaceutical ingredients (API) which broadens its use across research and quality control applications.

- Low protein binding gives high recovery in critical proteinaceous samples.
- Low API adsorption for accurate results.
- Chemically compatible and low extractables prevent artifacts in your analysis.

wwPTFE membranes

Technical specifications

wwPTFE membranes

Pore size (µm)	Nominal thickness (µm)	Typical water flow rate (mL/min/cm² at 0.294 bar, 29.4 kPa)	Minimum bubble point (in IPA, 100%)
0.2	260	10.9	1.0 bar (100 kPa)
0.45	260	17.4	0.63 bar (63 kPa)

Ordering information

wwPTFE membranes

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
25	0.2	60538	50
47	0.2	60539	50
50	0.2	60542	50
25	0.45	60547	50
47	0.45	60548	50
50	0.45	60550	50
90	0.45	60551	75

PM 2.5 air monitoring membrane

A high-purity, thin PTFE membrane in a sequentially numbered, chemically resistant polypropylene support ring for PM 2.5 ambient air monitoring. Whatman PM 2.5 membranes have low tare mass for accurate gravimetric determinations.

The PM 2.5 PTFE membranes are manufactured under clean room conditions. These chemically resistant, low chemical background filters permit sensitive, interference-free determinations. No glues or adhesives are used in making these products.

PM 2.5 Air Monitoring Membrane Filters

Statement of conformance

PTFE Filters for EPA PM 2.5 Reference Method. Under the requirements of 40 U.S. Code of Federal Regulations (CFR) Part 50, Appendix L, shown below, the manufacturer must perform the following tests as listed.

Any filter manufacturer or vendor who sells or offers to sell filters specifically identified for use with this PM 2.5 reference method shall certify that the required number of filters from each lot (0.1% or 10, whichever is greater) offered for sale have been tested as specified and meet 90% of each of the design and performance specifications:

- Loose, surface particle contamination (drop test—weight loss stability).
- Temperature stability (temperature—weight loss stability).

Any filter manufacturer or vendor who sells or offers to sell filters specifically identified for use with this PM 2.5 reference method shall certify that a minimum number of 50 filters from each lot of filters offered for sale have been tested as specified for the following tests and meet 90% of each of the design and performance specifications:

- Filter type
- Filter diameter
- Filter thickness
- Filter pore size
- Support ring width
- Support ring thickness (total)
- Maximum pressure drop (clean filter)
- Maximum moisture pickup
- Collection efficiency
- Alkalinity
- Special requirements

These include trace metal analysis by X-ray fluorescence (XRF) and visual inspection for defects such as pinholes, support ring separation, chaff or flashing, loose material, discoloration, filter nonuniformity, or any other obvious filter defect.

Every manufactured lot that is offered for sale, and is identified for use with the PM 2.5 reference method, conforms to EPA acceptance criteria.

Technical specifications

PTFE filters for use in US EPA PM 2.5 ambient air monitoring

Property	Test method	Unit of measure	Value	Range
Filter media	N/A	N/A	PTFE	–
Filter thickness	–	µm	40	± 10
Filter diameter	Template	mm	46.2	± 0.25
Filter pore size	ASTM f 316-94	µm	2.0	Maximum
Support ring media	N/A	N/A	Polypropylene	–
Total support ring thickness	–	mm	0.38	± 0.04
Support ring width	Template	mm	3.68	± 0.00—0.51
Particle retention (0.3 µm)	ASTM D 2986-95a	%	99.7	Minimum
Pressure drop (0.3 µm) at 16.67 L/min	ASTM D 2986-95a	cm water	30	Maximum
Alkalinity	Section 2.12 EPA/600/R-94/038b	µeq/g of filter	< 25	Maximum
Temperature weight loss stability	As above	µg	< 20	Maximum
Drop test weight loss stability	As above	µg	< 20	Maximum
Moisture weight gain stability	As above	µg	< 10	Maximum

Maximum trace element concentration by X-ray fluorescence

Ion	ng/cm²	Ion	ng/cm²	ion	ng/cm²	Ion	ng/cm²	Ion	ng/cm²	Ion	ng/cm²
Al	94.4	Sc	7.2	Ni	3.0	Br	2.0	Pd	9.6	Cs	25
Si	32.8	ti	13.8	Cu	2.8	Rb	2.0	Ag	9.6	Ba	32.2
P	22.6	V	4.8	Zn	2.2	Sr	2.2	Cd	10.8	La	87.6
S	13.4	Cr	2.2	Ga	1.8	Y	14.6	Sn	15.2	W	5
Cl	9.4	Mn	2.2	Ge	3.0	Zr	13.2	Sb	14.4	Au	4.4
K	5.6	Fe	5.8	As	2.8	Mo	11.6	Te	16.2	Hg	4.4
Ca	8.2	Co	4.0	Se	1.6	Rh	9.4	I	18.6	Pb	4.8

Ordering information

PM 2.5 air monitoring membrane circles

Diameter (mm)	Pore size (µm)	Catalog number	Description	Quantity/pack
46.2	2.0	7592-104	With support ring, sequentially numbered	50

GLA-5000 PVC membranes

GLA-5000 polyvinyl chloride (PVC) filters are inherently low ash membranes suited for environmental analytical methods for air monitoring. The low ash content, low moisture pick-up, and low tare weight provide gravimetric stability.

- Interference-free silica determinations.
- 25 and 37 mm diameters are suitable for use in air monitoring cassettes.

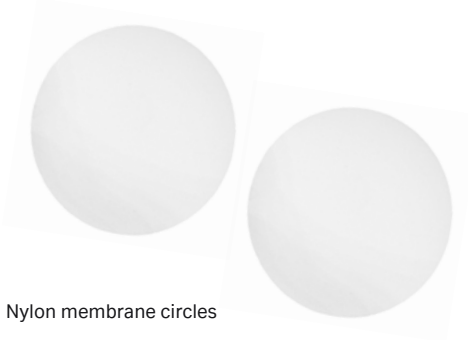
Ordering information

GLA-5000 PVC membranes

Diameter (mm)	Nominal pore size (µm)	Catalog number	Quantity/pack
25	5,0	66466	100
37 with pads	5,0	66467	100
37	5,0	66469	100
47	5,0	66468	100
8 × 10 in	5,0	60011	25

Nylon membranes

High-quality nylon membranes are suitable for filtering aqueous solutions and most organic solvents. The membranes can be used with a wide range of biological preparations works well where other membranes are unsuitable or difficult to use. Nylon membranes are hydrophilic, removing the need for wetting agents that could be extracted when filtering aqueous solutions. The membranes are flexible, durable, tear resistant, and autoclavable. Due to good chemical compatibility and low extractables the membrane is suitable for filtration of organic solvents and sample preparation.



Nylon membrane circles

Applications

- Filtration of aqueous and organic mobile phases.
- Vacuum degassing.
- Filtration of tissue culture media, microbiological media, buffers, and solutions.

Technical specifications

Nylon membranes

Pore size (µm)	Typical thickness (µm)	Fiber releasing	Flow rate (0.09MPa ml/min/cm²)	Minimum bubble point (psi)	Autoclavable (at 123°C, 1 bar, 60 min)
0.2	110	No	≥ 4	≥ 3.1	Yes
0.45	110	No	≥ 14	≥ 1.5	Yes
0.8	110	No	≥ 40	≥ 1.0	Yes
1.0	-	No	–	–	–

Ordering information

Nylon membrane circles

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
13	0.2	7402-001	100
13	0.45	7404-001	100
25	0.2	7402-002	100
25	0.45	7404-002	100
47	0.2	7402-004	100
47	0.45	7404-004	100
47	0.8	7408-004	100
47	1.0	7410-004	100
90	0.2	7402-009	50
90	0.45	7404-009	50

Nylaflo™ nylon membranes

Versatile laboratory membrane filter with excellent chemical compatibility with esters, bases, and alcohols. Nylaflo membrane is often selected for analytical sample preparation and filtering the mobile phase buffers used in HPLC and other similar analytical techniques.

- Aqueous and organic mobile phase filtration.
- Vacuum degassing and particulate removal for instrument protection.
- Column protection: 0.2 µm for uHPLC, 0.45 µm for HPLC.

Nylaflo nylon membranes

Technical specifications

Nylaflo nylon membranes

Pore size (µm)	Typical thickness (µm)	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Maximum operating temperature (°C)	Minimum bubble point (in water)
0.2	127	6	100	3.4 bar (340 kPa)
0.45	127	9	100	2.6 bar (260 kPa)

Ordering information

Nylaflo nylon membranes

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
25	0.2	66601	100
47	0.2	66602	100
90	0.2	66603	100
142	0.2	66604	25
13	0.45	66606	100
25	0.45	66607	100
47	0.45	66608	100
90	0.45	66609	100
142	0.45	66610	25

Polyamide membranes

Pure polyamide membranes are the recommended filter for clarification and sterile* filtration.

Polyamide membrane filters are mechanically strong and exhibit excellent wet strength and dry strength. They are hydrophilic, suitable for aqueous and organic solutions, and can be used in temperatures up to 135ºC.

Polyamide membrane circles

Applications

- Filtration of aqueous and organic mobile phases.
- Vacuum degassing.
- Filtration of tissue culture media, microbiological media, buffers, and solutions.

Technical specifications

Polyamide membranes

Pore size (µm)	Nominal thickness (µm)	Water flow rate Δp = 3 mbar (bar) (mL/min/cm²)	Air flow rate Δp = 0.9 bar (mL/min/cm²)	Bubble point (bar)	Maximum temperature (°C)
0.2 (NL 16)	110	10	10	4.2	121
0.45 (NL 17)	110	20	20	2.8	121

Ordering information

Polyamide membrane circles

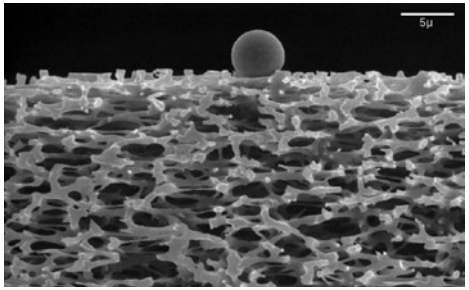
Diameter (mm)	Pore size (µm)	Catalog number	Membrane type	Quantity/pack
25	0.2	10414006	NL 16	100
25	0.45	10414106	NL 17	100
47	0.2	10414012	NL 16	100
47	0.45	10414112	NL 17	100
50	0.2	10414014	NL 16	100
50	0.45	10414114	NL 17	100

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Supor™ polyethersulfone membranes

Reduce filtration time with Supor polyethersulfone (PES) membranes, optimized for fast flow rates and low biomolecule binding. Save time and money with fewer filter changes. Low binding characteristics make Supor membrane suitable for aqueous biologic, pharmaceutical, buffer, and growth media filtration.

- Pore sizes range that can be layered for improved efficiencies.
- Diameters range from 25 to 293 mm.
- 142 and 293 mm discs available with a printed tab for quick identification and traceability.
- Compatible with gamma irradiation, EtO, and autoclave sterilization methods.
- Select sizes gamma irradiated for microbiological quality control testing.
- Passes USP <88> Class VI at 121ºC.
- Autoclave non-sterile membrane at 121-123ºC at 1.0 bar (100 kPa) for 15 to 30 min.



Close up of Supor polyethersulfone membranes

Technical specifications

Supor polyethersulfone membranes

Pore size (µm)	Typical thickness (µm)	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Maximum operating temperature (ºC)	Minimum bubble point in water (psi)
0.1	132	5	100	35 (in 60:40 IPA)
0.2	145	26	100	51
0.45	140	58	100	36
0.8	140	165	100	15

Ordering information

Supor polyethersulfone membranes

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
25	3.0	60309	100
47	0.1	60310	100
90	0.1	60311	100
142	0.1	66551	25
293	0.1	66552	25
142 (tab)	0.1	60312	25
13	0.2	60298	100
25	0.2	60300	100
47	0.2	60301	100

Ordering information

Supor polyethersulfone membranes (continuation)

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
47	0.2	66234	200*
47	0.2	68123	1000**
90	0.2	60334	100
142	0.2	66549	25
293	0.2	66550	25
142 (tab)	0.2	60305	25
293 (tab)	0.2	60307	25
13	0.45	60170	100
25	0.45	60172	100
47	0.45	60173	100
47	0.45	60043	200*
50	0.45	60174	100
90	0.45	60206	100
102	0.45	60175	100
142	0.45	66553	25
293	0.45	66554	25
142 (tab)	0.45	60177	25
293 (tab)	0.45	60179	25
25	0.8	60109	100
47	0.8	60110	100
47	0.8	65472	200*
90	0.8	60112	100
142	0.8	66555	25
293	0.8	66556	25
142 (tab)	0.8	60114	25
293 (tab)	0.8	60116	25

* *individually sealed, gamma irradiated*
** *Sentino dispenser packed, gamma irradiated*

See page 277 for additional specification on product 66234

Metricel™ Black (PES) membranes

Metricel Black membranes are inherently hydrophilic polyethersulfone membranes with high flow rate and throughput to provide better sample processing. The even coloration of the membrane deepens to black when it is wet for contrast for light colored colonies or particulates.

- Available non-sterile for general filtration or macroscopic particulate examination.
- Individually sealed or packaged for Sentino membrane dispenser and gamma irradiated:
  - Ready to use for microbiological QC testing
  - Suitable for beverage or water analysis
  - Use the standard 0.45 µm or select 0.8 µm for faster flow rate and efficient capture yeast
- Autoclave non-sterile membrane at 121 to 123°C at 1.0 bar (100 kPa) for 15 to 20 min.

Metricel Black (PES) membranes

Technical specifications

Metricel Black (PES) membranes

Pore size (µm)	Typical thickness (µm)	Typical air flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Minimum water bubble point (psi)	Percentage recovery *Saccharomyces cerevisiae*
0.45	117	> 34	23	≥ 85
0.8	135	> 102	13	≥ 85

Ordering information

Metricel Black (PES) membranes

Diameter (mm)	Pore size (µm)	Gamma irradiated	Catalog number	Quantity/pack
47	0.45	No	66586	100
47	0.45	Yes	66585	200
47	0.45	Yes	68124	1000*
47	0.8	No	66588	100
47	0.8	Yes	66587	200
47	0.8	Yes	68125	1000*

** Sentino dispenser pack refill*

Omega™ ultrafiltration membrane

Omega ultrafiltration membrane is made of polyethersulfone with high flow rates and low binding characteristics. Use in stirred cell applications for efficient processing time of complex biomolecule separations.

- Competitive with regenerated cellulose membranes for ultrafiltration.
- May be sanitized using 200 ppm sodium hypochlorite.

Technical specifications

Omega ultrafiltration membrane

MWCO (K)	pH range	Operating temperature range (°C)	Water flux (DI water mL/min/cm² at 25°C and 55 psi)	Percentage solute passage (DI water mL/min/cm² at 25°C and 55 psi)
1	2-14	0-40	> 0.05	< 25 of 0.17% bacitracin
3	2-14	0-40	0.09-0.35	15-25 of 0.17% PVP K-15
5	2-14	0-40	0.18-0.35	25-40 of 0.17% PVP K-15
10	2-14	0-40	1.0-2.3	< 1.0 of 0.2% BSA
30	2-14	0-40	2.0-4.2	< 5 of 0.2% BSA
50	2-14	0-40	2.0-5.0	< 20 of 0.2% BSA
100	2-14	0-40	7.0-14.0	< 20 of 0.1% IgG
300	2-14	0-40	> 0.70 (at 10 psi)	≥ 82 of 0.1% IgG (at 10 psi)

Ordering information

Omega ultrafiltration membrane

Diameter (mm)	MWCO (K)	Catalog number	Quantity/pack
43	1	OM001043	12
76	1	OM001076	12
43	3	OM003043	12
76	3	OM003076	12
43	5	OM005043	12
76	5	OM005076	12
43	10	OM010043	12
62	10	OM010062	12
76	10	OM010076	12
43	30	OM030043	12
62	30	OM030062	12
76	30	OM030076	12
43	50	OM050043	12
76	50	OM050076	12
43	100	OM100043	12
76	100	OM100076	12
43	300	OM300043	12

Versapor™ acrylic copolymer membranes

Supported and hydrophilic acrylic copolymer membrane that provides superior strength and flexibility whether the membrane is handled wet or dry. The larger pore sizes and durability of the membrane makes this the filter of choice for prefiltration and environmental applications. Use Versapor membrane as the prefilter to clean up viscous or particulate-laden solutions and extend the filter life of delicate downstream filters.

Applications

- Large prefiltration range pore sizes that can be layered for improved efficiencies.
- Compatible with gamma irradiation or sanitize with 70% ethanol.
- 25 and 37 mm diameters for environmental air monitoring cassettes.

Technical specifications

Versapor acrylic copolymer membranes

Pore size (µm)	Typical thickness (µm)	Typical water flow rate (mL/min/cm^2 at 0.7 bar, 70 kPa)	Maximum operating temperature (ºC)	Minimum bubble point (psi in water)
0.45	81	75	88	16
0.8	81	142	88	8
1.2	81	315	88	6
3.0	81	518	88	3
5.0	81	778	88	2

Ordering information

Versapor acrylic copolymer membranes

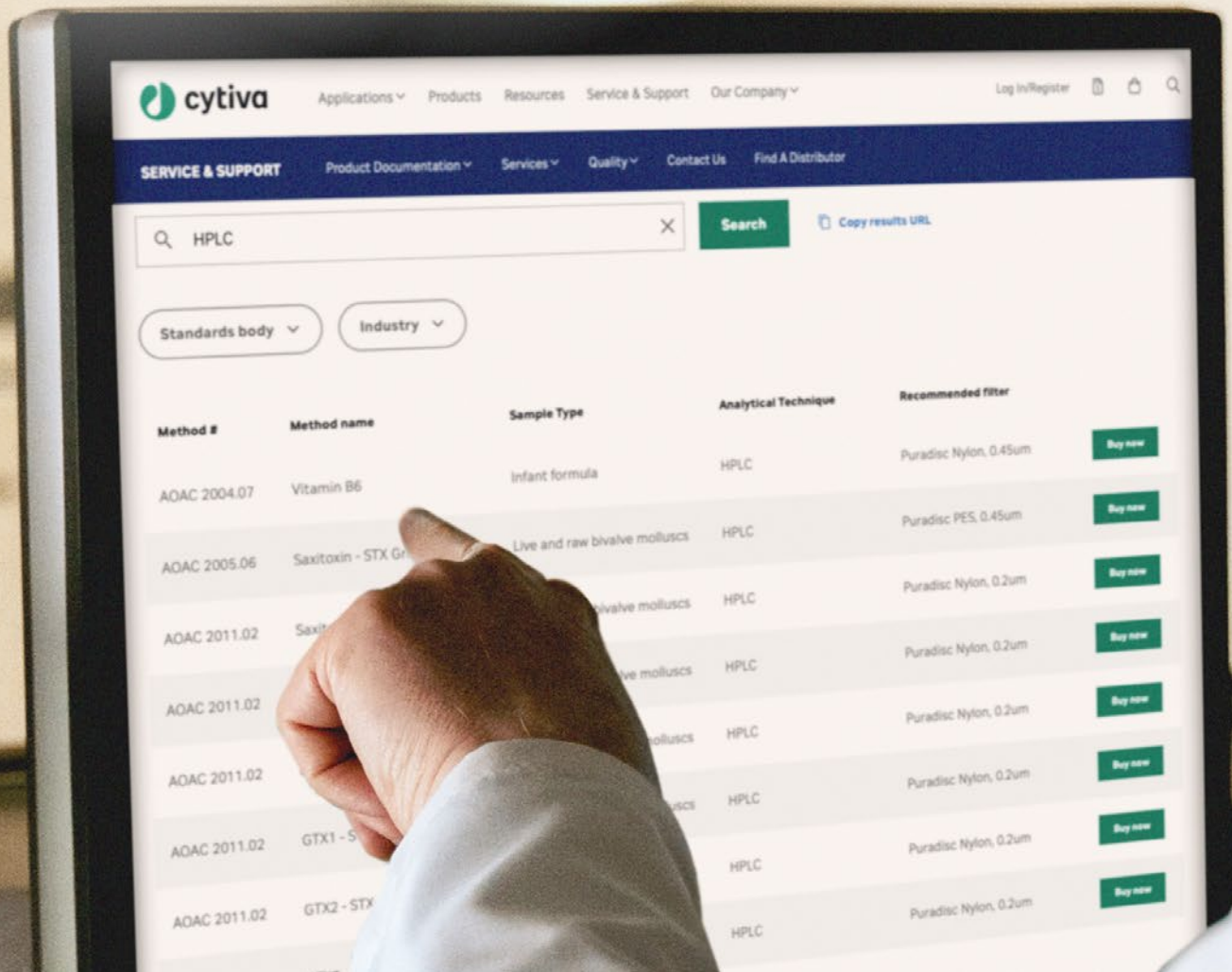
Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
47	0.45	66408	100
142	0.45	66410	25
293	0.45	66411	25
25	0.8	66400	100
25	0.8	66403	25
37	0.8	66331	100
47	0.8	66401	100
25	1.2	66393	100
47	1.2	66394	100
142	1.2	66396	25
293	1.2	66397	25
25	3.0	60039*	25
25	3.0	66386	100
37	3.0	60221	100
47	3.0	66387	100
142	3.0	66389	25
37	5.0	66332	100
47	5.0	60178	100

* *152 µm (6 mils) thickness*

Unsure on the best filter to use for your analytical method?

We have developed a standards and methods tool to help you select the optimal filter for your requirements.

cytiva.com/methodstool



03

Filtration hardware and accessories

Our filter holders and accessories are designed to deliver precision and convenience across a range of filtration applications. Vacuum funnels feature precision-ground faces for secure clamping and integral sealing. Graduated funnels include clearly printed scales for accurate measurement. Constructed entirely from 100% borosilicate glass, all glassware components are easily disassembled for cleaning, loading, and autoclaving. A variety of filter supports are available to suit specific needs: Stainless steel screens are ideal for proteinaceous solutions, while glass frit types are recommended for general filtration and biological analyses. For small-volume filtration, syringe-type holders offer a practical solution with replaceable or removable filters. Pressure filtration holders are available in multiple formats and sizes to accommodate various filter diameters.

Glass microfiber filter accessories

3-piece filter funnel

The increased use of high-efficiency glass microfiber filters in modern laboratories created a demand for simple and effective filter-holding systems. 3-piece filter funnels are designed to complement the range of fine particle retention, rapid flow rate glass microfiber filters.

Functional design

Three-piece construction. The funnel is quickly dismantled and ready for a new filter. The glass sealing flanges of the funnel and reservoir are ground flat to ensure a good filter seal.

Positive filter clamping

All retained solids are deposited within the filter circle. Edge clamping prevents peripheral loss and possible passage of solution around, rather than through, the filter circle.

Simple to clean

The parts can be quickly and efficiently cleaned because of the simplicity of the design.

A choice of plates

For quick and easy filtration, 3-piece filter funnels are available with a choice of plates. They also come in several sizes to match your needs.

- **Acrylic plate:** Supplied as standard. Suitable for filtration of most aqueous solutions. Maximum working temperature 65°C.
- **Polypropylene plate:** Optional accessory. Recommended for most acids (except concentrated nitric acid and fuming sulfuric acid) at room temperature. Suitable for most alcohols, glycols, ethers, and ketones. Maximum working temperature 100°C.
- **PTFE plate:** Optional accessory. For most common acids, alkalis, and solvents at temperatures up to 100°C. Maximum working temperature 200°C.

3- piece filter funnel

Ordering information

3-piece filter funnel

Filter dimensions (mm)	Catalog number	Reservoir volume (mL)	Effective filtration diameter (mm)	Effective filtration area (cm^2)	Filter support plate diameter (mm)	Filter funnel height (cm)
25	1950-002	16	16	2	30	13.6
47	1950-004	36	32	8	47	12.1
70	1950-007	115	50	19.6	70	15.9
70	1950-017	210	50	19.6	70	20.8
70	1950-027	400	50	19.6	70	30
90	1950-009	200	70	38.5	90	17.9
125	1950-012	530	92	66.5	125	22

Ordering information

3-piece filter funnel accessories

	Catalog number			
Dimensions (mm)	Polypropylene plates	PTFE plates	Replacement reservoirs	
47	–	1950-114	–	–
70	–	1950-117	1950-207*	1950-217***
90	1950-109	–	1950-209**	–

* *115 mL*
** *200 mL*
*** *210 mL*

Glass filter funnels and assemblies

Glass vacuum filtration devices come in two general styles: Glass filter funnels and assemblies. Both styles use a clamp to hold the upper funnel to the lower base, tightly sealing the filter in between to prevent fluid bypass. Borosilicate glass provides chemical compatibility and smooth surfaces for thorough cleaning. Selection of filter support is influenced by the nature of the fluid being filtered. Low particulate and low viscosity fluids filter well through in integrated porous glass support while high particulate, viscous, or aggressive solvents may require a removable glass or stainless steel frit to allow for more aggressive cleaning procedures or better chemical compatibility.

Filtration assembly

Glass filtration assemblies

Glass filtration assemblies are designed in three pieces: Upper funnel, lower base, and flask.

- Ideal for mobile phase filtration for analytical chemistry applications.
- Selected for chemistry applications requiring minimized contact with multiple materials of construction.
- Filter directly into a glass flask that can be removed and covered for analysis of filtrate, or retrieve filter for analysis of particulate collected.
- Can be used for microbiological analysis by membrane filter (MF) technique.

Glass filter funnels

Filter funnels are designed in two pieces: Upper funnel and lower base with stopper.

- Suitable for microbiological analysis by MF technique of water, beverages, pharmaceuticals, and personal care products.
- Versatile design allows individual filtration using a traditional side-arm Erlenmeyer flask or installation into a traditional 3- or 6-place manifold systems.
- Variety of funnel sizes and membrane diameters to suit applications including particulate and residue analysis, precipitation, and biochemical studies.

Glass filter funnel

Technical specifications

Glass vacuum filtration devices

Upper funnel, lower base, and flask	Borosilicate glass
Cap	Silicone
Frit	Glass D2
Sieve	Stainless steel
Seals	PTFE
Clamps	Aluminum and stainless steel
Silicone	Stoppers

Ordering information

Glass vacuum filtration devices

Catalog number	Format; system	Membrane diameter	Funnel volume	Flask volume or stopper size	Filter support
1960-002	Filter funnel	24-25 mm	25 mL	#5 Stopper	Integrated glass frit
1960-052	Filter funnel	24-25 mm	25 mL	#5 Stopper	Stainless steel with PTFE gasket
1960-032	Filter funnel	24-25 mm	50 mL	#5 Stopper	Integrated glass frit
1960-004	Filter funnel	47-50 mm	300 mL	#8 stopper	Integrated glass frit
4011-N	Filter funnel	47 mm	300 mL	#8 stopper	Integrated glass frit
1960-054	Filter funnel	47-50 mm	300 mL	#8 stopper	Stainless steel with PTFE gasket
1960-009	Filter funnel	90 mm	1000 mL	#8 stopper	Integrated glass frit
4013	Filtration assembly	47 mm	300 mL	1 L	Integrated glass frit
4012-N	Filtration assembly	47 mm	1 L	4 L	Integrated glass frit

Different glass vacuum filtration devices

Ordering information

Accessories and spare parts

Catalog number	Description	Spare part for	Quantity/pack
1961-054	Upper funnel, 300 mL, glass	1960-004; 1960-054	1
4014-N	Upper funnel, 300 mL, glass	4011-N	1
4019	Funnel base with #8 stopper, glass	4011-N	1
4015-N	Upper funnel, 1 L, glass	4012-N	1
4017	Funnel base with 40/35 joint, glass	4012-M, 4013	1
4016-N	Flask, 40/35 joint, 4 L, glass	4012-N	1
4018-N	Flask, 40/35 joint, 1 L, glass	4013	1
81595	Clamp, aluminum	4011-N, 4012-N, 4013	1
10446004	Rubber stopper for GV 100	10443000	1

Stainless steel filter funnels

We offer a variety of filter funnels made of stainless steel to provide broad chemical compatibility, ease of use, and thorough cleaning for years of service. The durable construction provides flexibility of use to high temperatures and compatible with a variety of filtration media including glass microfiber, membrane filters, and layered filtration.

Applications

- Microbiology (e.g., *E. coli*, *coliform*, fungi detection), biochemistry, hydrobiology.
- Food and beverage testing (e.g., cold sludge in beer and spoilage organisms), pharmaceuticals, cosmetics, water, wastewater.
- Residue analysis, precipitate analysis, and contamination tests.

MV 050A/0

Technical specifications

Stainless steel filter funnels

Apparatus selection	4221-N	10440020	4230
Filter size (mm)	47 to 50	47 to 50	47
Funnel volume	100 mL	500 mL	1 L
EFA	9.6 cm²	12.5 cm²	9.6 cm²
Prefilter diameter (mm)	35	40	35
Funnel to base connection	Weight of cylinder	Rapid clamp closure	Bayonet twist lock

Ordering information

Stainless steel filter funnels

Catalog number	Description	Quantity/pack
4221-N	Filter funnel	1
10440020	MV 050A/0 filter funnel	1
4230	Parabola filter funnel	1

Ordering information

Accessories and spare parts

Catalog number	Description	Spare part for	Quantity/pack
81312	Support Screen, 316 stainless steel	4221-N	1
10440006	O-ring, silicone for lid	10440020	1
10440102	Gasket, PTFE, sealing for support screen	10440020	1
4231	Base support, stainless steel	4230	1
4235	Support screen, stainless steel	4230	1
4301-N	Funnel and retaining ring assembly, 1L	4230	1

Plastic filter funnels

25 mm polysulfone filter funnels

Reusable 25 mm polysulfone filter funnels with transparent cylinders with graduations permit easy visual measurement. Plastic construction are lighter weight and more durable than glass. The twist lock coupling of cylinder to base securely seals membrane filters and are easy to change out without disturbing the membrane filter. Available in 50 and 200 mL capacities with a tapered stem that fits standard-size stoppers. Good selection for residue or precipitate analysis and contamination tests.

47 mm magnetic filter funnels

Reusable magnetic filter funnels are made of durable plastic, have a leak-free magnetic seal, and allow for a one-handed operation. Magnetic filter funnels are a popular selection for microbiological testing by MF technique for water testing, beverage monitoring, and environmental analysis. Available in three volume capacities, the durable polysulfone construction holds up to repeated autoclaving. The transparent cylinders with clearly marked graduations aid in sample measurement. (see p. 279 under microbiology for more information and product selection)

Technical specifications

Plastic filter funnels

Catalog number	Filter size	Funnel volume	EFA	Autoclavable at 121-123ºC at 1.0 bar (100 kPa) for 15- 20 min	Material of construction	Closure style
4203	25 mm	100 mL	2.9 cm^2	Yes	Polysulfone	Twist lock coupling
4204	25 mm	500 mL	2.9 cm^2	Yes	Polysulfone	Twist lock coupling
4247	47 mm	150 mL	9.6 cm^2	Yes	Polyphenylsulfone	Magnetic
4242-N	47 mm	300 mL	9.6 cm^2	Yes	Polyphenylsulfone	Magnetic
4238	47 mm	500 mL	13.1 cm^2	Yes	Polyphenylsulfone	Magnetic

Ordering information

Plastic filter funnels

Catalog number	Description	Quantity/pack
4203	25 mm filter funnel, polysulfone	1
4204	25 mm filter funnel, polysulfone	1
4247	150 mL magnetic filter funnel, long stem	1
4242-N	300 mL magnetic filter funnel, long stem	1
4238	500 mL magnetic filter funnel, medium stem	1

Ordering information

Accessories and spare parts

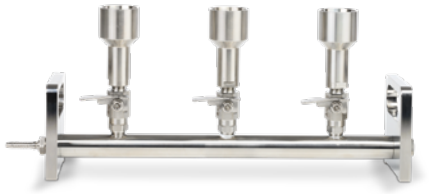
Catalog number	Description	Spare part for	Quantity/pack
79791	Support screen, stainless steel	4203, 4204	1
87265	Support screen, polysulfone	4203, 4204	1
87264	Support screen, polyphenylsulfone	4247, 4242-N, 4238	1
82728N	#8 stopper, rubber	4247, 4242-N, 4238	5
4248	150 mL, magnetic filter funnel cylinder	4247	1
4243	300 mL, magnetic filter funnel cylinder	4242-N	1
4254	500 mL, magnetic filter funnel cylinder	4238	1
4244	Base, standard long stem, no support screen	4247, 4242-N	1

Multiple vacuum filtration apparatus

AS 300 and 600 series

The stainless steel manifold and manifold assemblies for three or six filtration units are fitted with stainless steel units. The apparatus can be autoclaved and sterilized by dry heat at up to 180ºC. It is suitable for vacuum operation, not intended for positive pressure applications.

AS 610/3 showing rapid clamp closure



Stainless steel 3-place manifold

Applications

- Microbiological quality control.
- Residue analyses.
- Serial filtration carried out rapidly and easily with a common drainage outlet.

Technical specifications

Stainless steel manifolds

Style		Funnel volume (mL)	EFA (cm^2)	Autoclavable at 121-123 ºC at 1.0 bar (100 kPa) for 15- 20 min	Material of construction	Closure style	Drain port hosebarb
AS 310	3 integral stainless steel funnels	500	12.5	Yes	Stainless steel	Rapid clamp	Accepts 9 mm I.D. tubing
AS 610	6 integral stainless steel funnels	500	12.5	Yes	Stainless steel	Rapid clamp	Accepts 9 mm I.D. tubing
Standard 3-place	3 generic ports accept #8 stoppers*	–	–	Yes	Stainless steel	–	Accepts 9 mm I.D. tubing
Standard 6-place	6 generic ports accept #8 stoppers*	–	–	Yes	Stainless steel	–	Accepts 9 mm I.D. tubing

* *#8 stoppers and filter funnels sold separately*

See page 267 for microbiology-specific laboratory manifold.

Ordering information

Multiple vacuum filtration apparatus

Catalog number	Description	Quantity/pack
10445835*	AS310 manifold assembly, stainless steel 500 mL, rapid clamp closure	1
10498761**	Stainless steel filter funnel 3-place manifold, use with up to three manifold assemblies	1
Six-place filtration		
10444835*	AS610 manifold assembly, stainless steel 500 mL, rapid clamp closure	1
10498762**	Stainless steel filter funnel 6-place manifold, use with up to six manifold assemblies	1

* *With rapid closure clamp*

** *Recommended for use with funnels and #8 stopper, funnels not included*

Ordering information

Spare parts

Catalog number	Description	Spare part for	Quantity/pack
10440003	Support screen, stainless steel	10445835; 10444835	1
10440102	Gasket, PTFE, sealing for support screen	10445835; 10444835	1
10464103	Steel frit with ring	0445835; 10444835	1
10440006	O-ring, silicone for lid	10445835; 10444835	1

SolVac™ filter holder

SolVac filter holder simplifies clean up and degassing of mobile phase solvents and other non-sterile solutions. The stong magnetic seal is reliable, leak-proof, and prevents membrane shifting and tearing. The unique and versatile design allows filtration directly from the manufacturer's solvent bottle into the solvent reservoir, eliminating repeated lifting and pouring necessary with traditional glass filtration assemblies.

See our IFU on website for product dimensions and operating instructions. SolVac filter holder is not autoclavable.

SolVac filter holder (bottle not included)

Technical specifications

Solvac filter holders

Effective filtration area	10.2 cm²
Membrane diameter	Accepts 47 mm filters
Maximum vacuum	635 mm Hg, vacuum use only
Operating temperature	Ambient, do not exceed 38 °C, not autoclavable
Material of construction	
Upper housing, base	Polypropylene
Feedline tubing	Ultra chemical-resistant Tygon (4.8 mm) I.D.
Thumb clamp	Celcon
Vacuum port adapter	Polyethylene
Seal gasket, membrane seal gasket	Polypropylene, closed cell foam
Vacuum port	4.8 to 7.9 mm tapered hose barb
Outlet on base	Seals to bottles with openings 17.8 mm I.D. to 48.3 O.D.

Ordering information

Stainless steel filter holders

Catalog number	Description	Quantity/pack
4020	SolVac holder with 61 cm feedline tubing, thumb clamp, sinker, vacuum port adaptor, 2 membrane seal gaskets, and 2 seal gaskets."	1

Ordering information

Accessories and spare parts

Catalog number	Description	Quantity/pack
4022-N	122 cm replacement feedline tubing	1
4023-N	Replacement seal gaskets	10
4025-N	Membrane seal gaskets	10
4026	Sinker replacement kit	2
4028	Clamp replacement kit	2

Pressure filtration equipment

Stainless steel syringe filter holders

Stainless steel filter holders provide broad compatibility in a durable stainless steel housing for cleaning and reuse. The housings accommodate a range of filter media for applications that include particulate removal, venting, HPLC sample prep, clarification, or sterilization.* These housings are well suited for applications for which retrieval of the membrane filter and concentrated particulate is essential. Autoclave with membrane in place for applications requiring a sterile device.

Syringe filter holders have female locking luer inlets and male locking luer outlets compatible with typical syringes. Inline holders have hose barb inlet and outlet for tubing connections. Knurled edges assist in tightening and loosening the devices.

Syringe type 1980-002 and 1980-001

Ordering information

Stainless steel syringe filter holders

Filter diameter (mm)	Catalog number	Description	Quantity/pack
Membrane holders			
13	1980-001	Stainless steel syringe filter holder	1
25	1980-002	Stainless steel syringe filter holder	1
25	10460100	FM025/0 stainless steel, syringe filter holder*	1

* *Filter supports for 10460100 are not removeable from the holder*

Syringe type holder 10460100

Plastic syringe filter holders

Plastic syringe filter holders are cost effective and reusable for analysis of filtrate or when retrieval of the membrane is required. Simple, easy filtration using typical syringe filters make these holders a good alternative for field sampling kits, they can be prepared in a controlled environment and are lightweight to transport.

Pop-Top and Swin-Lok plastic filter holders

13 mm syringe filter holders

- Pop-top membrane holder (420100) has a unique clamp ring to seal cap to the base without disturbing delicate of membrane filters.
- Swinney filter holder (4317-N) has a traditional design that holds the membrane securely between an inlet threaded onto the outlet. The Celcon plastic construction provides a broader chemical compatibility for analytical applications.

25 mm syringe filter holders

- Swin-Lok filter holder (420200) is designed for secure sealing of delicate membrane in a chemically resistant polypropylene housing.
- Easy pressure syringe filter holder (4320-N) is made from chemically resistant Delrin plastic with the option of using a 20 mm prefilter for serial filtration within the housing.

47 mm syringe filter holder

- This unique and versatile design holds the membrane between an upstream and downstream support screen providing the option for dual flow of liquids or gasses.
- The inlet and outlet ports can connect to a syringe, tubing, or threaded connector.

Technical specifications

Plastic syringe filter holders

Materials	420100	420200	4320-N	420400
Housing material	Polycarbonate	Polypropylene	Delrin (acetal copolymer)	Polycarbonate
O-ring	NA	silicone	Viton	Ethylene propylene
Support	Integral to housing	Polypropylene	Integral stainless steel mesh	Polycarbonate
Membrane diameter	13 mm	25 mm	25 mm	47 mm
Prefilter diameter	10 mm	22 mm	20 mm	42 mm
Effective filtration area (EFA)	0.8 cm^2	3.5 cm^2	3.7 cm^2	11.3 cm^2
Inlet connection	Female luer slip	Female threaded luer	Female threaded luer	Multipurpose female luer slip 1/4 in. NPT male 1/4 in. tubing barb
Outlet connection	Male luer slip	Male luer slip	Male luer slip	
Autoclavable at 121-123 °C at 1.0 bar (100 kPa) for 15- 20 min	Yes	Yes	Yes	Yes
Maximum operating temperature and pressure	38°C at 3.5 bar	38°C at 3.5 bar	66°C at 2.8 bar	38 °C at 3.5 bar

Ordering information

Plastic syringe filter holders

Catalog number	Description	Quantity/pack
420100	–	10
420200	25 mm Swin-Lok syringe filter holder	10
4320-N	25 mm easy pressure syringe filter holder	6
420400	47 mm Swin-Lok filter holder	8

Ordering information

Accessories and spare parts

Catalog number	Description	Spare part for	Quantity/pack
83475N	Viton O-ring	4320-N	8

In-line filter holders

In-line filter holders are useful for incorporating into tubing systems for filtering liquids or gases for in-line or point of use filtration. They may be used to provide clean liquid or gases to systems downstream of the installed filter or to collect and analyze particulated retained by the filter. In-line filter holders come in a range of sized and materials.

Plastic in-line filter holders

- Available in 25 and 47 mm sizes.
- Light weight plastic.
- 420400 47 mm Swin-Lok filter holder with dual support screens to support membrane filter both upstream and downstream.

Aluminum in-line filter holder

- 47 mm.
- Aluminum construction provides more durability than plastic while remaining light weight as compared to stainless steel versions.

Stainless steel in-line filter holders

- Available in sizes 25, 47, 142, and 293 mm.
- Stainless steel construction is durable, offers good chemical resistance.
- 142 and 293 mm sizes are used for filtering media, buffers, and reagents.

Technical specifications

In-line filter holders

Catalog number	1109	1119	420400	1235	1209	2220	11872	11873
Housing material	Delrin (acetal copolymer)	Polycarbonate	Polycarbonate	Aluminum	Stainless steel	Stainless steel	Stainless steel	Stainless steel
O-ring	Viton	Silicone	Ethylene propylene	Viton	Viton	Viton	Viton	Viton
Support	Integral stainless steel mesh	Polyphenylsufone	Polycarbonate	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel
Membrane diameter	25 mm	47 mm	47 mm	47 mm	25 mm	47 mm	142 mm	293 mm
Prefilter diameter	20 mm	Not recommended	42 mm	42 mm		42 mm	127 mm	265 mm
Effective filtration area (EFA)	3.7 cm^2	9.6 cm^2	11.3 cm^2	9.6 cm^2	3.7 cm^2	9.6 cm^2	126 cm^2	587 cm^2
Inlet/outlet connection	Nylon 1/8 in. NPT to 6.4 mm hosebarb	Nylon 1/4 in. NPT to 6.4 mm hosebarb	Multipurpose female luer slip 1/4 in. NPT male 1/4 in. tubing barb Female luer slip 1/4 in. NPT male 1/4 in. tubing barb	Nylon, 3/8 in. NPT to 6.4 mm hosebarb	Nylon 1/8 in. NPT to 6.4 mm hosebarb	Nylon 3/8 in. NPT to 6.4 mm hosebarb	Sanitary 3.8 cm fittings	Sanitary 3.8 cm fittings
Autoclavable at 121-123°C at 1.0 bar (100 kPa) for 15- 20 min	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum operation pressure	2.8 bar	3.5 bar	3.5 bar	3.5 bar	14 bar	14 bar	6.9 bar	6.9 bar

Ordering information

In-line filter holders

Catalog number	Description	Quantity/pack
1109	25 mm in-line delrin filter holder	6
1119	47 mm polycarbonate in-line filter holder	1
420400	47 mm Swin-Lok filter holder	8
1235	47 mm aluminum in-line filter holder	1
1209	25 mm stainless steel in-line filter holder	1
2220	47 mm stainless steel in-line filter holder	1
11872	142 mm stainless steel in-line filter holder	1
11873	293 mm stainless steel in-line filter holder	1

Ordering information

Accessoried and spare parts

Catalog number	Description	Spare part for	Quantity/pack
83475N	O-ring, viton	1109	5
73179N	Hosebarb, nylon 1/8 in mnpt to 1/4 in barb	1109, 1209	5
81314	Hosebarb, nylon 1/4 in mnpt to 1/4 in barb	1119	10
86366N	O-ring, silicon	1119	5
73336N	O-ring, Viton	1209	5
79791	Support screen, stainless steel, 25 mm	1209	1
79792	Underdrain disc, stainless steel	1209	1
71242N	O-ring, Viton	1235, 2220	2
72970	Support screen, stainless steel, 47 mm	1235, 2220	1
72971	Underdrain disc, stainless steel	1235, 2220	1
76901N	O-ring, ethylenepropylene	1235, 2220	5
72978	Support screen, stainless steel, 142 mm	11872	1
72994	Underdrain disc, stainless steel	11872	1
72989N	O-ring, Viton	11872	2
70975N	O-ring, Viton	11873	2
72161	Support screen, stainless steel, 293 mm	11873	1
72191	Underdrain disc, stainless steel	11873	1

For additional accessories and spare parts, please visit our website and download the Instructions for Use (IFU)

Pressure filtration devices

Cytiva offers analytical pressure filtration equipment to provide flexibility for sample processing. The stainless steel construction provides broad compatibility. Our pressure filtration funnel is for use with a range of filter media including paper, glass fiber, and membrane filters.

4280, 47 mm pressure filter funnel

Pressure filter funnnel

The Cytiva 47 mm pressure filtration funnel is a high-quality, corrosion-resistant device designed for efficient batch filtration. Constructed from durable stainless steel, it offers exceptional chemical resistance, making it ideal for demanding laboratory environments. Its convenient hand-tightening mechanism allows for quick and easy filter changes, enhancing workflow efficiency and user convenience.

Applications

- Suitable for analysis of soils and other solids when you need to use pressure to drive the fluid component through a filter medium to analyze chemical content of the filtrate.
- Subject solids loaded into the cylinder to various fluids to characterize the extractables leaching from the solid under study.
- Maintain pressure on a sample being filtered so that evaporation doesn't affect the content of the sample during filtration.
- Use for polymer solutions that require steady pressure over the length of filtration time.

Technical specifications

Pressure filter funnels

Series	Material	Seals	Max pressure (bar)	Max temperature resistance (°C)	Filter diameter (mm)	Prefilter diameter (mm)
4280	Stainless steel	Viton/PTFE	13.8	204	47	43

Ordering information

Pressure filter funnels

Catalog number	Description	Quantity/pack
Stainless steel		
4280	Pressure filter funnel, 47 mm	1

Ordering information

Accessories and spare parts

Catalog number	Description	Spare part for	Quantity/pack
4235	Support screen, stainless steel, 47 mm	4280	1
4282	Center barrel, stainless steel	4280	1
4287	Seal kit, PTFE gasket, O-ring, hosebarb	4280	1

Pressure vessels

Pressure vessels available in three sizes are convenient for processing small batch fluids for clarification, sterilization, or other filtration studies. The electropolished stainless steel constructions provides broad chemical compatibility and smooth finish for thorough cleaning. Provided with pressure relief valve for safety, pressure gauge, and inlet/outlet barb connections. Pressure vessels are a useful accompaniment to the 142 or 293 mm in-line stainless steel filter holders. (catalog numbers 11872, 11873)

Cellular pressure vellsel

Technical specifications

Pressure vessels

Catalog Number	97132	97133	97134
Volume size	3.78 L	11.3 L	18.9 L
Housing material	Stainless steel	Stainless steel	Stainless steel
O-ring	Ethylene propylene	Ethylene propylene	Ethylene propylene
Vessel diameter	23.3 cm	23.3 cm	23.3 cm
Vessel height	21.6 cm	38.7 cm	57.2 cm
Maximum operating conditions*	38°C at 9 bar	38°C at 9 bar	38°C at 9 bar
Minimum operating conditions*	-29°C at 9 bar	-29°C at 9 bar	-29°C at 9 bar
Inlet/outlet connection	Accepts 9.5 mm ID tubing	Accepts 9.5 mm ID tubing	Accepts 9.5 mm ID tubing

* *For safety, the supplied pressure relief valve is preset at 6.9 bar*

Ordering information

Pressure filtration devices

Catalog number	Description	Quantity/pack
97132	Pressure vessel SS 3.78 L PED	1
97133	Pressure vessel SS 11.3 L PED	1
97134	Pressure vessel SS 18.9 L PED	1

Ordering information

Accessories and spare parts

Catalog number	Description	Spare part for	Quantity/pack
15214	Pressure vessel replacement parts kit includes: Pressure gauge, safety relief valve, and all necessary connections	97132, 97133, 97134	1

Prefilters and separators

The life of a membrane filter can be extended by placing a prefilter adjacent to or upstream of the membrane. The total particulate load challenging the membrane is considerably reduced which allows the membrane to operate efficiently.

Glass microfiber filters are used as prefilters for membranes. The outstanding properties of borosilicate glass microfibers mean the filters offer high loading capacity and retention of very fine particulates.

The multigrade GMF 150, used as a prefilter, nearly doubles the volume of sample filtered compared to a single density prefilter. Compared to an unprotected membrane, the volume of sample filtered is three to seven times greater. For highly particulate loaded samples, try our high performing GMF 150 filters.

Glass microfiber filters, binder free

Technical specifications

Glass microfiber prefilter circles

		Catalog number			
Prefilter diameter (mm)	**Pore size (µm)**	**Multigrade GMF 150**	**Grade GF/B (fine)**	**Grade GF/D (coarse)**	**Quantity/pack**
10	2.7	–	–	1823-010	100
25	1.0	–	1821-025	–	100
25	2.7	–	–	1823-025	100
35	2.7	–	–	1823-035	100
37	1.0	–	1821-037	–	100
42.5	1.0	–	1821-042	–	100
42.5	2.7	–	–	1823-042	100
47	1.0	–	1821-047	–	100
47	2.0	1842-047	–	–	40
47	2.7	–	–	1823-047	100
90	1.0	1841-090	–	–	20
90	2.0	1842-090	–	–	20
90	1.0	–	1821-090	–	25
90	2.7	–	–	1823-090	25
125	1.0	–	1821-125	–	25
125	2.7	–	–	1823-125	25
142	2.7	–	–	1823-142	25
257	2.7	–	–	1823-257	25

For further information on these grades please refer to the Filter papers section.

Polyester drain discs

Use these drain discs with hardware for extra support, or between membrane filters to improve flow rate and throughput. The polyester drain disc is binder free and has a thickness of 100 µm. It provides a flat surface to prevent filter tearing or rupturing of a filter when placed below, or used as a separator between membrane layers in serial stack filtration applications. This chemically inert support disc is available in a variety of diameters for use in a range of devices.

Polyester drain disc

Applications

- General laboratory microfiltration.
- Support for membranes such as polycarbonate track etched filters.
- For use under membrane filter to prevent imprinting of hardware support structure during filtration, facilitate sealing, and to aid in channeling fluid flow through entire effective filtration.
- Use between membrane filters to facilitate fluid flow between membrane layers.

Ordering information

Polyester drain discs

Diameter (mm)	Catalog number	Filter media	Typical Thickness (µm)	Pore size (µm)	Maximum operating temperature (°C)	Autoclavable	Quantity/pack
10	230300	Polyester	100	–	–	–	100
22	230500	Polyester	100	–	–	–	100
25	230600	Polyester	100	–	–	–	100
37	230800	Polyester	100	–	–	–	100
47	231100	Polyester	100	–	–	–	100
90	231200	Polyester	100	–	–	–	100
142	232310	Polyester	100	–	–	–	100
293	232300	Polyester	100	–	–	–	100
25	60343	Polypropylene, polyethylene	127	10	107	Yes	500
47	60344	Polypropylene, polyethylene	127	10	107	Yes	100

Stainless steel forceps

Stainless steel forceps for transferring membranes to a filter holder into a Petri dish. Molded plastic grips and easy flex blades provide comfort while performing the MF technique for microbiological testing.

- Smooth, blunt tip with rounded corners prevent damage while handling membrane filters.
- Molded finger grips available in black or multi-color pack of three.
- Use for all of your filter handling needs when loading or unloading any plastic, glass, aluminum or stainless steel filter holders in our range.
- PZ001 (10477602) manufactured of all stainless steel with angled jaws and blunt tips to aid in placement and retrieval of paper and glass microfiber filters in buchner or traditional glass funnels.

Forceps 4960

Forceps PZ 001

Technical specifications

Stainless steel forceps

	51147	4960	10477602
Sterile	Provided non-sterile; autoclavable at 121 to 123°C at 1.0 bar (100 kPa) for 15 to 20 min or flame tips for aseptic handling of membrane		
Material of construction			
Blades	Stainless steel	Stainless steel	Stainless steel
Grips	Polypropylene	Polypropylene	NA

Ordering information

Vacuum filtration apparatus accessories

Catalog number	Description	Quantity/pack
51147	Black	1
4960	Aqua, orange, chartreuse	3
10477602	Polished stainless steel	1

Air monitoring accessories

Open-face filter holders

Open-face filter holders are used for monitoring air quality by drawing air through the holder at a rate specified by the environmental method being followed.

- 25 mm Delrin open-face filter holder is designed for clean room sampling and is light enough to be mounted to a lapel for collection of breathing-zone air samples.
- 47 mm aluminum open-face filter holder is suited for work zone perimeter sampling, outdoor, or higher particulate density sampling. It's provided with a cap to protect the membrane during transit.

Technical specifications

Open-face filter holders

Catalog number	1107	1220
Housing material	Delrin (acetal copolymer)	Aluminum
O-ring	Viton	Viton
Support	Integral stainless steel mesh	304 stainless steel
Membrane diameter	25 mm	47 mm
Effective filtration area (EFA)	3.7 cm^2	9.6 cm^2
Outlet connection	Nylon 1/8 in. NPT to 6.4 mm hosebarb	Nylon 1/8 in. NPT to 6.4 mm hosebarb

Ordering information

Open-face filter holders

Catalog number	Description	Quantity/pack
1107	25 mm open-face delrin filter holder	6
1220	47 mm open-face aluminum filter holder	1

Ordering information

Accessoried and Spare parts

Catalog number	Description		Quantity/pack
83475N	O-ring, viton	1107	5
73179N	Hosebarb, nylon 1/8 in MNPT to 1/4 in barb	1107, 1220	5

Air monitoring essentials

37 mm air monitoring cassettes

Clear SAN plastic construction meets requirements for environmental and industrial hygiene monitoring.

Technical specifications

Housing material	Styrene acrylonitrile
Filter size (mm)	37
Dimensions (cm)	2-piece assembled: Length 2.8 cm, diameter 4.2 cm 3-piece assembled: Length 3.8 cm, diameter 4.2 cm
Inlet/outlet connections	Female luer taper, plugs provided

Ordering information

Air monitoring cassettes

Catalog number	Description	Quantity/pack
4338	37 mm 2-piece unassembled cassettes	50
4339-N	37 mm 3-piece unassembled cassettes	50
66239	Support pad, 37 mm	100
64747	Support pad, 37 mm	500

Analyslide Petri dish

Protect the integrity of samples during transport, microscopic examination, and storage.

- Rectangular base fits most microscope stages.
- Cover and raised ring fit securely together to protect samples.
- Clear lid, no interference reading samples.
- Frosted area on rectangular base for labeling.

Technical specifications

25 mm air conitoring cassettes

Base and lid material:	Polystyrene
Filter size (mm)	Accepts up to 47 mm diameter filter

Ordering information

Air monitoring cassettes

Catalog number	Description	Quantity/pack
7231	Analyslide petri dish	100

Bio-based polymers: What are they and how they're advancing sustainability

Bio-based polymers offers a fast, impactful way to cut emissions – without compromising performance

What are bio-based polymers: Bio-based plastics are made from renewable feedstocks not suitable for consumption like waste oils or non-food crops. In polymer production, manufacturers typically blend bio-based with traditional fossil-based ones, using a method called mass balance. Bio-based feedstocks are chemically identical to fossil-based ones, enabling a seamless switch without product requalification.

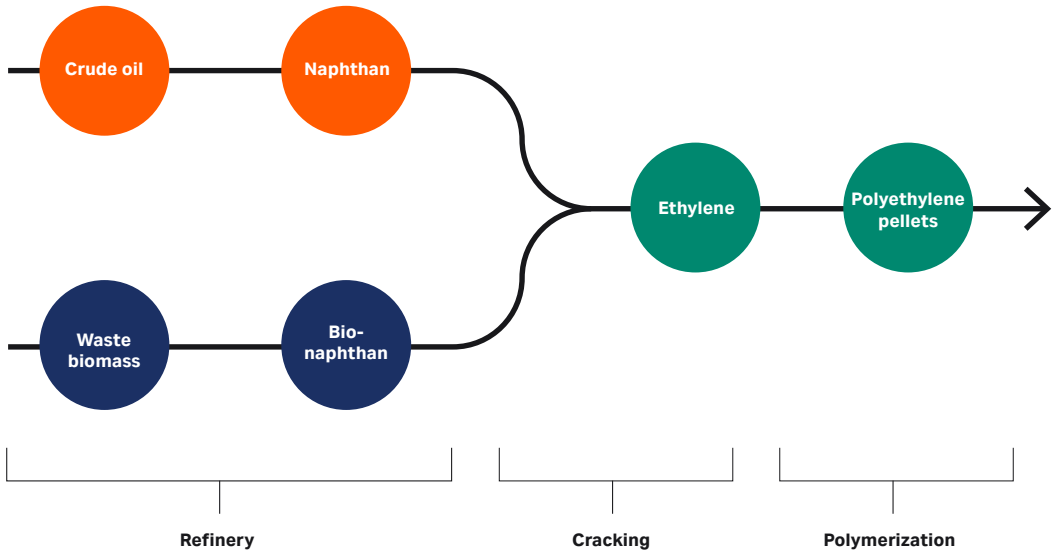
Why it matters: To meet global climate goals, industries must decarbonize. Our raw materials including plastics account for 34% of our total emissions. We use over six million kg of plastic annually, contributing around 18 000 tonnes of CO_2. A significant proportion of our customers emissions stem from their supply chain, also known as Scope 3 emissions. Transitioning to bio-based polymers offers a clear opportunity to support customers in reducing their carbon footprint.

What is mass balance: During polymer production the quantity of the final resin is independent of the type of feedstock used. Segregation of bio-sourced and fossil-based feedstock is not practical at industrial scale and suppliers will vary feedstock sources based on several external factors. Therefore, mass balance chain of custody allows mixed fossil/bio-based production segregated through bookkeeping. Supported by independent third party accreditation by the International Sustainability and Carbon Certification (ISCC) system, raw materials can be traced throughout supply chains and the corresponding reduction in greenhouse gas (GHG) emissions can be recognized and claimed.

What's next: We have started the process to have our own supply chain validated under ISCC in preparation for our transition to bio-based plastics.

For more information visit www.cytiva.com/sustainability or email us at sustainability@cytiva.com.

Mass balance chain of custody model



04

Filtration devices

Disposable filtration devices are designed for versatility and efficiency across many sample types and applications. Available with a wide selection of membrane materials, these devices feature durable polypropylene, acrylic, or polycarbonate housings and incorporate advanced construction techniques for reliable performance and ease of use.

Syringe filter selection guide

		Solvents														
		Aqueous														
		Hydrophilic													Hydrophobic	
		CN	CA	PES	GMF	NYL	PVDF	ANP	RC	wwPTFE	Versapor membrane	Posidyne	Ultipor	DpPP*	PTFE†
High performance These syringe filters deliver premium quality with efficiency to meet most analytical needs.	**Anotop syringe filters**							✓							
	Puradisc syringe filters	✓	✓	✓	✓	✓	✓		✓	✓	✓				✓
	Acrodisc syringe filters			✓	✓	✓	✓		✓	✓		✓	✓	✓	
Difficult filtration For use with high-particulate and viscous samples, these syringe filters contain two or more filter layers to allow efficient filtration without blockage for a cost-effective solution.	**Anotop Plus syringe filters**							✓							
	Whatman GD/X syringe filters		✓	✓	✓	✓	✓		✓		✓				✓
	GD/XP			✓		✓	✓				✓				✓
Automated systems These sturdy syringe filters are compatible with most high throughput or dissolution systems.	**Acrodisc PSF**			✓		✓	✓		✓	✓	✓				
	850-DS			✓	✓	✓	✓								✓
Application specific Dedicated uses: HPLC and IC with certification, bioethanol and protein purification production, environmental samples prior to COD/DOC analysis.	**IC Acrodisc syringe filters**			✓											
	Puradisc Aqua syringe filters		✓												
	SPARTAN Certified syringe filters								✓						
	Protein Prep								✓						
All-in-one Integrated devices include the collection receptacle to save time, reduce waste, and reduce sample handling	**Autovial syringeless filters**		✓	✓	✓	✓	✓								✓
	UniPrep syringeless filters				✓	✓	✓								✓
	Mini-UniPrep syringeless filters			✓	✓	✓	✓		✓		✓				✓
Advantage Reliable quality, economical portfolio for basic applications.	**Uniflo syringe filters**			✓	✓	✓	✓			✓					✓
Mobile phase Inline filter devices for degassing solutions used as the carrier phase in analytical equipment.	**Aqueous IFD**					✓									
	Solvent IFD														

ANP = Anopore membrane
CA = Cellulose acetate
CN = Cellulose nitrate
DpPP = Depth polypropylene filter
GMF = Glass microfiber
NYL = Nylon
PES = Polyethersulfone
H-PTFE = Hydrophilic Polytetrafluoroethylene
PTFE = Polytetrafluoroethylene
PVDF = Polyvinylidene difluoride
RC = Regenerated cellulose

** Mildly Hydrophobic can be used for aqueous sample but exhibits elevated water breakthrough*
† Select PTFE for applications where prevention of water intrusion is critical

Visit **cytiva.com** for additional selection guidance.

Filter diameter and recommended volume

Syringe filters/diameter	Puradisc filter	Anotop filter	Acrodisc filter	Whatman GD/X filter	GD/XP	Anotop Plus filter	Acrodisc PSF filter	850-DS	Puradisc Aqua filter	IC Acrodisc syringe filter	SPARTAN filter	ProteinPrep	Uniflo filter
4 mm for sample volume < 2 mL	●		●										
10 mm for sample volume 2 to 10 mL		●				●							
13 mm for sample volume 2 to 10 mL	●		●	●						●	●	●	●
25 mm for sample volume 10 to ~ 100 mL	●	●	●	●	●	●	●	●		●			●
30 mm for sample volume 10 to ~ 100 mL	●								●		●	●	●
32 mm for sample volume 10 to ~ 100 mL			●										
37 mm for sample volume 10 to ~ 100 mL			●										

Syringe filter diameter guide

Size	ANP	CA	CN	NYL	DpPP	PES	PTFE	H-PTFE	wwPTFE	PVDF	RC	GMF	Versapor	Luekosorb
4 mm sterile				●										
4 mm non-sterile				●			●							
10 mm sterile	●													
10 mm non-sterile	●													
13 mm sterile						●				●				
13 mm non-sterile		●		●		●	●	●	●	●	●	●		
25 mm sterile	●	●		●		●				●			●	●
25 mm non-sterile	●	●		●	●	●	●	●	●	●	●	●	●	
30 mm sterile		●	●				●							
30 mm non-sterile		●	●	●		●	●	●		●	●			
32mm sterile						●								
32mm non-sterile						●								
37mm non-sterile														
37mm sterile						●								

ANP = Anopore membrane
CA = Cellulose acetate
CN = Cellulose nitrate
NYL = Nylon
DpPP = Depth polypropylene filter
PES = Polyethersulfone
PTFE = Polytetrafluoroethylene
H-PTFE = Hydrophilic polytetrafluoroethylene
PVDF = Polyvinylidene difluoride
RC = Regenerated cellulose
GMF = Glass microfiber

Device media characteristics and properties

The right choice of filter media for any given application or analytical technique is critical for optimal performance. Chemical compatibility, hydrophilic or hydrophobic, low extractables, low protein binding, high loading capacity are all characteristics that need to be considered in filter media selection. Use the descriptions below to help guide your selection of the most appropriate solution for your sample type, application or technique.

Cellulose acetate (CA)

A hydrophilic membrane that exhibits very low protein binding characteristics. Used in applications involving filtration of proteinaceous suspensions, either for recovery or for analysis of proteins and amino acids. Limited compatibility with organic solvent, but can be used with some alcohols.

Cellulose nitrate (CN)

A hydrophilic membrane, generally used for aqueous samples though may be used with some organic solvents such as aliphatic hydrocarbons. Not generally recommended for applications where low protein binding characteristics and maximum recovery of proteins or amino acids are required.

Nylon/polyamide (NYL)

A hydrophilic membrane with resistance to a broad range of organic solvents and suitable for use with high pH samples. Not recommended for applications where low protein binding characteristics and maximum recovery of proteins or amino acids are required.

Polyethersulfone (PES)

A hydrophilic or Supor membrane exhibiting low protein binding and low extractables. Suitable for filtration of aqueous samples and some compatible organic solvents. Especially well-suited for aqueous sample preparation where low protein binding is important, and for HPLC sample preparation of aqueous suspensions.

Polyvinylidene difluoride (PVDF)

A hydrophilic membrane with good general chemical compatibility to a broad range of organic solvents and exhibiting low protein binding. Useful for filtering aqueous and organic suspensions, especially where minimal protein binding is required.

Polytetrafluoroethylene (PTFE)

A hydrophobic membrane that is resistant to most organic solvents and strong acids and bases. Generally low protein binding and low extractables. Main application is filtration of non-aqueous samples, especially where an inert nature and good chemical resistance are required, like strong, aggressive organic solvents. Prior to filtering aggressive aqueous solutions, the membrane must be wet with a water-miscible solvent such as methanol or IPA in order to allow aqueous suspension to pass.

Hydrophilic polytetrafluoroethylene (H-PTFE)

A hydrophilic membrane that offers broad chemical resistance or wwPTFE, low protein binding and low extractables and can be used for both aqueous and aggressive organic solvents. The inert nature and low extractables of hydrophilic PTFE makes it suitable for uHPLC/HPLC sample preparation where a variety of sample types may need to be prepared, as well as for many and for applications requiring broad chemical resistance.

Regenerated cellulose (RC)

A hydrophilic membrane that is resistant to a wide range of solvents that exhibits low protein binding characteristics. The broad chemical resistance and low extractable nature of regenerated cellulose makes it an excellent choice for general HPLC sample preparation of samples suspended in either aqueous or organic solvents. The low protein binding character suits applications where minimal binding and maximizing recovery of proteins and amino acids are important.

Depth polypropylene filter (DpPP)

A mildly hydrophobic filter with excellent flow rates and loading capacity and is compatible with both aqueous and organic solvents. This media is a good choice where increased loading capacity is required such as general clarification of samples.

Anopore (ANP) membrane

Anopore membrane in Anotop filters, is a hydrophilic membrane with excellent organic solvent compatibility, an inert nature, and low extractables, making it suitable for use with aqueous and organic samples. The membrane has a well-defined pore structure and very narrow pore-size distribution making it especially suitable for critical applications and sample preparation. Not suitable for use with very acidic or very basic samples.

Glass microfiber/glass fiber (GMF/GF)

Offers broad chemical compatibility with organic solvents and strong acids (except hydrofluoric acid) and bases due to the inert nature of glass microfiber. The physical structure of the glass microfiber filter matrix offers a combination of good loading capacity and high flow rates when compared to membrane filter media. Especially suited to use either as a prefilter or for general clarification of samples with high levels of particulates.

Versapor membrane

A hydrophilic membrane with high throughput and high liquid flow rates. The non-woven internal support results in high tensile strength and dimensional stability allowing compatibility with different manufacturing processes. Good resistance for filtering aqueous and organic solvents. Compatible with gamma irradiation, UV, or EtO treatment.

Leukosorb™ membrane

Patented, highly wettable, fibrous matrix with a retention efficiency rating of 8.0 µm. Useful for leukocyte removal, Molecular diagnostics, and DNA prep prior to PCR. Existing as Acrodisc WBC (white blood cell) filter.

Syringe filters

Disposable syringe filter devices provide fast and efficient filtration of aqueous and organic solutions. With a wide variety of membranes, our syringe filters are made with advanced methods and design features. These syringe filters are suitable for numerous applications in pharmaceutical, environmental, biotechnology, food and beverage, and agricultural testing laboratories.

Syringe filters are composed of pure polypropylene, acrylic, or polycarbonate housing, and heat sealed without the use of glues or sealants.

Product option overview

Syringe filters

Syringe filter	Membrane	Diameter (mm)	Features
Puradisc	CA, CN, RC, PTFE, H-PTFE, Nylon, DpPP, PES, PVDF, GMF	4, 13, 25, 30	High Performance filters with the most options for membranes, diameters and applications
Anotop	Anopore	10, 25	Contains proprietary alumina-based membrane, extremely small pore size
Whatman GD/X	CA, PTFE, Nylon, PES, PVDF, GMF, RC	13, 25	Contains proprietary Whatman GMF 150 prefiltration stack
Acrodisc	Supor, Versapor, PTFE, wwPTFE, PVDF, Nylon, Posidyne, GF	4, 13, 25, 32, 37	High-performance sterile and non-sterile filtration for mass spectrometry, chromatography, media preparation, cell culture, and protein purification
Acrodisc PSF	wwPTFE, Nylon, PVDF, PTFE, Supor, RC, Versapor, GF, Leukosorb	25	Acrodisc PSF syringe filters are designed to meet exacting requirements of automated filtration systems, and to demonstrate critical criteria including smooth filter-to-filter release
GD/XP	Nylon, PVDF, PES, PTFE, DpPP	25	Contains proprietary polypropylene prefiltration stack, suitable for inorganic ion analysis
Anotop Plus	Anotop	10, 25	Contains proprietary alumina-based membrane, extremely small pore size with added benefit of GMF prefilter
850-DS	PTFE, Nylon, PES, PVDF, GMF	25 (plate of 8)	Designed for use on Agilent 850-DS Dissolution Autosamplers
Puradisc Aqua	CA	30	Filter environmental samples prior to COD and DOC analysis
IC	Supor	13, 25	Designed for ion chromatography
SPARTAN	RC	13, 30	Certified for low UV-absorbing extractables
ProteinPrep	RC	13, 30	For use with ÄKTA systems and protein samples
Whatman Uniflo	Nylon, PES, PVDF, PTFE, H-PTFE	13, 25, 30	Advantage of Whatman filter performance, maximum value

CA—Cellulose acetate
CN—Cellulose nitrate
GMF—Glass Microfiber
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
H-PTFE—hydrophilic polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated Cellulose
DpPP—Depth polypropylene filter
Luekosorb membrane
Versapor membrane

Safety

These safety guidelines are applicable to all syringe filters.

Syringe use can result in high pressure. The smaller the syringe, the higher the pressure that can be generated. As a general guide, the following pressures can be obtained by hand with the syringes indicated:

- 20 mL: 2 bar
- 10 mL: 3.4 bar
- 5 mL: 5.2 bar
- 3 mL: 6.9 bar
- 1 mL: 10.3 bar

Individual users should determine the pressure they generate by hand with a specific size syringe and take appropriate safety precautions not to exceed the recommended rating for the device used. If the limitations are exceeded, the device may burst.

See appendix section for summary of typical properties, product availability and application guidance.

High performance syringe filters

Puradisc™ syringe filters

Puradisc syringe filters combine quality with high performance. They are used for quick, efficient filtration of samples up to 100 mL.

Puradisc filters are produced from pigment-free polypropylene or polycarbonate with standard inlet (female locking luer) and outlet (male locking luer) connections unless otherwise stated. Options include a sterile blister pack for critical applications and a tube tip outlet that allows the sample to be accurately dispensed into a micro-vial, removing air lock.

Features and benefits

- Pigment-free polypropylene (polycarbonate for Puradisc 30 mm and Puradisc Aqua filters).
- Standard inlet and outlet luer connectors.
- Tube-tip format (optional) for accurate dispensing into a micro-vial.
- Choice of membrane or glass microfiber filter media.
- Choice of filter sizes (4, 13, 25 or 30 mm) to minimize sample loss.
- Sterile* option for critical applications.
- Wide range of membranes to suit different sample types.

Puradisc 4 filters

Features

- 4 mm diameter syringe filter.
- Sample volume up to 2 mL.
- Low hold-up volume < 10 µL provides maximum sample recovery.
- Tube-tip format (optional).

Applications

- HPLC samples containing low solid content: Filtration improves column life.
- Capillary electrophoresis (CE) samples: Filtration will remove spurious peaks.
- Sterile* filtration of low volume samples.
- UV/Vis samples: Filter directly into cuvette using tube tip.
- Refractometry: Filter samples to prevent damage to instrument optics and improve accuracy of results.
- Minimizes nonspecific binding to membrane due to small membrane size.

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Puradisc 13 filters

Features

- 13 mm diameter syringe filter
- Sample volume up to 10 mL
- Low hold-up volume < 25 µL provides maximum sample recovery
- Glass microfiber option available
- Tube-tip format (optional)

Applications

- Biological sample preparation
- HPLC sample preparation

Puradisc 13 syringe filters with tube tip

Puradisc 25 filters

Features

- 25 mm diameter syringe filter
- Sample volume up to 100 mL
- Low hold-up volumes for maximum sample recovery
- Glass microfiber option available

Applications

- HPLC aqueous sample preparation
- Biological sample preparation
- Buffer solutions
- Salt solutions
- Tissue culture media
- Irrigation solutions
- Sterile* isolation

Puradisc 25 syringe filters

Puradisc 30 filters

Features

- 30 mm diameter
- Larger filtration area (44% greater in comparison to 25 mm)
- Designed for aqueous and non-aqueous samples

Puradisc 30 syringe filters

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Technical specifications

Puradisc syringe filters

	Puradisc 4	Puradisc 13	Puradisc 25	Puradisc 30
Housing	Polypropylene	Polypropylene	Polypropylene	Polycarbonate/Polypropylene
Filtration area	0.2 cm^2	1.3 cm^2	4.2 cm^2	5.7 cm^2
Maximum pressure	5.2 bar	5.2 bar	5.2 bar	6.9 bar
Volume hold-up full housing with air purge	< 10 µL	< 25 µL	< 100 µL	< 50 µL
Dimensions	10.1 × 23.5 mm	16.3 × 19.8 mm	22.9 × 28.4 mm	26 × 34 mm
Weight	0.55 g	0.95 g	2.7 g	4.7 g
Volume throughput	Up to 2 mL	Up to 10 mL	Up to 100 mL	Up to 100 mL
Inlet connection	Female locking luer	Female locking luer	Female locking luer	Female locking luer
Outlet connection	Male locking luer	Male locking luer	Male locking luer	Male locking luer
Sterlization	Autoclave at 121°C (131°C max)	Autoclave at 121°C (131°C max)	Autoclave at 121°C (131°C max)	Autoclave at 121°C (131°C max)

Ordering information

Puradisc 4 mm syringe filters

	Catalog number		
Pore size (µm)	**PVDF**	**PTFE**	**Quantity/pack**
Nonsterile with tube tip			
0.2	–	–	50
0.45	–	–	50
Sterile without tube tip			
0.2	–	–	50
Nonsterile without tube tip			
0.2	6779-0402	6784-0402	100
0.2	–	6783-0402	500
0.45	6779-0404	6784-0404	100
0.45	–	6783-0404	500

PTFE—Polytetrafluoroethylene

PVDF—Polyvinylidene difluoride

Ordering information

Puradisc 13 mm syringe filters (nonsterile)

	Catalog Number								
Pore size (µm)	**CA**	**Nylon**	**PES**	**PVDF**	**PTFE**	**GMF**	**RC**	**H-PTFE**	**Quantity/pack**
With tube tip									
0.2	–	–	–	6777-1302	–	–	–	–	50
0.2	–	–	–	–	–	–	–	–	100
0.45	–	–	–	–	6775-1304		–	–	50
0.45	–	–	–	–	10463713*	–	–	–	100
Without tube tip									
0.1	–	6789-1301	–	–	6784-1301	–	-	-	100
0.2	–	–	6782-1302	6779-1302	6784-1302	–	6756-1302	6772-1302	100
0.2	–	–	–	6792-1302	6783-1302	–	6757-1302	6773-1302	500
0.2	–	–	–	6765-1302	6766-1302	–	6758-1302	6774-1302	2000
0.45	6771-1304	–	6782-1304	6779-1304	6784-1304	–	6756-1304	6772-1304	100
0.45	–	–	6781-1304	6792-1304	6783-1304	6818-1304	6757-1304	6773-1304	500
0.45	–	–	–	6765-1304	6766-1304	–	6758-1304	6774-1304	2000
1.0	–	–	–	–	6784-1310	–	-	-	100
5.0	–	–	–	–	6784-1350		-	-	100
GF/F 0.7*	–	–	–	–	–	6825-1307	-	-	100
GF/B 1.0*	–	–	–	–	–	6821-1310	-	-	100
GF/C™ 1.2*	–	–	–	–	–	6822-1312	-	-	100
GF/A 1.6*	–	–	–	–	–	6820-1316	-	-	100
GF/A 1.6	–	–	–		–	6806-1316	-	-	500
GF/D 2.7*	–	–	–	–	–	6823-1327	-	-	100

** 10463713 comes with Mini-tip*

CA—Cellulose acetate
GMF—Glass microfiber
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated cellulose
H-PTFE—Hydrophilic PTFE

Ordering information

Puradisc 13 mm syringe filters (sterile)

	Catalog number		
Pore size (µm)	**PVDF**	**PES**	**Quantity/pack**
Without tube tip			
0.2	6791-1302	6780-1302	50
0.45	6791-1304	6780-1304	50

PES—Polyethersulfone
PVDF—Polyvinylidene difluoride

Ordering information

Puradisc 25 mm syringe filters

	Catalog Number								
Pore size (µm)	**Nylon**	**PES**	**PVDF**	**PTFE**	**H-PTFE**	**GMF**	**DpPP**	**RC**	**Quantity/pack**
Sterile									
0.2	–	6780-2502	–	–	–	–	–	–	50
0.2	–	6794-2512	–	–	–	–	–	–	1000
0.45	–	6780-2504	–	–	–	–	–	–	50
0.45	–	6794-2514	–	–	–	–	–	–	1000
1.0	–	6780-2510	–	–	–	–	–	–	50
Nonsterile									
0.1	–	–	–	6784-2501	–	–	–	–	50
0.1	–	–	–	6798-2501	–	–	–	–	1000
0.2	6750-2502	–	6746-2502	6784-2502	6772-2502	–	–	6756-2502	50
0.2	6751-2502	6781-2502	6747-2502	6785-2502	6773-2502	–	–	6757-2502	200
0.2	6753-2502	6794-2502	–	6798-2502	6774-2502	–	–	6758-2502	1000
0.45	6750-2504	–	6746-2504	6784-2504	6772-2504	–	6786-2504	6756-2504	50
0.45	6751-2504	6781-2504	6747-2504	6785-2504	6773-2504	–	6788-2504	6757-2504	200
0.45	6752-2504	–	–	–	–	–	–	–	500
0.45	6753-2504	6794-2504	6749-2504	6798-2504	6774-2504	–	6790-2504	6758-2504	1000
0.7 GF/F*	–	–	–	–	–	6825-2517	–	–	50
0.7 GF/F*	–	–	–	–	–	6825-2527	–	–	200
0.7 GF/F*	–	–	–	–	–	6787-2520	–	–	1000
1.0	6750-2510	–	–	6784-2510	–	–	–	–	50
1.0	–	6781-2510	–	–	–	–	–	–	200
1.0	6753-2510	–	–	6798-2510	–	–	–	–	1000
1.0 GD 1*	–	–	–	–	–	6783-2510	–	–	100
1.0 GD 1*	–	–	–	–	–	6792-2510	–	–	1000
2.0 GD 2*	–	–	–	–	–	6783-2520	–	–	100

* *Particle retention rating*

DpPP—Depth polypropylene filter
GD—Graded density
GMF—Glass microfiber
H-PTFE = Hydrophilic PTFE
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC = Regenerated cellulose

Ordering information

Puradisc 30 mm syringe filters

	Catalog number					
Media/housing	**CA / PC**	**CN/ PC**	**PTFE/PP**	**PTFE/PC**		
Pore size (µm)					**Connection in/out**	**Quantity/pack**
0.2	10462200*	–	10463500*	–	FLL/ML	50
0.2	10462701	–	–	–	FLL/ML	50
0.2	10462205*, **	–	–	–	FLL/MLL	50
0.2	10462710	–	10463503	–	FLL/ML	100
0.2	10462700	–	10463505	10462300*	FLL/ML	500
0.2	10462206	–	–	–	FLL/MLL	500
0.45	10462100*	–	–	–	FLL/ML	50
0.45	10462601	–	–	–	FLL/ML	50
0.45	10462610	–	10463513	–	FLL/ML	100
0.45	10462600	–	10463515	–	FLL/ML	500
0.8	10462241	–	–	–	FLL/ML	50
0.8	10462240*	–	–	–	FLL/ML	50
0.8	10462243	–	–	–	FLL/ML	500
1.0	–	–	10463523	–	FLL/ML	100
1.0	–	–	10463525	–	FLL/ML	500
1.2	10462260*	–	–	–	FLL/ML	50
1.2	10462261	–	–	–	FLL/ML	50
1.2	10462263	–	–	–	FLL/ML	500
5.0	–	10462000*	–	–	FLL/ML	50
5.0	–	10462520	–	–	FLL/ML	50
5.0	–	10462510	10463533*	–	FLL/ML	100
5.0	–	10462500	10463535	–	FLL/ML	500

* *Sterile*

** *Edotoxin-free according to LAL test (USPXXII), sensitivity: 0.25 EU/mL*

CA—Cellulose acetate
CN—Cellulose nitrate
FLL—Female luer lock
ML—Male luer
MLL—Male luer lock
PC—Polycarbonate

Puradisc syringe filters

Anotop™ syringe filters

Filters contain the proprietary alumina-based Anopore membrane and are supplied in three pore sizes. Anotop filters can be used with most organic solvents and aqueous materials.

Anotop 10 syringe filters, sterile

Anotop 10 filters

Features and benefits

- 10 mm diameter syringe filter
- Inorganic membrane
- Capillary pore structure
- Low protein binding
- Filters sample volume up to 10 mL
- Low hold-up volume < 20 µL ensures maximum sample recovery
- Sterile formats are available for critical applications

Anotop 25 filters

Features

- 25 mm diameter syringe filter
- Filters sample volume up to 100 mL

Applications

- Cold sterilization* of growth media
- Phage and virus filtration
- Removal of high molecular weight proteins or polymers
- Liposome extrusion
- Filtration of solvents for spectroanalysis and analytical sample preparation

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

Technical specifications

Anotop syringe filters

	Anotop 10	Anotop 25
Housing	Polypropylene	Polypropylene
Filtration area	0.78 cm^2	4.78 cm^2
Maximum pressure	6.9 bar	6.9 bar
Volume hold-up	< 20 µL	< 150 µL
Prefilter type	N/A	N/A
Membrane diameter	10 mm	25 mm
Membrane type	Anopore	Anopore
Average membrane thickness	60 µm	60 µm
Device width	15.4 mm	36.8 mm
Device length	18.5 mm	26.3 mm
Device shape	Hexagonal	Hexagonal
Construction process	Thermal weld	Thermal weld
Inlet connection	Female locking luer	Female locking luer
Outlet connection	Male locking luer	Male locking luer
Protein adsorption	Low	Low
Extractable materials	Low	Low
Cytotoxicity	Non-cytotoxic	Non-cytotoxic

Anotop 25 syringe filters

Ordering information

Anotop syringe filters

Pore size (µm)	Media	Catalog number	Quantity/pack
Anotop 10 filter			
0.02	Anopore	6809-1002	50
0.1	Anopore	6809-1012	50
0.2	Anopore	6809-1022	50
0.02	Anopore, sterile	6809-1102	50
0.1	Anopore, sterile	6809-1112	50
0.2	Anopore, sterile	6809-1122	50
Anotop 25 filter			
0.02	Anopore	6809-2002	50
0.1	Anopore	6809-2012	50
0.2	Anopore	6809-2022	50
0.02	Anopore, sterile	6809-2102	50
0.1	Anopore, sterile	6809-2112	50
0.2	Anopore, sterile	6809-2122	50

Acrodisc™ syringe filters

Acrodisc syringe filters are high-performance, sterile and non-sterile filtration for mass spectrometry, chromatography, media preparation, cell culture, and protein purification.

Acrodisc syringe filters

Non-sterile Acrodisc syringe filters

Our proprietary manufacturing process produces non-sterile syringe filters that incorporate the highest-quality membranes and plastics. The premium syringe filter (PSF) offers two-piece, sealed construction designed to resist damage when processed with robotics and liquid handlers.

Key benefits:

- Achieve cleaner samples.
- Minimize leachables and extractables that alter data.
- Protect expensive detectors and columns.
- Minimize back pressure and resistance to eliminate repetitive-use injuries.

Sterile Acrodisc syringe filters

Key applications

Media filtration and cell culture

When culturing cells, it's critical that the antibiotics, buffers, reagents, or nutrients are sterile when added to the media or culture to prevent contamination. Cytiva's sterile syringe filters with 0.2 µm membranes remove bacteria, microorganisms, and fungi that can contaminate valuable cultures.

Protein purification

Higher cell densities can be difficult to filter downstream due to bioburden, which can cause premature filter clogging. This problem can be aided by syringe filters that incorporate an integrated pre-filter to collect the larger debris, while keeping the downstream membrane clear. Syringe filters must also have low protein binding to ensure proteins are not retained in the filter.

Sample clean-up, virus filtration, and mycoplasma reduction

Laboratories need a wide range of membrane types and pore sizes for all varieties of sample clean-up, cell debris removal, virus filtration, or general filtration purposes. In addition, specialized sterile syringe filters can be used for serum, DMSO, white blood cells, and mycoplasma reduction. Cytiva offers syringe filters for virtually all laboratory applications.

key benefits

- Gamma-irradiated individual blister packs provide sterility.
- Integrated dual-layer pre-filter for high particulate-holding capacity and thorough, fast filtering.
- Low protein binding provides high protein recovery.
- Superior membrane performance achieves high filtration flow and capacity.
- Low back pressure promotes ease of use and quick filtering.
- Minimize back pressure and resistance to eliminate repetitive-use injuries.

Technical specifications

Acrodisc syringe filters

	Acrodisc 4 filter	Acrodisc 13 filter	Acrodisc 25 filter	Acrodisc 25 filter w/ Versapor membrane	Acrodisc 25 mm PSF filter	Acrodisc 32 filter	Acrodisc 37 filter
Housing	Polypropylene	Polypropylene	Polypropylene	Modified acrylic	Polypropylene	Modified acrylic	Acrylonitrile butadiene styrene (ABS)
Filtration area	0.12 cm^2	1.0 cm^2	2.8 cm^2	2.8 cm^2	3.9 cm^2	5.8 cm^2	7.5 cm^2
Maximum pressure	5.2 bar	PVDF - 3.5 bar (350 kPa) wwPTFE - 6.2 bar (620 kPa) Nylon, IC (PES), PTFE and Versapor membrane: - 6.9 bar (690 kPa)	PVDF - 3.5 bar (350 kPa) Glass Fiber and IC (PES) - 4.1 bar (410 kPa) GF/Nylon, GF/wwPTFE, Nylon and wwPTFE - 6.2 bar (620 kPa) PTFE - 6.9 bar (690 kPa)	5.2 bar (520 kPa)	GxF/Glass, GxF/Nylon, GxF/PVDF, GxF/Supor, GxF/PTFE, IC (PES), Nylon, PVDF, Versapor and PTFE - 4.1 bar (410 kPa) at 21-24°C GF55, GF92, RC and RC/GF - 5.0 bar (500 kPa) at 21-24°C GxF/wwPTFE and wwPTFE - 6.2 bar (620 kPa) at 21-24°C"	5.2 bar	5.2 bar
Volume hold-up full housing with air purge	< 10 µL	< 40 µL minispike < 60 µL male locking luer	< 150 µL - Glass fiber and prefilter (GxF) products < 125 µL - Non-prefilter products	< 300 µL	< 450 µL - Glass fiber and prefilter (GxF) products < 250 µL - Non-prefilter products	< 500 µL	< 650 µL
Volume throughput	< 2 mL	< 10 mL	< 100 mL	< 100 mL	< 150 mL	Up to 150 mL	< 200 mL
Inlet connection	Female locking luer	Female locking luer	Female locking luer	Female locking luer	Female locking luer	Female locking luer	Female locking luer
Outlet connection	Male locking luer	Male locking luer/ minispike option	Male locking luer	Male locking luer	Male locking luer	Male locking luer	Male locking luer
Sterlization	–	–	PTFE - Provided non-sterile. If desired, autoclave at 121-123°C at 1.0 bar (100 kPa) for a maximum of 15 min.	No claim (4188, 4190 and 4199 gamma-irradiated)	GxF/PTFE and PTFE - Provided non-sterile. If desired, autoclave at 121-123°C at 1.0 bar (100 kPa) for a maximum of 15 min.	No claim (4651, 4652, 4654, 4656, 4650 and 4658 gamma-irradiated)	No claim, is gamma-irradiated

Ordering information

Acrodisc syringe filters

Pore size (µm)	Supor membrane	Versapor membrane	PTFE	wwPTFE	PVDF	Nylon	DMSO nylon	Posidyne	GF	GF/Nylon	Quantity/ pack
Acrodisc 4 mm filter											
0.45	–	–	4472	–	–	–	–	–	–	–	750
Acrodisc 13 mm filter											
0.2	4602	–	–	–	–	–	–	–	–	–	75
0.45	4604	–	–	–	–	–	–	–	–	–	75
0.8	4608	–	–	–	–	–	–	–	–	–	75
Acrodisc 13 mm non-sterile mini filter											
0.2	–	–	4552TC	2400TC	4450TC	–	–	–	–	–	100
0.2	–	–	–	2400	4450	4550	–	–	–	–	300
0.2	–	–	–	2401	4544	4561	–	–	–	–	1000
0.45	–	–	4553TC	2402TC	4452TC	4551TC	–	–	–	–	100
0.45	–	–	4553	2402	4452	4551	–	–	–	–	300
0.45	–	–	4555	2403	4545	–	–	–	–	–	1000
0.8	–	–	–	–	–	–	–	–	–	–	300
Acrodisc 13 mm non-sterile filter											
0.2	–	–	–	–	4455TC	4427	–	–	–	–	100
0.2	–	–	4423	–	4455	4540	–	–	–	–	300
0.2	4692	–	4542	–	–	–	–	–	–	–	1000
0.45	–	–	–	–	4457TC	4426	–	–	–	–	100
0.45	–	–	4422	–	4457	4541	–	–	–	–	300
0.45	–	–	4543	–	–	–	–	–	–	–	1000
Acrodisc 25 mm sterile filter											
0.1	4611	–	–	–	–	–	–	–	–	–	50
0.2	4612	–	–	–	–	–	4433	4908-N	–	–	50
0.45	4614	–	–	–	–	–	–	–	–	–	50
0.45	–	–	–	–	–	–	–	–	–	–	300
0.8/0.2	4187	–	–	–	–	–	–	–	–	–	50
0.8	4618	–	–	–	–	–	–	–	–	–	50
1.2	–	4190	–	–	–	–	–	–	–	–	50
5.0	–	4199	–	–	–	–	–	–	–	–	50

Ordering information

Acrodisc syringe filters (continuation)

Pore size (µm)	Supor membrane	Versapor membrane	PTFE	wwPTFE	PVDF	Nylon	DMSO nylon	Posidyne	GF	GF/Nylon	Quantity/ pack
Acrodisc 4 mm filter											
0.45	–	–	4472	–	–	–	–	–	–	–	750
Acrodisc 25 mm non-sterile filter											
0.1	4668	–	–	–	–	–	–	–	–	–	1000
0.2	–	–	4225TC	–	4406TC	–	–	–	–	–	50
0.2	–	–	4225	4927	4406	–	–	–	–	–	200
0.2	4506	–	4521	4929	4520	4436TC	–	–	–	–	1000
0.45	4508TC	–	4219TC	4914TC	4408TC	4436	–	–	–	–	50
0.45	–	–	4219	4914	4408	4522	–	–	–	4549	200
0.45	–	4487	–	–	–	4438TC	–	–	–	–	300
0.45	4508	–	4501	4932	–	4438	–	–	–	4528	1000
0.8	4509	–	–	–	–	–	–	–	–	–	1000
0.8/0.2	4504	–	–	–	4500	4502	–	–	–	–	1000
1.0	–	–	–	–	–	–	–	–	–	–	50
1.0	–	–	4226	–	–	–	–	–	4523	–	200
1.0	–	–	4503	–	–	–	–	–	4529	–	1000
1.2	–	4488	–	–	–	–	–	–	–	–	300
5.0	–	4489	–	–	–	–	–	–	–	–	300
Acrodisc 32 mm sterile filter											
0.1	4651	–	–	–	–	–	–	–	–	–	50
0.2	4652	–	–	–	–	–	–	–	–	–	50
0.45	4654	–	–	–	–	–	–	–	–	–	50
0.8/0.2	4658	–	–	–	–	–	–	–	–	–	50
1.2	4656	–	–	–	–	–	–	–	–	–	50
5 .0	4650	–	–	–	–	–	–	–	–	–	50
Acrodisc 32 mm non-sterile filter											
0.2	4655	–	–	–	–	–	–	–	–	–	1000
0.45	4653	–	–	–	–	–	–	–	–	–	1000
0.8/0.2	4659	–	–	–	–	–	–	–	–	–	1000
1.2/0.45	4661	–	–	–	–	–	–	–	–	–	1000
5 .0	4662	–	–	–	–	–	–	–	–	–	1000

Acrodisc PSF syringe filters

Acrodisc PSF are high performance syringe filters provide consistent, reliable results that can be used for general clarification or application specific uses like dissolution, HPLC, and IC.

Acrodisc PSF syringe filters

- Accurate pore size rating: Acrodisc PSF syringe filters contain more membrane by surface area and are more retentive.
- Superior HPLC column protection: Better retention efficiency extends column life.
- 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 designed to withstand high operating pressure and avoid filter burst.
- 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 filtration systems.

- Hydrophilic polytetrafluoroethylene (wwPTFE)
- Hydrophilic nylon
- Hydrophilic polyvinylidene fluoride (PVDF)
- Hydrophobic polytetrafluoroethylene (PTFE)
- Regenerated cellulose (RC)
- Versapor membrane (hydrophilic acrylic copolymer on a nonwoven support)
- GF55 and GF92 glass microfiber media

Technical specifications

Acrodisc PSF syringe filters

Filter media	wwPTFE, Nyl, PVDF, PTFE, Supor RC membrane, and Versapor membrane
GxF prefilter	GF55, GF92 and GF
Housings	Polypropylene (PP)
Effective filtration area	3.9 cm^2
Sample volume	< 150 mL
Inlet and outlet connections	Female threaded luer inlet, male slip luer outlet
Maximum operating temperature	55°C

Ordering information

Acrodisc PSF syringe filters

Pore size (µm)	Media	Catalog number	Autopack tubes	Quantity/pack
1.0	Glass fiber	AP-4523		200
1.0	Glass fiber	AP-4527	Yes	200
1.0	Glass fiber	AP-4529		1000
0.2	GF/Nylon	AP-4787		200
0.45	GF/Nylon	AP-4548	Yes	200
0.2	GF/Nylon	AP-4788		1000
0.45	GF/Nylon	AP-4528		1000
0.2	GF/PTFE	AP-4790		200
0.2	GF/PTFE	AP-4791		1000
0.2	GF/PVDF	AP-4793		200
0.45	GF/PVDF	AP-4310		200
0.45	GF/PVDF	AP-4308		1000
0.45	GF/Supor	AP-4426		1000
0.2	GF/wwPTFE	AP-4913TC		50
0.2	GF/wwPTFE	AP-4913		200
0.2	GF/wwPTFE	AP-4915		1000
0.45	GF/wwPTFE	AP-4919TC		50
0.45	GF/wwPTFE	AP-4919		200
0.45	GF/wwPTFE	AP-4920	Yes	200
0.45	GF/wwPTFE	AP-4921		1000
0.7	GF55	AP-4140		1000
0.7	GF55	AP-4141	Yes	200
1.0	GF92	AP-4142		1000
1.0	GF92	AP-4143	Yes	200
0.2	GXF/Nylon	AP-4787TC		50
0.45	GXF/Nylon	AP-4549TC		50
0.45	GXF/Nylon	AP-4549		200
0.45	GXF/PTFE	AP-4303TC		50
0.45	GXF/PTFE	AP-4303		200
0.45	GXF/PTFE	AP-4302		1000
0.2	GXF/PVDF	AP-4793TC		50
0.45	GXF/PVDF	AP-4310TC		50
0.45	GXF/PVDF	AP-4309	Yes	200
0.2	GXF/Supor	AP-4799		200
0.2	GXF/Supor	AP-4798	Yes	200

Ordering information

Acrodisc PSF syringe filters (continuation)

Pore size (µm)	Media	Catalog number	Autopack tubes	Quantity/pack
0.45	GXF/Supor	AP-4425		200
0.2	Nylon	AP-4436TC		50
0.2	Nylon	AP-4436		200
0.2	Nylon	AP-4522		1000
0.45	Nylon	AP-4438TC		50
0.45	Nylon	AP-4438		200
0.45	Nylon	AP-4517	Yes	200
0.45	Nylon	AP-4502		1000
0.2	PTFE	AP-4225TC		50
0.2	PTFE	AP-4225		200
0.2	PTFE	AP-4521		1000
0.45	PTFE	AP-4219TC		50
0.45	PTFE	AP-4518	Yes	200
0.45	PTFE	AP-4219		200
0.45	PTFE	AP-4501		1000
0.2	PVDF	AP-4796TC		50
0.2	PVDF	AP-4797		1000
0.45	PVDF	AP-4408TC		50
0.45	PVDF	AP-4408		200
0.45	PVDF	AP-4519	Yes	200
0.45	PVDF	AP-4500		1000
0.45	RC	AP-4145	Yes	200
0.45	RC	AP-4144		1000
0.45	RCGF	AP-4147	Yes	200
0.45	RCGF	AP-4146		1000
0.2	wwPTFE	AP-4910TC		50
0.2	wwPTFE	AP-4910		200
0.2	wwPTFE	AP-4912		1000
0.45	wwPTFE	AP-4916TC		50
0.45	wwPTFE	AP-4916		200
0.45	wwPTFE	AP-4917	Yes	200
0.45	wwPTFE	AP-4918		1000
0.8	Versapor	AP-4189		200
10	Versapor	AP-4001		200
10	Versapor	AP-4000	Yes	200
10	Versapor	AP-4002		1000

wwPTFE–Water-wettable polytetrafluoroethylene
PTFE–Polytetrafluoroethylene
GF55–Glass microfiber media
GF92–Glass microfiber media
RC–Regenerated cellulose
PES–Polyethersulfone
PVDF–Polyvinylidene difluoride

Difficult to filter

Whatman GD/X™ syringe filters

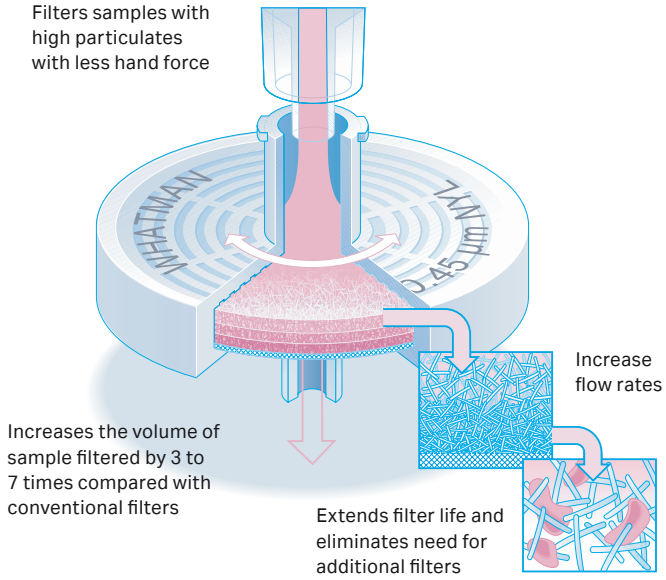
The Whatman GD/X range is designed for difficult to filter, high particulate loaded samples. Constructed of a pigment-free polypropylene housing with a prefiltration stack of Whatman GMF 150 (graded density) and GF/F glass microfiber media, these filters remove sample contamination and allow you to filter difficult samples with less hand pressure. Whatman GD/X syringe filters can process three to seven times more sample volume than standard syringe filters.

GMF 150 and GF/F are produced from 100% borosilicate glass microfiber. Graded density GMF 150 medium has a coarse top layer meshed with a fine bottom layer that retains particles to 1.0 µm. A GF/F filter then retains particles down to 0.7 µm. The prefilter stack ends with a final membrane.

The filter construction facilitates exceptional loading capacity with fast flow rates. This prevents the build up of back pressure typically caused by the blocking of an unprotected membrane.

Features and benefits

- 13 mm devices for samples up to 10 mL and 25 mm devices for samples greater than 10 mL. The volume of sample that can be filtered through each filter depends on the characteristics of the sample.
- Sterile options.
- Pigment-free polypropylene housing.
- Prefiltration stack of Whatman GMF 150 (graded density) and GF/F glass microfiber media.
- Minimizes sample contamination.
- Requires less hand pressure, even with difficult samples.
- Processes three to seven times more sample volume.



Applications

Whatman GD/X syringe filters are excellent for heavily particulate-laden samples found in:

- Dissolution testing
- Content uniformity testing
- Concentration analysis
- Routine sample preparation
- Food analysis
- Environmental samples
- Composite assay

Technical specifications

Whatman GD/X syringe filters

	Whatman GD/X 13 mm filter	Whatman GD/X 25 mm filter
Housing	Polypropylene (pigment free)	Polypropylene (pigment free)
Filtration area	1.3 cm^2	4.6 cm^2
Maximum pressure	6.9 bar	5.2 bar
Volume hold-up*—full housing	0.5 mL	1.4 mL
—with air purge	50 µL (approx)	250 µL (approx)
Dimensions*	20.8 × 30.0 mm	20.8 × 30.0 mm
Weight	3 g (approx)	3 g (approx)
Flow direction	Flow should enter from the inlet	Flow should enter from the inlet
Inlet connection	Female locking luer	Female locking luer
Outlet connection	Male locking luer	Male locking luer
Sterlization	Autoclave at 121°C (131°C max) at 1 bar for 20 min	Autoclave at 121°C (131°C max) at 1 bar for 20 min
Glass microfiber prefiltration media	100% borosilicate glass fiber GMF 150 10 µm: 1 µm GF/F 0.7 µm	100% borosilicate glass fiber GMF 150 10 µm: 1 µm GF/F 0.7 µm

* *Housings are the same size but the filtration size is smaller*

Ordering information

Whatman GD/X syringe filters

Pore size (µm)	Catalog number	Media	Quantity/pack
Whatman GD/X 13 mm non-sterile filter			
0.2	6880-1302	CA	150
0.2	6870-1302	Nylon	150
0.45	6870-1304	Nylon	150
0.45	6871-1304	Nylon	1500
0.2	6876-1302	PES	150
0.2	6872-1302	PVDF	150
0.45	6872-1304	PVDF	150
0.45	6873-1304	PVDF	1500
0.2	6874-1302	PTFE	150
0.2	6875-1302	PTFE	1500
0.45	6874-1304	PTFE	150
0.45	6875-1304	PTFE	1500
1.6*	6882-1316	GF/A**	150
1.0*	6884-1310	GF/B**	150
2.7*	6888-1327	GF/D**	150
0.7*	6890-1307	GF/F**	150
0.45*	6894-1304	GMF	150
Whatman GD/X 25 mm non-sterile filter			
0.45	6882-2504	RC	150
0.45	6883-2504	RC	1500
0.2	6880-2502	CA	150
0.45	6880-2504	CA	150
0.45	6881-2504	CA	1500
0.2	6870-2502	Nylon	150
0.2	6871-2502	Nylon	1500
0.45	6870-2504	Nylon	150
0.45	6871-2504	Nylon	1500
5.0	6870-2550	Nylon	150
5.0	6871-2550	Nylon	1500
0.2	6876-2502	PES	150
0.2	6905-2502	PES	1500
0.45	6876-2504	PES	150
0.45	6905-2504	PES	1500

* *Glass microfiber particle retention rating*
** *Contains GMF 150 without the GF/F prefilter*
*** *Mildly hydrophobic*

CA—Cellulose acetate
GF—Glass fiber
GMF - Glass microfiber
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated cellulose

Ordering information

Whatman GD/X syringe filters (continuation)

Pore size (µm)	Catalog number	Media	Quantity/pack
Whatman GD/X 25 mm non-sterile filter			
0.2	6872-2502	PVDF	150
0.2	6873-2502	PVDF	1500
0.45	6872-2504	PVDF	150
0.45	6873-2504	PVDF	1500
0.2	6874-2502	PTFE	150
0.2	6875-2502	PTFE	1500
0.45	6874-2504	PTFE	150
0.45	6875-2504	PTFE	1500
1.6*	6882-2516	GF/A**	150
1.6*	6883-2516	GF/A**	1500
1.0*	6884-2510	GF/B**	150
1.2*	6886-2512	GF/C™**	150
2.7*	6888-2527	GF/D**	150
0.7*	6890-2507	GF/F**	150
0.7*	6891-2507	GF/F**	1500
0.45*	6894-2504	GMF**	150
0.45*	6895-2504	GMF**	1500
1.5*	6892-2515	934-AH™**	150
Whatman GD/X 25 mm sterile filtration			
0.2	6896-2502	PES	50
0.45	6896-2504	PES	50
0.2	6900-2502	PVDF	50
0.45	6900-2504	PVDF	50
0.45*	6902-2504	GMF**	50
0.2	6901-2502	CA	50
0.45	6901-2504	CA	50

* *Glass microfiber particle retention rating*
** *Contains GMF 150 without the GF/F prefilter*
*** *Mildly hydrophobic*

CA—Cellulose acetate
GF—Glass fiber
GMF - Glass microfiber
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated cellulose

GD/XP syringe filters

GD/XP disposable syringe filters are suitable for use with samples that require inorganic ion analysis, as levels of ion extractables are minimized. They are an alternative choice for users requiring a filter that exhibits extremely low protein binding characteristics.

GD/XP syringe filters contain a two-layer prefilter stack comprised of 20 µm and 5 µm polypropylene filters. The last stage of filtration is by membrane, which is positioned below the prefilter stack.

Applications

- HPLC sample preparation
- Trace metal analysis
- Sample preparation prior to determination of dissolved heavy metals

Technical specifications

GD/XP syringe filters

	GD/XP 25 mm
Housing	Polypropylene (pigment free)
Filtration area	4.6 cm^2
Maximum pressure	5.2 bar
Volume hold-up full housing with air purge	1.4 mL 250 µL (approx)
Dimensions	20.8 × 30.0 mm
Weight	3 g (approx)
Flow direction	Flow should enter from the inlet
Inlet connection	Female locking luer
Outlet connection	Male locking luer
Sterlization	Autoclave at 121°C (131°C max) at 1 bar for 20 min
Prefiltration media	PP 20 µm: 5 µm

Ordering information

GD/XP syringe filters

Diameter (mm)	Pore size (µm)	Catalog number	Media	Hydrophilic	Quantity/pack
25	0.45	6970-2504	Nylon	Yes	150
25	0.45	6971-2504	Nylon	Yes	1500
25	0.45	6994-2504	PES	Yes	150
25	0.45	6995-2504	PES	Yes	1500
25	0.45	6972-2504	PVDF	Yes	150
25	0.45	6973-2504	PVDF	Yes	1500
25	0.45	6992-2504	DpPP	No	150
25	0.45	6974-2504	PTFE	No	150
25	0.45	6993-2504	DpPP	No	1500

DpPP—Depth polypropylene filter
PES—Polyethersulfone
PVDF—Polyvinylidene difluoride
PTFE—Polytetrafluoroethylene

Anotop 10 and Anotop 25 Plus

The Anotop Plus syringe filter offers the added benefit of an integral glass microfiber prefilter. This unit enables difficult and hard-to-filter solutions to be filtered without adversely affecting the filtration efficiency of the final membrane. This can remove the need for sample clean-up or expensive and time-consuming sequential filtration.

Anotop Plus syringe filters

Applications

- Filtration of tissue culture media
- Clean-up of difficult samples
- Filtration of colloidal material
- Removal of mycoplasma
- HPLC sample preparation
- Biological sample preparation

Technical specifications

Anotop syringe filters

	Anotop 10 Plus	Anotop 25 Plus
Housing	Polypropylene	Polypropylene
Filtration area	0.78 cm^2	4.78 cm^2
Maximum pressure	6.9 bar	6.9 bar
Volume hold-up	< 30 µL	< 200 µL
Prefilter type	Glass microfiber (binderless)	Glass microfiber (binderless)
Membrane diameter	10 mm	25 mm
Membrane type	Anopore membrane	Anopore membrane
Average membrane thickness	60 µm	60 µm
Device width	15.4 mm	36.8 mm
Device length	18.5 mm	26.3 mm
Device shape	Hexagonal	Hexagonal
Construction process	Thermal weld	Thermal weld
Inlet connection	Female locking luer	Female locking luer
Outlet connection	Male locking luer	Male locking luer
Protein adsorption	Medium/High	Medium/High
Extractable materials	Low	Low
Cytotoxicity	Non-cytotoxic	Non-cytotoxic

Anotop 25 Plus Syringe Filters

Ordering information

Anotop syringe filters

Pore size (µm)	Media	Catalog number	Quantity/pack
Anotop 10 Plus filter			
0.02	Anopore membrane with prefilter	6809-3002	50
0.1	Anopore membrane with prefilter	6809-3012	50
0.2	Anopore membrane with prefilter	6809-3022	50
0.02	Anopore membrane with prefilter, sterile	6809-3102	50
Anotop 25 Plus filter			
0.02	Anopore membrane with prefilter	6809-4002	50
0.1	Anopore membrane with prefilter	6809-4012	50
0.2	Anopore membrane with prefilter	6809-4022	50
0.02	Anopore membrane with prefilter, sterile	6809-4102	50

850-DS channel filter plate

The 850-DS 8-channel filter plate is a disposable plate for use in the Agilent 850-DS dissolution sampling station, used for automated sample preparation in dissolution testing.

Automated dissolution sample preparation for increased productivity

The filter plates are designed for use with the optional filter module on the Agilent 850-DS dissolution sampling station to simplify filter replacement. Reliable alignment of the liquid path increases productivity in two ways: By reducing the risk of jamming, and by reducing leaks that may occur with manual sampling or other dissolution sample preparation systems.

Save time and eliminate errors associated with manual sampling. Use 850-DS 8-channel filter plates in your Agilent 850-DS dissolution sampling station.

- **Automated processing**: Up to 8 samples simultaneously.
- **Readily available:** Wide range of pore sizes and membranes.

850-DS 8-channel filter plates have been developed in conjunction with Agilent.

850-DS 8-channel filter plate

Ordering information

850-DS 8-channel filter plate

Pore size (µm)	Media	Catalog number	Quantity/pack
0.45	PTFE	7707-3000	50
0.45	Nylon	7707-3100	50
0.45	PES	7707-3200	50
0.7	GMF	7707-3300	50
0.2	PTFE	7707-3400	50
0.2	Nylon	7707-3500	50
0.2	PES	7707-3600	50
0.2	PVDF	7707-3700	50
0.45	PVDF	7707-3800	50
1.0	GMF	7707-3900	50

Application specific syringe filters

Puradisc Aqua filters

Puradisc Aqua syringe filters are designed for filtration of environmental samples prior to chemical oxygen demand (COD) and dissolved organic carbon (DOC) analysis. The membranes used in these devices are prewashed prior to assembly of the filters to reduce the organic carbon level.

Puradisc Aqua filters

Ordering information

Puradisc Aqua syringe filters

Pore size (µm)	Catalog number	Media/housing	Connection in/out	Color code	Quantity/pack
0.45	10462656	CA/PC	FLL/ML	White	50
0.45	10462655	CA/PC	FLL/ML	White	100
0.45	10462650	CA/PC	FLL/ML	White	500

CA—Cellulose acetate PC—Polycarbonate
FLL—Female luer lock
ML—Male luer

Ion chromatography (IC) Acrodisc syringe filters

Ion chromatography (IC) Acrodisc syringe filters are optimized to provide consistent results when analyzing ionic species.

Key features:

- Accurate results for the most sensitive analysis of ionic species. Certified for low levels of extractables detected by conductivity.
- High flow rates with optimized Supor polyethersulfone membrane.
- Conforms to quality release criteria for ion chromatography (IC) extractables.
- Convenient sizes for small sample volumes.

Applications:

- Specifically designed for IC applications.
- Excellent filter selection for dissolution samples.
- Low drug and protein binding for pharmaceutical filtration.
- Supor IC membrane discs are recommended for aqueous samples only.
- The syringe filters for ion chromatography applications are certified for low levels of inorganic extractables, with actual background levels of filter extractables for the first 1.5 mL of filtrate that typically are less than 50 ppb for nitrate and less than 20 ppb for chloride, phosphate, and sulfate.

Ion chromatography (IC) Acrodisc syringe filters

Ordering information

Ion chromatography (IC) Acrodisc syringe filters

Pore size (µm)	Catalog number	Quantity/pack
IC Acrodisc 13 mm non-sterile		
0.2	4483	300
0.2	4683	1000
0.45	4485	300
0.45	4685	1000
IC Acrodisc 25 mm non-sterile		
0.2	4583	200
0.2	4783	1000
0.45	4585	200
0.45	4785	1000
PSF IC Acrodisc 25 mm non-sterile		
0.45	AP-4585	200
0.45	AP-4785	1000

SPARTAN™ HPLC certified syringe filters

SPARTAN syringe filters provide reproducible results from filtration of organic or aqueous solutions for HPLC. For batch-to-batch consistency, the SPARTAN range of filters is tested and certified for the absence of UV-absorbing substances at wavelengths of 210 and 254 nm with water, methanol, and acetonitrile.

Features and benefits

- Ready-to-use filter unit with a hydrophilic, low protein-binding membrane made of regenerated cellulose.
- Excellent chemical resistance against the standard aqueous and organic HPLC solvents.
- 13 mm diameter with extremely low dead volume < 30 µL.
- Use for any application requiring a chemically resistant, hydrophilic, low protein- binding membrane.
- Documented batch-to-batch quality and consistency ensure reproducible results.
- 13 mm diameter with mini-tip outlet is excellent for filtration into very small sample bottles.

Applications

- Filtration of organic and aqueous solutions in HPLC with reproducible results.
- Purification of aqueous and organic solutions.
- Filtration of protein solutions.

Technical tip

Download your SPARTAN 13 and 30 batch certificate from to document the purity of each batch.

To download, visit *cytiva.com/support/quality/certificates*. Enter the lot number, and you will receive the lot-specific chromatogram and test conditions.

SPARTAN 30 mm syringe filter

Ordering information

SPARTAN HPLC certified syringe filters

Diameter (mm)	Pore size (µm)	Catalog number	Membrane/ housing material	Connection (in/out)	Color code	Quantity/pack
13	0.2	10463040	RC/PP	FLL/mini-tip	Dark brown	100
13	0.2	10463042	RC/PP	FLL/mini-tip	Dark brown	500
13	0.2	10463100	RC/PP	FLL/ML	Dark brown	100
13	0.2	10463102	RC/PP	FLL/ML	Dark brown	500
13	0.45	10463030	RC/PP	FLL/mini-tip	Light brown	100
13	0.45	10463032	RC/PP	FLL/mini-tip	Light brown	500
13	0.45	10463110	RC/PP	FLL/ML	Light brown	100
13	0.45	10463112	RC/PP	FLL/ML	Light brown	500
30	0.2	10463062	RC/PP	FLL/ML	Dark brown	500
30	0.45	10463053	RC/PP	FLL/ML	Light brown	50
30	0.45	10463052	RC/PP	FLL/ML	Light brown	500

FLL—Female locking leur
ML—Male locking leur
PP—Polypropylene
RC—Regenerated cellulose

Protein Prep syringe filter for ÄKTA™ systems

Sample preparation with the Protein Prep syringe filter for ÄKTA systems

Sample
(from cell lysis and centrifugation)

Filtration with syringe filter
To remove particles and microorganisms

The sample can be injected into the system

ÄKTA™ start system

Protein Prep syringe filter for ÄKTA systems

- 13 mm or 30 mm diameter
- 0.2 µm or 0.45 µm pore size

Tips for choosing the right filter

- Use 13 mm diameter filter for sample volumes < 10-30 mL
- Use 0.2 µm pore size filter if the particle size of the chromatography resin is < 3 µm

Ordering information

Protein Prep syringe filter for ÄKTA systems

Diameter (mm)	Pore size (µm)	Catalog number	Quantity/pack
13	0.2	150	10463103
13	0.45	150	10463113
30	0.2	150	10463043
30	0.45	150	10463033

All-in-one filters and filter vials

Whatman all-in-one syringeless filters and filter vials are preassembled, convenient filtration devices for removing particulates from samples. They replace syringe-coupled filtration devices with a single disposable unit, making sample preparation easier, faster, and efficient.

Mini-UniPrep syringeless filters

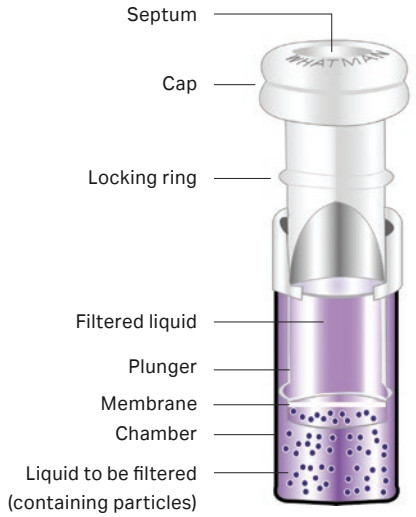
Mini-UniPrep™ integrated syringeless filters and filter vials

The Mini-UniPrep preassembled filtration device consists of a 0.4 mL capacity chamber and plunger. The plunger contains a filtration membrane at one end and a preattached cap and septum at the other. The plunger is pressed through the sample in the outer chamber and positive pressure forces the filtrate into the reservoir of the plunger. Air escapes through the vent hole until the locking ring is engaged, providing an air-tight seal. Within seconds, Mini-UniPrep device can be placed into any autosampler able to contain 2 mL vials for injection into your instrument.

The device can be used manually or with a compressor unit. The multicompressor can process up to six samples at one time, further improving sample processing time and reducing the risk of hand stress. The Mini-UniPrep device is designed to fit into any autosampler accommodating 12 × 32 mm vials. Alternatively, the septum can be pierced with a needle and the sample drawn off for manual injection into an analyzer.

Features and benefits

- All-in-one filtration process allows you to process sample loads in one-third of the time.
- Wide range of membrane choices from 0.2 and 0.45 µm pore sizes to meet specific sample application requirements.
- Compatible with most major autosamplers.
- Fewer consumables are required, reducing waste by up to 40%.



Applications

- Routine HPLC/UHPLC analysis
- Composite assays
- Content uniformity
- Protein precipitation
- Solubility testing
- Dissolution testing
- Sample filtration

A variety of Mini-UniPrep filters to meet your needs

- Amber Mini-UniPrep device for customers who need to filter light-sensitive samples.
- Slit septa Mini-UniPrep device for customers using robotics to maximize throughput.

Amber Mini-UniPrep filter vial

Protects samples from UV damage.

Features and benefits

- Amber colorant prevents photodegradation of light sensitive samples.
- Same colorant used in pharmaceutical containers designed to meet United States Pharmacopeia specifications for light resistance.
- Translucent amber chamber and plunger enable easy visual inspection.

Applications

- Use with any compound that requires protection from light, such as catecholamines or vitamins.

Mini-UniPrep multi-compressor

Mini-UniPrep multi-compressor tray

Slit septa Mini-UniPrep filter vial

For high-throughput automation.

Features and benefits

- Slit septum cap allows Mini-UniPrep device use with current robotics on HPLC instruments for high throughput automation.
- Durable yet flexible slit septum cap is designed for instruments with sensitive sampling needs. Sample evaporation is minimal.
- Pre-slit septa allows easier needle penetration.

Applications

- Use with standard robotics on HPLC instruments with sensitive needles, allowing for higher throughput.

Mini-UniPrep in an HPLC autosampler

Amber Mini-UniPrep filter vial

Selection

Mini-UniPrep device filtering media

Sample type	Suitable Mini-UniPrep device media
High particulate laden liquids	Glass microfiber
Aqueous/organic samples in 3 to 10 pH range	Nylon
Chemically aggressive solutions	Polytetrafluoroethylene
Biological samples requiring low protein binding media	Regenerated cellulose (RC) or polyethersulfone
Aqueous/organic solvents, low nonspecific protein binding media	Polyvinylidene difluoride (PVDF) or regenerated cellulose
Aqueous/organic solvents, high flow and loading capacity	Depth polypropylene filter, non-woven PP fibers

Technical specifications

Mini-UniPrep device integrated syringeless filters and filter vials

Sample type	Suitable Mini-UniPrep device media
Dimensions	Equivalent in size to 12 × 32 mm vials
Materials of construction	
Housing and cap	Polypropylene
Filter media	As specified
Septa	PTFE coated silicone rubber
Filtering capacity	0.4 mL
Nominal force needed to compress	Approximately 8.2 kg
Maximum operating temperature	50°C

Ordering information

Mini-UniPrep integrated syringeless filters and filter vials

Pore size (µm)	Catalog number	Media	Quantity/pack
Standard cap: Translucent housing			
0.2	UN203NPENYL	Nylon	100
0.2	UN503NPENYL	Nylon	1000
0.45	UN203NPUNYL	Nylon	100
0.45	UN503NPUNYL	Nylon	1000
0.2	UN203NPEAQU	PVDF	100
0.2	UN503NPEAQU	PVDF	1000
0.45	UN203NPUAQU	PVDF	100
0.45	UN503NPUAQU	PVDF	1000
0.2	UN203NPERC	RC	100
0.2	UN503NPERC	RC	1000
0.45	UN203NPURC	RC	100
0.2	UN203NPEORG	PTFE	100
0.2	UN503NPEORG	PTFE	1000
0.45	UN203NPUORG	PTFE	100
0.45	UN503NPUORG	PTFE	1000
0.45	UN203NPUDPP	DpPP	100
0.45	UN503NPUDPP	DpPP	1000
0.45	UN203NPUGMF	GMF	100
0.45	UN503NPUGMF	GMF	1000
Accessories: Multi-compressor			
–	MUPMCPBC8	Mini-UniPrep multi-compressor 1/pack comes with one tray	
–	MUPMCBT8	Mini-UniPrep multi-compressor tray 1/pack	

PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated cellulose
DpPP—Depth polypropylene filter
GMF—Glass microfiber

Ordering information

Mini-UniPrep integrated syringeless filters and filter vials (continuation)

Pore size (µm)	Catalog number	Media	Quantity/pack
Slit septum cap, translucent housing			
0.2	US503NPENYL	Nylon	1000
0.45	US203NPUNYL	Nylon	100
0.2	US203NPEPES	PES	100
0.2	US503NPEPES	PES	1000
0.45	US203NPUPES	PES	100
0.2	US203NPEAQU	PVDF	100
0.2	US503NPEAQU	PVDF	1000
0.45	US203NPUAQU	PVDF	100
0.45	US503NPUAQU	PVDF	1000
0.2	US203NPEORG	PTFE	100
0.2	US503NPEORG	PTFE	1000
0.45	US203NPUORG	PTFE	100
0.45	US503NPUORG	PTFE	1000
0.45	US503NPUDPP	DpPP	1000
0.45	US203NPUGMF	GMF	100
0.45	US503NPUGMF	GMF	1000
Amber housing (for light sensitive samples), standard cap			
0.45	UN203APUPES	PES	100
0.2	UN203APEAQU	PVDF	100
0.45	UN203APUORG	PTFE	100

PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
RC—Regenerated cellulose
DpPP—Depth polypropylene filter
GMF—Glass microfiber

UniPrep™ filter vials

UniPrep filter vials are preassembled filtration devices for the filtration and storage of laboratory samples. These devices are quick and easy to use and feature a plunger, filter, and vial in one unit. They replace syringe-coupled filtration devices with single, disposable units.

UniPrep devices consist of two parts: A test tube and filter-plunger. The design incorporates a prefilter and a membrane into the tip of the plunger. When the filter-plunger is pressed through the liquid placed in the test tube, positive pressure forces the filtrate up into the reservoir of the filter-plunger.

UniPrep devices function in a similar way to the Mini-UniPrep device. However, UniPrep filter vial does not contain a septum in the cap and can be used to filter larger volumes (1 to 5 mL).

UniPrep syringeless filters

Features and benefits

- Integral storage vial saves time and minimizes laboratory waste.
- Built-in glass fiber prefilter means even difficult samples are quick and easy to prepare.
- Choice of membranes for wide sample compatibility.

Applications

- Sample preparation (e.g., prior to preparative HPLC)
- Difficult-to-filter samples
- Quick filtration of samples

The UniPrep filter vial is selected based on compatibility with the sample in use. In manual operation, the tip is brought into contact with the liquid, then the filter plunger is slowly pushed into the test tube until it stops at the bottom. The UniPrep vial is emptied either by decanting into a sample or autosampler vial or by drawing the filtered sample into a syringe for manual injection into an instrument.

UniPrep vial membranes are available in a range of media for various applications.

- **GMF:** Layered glass microfiber depth filter for use with samples containing aqueous or organic solvents (indicated pore size is the particle retention rating).
- **NYL:** Naturally hydrophilic membrane for filtration of samples containing aqueous or organic solvents with a pH range of 3-10.
- **PTFE:** Chemically inert PTFE membrane for filtration of samples containing > 50% organic solvent.
- **PVDF:** Low protein binding membrane for filtration of samples with aqueous or aqueous/organic solvent composition.

Technical specifications

UniPrep filter vials

Housing	Polypropylene
Filtration area	0.3 cm^2
Capacity	1-5 mL
Volume hold-up	50 µL
Prefilter	Glass fiber
Sterilization	Autoclave: 121°C at 1 bar for 20 min

Ordering information

UniPrep filter vials

Pore size (µm)	Catalog number	Media	Quantity/pack
0.45	UN113UNYL	Nylon	50
0.45	UN513UAQU	PVDF	1000
0.45	UN113UORG	PTFE	50
0.45*	UN113UGMF	GMF	50

* *Particle retention rating*
GMF—Glass microfiber
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride

Autovial™ filter vials

Autovial filter vials are preassembled filtration devices for removing particulates from samples. They replace syringe-coupled filtration devices with single, disposable units.

Autovial devices are comprised of two parts: A graduated filter barrel and plunger. The design features an integral filter, built-in air purge, and a support stand that protects the recessed slip-luer tip. They are available in a 5 mL and 12 mL volume capacity.

The Autovial filter is selected according to membrane compatibility with the sample. In practice, the sample is poured into the 5 mL or 12 mL capacity filter barrel. A plunger is inserted into the barrel until the bottom is securely in place, there will be an air gap between the sample and plunger. Then, the tip of the Autovial filter is placed into the mouth of an autosampler vial or container and the plunger compressed. Filtration begins immediately. Plunger is compressed as it reaches the bottom and the membrane is purged with air for maximum sample recovery. For direct instrument injection, a needle is placed on the Autovial slip-luer outlet.

Autovial syringeless filters

Features and benefits

- Single unit convenience: Unit is pre-assembled and easy to load.
- Choice of filter media for compatibility with a wide range of sample types.
- Excellent for hazardous samples. Self-contained device removes the risk of filter pop-off.
- Built-in air purge maximizes sample recovery.
- Glass fiber or polypropylene prefilter is available in selected 12 mL vials for difficult-to-filter samples.

Autovial filter membranes are available in a range of filter materials for various applications.

- **GMF:** Glass microfiber depth filter for samples in aqueous or organic solutions.
- **NYL:** Nylon membrane for aqueous and organic samples within a pH range of 3 to 10.
- **PTFE:** For samples with > 50% organic solvent.
- **PVDF:** Low nonspecific protein binding membrane for samples in aqueous solutions and/ or organic solvents.

Technical specifications

Autovial filter vials

	Autovial 5	Autovial 12
Housing	Polypropylene	Polypropylene
Filtration area	1.7 cm^2	3.0 cm^2
Capacity	5 mL	12 mL
Volume hold-up	30 µL	140 µL
Outlet connection	Male slip luer	Male slip luer
Sterilization	Autoclave at 121°C for 20 min	Autoclave at 121°C for 20 min

Ordering information

Autovial filter vials

Pore size (µm)	Catalog number	Media	Quantity/pack
Autovial 5 filter no prefilter			
0.45	AV115NPUAQU**	PVDF	50
0.2	AV115NPEORG**	PTFE	50
0.45	AV115NPUORG**	PTFE	50
0.45*	AV115UGMF**	GMF	50
Autovial 12 filter with glass prefilter			
0.2	AV125ENAO	Nylon	50
0.45	AV125UNAO	Nylon	50
0.45	AV525UNAO	Nylon	1000
0.2	AV125EAQU	PVDF	50
0.45	AV125UAQU	PVDF	50
0.45	AV525UAQU	PVDF	1000
0.45	AV125NPUAQU**	PVDF	50
0.2	AV125EORG	PTFE	50
0.45	AV125UORG	PTFE	50
0.45	AV525UORG	PTFE	1000
0.45*	AV125UGMF	GMF	50

* *Particle retention rating*
** *No prefilters*

GMF—Glass microfiber
PES—Polyethersulfone
PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride

Advantage syringe filters

Uniflo™ syringe filters

Uniflo syringe filters are disposable filters designed to provide clean filtrate from small volumes up to 100 mL. They are available in a variety of membrane choices with a polypropylene overmold housing. Uniflo syringe filters are available with:

- 13 mm, 25 mm or 30 mm diameters
- 0.2 µm or 0.45 µm pore sizes
- Sterile and non-sterile options
- Laser etched printing on the filter for easy identification

Whatman Uniflo syringe filters

Filter media	Typical application
Nylon	Aqueous or organic samples; hydrophilic
PES	Aqueous samples
PTFE	Organic based samples Hydrophobic membrane
PVDF	Aqueous or organic based samples; low protein binding membrane
H-PTFE	Aqueous and/or aggressive organic solvents; hydrophilic

Integrity test data

Description	Pore size (µm)	Minimum bubble point (psi)
Nylon	0.2	29.0
Nylon	0.45	20.0
Polyethersulfone	0.2	40.0
Polyethersulfone	0.45	33.0
Polytetrafluoroethylene*	0.2	10.0
Polytetrafluoroethylene*	0.45	6.0
Polyvinylidene difluoride	0.2	39.0
Polyvinylidene difluoride	0.45	17.5
Hydrophilic polytetrafluoroethylene	0.2	49
Hydrophilic polytetrafluoroethylene	0.45	28

* *Bubble point determined with 95% isopropyl alcohol (IPA) (v/v), all others determined with water.*

Technical specifications

Uniflo syringe filters

	Uniflo 13 mm filter	Uniflo 25 mm filter	Uniflo 30mm w/GF prefilter syringe filter
Dimensions	19.6 mm × 16.9 mm	24.5 mm × 29.2 mm	24.5 mm × 34.5 mm
Filtration area	0.88 cm^2	3.45 cm^2	4.98 cm^2
Operating pressure	67.5 psi	67.5 psi	67.5 psi
Housing	Polypropylene	Polypropylene	Polypropylene
Volume hold up	≤ 50 µL after air purge	≤ 100 µL after air purge	≤ 200 µL after air purge
Flow direction	Flow should enter from inlet	Flow should enter from inlet	Flow should enter from inlet
Inlet connectors	Female locking luer	Female locking luer	Female locking luer
Outlet connectors	Male slip luer	Male slip luer	Male slip luer
Sterilization	Autoclave at 121°C at 15 psi for 20 min	Autoclave at 121°C at 15 psi for 20 min	Autoclave at 121°C at 15 psi for 20 min
Biosafe	Polymer grade and membrane types meet the USP test requirements (for Class VI Plastics)	Polymer grade and membrane types meet the USP test requirements (for Class VI Plastics)	Polymer grade and membrane types meet the USP test requirements (for class VI plastics)
Prefiltration media	N/A	N/A	100% borosilicate glass

Whatman Uniflo syringe filters

Ordering information

Uniflo syringe filters

Diameter (mm)	Sterility	Pore size (µm)	Media	Catalog number	Quantity/pack
13	Nonsterile	0.2	PVDF	9909-1302	500
13	Nonsterile	0.45	PVDF	9909-1304	500
13	Nonsterile	0.2	Nylon	9910-1302	500
13	Nonsterile	0.45	Nylon	9910-1304	500
13	Nonsterile	0.2	PTFE	9911-1302	500
13	Nonsterile	0.45	PTFE	9911-1304	500
13	Nonsterile	0.2	H-PTFE	9920-1302	100
13	Nonsterile	0.2	H-PTFE	9921-1302	500
13	Nonsterile	0.45	H-PTFE	9920-1304	100
13	Nonsterile	0.45	H-PTFE	9921-1304	500
13	Nonsterile	0.2	PES	9912-1302	500
13	Nonsterile	0.45	PES	9912-1304	500
25	Nonsterile	0.2	PVDF	9909-2502	500
25	Nonsterile	0.45	PVDF	9917-2504	100
25	Nonsterile	0.45	PVDF	9909-2504	500
25	Nonsterile	0.2	Nylon	9910-2502	500
25	Nonsterile	0.45	Nylon	9918-2504	100
25	Nonsterile	0.45	Nylon	9910-2504	500
25	Nonsterile	0.2	PTFE	9911-2502	500
25	Nonsterile	0.45	PTFE	9911-2504	500
25	Nonsterile	0.2	H-PTFE	9920-2502	100
25	Nonsterile	0.2	H-PTFE	9921-2502	500
25	Nonsterile	0.45	H-PTFE	9920-2504	100
25	Nonsterile	0.45	H-PTFE	9921-2504	500
25	Nonsterile	0.2	PES	9912-2502	500
25	Nonsterile	0.45	PES	9912-2504	500
13	Sterile	0.2	PES	9916-1302	100
13	Sterile	0.45	PES	9916-1304	100
25	Sterile	0.2	PVDF	9913-2502	45
25	Sterile	0.45	PVDF	9913-2504	45
25	Sterile	0.2	PES	9914-2502	45
25	Sterile	0.45	PES	9914-2504	45
25	Sterile	0.2	PES	9915-2502	200
25	Sterile	0.45	PES	9915-2504	200

PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
PES—Polyethersulfone
H-PTFE – Hydrophilic polytetrafluoroethylene

Ordering information

Uniflo syringe filters (continuation)

Diameter (mm)	Sterility	Pore size (µm)	Media	Catalog number	Quantity/pack
30 mm with GF prefilter	Non-sterile	0.2	PES	9923-3002	100
30 mm with GF prefilter	Non-sterile	0.45	PES	9923-3004	100
30 mm with GF prefilter	Non-sterile	0.2	PES	9924-3002	500
30 mm with GF prefilter	Non-sterile	0.45	PES	9924-3004	500
30 mm with GF prefilter	Non-sterile	0.2	PVDF	9925-3002	100
30 mm with GF prefilter	Non-sterile	0.45	PVDF	9925-3004	100
30 mm with GF prefilter	Non-sterile	0.2	PVDF	9926-3002	500
30 mm with GF prefilter	Non-sterile	0.45	PVDF	9926-3004	500
30 mm with GF prefilter	Non-sterile	0.2	PTFE	9927-3002	100
30 mm with GF prefilter	Non-sterile	0.45	PTFE	9927-3004	100
30 mm with GF prefilter	Non-sterile	0.2	PTFE	9928-3002	500
30 mm with GF prefilter	Non-sterile	0.45	PTFE	9928-3004	500
30 mm with GF prefilter	Non-sterile	0.2	Nylon	9929-3002	100
30 mm with GF prefilter	Non-sterile	0.45	Nylon	9929-3004	100
30 mm with GF prefilter	Non-sterile	0.2	Nylon	9930-3002	500
30 mm with GF prefilter	Non-sterile	0.45	Nylon	9930-3004	500
30 mm with GF prefilter	Non-sterile	0.2	H-PTFE	9931-3002	100
30 mm with GF prefilter	Non-sterile	0.45	H-PTFE	9931-3004	100
30 mm with GF prefilter	Non-sterile	0.2	H-PTFE	9932-3002	500
30 mm with GF prefilter	Non-sterile	0.45	H-PTFE	9932-3004	500

PTFE—Polytetrafluoroethylene
PVDF—Polyvinylidene difluoride
PES—Polyethersulfone
H-PTFE – Hydrophilic polytetrafluoroethylene

Cytiva™ Protein chromatography sample and buffer filtration kit

Optimize protein purification with laboratory filtration solutions

Protein samples are essential for discovering new therapeutics and understanding disease pathways, however impurities can compromise results, clog columns, and damage instruments. Effective filtration is key to maintaining accuracy and protecting your workflow.

Cytiva's all-in-one Protein chromatography sample and buffer filtration kit simplifies sample prep by removing contaminants, safeguarding equipment, and delivering publication-ready results. Designed to work seamlessly with our chromatography resins and ÄKTA systems, it's the ideal solution for reliable protein purification.

Scan the QR code to know more or order the Cytiva protein chromatography sample and buffer filtration kit.

Filtration membrane and application decision chart

	Aqueous						Solvent		Venting, equipment protection			
	PES	**GMF/ PES**	**Quartz/ Nylon**	**PVDF**	**Acrylic copolymer**	**GMF/acrylic copolymer**	**GMF/ nylon**	**Depth PP**	**PTFE**	**Dessicant or carbon/ PTFE**	**Carbon/GMF**	**GMF**
Aqueous Filtration of water-basd solutions like buffers, growth media, and reagents	AcroPak™ Supor AcroPak Supor EKV AcroCap™ VacuCap™ VacuCap PF Polycap TC	Polydisc AS Polydisc SPF Polycap SPF	–	–	Versapor	Versapor serum capsule	Polycap AS	Polydisc HD Polycap HD Mini Profile	–	–	–	–
Solvent Filtration of solutions such as alcohols, organic solvents, cleaning solvents, oils and polymers	–	–	–	–	–	–	–	Polydisc HD Polycap HD	Polydisc TF Polycap TF ReZist AcroPak PTFE	–	–	–
Venting/inline gas filtration Equipment protection, exhaust filtration, and venting of culture vessels, incubators, lyophilizers, hoods and pumps	–	–	–	–	–	–	–	–	Acrovent Polyvent	–	–	–
Vacuum protection Vaccuum protection from particulate or water-intrusion in applications involving aspiration, vacuum filtration, pumps and house vacuum	–	–	–	–	Versapor HEPA	–	–	–	VACU-GUARD 50/60 VacuShield™	VACU-GUARD 150	Carbon capsule	HEPA-VENT HEPA-CAP
Ground-water Filtration of particulate in surface and deep-well water samples prior to total dissolved metals analysis	Polycap GW Aquaprep™ AcroCap	–	Polydisc GW	GWV Capsule	–	–	–	–	–	–	–	–

PES = Polyethersulfone
GMF = Glass microfiber
PTFE = Polytetrafluoroethylene

Disc filters

AcroPak™ and Polydisc inline disc filters are designed for larger volume sample filtration in the laboratory, at a pilot plant, or in manufacturing. Sample volumes up to 2 L can be filtered with one device. AcroPak 20 and Polydisc devices can be used in conjunction with a syringe or connected inline via stepped hose barbs.

Our disc filters feature a high-purity polypropylene housing and are available with a choice of filtration media to suit aqueous and organic samples. The devices are autoclavable and gamma irradiated options are available.

AcroPak 20 filter

AcroPak 20 filters filter up to 2 L of aqueous solutions, cell culture media, and serum. Available with Supor, Supor EKV, and Fluorodyne™ PVDF membranes, their unique design generates twice the effective filtration area and double the throughput and flow rate of conventional metal 47 mm reusable filter holders. The AcroPak 20 filters are benefit of being available sterile and non-sterile, non-pyrogenic, and integrity testable by the bubble point method.

Features and benefits

- Sterilizing grade
- Built-in pre-filter (Supor membrane)
- Asymmetric membrane (Supor EKV membrane)
- Barbed hose connections fit multiple tubing sizes
- Integrity-testable (bubble point method)
- Low protein binding PES and PVDF

Applications

- Cell culture media
- Buffer solutions
- Biologicals
- Proteins
- High turbidity and bioburden solutions

AcroPak 20 filter

Technical specifications

AcroPak 20 capsule filters

Membrane	Pore size (µm)*	Filter media	Inline connection	Filtration area	Typical water flow rate (mL/min at 0.1 bar (10 kPa))
Supor	0.8/0.2	PES	6.4-12.7 mm diameter stepped hose barb with female luer slip interior and filling bell outlet	20 cm^2	40
Supor EKV	0.65/0.2	Asymmetric PES	6.4-12.7 mm diameter stepped hose barb with female luer slip interior and filling bell outlet	20 cm^2	–
Fluorodyne	0.2	Hydrophilic PVDF	6.4-12.7 mm diameter stepped hose barb with female luer slip interior and filling bell outlet	20 cm^2	26

Ordering information

AcroPak 20 capsule filters

Catalog number	Description	Sterile	Quantity/pack
12201	AcroPak 20 with Fluorodyne II membrane, 0.2 µm	Yes	3
12203	AcroPak 20 with Supor membrane, 0.8/0.2 µm	Yes	3
12247	AcroPak 20 with Supor membrane, 0.65/0.2 µm	Yes	3
12202	AcroPak 20 with Supor membrane, 0.8/0.2 µm	No	3

Polydisc AS

The Polydisc AS (aqueous solution) family of 50 mm filter devices features a high throughput polyethersulfone membrane with has low protein binding. These devices are suitable for filtration of buffers, media, and post-fermentation sample preparation. A glass microfiber prefilter extends the life of the membrane and effectively filters heavily contaminated samples. Each Polydisc AS device has a cap on the outlet and is sealed in its own clear blister pack, gamma irradiated, and secured in a protective shelf pack.

AcroPak 20 filter

Features and benefits

- Gamma irradiated, 25-40 kGy. No EtO residuals
- Barbed hose connections fit multiple tubing sizes
- Integrity-testable (bubble point method)
- Lightweight (11.5 g) avoids collapse of tubing, which can be caused by heavy filter devices

Applications

- Tissue culture media
- Reagent preparation
- Buffer clarification
- Fermentation broth
- Particle counting solutions

Technical specifications

Polydisc AS

Pore size (µm)*	Inline connection	Filling volume (µL)	Prefilter/media	Filtration area (cm^2)	Water flow rate mL/min at 0.7 bar
0.2	6–10 mm ID hose	540	GMF/PES	16	150
0.45	6–10 mm ID hose	540	GMF/PES	16	225

** Liquid rating. Retention efficiency in gas streams is significantly higher*

GMF—Glass microfiber
PES—Polyethersulfone

Ordering information

Polydisc AS

Pore size (µm)	Catalog number	Prefilter/media	Quantity/pack
Gamma irradiated			
0.2	6724-5002	GMF/PES	10
Nonsterile			
0.45	6724-5145	GMF/PES	50

Polydisc TF and ReZist™ filter

This device features a PTFE membrane, which is suitable for chemically aggressive solutions, reagents, and organic solvents. This lightweight unit is particularly suitable for protective vents and for inline filtration and isolation applications. The 1 µm device features a polypropylene prefilter for use with heavily contaminated samples.

Polydisc inline filters, TF

Features and benefits

- Solvent-resistant membrane
- Chemical-resistant housing
- Hydrophobic PTFE membrane
- Autoclavable (121ºC at 15 MPa for 20 min.)
- Integrity-testable (bubble point or water breakthrough pressure “in situ” methods)
- Biosafe
- Lightweight (11.5 g for Polydisc and 17.9 g for ReZist filter); avoids tubing collapse, which can be caused by heavy filter devices

Applications

- Pharmaceutical: Vents and inline applications
- Biotech: Vents and exhausts for growth environments, inline filtration of gases
- Laboratory: Filtration of solvents and reagents, drying gases
- Electronics: Photoresists, solvents, gases for research

Technical specifications

Polydisc TF

	Integrity test data* IPA bubble point	Water breakthrough		
Pore size (µm)	**(bar)**	**(bar)**	**Flow rates** methanol mL/min at 0.7 bar**	**Air SLPM at 0.2 bar**
0.1	1.7	3.4	200	8
0.2	0.9	2.1	400	16
1.0	0.2	0.3	900	30

* *Refers to sterilization by filtration for small sample use which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

** *Typical values*

Ordering information

Polydisc TF and ReZist filters

Pore size (µm)	Media	Catalog number	Sterile	Quantity/pack
Polydisc TF				
0.1	PTFE	6720-5001	No	10
0.2	PTFE	6720-5002	No	10
0.45	PTFE	6720-5045	No	10
1.0	PTFE*	6721-5010	No	10
ReZist filter 50 mm, sterile				
0.2	PTFE	10463607	Yes	10
0.2	PTFE	10463608	No	10
0.2	PTFE	10463609	No	50

* *With PP prefilter*

Inline connection 6-10 mm ID hose
PTFE—Polytetrafluoroethylene

Polydisc ReZist filter

Polydisc HD

Excellent flow rate characteristics for filtering large volumes to 1 L of aqueous and solvent samples. Polydisc HD (heavy duty) is available in 5 and 10 µm retention ratings.

Polydisc HD filter

Features and benefits

- All polypropylene unit for aqueous and solvent samples
- Broad solvent compatibility

Applications

- Large volume sample preparation

Technical specifications

Polydisc HD

Pore size (µm)*	Filling volume (µL)	Air flow rate SLPM at 1.0 bar	Filtration area (cm^2)	Water flow rate mL/min at 1.0 bar
5.0	540	110	16	1500
10.0	540	140	16	2200

** Liquid rating. Retention efficiency in gas streams is significantly higher*

Ordering information

Polydisc HD

Pore size (µm)	Catalog number	Media	Quantity/pack
5.0	6728-5050	Polypropylene	10
10.0	6728-5100	Polypropylene	10
5.0	2227	Polypropylene	50

Polydisc GW

Polydisc GW (ground water) is specifically designed for sample preparation of ground water samples for the analysis of dissolved heavy metals. It is an aqueous filter with low background values for the determination of trace elements. Each pack contains a certificate.

Polydisc GW features simplify the preparation of aqueous solutions for the analysis of dissolved heavy metals.

- Large filter surface
- Quartz fiber prefilter
- Membrane filter in sandwich arrangement
- High dirt loading capacity

Polydisc GW filters

Technical specifications

Polydisc GW

Housing	Polypropylene
Membrane type	Nylon
Prefilter	100% quartz fiber
Filtration diameter	52 mm
Filtration area	20.4 cm^2
Dead volume	220 µL
Filling volume	540 µL
Maximum pressure	4.5 bar
Connections	Tubing nozzle 6-14 mm i.d. hose
Maximum operating temperature	80°C

Ordering information

Polydisc GW 50 mm

Pore size (µm)	Catalog number	Prefilter/media	Quantity/pack
0.45	10463400	Quartz fiber/nylon	20
0.45	10463401	Quartz fiber/nylon	50

Inline connection—Polydisc GW accepts 6-14 mm i.d. hose

Polydisc SPF

Filtering serum requires removing proteins, lipids, salts, and other cell debris. This range of particulate matter is effectively handled with multilayer prefilters to facilitate downstream work and to avoid clogging later serum filters.

Polydisc SPF stacks a high-flow, hydrophilic PES membrane with a high particle- loading GMF filter to clean out particulates from serum and reduce stress on the final-stage serum filters.

Polydisc SPF Filters

Features and benefits

- High-throughput, inline prefilters for use upstream of serum filters.
- GMF prefilter captures large particles and cell debris while PES stack removes remaining particles and bacteria larger than 1 µm.
- Designed to extend the life of downstream serum filters.
- Effective for microbiology and tissue culture, immunoassays, virology, and diagnostic controls.
- 6 to 10 mm i.d. hose connection.

Technical specifications

Polydisc SPF

Prefilter material	Glass microfiber (GMF)
Diameter	50 mm
Housing	Polypropylene (PP)
Connections	Tubing nozzle 6-10 mm i.d. hose
Filtration area	16 cm^2
Filling volume	540 µL

Ordering information

Polydisc SPF

Pore size (µm)	Catalog number	Prefilter/media	Membrane	Quantity/pack
1.0	6724-5000	Glass microfiber	1.0 µm PES	10

PES—Polyethersulfone

Anti-foaming devices

AcroCap positive pressure devices

AcroCap™ positive pressure devices

AcroCap positive pressure devices are designed as an alternative to vacuum filtration with self-venting technology to limit bubbling in solutions that are prone to foaming.

AcroCap devices

The Acrocap device is a sterile disposable filter unit ideal for sterilization or clarification of up to 3 L of serum-free cell culture media and other aqueous solutions. It can be connected to a peristaltic pump, a repeating syringe, or a pressure vessel.
The AcroCap device is self-venting and incorporates our patented Supor membrane for fast and complete sample filtration.

Features and benefits

- Integral hydrophobic vent
- Mitigates foaming
- Low-protein binding
- Sterile

Technical specifications

AcroCap devices

Membrane	Pore size (µm)*	Filter media	Inline connection	Filtration area	Typical water flow rate
Supor	0.45	PES	6.4 mm hose barb, inner taper accepts male slip luer; removable filling bell attached to outlet	15 cm^2	500 mL/min at 1 bar (100 kPa)
	0.2	PES	6.4 mm hose barb, inner taper accepts male slip luer; removable filling bell attached to outlet	15 cm^2	220 mL/min at 1 bar (100 kPa)

Ordering information

AcroCap devices

Catalog number	Description	Quantity/pack
4482	AcroCap with Supor membrane, 0.45 µm, gamma-irradiated	10
4481	AcroCap with Supor membrane, 0.1 µm, gamma-irradiated	10
4480	AcroCap with Supor membrane, 0.2 µm, gamma-irradiated	10

Vacuum bottle top devices

VacuCap™ and VacuCap PF bottle-top filter devices

Buffer and media preparation for cell culture applications can be a tedious process, depending on the volume and viscosity of the material to be filtered. VacuCap and VacuCap PF bottle-top devices are engineered as low-profile, sustainable vacuum filters ideal for solutions varying in viscosity and particulate load up to 5 L.

VacuCap and VacuCap PF devices

VacuCap with Supor PES membrane is an innovative bottle-top device ideal for vacuum-driven filtration of cell and tissue culture media, microbiological media, aqueous solutions, protein solutions, and buffers. The patented, small design accepts variety of collection vessel sizes and reduces plastic waste and storage space compared to traditional bottle-top filters. There is no need to refill the upper fluid reservior. Draw directly from the mixing reservior with tubing and eliminate the contamination by filtering directly into your desired container. VacuCap PF devices with a built-in prefilter, has increased throughput performance with serum-containing media or other viscous solutions. Applications including buffers requiring 0.2 µm filtration also gain speed and throughput benefits of VacuCap PF devices when encountering high particle load in a solution.

Features and benefits

- Sterilizing grade
- Reduced plastic waste
- Space saver
- Built-in pre-filter
- Low-protein binding

Applications

- Cell culture media
- Buffer
- Aqueous solutions

VacuCap PF filter

Technical specifications

VacuCap and VacuCap PF devices

	VacuCap 60 devices	VacuCap 90 devices
Materials of construction	Filter media: Supor membrane (hydrophilic polyethersulfone) Housing: Modified acrylic Membrane support material: Polyester Sinker Material: Glass-filled polyurethane elastomer Inlet tubing: Polyvinyl chloride (PVC) medical-grade tubing Gasket seal material: Polyethylene	Filter media: Supor membrane (hydrophilic polyethersulfone) Housing: modified acrylic Membrane support material: Polyester Sinker material: Glass-filled polyurethane elastomer Inlet tubing: Polyvinyl chloride (PVC) medical-grade tubing Gasket seal material: Polyethylene
Effective filtration area	VacuCap 60 devices: 30 cm^2	VacuCap 90 devices: 60 cm^2
Typical throughput	(RPMI + 10% newborn calf serum) VacuCap 60 Devices, 0.2 µm: 1 L (RPMI + 10% calf serum) VacuCap 60 PF Devices: 500 mL	(RPMI + 10% newborn calf serum) VacuCap 90 devices, 0.2 µm: 5 L (RPMI + 10% calf serum) VacuCap 90 PF Devices: 1 L
Typical water flow rate (mL/min at 25.4 cm MPa	VacuCap 60 devices 0.1 µm: 50 0.2 µm: 200 0.45 µm: 280 PF: 200	VacuCap 90 devices 0.1 µm: 100 0.2 µm: 400 0.45 µm: 560 PF: 400
Typical hold-up volume	3.4 mL	3.4 mL
Maximum operating temperature	55° C	55° C
Maximum vacuum	63.5 cm Hg	63.5 cm Hg
Endotoxin	< 0.25 EU/mL using limulus amoebocyte lysate (LAL) test	< 0.25 EU/mL using limulus amoebocyte lysate (LAL) test
Sterilization	Sterilized by gamma irradiation and individually bagged	Sterilized by gamma irradiation and individually bagged
Bacterial retention	Lot samples retain a minimum of 10^7 cfu/cm^2 of *B. diminuta* per modified ASTM F838, current revision (7 and 2 must be superscripted in document)	Lot samples retain a minimum of 10^7 cfu/cm^2 of *B. diminuta* per modified ASTM F838, current revision (7 and 2 must be superscripted in document)

Ordering information

VacuCap and VacuCap PF devices

Catalog number	Pore size (µm)*	Diameter (mm)	Quantity/pack
VacuCap 60 bottle-top filter devices			
4631	0,1	60	10
4632	0,2	60	10
4634	0,45	60	10
TA4632*	0,2	60	10
4638	PF (0.8/0.2)	60	10
VacuCap 90 bottle-top filter devices			
4621	0,1	90	10
4622	0,2	90	10
TA4622*	0,2	90	10
4624	0,45	90	10
TA4624*	0,45	90	10
4628	PF (0.8/0.2)	90	10
Accessories			
Catalog number	**Description**		**Quantity/pack**
4623	Feedline assories kit		1

* *"TA" products come with individual atached tubing for each filter device. Standard products come with one piece of tubing per 10 filter devices*

Capsule filters

Whether you are conducting research or filtering large volumes or hard-to-filter samples, we have an AcroPak or Polycap capsule to fit your needs.

AcroPak capsule filter

AcroPak capsule filters

AcroPak capsules are designed for high performance across all buffer, reagent, and media applications from 5 L-150 L. Available with fast flow Supor, Supor EKV, and Fluorodyne PVDF membranes, these capsules maintain their effectiveness with high-density cell cultures no matter the turbidity level. The low protein binding membranes with extensive pore size configurations are ideal for sterilization and mycoplasma reduction with many options including built-in prefilters and asymmetric membranes for additional debris holding and limited clogging.

Features and benefits

- Sterilizing grade
- Built-in pre-filter (Supor membrane)
- Asymmetric membrane (Supor EKV membrane)
- Barbed hose connections fit multiple tubing sizes
- Integrity-testable (bubble point method)
- Low protein binding PES and PVDF

Applications

- Cell culture media
- Buffer solutions
- Biologicals
- Proteins
- High turbidity and bioburden solutions

Technical specifications

AcroPak capsule filters

	Supor PES (polyethersulfone) membrane	Supor EKV asymmetric PES membrane	Fluorodyne II PVDF (hydrophilic polyvinylidene fluoride)
Pore size	0.8/0.2, 0.8/0.45, 0.2/0.2, and 0.1/0.1 µm	Asymmetric 0.65/0.2 µm	0.1 and 0.2 µm
Effective filtration area	20, 200, 500, 1000, and 1500cm^2	20, 200, 400, 800, and 1500 cm^2	20, 200, 400, and 800 cm^2
Application	With high flow and capacity, broad fluid compatibility, low protein adsorption, active ingredients, and stabilizers, Supor membranes are suited for filtration of preparative fluids such as buffers, media, clarified cell culture, and protein solutions.	PES filters with asymmetric membrane layers have the same benefits of Supor PES membrane, but with additional debris holding for high turbidity, high bioburden solutions.	Low extractables, low product and excipient adsorption for the sterilization of a wide range of formulations and fluids containing dilute proteins or preservatives. Compatible with many organic solvents.

* *Filter with 0.2 µm: Lot samples retain a minimum of 10^7 cfu/cm^2 of B. diminuta per modified ASTM F838, current revision (7 and 2 must be superscripted in document)*

** *Filter with 0.1 µm: Mycoplasma reduction claim to spec table*
Lot samples retain a minimum of 10^7 cfu/cm^2 of A. laidlawii per modified ASTM F838, current revision (7 and 2 must be superscripted in document)

Ordering information

AcroPak capsule filters

Catalog number	Description	Inline connection	Quantity/pack
12941	AcroPak 200 capsule, Supor PES, 0.8/0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	3
12093	AcroPak 200 capsule, Supor PES, 0.8/0.2 µm, sterile	1/4 in. MNPT inlet, 1/4 - 1/2 in. stepped barb outlet	3
12991	AcroPak 500 capsule, Supor PES, 0.8/0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12992	AcroPak 1000 capsule, Supor PES, 0.8/0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12993	AcroPak 500 capsule, Supor PES, 0.8/0.45 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12994	AcroPak 1000 capsule, Supor PES, 0.8/0.45 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12995	AcroPak 500 capsule, Supor PES, 0.2/0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12996	AcroPak 1000 capsule, Supor PES, 0.2/0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12997	AcroPak 500 capsule, Supor PES, 0.1/0.1 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12999	AcroPak 1000 capsule, Supor PES, 0.1/0.1 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12675	AcroPak 1500 capsule Supor PES, 0.8/0.2 µm, sterile	1/2 in. straight barb inlet/outlet	1
12686	AcroPak 1500 capsule Supor PES, 0.2/0.2 µm, sterile	1/2 in. straight barb inlet/outlet	1
12094	AcroPak 200 capsule, Supor EKV, 0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	3
12095	AcroPak 200 capsule, Supor EKV, 0.2 µm, sterile	½ in. sanitary flange	3
12460	AcroPak 400 capsule, Supor EKV, 0.2 µm, sterile	2.5 - 3.8 cm sanitary flange inlet/outlet	1
12461	AcroPak 400 capsule, Supor EKV, 0.2 µm, sterile	1/2 in. straight barb inlet/outlet	1
12463	AcroPak 800 capsule, Supor EKV, 0.2 µm, sterile	2.5 - 3.8 cm sanitary flange inlet/outlet	1
12464	AcroPak 800 capsule, Supor EKV, 0.2 µm, sterile	1/2 in. straight barb inlet/outlet	1
12466	AcroPak 1500 capsule, Supor EKV, 0.2 µm, sterile	2.5 - 3.8 cm sanitary flange inlet/outlet	1
12467	AcroPak 1500 capsule, Supor EKV, 0.2 µm, sterile	1/2 in. straight barb inlet/outlet	1
12069	AcroPak 200 capsule, Fluorodyne II PVDF, 0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	3
12471	AcroPak 800 capsule, Fluorodyne II PVDF, 0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12473	AcroPak 800 capsule, Fluorodyne II PVDF, 0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1
12478	AcroPak 400 capsule, Fluorodyne II PVDF, 0.2 µm, sterile	1/4 - 1/2 in. stepped barb inlet/outlet	1

Polycap TC

Polycap TC (PES) is available with and without a filling bell. These disposable, dual layer polyethersulfone (PES) membrane filtration capsules provide efficient filtration for critical aqueous solutions.

The PES membrane is inherently hydrophilic, has low extractables, is biosafe, has excellent flow rates, and exhibits low protein binding.

Features and benefits

- 100% integrity-tested during manufacturing; results are correlated to microbial retention.
- Housing thermally fused (no surfactants or mold releasing agents)
- Integrity-testable by bubble point, pressure decay or forward flow methods.
- Available in gamma irradiated and nonsterile versions with a filling bell option.
- Manufactured in clean room facilities under ISO quality systems.
- PES membrane protein adsorption characteristics:
  - HSA 0.4 µg/cm^2
  - Insulin 2.0 µg/cm^2
  - Gammaglobulin 1.5 µg/cm^2

Applications

- Aqueous solutions
- Biologicals
- Buffers
- Cleaning and rinsing solutions
- Enzymes
- High-quality water
- Particle counting solutions
- Reagent preparation
- Salt solutions
- Tissue culture media

Polycap TC capsule filters

Technical specifications

Polycap TC

Housing	Polypropylene
Vent	On inlet
Membrane	Polyethersulfone (PES)
Support system	Polypropylene
Sealing	Heat-fused
Maximum pressure	4.1 bar
Flow direction	If there is a prefilter, it is located on the inlet side and flow should follow arrows
Endotoxin level	LAL tested, ≤ 0.5 EU/mL
Biosafety	Materials pass USP class VI
Autoclavable	Certain filter devices have been gamma irradiated*. Capsule may be autoclaved at 121°C at 15 MPa for 20 min. However, an integrity test should be performed after autoclaving.
Nominal filtration area	36 mm capsule: ~ 440 cm^2 75 mm capsule: ~ 930 cm^2 150 mm capsule: ~ 1900 cm^2
Water bubble point (final membrane)	0.1 µm ≥ 3.2 bar 0.2 µm ≥ 2.7 bar 0.45 µm ≥ 2.1 bar 1.0 µm ≥ 1.1 bar

Ordering information

Polycap TC

			Connections			
Pore size (µm)	**Catalog number**	**Media**	**Inlet**	**Outlet**	**Gamma irradiated**	**Quantity/pack**
Polycap TC 36						
0.2/0.1	6714-3601	PES	SB	SB	Yes	1
0.2/0.2	6714-3602	PES	SB	SB	Yes	1
0.2/0.2	2642	PES	SB	SB	No	5
	6714-3604	PES	SB	SB	Yes	1
Polycap TC 36 plus filling bell						
0.2/0.1	6715-3601	PES	SB	SB	Yes	1
0.2/0.2	6715-3602	PES	SB	SB	Yes	1
0.2/0.2	6716-3602	PES	MNPT	SB	Yes	1
0.65/0.45	6715-3604	PES	SB	SB	Yes	1
0.8/0.2	6715-3682	PES	SB	SB	Yes	1
Polycap TC 75						
0.2/0.1	6714-7501	PES	SB	SB	Yes	1
0.2/0.2	6714-7502	PES	SB	SB	Yes	1
0.65/0.45	6717-7504	PES	1/2 SB	1/2 SB	Yes	1
1.0/1.0	6717-7510	PES	1/2 SB	1/2 SB	Yes	1
Polycap TC 75 plus filling bell						
0.2/0.2	6715-7502	PES	SB	SB	Yes	1
0.8/0.2	6715-7582	PES	SB	SB	Yes	1
Polycap TC 150						
0.2/0.1	6717-9501	PES	1/2 SB	1/2 SB	Yes	1
0.2/0.2	6717-9502	PES	1/2 SB	1/2 SB	Yes	1
0.2/0.2	6704-9502	PES	1 1/2" Sanitary	1 1/2" Sanitary	No	5
0.65/0.45	6717-9504	PES	1/2 SB	1/2 SB	Yes	1
Polycap TC 150 plus filling bell						
0.2/0.2	6718-9502	PES	1/2 SB	1/2 SB	Yes	1
0.8/0.2	6718-9582	PES	1/2 SB	1/2 SB	Yes	1

MNPT—Male national pipe thread
PES—Polyethersulfone
1/2 SB—Stepped barb for 10-12 mm tubing
SB—Stepped barb for 6-10 mm tubing

Polycap AS

Polycap AS (aqueous solution) is recommended for filtering aqueous solutions. It combines a glass microfiber prefilter and a nylon membrane, which prolongs the life of the filter and allows larger volumes and difficult samples to be filtered easily.

Features and benefits

- First layer (GMF) acts as a prefilter for longer membrane (0.2, 0.45, and 1.0 µm) life and higher filtration efficiency.
- Nylon membrane layer is inherently hydrophilic, has low extractables, is biosafe, and has excellent flow rates.
- Ultra-clean containing no surfactant or mold release agents.
- Housing is thermally fused (no glues, adhesives or extraneous materials).
- Integrity-testable by bubble point, pressure decay, or forward flow methods.
- Provides highly effective filtration area in a small size.
- Autoclavable, some options provided gamma irradiated.
- Manufactured in clean room facilities under ISO quality systems.

Applications

- Admixtures
- Biologicals
- Buffers
- Cleaning and rinsing solutions
- Enzymes
- Immunologicals
- Irrigation solutions
- Nutrients
- Reagent preparation
- Salt solutions
- Tissue culture media

Polycap AS capsule filter

Technical specifications

Polycap AS

Housing	Polypropylene
Vent	On inlet
Prefilter	Glass microfiber double laminated with polyolefin monofilament nonwoven
Membrane	Nylon
Support system	Polypropylene
Sealing	Heat-fused
Maximum pressure	4.1 bar
Endotoxin level	LAL tested, ≤ 0.5 EU/mL
Biosafety Materials pass	USP Class VI
Sterilization	Certain filter devices have been gamma irradiated*. Capsules may be autoclaved at 121°C at 15 MPa for 20 min. However, an integrity test should be performed after autoclaving. Filling bell is not autoclavable but is detachable.
Nominal filtration area	36 mm capsule: ~ 400 cm^2 75 mm capsule: ~ 820 cm^2
IPA bubble point	0.2 µm membrane: ≥ 1.1 bar 0.45 µm membrane: ≥ 0.70 bar 1.0 µm membrane: ≥ 0.21 bar

* *Filter with 0.2 µm: Lot samples retain a minimum of 10^7 cfu/cm^2 of B. diminuta per modified ASTM F838, current revision (7 and 2 must be superscripted in document)*

** *Filter with 0.1 µm: Mycoplasma reduction claim to spec table*
Lot samples retain a minimum of 10^7 cfu/cm^2 of A. laidlawii per modified ASTM F838, current revision (7 and 2 must be superscripted in document)

Ordering information

Polycap AS

				Connections			
Pore size (µm)	**Catalog number**	**Media**	**Prefilter**	**Inlet**	**Outlet**	**Gamma irradiated**	**Quantity/pack**
Polycap AS 36							
0.2	6708-3602	Nylon	GMF	1/2 SB	1/2 SB	Yes	1
0.2	6705-3602	Nylon	GMF	SB	SB	Yes	1
0.2	6709-3602	Nylon	GMF	MNPT	SB	Yes	1
0.2	2606T	Nylon	GMF	FNPT	FNPT	No	5
0.45	6705-36f04	Nylon	GMF	SB	SB	Yes	1
1.0	2608NS	Nylon	GMF	SB	SB	No	5
Polycap AS 36 plus filling bell							
0.2	6706-3602	Nylon	GMF	SB	SB	Yes	1
Polycap AS 75							
0.2	2706T	Nylon	GMF	FNPT	FNPT	No	5
0.45	2707NS	Nylon	GMF	SB	SB	No	5

Versapor and Versaflow™ capsules

Versapor and Versaflow capsule filters contain a robust acrylic copolymer membrane for large particle clarification or prefiltration of hard to filter and viscous solutions. Avaliable in multiple pore sizes and EFA formats, there are several options to fit your prefiltration needs. The Versapor serum capsule contains a glass fiber pre-filter to maximize throughput and a 1.2 µm membrane layer adept at serum filtration in cell culture applications, while Versapor pleated capsules are a reliable option for particle removal from DI and distilled water, reagents, and diluents.

Features and benefits

- Reduced filter clogging
- Strong and flexible membrane
- Barbed hose connections fit multiple tubing sizes

Applications

- Prefiltration
- Serum
- Distilled water
- High particulate load solutions

Versapor capsule

Technical specifications

Versapor and Versaflow capsules

	Versaflow capsule, sterile	Mini capsule, sterile	Versapor serum capsule	Versapor pleated capsule
Materials of construction	Filter media: Acrylic copolymer on a non-woven support Housing: Polycarbonate Filter support: Polyester Core: Polypropylene Sealing material: Polyurethane	Filter media: Acrylic copolymer on a non-woven support Housing: Polycarbonate Filter support: Polyester Core: Polypropylene Sealing material: Polyurethane	Filter media: Glass fiber upstream, Versapor membrane (acrylic copolymer on a non-woven support) downstream Housing: Polycarbonate Filter support: Polyester Core: Polypropylene Sealing material: Polyurethane	Filter media: Acrylic copolymer on a non-woven support Housing: Polycarbonate Filter support: Polyester Core: Polypropylene Sealing material: Polyurethane
Effective filtration area	1390 cm^2	500 cm^2	500 cm^2	PN 12117: 1350 cm^2 PN 12116: 1740 cm^2
Dimensions	Housing length: 17.2 cm Overall length: 21.7 cm Diameter: 6.3 cm	Housing length: 9.3 cm Overall length: 13.3 cm Diameter: 6.3 cm	Housing length: 9.3 cm Overall length: 13.3 cm Diameter: 6.3 cm	Housing length: 9.3 cm Overall length: 13.3 cm Diameter: 6.3 cm
Pore sizes	0.8/0.45 µm	0.8/0.45 µm	1.2 µm	PN 12117: 0.2 µm PN 12116: 3 µm
Inlet/outlet connections	Hose barb fittings accept 12.7 mm ID tubing	Hose barb fittings accept 12.7 mm ID tubing	Hose barb fittings accept 12.7 mm ID tubing	Hose barb fittings accept 12.7 mm ID tubing
Maximum operating temperature	88°C at 2.1 bar (210 kPa)	88°C at 2.1 bar (210 kPa)	88°C at 2.1 bar (210 kPa)	88°C at 2.1 bar (210 kPa)
Maximum operating pressure	3.4 bar (340 kPa) at ambient temperature	3.4 bar (340 kPa) at ambient temperature	3.4 bar (340 kPa) at ambient temperature	3.4 bar (340 kPa) at ambient temperature
Minimum bubble point (water)	0.6 bar (60 kPa)	0.6 bar (60 kPa)	–	–
Typical water flow rate	11.4 Lpm at 0.5 bar (50 kPa)	11.4 Lpm at 0.5 bar (50 kPa)	4 Lpm at 0.1 bar (10 kPa)	9-5 to 11.4 Lpm at 0.3 bar (30 kPa)
Endotoxin	< 0.25 EU/mL using limulus amoebocyte lysate (LAL) test	< 0.25 EU/mL using limulus amoebocyte lysate (LAL) test	–	–

Ordering information

Versapor and Versaflow capsules

Catalog number	Description	Quantity/pack
12123	Versapor capsule, mini 0.8/0.45 µm, sterile	1
12131	Versaflow capsule, 0.8/0.45 µm, sterile	1
12168	Versapor capsule, serum GF/1.2 µm	1
12116	Versapor capsule, pleated 3 µm, non-sterile	1
12117	Versapor capsule, pleated 2 µm, sterile	1

Polycap SPF

Serum is difficult to filter because it contains complex particulates, lipids, triglycerides, and lipoproteins that clog filters. When filtering serum without proper prefiltration, membrane filters clog rapidly. Polycap SPF incorporates three layers of media for effective filtration without clogging.

Polycap SPF

Features and benefits

- Three layers of special media: Fine and ultrafine glass microfiber and polyethersulfone membrane.
- Excellent for hard-to-filter solutions such as serums and protein solutions.
- Autoclavable, 121ºC at 15 psi for 20 min.
- Manufactured under ISO manufacturing system.
- Suitable for filtering serums, viral suspensions, nutrients, biologicals, immunologicals, enzymes, and buffers.
- Prefilters extend the life of the final filter.

Applications

- Biologicals
- Buffers
- Diagnostic standards
- Enzymes
- Immunologicals
- Nutrients
- Serum prefiltration
- Tissue culture media
- Viral suspensions

Technical specifications

Polycap SPF

Housing	Polypropylene
Vent	On inlet
Prefilter	Two layers of glass microfiber
Membrane	Polyethersulfone (PES)
Support system	Polypropylene
Sealing	Heat-fused
Maximum pressure	4.1 bar
Autoclavable	121ºC at 15 psi for 20 min
Nominal filtration area	36 mm capsule: ~ 260 cm^2, 75 mm capsule: ~ 535 cm^2, 150 mm capsule: ~ 110 cm^2

Ordering information

Polycap SPF (nonsterile)

				Connections		
Pore size (µm)	**Catalog number**	**Media**	**Prefilter**	**Inlet**	**Outlet**	**Quantity/pack**
Polycap SPF 36						
1.0	6705-3600	PES	GMF	SB	SB	1
Polycap SPF 75						
1.0	6705-7500	PES	GMF	SB	SB	1
Polycap SPF 150						
1.0	2820	PES	GMF	1/2 HB	1/2 HB	5

GMF—Glass microfiber filter *PES—Polyethersulfone* *SB—Stepped barb for 6-10 mm tubing*

Polycap HD

Polycap HD provides an advantage in process applications as its characteristics fit between gross filters and microporous membrane filters used for final filtration.

Features and benefits

- 100% polypropylene filter media, support system, and housing allows usage with a broad range of solutions, pH, and temperature.
- High flow and high retention capacity.
- Materials of construction are FDA approved for food contact.
- Autoclavable, 121ºC at 15 psi for 20 min.
- Manual vent with luer lock to bleed air from upstream or serve to as an injection or sample port.
- Available with a retention rating of 0.2, 0.45, 1.0, 5.0, or 10 µm and a variety of end fitting configurations.
- Manufactured in a Class 10 000 clean room in an ISO certified manufacturing plant.

Applications

- Buffers
- Clean air and gas equipment
- Cosmetics and personal care products
- General fine filtration
- Inks and pigments
- Photographic emulsions and make-up water
- Prefiltration for RO, UF, MF membranes
- Reagents
- Sample preparations
- Semiconductor and magnetic media
- Solvents

Polycap HD

Technical specifications

Polycap HD

Housing	Polypropylene
Vent	On inlet
Filter media	Polypropylene
Support system	Polypropylene
Biosafety	Materials pass USP Class VI
Nominal filtration area	36 mm capsule: ~ 400 cm^2 75 mm capsule: ~ 820 cm^2 150 mm capsule: ~ 1650 cm^2
Autoclavable	121°C at 15 psi for 20 min
Maximum pressure	4.1 bar

* *Nonsterile options offered*

Ordering information

Polycap HD (nonsterile)

Pore size (µm)	Catalog number	Media	Prefilter	Connections		Quantity/pack
				Inlet	Outlet	
Polycap HD 36						
0.2	2610T	PP	No	FNPT	FNPT	5
1.0	6703-3610	PP	No	SB	SB	1
1.0	2611	PP	No	SB	SB	5
1.0	2611T	PP	No	FNPT	FNPT	5
5.0	6703-3650	PP	No	SB	SB	1
5.0	2612T	PP	No	FNPT	FNPT	5
10.0	6703-3611	PP	No	SB	SB	1
10.0	2613T	PP	No	FNPT	FNPT	5
20.0	6703-3621	PP	No	SB	SB	1
20.0	2614T	PP	No	FNPT	FNPT	5
Polycap HD 75						
0.45	2710	PP	No	1/2 HB	1/2 HB	5
1.0	6703-7510	PP	No	1/2 SB	1/2 SB	1
1.0	2711T	PP	No	FNPT	FNPT	5
5.0	6703-7550	PP	No	1/2 SB	1/2 SB	1
5.0	2712M	PP	No	MNPT	MNPT	5
5.0	2712T	PP	No	FNPT	FNPT	5
10.0	6703-7511	PP	No	1/2 SB	1/2 SB	1
10.0	2713T	PP	No	FNPT	FNPT	5
10.0	2713	PP	No	HB	SB	5
20.0	6703-7521	PP	No	1/2 SB	1/2 SB	1
20	2714	PP	No	1/2 HB	1/2 HB	5
20.0	2714T	PP	No	FNPT	FNPT	5
Polycap HD 150						
0.45	2810	PP	No	1/2 HB	1/2 HB	5
0.45	2810T	PP	No	FNPT	FNPT	5
5.0	2812T	PP	No	FNPT	FNPT	5
10.0	2813T	PP	No	FNPT	FNPT	5
10.0	2813	PP	No	1/2 HB	1/2 HB	5
20.0	2814T	PP	No	FNPT	FNPT	5

FNPT—Female national pipe thread
HB—1/2 hose barb
MNPT—Male national pipe thread
PP—Polypropylene
1/2 SB—Stepped barb for 10-12 mm tubing
SB—Stepped barb for 6-10 mm tubing

Mini Profile capsule

Mini Profile capsules contain all polypropylene depth filter elements, featuring tapered pores that narrow to an inner (downstream) absolute rated section suited for upstream clarification of larger particles. This thick depth structure provides high capacity for larger solids and gels as well as for fine particles.

Mini Profile capsule

Features and benefits

- High capacity depth medium
- Absolute retention for reliable results
- Low extractables
- Low protein binding
- Broad chemical compatibility

Applications

- Viscous fluids
- Gel removal
- Cell lysate and debris
- Large particle prefiltration

Technical specifications

Mini Profile Capsule

Materials of construction	Medium: Polypropylene Core end caps: Polypropylene Housing: Polypropylene 13 mm single hose barb adapter: Acetal
Connections (inlet/outlet)	13 mm (9/16 inch) hose barb
Effective filtration area	90 cm^2
Maximum accumulated autoclave time	Up to 125 °C for 3 × 30 min
Maximum operating pressure and temperature	50°C at 5.0 bar (500 kPa)

Ordering information

Mini profile capsule

Catalog number	Description	Quantity/pack
12070	Mini Profile capsule with Profile Star filter, 1.5 µm	3
12071	Mini Profile capsule with Profile Star filter, 3 µm	3
12072	Mini Profile capsule with Profile Star filter, 5 µm	3

Polycap GW

The US Environmental Protection Agency (EPA) and local Departments for Environmental Protection protocols specify filtering ground water samples with a 0.45 µm filter when analyzing dissolved or suspended metals (EPA Method 3005). Specifically designed with field sampling in mind, the Whatman Polycap ground water sampling capsule can be used as a convenient inline filter unit.

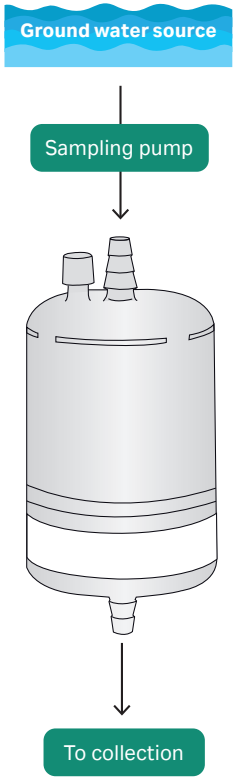
Features and benefits

- Connects directly to outlet of a sampling pump.
- Filtration membrane is encapsulated in durable polypropylene housing.
- Large surface area is optimized to provide at least 600 cm^2 of effective filtration area for rapid sample collection.
- Housing components are thermally fused (no glues, adhesives, metals, epoxies, or extraneous materials).
- Suitable for filtration procedure outlined in EPA Method 3005 for ground water analysis.
- Stepped hose barb fittings allow for connection with various size tubings.
- Lot number printed on each unit for traceability.

Applications

- Filter ground water samples before dissolved metal analysis.

Polycap GW



Technical specifications

Polycap GW

Housing	Polypropylene
Filter media	0.45 µm: PES filter
Inlet/outlet	6-9 mm stepped barb (SB)
Support system	Polypropylene
Vent	On inlet
Nominal filtration area	600 cm^2
Wetting characteristics	Hydrophilic
Maximum pressure	4.1 bar water flow rate at 1.0 bar 60 L/min
Flow direction	Flow follows arrows

Ordering information

Polycap GW

			Connections		
Pore size (µm)	**Catalog number**	**Media**	**Inlet**	**Outlet**	**Quantity/pack**
Polycap GW 75					
0.45	6714-6004	PES	SB	SB	1
0.45	6724-6004	PES	SB	SB	100

PES—Polyethersulfone
SB—Stepped barb for 6-10 mm tubing

AquaPrep™ and GWV capsules

AquaPrep and GWV capsules are designed for preparation of groundwater samples for dissolved metals analysis. The United States Environmental Protection Agency requires that groundwater samples collected for dissolved or suspended metals analysis be filtered through a 0.45 µm filter. The membrane filters used in these devices don't contribute or remove metals from the collected sample. Vent ports on either side of the AquaPrep 600 capsule filters are both upstream to allow field technicians to use the capsule in any orientation while collecting the sample. A large filter area provides rapid collection of most groundwater samples and the tapered hose barb connections allow easy insertion and removal of a variety of tubing sizes. 1 and 5 µm filters are available for certain state and regional requirements.

AquaPrep filter capsules

Features and benefits

- High capacity
- Multiple pore sizes

Applications

- Groundwater sample prep

Technical specifications

Aquaprep and GWV capsules

Materials of construction	Housings: Polypropylene Filter Media: 12175, 12176: Supor membrane (hydrophilic polyethersulfone) 12179, 12180, 12019, 12020: Versapor membrane (acrylic copolymer on a nonwoven support)
Effective filtration area	AquaPrep devices: 20 cm^2 AquaPrep 600 capsules: 600 cm^2 GWV High capacity groundwater sampling capsules: 700 cm^2
Inlet/outlet connections	12175, 12176: 6.4-12.7 mm stepped hose barbs GWV high capacity groundwater sampling capsules: MNPT inlet and outlet
Overall length (including fittings)	AquaPrep 600 capsule: 14.5 cm GWV high capacity groundwater sampling capsules: 11.4 cm
Maximum operating pressure	AquaPrep: 5.1 bar (510 kPa) at ambient temperature AquaPrep 600 capsules: 12175, 12176: 4.1 bar (410 kPa) at ambient temperature GWV high capacity groundwater sampling capsules: 3.4 bar (340 kPa) at ambient temperature
Maximum operating temperature	AquaPrep filter products: 60°C GWV high capacity groundwater sampling capsules: 88 °C

Ordering information

AquaPrep and GWV capsules

Description	Catalog number	Quantity/pack
AquaPrep groundwater sampling capsules and devices, 0.45 µm, Supor membrane	12175	1
AquaPrep groundwater sampling capsules and devices, 0.45 µm, Supor membrane	12176	10
GWV high capacity groundwater sampling capsules, 0.45 µm	12179	10
GWV high capacity groundwater sampling capsules, 0.45 µm	12180	50
GWV high capacity groundwater sampling capsules, 5 µm	12020	10

Polycap TF

Polycap TF filter capsules are made with durable, hydrophobic polytetrafluoroethylene (PTFE) membranes in a polypropylene housing and are designed for use with organic solvents and chemically aggressive solutions.

Features and benefits

- Resistant to most solvents, autoclavable, and integrity-testable.
- Available in 0.1, 0.2, 0.45, and 1.0 µm pore sizes.
- 1.0 µm used for extended life and filtration of highly contaminated solutions.
- Autoclavable at 121ºC at 15 psi for 20 min.
- Manufactured under very clean conditions in a Class 10 000 clean room and under ISO quality systems.

Applications

- Venting
- Inline filtration
- Isolation
- Electronics
- Pharmaceutical
- Biotech
- Laboratory
- Other uses

Polycap TF filter capsule

Technical specifications

Polycap TF

Housing	Polypropylene
Membrane	PTFE
Vent	On inlet
Support system	Polypropylene
Sealing	Heat-fused
Maximum pressure	4.1 bar
Flow direction	Supported bi-directionally. certain applications may require orientation, i.e., vents.
Reverse flow only for low-pressure applications.	LAL tested, ≤ 0.5 EU/mL
Biosafety	Materials pass USP Class VI
Autoclavable	May be autoclaved at 121ºC at 15 psi for 20 min. Multiple autoclave cycles are possible. However, the responsibility for reuse is with the operator. The device should be protected from cross contamination. An integrity test should be performed after autoclaving.
Nominal filtration area	36 mm capsule: ~ 500 cm^2 75 mm capsule: ~ 1000 cm^2 150 mm capsule: ~ 2000 cm^2
IPA bubble point	0.1 µm membrane: ≥ 1.6 bar 0.2 µm membrane: ≥ 0.9 bar 0.45 µm membrane: ≥ 0.5 bar 1.0 µm membrane: ≥ 0.2 bar

Ordering information

Polycap TF (nonsterile)

			Connections		
Pore size (µm)	**Catalog number**	**Media**	**Inlet**	**Outlet**	**Quantity/pack**
Polycap TF 36					
0.1	6711-3601	PTFE	MNPT	3/8 SB	1
0.2	6711-3602	PTFE	MNPT	3/8 SB	1
0.2	6710-3602	PTFE	1/2 SB	1/2 SB	1
0.2	6700-3602	PTFE	3/8 SB	3/8 SB	1
0.2	2601	PTFE	–	–	5
0.2	2601T	PTFE	FNPT	FNPT	5
0.45	6711-3604	PTFE	MNPT	3/8 SB	1
0.45	2602S	PTFE	1 1/2" sanitary	1 1/2" sanitary	5
1.0	6700-3610	PTFE	3/8 SB	3/8 SB	1
1.0	2603	PTFE	–	–	5
1.0	2603T	PTFE	FNPT	FNPT	5
Polycap TF 75					
0.1	6700-7501	PTFE	3/8 SB	3/8 SB	1
0.1	2700T	PTFE	FNPT	FNPT	5
0.2	6711-7502	PTFE	MNPT	3/8 SB	1
0.2	6710-7502	PTFE	1/2 SB	1/2 SB	1
0.2	6700-7502	PTFE	3/8 SB	3/8 SB	1
0.2	2702M	PTFE	MNPT	MNPT	5
0.2	2702T	PTFE	FNPT	FNPT	5
0.45	6700-7504	PTFE	3/8 SB	3/8 SB	1
0.45	2703T	PTFE	FNPT	FNPT	5
1.0	6701-7510	PTFE	1/2 SB	1/2 SB	1
Polycap TF 150					
0.1	2800T	PTFE	FNPT	FNPT	5
0.2	2802T	PTFE	FNPT	FNPT	5
0.2	2801	PTFE	1 1/2" sanitary	1 1/2" sanitary	5
0.45	2803T	PTFE	FNPT	FNPT	5
1.0	2804T	PTFE	FNPT	FNPT	5

FNPT—Female national pipe thread
MNPT—Male national pipe thread
PTFE—Polytetrafluoroethylene
1/2 SB—Stepped barb for 10-12 mm tubing
SB—Stepped barb for 6-10 mm tubing

AcroPak 300 capsule with PTFE membrane

AcroPak 300 capsule with its large effective filtration area (280 cm2), is designed for bioreactor venting requiring high air flow rates or chemical and solvent filtration. The filter can be sterilized by autoclaving and can be integrity tested after each autoclave cycle and before use.

AcroPak 300 capsule

Features and benefits

- High flow rate
- Broad chemical compatibility
- Sterilizing grade
- Barbed hose connections fit multiple tubing sizes

Applications

- High system air flow venting
- Bioreactor venting

Technical specifications

AcroPak 300 capsule with PTFE membrane

Materials of construction	Filter Media: PTFE on a polypropylene support Housing: Polypropylene
Effective filtration area	280 cm^2
Dimensions	Length: 10.5 cm with hose barbs Housing diameter with vent: 6.7 cm Housing diameter without vent: 5.3 cm
Inlet/outlet connections	Stepped hose barb 6.4 - 12.7 mm diameter
Typical hold-up volume	< 6 mL
Maximum operating temperature	60°C at 2.1 bar (210 kPa)
Maximum operating pressure	4.1 bar (410 kPa) at ambient temperature
Recommended integrity test minimum bubble point - 60% IPA/40% H_2O (v:v)	1.2 bar (120 kPa)
Typical liquid flow rate (1 cp)	0.8 L/min/0.1 bar (10 kPa)
Typical air flow rate	32 L/min/0.07 bar (7 kPa)

Ordering information

AcroPak 300 capsules with PTFE membrane

Catalog number	Description	Membrane type	Connection	Pore size	Quantity/pack
12082	AcroPak 300 capsule	PTFE	Stepped hose barb	0.2 µm	3
12085	AcroPak 300 capsule	PTFE	Stepped hose barb	0.2 µm	100

Carbon capsules

These filters are suitable for adsorption of organics, removing odor from air and removal of color, organics, and chlorine from water.

They are filled with high-purity, high-efficiency, acid washed, granular-activated carbon and the Whatman carbon cap contains a pleated HEPA filter. It's made to meet the requirements for continuous column percolation purification processes.

Features and benefits

- Carbon acts as an adsorption medium.
- Pleated glass microfiber filter structure.
- Retains 99.97% of particles greater than 0.3 µm.
- Large surface area of activated carbon for effective operation.
- Two capsule sizes available.
- Removes noxious odors, oil mists, and contaminants.
- Removes a potential health hazard from the workplace.

Applications

- Water, chemical, and reagent purification.
- Compressed air lines and vacuum pumps.
- Instrument outlet exhausts.

Carbon capsule filters

Technical specifications

Carbon capsule

Catalog number	12011	6704-7500 and 6704-1500
Housing	Polycarbonate	Polypropylene
Filter media	100 g activated carbon	Activated carbon with a pleated HEPA cartridge
Typical effective surface area	65 000 m^2 of carbon	Carbon Cap 75 capsule: 26 000 m^2 Carbon Cap 150 capsule: 82 000 m^2
Dimensions	Housing Length: 18.7 cm Overall Length: 25.4 cm Diameter: 5.8 cm	65 × 100 mm (2.6 × 6.3 in.) for 6704-7500 65 × 236 mm (2.6 × 9.3 in.) for 6704-1500
Inlet/outlet connections	⅜ in. FNPT; includes optional hose barb fittings to accept 12.7 mm ID tubing	Inlet: 12.7 mm (½ in.) hose barb Outlet: 10 to 12 mm stepped barb
Maximum operating temperature	80°C	
Maximum operating pressure	3.4 bar (340 kPa) at ambient temperature	4.1 bar

Carbon capsule filters

Ordering information

Carbon capsule

Description	Catalog number	Quantity/pack
Carbon capsule 75	6704-7500	1
Carbon capsule 150	6704-1500	1
Carbon capsule	12011	1

Venting filters

Venting filters are disposable devices designed and manufactured with a high-purity polypropylene housing to maintain sample purity. Products are available with a choice of filtration media to suit a range of venting applications. All seals are fused with no glue, adhesive, metal, epoxy, or other extraneous materials used in construction.

AcroVent device

AcroVent devices are suitable for venting sterile collection vessels and carboys. They are offered in 37 mm and 50 mm formats with several pore sizes. Available with Emflon™ II PVDF and PTFE membranes, these non-sterile devices support air flow rates up to 40 L/min. AcroVents devices purge the sterile gas of culture vessels and filtering sterile air for cell factories, are autoclavable, and can be integrity tested before and after use.

Features and benefits

- High flow rate
- Sterilizing grade
- Broad chemical compatibility
- Barbed hose connections fit multiple tubing sizes

Applications

- Low to high system air flow venting
- Carboy venting
- Bioreactor venting
- Solvent filtration

AcroVent devices

Technical specifications

AcroVent device

	Acro 37 TF vent device	Acro 50 vent devices	Acro 50 vent devices with Emflon II membrane
Materials of construction	Filter media: PTFE on a polypropylene support Housing: Polypropylene	Filter media: PTFE on a polypropylene support Housing: Polypropylene	Filter media: Emflon II membrane (hydrophobic PVDF) Housing: Polypropylene
Effective filtration area	7.5 cm^2	19.6 cm^2	20 cm^2
Dimensions	Overall length: 5.3 cm Diameter: 4.5 cm	Overall length: 8.2 cm Diameter: 7.3 cm	–
Inlet/outlet connections	Stepped hose barbs, 6.4 - 9.5 mm diameter	Stepped hose barbs 6.4 - 12.7 mm diameter, MNPT, 9.5 mm straight pipe	Stepped hose barbs, 6.4 - 12.7 mm diameter with slip luer ID in the hose barb
Maximum operating temperature	100°C	–	60°C
Maximum operating pressure	4.1 bar (410 kPa)	4.1 bar (410 kPa) at ambient temperature	4.1 bar (410 kPa) at ambient temperature
Minimum water breakthrough	2.1 bar (210 kPa), bi-directional	–	–
Recommended integrity test minimum bubble point IPA, 100%	0.9 bar (90 kPa)	0.2 µm: 1.31 bar (131 kPa) 0.45 µm: 0.34 bar (34 kPa) 1 µm: 0.21 bar (21 kPa)	1.1 bar (110 kPa)
Typical air flow rate	3.58 L/min at 0.2 bar (20 kPa)	L/min at 0.2 bar (20 kPa) 0.2 µm: > 8 0.45 µm: > 12 1 µm: > 15	Air flow rate > 25 LPM at 100 kPa, 1 bar
Sterilization	Provided non-sterile. Autoclavable if desired 121-123°C for a maximum of 20 min.	Provided non-sterile. All are individually packaged (except PN 4250). Can be sterilized by autoclaving at 121-123°C for 20 min.	Provided non-sterile. Stable with gamma irradiation up to 50 kilogray. Can be sterilized by autoclaving at 121°C for 20 min.

Ordering information

AcroVent device

Catalog number	Descriptiion	Membrane type	Connection	Pore size (µm)	Diameter (mm)	Quantity/pack
4464	Acro 37 TF vent device	PTFE	Stepped hose barb	0.2	37	24
4465	Acro 37 TF vent device	PTFE	Stepped hose barb	0.2	37	200
4250	Acro 50 vent device	PTFE	Stepped hose barb	0.2	50	72
4251	Acro 50 vent device	PTFE	Stepped hose barb	0.2	50	18
4400	Acro 50 vent device	PTFE	MNPT	0.2	50	18
4401	Acro 50 vent device	PTFE	3/8" straight pipe	0.2	50	18
4256	Acro 50 vent device	PTFE	Stepped hose barb	0.45	50	18
4258	Acro 50 vent device	PTFE	Stepped hose barb	0.1	50	18
4003	Acro 50 vent device	PTFE	MNPT	0.1	50	18
A50V002P2	Acro 50 vent device	Emflon II (PVDF)	Stepped hose barb	0.2	50	3
A50V002P2NV	Acro 50 vent device	Emflon II (PVDF)	Stepped hose barb	0.2	50	100
A50V002NV300	Acro 50 vent device	Emflon II (PVDF)	Stepped hose barb	0.2	50	300

PolyVENT integral vent filters

PolyVENT filters are integral venting filters that work bidirectionally to prevent bacterial and other contaminants from entering vessels like incubators, bioreactors, or fermentation tanks during draining or filling. With an integral PTFE filter membrane, PolyVENT acts as an industrial air filter media for sterilization* of gases entering bioreactors such as fermentation tanks.

Features and benefits

- 0.2 µm hydrophobic PTFE air filters are excellent industrial air filter media.
- Testable by water breakthrough (WBT) test or bubble point testing.
- Biosafe: All materials pass USP Class VI Test for Plastics.
- Manufactured in clean room facilities.
- Range of filtration areas from 4–2000 cm^2 to support filtration volumes as small as one liter and as large as a large tank vessel.

Applications

- Bioreactors
- Fermentation tanks
- Incubators

* *Refers to sterilization by filtration for small sample use, which is an industry term for filters of pore size 0.2 µm or smaller as referenced in guidance such as EPA Guidance for Industry Sterile Drug Products Produced by Aseptic Processing — Current Good Manufacturing Practice Section IX, Part B (September 2004).*

PolyVENT integral vent filters

Technical specifications

PolyVENT venting filters

Housing	Polypropylene
Filter media	PTFE (polytetrafluoroethylene)
Pore size	0.2 µm
Vent	On inlet
Support system	Polypropylene
Sealing	Heat-fused
Maximum pressure	2 bar: Forward direction
Water breakthrough test	2 bar/15 seconds
Flow direction	Bidirectional
Biosafety	Materials pass USP Class VI
Autoclavable	Can be autoclaved at 121°C at 15 psi for 20 min. Multiple autoclave cycles are possible. However, the responsibility for reuse is with the operator. The device should be protected from cross contamination. An integrity test should be performed after autoclaving.
Nominal filtration area	36 mm capsule: ~ 500 cm^2 75 mm capsule: ~ 1000 cm^2 150 mm capsule: ~ 2000 cm^2 50 mm disc: 16 cm^2 25 mm disc: 4 cm^2

Ordering information

PolyVENT venting filters

			Connections			
Pore size (µm)	**Catalog number**	**Housing type**	**Inlet**	**Outlet**	**Media**	**Quantity/pack**
PolyVENT 36						
0.2	6713-5036	Capsule	SB	SB	PTFE	1
0.2	2103	Capsule	1/2 SB	1/2 SB	PTFE	1
PolyVENT 75						
0.2	6713-1075	Capsule	1/2 SB	1/2 SB	PTFE	1
PolyVENT 150						
0.2	2107	Capsule	1/2 SB	1/2 SB	PTFE	1
0.2	2108	Capsule	1 1/2" sanitary	1 1/2" sanitary	PTFE	1
PolyVENT discs						
0.2	6713-0425	25 mm	FLL	ML	PTFE	50
0.2	6713-1650	50 mm	SB	SB	PTFE	10
0.2	6713-1651	50 mm	SB	SB	PTFE	100

HEPA-VENT, HEPA-CAP, and HEPA capsule with Versapor membrane

HEPA filter media are used throughout scientific, research, and industrial environments in a variety of air and gas filtration applications where high retention, dirt-holding capacity, and flow rates are required.

Features and benefits

- Glass filter media strengthened by dual lamination with a tough polyester monofilament.
- Retains 99.97% of all particles ≥ 0.3 µm in air.
- Durable polypropylene housing.
- High flow rates with low pressure drops across filter media, ensuring clean air passing in and out of vessels.
- Suitable for particulate removal from air and gases, prefilter for suction or to serve gas inline filter.
- Can be sterilized by autoclaving at 121ºC at 15 psi for 20 min.
- Available in a variety of end-fitting configurations.
- Manufactured in clean room facilities under ISO quality systems.
- Allows bidirectional flow.
- Depth filter design allows for high loading capacity.

Applications

- Preventing bacterial, algal, or fungal contamination in fermentors or incubators.
- Tissue culture applications.
- Gas line filter.
- Particulate removal from gases.
- Prefilters for suction.

HEPA capsule with Versapor filter

HEPA-VENT and HEPA-CAP filters

Technical specifications

HEPA venting filters

	HEPA venting filters	Hepa capsule with Versapor membrane
Housing and support	Polypropylene	Polypropylene
Filter media	Glass microfiber	Versapor membrane (acrylic copolymer on a non-woven support)
Support system	Polypropylene	Polyester
Effective filtration area	36 mm capsule: ~ 625 cm^2 75 mm capsule: ~ 1300 cm^2 150 mm capsule: ~ 2590 cm^2 50 mm disc: 16 cm^2	860 cm^2
Sealing	Heat-fused	Membrane Sealing Material: Polyurethane Housing Sealing Material: Polypropylene-encapsulated stainless steel
Maximum operating pressure	0.41 MPa (4.1 bar)	3.4 bar (340 kPa, 50 psi)
Flow direction	Bidirectional	–
Biological safety	Materials pass USP Class VI	Passes United States Pharmacopeia (USP) Biological Reactivity Test, *In Vivo* <88>

Ordering information

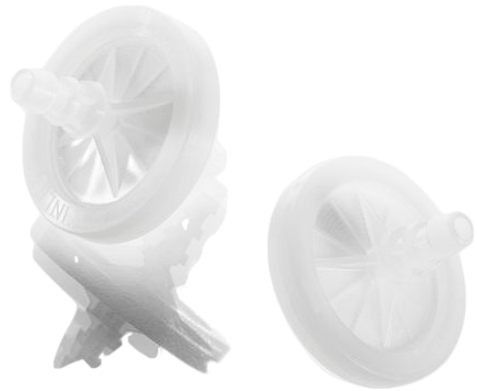
HEPA-VENT and HEPA-CAP filters

Catalog Number	Description	Pore size (µm)	Housing Type	Inline connection	Quantity/pack
12144	HEPA capsule Versapor 1.2 µm HB	1.2	Capsule	3/8 in. FNPT; includes optional hose barb fittings to accept 12.7 mm ID tubing	1
6702-3600	HEPA-CAP 36	1	Capsule	1/4-3/8 in. stepped barb	1
2609T	HEPA-CAP 36	1	Capsule	3/8 in. FNPT*	5
6702-7500	HEPA-CAP 75	1	Capsule	3/8-1/2 in. stepped barb	1
2709T	HEPA-CAP 75	1	Capsule	3/8 in. FNPT	5
6702-9500	HEPA-CAP 150	1	Capsule	3/8 in. FNPT	1
2809T	HEPA-CAP 150	1	Capsule	3/8 in. FNPT	5
6723-5000	HEPA-VENT disc filter	1	50 mm disc	1/4-3/8 in. stepped barb	10

* *FNPT—Female national pipe thread*

Bacterial air vents

Bacterial air vent filters are recommended for small-volume venting and degassing for receiving vessels and small isolation or environmental chambers. Their hydrophobic media allows air and gasses to pass freely while blocking aqueous fluid and aerosol contaminents, and their high pressure rating provides product integrity during pressure surges. Can be used for in-line barrier on culture vessels or for bioisolation of vacuum sources.



Bacterial air vents

Features and benefits

- Hydrophobic glass laminate membrane
- High pressure rating
- Compact design
- Barbed hose connections fit multiple tubing sizes
- Sterile and non-sterile options

Applications

- Small-volume venting
- Receiving vessels
- Culture vessels
- Isolation chambers

Technical specifications

Bacterial air vents

Materials of construction	Filter media: Hydrophobic glass laminate (polyester, glass fiber, polyester) Housing: Polypropylene
Effective filtration area	7.5 cm^2
Dimensions	Overall Length: 5.3 cm Diameter: 4.5 cm
Inlet/outlet connections	Stepped hose barbs, 6.4 - 9.5 mm
Maximum operating temperature	121°C at 1.0 bar (100 kPa)
Maximum operating pressure	5.2 bar (520 kPa) at ambient temperatures
Minimum air flow rate	40 L/min at 0.4 bar (40 kPa)
Typical aerosol retention*	99.97% 0.3 µm (aerosolized DOP) at 32 L/min/100 cm^2
Sterilization	PN 4210: Provided non-sterile. Autoclavable if desired at 121 - 123 °C for a maximum of 15 min PN 4308: Sterilized by gamma irradiation

** Following ASTM D 2986-95A*

Ordering information

Bacterial air vents

Catalog number	Description	Quantity/pack
4210	1 µm (nominal), 37 mm	24
4308	1 µm (nominal), 37 mm, sterile	10

Vacuum protection filters

VACU-GUARD vacuum protection filters

VACU-GUARD and VacuShield inline filters protect your equipment from potentially damaging contaminants. Choose from disc and capsule formats, depending on your application.

VACU-GUARD disc filters

VACU-GUARD disc filter

Features and benefits

- Prevents Fluid and aerosol contamination of vacuum pumps or aspiration suction systems while removing hazardous exhaust.
- Flexible: Designed for use with 6–10 or 10–12 mm ID tubing.
- Biosafe: All materials pass USP Class VI Test for Plastics.

Applications

- Protects vacuum pumps and systems from aerosols and particulate contamination.

VACU-GUARD 150 capsule filters

VACU-GUARD 150 capsule filter

Features and benefits

- Choice of media: VACU-GUARD 150 capsule filters include all the features and benefits of standard VACU-GUARD disc filters, plus a range of media for specific applications.

Applications

- Added back-up protection: Use as a backup between a cold trap and pump to protect against moisture and organic vapors if cold trap fails.
- Activated carbon removes organic vapors from air.
- Desiccant for use with high velocity acidic air.

VacuShield vent device

VacuShield™ vent device

Features and benefits

- Protects valves and pump components from damage due to liquids.
- Hydrophobic PTFE membrane.
- Barbed hose connections fit multiple tubing sizes.

Applications

- Protects vacuum pumps and systems from aerosols and particulate contamination.

Technical specifications

VACU-GUARD inline disc filter: 50 and 60 mm

	50 mm	60 mm
Filtration area	16 cm^2	25 cm^2
Maximum operating pressure	1 bar	1 bar
Biosafety	All materials pass USP Class VI test for plastics	All materials pass USP Class VI test for plastics
Rated retention in air	99.99% particle retention for particles ≥ 0.1 µm	99.99% particle retention for particles ≥ 0.1 µm
Pore size (in liquid)	0.45 µm	0.45 µm
Housing	Polypropylene	Polypropylene
Filtration media	PTFE membrane	PTFE membrane
Connectors	16–10 mm SB (stepped barb) inlet and outlet	310–12 mm SB inlet and outlet
Flow rates (SLPM): 0.14 bar* 0.28 bar* 0.41 bar* 0.69 bar*	 15 27 38 53	 27 57 83 139
Flow direction	Inlet to outlet	Inlet to outlet

* *Differential pressure*

Technical specifications

VACU-GUARD 150 inline capsule filter

	Activated carbon	Desiccant
Chemical trap media	Activated carbon	Anhydrous calcium sulphate
Filter media	PTFE	PTFE
Surface area or weight (nominal)	82 000 m^2 (carbon)	318 g (desiccant)
Flow rates (SLPM) (nominal): 0.1 bar* 0.5 bar*	 210 450	 280 600
Maximum operating pressure: Dry gas Wet gas	 4 bar 1 bar	 4 bar 1 bar
Connectors: Inlet Outlet	 Hose barb for 12.7 mm tube 10–12 mm step barb	 Hose barb for 12.7 mm tube 10–12 mm step barb

* *Differential pressure*

Note: as with any chemical reaction, care should be used to determine the safety and usefulness of VACU-GUARD 150 products prior to routine use.

Technical specifications

VacuShield vent device

Materials of construction	Filter Media: PTFE on a polypropylene support Housing: Polypropylene
Typical aerosol retention*	99.97% 0.3 µm (DOP) at 32 L/min/100 cm^2 (following ASTM D298-95A)
Inlet/outlet connections	Stepped hose barbs, 6.4-12.7 mm diameter; internal taper accepts male slip luer
Maximum operating temperature	130 °C
Maximum operating pressure	1.0 bar (100 kPa)
Typical air flow rate	8 L/min at 0.2 bar (20 kPa)
Sterilization	Provided non-sterile. If desired, autoclave only once prior to use at 121-123 °C for a maximum of 20 min

* *Differential pressure*

Ordering information

Vacuum protection

Description	Catalog number	Quantity/pack
VACU-GUARD, 50 mm disc	6722-5000	10
VACU-GUARD, 60 mm disc	6722-5001	10
VACU-GUARD 150 capsule, activated carbon	6722-1001	1
VACU-GUARD 150 capsule, desiccant	6722-1002	1
VacuShield vent device, 50 mm	4402	3

Tangential flow filtration

Tangential flow filtration (TFF) is a rapid and efficient method for the concentration or diafiltration of biomolecules. We offer an extensive line of TFF capsules with eleven molecular weight cutoffs (MWCO) designed to work with our lab-friendly plug-and-play Minimate EVO TFF System. These can be used in a wide range of applications.

- Concentrate and desalt proteins, peptides, or nucleic acids (DNA, RNA, oligonucleotides).
- Recover antibodies or recombinant proteins from clarified cell culture media.
- Process metal sensitive enzymes and molecules.
- Separate (fractionate) large from small biomolecules.
- Recover or remove viruses from solutions.
- Prepare samples prior to column chromatography.
- Concentrate samples after gel filtration.
- Replace dialysis applications.
- Depyrogenate water, buffers, and media solutions.

Minimate™ EVO tangential flow filtration system

The Minimate EVO system is a plug-and-play benchtop TFF system designed for reliable buffer exchange or concentration of samples up to 1 L. Designed to work with Minimate capsules and compatible with small volume hollow fiber cartridges, the system provides high concentration factors of samples and features system working volume as low as 15 mL. Roller head peristaltic pumps provide gentle processing for critical applications such as fragile biomolecules. The reservoir design allows for either continuous or discontinuous diafiltration to be performed in the same system without sample transfer for greater user control and easier validation. All wetted components are made from low protein binding and chemically resistant materials.

Features and benefits

- Compact footprint
- Easy set-up
- Versatile reservior
- Flexibility (TFF capsules and hollow fiber compatible)
- Peristaltic pump and pressure gauges
- Everything needed to begin TFF processing

Applications

- Protein concentration
- Desalting
- Buffer exchange
- Continuous diafiltration
- Fractionation
- Recovery from cell culture and lysates

Minimate EVO TFF system

Technical specifications

Minimate EVO TFF system

Materials of construction	Reservoir: Polysulfone Reservoir cover: Polypropylene Reservoir O-ring: Silicone Magnetic stir bar: PTFE coated Gauge wetted parts: Type 316 L stainless steel SS fitting O-ring: EPDM rubber Gauge mounting block: Polypropylene Luer fittings: Polypropylene and stainless steel Tubing: PharMed #16 Stopcocks and valves: PVDF Drip tray: Acetal with T304 stainless steel brackets
Includes	Peristaltic pump, pump head pressure gauge, valves, reservoir with stir bar, built-in stir plate on a drip tray
Dimensions	32.6 cm W × 48.2 cm D × 22 cm H
Recommended operating pressure	2.07 bar (206.8 kPa)
Operating temperature range	5 – 50 °C
Approximate recirculation flow rate	10 – 240 mL/min
Minimum system working volume	15 mL

Ordering information

Minimate EVO TFF system

Description	Catalog number
Minimate EVO TFF system package includes: Peristaltic pump, pump head, pressure gauges (2), reservoir, stir plate, drip tray, and assorted fittings	OAPMPUNV
Minimate EVO fittings kit includes: 3-way valve for reservoir (2), 1-way valve reservoir lid (2), male luer coupler (1), male luer lock - hose barb (3), male luer lock - hose barb elbow (4), female luer lock - hose barb (1), tubing clamps (8), PharMed tubing (2 ft.), screw clamp for tubing (1), male luer plug (4)	97014
Minimate EVO reservoir kit	97008
Minimate EVO stir plate kit	97010
Minimate EVO drip tray kit	97009
Minimate EVO pump drive	97011
Minimate EVO pump head	97012

Minimate tangential flow filtration capsules

Minimate TFF capsules are disposable devices that acclerate and simplify processing samples up to 1 L. Designed to work with the Minimate EVO TFF System, their cost-effective plastic construction and chemical compatibility of the Omega PES ultrafiltration membrane facilitate cleaning and reuse. The eleven MWCOs offer flexibility and tailoring to your application for high flux throughout. Each capsule is 100% integrity tested during manufacture. The Minimate TFF capsules are the central part of a system for performing concentration or diafiltration on solutions of biomolecules.

Minimate EVO tangential flow filtration system

Features and benefits

- High flux
- Low protein-binding
- 11 MWCOs
- 50 cm^2 EFA
- Integrity tested

Applications

- Protein concentration
- Desalting
- Buffer exchange
- Continuous diafiltration
- Fractionation
- Recovery from cell culture and lysates

Technical specifications

Minimate tangential flow filtration capsules

Materials of construction	Filter media: Omega membrane (modified polyethersulfone) Housing: Polypropylene, glass reinforced Screens, housing, housing sealing ring, fittings: Polypropylene Membrane plate and filtrate channels: Polyethylene Internal gasket: Ethylene propylene elastomer
Effective filtration area	50 cm^2
Dimensions (nominal)	20 cm × 3.8 cm × 1.8 cm
Recommended crossflow	30-80 mL/min
Membrane/non-recoverable hold-up volume	1.3 mL
Operating temperature range	5-50°C
Maximum operating pressure	4 bar (400 kPa) at 20°C
pH range	2-14
Forward flow air integrity value	< 7 mL/min at 0.7 bar (70 kPa)

Ordering information

Minimate tangential flow filtration capsules

Catalog number	Description	Quantity/pack
OA001C12	Minimate TFF capsules with Omega membrane: 1K	1
OA003C12	Minimate TFF capsules with Omega membrane: 3K	1
OA005C12	Minimate TFF capsules with Omega membrane: 5K	1
OA010C12	Minimate TFF capsules with Omega membrane: 10K	1
OA030C12	Minimate TFF capsules with Omega membrane: 30K	1
OA050C12	Minimate TFF capsules with Omega membrane: 50K	1
OA070C12	Minimate TFF capsules with Omega membrane: 70K	1
OA100C12	Minimate TFF capsules with Omega membrane: 100K	1
OA300C12	Minimate TFF capsules with Omega membrane: 300K	1
OA500C12	Minimate TFF capsules with Omega membrane: 500K	1
OA990C12	Minimate TFF capsules with Omega membrane: 1000K	1
88216	Minimate fittings kit (included with each capsule, sold separately if needed)	1

05

Centrifugal filtration devices

These sample processing devices are engineered to maximize recovery in a wide range of laboratory applications including buffer exchange, concentration and desalting of biomolecules. These devices accommodate starting volumes from less than 50 µL to 60 mL. They provide high flow rates and minimal non-specific binding of proteins and nucleic acids.

Cytiva centrifugal devices

Our devices offer versatility with various membrane types, including low-binding Bio-Inert™, Supor, wwPTFE, and Omega ultrafiltration membranes which are available in a range of MWCOs. Membrane seals prevent solution bypass, which minimizes sample loss. Color-coded devices provide easy identification of membranes ranging from 1 kD to 0.45 µm. The unique vertical paddle design in Microsep Advance and Macrosep Advance centrifugal devices reduce the risk of protein aggregation, and large sample reservoirs facilitate easy sample recovery.

Applications

Centrifugal devices can replace traditional separation techniques, such as column chromatography, preparative electrophoresis, alcohol or salt precipitation, dialysis, and gradient centrifugation, when performing the following:

- Biomolecule concentration
- Desalting
- Buffer exchange
- Deproteination of biological samples
- Fractionation of protein mixtures
- Separation of primers from PCR products
- Separation of labeled nucleic acids or proteins from unincorporated nucleotides
- Virus concentration or removal
- Clarification of cell lysates and tissue homogenates
- Nucleic acid isolation

How to choose the best centrifugal ultrafiltration device

Our centrifugal devices streamline biomolecule sample preparation, offering efficient concentration and salt removal for samples ranging from 50 µL to 60 mL within minutes. These devices feature membranes designed to minimize non-specific biomolecule binding resulting in a > 90% recovery of target biomolecules.

What is ultrafiltration?

Ultrafiltration is a membrane separation technique used to separate extremely small particles and dissolved molecules in fluids. The primary basis for separation is molecular size, although other factors such as molecule shape and charge can also play a role. Molecules larger than the membrane pores will be retained, but not bound, at the surface of the membrane and concentrated during the ultrafiltration process.

Compared to non-membrane processes (chromatography, dialysis, solvent extraction, or centrifugation), ultrafiltration:

- Is gentler on the molecules being processed.
- Does not require an organic extraction which may denature labile proteins.
- Maintains ionic and pH conditions.
- Is fast and relatively inexpensive.
- Can be performed at low temperatures.
- Is efficient as can simultaneously concentrate and purify molecules.

The retention properties of ultrafiltration membranes are expressed as molecular weight cut-off (MWCO) and measured in kilodaltons (kD). This value refers to the approximate molecular weight of a dilute globular solute (i.e., a typical protein) which is 90% retained by the membrane. A molecule's shape can have a direct effect on its retention by a membrane. For example, linear molecules like DNA may find their way through pores that will retain a globular species of the same molecular weight. There are three generic applications for ultrafiltration:

1. **Concentration:** Ultrafiltration is a very convenient method for the concentration of dilute protein, DNA, orRNA samples. It does not shear DNA as large as 100 Kb or cause loss of enzymatic activity in proteins and is efficient with > 90% recovery.
2. **Desalting and buffer exchange (diafiltration):** Ultrafiltration provides a convenient and efficient way to remove or exchange salts, remove detergents, separate free from bound molecules, remove low molecular weight components, or rapidly change the ionic or pH environment.
3. **Fractionation:** Ultrafiltration will not accomplish a sharp separation of two molecules with similar molecular weights. The molecules to be separated should differ by at least one order of magnitude (10X) in size for effective separation. Fractionation using ultrafiltration is effective in applications, such as the preparation of protein-free filtrates, the separation of unbound or unincorporated label from DNA and protein samples, and the purification of PCR products from synthesis reactions.

Choosing the correct MWCO

Once sample volume is determined, the next step is to select the appropriate MWCO for ultrafiltration or pore size for microfiltration. MWCOs are nominal ratings based on the ability to retain > 90% of a solute of a known molecular weight in kilodaltons.

It is important to recognize that retention of a molecule by an ultrafiltration membrane is determined by a variety of factors, its molecular weight serves only as a general indicator.

Choosing the appropriate MWCO for a specific application requires consideration of a number of factors including molecular shape, electrical charge, sample concentration, sample composition, and operating conditions.

Different manufacturers use different molecules to define the MWCO of their membranes, so it's important to perform pilot experiments to verify membrane performance in a particular application.

MWCO selection for protein, viral and nucleic acid applications

MWCO (K)	Membrane nominal pore size* (nm)	Biomolecule size (nm)	Biomolecule molecular weight (K)	Virus or particle diameter (nm)	Nucleic acid base pairs (DS) (Bp)	Nucleic acid bases (SS) (Bs)
1	–	–	3 – 9	–	5 – 16	9 – 32
3	–	–	9 – 30	–	16 – 50	32 – 95
10	–	–	30 – 90	–	50 – 145	95 – 285
30	–	–	90 – 300	–	145 – 475	285 – 950
100	10	30 – 90	300 – 900	30 - 90	475 – 1450	950 – 2900
300	35	90 – 200	900 – 3000	90 - 200	1450 – 9500	2900 – 9500

* Nominal pore size as measured by electron microscopy

Common variables that increase molecule passage

- Sample concentration less than 1 mg/mL.
- Linear versus globular molecules.
- High transmembrane pressure created by g-force in centrifugal concentrators. This is especially important in the case of linear molecules, for example DNA fragments.
- Decreasing the g-force can increase retention of molecules by a membrane.
- Buffer composition that favors breakup of molecules.
- pH and ionic conditions that change the molecule (i.e., conformational changes).

Common variables that decrease molecule passage

- Sample concentration higher than 1 mg/mL.
- Buffer conditions that permit molecules to aggregate.
- Presence of other molecules that increase sample concentration.
- Lower transmembrane pressure (in the case of centrifugal concentrators, lower g-force).
- Adsorption to the membrane or device.
- Low temperature (4°C versus 24°C).

Nanosep™, Nanosep Microfiltration (MF), and Nanosep Nucleic acid binding (NAB) centrifugal devices

Nanosep centrifugal filters provide rapid processing of 50 to 500 µl samples with typical recoveries > 90%.

- Available with low protein binding Omega, Bio-Inert, and wwPTFE membranes.
- A wide range of MWCOs, color-coded for easy identification.
- Constructed of low-binding polypropylene.
- Ultrasonically welded seals prevent bypass or seal failure.
- Fits standard centrifuge rotors that accept 1.5 mL tubes.
- The NAB nanosep utilises a silica-based quartz glass fiber media that allows efficient binding and elution of DNA and RNA.

Nanosep centrifugal filters

Applications

- Concentrate, purify, and desalt oligonucleotides, DNA and RNA.
- Clean up labeling and PCR reactions.
- Concentrate and desalt biomolecules.
- Exchange buffer or remove salt of chromatography eluate and gradient fractions
- Isolate DNA from agarose gel slices.
- Separate oligonucleotides and RNA from acrylamide gels.
- Concentrate PCR products regardless of size with 100K device if primer removal is required.
- Prepare sample for analytical techniques (e.g., HPLC, LC/MS).
- Binding and purification of plasmid DNA, genomic DNA, or total RNA.

Technical specifications

Nanosep, Nanosep MF, and Nanosep NAB centrifugal devices

Materials of construction	Nanosep devices filter media: Omega (modified polyethersulfone) ultrafiltration membrane Nanosep MF devices filter media: Bio-Inert (modified nylon) and wwPTFE membranes Nanosep NAB device filter media: Glass fiber Sample reservoir, membrane support base, and filtrate receiver: Polypropylene
Effective filtration area	0.28 cm^2
Dimensions	Overall Length (fully assembled with cap): 4.5 cm
Capacities	Maximum sample volume: 500 µL Final concentrate volume: 15 µL Filtrate receiver volume: 500 µL Hold-up volume: < 5 µL
Operating temperature range	0 – 40°C
pH range	Nanosep devices: 2 – 14 Nanosep MF devices: 2 – 14
Maximum centrifugal force	14 000 × g
Centrifuge	Fits rotors that accept 1.5 mL tubes
Sanitization	Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.

Ordering information

Nanosep, Nanosep MF, and Nanosep NAB centrifugal devices

Catalog number	Description	Quantity/pack
Nanosep centrifugal devices with Omega membrane		
OD003C33	3K, gray	24
OD003C34	3K, gray	100
OD003C35	3K, gray	500
OD010C33	10K, blue	24
OD010C34	10K, blue	100
OD010C35	10K, blue	500
OD030C33	30K, red	24
OD030C34	30K, red	100
OD030C35	30K, red	500
OD100C33	100K, clear	24
OD100C34	100K, clear	100
OD100C35	100K, clear	500
OD300C33	300K, orange	24
OD300C34	300K, orange	100
OD300C35	300K, orange	500
Nanosep Microfiltration (MF) centrifugal devices with Bio-Inert membrane		
ODM02C33	0.2 µm, aqua	24
ODM02C34	0.2 µm, aqua	100
ODM02C35	0.2 µm, aqua	500
ODM45C33	0.45 µm, wildberry	24
ODM45C34	0.45 µm, wildberry	100
ODM45C35	0.45 µm, wildberry	500
Nanosep Microfiltration (MF) centrifugal devices with wwPTFE membrane		
ODPTFE02C34	0.2 µm	100
ODPTFE02C35	0.2 µm	500
ODPTFE04C34	0.45 µm, clear	100
ODPTFE04C35	0.45 µm, clear	500
Nanosep centrifugal devices for Nucleic acid binding (NAB) with glass fiber membrane		
ODNABC33	Nucleic acid binding Nanosep, white	24*
ODNABC34	Nucleic acid binding, white	100*

** Both pack sizes come with 2 additional filtrate tubes for each device*

Nanosep centrifugal filters

Microsep™ Advance centrifugal devices

Precise, quick recovery of microliter volumes of concentrate from starting volumes up to 5.0 mL.

Features

- High recovery. Achieve 50X concentration and > 90% recovery in minutes.
- Features deadstop to prevent samples from spinning to dryness.
- Versatile Omega membrane is available in a variety of MWCOs.
- Color-coded and laser etched for easy identification.

Applications

- Concentrate dilute biomolecule samples.
- Exchange buffer and remove salt in samples.
- Remove proteins and particulate from samples for HPLC analysis of drugs, amino acids, and antibodies.
- Isolate low molecular weight compounds from fermentation broths for natural product screening.
- Recover biomolecules from cell culture supernatants or lysates.
- Clarify samples with gross particulate.
- Filtration of biological samples containing up to 20% DMSO (microfiltration only).

Microsep Advance centrifugal filters

Technical specifications

Microsep Advance centrifugal devices

Materials of construction	Filter media: Omega (modified polyethersulfone) and Supor (polyethersulfone) membranes Sample reservoir and filtrate receiver: Polypropylene Paddle and cap: Polyethylene
Effective filtration area	3.3 cm^2
Dimensions	Diameter: 17 mm Length: 12.0 cm
Capacities	Maximum sample volume: 5.0 mL Final concentrate volume: 65 µL (swinging bucket) 80 µL (45° angle rotor) 100 µL (34° angle rotor) Filtrate receiver volume: 6.5 mL Hold-up volume: 40 µL
Operating temperature range	0 – 40°C
pH range	2 – 14
Maximum centrifugal force	Ultrafiltration: 7,500 × g Microfiltration: 14,000 × g
Centrifuge	Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.
DMSO compatibility	MCPM02C67, MCPM02C68, MCPM45C67, and MCPM45C68 are compatible with samples containing up to 20% DMSO.

Ordering information

Microsep Advance centrifugal devices

Catalog number	Description	Quantity/pack
Microsep Advance centrifugal devices with Omega membrane		
MCP001C41	1K, yellow	24
MCP001C46	1K, yellow	100
MCP003C41	3K, gray	24
MCP003C46	3K, gray	100
MCP010C41	10K, blue	24
MCP010C46	10K, blue	100
MCP030C41	30K, red	24
MCP030C46	30K, red	100
MCP100C41	100K, clear	24
MCP100C46	100K, clear	100
Microsep Advance centrifugal devices with Supor membrane		
MCPM02C67	0.2 µm, aqua	24
MCPM02C68	0.2 µm, aqua	100
MCPM45C67	0.45 µm, wildberry	24
MCPM45C68	0.45 µm, wildberry	100

Macrosep™ Advance centrifugal devices

Quickly concentrates up to 20 mL of biological sample without valuable sample loss.

Features

- Rapidly concentrates 20 mL sample volumes to 450 µL.
- Provides high recoveries, typically > 90%.
- Low protein-binding Omega membrane and polypropylene housing minimize losses due to non-specific binding.
- Versatile Omega membrane is available in a variety of MWCOs.
- Built-in deadstop prevents spinning to dryness.
- Color-coded for easy identification.

Applications

- Concentrate and desalt biomolecules.
- Exchange buffer or remove salt of chromatography eluates and gradient fractions.
- Recover proteins or other molecules from cell culture supernatants.
- Remove particulate from aqueous solutions.
- Filtration of biological samples containing up to 20% DMSO (microfiltration only).

Macrosep Advance centrifugal devices

Technical specifications

Macrosep Advance centrifugal devicess

Materials of concentration	Filter media: Omega (modified polyethersulfone) and Supor (polyethersulfone) membranes Sample reservoir and filtrate receiver: Polypropylene Paddle and cap: Polyethylene
Effective filtration area	7.2 cm^2
Dimensions	Diameter: 50 mm Length: 12.0 cm
Operating temperature range	0 – 40 °C
Capacities	Maximum sample volume: 20 mL Final concentrate volume: As low as 450 µL, depending on rotor used Filtrate receiver volume: 22 mL Hold-up volume: 80 µL
pH range	2 – 14
Maximum centrifugal force	Ultrafiltration: 5 000 × g Microfiltration: 14 000 × g
Centrifuge	Fits centrifuges that accept standard 50 mL conical end tubes
Sanitization	Provided non-sterile. May be sanitized by filtering 70% ethanol through the device prior to use.
DMSO compatibility	MAPM02C67, MAPM02C68, MAPM45C67 and MAPM45C68 are compatible with samples containing up to 20% DMSO

Ordering information

Macrosep Advance centrifugal devicess

Catalog number	Description	Quantity/pack
Macrosep Advance centrifugal devices with Omega membrane		
MAP001C36	1K, yellow	6
MAP001C37	1K, yellow	24
MAP001C38	1K, yellow	100
MAP003C36	3K, gray	6
MAP003C37	3K, gray	24
MAP003C38	3K, gray	100
MAP010C36	10K, blue	6
MAP010C37	10K, blue	24
MAP010C38	10K, blue	100
MAP030C36	30K, red	6
MAP030C37	30K, red	24
MAP030C38	30K, red	100
MAP100C36	100K, clear	6
MAP100C37	100K, clear	24
MAP100C38	100K, clear	100
Macrosep Advance centrifugal devices with Supor membrane		
MAPM02C67	0.2 µm, aqua	24
MAPM02C68	0.2 µm, aqua	100
MAPM45C67	0.45 µm, wildberry	24
MAPM45C68	0.45 µm, wildberry	100

Jumbosep™ centrifugal devices

Convenient and reusable concentration, purification, and diafiltration of 15 to 60 mL biological samples.

Features

- Concentrates 60 mL sample volumes to 5 mL in 30 min.
- Provides high recoveries, typically > 90%.
- Low protein-binding Omega membrane and polysulfone housing minimize losses due to nonspecific binding.
- Versatile Omega membrane is available in a variety of MWCOs, color-coded for easy identification.
- Built-in deadstop prevents spinning to dryness.
- Unique sealing mechanism prevents retentate leakage and filtrate contamination.
- Sustainable. Sample reservoir and filtrate receiver can be sanitized and reused. Only the membrane needs to be replaced between each sample.

Applications

Replaces dialysis, chemical precipitation, and lyophilization when:

- Concentrating and desalting biomolecule.
- Exchanging buffer or removing salt of chromatography eluates and gradient fractions.
- Separating biomolecules from cell culture supernatants.
- Concentrating or removing viruses.
- Performing crude fractionation of dilute protein mixtures.
- Removing debris and particulates from cell lysates.

Jumbosep centrifugal devices

Technical specifications

Jumbosep centrifugal devices

Materials of concentration	Filter media: Omega (modified polyethersulfone) membrane Sample reservoir and filtrate receiver: Polysulfone Sample reservoir cap: Polyethylene Insert without membrane: High density polyethylene Filtrate receiver cap and insert release: Polypropylene
Effective filtration area	15.2 cm^2
Dimensions	Outside diameter: 6 cm Overall height (fully assembled with cap) 11.3 cm
Operating temperature range	0 – 40 °C
Capacities	Maximum sample volume: 60 mL Final concentrate volume: 3.5 – 4 mL Maximum filtrate receiver volume: 60 mL Hold-up volume: 0.2 mL
pH range	2 – 14
Centrifuge	Swinging bucket rotor is required that accepts flat-bottomed 250 mL bottles and is capable of spinning at up to 3,000 × g
Sanitization	Provided non-sterile. The entire device, including the filter media, may be sanitized by filtering 70% ethanol through it prior to use

Ordering information

Jumbosep centrifugal devices

The generic starter kit includes four holders, cups, and caps. Membrane inserts sold separately. Starter kits include four holders, cups, caps, and membrane inserts.

Catalog number	Description	Quantity/pack
Jumbosep centrifugal device starter kits		
FD000K65	Generic starter kit, (no membrane inserts)	4
FD003K65	3K starter kit, gray	4
FD010K65	10K starter kit, blue	4
FD030K65	30K starter kit, red	4
FD100K65	100K starter kit, clear	4
FD300K65	300K starter kit, orange	4
Jumbosep centrifugal device membrane inserts		
OD003C65	3K membrane insert, gray	12
OD010C65	10K membrane insert, blue	12
OD030C65	30K membrane insert, red	12
OD100C65	100K membrane insert, clear	12
OD300C65	300K membrane insert, orange	12
Accessories and replacement parts		
FD001X65	Filtrate receiver and cap	12
FD002X65	Sample reservoir and cap	12
FD003X65	Insert release	24

06

Filter plates

Multi-well filter plates to fit your application needs

Cytiva filter plates are designed for high-throughput workflows and comply with ANSI/SLAS standards for seamless integration with automated systems. Available in a variety of membranes, well volumes, and tip configurations, these plates support a wide range of high throughput laboratory applications.

For whatever is on your plate

As sample volumes get smaller but more numerous, multi-well plates have become a standard tool in many laboratories. They provide processing of numerous samples at once, often by an automated platform.

In the 1990s we introduced our first multi-well filter plate range which allowed scientists to perform high throughput filtration and purification steps.

Today we continue to combine innovative membrane filter technology with optimized multi-well plate designs. The AcroPrep filter plate portfolio offers 24-, 96-, and 384-well high performance filter plates. They provide fast sample flow and targeted size separation for efficient filtration, accurate separation, and reliable sample recovery while minimizing signal interference and extractables (leachables) that interfere with downstream analysis.

AcroPrep filter plates are designed to meet stringent requirements for high throughput applications and comply with ANSI/SLAS standards. A rigid construction prevents plates from flexing or jamming in robotic systems and barcode labeling provides easy sample tracking and identification.

A comprehensive selection of membranes, sample well volumes, and tip configurations allows researchers to select the best filter plate for their application needs. As your workflow evolves, AcroPrep filter plates can scale with you in sample volume and sample size without re-validation or product re-selection.

General filter plate applications

Applications	Membrane	Description	Pore sizes option
Aqueous filtration	Supor (polyethersulfone) membrane, wwPTFE (water-wettable polytetrafluoroethylene)	The Acroprep filter plates enable fast and efficient sterilization, clarification, and sample prep prior to downstream analysis. Supor membrane offers high flow rates, low protein binding, and broad chemical compatibility.	0.1 µm: Mycoplasma reduction 0.2 µm: Sterile filtration (Supor EKV only) 0.45 µm: Clarification, large virus filtration 0.8–5 µm: Large particulate removal, prefiltration
Cell clarification and lysate clarification	Seitz depth media and Supor EKV (hydrophilic polyethersulfone membrane), glass fiber and Supor PES membrane)	AcroPrep filter plates feature dual-layer wells with both a depth media pre-filter and a final surface membrane. This integrated design enables efficient removal of large particulates—ideal for cell clarification and lysate clearance—followed by precise filtration through a PES membrane (0.2 µm or 1.2 µm), ready for downstream analysis.	3 µm glass fiber over a 0.2 µm PES Supor membrane (96 well only) 3 µm glass fiber over a 1.2 µm PES Supor membrane (96 well only) Seitz depth media over a 0.2 µm PES Supor EKV membrane (24 well only)
Chromatography screening	Supor (polyethersulfone) membrane	AcroPrep filter plates can be combined with resins to form high-throughput chromatography platforms. A resin slurry can be introduced to the individual wells of an AcroPrep or AcroPrep Advance filter plate allowing for the screening of multiple resin types and the analysis of different binding, washing, and elution characteristics.	0.2 µm PES Supor membrane 0.45 µm PES Supor membrane 0.8 µm PES Supor membrane 1.2 µm PES Supor membrane
Concentration, buffer exchange and desalting	Omega (modified polyethersulfone) membrane	Filter plates utilizing the Omega membrane membrane allow concentration, buffer exchange, or desalting of biomolecules. To select the correct MWCO use the recommendation of a MWCO 3-6x smaller than your biomolecule of interest.	3K 10K 30K 50K 100K
Flow cytometry sample preparation	PP/PE non-woven (polypropylene, polyethylene) media	AcroPrep filter plates with 30/40 µm PP/PE non-woven media are ideal for preparing samples prior to flow cytometry. These membranes effectively remove cell aggregates, preventing clogs in the flow chamber. This ensures clearer results, reduced instrument downtime, and more consistent data quality.	30/40 µm PP/PE
Genomic DNA, plasmid DNA and RNA purification	Silica-based quartz glass fiber	Filter plates containing a Silica-based quartz glass fiber membrane enable the simultaneous purification of plasmid DNA, genomic DNA, or total RNA from various cell types. This membrane is available in 96 well or 384 well formats.	Silica-based quartz glass fiber

General filter plate applications (continuation)

Applications	Membrane	Description	Pore sizes option
Labeling clean-up	Supor (polyethersulfone) membrane or Omega (modified polyethersulfone) membrane	Plates can be used to separate unbound or unincorporated label from DNA and protein samples. The labelled biomolecule is retained above the membrane and the unbound flows through the membrane.	0.2 µm PES Supor membrane 0.45 µm PES Supor membrane 0.8 µm PES Supor membrane 1.2 µm PES Supor membrane 3K 10K 30K 50K 100K
Multiplex assays	Supor (polyethersulfone) membrane or PP/PE non-woven	AcroPrep filter plates support multiplex assays by allowing each well to function as an individual reaction vessel. Multiple wash and incubation steps can be performed efficiently, with the membrane acting as a support to retain microsphere beads. The Supor (PES) membrane offers a smooth, consistent surface morphology that prevents bead entrapment, ensuring high recovery and reproducible results. For larger bead-based assays, PP/PE non-woven media is also available.	0.2 µm PES Supor membrane 0.45 µm PES Supor membrane 0.8 µm PES Supor membrane 1.2 µm PES Supor membrane 30/40 µm PP/PE
Particulate removal	Glass fiber	The glass fiber membrane filter plates offer a high loading capacity, making it ideal for filtering viscous or debris-rich samples that other membranes cannot handle effectively.	1 µm glass fiber
Sample fractionation using ion exchange (IEX) membranes	Mustang™ Q, Mustang S membrane	The Mustang Q membrane features strong IEX quaternary amine ligands, and the Mustang S membrane features strong IEX sulfonic functional groups. Mustang IEX membranes deliver efficient and rapid flow rates with a convective pore structure that results in processing times that are much shorter than conventional resin-based technologies.	0.8 µm Mustang Q membrane 0.8 µm Mustang S membrane
Solvent filtration	PTFE, wwPTFE (water-wettable polytetrafluoroethylene)	AcroPrep and AcroPrep Advance filter plates, made from durable polypropylene, are compatible with a wide range of organic solvents when paired with hydrophobic PTFE or hydrophilic wwPTFE membranes. wwPTFE is also suitable for aqueous samples, offering flexibility across diverse applications.	0.2 µm PTFE 0.45µm PTFE 0.2 µm wwPTFE (hydrophilic) 0.45 µm wwPTFE (hydrophilic)

AcroPrep filter plate family

AcroPrep 24-well filter plates

The AcroPrep 24-well filter plates provide researchers with a comprehensive solution for their workflow needs, from cell harvesting to final sample preparation for analysis. Each well in the 24-well format can filter up to 7 mL of sample, offering substantial capacity for various applications. By maintaining a consistent 24-well footprint, these plates reduce the chance of error or loss of valuable product that can occur when transferring to other formats for processing. This consistency allows researchers to seamlessly continue their work for efficiency and reliability in their experiments.

AcroPrep 24-well filter plates

Technical specifications

AcroPrep 24-well filter plates

Filter media	Supor EKV filtration plates	Omega membrane	Supor membrane
Effective filtration area	1.57 cm^2	1.57 cm^2	1.57 cm^2
Plate housing	Polypropylene	Polypropylene	Polypropylene
Lid		Polystyrene	Polystyrene
Dimensions	Length: 12.75 cm Width: 8.52 cm Height w/o receiver 3.76 cm Hight w/ receiver: 7.41 cm EFA: 1.57 cm^2		
Recommended working volume	7 mL for vacuum and 6 mL for centrifugation	7 mL for vacuum and 6 mL for centrifugation	7 mL for vacuum and 6 mL for centrifugation
Recommended operating vacuum	38 cm Hg	38 cm Hg	≥ 38 cm Hg
Recommended centrifugal force	1500 × g	1,500 × g	1,500 × g
Recommended positive pressure		50 psi	20 psi
Aplication	• Sterile filtration of media, reagents, serum or protein	• Concentration and purification of peptides, proteins, oligonucleotides, DNA, and RNA • Clean-up of labelling and PCR reactions • Desalting and buffer exchange • Fractionation based on size exclusion	• Aqueous filtration • Chromatography screening • General sample preparation • Lysate clarification • Multiplexing assays • Mycoplasma reduction • Protein purification • Sterile filtration

Ordering information

AcroPrep 24-well filter plates

Catalog number	Description	Quantity/pack
AcroPrep 24 well filter plates with Supor EKV membrane for sterile filtration		
97027	7 mL, 0.2 µm Supor EKV membrane	8
97017	7 mL, 0.2 µm Supor EKV membrane	2
AcroPrep 24 well filter plates for cell clarification		
97026	7 mL, Seitz depth media/0.2 µm Supor EKV membrane	8
97016	7 mL, Seitz depth media/0.2 µm Supor EKV membrane	2
AcroPrep 24-well filter plates with Supor membrane		
97029	7 mL, 0.1 µm Supor membrane	8
97030	7 mL, 0.1 µm Supor membrane	2
97031	7 mL, 0.45 µm Supor membrane	8
97032	7 mL, 0.45 µm Supor membrane	2
97033	7 mL, 0.8 µm Supor membrane	8
97034	7 mL, 0.8 µm Supor membrane	2
97035	7 mL, 1.2 µm Supor membrane	8
97036	7 mL, 1.2 µm Supor membrane	2
97047	7 mL, 5 µm Supor membrane	8
97048	7 mL, 5 µm Supor membrane	2
AcroPrep 24-well filter plates with Omega membrane		
97049	7 mL, Omega membrane 1K MWCO	8
97050	7 mL, Omega membrane 1K MWCO	2
97051	7 mL, Omega membrane 3K MWCO	8
97052	7 mL, Omega membrane 3K MWCO	2
97053	7 mL, Omega membrane 10K MWCO	8
97054	7 mL, Omega membrane 10K MWCO	2
97055	7 mL, Omega membrane 30K MWCO	8
97056	7 mL, Omega membrane 30K MWCO	2
97057	7 mL, Omega membrane 50K MWCO	8
97058	7 mL, Omega membrane 50K MWCO	2
97059	7 mL, Omega membrane 100K MWCO	8
97060	7 mL, Omega membrane 100K MWCO	2

AcroPrep Advance 96-well filter plates

The AcroPrep Advance 96-well filter plates are versatile tools used in laboratory applications such as multiplexing, lysate clearance, protein purification, nucleic acid purification, ultrafiltration, and solvent filtration. These plates are available in well volumes of 350 µL, 1 mL, and 2 mL deep well formats for different experimental needs.

AcroPrep Advance 96-well filter plates

Technical specifications

AcroPrep Advance 96-well filter plates

Filter media	Supor (polyethersulfone) membrane Glass fiber (borosilicate glass without binder) media DNA binding (borosilicate glass without binder) media Mustang Q (anion exchange) membrane Mustang S (cation exhange) membrane Omega (modified polyethersulfone) media PP/PE non-woven (polypropylene/polyethylene) media PTFE (polytetrafluoroethylene) membrane Plate housing: Polyproylene Lid: Polystyrene
Dimensions	Length: 12.78 cm Width: 8.55 cm Height: 1.75 cm Height (without lid): 350 µL: 1.44 cm 1 mL: 3.29 cm 2 mL: 4.70 cm
Well-bottom area	0.25 cm^2
Recommended working volume	350 µL: ≤ 300 µL 1 mL: ≤ 900 µL 2 mL: ≤ 1.9 mL
Recommended operating vacuum	≥ 25.4 cm Hg
Recommended centrifugal force	1500 × g

Ordering information

AcroPrep Advance 96-well filter platess

Product number	Description	Quantity/pack
AcroPrep Advance 96-well filter plates with Supor membrane		
8019	350 µL, 0.2 µm Supor membrane	10
8029	350 µL, 0.45 µm Supor membrane	10
8039	350 µL, 1.2 µm Supor membrane	10
8119	1 mL, 0.2 µm Supor membrane	5
8129	1 mL, 0.45 µm Supor membrane	5
8130	1 mL, 1.2 µm Supor membrane	5
AcroPrep Advance 96-well filter plates with wwPTFE membrane		
8582	350 µL, 0.2 µm wwPTFE membrane	10
8586	350 µL, 0.2 µm wwPTFE membrane, long tip	10
8584	350 µL, 0.45 µm wwPTFE membrane	10
8588	350 µL, 0.45 µm wwPTFE membrane, long tip	10
8682	1 mL, 0.2 µm wwPTFE membrane	5
8686	1 mL, 0.2 µm wwPTFE membrane, long tip	5
8684	1 mL, 0.45 µm wwPTFE membrane	5
8688	1 mL, 0.45 µm wwPTFE membrane, long tip	5
8782	2 mL, 0.2 µm wwPTFE membrane	5
8784	2 mL, 0.45 µm wwPTFE membrane	5
AcroPrep Advance 96-well filter plates with PTFE membrane		
8047	350 µL, 0.2 µm PTFE membrane	10
8048	350 µL, 0.45 µm PTFE membrane	10
8147	1 mL, 0.2 µm PTFE membrane	5
8148	1 mL, 0.45 µm PTFE membrane	5
8247	2 mL, 0.2 µm PTFE membrane	5
8248	2 mL, 0.45 µm PTFE membrane	5

Product number	Description	Quantity/pack
AcroPrep Advance 96-well filter plates with Omega membrane		
8033	350 µL, Omega membrane 3K MWCO	10
8034	350 µL, Omega membrane 10K MWCO	10
8035	350 µL, Omega membrane 30K MWCO	10
8036	350 µL, Omega membrane 100K MWCO	10
8163	1 mL, Omega membrane 3K MWCO	5
8164	1 mL, Omega membrane 10K MWCO	5
8165	1 mL, Omega membrane 30K MWCO	5
8166	1 mL, Omega membrane 100K MWCO	5
AcroPrep Advance 96-well filter plates for lysate clearance		
8075	350 µL, 3 µm glass fiber/0.2 µm Supor membrane	10
8040	350 µL, 3 µm glass fiber/1.2 µm Supor membrane	10
8175	1 mL, 3 µm glass fiber/0.2 µm Supor membrane	5
8275	2 mL, 3 µm glass fiber/0.2 µm Supor membrane	5
AcroPrep Advance 96-well filter plates with Mustang membrane		
8071	350 µL, Mustang Q membrane	10
8072	350 µL, Mustang S membrane	10
8171	1 mL, Mustang Q membrane	5
8172	1 mL, Mustang S membrane	5
AcroPrep Advance 96-well filter plates with PP/PE (polypropylene/polyethylene)		
8027	350 µL, 30-40 µm PP/PE	10
8127	1 mL, 30-40 µm PP/PE	5
8227	2 mL, 30-40 µm PP/PE	5
AcroPrep Advance 96-well filter plates for nucleic acid purification		
8032	350 µL, DNA binding	10
8132	1 mL, DNA binding	5
8133	NAB Plate - 1 mL, DNA binding, long tips	5
8151	1 mL, 1.0 µm glass fiber	5
AcroPrep Advance 96-well filter plates with glass fiber		
8031	350 µL, 1.0 µm glass fiber	10
8131	1 mL, 1.0 µm glass fiber	5
8231	2 mL, 1.0 µm glass fiber	5

AcroPrep 384-well filter plates

The AcroPrep 384-well filter plates are designed to allow laboratories to process hundreds of samples simultaneously, for low volume, high throughput applications. These plates feature a maximum well volume of 100 µL and a recommended working volume of 80 µL. They are available in two types: Long and short outlet tips. Both types can be used for filtrate or retentate-based applications, but the longer tip version is recommended for critical filtrate studies and for the filtration of low viscosity solutions.

AcroPrep 384-well filter plates

Technical specifications

AcroPrep 384-well filter plates

Materials of construction	Filter media: Glass fiber (borosilicate glass), Omega (modified PES), and Supor (PES) membranes Plate housing: Polypropylene Lid: Polystyrene
Dimensions	Height: (with short tips): 1.66 cm with lid and 1.44 cm without lid Height (with long tips): 2.07 cm with lid and 1.85 cm without lid Length: 12.78 cm Width: 8.55 cm
Well bottom area	0.05 cm^2
Maximum well volume	100 µL
Recommended maximum working volume	80 µL
Recommended operating vacuum	25.4 cm Hg or greater
Filtration by centrifugation	500-3,000 × g
Typical sample hold-up volume	< 4 µL per well

Ordering information

AcroPrep Advance 96-well filter plates

Catalog number	Description	Quantity/pack
AcroPrep Advance 384-well filter plates with Supor membrane		
5084	100 µL, 1.2 µm Supor membrane, long tips	10
5085	100 µL, 1.2 µm Supor membrane, short tips	10
Acroprep 384-well filter plates with Omega membrane		
5076	100 µL, Omega membrane 10K MWCO, long tips	10
5077	100 µL, Omega membrane 10K MWCO, short tips	10
5078	100 µL, Omega membrane 30K MWCO, long tips	10
5079	100 µL, Omega membrane 30K MWCO, short tips	10
5080	100 µL, Omega membrane 100K MWCO, long tips	10
5081	100 µL, Omega membrane 100K MWCO, long tips	10
AcroPrep Advance 384-well filter plates with glass fiber		
5072-N	100 µL, 1.0 µm glass fiber, long tips	10
5073W	100 µL, 1.0 µm glass fiber, short tips, white housing	10

UNIPLATE collection and analysis microplates

UNIPLATE microplates

Our UNIPLATE collection microplates are designed to meet ANSI/SBS microplate standards, making them compatible with most microplate readers and automated plate handling devices. These microplates are versatile and suitable for applications, including filtrate collection and homogeneous assay techniques used in high-throughput screening (HTS). The 96-well format UNIPLATE with a “V” bottom is advantageous for small sample volumes. The vertical sides and “V” design at the base of each well allow all material to channel into the well base, achieving a liquid sample recovery rate of typically ≥ 99%.

UNIPLATE microplates

Features and benefits

- Range of volumes: Choice of well volumes: 250 µL, 650 µL, 2 mL, 5 mL, and 10 mL.
- Well densities: Choice of well densities: 24-, 48-, and 96-wells.
- Conforms to ANSI/SBS microplate standards: Suitable for use with robotic handlers and centrifuge carriers.

Ordering information

UNIPLATE microplates

Catalog number	Well format	Well volume	Plate material	Well Volume	Irradiated with lid	Quantity/case
UNIPLATE microplates						
7701-5102	24	10 mL	Polypropylene	Round	No	25
7701-5110	24	10 mL	Polypropylene	Round	Yes	25
7701-5500	48	5 mL	Polypropylene	Flat (rectangular well)	No	25
7701-5200	96	2 mL	Polypropylene	Round	No	25
UNIPLATE “V” bottom microplate						
7701-3250	96	250 µL	White polystyrene	“V”	-	50
UNIPLATE “Flat” bottom microplate						
7701-1651	96	650 µL	Clear Polystyrene	Flat (square well)	No	25

Vacuum manifold and accessories

The Cytiva vacuum manifold supports all ANSI/SLAS-compliant plates, including AcroPrep 24-well (7 mL), 384-well (100 µL), and AcroPrep and Acroprep Advance filter plates (350 µL, 1 mL, 2 mL). Equipped with a pressure gauge, metering valve, and release valve, it ensures consistent, repeatable vacuum filtration. Two Delrin spacer blocks, 350 µL and 1 mL, enable compatibility with a range of ANSI/SLAS compliant receiver plates. These spacers position the receiver plate just below the filter plate outlets, minimizing the risk of well-to-well cross-contamination

Vacuum manifold

Technical specifications

Vacuum manifold

Materials of construction	Vacuum manifold: Anodized aluminum Gasket: EDPM (Ethylene propylene) O-ring: Silicone Spacer blocks: Delrin plastic Adapter collar: Stainless steel
Dimensions	Length: 17.48 cm Width: 12.37 cm Height: 8.05 cm Weight: 2.38 kg
Maximum operating vacuum	63.5 cm Hg Note: The multi-well plate vacuum manifold can be used with multi-well filter plates that meet the specifications set forth by the ANSI/SBS X-2004.

Ordering information

Vacuum manifold and accessories

Catalog number	Description	Quantity/pack
5017	Multi-well plate vacuum manifold	1
5014-N	1 mL receiver plate spacer block	1
5015-N	350 µL receiver plate spacer block	1
5016	Replacement accessory kit (includes O-ring and gasket)	1
5028-N	Waste drain adapter	1
5225	Adapter collar for centrifugation	2
5226	Adapter collar for PCR receiver plate centrifugation	2
Other accessories		
5230	Cap mat for incubation	5
8001	AcroPrep Advance multi-well plate lid	10
5231	Multi-well plate lid	10

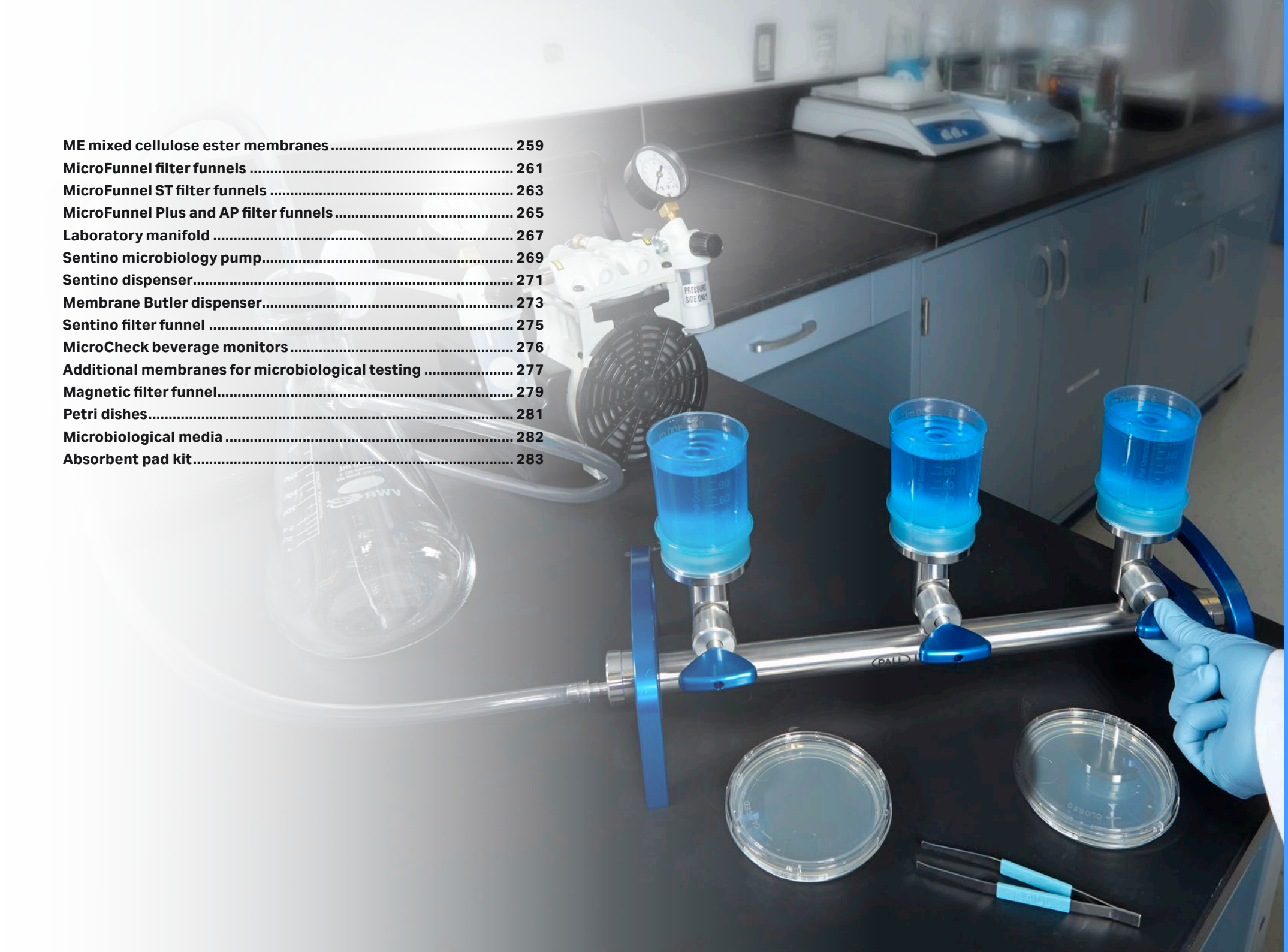
07

Microbiology products

Microorganisms pose significant risks across industries- They can disrupt pharmaceutical production, spoil food, compromise the flavor and quality of beverages, and lead to serious health concerns. Accurate and dependable microbial detection is essential to safeguard product integrity and maintain consumer safety. We meet this need with a suite of solutions that support the entire workflow.

Our high-performance membranes are designed for key applications including:

- **Pharmaceutical quality control**
- **Microbiological quality control in the food and beverage industry**
- **Environmental monitoring and analysis**
- **Wastewater testing**



ME mixed cellulose ester membrane

ME (MCE) membranes are a mixture of cellulose acetate and cellulose nitrate for microbiological recovery and colony growth applications using membrane filtration (MF) technique. The ME range of microbial recovery filters are tested in accordance with ISO 7704, ISO 8199 and ISO 11133 guidance.

- Use for microbiological quality control of aqueous samples or solids that completely dissolve in aqueous buffers.
- ME25/21 satisfies the requirements for most commonly selected 0.45 µm white, gridded membrane for MF techinque applications.
- Full range of pore sizes for organisms outside the typical range.
- Variety of packaging including individually sealed or dispenser refill packs provided EtO or gamma irradiated as indicated.
- Non-toxic gridlines neither enhance nor inhibit colony growth.
- Inherently hydrophilic to wet evenly and quickly.

Sterile cellulose ME25/21 MCE membrane filters

Technical specifications

ME mixed cellulose ester membranes

Pore size (µm)	Typical thickness (µm)	Typical sugar solution flow rate (mL/min/ 12.5 cm^2 at 0.9 bar)	Test organism	Percent recovery (%)	Bacterial challenge test (ASTM D3862-13)
0.2	130-160	≥ 80	*Escherichia coli*	≥ 80	Retains *Brevundimonas diminuta*
0.45	130-160	≥ 100	*Escherichia coli*	≥ 80	Retains *Serratia marcescensa*
0.8	130-160	–	*Saccharomyces cerevisiae*	≥ 80	–
1.2	130-160	–	*Saccharomyces cerevisiae*	≥ 80	–

Ordering information

ME mixed cellulose ester membranes

Diameter (mm)	Membrane type	Pore size (µm)	Membrane color; grid	Package style	Catalog number	Quantity/pack
47	ME24 (MCE)	0.2	White; plain	Individual pack	10401770	100
50	ME24 (MCE)	0.2	White; plain	Individual pack	10401772	100
47	ME24/21 (MCE)	0.2	White; gridded	Individual pack	10406970	100
50	ME24/21 (MCE)	0.2	White; gridded	Individual pack	10406972	100
47	ME25 (MCE)	0.45	White; plain	Individual pack	10401670	100
50	ME25 (MCE)	0.45	White; plain	Individual pack	10401672	100
50	ME25/20 (MCE)	0.45	White; plain	Individual pack	10406572	100
47	ME25/21 (MCE)	0.45	White; gridded	Individual pack	10406870	100
47	ME25/21 (MCE)	0.45	White; gridded	Individual pack	10406871	1000
47	ME25/21 (MCE)	0.45	White; gridded	Individual pack	66191ME	2000
50	ME25/21 (MCE)	0.45	White; gridded	Individual pack	10406872	100
47	ME25/41 (MCE)	0.45	Green; gridded	Individual pack	10409470	100
50	ME25/41 (MCE)	0.45	Green; gridded	Individual pack	10409472	100
47	ME25/31 (MCE)	0.45	Black; gridded	Individual pack	10409770	100
47	ME25/31 (MCE)	0.45	Black; gridded	Individual pack	10409771	1000
50	ME25/31 (MCE)	0.45	Black; gridded	Individual pack	10409772	100
47	ME27/21 (MCE)	0.8	White; gridded	Individual pack	10408970	100
50	ME28/41 (MCE)	1.2	Green; gridded	Individual pack	10408472	100
47	ME24/21 (MCE)	0.2	White; gridded	Dispenser pack, eButler	10408712	400
50	ME24/21 (MCE)	0.2	White; gridded	Dispenser pack, eButler	10408714	400
50	ME25/20 (MCE)	0.45	White; plain	Dispenser pack, eButler	10407324	400
47	ME25/21 (MCE)	0.45	White; gridded	Dispenser pack, eButler	10407312	400
50	ME25/21 (MCE)	0.45	White; gridded	Dispenser pack, eButler	10407314	400
47	ME25/41 (MCE)	0.45	Green; gridded	Dispenser pack, eButler	10407370	400
50	ME25/41 (MCE)	0.45	Green; gridded	Dispenser pack, eButler	10407372	400
47	ME25/31 (MCE)	0.45	Black; gridded	Dispenser pack, eButler	10407332	400
50	ME25/31 (MCE)	0.45	Black; gridded	Dispenser pack, eButler	10407334	400
50	ME27/21 (MCE)	0.8	White; gridded	Dispenser pack, eButler	10408915	400
50	ME27/41 (MCE)	0.8	Green; gridded	Dispenser pack, eButler	10407615	400
47	ME25/31 (MCE)	0.8	Black; gridded	Dispenser pack, eButler	10407342	400
47	ME25/21 (MCE)	0.45	White; gridded	Dispenser pack, Sentino*	68121ME	1000

MicroFunnel™ filter funnel

MicroFunnel filter funnel is a disposable filter unit designed to recover and culture microorganisms from purified water systems, aqueous fluids, or solids that completely dissolve in buffer solutions. The flexible cylinder design allows easy access to the membrane filter for submersion in broth media or plating onto an agar surface.

- Disposable, ready to use filter funnel suitable for water system monitoring, bioburden testing, or sterility testing.
- Individually bagged for protection until time of use.
- Meets pharmacopoeial requirements for membrane filtration testing applications.
- Easy squeeze access to retrieve the membrane reduces operator fatigue and repetitive motion injury.
- Available in 100 and 300 mL varieties in a range of pore sizes.
- Item 4810ME has a lid that doubles as a petri dish.
- MicroFunnel filter funnels with polycarbonate track-etched membrane (PC TEM) are intended for capture and elute applications.

MicroFunnel filter funnels

Technical specifications

MicroFunnel filter funnels

Effective filtration area	13.46 cm²
Membrane diameter	47 mm
Maximum vacuum	635 mm Hg vacuum use only
Gamma irradiated	Not autoclavable
Material of construction	
Funnel, base, lid Petri base	Polypropylene
Funnel cover	Polystyrene
Support pad	Cellulose
Plug, adapter	Polyethylene

Pore size (µm)	Membrane type	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Test organism	Percent recovery (%)
0.2	Supor (PES)	26	*Pseudomonas aeruginosa*	≥ 90
0.45	Supor (PES)	58	*Escherichia coli*	≥ 90
0.45	ME25 (MCE)	165	*Saccharomyces cerevisiae*	≥ 85
0.45	Metricel Black (PES)	> 34	*Saccharomyces cerevisiae*	≥ 85
0.8	Metricel Black (PES)	> 102	*Saccharomyces cerevisiae*	≥ 85
0.4	PC TEM	–	Not intended for growing colonies on the membrane applications	

Ordering information

MicroFunnel filter funnels

Pore size (µm)	Membrane type	Membrane color; grid	Funnel size	Catalog number	Quantity/pack
0.2	Supor (PES)	White; gridded	100	4803	50
0.2	Supor (PES)	White; plain	100	4806	50
0.2	Supor (PES)	White; gridded	300	4818	20
0.45	ME25 (mce)	White; gridded	100	4800ME	50
0.45	ME25 (mce)	White; gridded	100	4801ME	50*
0.45	ME25 (mce)	White; gridded	100	4804ME	200
0.45	ME25 (mce)	White; gridded	100	4810ME	50**
0.45	ME25 (mce)	White; gridded	300	4815ME	20
0.45	Supor (PES)	White; gridded	100	4852	50
0.45	Supor (PES)	White; gridded	300	4828	20
0.45	Metricel Black (PES)	Black; gridded	100	4805	50
0.45	Metricel Black (PES)	Black; gridded	300	4817	20
0.8	Metricel Black (PES)	Black; gridded	300	4819	20
0.4	PC TEM	Natural; plain	100	FMFNL1050	50
0.4	PC TEM	Natural; plain	300	FMFNL3020	20

* *Not individually packed*
** *With lid Petri kit*

MicroFunnel ST filter funnel

MicroFunnel ST filter funnel is a disposable filter unit designed to recover and culture microorganisms from purified water systems, aqueous fluids, or solids that will completely dissolve in buffer solutions. The flexible cylinder design allows easy access to retrieve the membrane filter for submersion in broth media or plating onto an agar surface. MicroFunnel ST has the additional feature of being double bagged—individually bagged funnels within an overpack bag—which is more convienent to sanitize and transfer product into a cleanroom, laboratory or testing hood.

MicroFunnel ST filter funnels

- Disposable, ready to use filter funnel suitable for water system monitoring, bioburden testing, or sterility testing.
- Overpack bag sized to allow easy sanitary transfer through size-restricted portals into the testing area.
- Meets pharmacopoeial requirements for membrane filtration testing applications.
- Easy squeeze access to retrieve the membrane reduces operator fatigue and repetitive motion injury.
- Available in 100 and 300 mL varieties in a range of pore sizes.

Technical specifications

MicroFunnel ST filter funnels

Effective filtration area	13.46 cm^2
Membrane diameter	47 mm
Maximum vacuum	635 mm Hg vacuum use only
Gamma irradiated	Not autoclavable
Material of construction	
Funnel, base	Polypropylene
Funnel cover	Polystyrene
Support pad	Cellulose
Adapter	Polyethylene

Pore size (µm)	Membrane type	Typical water flow rate (mL/min/cm^2 at 0.7 bar (70 kPa)	Test organism	Percent recovery (%)
0.2	Supor (PES)	26	*Pseudomonas aeruginosa*	≥ 90
0.45	Supor (PES)	58	*Escherichia coli*	> 90
0.45	ME25 (MCE)	165	*Escherichia coli*	≥ 80

Ordering information

MicroFunnel ST filter funnels

Pore size (µm)	Membrane type	Membrane color; grid	Funnel size	Catalog number	Quantity/pack
0.2	Supor (PES)	White; gridded	100	4851	40*
0.2	Supor (PES)	White; plain	300	4853	20**
0.45	ME25 (mce)	White; gridded	100	4811ME	40
0.45	ME25 (mce)	White; gridded	300	4812ME	20
0.45	Supor (PES)	White; plain	100	4750	40
0.45	Supor (PES)	White; plain	300	4751	20

* *100 mL product packaged 10 individually bagged funnels per overpack bag; 4 overpack bags per box*
** *300 mL product packaged 5 individually bagged funnels per overpack bag; 4 overpack bags per box*

MicroFunnel Plus and AP filter funnel

The MicroFunnel Plus filter funnel is a disposable filter unit designed for monitoring purified water systems. Its innovative design allows the device to function as a sample container and a filter funnel. Simply collect the sample at the water system sampling point, snap the lid, and transport it back to the lab for filtration and culturing. The MicroFunnel Plus AP variant features an additional lid that allows for aseptic sample collection through a sampling tube (sold separately, catalog number 4845).

MicroFunnel Plus AP filter funnels

- Streamline sample processing and minimize contamination risk with the integrated sample cup and filter funnel design.
- Varieties with Supor membrane can be used to collect samples from hot water loop systems.
- Individually bagged to provide protection until time of use.
- Complies with pharmacopoeial requirements for membrane filtration testing applications.
- Easy squeeze access to retrieve the membrane reduces operator fatigue and the risk of repetitive motion injuries.
- Available in 100 and 300 mL capacities with a variety of pore sizes.

Technical specifications

MicroFunnel ST filter funnels

Effective filtration area	13.46 cm²
Membrane diameter	47 mm
Maximum vacuum	635 mm Hg vacuum use only
Gamma irradiated, not autoclavable	
Material of construction	
Funnel, base, and AP port cap	Polypropylene
Funnel cover	Polyethylene
Support pad	Cellulose
Plug, adapter	Polyethylene
Adhesive seal	Urethane (between funnel and base)

Technical specifications

MicroFunnel ST filter funnels

Pore size (µm)	Membrane type	Typical water flow rate (mL/min/cm² at 0.7 bar (70 kPa))	Test organism	Percent recovery (%)	Maximum sampling temperature (°C)
0.2	Supor (PES)	26	*Pseudomonas aeruginosa*	≥ 90	90
0.45	Supor (PES)	58	*Escherichia coli*	≥ 90	90
0.45	ME25 (MCE)	165	*Escherichia coli*	≥ 80	Ambient
0.45	Metricel black (PES)	> 34	*Saccharomyces cerevisiae*	≥ 85	Ambient

Ordering information

MicroFunnel Plus filter funnels

Pore size (µm)	Membrane type	Membrane color; grid	Funnel size	Catalog number	Quantity/pack
0.2	Supor (PES)	White; gridded	100	4809	50
0.2	Supor (PES)	White; gridded	300	4813	20
0.2	Supor (PES)	White; gridded	300	4857*	20
0.45	ME25 (MCE)	White; gridded	100	4807ME	50
0.45	ME25 (MCE)	White; gridded	300	4829ME	20
0.45	Supor (PES)	White; gridded	100	4823	50
0.45	Supor (PES)	White; gridded	300	4814	20
0.45	Supor (PES)	White; gridded	300	4858*	20
0.45	Metricel Black (PES)	Black; gridded	100	4808	50

* *Packaged 5 individually bagged funnels per overpack bag; 4 overpack bags per box*

Ordering information

MicroFunnel Plus AP filter funnels

Pore size (µm)	Membrane type	Membrane color; grid	Funnel size	Catalog number	Quantity/pack
0.45	Supor (PES)	White; gridded	100	4844	50
0.45	Supor (PES)	White; gridded	100	4859**	40
0.45	Supor (PES)	White; gridded	300	4855	20

** *Packaged 10 individually bagged funnels per overpack bag; 4 overpack bags per box*

Laboratory manifold

A versatile and modular manifold designed to adapt and grow with the testing needs of a busy microbiology laboratory. Press-fit connections for easy assembly or disassembly without the need for tools provides the flexibiity to select different connectors to support a range of disposable and reusable filter funnels and increase testing capacity.

Laboratory manifold

- Stainless steel construction for all fluid-contact surfaces with complete disassembly for cleaning and autoclaving.
- Access all inner surfaces, even valve assemblies, to eliminate biofilms inside manifold.
- No sticky valves due to residue build up.
- Comfort grip valve handles for leverage and smooth motion.
- Variety of adapters to support disposable and reusable filter funnels with simple press-fit to switch between testing formats.
- Coupling connector to attach 3-place segments together to quickly increase testing capacity.
- Disassemble to smallest components to maximize autoclave load.

Technical specifications

Laboratory manifold

- Autoclavable at 121-123 ºC at 1.0 bar (100 kPa) for 15-20 min
- See IFU posted on website for dimensions and maintenance
- Material of construction
  - 3-place segment, valve stems, funnel adapters, coupler, endcap, hose-barb endcap: 316 L stainless steel
  - Manifold endstand and handles, valve knobs, and lock collars: Anodized aluminum
  - Valve and adapter O-rings: Viton fluoroelastomer rubber
  - Endcap O-rings: Silicone

Ordering information

Laboratory Manifold

Description	Catalog number	Quantity/pack
3 Place Manifold including 3 valves, 1 end cap, 1 hose barb cap	4889*	1 set
Microfunnel filter funnel adapter	4890	3
Sentino funnel adapter	4891	3
Standard adapter	4892	3
Elongated standard adapter	4959	3
Coupling device	4893	1

* *Adapters sold separately from catalog number 4889*

Ordering information

Manifold accessories and replacement parts

Description	Catalog number	Quantity/pack
Spare O-ring kit	4878	1 set
Manifold valves	4894	1
ID-compatible hose barb end cap	4887	1
ID-compatible hose barb end cap	4967-N	1
Standard end cap	4899	1

Sentino™ microbiology pump

The Sentino pump is part of our versatile collection of equipment for microbiological testing using the MF technique. Quickly set up for filtrations. Peristaltic pump action drives the filtration and sends filtrate to waste collection. Replace fluid path before biofilm becomes a contamination risk.

- The compact size frees up valuable lab space and is easy to store.
- Gamma irradiated fluid paths for quick replacement support filtrations with MicroFunnel filter funnel or Microcheck beverage monitor formats.
- Accessory filter supports for Sentino magnetic filter funnel or Sentino filter funnel formats.
- Use corded or cordless

Sentino microbiology pump

Technical specifications

Sentino microbiology pump

Length	13.6 cm
Width	9.5 cm
Height	10.4 cm
Weight	680 g
Operating temperature range	15 - 30 °C
Hose dimensions	4.8 mm ID × 7.9 mm OD 1.6 mm wall thickness
Battery	12.0 V, NiMH (nickel metal hydride)
Voltage	24.0 V
AC/DC power transformer	24 VDC 1.6 Amp 100-240 VAC, 47-63 Hz
Power cords	IEC 320 connector and NEMA 5-15P grounded plug IEC 320 connector and European CEE 7/7 plug IEC 320 connector and UK BS1363 plug
Materials of construction	
Housing material	Polycarbonate ABS-blended polymer
Keypad and label	Polyester
Pump head	PEI with PTFE-filled PBT rollers
Foot pads	Rubber
Hose material	Thermoplastic elastomer

Ordering information

Sentino microbiology pump

Description	Catalog number	Quantity/pack
Sentino pump (includes one fluid path)	13184	1
Fluid paths, gamma irradiated	4861	10
Adapter, magnetic filter funnel	4283	1
Tubing, 2 ft length fluid path	4285	10
Adapter, Sentino filter funnel	4872	1

Sentino dispenser

The Sentino membrane dispenser is part of our collection of equipment for microbiological testing using the MF technique. This automatic dispenser provides a sterile membrane at the push of a button. Maintain a clean workspace with packaging waste contained on spools. Guide plates provide easy loading and maintain alignment to prevent jamming.

- Pairs with refill packs of membrane containing 200 disc filters.
- Compact dispenser refill packs minimized packaging waste.
- Small footprint to minimize benchtop space needed.
- Use corded or cordless.
- Dispense button centrally located to support right or left-handed set-up.
- Refill membranes are gamma irradiated.

Sentino dispenser

Technical specifications

Sentino dispenser

Length	22.0 cm
Width	12.0 cm
Height	20.0 cm
Weight	0.9 kg
Operating temperature range	15-30 °C
Battery	12.0 V, NiMH (nickel metal hydride)
Voltage	24.0 V
AC/DC power transformer	24 VDC 1.6 Amp 100-240 VAC, 47-63 Hz
Power cords	IEC 320 connector and NEMA 5-15P grounded plug IEC 320 connector and European CEE 7/7 plug IEC 320 connector and UK BS1363 plug
Materials of construction	
Housing material	Polycarbonate ABS-blended polymer
Keypad and label	Polyester
Bottom plate	Aluminum
Upright	Anodized aluminum
Spools	Anodized aluminum
Guide plates	Anodized aluminum
Retainer clips	Stainless steel with anodized aluminum knobs
Box Retainer	Stainless steel
Foot Pads	Rubber

Technical specifications

Sentino dispenser

Pore size (µm)	Membrane type	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Test organism	Percent recovery (%)
0.2	Supor (PES)	26	*Pseudomonas aeruginosa*	≥ 90
0.45	ME25 (MCE)	165	*Escherichia coli*	≥ 80
0.45	Metricel Black (PES)	> 34	*Saccharomyces cerevisiae*	≥ 85
0.8	Metricel Black (PES)	> 102	*Saccharomyces cerevisiae*	≥ 85

* *Adapters sold separately from catalog number 4889*

Ordering information

Sentino dispenser

Description	Catalog number	Quantity/pack
Sentino Dispenser	13184	1

Ordering information

Dispenser membrane refill packs

Pore size (µm)	Membrane type	Membrane color; grid	Catalog number	Quantity/pack*
0.2	Supor (PES)	White; gridded	68123	1000
0.45	ME25 (MCE)	White; gridded	68121ME	1000
0.45	Metricel Black (PES)	Black; gridded	68124	1000
0.8	Metricel Black (PES)	Black; gridded	68125	1000

* *5 boxes of 200/pkg*

Membrane butler dispenser

Automatic eButler dispenses membrane filters quickly and easily while maintaining sterility.

- Push-button or sensor dispense.
- Durable and easy-to-load guides are printed on the equipment.
- Complete membrane selection of pores sizes, colors, and 47 or 50 mm diameters.
- Membrane identification is easy to read with every dispense.
- Maintain a tidy workspace free of packaging material.
- Manual butler also available.
- Refill membrane EtO sterilized

eButler membrane dispenser

Technical specifications

Membrane butler dispenser

Membrane	Pore size (µm)	Typical thickness (µm)	Typical sugar solution flow rate (mL/min/ 12.5 cm^2 at 0.9 bar)	Test organism	Percent recovery (%)	Bacterial challenge test (ASTM D3862-13)
ME24 (MCE)	0.2	130-160	≥ 80	*Escherichia coli*	≥ 80	*Retains Brevundimonas diminuta*
ME25 (MCE)	0.45	130-160	≥ 100	*Escherichia coli*	≥ 80	*Retains Serratia marcescensa*
ME27 (MCE)	0.8	130-160	–	*Saccharomyces cerevisiae*	≥ 80	–
MicroPlus (NC)	0.45	140	> 750	*Escherichia coli*	≥ 80	*Retains Serratia marcescensa*

Ordering information

Membrane butler dispenser

Description	Catalog number	Quantity/pack
eButler dispenser, automatic	10477103	1
Butler dispenser, manual	10477100	1

Ordering information

Membrane refill packs

Diameter (mm)	Membrane type	Pore size (µm)	Membrane color; grid	Package style	Catalog number	Quantity/pack*
47	ME24/21 (MCE)	0.2	White; gridded	Dispenser pack, eButler	10408712	400
50	ME24/21 (MCE)	0.2	White; gridded	Dispenser pack, eButler	10408714	400
50	ME25/20 (MCE)	0.45	White; plain	Dispenser pack, eButler	10407324	400
47	ME25/21 (MCE)	0.45	White; gridded	Dispenser pack, eButler	10407312	400
50	ME25/21 (MCE)	0.45	White; gridded	Dispenser pack, eButler	10407314	400
47	ME25/41 (MCE)	0.45	Green; gridded	Dispenser pack, eButler	10407370	400
50	ME25/41 (MCE)	0.45	Green; gridded	Dispenser pack, eButler	10407372	400
47	ME25/31 (MCE)	0.45	Black; gridded	Dispenser pack, eButler	10407332	400
50	ME25/31 (MCE)	0.45	Black; gridded	Dispenser pack, eButler	10407334	400
50	ME27/21 (MCE)	0.8	White; gridded	Dispenser pack, eButler	10408915	400
50	ME27/41 (MCE)	0.8	Green; gridded	Dispenser pack, eButler	10407615	400
47	ME25/31 (MCE)	0.8	Black; gridded	Dispenser pack, eButler	10407342	400
47	MicroPlus (NC)	0.45	White; gridded	Dispenser pack, eButler	10407112	400
50	MicroPlus (NC)	0.45	White; gridded	Dispenser pack, eButler	10407114	400
47	MicroPlus (NC)	0.45	Black; gridded	Dispenser pack, eButler	10407132	400
50	MicroPlus (NC)	0.45	Black; gridded	Dispenser pack, eButler	10407134	400
47	MicroPlus (NC)	0.45	Green; gridded	Dispenser pack, eButler	10407170	400
50	MicroPlus (NC)	0.45	Green; gridded	Dispenser pack, eButler	10407172	400

** 4 Boxes of 100/pack*

Sentino filter funnel

The Sentino filter funnel is part of our collection of equipment for microbiological testing using the MF technique. The easy to use cylinders come in 100 and 250 mL sizes and are designed for press-fit sealing onto the Sentino filter funnel platform available for manifold or Sentino pump. The Sentino filter funnel provides an option to speed sample processing over reueable filter holders.

- 100 mL funnel marked in 20, 50, and 100 mL increments.
- 250 mL funnel marked in 50, 100, 200, and 250 mL increments.
- Use with a variety of membrane filter types including polycarbonate track-etched, membrane filters, and glass microfiber.

Sentino filter funnel

Technical specifications

Sentino filter funnel

Effective filtration area	Membrane diameter	Typical vacuum	Gamma irradiated
12.6 cm²	47 mm	15 in. Hg, vacuum use only	Yes

Ordering information

Membrane butler dispenser

Funnel size (mL)	Material	Diameter	Height
100	Polypropylene	8.1 cm	5.3 cm
250	Polypropylene	8.1 cm	9.6 cm

Ordering information

Membrane refill packs

Funnel size (mL)	Catalog number	Quantity/pack
100	4870	100
250	4871	80

MicroCheck™ beverage monitors

MicroCheck beverage monitor is a disposable filter unit designed to recover and culture microorganisms from aqueous fluids or solids that completely dissolve in buffer solutions. The flexible cylinder design allows easy access to retrieve the membrane filter for submersion in broth media or plating onto an agar surface or broth soaked pad.

- Test a variety of aqueous samples such as flavorings, syrups, finished beverages, and the water used in their manufacture.
- Disposable, ready to use filter funnel.
- Collapse filter funnel to a petri dish for economical culturing in the base using broth ampoule media.
- Not individually bagged to speed sample processing time.
- Available in 100 mL capacity.

MicroCheck beverage monitors

Technical specifications

MicroCheck beverage monitors

Pore size (µm)	Membrane type	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Test organism	Percent recovery (%)
0.45	ME25 (MCE)	165	*Escherichia coli*	≥ 80
0.45	Metricel Black (PES)	> 34	*Saccharomyces cerevisiae*	≥ 85
0.8	Metricel Black (PES)	> 102	*Saccharomyces cerevisiae*	≥ 85

Ordering information

MicroCheck beverage monitors

Pore size (µm)	Membrane type	Membrane color; grid	Funnel size	Catalog number	Quantity/pack
0.45	ME25 (MCE)	White; gridded	100	4761ME	50
0.45	Metricel black (PES)	Black; gridded	100	4763	50
0.8	Metricel black (PES)	Black; gridded	100	4764	50

Additional membranes for microbiological testing

We offer additional membranes that are QC tested and released for use in microbiological testing by MF technique. Each batch is thoroughly tested using methods that embrace the guidance of ISO 7704.

- Use for microbiological quality control of aqueous samples or solids that completely dissolve in aqueous buffers.
- Supor (PES) 0.2 µm membrane is often selected for maximum recovery of organisms potentially stunted in size due to low nutrient environments.
- Supor (PES) 0.2 and 0.45 µm membrane are low binding for thorough rinsing of preservatives, active pharmaceutical ingredients, and other inhibitory substances that can supress colony growth.
- Metricel Black membrane is used for better contrast to light colored colonies for easier counting.
- MicroPlus membrane has a fast flow rate, made of nitrocellulose, and is available in white, black and green.
- Variety of packaging included individually sealed or dispenser refill packs provided gamma irradiated or ethylene oxide exposed as indicated.
- Inherently hydrophilic with non-toxic gridlines neither enhance nor inhibit colony growth.

Technical specifications

Additional membranes for microbiological testing

Pore size (µm)	Membrane type	Typical thickness (µm)	Typical water flow rate (mL/min/cm² at 0.7 bar, 70 kPa)	Test organism	Percent recovery (%)
0.2	Supor (PES)	145	26	*Pseudomonas aeruginosa*	≥ 90
0.45	Supor (PES)	140	58	*Escherichia coli*	≥ 90
0.8	Supor (PES)	140	165	*Saccharomyces cerevisiae*	≥ 85
0.45	Metricel Black (PES)	117	> 34	*Saccharomyces cerevisiae*	≥ 85
0.8	Metricel Black (PES)	135	> 102	*Saccharomyces cerevisiae*	≥ 85
0.45	MicroPlus (NC)	140	–	*Escherichia coli*	≥ 80

Ordering information

Additional membranes for microbiological testing

Diameter (mm)	Membrane type	Pore size (µm)	Membrane color; grid	Package style	Sterilization	Catalog number	Quantity/pack
47	Supor (PES)	0.2	White; gridded	Individual pack	Gamma irradiated	66234	200
47	Metricel Black (PES)	0.8	Black; gridded	Individual pack	Gamma irradiated	66587	200
47	Metricel Black (PES)	0.45	Black; gridded	Individual pack	Gamma irradiated	66585	200
47	Supor (PES)	0.2	White; gridded	Dispenser pack, Sentino	Gamma irradiated	68123	1000
47	Metricel Black (PES)	0.45	Black; gridded	Dispenser pack, Sentino	Gamma irradiated	68124	1000
47	Metricel Black (PES)	0.8	Black; gridded	Dispenser pack, Sentino	Gamma irradiated	68125	1000
47	MicroPlus (NC)	0.45	White; gridded	Individual pack	EtO	10407713	100
50	MicroPlus (NC)	0.45	White; gridded	Individual pack	EtO	10407714	100
50	MicroPlus (NC)	0.45	Black; gridded	Individual pack	EtO	10407734	100
47	MicroPlus (NC)	0.45	White; gridded	Dispenser pack, eButler	EtO	10407112	400
50	MicroPlus (NC)	0.45	White; gridded	Dispenser pack, eButler	EtO	10407114	400
47	MicroPlus (NC)	0.45	Black; gridded	Dispenser pack, eButler	EtO	10407132	400
50	MicroPlus (NC)	0.45	Black; gridded	Dispenser pack, eButler	EtO	10407134	400
47	MicroPlus (NC)	0.45	Green; gridded	Dispenser pack, eButler	EtO	10407170	400
50	MicroPlus (NC)	0.45	Green; gridded	Dispenser pack, eButler	EtO	10407172	400

Magnetic filter funnel

Reusable magnetic filter funnels are made of durable plastic, have a leak-free magnetic seal, and can be operated with one hand. Magnetic filter funnels are a popular selection for microbiological testing by MF technique for water testing, beverage monitoring, and environmental analysis.

- Available in 150, 300, and 500 mL.
- Durable and safe polyphenylsulfone construction holds up to repeated autoclaving and is compatible with anti-foaming agents.
- Guides to help membrane placement with forceps access point for membrane retrieval.
- Graduated in 50 mL increments to aid sample measurement.
- Available with standard long stem for extending below side arms in flasks or in the shortened stem on the Sentino magnetic filter funnel.

See our IFU on website for product dimensions and operating instrucions.

Magnetic filter funnel

Technical specifications

Magnetic filter funnel

Effective filtration area	
150, 300 mL	9.6 cm² (35 mm effective diameter)
500 mL	13.1 cm² (41 mm effective diameter)
Membrane diameter	Accepts 47 mm filters
Maximum vacuum	635 mm Hg (25 in. Hg), vacuum use only
Autoclavable	At 121-123 °C at 1.0 bar (100 kPa) for 15-20 min
Graduation mark accuracy at maximum volume	±2% (300 and 500 mL funnels)
Material of construction	
Funnel, base, lid, support screen	Polyphenylsulfone
Vent plugs (on lid)	Polypropylene

Lid supplied separately as catalog number and with catalog number 4241

Ordering information

Magnetic filter funnel

Description	Catalog number	Quantity/pack
150 mL, standard long stem	4247	1
300 mL, standard long stem, with lid	4241	1
300 mL, standard long stem	4242-N	1
500 mL, standard mid-length stem	4238	1
150 mL, Sentino shortened stem	4271	1
300 mL, Sentino shortened stem	4273	1
500 mL, Sentino shortened stem	4277	1

Ordering information

Accessories and replacement parts for magnetic filter funnel

Description	Catalog number	Quantity/pack
#8 stopper, single hole	82728N	5
Support screen, polyphenylsulfone	87264	1
150 mL, funnel cylinder	4248	1
300 mL, funnel cylinder	4243	1
500 mL, funnel cylinder	4254	1
Base, standard long stem, no support screen	4244	1
Base, Sentino shortened stem, with support screen	4279	1
Lid kit for 300 mL magnetic funnel	4246	1

Petri dishes

50 mm Petri dishes designed for easy handling when performing microbiological analysis by MF technique. Can be used with agar or broth-soaked pads for culturing membrane filters.

- Available with or without absorbent pads.
- Wide base rim for easier opening and handling.
- Tight fitting lid to secure Petri dish and retain humidity for culturing.
- Alignment feature on base for stable stacks during culturing.

Technical specifications

Petri dishes

Dimensions	
Height	11 mm
Width (at widest point on base)	57 mm
Accepts	47 mm filter disc
Absorbent pad diameter	45.5 mm
Gamma irradiated	Not autoclavable
Material of construction	
Lid and base	Polystyrene
Absorbent pad	Cellulose

Ordering information

Petri dishes

Absorbent pad	Packaging	Catalog number	Quantity/pack
No	Bulk; 25/sleeve, 20 sleeves/pack	7232	500
No	Tray; 50/tray, 2 trays/pack	7242	100
Yes	Tray; 50/tray, 2 trays/pack	7245	100

Microbiological media

Prepared broth media for microbiological analysis, available in a variety of selective and non-selective nutrient broths for use in municipal water, food and beverage, pharmaceutical, and microelectronics industries.

- Prepared, sterile, and ready to use.
- Plastic ampoules, premeasured to wet the absorbent pad in 50 mm Petri dish.
- 100 mL bottle of MF-Endo media efficiently packaged for busy water quality labs.

Technical specifications

Microbiological media

Broth	Target organism	Recovery (%)	Test organisms	pH at 25 °C	Shelf life (2-8 °C)	Media color	Test colony color
MF-Endo	Total coliforms	> 85 %	*Escherichia coli*	7.2 +/- 0.2	1 Year	Pinkish red	Pink with metallic sheen
M-FC with Rosolic acid*	Fecal coliforms	> 85%	*Escherichia coli*	7.4 +/- 0.2	1 Year	Purple to dark purple	Blue
M-TGE	Total bacteria	> 85%	*Escherichia coli, S. epidermidis*	7.0 +/- 0.2	1 Year	Pale yellow	Organism dependent
M-TGE with TTC Indicator	Total bacteria	> 85%	*Escherichia coli*	7.0 +/- 0.2	1 Year	Pale yellow	Red
Pseudomonas	Pseudomonas sp.	> 85%	*Pseudomonas aeruginosa*	7.1 +/- 0.2	1 Year	Light amber	Green blue
M-Green YM	Yeasts and molds	> 85%	*Saccharomyces cerevisiae*	4.6 +/- 0.2	1 Year	Green	Pale green
HPC with TTC Indicator	Total bacteria	> 85%	*Escherichia coli*	7.1 +/- 0.2	1 Year	Pale yellow	Red

Ordering information

Microbiological media

Broth	Product format	Catalog number	Quantity/pack
MF-Endo	100 mL, bottle	4313-N	1
MF-Endo	2 mL, plastic	68105	50
M-FC with rosolic acid	2 mL, plastic	4302-N	50
M-TGE	2 mL, plastic	68106	50
M-TGE with TTC Indicator	2 mL, plastic	68111	50
Pseudomonas	2 mL, plastic	4306-N	50
M-Green YM	2 mL, plastic	68107	50
HPC with TTC Indicator	2 mL, plastic	4352	50

Absorbent pad kit

Absorbent cellulose pad material used packaged 100 per tube, 10 tubes per kit with a dispenser for one-handed dispensing of pads.

- Available non-sterile and gamma irradiated
- Use the pads in petri dishes to hold liquid broth media for culturing organisms in accordance with MF technique

Technical specifications

Absorbent pad kit

Pad composition	Diameter	Nominal thickness
Cellulose	45.5 mm	0.8 mm

Ordering information

Absorbent pad kit

Gamma irradiated	Catalog number	Quantity/pack
Yes	66025	1000
No	66191	1000

08

Specialty products

Separate organic from inorganic. Protect lab surfaces. Test the pH levels in swimming pools. We offer a range of products to meet your specific testing requirements.

Chromatography papers

Chromatography paper media are made from selected cotton cellulose. They are quality controlled for characteristics important to the chromatographer and provide uniformity within the grade.

Cellulose chromatography papers

Features and benefits

- Pure cellulose produced entirely from cotton linters with no additives.
- Manufactured and tested for chromatographic techniques for wicking capability and uniformity of capillary action.
- Widely used in protein and nucleic acid blotting.

Cellulose chromatography papers

Grade 1 Chr

A smooth surface, 0.18 mm thick with a linear flow rate (water) of 130 mm/30 min. Good resolution for general analytical separations.

Grade 2 Chr

Thickness: 0.18 mm. Flow rate: 115 mm/30 min. Slower than 1 Chr for higher resolution applications. Smooth surface. Recommended for optical or radiometric scanning.

Grade 3 Chr

A medium thickness paper, 0.36 mm, with a flow rate of 130 mm/30 min. For general applications with medium to heavy solute loadings. Frequently used for separation of inorganic compounds and for electrophoresis.

Grade 4 Chr

Thickness: 0.21 mm. Flow rate: 180 mm/30 min. Fastest of our thin papers. Recommended for routine or repetitive chromatography when loadings are relatively low. Smooth surface. Suitable where speed is important and very high resolution is not required.

Grade 17 Chr

A thick, 0.92 mm, highly absorbent paper with a very high flow rate of 190 mm/30 min. Suitable for heavy loadings and for preparative paper chromatography and electrophoresis.

Grade 20 Chr

Thickness: 0.17 mm. Flow rate: 85 mm/30 min. For maximum resolution, this grade gives the greatest separation of closely related compounds. Smooth surface. Recommended for separation of samples of unknown composition, with outstanding resolution at low loadings.

Grade 31ET Chr

Thickness: 0.50 mm. Flow rate: 225 mm/30 min. Extremely fast. Flow rate is the highest of all chromatography papers in the range. Thick paper with fairly soft surface. Principal application is in electrophoresis of large molecules.

Grade 54 SFC

Thin 0.18 mm, hardened paper with high speed of 180 mm/30 min, and fair to good resolution. Recommended for routine chromatography. High wet strength.

Grade 2668 Chr

Thickness: 0.9 mm. Flow rate: 155 mm/10 min. For separation of relatively large molecules by electrophoresis.

Grade 2727 Chr

Thickness: 1.40 mm. Flow rate: 180 mm/30 min. For separation of very large amounts of substance.

Grade SG81

Thickness: 0.27 mm. Flow rate: 110 mm/30 min. Ion exchange chromatography paper combining cellulose and large pore silica gel. For enzyme assays to separate product from reactant by charge or polarity.

Ordering information

Cellulose chromatography paper

Dimensions	Catalog number											Quantity/ pack
	Grade 1 Chr	Grade 2 Chr	Grade 3 Chr	Grade 4 Chr	Grade 17 Chr	Grade 20 Chr	Grade 31ET Chr	Grade 54 SFC	Grade 2668 Chr	Grade 2727 Chr	Grade SG81	
Circles												
185 mm	–	–	–	–	–	–	–	–	–	10382514	–	100
Sheets												
2 × 5 cm	–	–	–	–	–	–	3031-901	–	–	–	–	1000
2.5 × 22 cm	–	–	–	–	3017-8793	–	–	–	–	–	–	100
7 × 9 cm	–	–	–	–	3017-820	–	–	–	–	–	–	100
10 × 30 cm	3001-845	–	–	–	–	–	–	–	–	–	–	100
19 × 19 cm	–	–	–	–	–	–	–	–	–	10382581	–	100
20 × 20 cm	3001-861	–	–	–	–	–	–	–	–	–	–	100
25 × 25 cm	3001-878	–	–	–	–	–	–	–	–	–	–	100
46 × 57 cm	–	–	–	–	3017-915	–	3031-915	–	–	–	3668-915	25
46 × 57 cm	3001-917	3002-917	3003-917	3004-917	3017-917	3020-917	–	–	–	–	–	100
46 × 57 cm	3001-918	–	–	–	–	–	–	–	–	–	–	500
58 × 60 cm	–	–	–	–	–	–	–	–	–	10382562	–	50
58 × 60 cm	–	3002-911	–	–	–	–	–	–	10382461	–	–	100
58 × 68 cm	3001-931	–	–	–	–	–	–	–	–	–	–	100
Reels												
1.0 cm × 100 m	3001-604	–	–	–	–	–	–	–	–	–	–	1
2.0 cm × 100 m	3001-614	–	–	3004-614	–	–	–	–	–	–	–	1
2.5 cm × 30 m	–	–	–	–	3017-621	–	–	–	–	–	–	1
2.5 cm × 110 m	–	–	–	–	–	–	–	–	–	–	3668-6871	1
3.0 cm × 100 m	3001-640	–	–	–	–	–	–	–	–	–	–	1
4.0 cm × 100 m	3001-652	–	–	–	–	–	–	–	–	–	–	1
5.0 cm × 100 m	3001-653	–	–	–	–	–	–	–	–	–	–	1
10.0 cm × 100 m	3001-672	–	–	–	–	–	–	–	–	–	–	1
15.0 cm × 100 m	3001-681	–	–	–	–	–	3031-681	–	–	–	–	1
1.5″ × 300′	3001-651	–	–	–	–	–	–	3454-651	–	–	–	1
18″ × 3800 m	300110115	–	–	–	–	–	–	–	–	–	–	1
Strips												
11 × 21.3 cm with 12 strips of 1.5 cm*	3001-964	–	–	–	–	–	–	–	–	–	–	100

* *1 Chr sheet divided into 1.5 cm lanes for running up to 12 samples in parallel*

For details on 3MM Chr products please visit cytiva.com

Extraction thimbles

These thimbles are widely used in Soxhlet extraction units, providing a safe, convenient, and efficient method of solvent extraction from solids and semi-solids. Soxhlet extraction is a widely technique used for analysis of fats or pesticides in foods and soil materials, and other procedures that involve a solid-liquid extraction.

High performance cellulose extraction thimbles

Cellulose thimbles

High-performance cellulose thimbles

Cellulose extraction thimbles are produced from high-quality alpha cellulose cotton linter and have excellent mechanical strength and retention. The high purity of the materials provides reliable and reproducible analytical results.

Standard single thickness thimbles have a wall thickness of approximately 1 mm (10.0 µm nominal particle retention).

Double thickness thimbles have a wall thickness of approximately 2 mm (6.0 µm nominal particle retention) for applications where higher retention and increased wet or dry strength or rigidity are required.

Standard cellulose thimbles

Thimbles of type 603 are made from high-quality cellulose, and 603 g thimbles are made from borosilicate glass fibers with an inorganic binder. For all automated extraction apparatus in common use, we offer thimbles that match the dimensions of the holders for an optimal fit.

Technical specifications

Standard thimbles

Grade	Material	Maximum temperature °C
603	Cellulose	130
603 g	Borosilicate glass fibers*	500

* *With inorganic binder*

Thimble size selection guide

Thimble sizes should be selected carefully to fit extractors correctly. The different sizes represent the established practice of showing the internal diameter and overall length of the thimble in millimeters. Therefore, make an extra allowance for wall thickness when calculating external diameters. The thimble should pass through the narrower end of the upper extractor socket with 1-2 mm clearance, and be 5-10 mm above the level of the top of the siphon tube.

Ordering information

High-performance cellulose thimbles

Dimensions (mm)*†	Catalog number	Quantity/pack
Single thickness (nominal wall thickness = 1 mm)		
10 × 50	2800-105	25
18 × 55	2800-185	25
19 × 90	2800-199	25
22 × 65	2800-226	25
22 × 80	2800-228	25
25 × 80	2800-258	25
25 × 90	2800-259	25
25 × 100	2800-250	25
26 × 60	2800-266**	25
26 × 100	2800-260	25
28 × 80	2800-288	25
28 × 100	2800-280	25
28 × 120	2800-282	25
30 × 80	2800-308	25
30 × 100	2800-300	25
33 × 80	2800-338	25
33 × 94	2800-339	25
33 × 100	2800-330	25
33 × 118	2800-331	25
37 × 130	2800-373	25
41 × 123	2800-412	25
43 × 123	2800-432	25
60 × 180	2800-608#	25
Double thickness (nominal wall thickness = 2 mm)		
16 × 60	2810-166	25
22 × 80	2810-228	25
25 × 80	2810-258	25
26 × 60	2810-266	25
33 × 80	2810-338	25
33 × 94	2810-339	25
43 × 123	2810-432	25
90 × 200	2810-902	25

* *Internal diameter and external length*
** *Fits Soxtec extractor*
† *See Thimble size selection guide on p. XXX*
# *Nominal wall thickness 1.5 mm*

Ordering information

Standard cellulose thimbles

Dimensions (mm)*†	Grade	Wall thickness (mm)	Catalog number	Quantity/pack
22 × 60	603	2.0	10350306	25
22 × 80	603	1.5	10350211	25
25 × 60	603	1.5	10350215	25
25 × 80	603	1.5	10350217	25
25 × 100	603	1.5	10350219	25
26 × 60	603	1.5	10350220	25
27 × 25 × 60	603T	1.0	10350416	25
27 × 80	603	1.5	10350223	25
28 × 60	603	1.5	10350225	25
28 × 80	603	1.5	10350226	25
28 × 100	603	1.5	10350227	25
30 × 80	603	1.5	10350234	25
30 × 100	603	1.5	10350236	25
33 × 60	603	1.5	10350238	25
33 × 80	603	1.5	10350240	25
33 × 31 × 80	603T	1.0	10350437	25
33 × 90	603	1.5	10350241	25
33 × 94	603	1.5	10350242	25
33 × 100	603	1.5	10350243	25
33 × 118	603	1.5	10350245	25
33 × 130	603	1.5	10350247	25
33 × 205	603	1.5	10350250	25
34 × 130	603	1.5	10350252	25
35 × 150	603	1.5	10350255	25
40 × 85	603	2.0	10350261	25
41 × 123	603	2.0	10350265	25
44 × 230	603	2.0	10350275	25
48 × 145	603	2.0	10350273	25
48 × 200	603	2.0	10350274	25
75 × 250	603	2.5	10350287	25
80 × 250	603	3.0	10350324	25

* *Internal diameter and external length*
† *See Thimble size selection guide on p. 156*

Standard cellulose thimbles for DIONEX ASE

Extraction volume (mL)	Extraction system	Nominal wall thickness (mm)	Catalog number	Quantity/pack
11	200	1.0	10350106	25
22	200	1.0	10350108	25

Glass and quartz thimbles

High-purity glass microfiber thimbles

High-purity glass microfiber thimbles manufactured from 100% pure borosilicate glass are available for specialized applications. The thimbles are free of binders or additives and can be used at temperatures up to 500°C or when using solvents that are incompatible with cellulose thimbles. These thimbles are also used in pollution monitoring techniques (0.8 µm nominal particle retention). Typical thickness 1.7 mm.

High-purity glass microfiber thimbles

Features and benefits

- Available in a range of sizes and wall thicknesses to suit your application.
- Designed to fit most commercially available Soxhlet extractors.
- No added binders.

Applications

- Smoke stack gas monitoring.
- Soxhlet extraction.
- Analyzing pesticide residues.
- Determining oil or fat content of foods (e.g., french fries).
- Analysis of oil and grease in solid wastes.

Quartz microfiber thimbles

Made from high-purity quartz microfiber, this thimble can withstand temperatures up to 1000°C. Suitable for solvent extraction, dioxin detection, and smoke stack gas sampling.

Standard glass fiber thimbles

Thimbles of type 603 g are made from borosilicate glass fibers with inorganic binder. We also offer a selection of borosilicate glass thimbles without binder.

Ordering information

High-purity glass and quartz microfiber thimbles

Dimensions (mm)*	Catalog number	Quantity/pack
Glass microfiber thimbles: Grade HP-GF		
19 × 90	2814-199	25
25 × 90, tapered	2814-259	25
30 × 100	2814-300	25
43 × 123	2814-432	25
33 × 135	2814-533	25
Quartz microfiber thimbles		
25 × 90, tapered	2812-259	10
28 × 70, tapered	2812-287	10

* *See Thimble size selection guide on p. XXX*

Ordering information

Standard glass microfiber thimbles

Dimensions (mm)*	Wall thickness (mm)	Catalog number	Quantity/pack
Grade 603 g (glass fiber with inorganic binder)			
10 × 38	1.0	10371103	25
16 × 50	1.0	10371005	25
19 × 90	1.0	10371007	25
22 × 80	1.5	10371011	25
23.8 × 68	1.5	10371114	25
25 × 100	1.5	10371019	25
28 × 60	1.5	10371025	25
30 × 100	1.5	10371036	25
33 × 94	1.5	10371042	25
33 × 100	1.5	10371043	25
33 × 118	1.5	10371045	25
35 × 150	1.5	10371055	25
44 × 230	1.5	10371075	25
Glass microfiber (without binder)			
30 × 80	–	2811-308	25

* *Internal diameter and external length*

Benchkote™ and Benchkote Plus surface protector

Benchkote is an absorbent, impermeable material designed to protect laboratory surfaces against hazardous spills. The material features a high-quality, smooth, absorbent Whatman paper, which quickly absorbs liquid spills, and a laminated polyethylene layer that prevents flow through to the working surface. After use, the sheet is incinerated or disposed of according to local regulations.

Benchkote Plus surface protector

Benchkote Plus is a thicker, more absorbent material for more demanding applications and can absorb over of 0.75 liters of water per square meter.

Features and benefits

- Material is very strong, making it tear resistant wet or dry.
- Smooth white surface can be written on with ink or pencil and lies flat.
- Suitable for saturation with disinfectant to protect benches where pathogens and other bacteria are present.
- Use polyethylene side up to collect deposits without absorption.
- Paper side quickly absorbs liquid spills, preventing liquids from going through to the work surface.
- Spillages are trapped in the absorbent paper.
- Benchkote™ surface protector can be incinerated after use; the polyethylene layer does not melt or drip but is rapidly consumed in the flames.

Applications

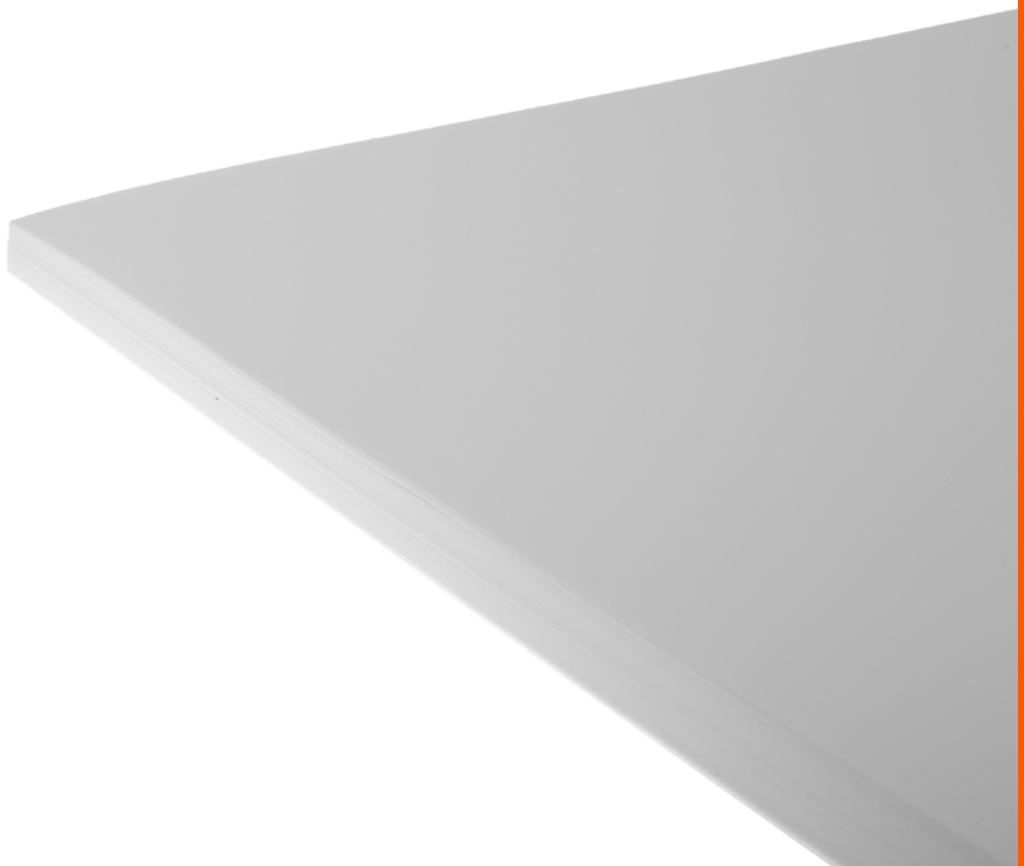
- Contain radiochemical spillage and avoid contamination.
- Recover spillage of expensive materials.
- Protect hard surfaces to lessen impact.
- Water or solvent wick for humidity chambers.
- Line chemical cabinets, laboratory bench drawers, and laboratory hoods.

Benchkote surface protector

Ordering information

Benchkote surface protector

Dimensions (mm)	Catalog number	Description	Quantity/pack
Benchkote surface protector			
460 × 570	2300-594	Pad (NA)	1 (50 sheets)
460 × 570	2300-599	Pad (EU)	1 (50 sheets)
460 × 570	2300-916	Sheets	50
460 × 570	2300-917	Sheets	100
–	2300-004	A4 sheets	1000
460 mm × 50 m	2300-731	Reel	1
920 mm × 50 m	2300-772	Reel	1
Benchkote Plus surface protector			
460 × 570	2301-916	Sheets	50
500 × 600	2301-6150	Sheets	50
600 mm × 50 m	2301-6160	Reel	1



Benchkote surface protector for lab-scale ÄKTA system

Benchkote sheets for lab-scale ÄKTA systems protect the top buffer trays from buffer spillages and salt deposits.

Features and benefits

- Simplify daily and weekly preventive maintenance of the top buffer tray of your ÄKTA systems.
- Smooth, absorbent paper quickly absorbs spills.
- Laminated polyethylene layer prevents flow-through to the working surface.
- Sizes that fit the top buffer tray on ÄKTA go™, ÄKTA avant™, ÄKTA pure™, and ÄKTA start™ protein purification systems.
- Offered in three convenient pack sizes: 10/pk, 25/pk and 50/pk sheets.
- Convenient and easy to use.

Ordering information

Benchkote surface protector for ÄKTA system

Dimensions (mm)	Catalog number	Description	Quantity/pack
Benchkote sheet for ÄKTA system			
420 × 300	2300-10060	Benchkote sheet for ÄKTA pure system	10
420 × 300	2300-10061	Benchkote sheet for ÄKTA pure system	25
420 × 300	2300-10062	Benchkote sheet for ÄKTA pure system	50
310 × 210	2300-10063	Benchkote sheet for ÄKTA start system	10
310 × 210	2300-10064	Benchkote sheet for ÄKTA start system	25
310 × 210	2300-10065	Benchkote sheet for ÄKTA start system	50
520 × 500	2300-10072	Benchkote sheet for ÄKTA avant system	10
520 × 500	2300-10073	Benchkote sheet for ÄKTA avant system	25
520 × 500	2300-10074	Benchkote sheet for ÄKTA avant system	50
233 x 290	2300-10092	Benchkote sheets for AKTA go system	10
233 x 290	2300-10093	Benchkote sheet for AKTA go system	25
233 x 290	2300-10094	Benchkote sheet for AKTA go system	50

Weighing papers

Kjeldahl weighing boats

Transfer your samples completely loss-free by simply dropping the entire weighing boat containing the sample into the acid solution in the Kjeldahl flask or digestion tube.

Kjeldahl analysis weighing boat

Features and benefits

- Excellent for weighing and transferring Kjeldahl samples safely and reliably.
- Dissolves residue-free in the digestion solution without influencing the analytical results in any way.
- Made from very low nitrogen parchment paper without any glue or additives.

Parchment paper

Features and benefits

- Transparent and smooth
- Simplifies sample transfer
- Quantitative transfer from paper

Technical specifications

Weighing papers

Product	Grade	Nominal thickness (mm)	Nominal weight (g/m²)
Weighing boat, ≤ 0.07% N	609	0.07	80
Pergamyne paper	2122	0.03	40
Parchment paper, ≤ 0.05% N	B-2	0.04	43

Ordering information

Weighing papers

Dimensions (mm)	Grade	Catalog number	Description	Quantity/pack
55 × 10 × 10	609	10313032	Kjeldahl weighing boat	100
100 × 100	2122	10347893	Sheets	500
150 × 150	2122	10347890	Sheets	500
76.2 × 76.2	B-2	10347671	Sheets	500
101.6 × 101.6	B-2	10347672	Sheets	500
152.4 × 152.4	B-2	10347673	Sheets	500
304.8 × 304.8	B-2	10347670	Sheets	500

Paper for ignition strength (IS) measurement

This certified Grade 2 is tested according to the procedure detailed in ASTM E 2187-09, Sections 9.3.1 and 9.3.2. The paper meets both the conditioned (26.1 ± 0.5 g, SD < 0.3 g) and dried (24.7 ± 0.5 g, SD < 0.3 g) weight requirements.

The lot-specific certificate can be downloaded from cytiva.com/certificates.

Features and benefits

- Each lot is guaranteed to meet the ASTM E 2187-09 specifications.
- Simplifies testing process by removing lot suitability testing.
- Just condition and use.

Ordering information

Paper for IS measurement

Diameter (mm)	Catalog number	Grade	Quantity/pack
150	1002-147	Grade 2 (for IS testing)	100

Ashless clippings

Whatman ashless filter aids enhance filtration speed by coagulating precipitates or suspensions to form a thick retentive layer on top of normal filter paper.

Ordering information

Ashless clippings

Diameter (mm)	Catalog number	Quantity/pack
Ashless clippings	1703-050	500 gm

pH Indicator and test papers

Whatman pH indicator and test papers combine ease of use with exceptional accuracy and consistency.

The convenience of using indicator papers for the rapid determination of pH values has led to many applications in laboratories and industry.

Features and benefits

- Instant pH readings.
- Accurate routine pH testing.
- Inexpensive.
- Convenient and portable for field use.

pH indicators

pH indicators

Strips type CF (color bonded dye system)

Individual plastic support strips carry four different segments of dye-impregnated indicator papers. The resulting combination of color differences gives an extremely clear and accurate visual pH value. All the dyes are chemically bonded to the paper and cannot be leached into solution. Problems associated with contamination of the sample and resultant anomalous readings are avoided.

Strips type CS (integral comparison chart)

Each test strip has a central segment of indicator dye and is printed alongside eight or more different color segments marked with corresponding pH values for matching purposes.

The pH test value can be read off by direct comparison of the test strip color and the color bars. Excellent for colored solutions, when a change in color occurs, paper stock are automatically cancelled out.

Dispensers type TC (triple color band)

The strip has three separate indicator dye color bands. The individual combination of color change resulting from each test is compared with the color-coded comparison chart printed on the dispenser, giving improved speed and accuracy in reading.

Dispensers type SR (standard range)

Tapes for this popular pH indicator dispenser are available in both full range and standard narrow ranges.

Indicator books

The book format is particularly suitable for educational and industrial use. In schools they are economical because the amount of paper per student can be carefully controlled.

Acid-alkali test papers

Litmus blue and litmus red

These easy to use test papers facilitate a general test for acid or alkaline reaction. The change occurs around pH 5-8. They are recommended for educational use.

Congo red

This test paper changes color from blue to red in the range pH 3-5 for the determination of neutralization point in strong acid and weak alkali reactions.

Phenolpthalein

This white paper changes to pink at pH 8.3 and becomes red at pH 10. It is useful for the determination of the neutralization point in weak acid/strong alkali reactions.

Specialized test papers

Lead acetate test paper

Used for detecting hydrogen sulfide, this rapid qualitative test paper, when wetted with distilled water, can detect as little as 5 ppm of H_2S in the atmosphere or in a gas stream. Hydrogen peroxide can be detected with this paper by preblackening the paper in H_2S. Concentrations as low as 4 ppm can be detected.

Potassium iodide test paper

Used for detecting chlorine and other oxidizing agents. In acid solution, oxidizing agents react with the iodide in the test paper to liberate iodine. The paper will turn blue in the presence of an oxidizing agent (e.g., Cl_2, Br_2, H_2O_2, HNO_2 etc.).

Universal indicator papers

Universal indicator papers have been impregnated with a mixture of several indicators. On contact with the sample solution they assume a particular color. A check against the color comparison table supplied allows the pH to be determined.

Ordering information

pH indicators and test papers

Dimensions (mm)	pH range	Catalog number	Description	Packaging	Quantity/pack
Strips					
6 × 80	0.0 to 14.0	2613-991	Color bonded	100 strips	100 strips
6 × 80	4.5 to 10.0	2614-991	Color bonded	100 strips	100 strips
6 × 85	0.0 to 14.0	10362000	Panpeha Plus, non bleeding	Strip, 4 sections	100
6 × 85	2.0 to 9.0	10362010	Panpeha Plus, non bleeding	Strip, 3 sections	100
11 × 100	1.0 to 12.0	2612-990	Integral comparison strip	200 strips	200 strips
11 × 100	1.8 to 3.8	2626-990	Integral comparison strip	200 strips	200 strips
11 × 100	3.8 to 5.5	2627-990	Integral comparison strip	200 strips	200 strips
11 × 100	5.2 to 6.8	2628-990	Integral comparison strip	200 strips	200 strips
11 × 100	6.0 to 8.1	2629-990	Integral comparison strip	200 strips	200 strips
11 × 100	8.0 to 9.7	2630-990	Integral comparison strip	200 strips	200 strips
11 × 100	9.5 to 12.0	2631-990	Integral comparison strip	200 strips	200 strips
Dispensers (reel)					
10 mm × 5 m	1.0 to 11.0	2611-628	Three colors	–	1
7 mm × 5 m	–	2600-201A	Litmus blue	–	1
7 mm × 5 m	–	2600-202A	Litmus red	–	1
7 mm × 5 m	–	2600-204A	Phenophthalein	–	1
7 mm × 5 m	–	2602-500A	Potassium iodide	–	1
7 mm × 5 m	1.0 to 14.0	2600-100A	Standard full range	–	1
7 mm × 5 m	0.5 to 5.5	2600-101A	Standard narrow range	–	1
7 mm × 5 m	4.0 to 7.0	2600-102A	Standard narrow range	–	1
7 mm × 5 m	6.4 to 8.0	2600-103A	Standard narrow range	–	1
7 mm × 5 m	8.0 to 10.0	2600-104A	Standard narrow range	–	1
7 mm × 5 m	1.0 to 11.0	10362030	Panpeha	–	1
Books					
–	1.0 to 11.0	2600-500	–	–	1 carton*
–	–	2600-601	Litmus blue	10 books of 20 strips	1 carton*
–	–	2600-602	Litmus red	10 books of 20 strips	1 carton*

* *1 carton contains 10 packs of 10 books, product is 20 strips per book*

Papers for healthcare applications

Antibiotic assay discs

For determining the type of causal agent of infectious diseases and checking their sensitivity to antibiotics and chemotherapeutic agents in vitro by means of the inhibition zone determination method. The antibiogram allows rational and selective chemotherapy.

The test discs can be coated with chemotherapeutic agents, placed on the innoculated nutrient agar and incubated. The size of the inhibition zone is a measure for the effectiveness of the substances.

Ordering information

Antibiotic assay (AA) paper

Diameter (mm)	Catalog number	Quantity/pack
6	2017-006	1000
9	2017-009	1000
13	2017-013	1000

Grade 470

Soft surface. For gelatinous samples. Used for the absorption of culture media, as a blotting paper, for electrophoresis, and amino acid chromatography.

Ordering information

Papers for healthcare applications

Dimensions (mm)	Grade	Catalog number	Format	Quantity/pack
460 × 570	470	10318493	Sheets	100
1.5" × 450'	470	10539028*	Reel	1
12.7	740E	10328170	Circles	1000
1.5" × 550'	740E	10539167*	Reel	1

* *Dimensions are Inches × feet*

Phase separator paper

Whatman 1PS phase separator is a high-grade filter paper impregnated with a stabilized silicone that renders it hydrophobic, retaining the aqueous phase and passing the solvent phase through.

1PS phase separator papers

Features and benefits

- Ease of use, no special training required.
- Many separations can be processed together.
- Staff involvement in routine separations is minimal.

Automatic cut-off, separatory funnel replacement

After being shaken, the mixed phases are poured directly into the 1PS circle, which is quadrant-folded in a funnel. The separation is rapid so it is unnecessary to wait until the two phases have settled into separate layers. Droplets are automatically separated after a few moments, giving a solvent phase completely free of the aqueous phase.

In many applications, 1PS can replace the use of separatory funnels. The solvent phase flows through the paper quickly and cleanly. It stops automatically, leaving the aqueous phase completely in the paper. This feature is important when carrying out a large number of routine solvent extractions at the same time. Samples can be shaken with solvent in stoppered conical flasks or test tubes and transferred directly to funnels containing 1PS.

Unsupervised separation

A key benefit of the 1PS method is that cut-off is automatic and complete as soon as the solvent phase has passed through*.

* *Water may break through upon prolonged standing.*

Ordering information

1PS phase separators

Diameter (mm)	Catalog number	Quantity/pack
70	2200-070	100
90	2200-090	100
110	2200-110	100
125	2200-125	100
150	2200-150	100
185	2200-185	100
240	2200-240	100
270	2200-270	100

Lens cleaning tissue

Lenses and other optical surfaces made from glass, quartz, or plastic can be scratched if you do not clean them with a very soft surface. High-quality Whatman lens cleaning tissue is chemically pure and free from silicones and other additives and can it can be relied on to safely remove surface moisture and grease.

Lens cleaning tissue

Features and benefits

- Soft texture will not damage lenses or optical surfaces.
- Chemically pure tissue is free from silicones and other additives.
- High absorbency provides safe removal of surface moisture and grease.
- Thickness 0.035 to 0.040 mm.
- Very strong and leaves no fibers.

Ordering information

Lens cleaning tissues

Dimensions (mm)	Catalog number	Packaging	Quantity/pack
Grade 105 (sheets)			
100 × 150	2105-841	25 wallets of 25 sheets	25
200 × 300	2105-862	–	100
460 × 570	2105-918	–	500

Moisture testing papers

Moisture test paper for use when drying samples during moisture assessment.

Ordering information

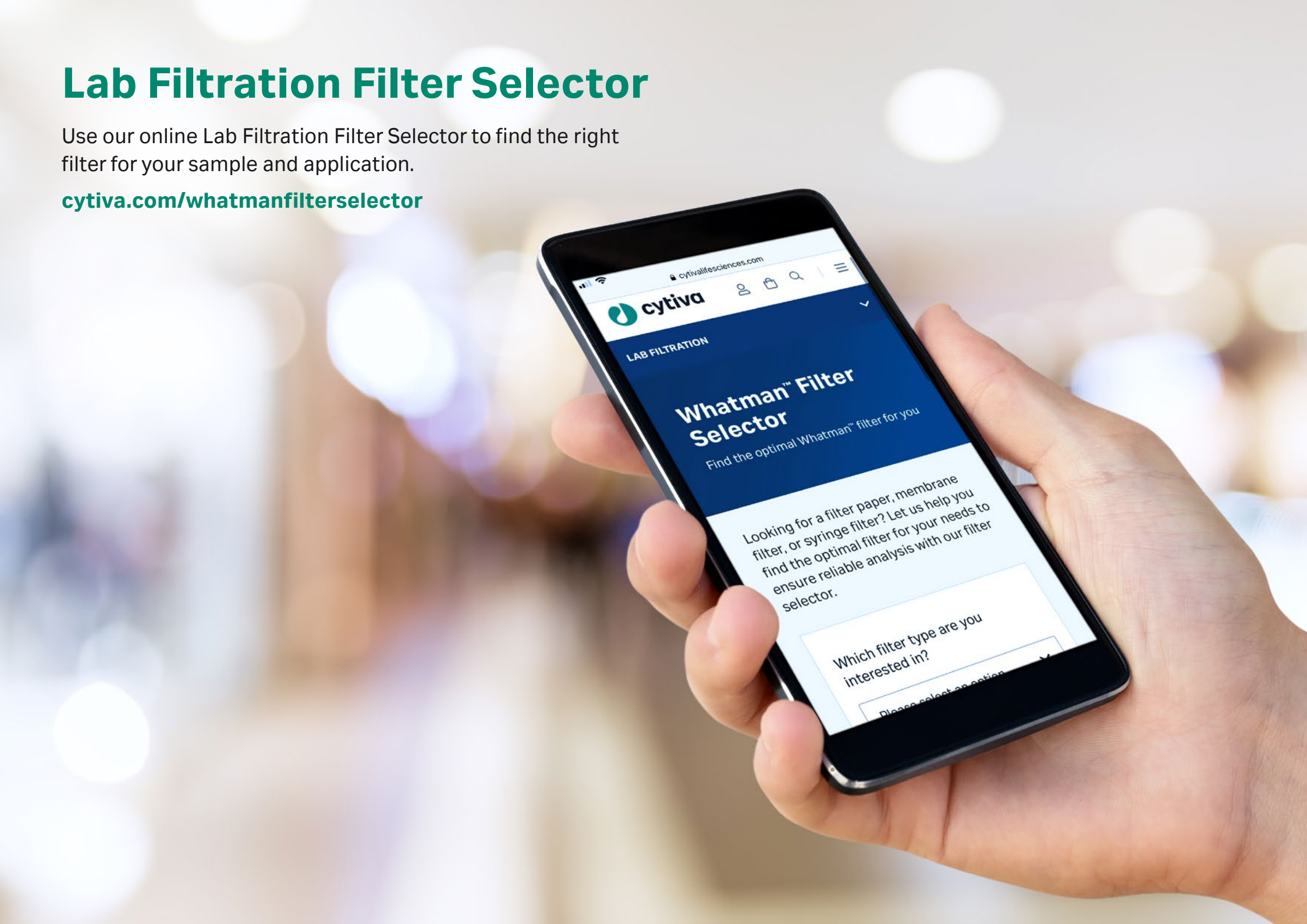
Moisture testing papers

Dimensions (mm)	Material	Catalog number	Quantity/pack
90	Borosilicate glass	5401-090E	100

Lab Filtration Filter Selector

Use our online Lab Filtration Filter Selector to find the right filter for your sample and application.

cytiva.com/whatmanfilterselector



09
Appendices

Filtration simplified

Basic filtration concepts and terms

Selecting a filter with the appropriate properties can help you achieve accurate results and reach discovery faster. Use this compilation of basic filtration concepts and terms as a handy reference to clarify the various options available to you to speed up your selection process.

Ash content

Determined by ignition of the cellulose filter at 900°C in air. Minimizing ash content is essential in gravimetric applications and also a useful measure of the level of general purity.

Chemical compatibility

It is important that the structure of the filter media will not be impaired by exposure to certain chemicals. Exposure to these chemicals should not cause the filter to shed fibers or particles, or add extractables. Length of exposure time, temperature, concentration, and applied pressure can all affect compatibility. Chemical compatibility charts are provided to aid your filter selection.

Depth filters

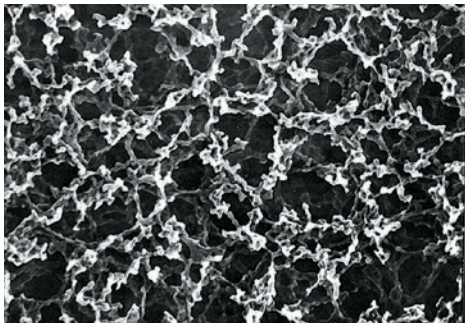
Depth filters are usually characterized as filters that retain particles on the surface and within the filter matrix. All conventional fibrous filters (whether manufactured from cellulose, borosilicate glass microfiber or other fibrous material) are depth filters and are normally characterized by good loading capacity.

Hydrophilic

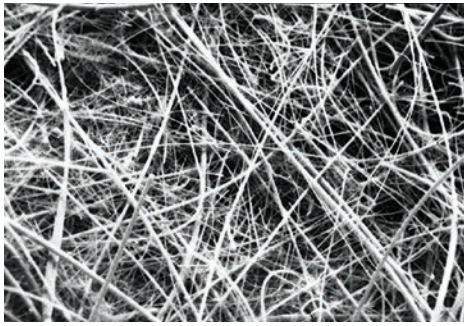
Hydrophilic filters possess an affinity for water and can be wetted with virtually any liquid. They are typically used for aqueous solutions and are compatible organic solvents.

Hydrophobic

These filters repel water, and are suited for filtering organic solvents for venting and gas filtration applications.



Membrane filters allow the efficient retention of submicron particulates and organisms.



Glass microfiber filters are manufactured from 100% borosilicate glass.

Liquid flow rate (including Herzberg method)

Under practical filtration conditions, the liquid flow rate depends on a number of factors, which are specific to the solid and/or liquid being filtered. In order to compare filter performances, a standardized set of conditions is required which characterize liquid flow rate for a given filter without the complicating secondary effects derived from the presence of particulates.

Liquid flow rate can be quantified by a variety of methods. For example, the Herzberg flow rate test where prefiltered, deaerated water is applied to the test filter (effective area 10 cm^2) at a constant hydrostatic head (10 cm) is commonly used. The rate of the flow is measured in seconds per 100 mL.

Flow rate can also be measured by the modified ASTM method which uses a quadrant folded filter held in a wire loop.

Loading capacity

Loading capacity is the ability of a filter to load particulates into the fibrous matrix while maintaining a practical filtration speed and a workable pressure differential across the filter. In general, glass microfiber filters have a high loading capacity when compared with cellulose filters of the same retention rating and thickness. Membranes have inherently low loading capacity.

Particle retention (air and gas)

Retention mechanisms for removing particulates from air or gas provide higher efficiencies than those applicable to liquids. Efficiencies for air filtration are normally expressed as percent penetration or retention for a stated airborne particle size. The dioctyl phthalate (DOP) test is commonly used, the filter is tested with an aerosol containing 0.3 µm particles.

Particle retention (liquid)

In a filtration process, the particle retention efficiency of a depth-type filter is expressed in terms of the particle size (in µm) at a set level of the total number of particles initially testing the filter is obtained. It is customary to quote the retention levels at 98% efficiency to allow for secondary filtration effects.

Pore size (membranes)

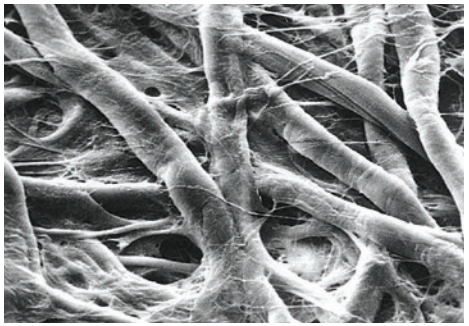
For membranes, the pore size, usually stated in micrometers (µm), is based upon bubble point. Pore size ratings are nominal for all membranes apart from those for track-etched and Anopore membranes. For track-etched and Anopore membranes the pore sizes are absolute, as these membranes have true pores (i.e., a top-to-bottom hole through the membrane).

Prefilters

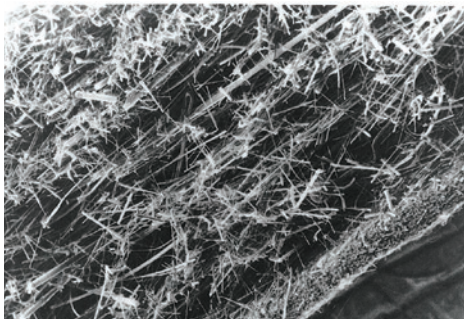
The life of a membrane filter can be extended many times by placing a prefilter upstream of the membrane. The total particulate load challenging the membrane is considerably reduced, thus allowing the membrane to operate efficiently.

Screen or surface filters

Membrane filters are generally described as screen filters because particles are almost entirely trapped on the filter surface. The narrow effective pore size distribution of membrane filters is one of their major features.



Cellulose filter papers exhibit particle retention levels down to 2.5 µm.



Multigrade GMF 150 combines two filters in one for fast, effective, multilayered filtration.

Basic filtration concepts and terms

Filter papers

Qualitative and quantitative filter papers are generally manufactured from high-quality cotton linters that are treated to achieve a minimum alpha cellulose content of 98%. These cellulose filter papers are used for general filtration and exhibit particle retention levels down to 2.5 µm. There many retention and flow rate combinations to meet the needs of numerous laboratory applications. Different groups of filter paper types offer increasing degrees of purity, hardness, and chemical resistance. Quantitative filter papers have extremely high purity to allow for analytical and gravimetric work.

Glass microfiber filters (GMF)

The properties of borosilicate glass microfibers allow us to manufacture filters with retention levels extending into the submicron range. These depth filters combine fast flow rate with high loading capacity and retention of very fine particulates. Due to the high void volume exhibited by glass microfiber filters, the loading capacity is considerably higher than for a cellulose filter of similar retention. Glass microfiber filters must be used flat and should not be folded. They are manufactured from 100% borosilicate glass and most are binder-free. Binder-free glass microfiber filters withstand temperatures up to 550°C and can be used in gravimetric analysis where ignition is involved.

Membrane filters

Unlike cellulose and glass microfiber depth filters, membrane filters are conventionally classified as surface filters because the filter matrix acts as a screen and retains particulates almost entirely on the smooth membrane surface. The retention levels for these filters extend down to 0.02 µm and allow for retention of sub-micron particulates and organisms. Water microbiology and air pollution monitoring are major applications for membranes.

Standard circle funnel volumes

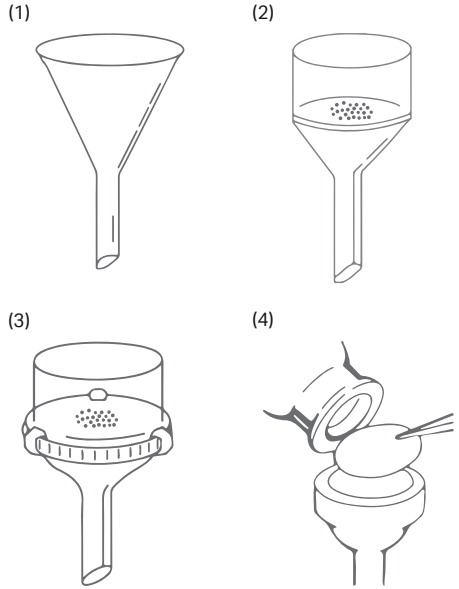
The maximum practical volume of the most popular circle sizes (quadrant folded) is given in the following chart. Membrane and glass microfiber filters are used flat.

Standard circle funnel volumes:

Diameter (cm)	Volume (mL)
9	15
11	20
12.5	35
15	75
18.5	135
24	300

Types of filter holders

A filter matrix requires suitable support structure to be used for the filtration of liquids or gases. One of the simplest forms of holder is the conical glass filter funnel into which a quadrant folded or fluted filter paper is placed (1). Some applications require additional motivating force for the solid particulate and liquid separation to occur (i.e., vacuum assisted filtration). This type of filtration can be done in a one-piece Büchner style funnel where the filter is used flat on a perforated base sealed into the funnel (2). Due to the difficulties encountered in cleaning this type of funnel, the demountable 3-piece funnel was developed (3). Three-piece filter funnels can be fully disassembled so the filter paper can be securely clamped between the support plate and filter reservoir flange. Membrane holders incorporate either sealed-in sintered glass or removable stainless steel mesh supports for the membrane (4). Syringe and inline filters are also available. Large diameter membranes are typically used in pressure holders.



Examples of filter holders

Selecting the right filter

The selection of a laboratory filter depends on the conditions and objectives of the experiment or analytical procedure. The three most important characteristics of any laboratory filter are:

- Particle retention efficiency
- Fluid flow rate through the filter
- Loading capacity

According to the particular application, other important characteristics may require examination. Wet strength, chemical resistance, purity, and ash level may be of equal importance under certain circumstances.

The vacuum level placed across a filter will influence the flow rate, but the relationship is not linear. For depth filters, it was found that when the vacuum increases over about 5 cm Hg, no significant increase in flow rate occurs. Generally, the optimum vacuum level is between 2–5 cm Hg. The type of support under the filter can also play a role in the level of vacuum that can be applied to a fibrous material.

Standard 58° or 60° funnels

Glass/polyethylene funnel diameter (mm)	Filter paper size (cm)
35	5.5
45	7.0
55	9.0
65	11.0
75	12.5
90	15.0
100	18.5
160	24.0
180	32.0
220	40.0
260	50.0

Büchner funnel filter selection

Diameter (mm)	Perforated area (mm)	Filter paper size (mm)
43	32	42.5
63	42	55
83	60	75
100	77	90
114	95	110
126	105	125
151	135	150
186	160	185
253	213	240

Typical particle sizes

		µm
Gelatinous precipitates	Metal hydroxides	25–40
	Precipitated silica	25–40
Crystalline precipitates	Ammonium phosphomolybdate	20
	Calcium oxatate	15
	Lead sulfate	10
	Barium sulfate (hot ppt.)	8
	Barium sulfate (cold ppt.)	3
Blood cells	Platelets	2–3
	Erythrocytes (average)	7
	Polymorphs	8–12
	Small lymphocytes	7–10
	Large lymphocytes	12–15
	Monocytes	16–22
Bacteria*	Cocci	0.5
	Bacilli	1.0 × (2.0–6.0)
	Serratia marcescens	0.5 × (0.5–1.0)
	Pneumococcus	1.0
	Bacillus tuberculosis	0.3 × (2.5–3.5)
	Amoeba	12–30
	Escherichia Coli	0.5 × (1.0–3.0)
	Smallest bacteria	0.22
Other microorganisms, etc.	Yeast cells	2.0–8.0
	Colloids	0.06–0.30
	Rye grass pollen	34
	Ragweed pollen	20
	Puffball spores	3.3

* *Where bacteria are rod-shaped, range of lengths is given in parentheses*

Glossary of terms

A	
Absolute filter rating	This rating refers to the size of particles retained by the filter at 100% efficiency.Particles larger than the specified size rating of the filter medium will not pass through that filter (e.g., particles larger than 0.2 µm will not pass through a filter with an absolute rating of 0.2 µm).
Activated carbon	Porous carbon with a large surface area that can adsorb certain organic chemicals.
Absorption	The amount of material taken up by the structure of the filter medium. Usually expressed as volume or mass per unit area of filter.
Adsorption	Retention of substances by loosely attaching to the surface of the filter.
Aerosol	A dispersion (suspension) of particles or droplets of liquid in air or gas.
Air filter	A filter that removes contamination (particles) from air or a gas. If the filter medium is hydrophobic it will also remove water based liquid from air streams.
Air lock	Liquid flow is prevented by the high pressure required to expel air trapped in the pore structure of a wet membrane.
Air venting filter	A filter that removes air from liquid or allows air to pass in or out of a closed container.
Ambient	The term used to present a generalized description of an environment. Usually room temperature (20-25°C) and standard atmospheric pressure.
Anisotropic membrane	A membrane in which the pore openings are larger on one side than the other. The membrane must be oriented correctly to obtain the best filtration characteristics.
Aseptic conditions	A test or operation performed in a sterile environment designed to prevent the introduction of bacteria.
Ash content	The amount of material remaining after a known mass of filter paper is completely combusted. Expressed as a %.
B	
Back pressure	A pressure downstream (outlet side) of the filter that creates resistance to flow of liquid or gas. This can result from closing a valve or trapped air in a liquid system. This can also result from gradual blocking of the filter during use or to the resistance to flow caused by the filter itself. The amount of force required to move a sample through a filter increases as back pressure increases.
Bacterial retention	The number of microorganisms that a membrane filter will retain upstream with no passage through the membrane. Usually expressed as a log reduction in the number of organisms (CFU—colony forming units), from a defined starting concentration.
Basis weight	Weight of a sheet, usually expressed as g/m at a predefined level of moisture content or conditions of measurement.
Bubble point	The pressure at which air will pass through a wetted membrane filter. This pressure is correlated to the pore size of the membrane and thus this test can be used to confirm the pore size and integrity of a membrane or filter device.
Burst pressure	The pressure at which a membrane or filter device will rupture.
C	
Cold sterilization	Removal of bacteria by filtration, generally using a 0.2 µm filter to a pre-defined level. General definition is a log 10^7 reduction in CFU/mL.
D	
Depth filter	A filter that does not have a defined pore size or structure. Particles are trapped or adsorbed both within and on the filter due to a random matrix or structure that creates a tortuous path through the filter.
Downstream (of the filter)	Any process occurring after the sample has passed through the filter positioned in the system.
Dry burst	The pressure required to burst a dry, unsupported area of filter paper using compressed air.

E	
EFA (effective filtration area)	The total area of the filter medium exposed to the flow of liquid or air, that is usable for filtration. This is usually designated in square centimeters (cm^2).
EtO sterilization	Chemical method of treating a material to render microorganisms non viable.
Extractables	Chemicals which may leach from a material such as a filter or filter device under certain conditions. Care should be taken to ensure that extractables do not interfere with the analysis.
F	
Filter medium	Permeable material that removes particles from a fluid that is passed through the material.
Filtrate	The liquid, air, or gas which has passed out of the filter.
Filtration	The process by which particles are removed from a fluid by passing it through a permeable material.
Flow rate	The volume of liquid or gas which flows through a filter or device at a specified pressure in a specified amount of time (e.g., 20 mL/min at 30 psi).
G	
Grammage	Weight of a 1 m^2 sheet at a predfined level of moisture content or conditions of measurement.
Gurley porosity	Expression of air flow rate. Expressed as the time taken for a certain volume of air to pass through a specific filter area under a certain pressure.
H	
Hardened	Process of treating a cellulose paper to increase its strength.
HEPA filter	A high efficiency particulate air filter that removes particles from an air stream to a defined level of efficiency.
Herzberg	The time taken to filter a defined volume of water through a filter area of 10 cm^2 at a constant, defined head of pressure.
Hold-up volume	The volume of liquid retained in a filter or housing (can be expressed with or without air purge).
Hydrophilic	Having an affinity for water. A membrane which will wet with aqueous (water) solutions. Hydrophilic membranes are generally chosen for use with aqueous solutions.
Hydrophobic	A membrane which will not readily wet with aqueous (water) solutions. It acts as a barrier to aqueous solutions but allows air to pass freely through it.
K	
Klemm	The time taken for a liquid flow front to travel a defined distance in the lateral plane of a defined width strip of test material while the sample is maintained either horizontally or vertically (e.g., Vertical Klemm of 40 seconds for 7.5 cm).
L	
Loading capacity	A characteristic of a filter that indicates the relationship between reduction in flow rate and volume throughput.
LRV (log reduction value)	A way of expressing the bacterial retention of a filter.
Luer fitting	A fitting made to connect components of systems together in the medical and scientific industries. These fittings have specific dimensions that allow them to withstand relatively high pressure.
M	
Micron	A measure of length equal to one millionth of a meter.

N	
Nominal filter retention (efficiency)	The particle size which is retained at a given % efficiency (often expressed at 98%). This is usually how depth filters are specified.
P	
Particle	A single piece of solid material which is small in relation to its environment. Normally characterized by its size and shape.
Pinched pleat	A pleat that is closed off by excessive pressure or crowding, thus reducing the effective filtration area.
Pleating	The folding process which provides a large surface area within a given volume of filter.
Pore	A hole or cavity.
Pore size (absolute)	The pore size at which a particle of defined size will be retained with an efficiency of 100% under specified conditions.
Pore size (nominal)	The pore size at which a particle of defined size will be retained with an efficiency below 100% (typically 90-98%).
Pore size rating	The diameter of a particle which normally will be retained by the filter. This applies whether the pore size rating is nominal or absolute.
Porosity	A measure of how porous a filter material is. Normally expressed as a percentage, it is the volume of the filter that is composed of pores compared to the total volume.
Prefilter	A filter for removing gross contamination before the substance being filtered passes through the final filter. This is used to extend the life of a small pore size filter.
R	
Radiation sterilized	Rendering microorganisms inactive by subjecting the object to be sterilized to a beam or field of concentrated energy.
Retention	The ability of a filter medium to hold back particles of a given size.
S	
Sterile	Free from living microorganisms to a defined level.
Sterilizing filter	A filter that removes bacteria to a specified level when used according to a specific method.
T	
Tensile strength	A measure of how much a material stretches and then breaks under tension. Test can be performed in different directions across the paper, wet or dry.
Thickness	Thickness of a sheet measured under defined compression force.
Throughput	The amount of fluid that will pass through a filter before the filter blocks or the flow rate is reduced to a point that is unacceptable.
U	
Upstream	Before the filter positioned in the system.

W	
Water absorption	The amount of water absorbed by a sheet per square area.
Water breakthrough pressure	The pressure required to force water through the pores of a hydrophobic membrane.
Water flow rate	The rate of passage of clean (prefiltered) water through a filter of defined area under defined conditions of pressure or vacuum. The flow rate may be expressed as volume/time or as time for a defined volume to pass through the filter.
Wet burst	The pressure required to burst a wet, unsupported area of filter paper (uses water).
Wet strength	An indication of the strength of a sheet of material when wet. Tested by applying water pressure to an unsupported area of filter material.
Wicking rate	The rate of movement of a liquid, usually water, laterally through a sheet of filter material. The rate can be expressed as the time taken for liquid to move a certain distance or the distance moved in a certain time. The orientation of the material must be specified and can be either vertical or horizontal.

Trace element composition cellulose and glass microfiber filters

Cellulose filters: Trace element composition

Typical values (µg/g paper)

Grade	1	2	3	4	5	6	40	41	42	43	44	540	541	542
Aluminum	3.6	3.6	3.6	3.6	2.5	–	2.5	2.5	2.5	2.5	2.5	3.4	3.4	3.4
Antimony	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Arsenic	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Barium	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Boron	< 1	< 1	< 1	< 1	< 1	–	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Calcium	27.5	27.5	27.5	27.5	8.3	–	8.3	8.3	8.3	8.3	8.3	14.7	14.7	14.7
Chromium	1	1	1	1	1.5	–	1.5	1.5	1.5	1.5	1.5	1.1	1.1	1.1
Copper	0.9	0.9	0.9	0.9	2	–	2	2	2	2	2	8.2	8.2	8.2
Iron	13.7	13.7	13.7	13.7	12	–	12	12	12	12	12	16.3	16.3	16.3
Lead	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Magnesium	21	21	21	21	4	–	4	4	4	4	4	3.3	3.3	3.3
Manganese	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mercury	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	–	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Potassium	6.2	6.2	6.2	6.2	2.3	–	2.3	2.3	2.3	2.3	2.3	3.7	3.7	3.7
Silicon	8.8	8.8	8.8	8.8	6.2	–	6.2	6.2	6.2	6.2	6.2	< 6	< 6	< 6
Sodium	32.3	32.3	32.3	32.3	16.8	–	16.8	16.8	16.8	16.8	16.8	17	17	17
Zinc	58.3	58.3	58.3	58.3	64.5	–	64.5	64.5	64.5	64.5	64.5	87.8	87.8	87.8

Glass microfiber and quartz filters: trace element composition

Typical values (µg/g paper)

	QM-A*	EPM 2000	934-AH filter	GF/A and GF/C filter
Arsenic (As)	< 1	< 1	24	5
Beryllium (Be)	< 1	< 1	< 1	< 1
Cobalt (Co)	< 1	1	< 1	< 1
Cadmium (Cd)	< 1	< 1	< 1	< 1
Copper (Cu)	< 1	5	3	< 1
Lead (Pb)	< 1	3	9	5
Manganese (Mn)	2	20	18	6
Mercury (Hg)	< 1	< 1	< 1	< 1
Nickel (Ni)	1	1	3	1
Selenium (Se)	< 3	< 3	< 3	< 3
Silver (Ag)	< 1	< 1	< 1	< 1
Thallium (Tl)	< 1	< 1	< 1	< 1

Typical composition based on ICP-MS analysis

* *Trace element report can be downloaded from the Cytiva website for each lot of QM-A*

Chemical compatibility of membranes and housings*

Solvent	ANP	CA	CN	PC	PE	GMF	NYL	PP	DpPP	PES	H-PTFE	PTFE‡	PVDF	RC
Acetic acid, 5%	R	LR	R	R	–	R	R	R	R	R	R	R	R	R
Acetic acid, glacial	R	NR	NR	–	–	R	LR	R	R	R	R	R	R	NR
Acetone	R	NR	NR	NR	R	R	R	R	R	NR	R	R	NR	R
Acetonitrile	R	NR	NR	–	–	R	R	R	R	NR	R	R	R	R
Ammonia, 6 N	NR		NR	NR	LR	LR	R	R	R	R	R	R	LR	LR
Amyl acetate	LR	NR	NR	NR	R	R	R	R	R	LR	R	R	LR	R
Amyl alcohol	R	LR	LR	–	–	R	R	R	R	NR	R	R	R	R
Benzene†	R	R	R	NR	R	R	LR	NR	NR	R	R	R	R	R
Benzyl alcohol†	R	LR	LR	LR	R	R	LR	R	R	NR	R	R	R	R
Boric acid	R	R	R	R	R	R	LR	R	R	–	–	R	R	R
Butyl alcohol	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Butyl chloride†	–	–	–	–	–	R	NR	NR	NR	–	–	R	R	–
Carbon tetrachloride†	R	NR	R	LR	R	R	LR	NR	NR	NR	R	R	R	R
Chloroform†	R	NR	R	NR	R	R	NR	LR	LR	NR	R	R	R	R
Chlorobenzene†	R	–	LR	NR	–	R	NR	LR	–	NR	–	R	R	R
Citric acid	–	–	–	–	–	R	LR	R	–	R	–	R	R	R
Cresol	–	NR	R	–	–	R	NR	NR	NR	NR	–	R	NR	R
Cyclohexane	R	NR	NR	R	R	R	NR	NR	NR	NR	–	R	R	R
Cyclohexanone	R	NR	NR	–	–	R	NR	R	R	NR	R	R	R	R
Diethylacetamide	–	NR	NR	–	–	R	R	R	R	–	–	R	NR	R
Dimethylformamide	LR	NR	NR	–	–	R	R	R	R	NR	R	R	NR	LR
Dioxane	R	NR	NR	NR	R	R	R	R	R	LR	–	R	LR	R
DMSO	LR	NR	NR	NR	R	R	R	R	R	NR	R	R	LR	LR
Ethanol	R	R	NR	R	R	R	R	R	R	R	–	R	R	R
Ethers	R	LR	LR	R	R	R	R	NR	NR	R	R	R	LR	R
Ethyl acetate	R	NR	NR	NR	R	R	R	R	R	NR	R	R	NR	R
Ethylene glycol	R	LR	LR	R	R	R	R	R	R	R	R	R	R	R
Formaldehyde	LR	LR	R	R	R	R	R	LR	LR	R	R	R	R	LR

* *ANP = Anopore membrane; CA = Cellulose acetate; CN = Cellulose nitrate; DpPP = Polypropylene depth filter; GMF = Glass microfiber; NYL = Nylon; PC = Polycarbonate; PE = Polyester; PES = Polyethersulfone; PP = Polypropylene; H-PTFE = Hydrophilic polytetrafluoroethylene; PTFE = Polytetrafluoroethylene; PVDF = Polyvinylidene difluoride; RC = Regenerated cellulose R = Resistant; LR = Limited resistance; NR = Not recommended.*

† *Short term resistance of housing.*

‡ *Membrane may need pre-wetting with isopropanol or methanol if filtering a polar liquid.*

The above data is to be used as a guide only. Testing prior to application is recommended.

Solvent	ANP	CA	CN	PC	PE	GMF	NYL	PP	DpPP	PES	H-PTFE	PTFE‡	PVDF	RC
Freon TF	R	R	R	R	R	R	NR	NR	NR	R	–	R	R	–
Formic acid	–	LR	LR	–	–	R	NR	R	R	R	–	R	R	LR
Hexane	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Hydrochloric acid, conc.	NR	NR	NR	NR	NR	R	NR	LR	LR	R	R	R	R	NR
Hydrofluoric acid	–	NR	NR	–	–	NR	NR	LR	LR	–	–	R	R	NR
Isobutyl alcohol	R	LR	LR	R	R	R	R	R	R	–	R	R	R	R
Isopropyl alcohol	R	R	LR	–	–	R	R	R	R	–	R	R	R	R
Methanol	R	R	NR	R	R	R	R	R	R	R	R	R	R	R
Methyl ethyl ketone	R	LR	NR	NR	R	R	R	R	R	NR	R	R	NR	R
Methylene chloride†	R	NR	LR	–	–	R	NR	LR	LR	NR	R	R	R	R
Nitric acid, conc.	–	NR	NR	LR	NR	R	NR	NR	NR	NR	R	R	R	NR
Nitric acid, 6 N	–	LR	LR	–	–	R	NR	LR	LR	LR	R	R	R	LR
Nitrobenzene†	LR	NR	NR	NR	R	R	LR	R	R	NR	–	R	R	R
Pentane	R	R	R	R	R	R	R	NR	NR	R	–	R	R	R
Perchloroethylene	R	R	R	–	–	R	LR	NR	NR	NR	R	R	R	R
Phenol 0.5%	LR	LR	R	–	–	R	NR	R	R	NR	–	R	R	R
Pyridine	R	NR	NR	NR	R	R	LR	R	R	NR	R	R	NR	R
Sodium hydroxide, 6N	NR	NR	NR	NR	NR	NR	LR	R	R	R	R	R	NR	NR
Sulfuric acid, conc.	NR	NR	NR	NR	NR	R	NR	NR	NR	NR	R	R	NR	NR
Tetrahydrofuran	R	NR	NR	–	–	R	R	LR	LR	NR	R	R	R	R
Toluene†	R	LR	R	NR	R	R	LR	LR	LR	NR	R	R	R	R
Trichloroethane†	R	NR	LR	NR	R	R	LR	LR	LR	NR	R	R	R	R
Trichloroethylene†	R	–	R	–	–	R	NR	LR	LR	NR	R	R	R	R
Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Xylene†	R	R	R	–	–	R	LR	LR	LR	LR	R	R	R	R

* *ANP = Anopore membrane; CA = Cellulose acetate; CN = Cellulose nitrate; DpPP = Polypropylene depth filter; GMF = Glass microfiber; NYL = Nylon; PC = Polycarbonate; PE = Polyester; PES = Polyethersulfone; PP = Polypropylene; H-PTFE = Hydrophilic polytetrafluoroethylene; PTFE = Polytetrafluoroethylene; PVDF = Polyvinylidene difluoride; RC = Regenerated cellulose R = Resistant; LR = Limited resistance; NR = Not recommended.*

† *Short term resistance of housing.*

‡ *Membrane may need pre-wetting with isopropanol or methanol if filtering a polar liquid.*

The above data is to be used as a guide only. Testing prior to application is recommended.

Using an irregular chemical solvent? Consult our chemical compatibility table, and contact us for a free sample of the membrane most suitable for your application.

Alphabetical index

Lab filtration: An environmental perspective

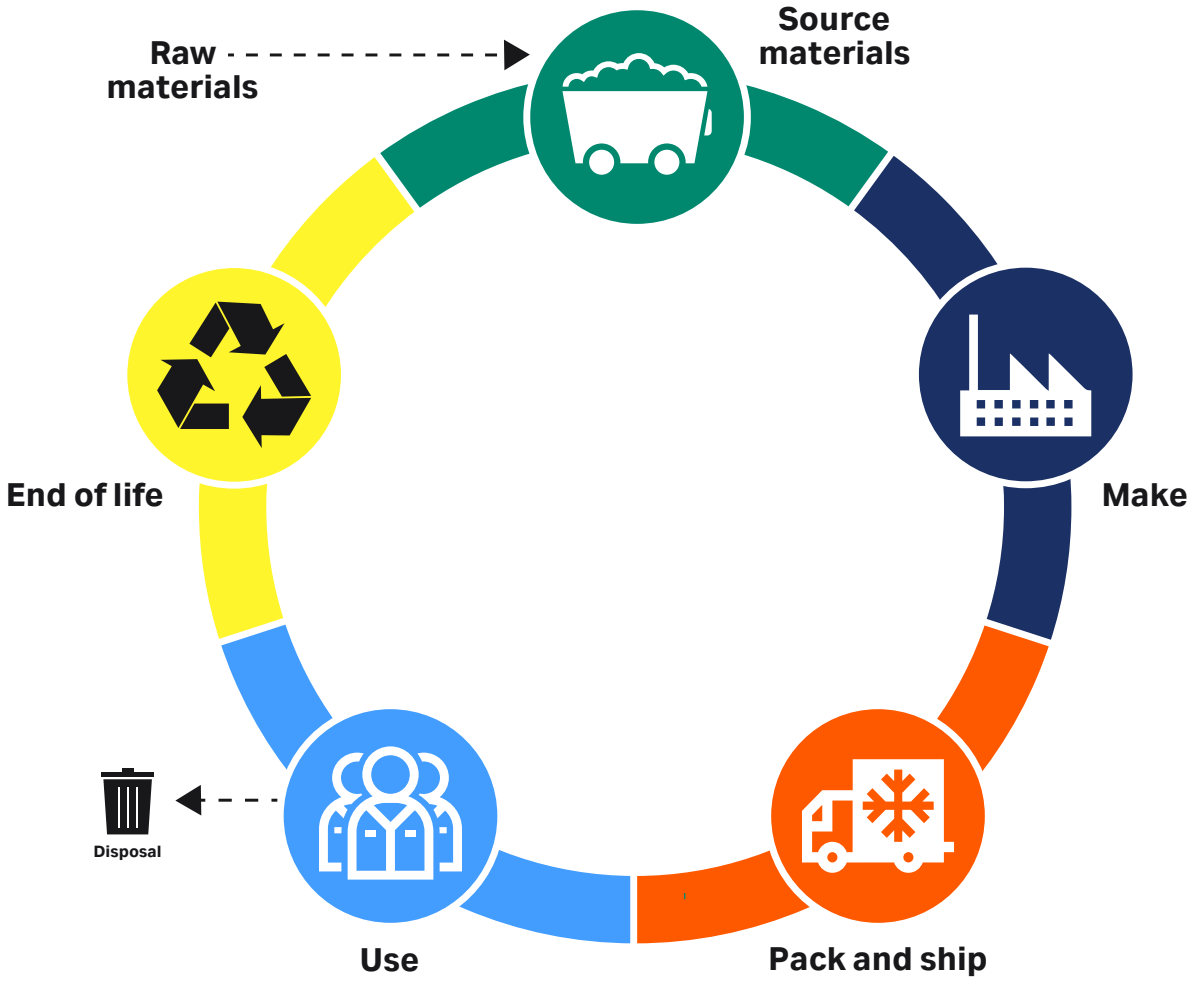
Unleashing the power of life cycle management

Since 1733, Cytiva's lab filtration businesses of Whatman and Pall (since 1946) have been positively impacting society and the environment through the way our products have been used in research, manufacturing, quality, and testing.

Now we are prioritizing how we incorporate eco-design principles into every phase of our lab filtration products to reduce the environmental footprint. We set a goal to complete product carbon footprints (PCF) on 20% of our top products (by revenue) in 2025.

We will only succeed if we work together across the full value chain, suppliers and customers both. ~95% of our carbon emissions are Scope 3 emissions with raw materials and distribution being the primary categories. As of Q4 2024, 81% of our direct spend has been EcoVadis assessed. Also, we are actively sourcing biobased feedstock for plastic alternatives to reduce our dependence on virgin fossil fuels and the carbon impact of that plastic.

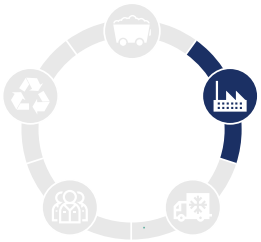
Cytiva is committed to decarbonizing our products, processes and ways of working to ensure we meet our current and future sustainability goals.



Raw materials

We recognize the importance of what material we are choosing and how much we are using when designing products. We must pursue materials with a reduced environmental impact, ensure responsible sourcing and preserve labour and human rights.

With that in mind, we've identified multiple processes where waste has been eliminated during syringe filter production. We are also pursuing certification through ISCC for bio-based polypropylene alternatives in 2025.



Manufacturing

Manufacturing filtration devices uses a lot of energy and water, and this is conducted at four primary facilities: China, England, Germany, and Puerto Rico. At each site we look to improve operational efficiencies, for example:

- China has invested more than $3 million to improve water efficiency and has reduced water consumption by more than 80%

15%
of Benchkote product raw materials are offset by reuse of wastepaper.

1/4
of the size of typical filters, VacuCap filters are designed with 80% less plastic to dispose.

72%
Mini-UniPrep plastic reduction in setup vs standard filter setup.

100%
of our filtration manufacturing sites run on renewable electricity.

>6.5g
plastic eliminated via manufacturing design change of cold to hot runners at Cardiff & Dassel.

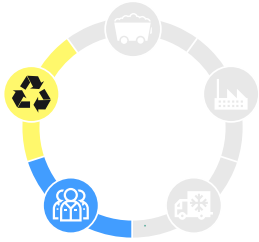
112
tons emissions reductions in CO_2 at Cardiff in 2024.

Distribution

Over the past few years, we've had multiple projects supporting the transition to more sustainable business practices, with a big focus on packaging.

Through analysis of our plastic use, from shrink wrap to heavy jars, we're identifying ways to eliminate plastic and make our packaging easier to recycle.

"By refining and perfecting our packaging, we cultivate a new narrative for sustainability, where each thoughtful gain collectively lights the way to a brighter, sustainable world." — H. Gee-Wing, Engineering



Use and end of life

Understanding how you are using and disposing of your lab filtration devices can provide Cytiva crucial insights on how best to design more environmentally-friendly products in the future.

Connect with us today if you're interested in collaborating on product design.

20%
reduction in plastic packaging at our Tonglu site.

7
tonnes of CO_2 emissions saved by removing plastic shrink wrap in ~200 products in our device portfolio.

> 3.5
tonnes CO_2 emissions saved by replacing hard plastic with cardboard cartons.

650 000
filtration devices recycled since 2022.

2.2
tons of CO_2 saved by transferring instructions-for-use to the website.

Fostering
collaboration and transparency across the value chain.

Our commitment to sustainability

Our impact to the United Nations Sustainable Development Goals

Thriving people, thriving planet, a resilient business. For Cytiva, these three aims are deeply connected. Achieving them is our ambition and our responsibility. That's why we commit to integrating respect for people and care of the environment in our decisions in ways that have a lasting impact on society, our customers, patients, and Cytiva associates.

PLATINUM Top 1% 2023 ecovadis Sustainability Rating

LRQA CERTIFIED ISO 14001

Science-based targets + Net Zero

WE SUPPORT UN GLOBAL COMPACT

This statement of our commitment to sustainability reflects our support of the UN Global Compact and its 10 principles on human and labor rights, environmental protection, and anti-corruption. It is echoed in relevant policies, procedures and strategic priorities across Cytiva.

Want to learn more?
cytiva.com/sustainability

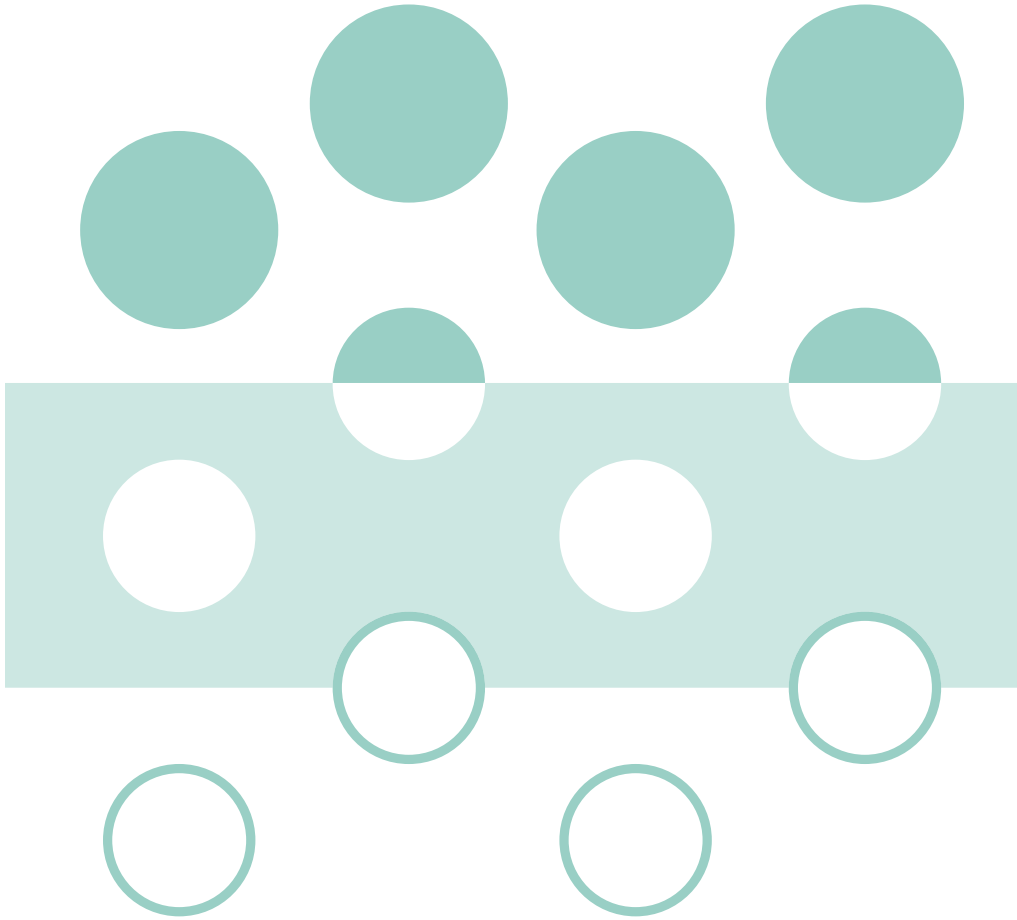
Easy ways to buy

We are where you are

For local office contact information, visit **cytiva.com/contact**

1. Shop online at **cytivalifesciences.com/shop/lab-filtration**.
2. Email your customer service team.
3. Call us now. Our customer service representatives will answer your questions and help you find the right filtration product to meet your needs.
4. Find a distributor. Details of your nearest distributor can be found at **cytiva.com/support/find-a-distributor**.

Notes



cytiva.com

For local office contact information, visit cytiva.com/contact

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Cytiva stands for quality and innovation in laboratory filtration. Our products are engineered to enhance efficiency and deliver consistent, reliable results—whether you're in a research lab, quality control environment, or working in the field. Trust Cytiva to support your science with precision and performance.

cytiva

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