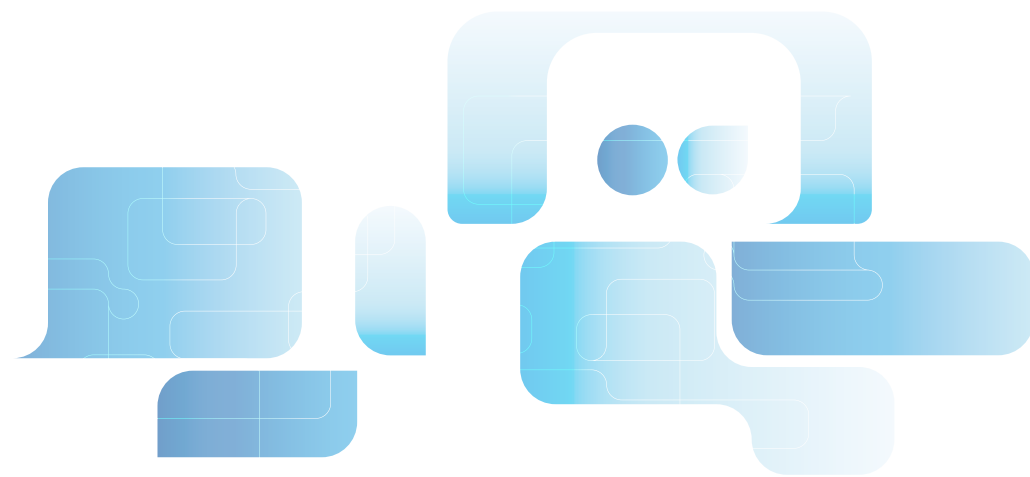




DISC AND SHEET MEMBRANES PRODUCT COLLECTION





The GVS Group

In over 45 years of history, GVS has evolved from a supplier of components for the healthcare sector to a global group that produces highly technological diversified filtration solutions.

Wide range of products and custom design expertise

GVS produces a wide range of filter materials, filters and off-the-shelf components in all its divisions, enabling its customers to reduce the design time for new product launches.

All the GVS divisions work in highly regulated environments and the Group therefore operates with extremely high-quality standards. Thanks to its research and development centres located all over the world, GVS is also able to offer an extremely efficient and personalized service to meet its customers' needs: from product conception and design to testing and mass production.

Dynamic and flexible structure

GVS has developed a streamlined, dynamic and technologically advanced structure that has made it possible to achieve constant and balanced growth. The Group currently employs a total of 4869 people who work in automated assembly departments, in lines for the production and processing of filter membranes and in class 10,000 and 100,000 cleanrooms.

Global growth

The GVS Group has always paid great attention to research, development and innovation of its products and processes and has shown a strong trend towards development in global markets since its foundation.

In addition to the corporate headquarters in Bologna, GVS currently has 19 plants in Italy, United Kingdom, Brazil, United States, China, Mexico, Romania e Puerto Rico, and 29 commercial offices located all over the world. GVS has always adopted a "glocal" approach: it operates locally in contact with its customers, but relies on the strength of a global network.

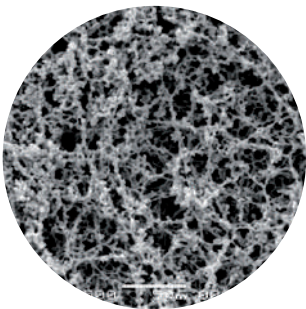
For more information, visit www.gvs.com



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Cellulose Acetate (CA) Membrane



GVS Cellulose Acetate (CA) Filtration Membrane is a supported, hydrophilic membrane that is naturally low binding. It is ideal for use in filtration applications where maximal recovery of protein is critical.

Exceptional Strength for Improved Performance

GVS CA Filtration membranes are composed of pure cellulose acetate that is internally supported by an inert polyester web. This web gives each membrane exceptional strength to prevent cracking, tearing, breaking and distortion when handled or creased. The resulting membrane has dimensional stability that can withstand autoclaving or steam sterilizing leaving the membrane unaffected in temperatures up to 135°C (274°F). The exceptional dimensional strength and low binding characteristics of GVS CA Filtration Membranes provides higher throughputs than competitive offerings and reduces the amount of filter changes needed during proteinaceous solution filtering. Its uniform pore size and consistent flow rates ensure reliable performance.

Performance

| Pore Size (µm) | Flow Time (s) | Volume/Vacuum (mL/ in Hg) | Flow Rate (mL/min/cm² @ 10psi) | Bubble Point (psi) |
|----------------|---------------|---------------------------|--------------------------------|--------------------|
| 0.22 | 70-155 | 250/20 | 10.26-22.72 | 50-72 |
| 0.45 | 20-49 | 250/20 | 32.46-79.53 | 30-45 |
| 0.65 | 15-40 | 250/20 | 39.77-106.04 | 18-32 |
| 0.8 | 13-36 | 250/20 | 44.18-122.36 | 14-28 |
| 1.2 | 40-248 | 500/5 | 51-318 | 11-22 |
| 5.0 | 23-59 | 500/5 | 216-553 | 6-16 |

Ordering information

| Dimen- sions Packa- ging | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk | 50 mm 100/pk | 90 mm 25/pk | 102 mm 25/pk | 142 mm 25/pk | 293 mm 25/pk | 20x20 mm 5/pk | 30 cmx 3m 1/pk |
|--------------------------|--------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|---------------|----------------|
| Pore sizes | 0.22 µm | 1212374 | 1213124 | 1213804 | 1221730 | 1214357 | 1215074 | 1215427 | | 1224211 |
| | 0.45 µm | 1215533 | 1215635 | 1215676 | 3052874 | 1212375 | 1221546 | 1212517 | 1212620 | 1240382 |
| | 0.65 µm | | 1212846 | 1212942 | | 1213037 | | | | 3061196 |
| | 0.8 µm | 1213305 | | 1213358 | | | | 1213316 | 3034974 | 3034975 |
| | 1.2 µm | | | 1213805 | | | 1213958 | 1214038 | | 3041202 |
| | 5.0 µm | | 1214370 | 1214411 | | 1212648 | | | | 3049247 |

Features & Benefits

- Superior strength: Can withstand aggressive handling or be used with automated equipment without breaking or tearing
- Low extractables: Ensures tests will be clean with consistent results
- Hydrophilic: Wets out rapidly
- Lot-to-lot consistency: Quality checks ensure consistent flow and diffusion rates for dependable results every time
- Nonlysing of cells: Prevents contamination of critical solutions
- Can be autoclaved or steam sterilized

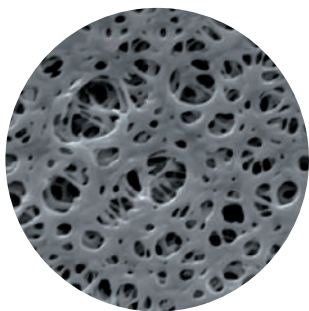
Typical Applications

- Protein and enzyme filtration
- Biological fluid sterilization
- Tissue culture media sterilization
- Cold sterilization

Product Characteristics

| | |
|-------------------------------|---|
| USP Class VI testing | Passed |
| Thickness | 65 - 100 µm |
| Maximum Operating Temperature | 274°F (135°C) |
| Sealing Compatibility | Ultrasonics, Heat, Radio Frequency and Insert Molding |
| Pore Size Range | 0.22 to 5.0 µm |

Polyethersulfone (PES) Membrane



GVS Polyethersulfone (PES) Filtration Membrane is hydrophilic and cast from pure polyethersulfone polymer. It is designed to remove particulates during general filtration and its low protein and drug binding characteristics make it ideally suited for use in life science applications.

Product Uniformity and High Sensitivity Maximize Performance

This strong, microporous film asymmetric membrane is constructed from a high-temperature polyethersulfone polymer that is acid and base resistant. Its strength and durability are advantageous during usage that involves aggressive handling or automated equipment. GVS PES Filtration Membrane is naturally hydrophilic without

added wetting agents and has low extractables. Due to its inherent uniform porosity and controlled pore size, GVS PES Filtration Membrane efficiently removes particulates from solutions during general filtration. Additionally, its low protein and drug binding characteristics maximize recovery of critical drugs used in I.V. therapy, chemotherapy and open-heart surgery.

Features & Benefits

- Hydrophilic: Eliminates the need for wetting agents that can potentially interfere with analyses
- Low extractables: Ensures test results will not be compromised by wetting agents or other extractables
- Low drug and protein binding: Maximizes recovery of critical drugs or proteins
- Wide range of pore sizes: Pore size range of 0.03 µm to 8.0 µm enables specific pore size selection for given applications
- Superior burst strength: Protects the integrity of the membrane under high pressure
- Lot-to-lot consistency: Quality checks, both down and across the membrane, ensure dependable results every time

Typical Applications

- Protein and enzyme filtration and sterilization
- Biological fluid filtration and sterilization
- Pharmaceutical sterilization
- Environmental water studies

Performance

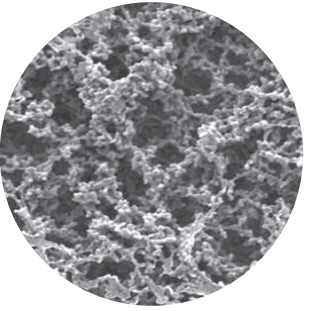
| Pore Size (µm) | Flow Time (s) | Volume/Vacuum (mL/ in Hg) | Flow Rate (mL/min/cm² @ 10 psi) | Bubble Point (psi) |
|----------------|---------------|---------------------------|---------------------------------|--------------------|
| 0.03 | 200-500 | 250/20 | 3.18-7.95 | 90-110 |
| 0.1 | 100-200 | 250/20 | 7.95-15.91 | 70-90 |
| 0.2 | 35-70 | 250/20 | 22.72-45.45 | 50-70 |
| 0.4 | 20-40 | 250/20 | 39.77-79.53 | 35-50 |
| 0.6 | 12-25 | 250/20 | 63.63-132.55 | 21-32 |
| 0.8 | 80-160 | 500/5 | 80-159 | 13-28 |
| 1.2 | 65-130 | 500/5 | 98-196 | 11-22 |

Ordering information

| | Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk | 47 mm 200/pk | 90 mm 25/pk | 142 mm 25/pk | 293 mm 25/pk | 200x200 mm 5/pk | 30 cmx3 m 1/pk |
|------------|-------------------------|-----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|--------------------|-------------------|
| Pore sizes | 0.03 µm | 3032875 | 3032876 | 3029505 | 3018505 | | | | 1235748 | 3057106 |
| | 0.1 µm | 1214756 | | | 1222230 | | | | 1225881 | 3026365 |
| | 0.22 µm | | 1214193 | 1214465 | 1226158* | 1214920 | 1214169 | 1214759 | 1223871 | 1226664 |
| | 0.45 µm | | 1214532 | 1214475 | 1226159* | 1215368 | 1214170 | 1214760 | 1225882 | 1226665 |
| | 0.65 µm | | 1215238 | | | | 1224490 | | 1225883 | 1225985 |
| | 0.8 µm | | 1214604 | 1214568 | 1214669 | | | | 1225884 | 3037376 |
| | 1.2 µm | | 1222267 | 1221008 | 1224492 | | | | 1223340 | 1242278 |
| | 5.0 µm | | 1215396 | | | 1224496 | | | | 1236292 |
| | 8.0 µm | | | | | | | | | 1225885 |

*Sterile

Mixed Cellulose Esters (MCE) Membrane



GVS Mixed Cellulose Esters (MCE) Filtration Membrane is an unsupported, hydrophilic membrane. Its rapid flow rate and high throughput make it ideal for use in diagnostic kit manufacturing applications.

Characteristics

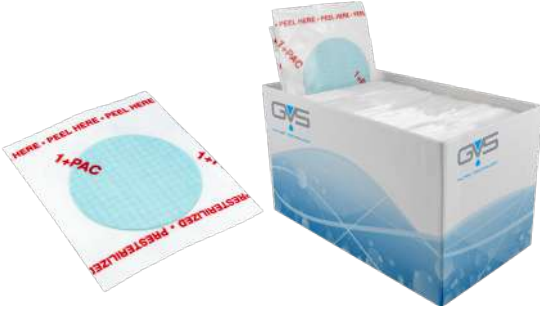
- High flow rate: fast filtration rates
- Uniform pore structure: consistent flow and diffusion rates
- Lot-to-lot consistency

Typical Applications

- Aqueous filtration
- Sterility testing
- Gravimetric analysis with ashing technique
- Microbiological and particulate analysis
- Black for food and beverage applications

Consistent Uniformity Improves Control and Performance

GVS MCE Filtration Membranes are composed of a mixture of inert cellulose nitrate and cellulose acetate polymers. The uniform microporous structure of these



filters provides the fastest flow rates and highest throughputs available in a membrane filter. Because they are biologically inert, GVS MCE Filtration Membranes are ideal for a wide range of clarification, sterilization and analytical applications such as: microbiological analysis, clarification or sterilization of aqueous solutions, industrial hygiene applications, silt density index and particulate-matter analysis. For gravimetric analysis using ashing techniques, GVS MCE Membranes yield a residue or less than 0.045% of their initial weight. They are hydrophilic with a noncytotoxic wetting agent and yield extractable levels of less than 4% of their weight. These membranes are autoclavable at 121°C (250°F) for 20 minutes. Sterilized product lifetime is 24 months from sterilization date.

Product Characteristics

| | |
|-------------------------------|--|
| Sterilization | Gamma Irradiation or Ethylene Oxide (EtO) |
| USP Class VI testing | Passed |
| Thickness | 100 - 190 µm |
| Sealing Compatibility | Ultrasonic, Heat, Radio Frequency and Insert Molding |
| Pore Size Range | 0.1 to 8.0 µm |
| BSA Protein Binding | Approx. 160 µg/cm² (depending on pore size) |
| Maximum Operating Temperature | 356°F (180°C) |

Performance

| Pore Size (µm) | Flow Time (s) | Volume/Vacuum (mL/ in Hg) | Flow Rate (mL/min/cm² @ 10psi) | Bubble Point (psi) |
|----------------|---------------|---------------------------|--------------------------------|--------------------|
| 0.1 | 198-263 | 250/20 | 6.05-8.03 | 80-110 |
| 0.22 | 60-136 | 250/20 | 11.70-26.51 | 52-65 |
| 0.45 | 23-46 | 250/20 | 34.58-69.16 | 30-42 |
| 0.65 | 13-35 | 250/20 | 45.45-122.36 | 25-42 |
| 0.8 | 5-18 | 250/20 | 88.37-318.13 | 11-19 |
| 1.2 | 30-80 | 500/5 | 159-424 | 9-18 |
| 5.0 | 13-36 | 500/5 | 353-979 | 6-15 |
| 8.0 | 3-25 | 500/5 | 509-4242 | 4-11 |

Disc and Sheet Membranes

Mixed Cellulose Esters membrane - Sterile, white and black
Ordering information

| | Individually Packaged Without Pad Gridded | | | | |
|------------|---|--------------|--------------|---------------|---------------|
| | Dimensions Packaging | 47 mm 100/pk | 47 mm 100/pk | 47 mm 1000/pk | 50 mm 1000/pk |
| | Color | white | black | white | black |
| Pore sizes | 0.22 µm | 1216720 | | 1214396 | |
| | 0.45 µm | 1216721 | 1216719 | 1214923 | 1213643 |
| | 0.7 µm | | 1216718 | 1221948 | |

Cellulose Mixed Esters - Non sterile, white and black

| | Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 25 mm Gridded 100/pk | 25 mm 100/pk | 25 mm Gridded 100/pk |
|------------|----------------------|--------------|--------------|----------------------|--------------|----------------------|
| | Color | white | white | white | black | black |
| Pore sizes | 0.1 µm | | 1214527 | | | |
| | 0.22 µm | 1214882 | 1214898 | | | |
| | 0.45 µm | 1215257 | 1215263 | | | |
| | 0.65 µm | | 1215376 | | | |
| | 0.8 µm | 1215424 | 1215425 | 1215419 | 1215415 | 1215411 |
| | 1.2 µm | 1215438 | 1215440 | 1215435 | | |
| | 5.0 µm | 1215448 | 1215450 | | | |
| | 8.0 µm | | 1215455 | | | |

| | Dimensions Packaging | 47 mm 100/pk | 47 mm Gridded 100/pk | 47 mm 100/pk | 47 mm Gridded 100/pk | 90 mm 25/pk |
|------------|----------------------|--------------|----------------------|--------------|----------------------|-------------|
| | Color | white | white | black | black | white |
| Pore sizes | 0.1 µm | 1214533 | | | | |
| | 0.22 µm | 1214909 | 1214839 | | | 1214941 |
| | 0.45 µm | 1215281 | 1215207 | | 1214977 | 1215305 |
| | 0.65 µm | 1215380 | | | | |
| | 0.8 µm | 1215428 | 1215421 | 1215416 | 1215412 | 1215431 |
| | 1.2 µm | 1215441 | 1215437 | | | 1215442 |
| | 5.0 µm | 1215451 | | | | 1215452 |
| | 8.0 µm | 1215456 | | | 3053377 | 1215027 |

| | Dimensions Packaging | 142 mm 25/pk | 293 mm 25/pk | 20x20 cm 5/pk | 20x20 cm 5/pk |
|------------|----------------------|--------------|--------------|---------------|---------------|
| | Color | white | white | white | black |
| Pore sizes | 0.1 µm | 1214554 | 1214565 | | |
| | 0.22 µm | 1214950 | 1214959 | 1215464 | |
| | 0.45 µm | 1215316 | 1215323 | 1225781 | 3053082 |
| | 0.65 µm | | | | |
| | 0.8 µm | 1215432 | 1215433 | 3050851 | |
| | 5.0 µm | 1215453 | | | |
| | 8.0 µm | 1221955 | | | |

Disc and Sheet Membranes

Speed Pack Sterile MCE Membrane Perforated Ribbons

SPEED PACK



GVS Speed Pack folded ribbons provide the user with the same quality and reliability as the GVS individually packed MCE membranes. The folded ribbons provide hands-free convenience, reduce laboratory time and boost lab efficiency. Speed Pack have ribbons designed for use with most popular membrane dispensers.

Packaged in 150 count ribbons are available to order in pack size of 150 or 600 (4 x 150). Select either gridded white or black sterilized membranes in a continuous folded ribbon for easy dispensing and convenience.

GVS MCE sterile filtration membranes are ideally used for the microbiological culturing and examination of water, beverages, beer, wine, juices, waste water, pharmaceuticals, food and other critical applications. It boosts a rapid flow rate and high throughput for consistent and uniform results.

- Available in 0.2 µm, 0.45 µm and 0.8 µm pore sizes
- Available in White or Black membranes with gridded surfaces
- Pre-sterilized (gamma irradiation) and ready to use product
- Comes in box of 150 count
- Sold in packs of 150 or or 600 (4 x 150), 47 mm. For 50 mm size please contact GVS sales team

Speed Pack Ribbons of Membranes

Mixed Cellulose Esters (MCE) membrane, Sterile Ordering information

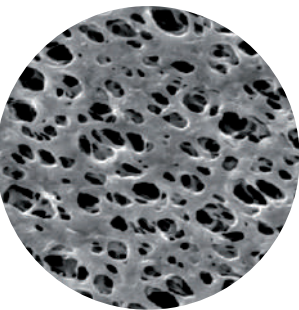
| Dimensions Packaging | 47 mm 150/pk | 47 mm 150/pk | 47 mm 600/pk | 47 mm 600/pk |
|----------------------|--------------|--------------|---------------|---------------|
| Color | white | black | white | black |
| 0.2 µm | SPNCW02BG47S | on demand | SPNCW02BG47S6 | on demand |
| 0.45 µm | SPNCW04BG47S | SPNCB04WG47S | SPNCW04BG47S6 | SPNCB04WG47S6 |
| 0.8 µm | SPNCW08BG47S | SPNCB08WG47S | SPNCW08BG47S6 | SPNCB08WG47S6 |

- Compatible with various dispensers (Microsart E-Motion, EZ-Pak, EZ-Pak Curve, Whatman Membrane-Butler)
- Individually sealed filters are printed with the membrane specification and lot number on the clear cover of each sealed filter
- Membranes are numbered from 1 to 150 to maintain control of the ribbon progressive usage

White MCE membranes with Black Grids are widely used for general purpose examination and enumeration of microorganisms. Commonly used for water, waste-water, pharmaceutical, medical, food and beverage analysis. The contrasting grid lines facilitate counting of colonies.

Black MCE with White Grids provide color contrast between the filter and white or beige microorganisms without the need for counter-stain. Commonly used for bottled water, carbonated beverages, beer and wine analysis. The contrasting grid lines facilitate counting of colonies.

Nylon 66 (NY) Membrane



Description and Use

GVS Nylon Filtration Membrane is a supported, naturally hydrophilic membrane designed to wet out evenly and retain its superior strength during use in general filtration or medical assays.

Versatile Capabilities, Consistent Performance

GVS Nylon Filtration Membrane is internally supported with an inert polyester support web giving it added dimensional strength and stability that prevents cracking, tearing, curling and breaking. This added strength and durability is advantageous during usage that involves aggressive handling or automated equipment. A naturally hydrophilic membrane, GVS Nylon Filtration

Membrane does not require wetting agents that can interfere with biological processes.

Features & Benefits

- Hydrophilic: Eliminates the need for wetting agents that can potentially interfere with biological processes
- Super strength: Eases handling when used with automated equipment
- Low extractables: Ensures tests will be clean and pure leading to more consistent results
- Lot-to-lot consistency: Quality checks ensure lot-to-lot consistency, both down and across the polyester web, for dependable results every time

Typical Applications

- Sterilization and clarification of aqueous and organic solvent solutions
- HPLC sample preparation

Product Characteristics

| | |
|-------------------------------|---|
| Sterilization | Steam, Gamma Irradiation or Ethylene Oxide (EtO) |
| USP Class VI toxicity | Passed |
| Thickness | 65 - 125 µm |
| Maximum Operating Temperature | 356°F (180°C) |
| Sealing Compatibility | Ultrasonics, Heat, Radio Frequency and Insert Molding |
| Pore Size Range | 0.1 to 5 µm |

Performance

| Pore Size (µm) | Flow Time (s) | Volume/Vacuum (mL/ in Hg) | Flow Rate (mL/min/cm² @ 10 psi) | Bubble Point (psi) |
|----------------|---------------|---------------------------|---------------------------------|--------------------|
| 0.1 | 300-553 | 250/20 | 2.88-5.30 | 70-100 |
| 0.2 | 113-255 | 250/20 | 6.24-14.08 | 50-72 |
| 0.4 | 44-84 | 250/20 | 18.94-36.15 | 30-45 |
| 0.6 | 18-48 | 250/20 | 33.14-88.37 | 18-32 |
| 0.8 | 13-37 | 250/20 | 42.99-122.36 | 13-28 |
| 1.2 | 40-248 | 500/5 | 51-318 | 11-22 |
| 3.0 | 33-100 | 500/5 | 127-386 | 8-16 |
| 5.0 | 28-57 | 500/5 | 223-454 | 6-13 |

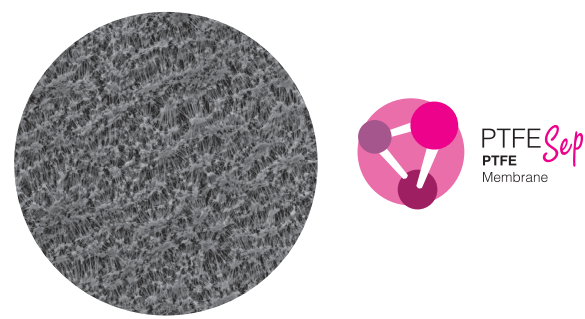
Nylon 66 (NY) Membrane, white
Ordering information

| Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 37 mm 100/pk | 47 mm 100/pk | 47 mm Gridded 100/pk |
|----------------------|--------------|--------------|--------------|--------------|----------------------|
| Pore sizes | 0.1 µm | 1213760 | 1213761 | 1213762 | |
| | 0.22 µm | 1213766 | 1213768 | 1213769 | |
| | 0.45 µm | 1213774 | 1213775 | 1213776 | 1213825 |
| | | | | 1220671* | 1213845 |
| | 0.65 µm | | 1213782 | 1213783 | |
| | 0.8 µm | 1213788 | 1213789 | 1214881 | 3013826 |
| | 1.2 µm | 1213794 | 1213796 | 1230356 | 1214880 |
| | 5.0 µm | 1213810 | 1213811 | 1213812 | 3048260 |

| Dimensions Packaging | 90 mm 25/pk | 142 mm 25/pk | 293 mm 25/pk | 200x200 mm 5/pk | 30 cm x3 m 1/pk |
|----------------------|-------------|--------------|--------------|-----------------|-----------------|
| Pore sizes | 0.1 µm | 1213763 | 1213764 | 1213765 | 1222859 |
| | 0.22 µm | 1213770 | 1213771 | 1213772 | 1222858 |
| | 0.45 µm | 1213778 | 1213779 | 1213780 | 1222857 |
| | 0.65 µm | 1213784 | 1213786 | | 1222856 |
| | 0.8 µm | 1213791 | 1213792 | 1213793 | 1222855 |
| | 1.2 µm | 1213798 | 1213799 | 1213800 | 1222854 |
| | 5.0 µm | 1213813 | 1213815 | 1213816 | 1222851 |
| | | | | | |

*sterile

Polytetrafluoroethylene (PTFE) Membrane



GVS Laminated PTFE filters are made of a polytetrafluoroethylene polymer (PTFE) laminated to a polypropylene support for improved durability and easy handling. These filters are chemically compatible with strong acids and most aggressive solvents such as alcohols.

PTFE (fine powder resin) is expanded into a 3-dimensional web-like structure called PTFE which creates billions of microscopic pores. This structure utilizes the inherent hydrophobic (water-resistant) and non-stick nature of PTFE to allow removal of particulate captured on the

membrane surface. This allows air to pass easily through the membrane while collecting particulate as small as 0.1 micron on its surface. PTFE membranes provide device manufacturers with a consistent, temperature and chemical compatible barrier to microbes and particulate matter. The optimal combination of air flow and water entry pressure adds value to most device designs. Inherently hydrophobic, PTFE membranes will not absorb moisture from air or gases, making it ideal for venting applications, phase separations and aerosol samplings. Laminated PTFE filters can be used to filter aqueous solutions when prewetted with methanol. They are autoclavable up to 130°C (260°F).

Features & Benefits

- Naturally hydrophobic
- Compatible with strong acids and aggressive solutions
- Improved durability and handling
- Autoclavable

Typical Applications

- Filtration of strong acids and aggressive solutions
- Venting applications
- Phase separations
- Aerosol samplings

Performance

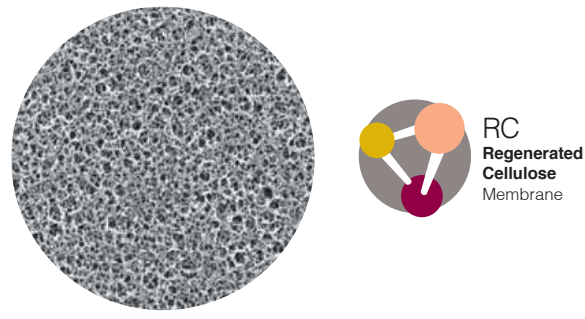
| Pore Size (µm) | Bubble Point (EtOH) (kPa) | Flow Time (MeOH) (sec) | Thickness (µm) |
|----------------|---------------------------|------------------------|----------------|
| 0.22 | 107.9 -152.0 | 80 -140 | 100 -180 |
| 0.45 | 63.7-103.0 | 40 - 75 | 100 -180 |

Ordering information

| Dimensions Packaging | 6.5mm 100/pk | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk |
|-------------------------|-----------------|-----------------|-----------------|-----------------|
| 0.22 µm | | 1215485 | 1215486 | 1215487 |
| 0.45 µm | 1238210 | 1215491 | 1215492 | 1215493 |
| 1.0 µm | | | 1215503 | 1215504 |

| Dimensions Packaging | 90 mm 25/pk | 142 mm 25/pk | 200x200 mm 5/pk | 305x305 mm 50/pk |
|-------------------------|----------------|-----------------|--------------------|---------------------|
| 0.22 µm | 1215488 | 1215489 | 3026028 | 1267681 |
| 0.45 µm | 1215494 | 1215495 | 1237423 | 3034300 |
| 1.0 µm | 1215505 | 1215506 | | 1235299 |

Regenerated Cellulose (RC) Membrane



GVS Regenerated Cellulose membrane is a hydrophilic high strength media. Regenerated Cellulose filters have a broad solvent compatibility, and they contribute very low extractable material in a wide variety of sample solvents. Thus, they are appropriate for sample preparation in many applications and as a standalone or syringe filter membrane. This membrane media can be sterilized by all common methods keeping a mechanical stability. The superior strength assures an high chemical resistance for

usage with a wide range of aqueous and organic media.

Features & Benefits

- Hydrophilic
- Excellent chemical compatibility and resistance to organic solvents
- Low non-specific adsorption
- Superior thermal resistance
- High mechanical strength
- Maximum Operating Temperature 134°C

Typical Applications

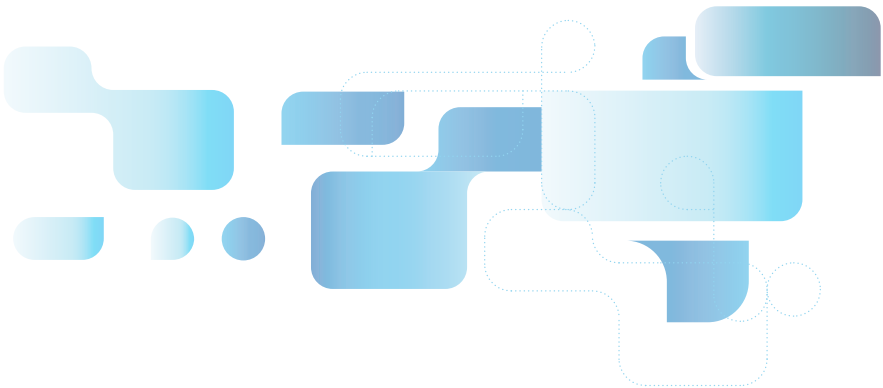
- Filtration of Aqueous and Organic Solutions
- Particle removal from organic solvents or mixtures of aqueous and non-aqueous samples
- Ultra-cleaning and de-gassing solvents and mobile phases for HPLC
- Clarification
- Protein Chemistry

Performance

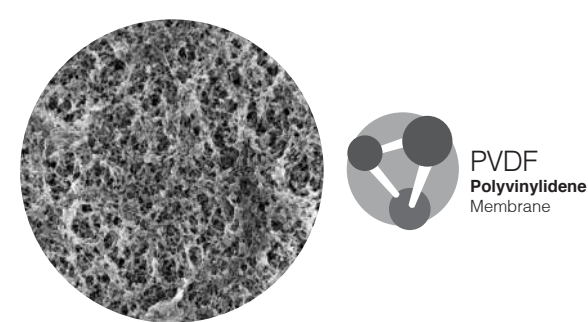
| Pore Size (µm) | Typical Flow Rate (mL/min/cm² @ 10 psi) | Typical Bubble Point (psi) | Typical Thickness (µm) |
|----------------|---|----------------------------|------------------------|
| 0.22 | 10.3 | 63.8 | ≥ 145 |
| 0.45 | 20.6 | 42.1 | ≥ 145 |

Ordering information

| Dimensions | 25 mm | 47 mm |
|------------|---------|---------|
| Packaging | 100/pk | 100/pk |
| 0.22 µm | 3099756 | 3099758 |
| 0.45 µm | 3099757 | 3099755 |



Polyvinylidene Fluoride (PVDF) Hydrophilic Membrane



GVS Hydrophilic Polyvinylidene Difluoride (Hydrophilic PVDF) Filtration Membrane is a supported, hydrophilic membrane that exhibits broad chemical compatibility and low protein binding. Composed of PVDF internally supported by an inert polyester web, the resulting membrane has dimensional stability. This provides higher throughputs than competitor offerings and reduces the amount of filter changes needed during filtration. It is ideal for use in filtration applications of biological solutions. This hydrophilic membrane has a great thermal stability with maximum operating temperature of 175°F and it is autoclavable.

Features & Benefits

- Superior strength to withstand aggressive handling or use with automated equipment without breaking or tearing
- Low protein binding minimizes retention of proteins in solution
- Low extractables ensure tests will be clean with consistent results
- Lot-to-lot consistency ensures consistent flow and diffusion rates for dependable results every time

Typical Applications

- Sterilizing clarification of biological solutions.
- Preparation of protein-containing solutions prior to chromatography or other instrumental analyses.
- Useful for a wide range of applications, including aggressive and non-aggressive solvent-based mobile phase.
- Offers excellent chemical compatibility, even with aggressive acids and alcohols.
- Provides high flow rates and throughput, low extractables and broad chemical compatibility.
- Better protection of your analytical results.

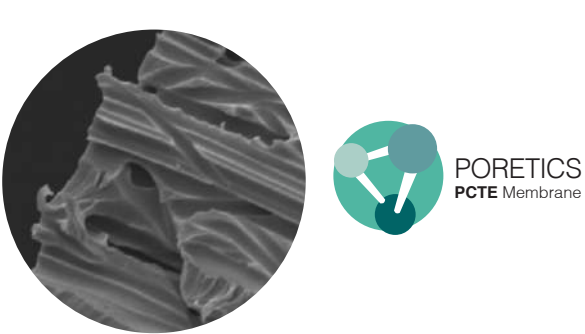
Performance

| Pore Size (µm) | Typical Flow Rate (mL/min/cm² @ 10 psi) | Typical Bubble Point (psi) | Typical Thickness (µm) |
|----------------|---|----------------------------|------------------------|
| 0.22 | 7 | 36 | 170 |
| 0.45 | 29 | 22 | 170 |

Ordering information

| Pore sizes | Dimensions | 25 mm | 47 mm | 90mm |
|------------|------------|---------|---------|---------|
| | Packaging | 100/pk | 100/pk | 25pk |
| | 0.22 µm | 3044272 | 3044270 | 3044271 |
| | 0.45 µm | 3037802 | 3037800 | 3037801 |

Polycarbonate Track Etched (PCTE) Membrane



GVS Polycarbonate Track Etched (PCTE) Membrane is made from a thin polycarbonate film with precisely defined pores. It is ideally suited for use in cellular-based filtration assays as well as filtration applications where high purity is required. The membrane is produced through a two-step, proprietary manufacturing process that employs high quality standards. In the first step, polycarbonate film is exposed to ion particles that pass through it. As the ions pass through the film, they create “tracks” where the polymer is damaged. The beamed film is then exposed to a chemical that etches out the tracks creating precise, cylindrical pores. Pore density is controlled by the number of tracks per unit area, and pore size is controlled by varying the temperature, strength and time of exposure to the etching solution. This unique process allows for increased control over pore size and density to ensure the physical properties of each membrane precisely fit your specifications. The resulting membrane is a thin, translucent polycarbonate film with a smooth, flat surface. All particles larger than the pore size are captured on its surface. GVS offers a unique solution for Legionella analysis following the new standard UNI EN ISO 11731. Our sterile gridded membranes are suitable for this test and give you the best performances.

Nominal Product Characteristics

| | |
|---|---------------------------------|
| Thickness | 5 - 20 µm |
| Refractive Indices | Birefringent at 1.584 and 1.625 |
| Water Adsorption (% wt. gain 24-hr immersion) | 0.24% |
| Residual Ash Weight Average | 0.92 µg/cm² |
| Specific Gravity | 0.94-0.97 |
| Autoclavable | Yes |
| Leachables | Negligible |
| Wetting Characteristics | Hydrophilic or Hydrophobic |
| Wetting Agent (hydrophilic) | Polyvinylpyrrolidone (PVP) |
| Burst Strength Minimum | 0.7 bar (10 psi) |
| Migration of Filter Media | 0 |
| Optical Properties | Semi-translucent |

GVS offers the PCTE Membrane for AOX use (adsorbable organic halogens) with exceptionally low protein-binding/extractable levels and precisely defined pores. These AOX -certified polycarbonate (PCTE) membranes are ideally suited for the detection of man-made pollution in groundwater and wastewater (organic halide adsorption determination).

To optimize the suitability of PCTE, we offer a variety of products with unique characteristics:

- PVP (polyvinylpyrillidone)-treated for a hydrophilic membrane
- AOX-certified for applications requiring extremely low extractables
- Black-dyed membrane for staining applications
- PVP-free for a hydrophobic membrane

Characteristics

- Absolute pore size and density allows for precise size separation
- Direct thickness and pore size measurements provide accurate characteristics
- Smooth, thin, glass-like surface is suitable for microscopy and cellular applications
- Superior strength allows for aggressive handling
- Low protein binding ensures clean results
- Resists chemical staining to ease microscopic visualization
- Passes USP VI Class toxicity testing for use

Typical Applications

- General filtration
- Legionella test (UNI EN ISO 11731_2017)
- Removal of red blood cells from plasma
- Flow control of reagents through assays
- Precise filtration and prefiltration
- Fuel testing
- Cytology
- Microscopy

Product Characteristics

| | |
|-------------------------------|--|
| Sterilization | Gamma Irradiation or Ethylene Oxide (EtO) |
| USP Class VI Testing | Passed |
| Extractables | Very Low |
| BSA Protein Binding | 5 µg/cm² |
| Maximum Operating Temperature | 284°F (140°C) |
| Sealing Compatibility | Ultrasonic, Heat, Radio Frequency and Insert Molding |
| Pore Size Range | 0.05 to 20 µm |

Disc and Sheet Membranes

Performance Characteristics

| Pore Size (a) (µm) | Pore Density (b) (pores/cm²) | Nominal Thickness (c) (µm) | Min. Bubble Point (d) (psi) | Typical Flow Rates | |
|-----------------------|---------------------------------|----------------------------------|-----------------------------------|---------------------------|--------------------|
| | | | | Water (e) (mL/min/cm²) | Air (L/min/cm²) |
| 20 | 4 x 10⁴ | 3 | 1 | 1000 | 11 (g) |
| 14 | 5 x 10⁴ | 6 | 0.2 | 1400 | 63.5 (g) |
| 12 | 1 x 10⁵ | 8 | 0.4 | 1250 | 63.5 (g) |
| 10 | 1 x 10⁵ | 10 | 0.5 | 1150 | 34.5 (g) |
| 8 | 1 x 10⁵ | 7 | 0.7 | 1000 | 30 (g) |
| 5 | 4 x 10⁵ | 10 | 1.2 | 700 | 30 (g) |
| 3 | 2 x 10⁶ | 9 | 2 | 440 | 37.5 (f) |
| 2 | 2 x 10⁶ | 10 | 3 | 300 | 16.5 (f) |
| 1 | 2 x 10⁷ | 11 | 6 | 130 | 20 (f) |
| 0.8 | 3 x 10⁷ | 9 | 7 | 90 | 18 (f) |
| 0.6 | 3 x 10⁷ | 9 | 9 | 60 | 7.5 (f) |
| 0.4 | 1 x 10⁸ | 10 | 12 | 33 | 7.5 (f) |
| 0.2 | 3 x 10⁸ | 10 | 20 | 10 | 3 (f) |
| 0.1 | 4 x 10⁸ | 6 | 30 | 2.5 | 1.5 (f) |
| 0.08 | 4 x 10⁸ | 6 | 38 | 0.6 | 0.75 (f) |
| 0.05 | 6 x 10⁸ | 6 | 50 | 0.4 | 0.37 (f) |
| 0.03 | 6 x 10⁸ | 6 | NA | 0.2 | 0.075 (f) |
| 0.01 | 6 x 10⁸ | 6 | NA | 0.1 | 0.0075 (f) |

(a) Tolerance + 0%, -20%
(b) Tolerance + / - 15%
(c) Tolerance + / - 10%
(d) Measured using Isopropanol (IPA)
(e) Initial flow rates using prefiltered water at 10 psid (0.7 kg/cm²)
(f) Initial flow rates using prefiltered air at 10 psid (0.7 kg/cm²)
(g) Initial flow rates using prefiltered air at 5 psi (0.35 kg/cm²)

PCTE Hydrophilic Membrane - Sheets and Rolls
Ordering information

| Dimensions Packaging | 19x42 mm 100/pk | 25x80 mm 50/pk | 203x254 mm 30/pk | 300x3000 mm 1/pk |
|-------------------------|--------------------|-------------------|---------------------|---------------------|
| 0.01 µm | | | 1215116 | 1225184 |
| 0.03 µm | | | 1227264 | 1239558 |
| 0.05 µm | | | 1215271 | 3027177 |
| 0.1 µm | | | 1215117 | 1239556 |
| 0.2 µm | | | 1215118 | 1239557 |
| 0.4 µm | | | 1215274 | |
| 0.6 µm | | | 1222027 | |
| 0.8 µm | | | 1222030 | 3035602 |
| 1 µm | | 1268126 | 1221429 | 1267667 |
| 2 µm | | | 1221232 | |
| 3 µm | | | 1215275 | 3002536 |
| 5 µm | 1221295 | | 1222080 | 1264835 |
| 8 µm | 1220867 | 1220686 | 1222085 | 3033093 |
| 10 µm | | | 1220823 | 3033092 |
| 12 µm | | | | 1235494 |
| 20 µm | | | 1221231 | |

PCTE PVP-Free Hydrophobic Membrane
Ordering information

| Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk | 90 mm 30/pk | 203x254 mm 30/pk | 25x80 mm 50/pk |
|-------------------------|-----------------|-----------------|-----------------|----------------|---------------------|-------------------|
| 0.01 µm | | | 1226494 | | | |
| 0.1 µm | 1221504 | 1215059 | | | 1232919 | |
| 0.2 µm | | 1222017 | 1222018 | | 1223036 | |
| 0.4 µm | | 1220835 | 1215073 | | 1233373 | |
| 0.8 µm | | 1222032 | | | | |
| 1.0 µm | | 1222037 | 1222038 | | 1224067 | |
| 3.0 µm | 1215050 | 1221871 | 1222077 | | 1228132 | 1221296 |
| 5.0 µm | 1215051 | 1221746 | 1222081 | 1222082 | 1225120 | 1221331 |
| 8.0 µm | 1215052 | 1221293 | 1215148 | 1222086 | 1225783 | 1215042 |
| 10.0 µm | 1215053 | 1222089 | 1220941 | | 1234298 | 1215043 |
| 12.0 µm | 1215055 | 1221300 | | | | 1215044 |
| 14.0 µm | 1221297 | | | | | |

PCTE AOX Hydrophilic Membrane
Ordering information

| Dimensions Packaging | 25 mm 100/pk | 47 mm 100/pk |
|-------------------------|-----------------|-----------------|
| 0.4 µm | 3026431 | 1215071 |

PCTE Hydrophilic Black Membrane
Ordering information

| Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk | 293 mm 20/pk | 203x254 mm 30/pk |
|-------------------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 0.1 µm | 1215311 | 1215315 | 1221503 | | 3048982 |
| 0.2 µm | 1215185 | 1215609 | 1213889 | 3027176 | |
| 0.4 µm | 1215142 | 1212790 | 1214567 | | 1227213 |
| 0.6 µm | 1222025 | 1215290 | 1215198 | | 3054144** |
| 0.8 µm | 1215236 | 1215138 | 1222028 | | |
| 1 µm | 1221181 | 1215161 | 1222035 | | |
| 2 µm | | 1215297 | | 3033301 | |
| 3 µm | | 1222452 | 3032159 | 3033302 | |
| 5 µm | 1221286 | 1215188 | 1221230 | | |
| 8 µm | | 1229540 | | | |

** 100/pack

Disc and Sheet Membranes

Disc and Sheet Membranes

PCTE Hydrophilic Membrane - Disks
Ordering information

| Dimensions Packaging | 13 mm 100/pk | 19 mm 100/pk | 25 mm 100/pk | 37 mm 100/pk | 47 mm 100/pk |
|-------------------------|-----------------|-----------------|-----------------|-----------------|---------------------|
| 0.01 µm | 1215046 | | 1215321 | | 1215068 |
| 0.03 µm | 1215047 | 1227353 | 1215057 | | 1215069 |
| 0.05 µm | 1215048 | 1221229 | 1220868 | | 1215070 |
| 0.08 µm | 1222092 | 1220668 | 1215058 | | 1222093 |
| 0.1 µm | 1215605 | 1215056 | 1215606 | | 1215608 |
| 0.2 µm | 1215610 | 1220694 | 1215611 | | 1215612 1226157* |
| 0.4 µm | 1215613 | 1215147 | 1215614 | 1215615 | 1226156* 1215617 |
| 0.6 µm | 1215618 | | 1215619 | | 1215620 |
| 0.8 µm | 1215621 | 1224516 | 1215622 | 1215623 | 1215624 |
| 1 µm | 1215625 | 1227203 | 1215627 | 1221302 | 1215628 |
| 2 µm | 1215985 | | 1215062 | | 1215629 |
| 3 µm | 1215049 | | 1215063 | | 1215036 |
| 5 µm | 1215630 | | 1215631 | | 1215632 |
| 8 µm | 1215633 | 3013894 | 1215634 | | 1215637 |
| 10 µm | 1221009 | | 1215638 | | 1212661 |
| 12 µm | 1215054 | | 1215984 | | 3027598 |
| 14 µm | 1222063 | | 1222064 | | 1215077 |
| 20 µm | 1222072 | | 1222073 | | 1215078 |

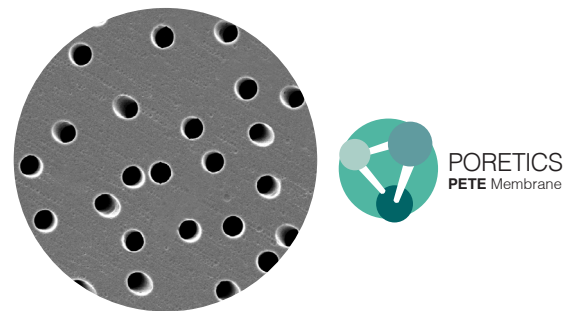
* white, sterile and single packed for Legionella test

PCTE Hydrophilic Membrane - Disks
Ordering information

| Dimensions Packaging | 62 mm 100/pk | 76 mm 30/pk | 76 mm 100/pk | 90 mm 30/pk | 142 mm 20/pk | 293 mm 20/pk |
|-------------------------|-----------------|----------------|-----------------|----------------|-----------------|-----------------|
| 0.05 µm | | | 1221291 | 1221227 | 1221290 | 1222091 |
| 0.08 µm | | | | 1222094 | 1222095 | 1222096 |
| 0.1 µm | | | 1220970 | 1215150 | 1215304 | 1215219 |
| 0.2 µm | | | 1220891 | 1215151 | 1215215 | 1215385 |
| 0.4 µm | 3023783 | | 1228342 | 1215303 | 1215152 | 1215317 |
| 0.6 µm | | 1224680 | | 1222026 | 1221485 | 1220861 |
| 0.8 µm | | 1225894 | | 1215194 | 1215309 | 1221720 |
| 1 µm | | | 1220860 | 1215153 | 1216611 | 1215145 |
| 2 µm | | | | 1222070 | 1222071 | 1221005 |
| 3 µm | | | 3013824 | 1222074 | 1215113 | 1222075 |
| 5 µm | | | 3013825 | 1221004 | 1215388 | |
| 8 µm | | | 3034848 | 1215403 | 1215201 | 1222084 |
| 10 µm | | | 1267014 | 1222482 | 1221292 | 1222088 |
| 12 µm | | | | 1239192 | | |
| 14 µm | | | | 1222479 | | |

Disc and Sheet Membranes

Polyester Track Etched (PETE) Membrane



GVS PETE Membrane is made from a thin polyester film with a high density of solvent resistance. It is ideal for use in blood assays or general filtration where chemically aggressive solvents may be used. The membrane is produced through a two-step proprietary manufacturing process similar to that of the PCTE membrane. In the first step, polyester film is exposed to ion particles that pass through the film. As the ions pass through the film, they create “tracks” where the polymer is damaged. The beamed film is then exposed to a chemical solution which etches out the tracks creating precise, cylindrical pores. Pore density is controlled by the number of tracks per unit area, and pore size is controlled by varying the temperature, strength and time of exposure to the etching solution. This unique process allows for increased control over pore size and density to ensure the physical properties of each membrane precisely fit

your specifications. The resulting membrane is a thin, translucent polyester film with a smooth, flat surface containing pores of controlled diameter and number. The membrane has better solvent resistance than polycarbonate and captures all particles larger than the precisely controlled pore size on its surface.

Characteristics

- Broad range of chemical compatibility for a wide range of applications
- Direct thickness and pore size measurements ensure accurate characteristics
- Naturally hydrophilic so pre-treatments and wetting agents are not required
- Smooth, thin, glass-like surface for microscopic visualization
- Low protein binding ensures clean results

Typical Applications

- General filtration
- Removal of red blood cells from plasma
- Flow control of reagents through assays
- Precise filtration and prefiltration
- Air analysis
- Filtration of aggressive solutions
- Cellular assays and diagnostics
- Trace element analysis

Product Characteristics

| | |
|-------------------------------|--|
| Sterilization | Gamma Irradiation or Ethylene Oxide (EtO) |
| USP Class VI Testing | Passed |
| Thickness | 10 - 20 µm |
| Extractables | Low |
| BSA Protein Binding | < 5 µg/cm² |
| Maximum Operating Temperature | 284°F (140°C) |
| Sealing Compatibility | Ultrasonic, Heat, Radio Frequency and Insert Molding |
| Pore Size Range | 0.2 to 10 µm |

Nominal Product Characteristics

| | |
|---|-----------------------|
| Water Adsorption (% wt. gain 24-hr immersion) | 0.24% |
| Residual Ash Weight Average | 0.92 µg/cm² |
| Specific Gravity | 0.94-0.97 |
| Autoclavable | Yes |
| Leachables | Negligible |
| Wetting Characteristics | Naturally Hydrophilic |
| Burst Strength Minimum | 0.7 bar (10 psi) |
| Migration of Filter Media | 0 |
| Optical Properties | Semi-translucent |

Performance Characteristics

| Pore Size (a) (µm) | Pore Density (b) (pores/cm²) | Nominal Thickness (c) (µm) | Min. Bubble Point (d) (psi) | Typical Flow Rates | |
|-----------------------|---------------------------------|-------------------------------|--------------------------------|---------------------------|--------------------|
| | | | | Water (e) (mL/min/cm²) | Air (L/min/cm²) |
| 10 | 1 x 10 ⁵ | 9 | 0.5 | 1150 | 34.5 (g) |
| 8 | 1 x 10 ⁵ | 7 | 0.7 | 1000 | 30 (g) |
| 5 | 4 x 10 ⁵ | 10 | 1.2 | 700 | 30 (g) |
| 3 | 2 x 10 ⁶ | 9 | 2 | 440 | 37.5 (g) |
| 2 | 2 x 10 ⁶ | 10 | 3 | 300 | 16.5 (f) |
| 1 | 2 x 10 ⁷ | 11 | 6 | 130 | 20 (f) |
| 0.8 | 3 x 10 ⁷ | 9 | 7 | 90 | 18 (f) |
| 0.6 | 3 x 10 ⁷ | 9 | 9 | 60 | 7.5 (f) |
| 0.4 | 1 x 10 ⁸ | 10 | 12 | 33 | 7.5 (f) |
| 0.2 | 3 x 10 ⁸ | 10 | 20 | 10 | 3 (f) |

- (a) Tolerance + 0%, -20%
- (b) Tolerance + / - 15%
- (c) Tolerance + / - 10%
- (d) Measured using Isopropanol (IPA)
- (e) Initial flow rates using prefiltered water at 10 psid (0.7 kg/cm²)
- (f) Initial flow rates using prefiltered air at 10 psid (0.7 kg/cm²)
- (g) Initial flow rates using prefiltered air at 5 psi (0.35 kg/cm²)

PETE Membrane - Disks and Sheets
Ordering information

| Dimensions Packaging | 13 mm 100/pk | 25 mm 100/pk | 47 mm 100/pk | 90 mm 30/pk | 142 mm* 20/pk | 293 mm 20/pk | 203x254 mm 30/pk |
|-------------------------|-----------------|-----------------|-----------------|----------------|------------------|-----------------|---------------------|
| Pore sizes | 0.2 µm | 1220969 | 1221383 | 1215288 | 1222240 | 1221385 | 1220886 |
| | 0.4 µm | 1221387 | 1221388 | 1215373 | 1220702 | 1221389 | 1222242 |
| | 0.8 µm | | 1221398 | 1215374 | 1221399 | | 1222246 |
| | 1.0 µm | 1215379 | 1215308 | 1220871 | 1221402 | 1222248 | 1221334 |
| | 2.0 µm | | 1221404 | 1221405 | | | 1222251 |
| | 3.0 µm | 1221409 | 1221410 | 1215367 | 1222253 | 1221411 | 1221412 |
| | 5.0 µm | 1215324 | 1221413 | 1215183 | 1221414 | 1221415 | 1222256 |
| | 8.0 µm | | 1221418 | 1221419 | 1221420 | | 1222258 |
| | 10.0 µm | | 1220827 | 1215173 | 1221424 | 1221426 | 1222260 |
| | | | | | | | |

*Bulk packaging available

Drain Disc



The polyester spun-bonded “drain” type disc prevents “pore blinding” or blockage of the capillary pores in screen membranes resulting in higher flow rates and increased throughputs. The drain disc increases flow and capture ability by lifting off of screen supports and exposing all the pores. This ensures efficient performance when placed between two filters in a serial filtration stack. The spacers prevent air locking of the downstream screen, or function as filters by binding a percentage of pores in the upstream filter. The spacer may be sized to fit within the diameter of the O-ring in the filter holder. For example , use a 42 mm spacer under a 47 mm filter.

Characteristics

- Frequently used with PCTE (Polycarbonate) and PETE (Polyester) membranes to increase flow
- Spacer between stacked membranes

Ordering information

| Product Code | Quantity | Description |
|--------------|----------|--------------------|
| 1215218 | 100/pk | Drain Disc, 13 mm |
| 1215141 | 100/pk | Drain Disc, 25 mm |
| 1215500 | 100/pk | Drain Disc, 42 mm |
| 1215163 | 100/pk | Drain Disc, 47 mm |
| 1221182 | 25/pk | Drain Disc, 90 mm |
| 1215522 | 25/pk | Drain Disc, 124 mm |
| 3033452 | 25/pk | Drain Disc, 142 mm |
| 3007164 | 25/pk | Drain Disc, 293 mm |

Quantitative filter paper

1. Ashless filter paper for quantitative analysis



These GVS filter papers are used for quantitative analysis and designed for preparation of samples and gravimetric analysis. They are made of refined pulp and linters with virtually 100% of alpha-cellulose content. These filter papers are guaranteed free of possible residual acids used in some production methods.

Extremely low percentage of ash content (maximum ash content of <0.007%).

DSL45 GRADE – Very fast filtration

Filter paper of very high rate of filtration, wide-pored, soft, spongy structure, extremely low-ash content.

Food industry applications: determination of ash contents and PCB determination in foodstuffs.

Beverage industry applications: processing (ashing) fruit juice samples for photometric determinations (e.g. phosphate).

Environmental analysis: Determination of filterable substances and the residue on ignition (dry weight) for the examination of water, wastewater and sludge (DIN 38 409 part 2).

DFA41 GRADE – Fast filtration

Fast ashless filter paper in the GVS quantitative range together with DSL45.

It is particularly suitable for analytical procedures and tests involving large particles or gelatinous precipitates (e.g. metal hydroxides and sulphides).

It is also used in metal (Pb) tests in water testing analysis, quantitative air pollution analysis, food industry, paper industry, etc.

DME43 GRADE - Medium filtration

Ashless filter paper with medium filtration speed and good retention (between Grade DMS40 and Grade DFA41) of medium and thick particles.

Suitable for gravimetric measurements of gypsum/lime suspensions in power plants.

DME43 Grade is particularly applied in metallurgical industry laboratories for metal tests. Typical applications include foodstuffs analysis, soil analysis, particle collection in air pollution monitoring, COD and TOC determination, inorganic analysis in the construction, mining and steel industries. They are also used for Blaine test in the cement industry (standards UNE 80-112-91 and EN 196-6), and to carry out other chemical analysis on cement.

DMS40 GRADE – Medium-slow filtration

The classic general purpose ashless filter paper with a medium-to-slow filtering rate.

Suitable for typical applications which includes gravimetric analysis for numerous components and for all kind of pre-filtrations.

Used as a primary filter for separating solid matter from aqueous extracts, in tests for fat and oil in water, in general soil analysis, quantitative determination of sediments in milk, as well as in analytical grade clean-up filter for solutions prior to AA spectro-photometry. Suitable for finer precipitates such as hot barium sulphate.

DSL44 GRADE – Slow filtration

A thinner version of DXS42 Grade but with a higher flow rate (twice as fast as DXS42 Grade).

Very fine particles but with lower ash weight per sample

DXS42 GRADE – Very slow filtration

An ashless world standard filter for critical gravimetric analysis. With slow filtering rate and fine particle retention.

Typical analytical precipitates such as cold barium sulphate, lead sulphate, zinc and nickel sulphides, etc.

| Grade | Applications |
|-------|--|
| DSL45 | Filtration of coarse and voluminous precipitates such as iron hydroxide, aluminium hydroxide and chromium hydroxide Silica content determinations in steel and iron Food and beverage analysis |
| DFA41 | Food analysis Soil analysis Determination of metals in water Filtration of lead sulphide, iron sulphide, silver sulphide and alkali carbonates Blaine test in the cement industry (standards UNE 80-112-91 and EN 196-6) |
| DME43 | Filtration of medium size particles Precipitates such as calcium oxalate, magnesium ammonium phosphate, and barium sulphate Blaine test in the cement industry (standards UNE 80-112-91 and EN 196-6) |
| DMS40 | Fine precipitates CaC ₂ O ₄ , PbSO ₄ , BaSO ₄ (precipitates) |
| DSL44 | Filtration of fine precipitates such as barium sulphate and cuprous oxide Soil analysis: measurement of soluble sulphates |
| DXS42 | Critical analytical filtration conditions Fine precipitates Precipitates such as cold barium sulphate, lead sulphate, zinc and nickel sulphides, etc |

Technical Specifications

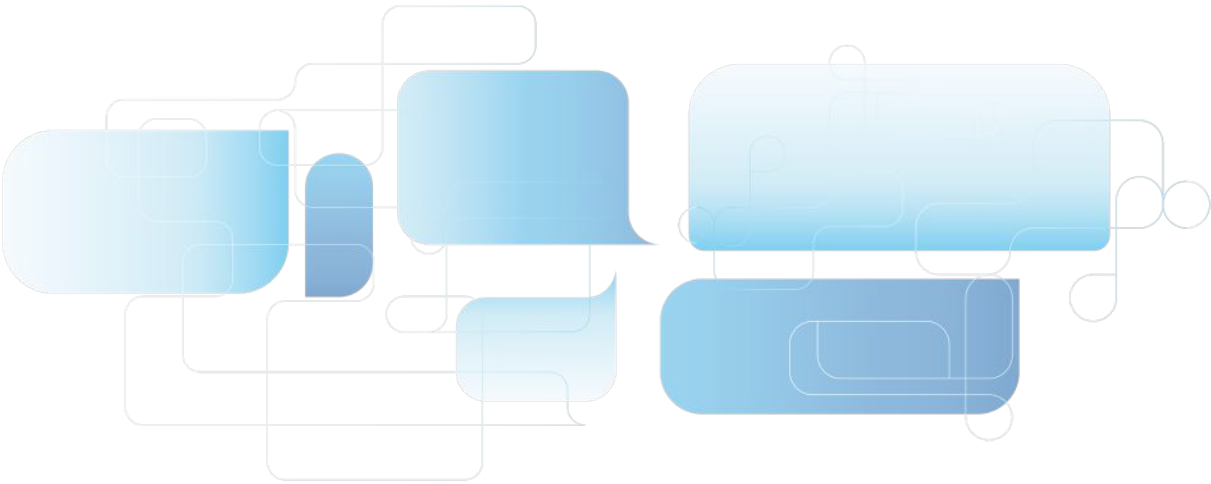
| | Grade | Filtration Speed | Weight (g/m ²) | Thickness (µm) | Retention Range (µm) | Ash Content (%) |
|---|-------|------------------|----------------------------|----------------|----------------------|-----------------|
| ● | DSL45 | Very Fast | 85 | 210 | 25-30 | <0.007 |
| ○ | DFA41 | Fast | 85 | 190 | 20-25 | <0.007 |
| ● | DME43 | Medium | 85 | 180 | 14-17 | <0.007 |
| ● | DMS40 | Medium-Slow | 85 | 170 | 7-9 | <0.007 |
| ● | DSL44 | Slow | 85 | 160 | 2-4 | <0.007 |
| ● | DXS42 | Very Slow | 100 | 160 | 2-3 | <0.007 |

Ordering information

| Diameter (mm) | DSL45 | DFA41 | DME43 | DMS40 | DSL44 | DXS42 |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 100 Circles/Box | | | | | | |
| 37 | FP037DSL45QANC01 | - | - | - | - | - |
| 42.5 | FP042DSL45QANC01 | FP042DFA41QANC01 | FP042DME43QANC01 | FP042DMS40QANC01 | FP042DSL44QANC01 | FP042DXS42QANC01 |
| 47 | FP047DSL45QANC01 | FP047DFA41QANC01 | FP047DME43QANC01 | FP047DMS40QANC01 | FP047DSL44QANC01 | FP047DXS42QANC01 |
| 55 | FP055DSL45QANC01 | FP055DFA41QANC01 | FP055DME43QANC01 | FP055DMS40QANC01 | FP055DSL44QANC01 | FP055DXS42QANC01 |
| 70 | FP070DSL45QANC01 | FP070DFA41QANC01 | FP070DME43QANC01 | FP070DMS40QANC01 | FP070DSL44QANC01 | FP070DXS42QANC01 |
| 90 | FP090DSL45QANC01 | FP090DFA41QANC01 | FP090DME43QANC01 | FP090DMS40QANC01 | FP090DSL44QANC01 | FP090DXS42QANC01 |
| 110 | FP110DSL45QANC01 | FP110DFA41QANC01 | FP110DME43QANC01 | FP110DMS40QANC01 | FP110DSL44QANC01 | FP110DXS42QANC01 |
| 125 | FP125DSL45QANC01 | FP125DFA41QANC01 | FP125DME43QANC01 | FP125DMS40QANC01 | FP125DSL44QANC01 | FP125DXS42QANC01 |
| 150 | FP150DSL45QANC01 | FP150DFA41QANC01 | FP150DME43QANC01 | FP150DMS40QANC01 | FP150DSL44QANC01 | FP150DXS42QANC01 |
| 185 | FP185DSL45QANC01 | FP185DFA41QANC01 | FP185DME43QANC01 | FP185DMS40QANC01 | FP185DSL44QANC01 | FP185DXS42QANC01 |
| 240 | FP240DSL45QANC01 | FP240DFA41QANC01 | FP240DME43QANC01 | FP240DMS40QANC01 | FP240DSL44QANC01 | FP240DXS42QANC01 |
| 320 | FP320DSL45QANC01 | FP320DFA41QANC01 | FP320DME43QANC01 | FP320DMS40QANC01 | FP320DSL44QANC01 | FP320DXS42QANC01 |

Equivalence Table

| GVS | Filtration Speed | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|------------------|--------------|--------------|--------------|--------------|
| DSL45 | Very fast | - | 589/1 | 640we | 388 |
| DFA41 | Fast | 41 | 589/2 | 640w | 389 |
| DME43 | Medium | 43 | 589/5 | 640m | 392 |
| DMS40 | Medium-slow | 40 | 589/6 | 640md | 390 |
| DSL44 | Slow | 44 | 589/3 | 640d | 391 |
| DXS42 | Very slow | 42 | - | 640de | 393 |



Quantitative filter paper

2. Ashless hardened filter paper for quantitative analysis

Ashless hardened Filter papers are acid hardened which reduce the ash content to an extremely low level.

These filters are produced by a complex elaborate washing process under stringently controlled conditions. Firstly, acid washing is arranged. Then a series of washes in demineralised water come, which increase the strength of the paper, therefore making them particularly suitable for Büchner filter funnels and a wide range of critical analytical filtration operations.

Through this process, a maximum ash content of <0.006% is attained, which means that no contaminants are introduced when filtering. Also, full compliance with international standards on this subject is achieved.

Thanks to the hardened texture, they are often used when the analyst must recover the precipitates retained on the filter surface.

DF541 GRADE - Fast filtration

Hardened ashless filter paper with a fast flow rate. Preferably used for the filtration of coarse flocculent and bulky precipitates (as aluminium, chromium or hydroxides of iron, bismuth, cobalt, sulphides of copper, various organic metal precipitates, etc.) and gelatinous precipitates in acid/alkaline solutions during gravimetric analysis.

DF540 GRADE – Medium filtration

Hardened ashless filter paper with medium retention and flow rate.

Extremely strong and pure. With a hard surface, it is recommended for filtering medium-sized precipitates such as most metal sulphides.

High chemical resistance. Used in the gravimetric analysis of metals in acid and slightly alkalinized solutions, pressure filtration.

DF542 GRADE - Slow filtration

Hardened ashless filter paper with high retention and slow flow rate.

High chemical resistance. Often used for filtering very fine precipitates and in gravimetric metal determinations.

| Grade | Applications |
|-------|---|
| DF541 | Food analysis Fibre detection in pet food Filtration of coarse flocculent and bulky precipitates (as aluminium, chromium or hydroxides of iron, bismuth, cobalt, sulphides of copper, various organic metal precipitates, etc.) Gravimetric analysis of gelatinous precipitates in acid/alkaline solutions |
| DF540 | Filtration of fine crystalline precipitates Gravimetric analysis of metals in acid/alkaline solutions |
| DF542 | Filtration of very fine precipitates Gravimetric metal determinations |

Technical Specifications

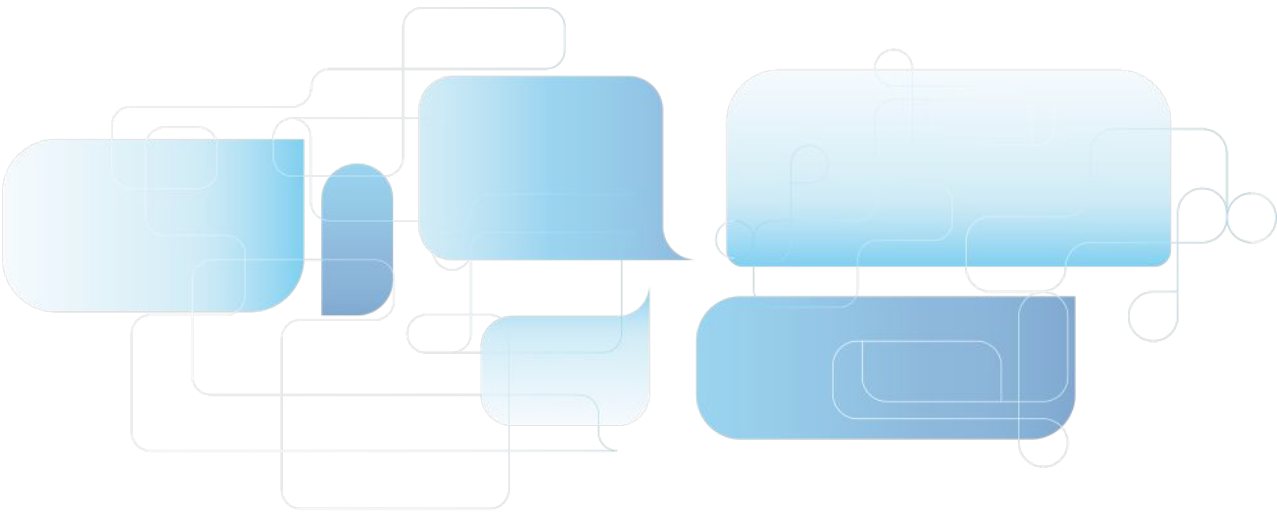
| GVS | Filtration Speed | Weight (g/m²) | Thickness (µm) | Retention Range (µm) | Ash Content (%) |
|-------|------------------|---------------|----------------|----------------------|-----------------|
| DF541 | Fast | 84 | 170 | 20-25 | <0.006 |
| DF540 | Medium | 84 | 160 | 7-12 | <0.006 |
| DF542 | Slow | 95 | 150 | 2-4 | <0.006 |

Ordering information

| Diameter (mm) | DF541 | DF540 | DF542 |
|------------------|------------------|------------------|------------------|
| 1000 Circles/Box | | | |
| 25 | FP025DF541QANC01 | FP025DF540QANC01 | FP025DF542QANC01 |
| 100 Circles/Box | | | |
| 40.5 | FP040DF541QANC01 | FP040DF540QANC01 | FP040DF542QANC01 |
| 42.5 | FP042DF541QANC01 | FP042DF540QANC01 | FP042DF542QANC01 |
| 47 | FP047DF541QANC01 | FP047DF540QANC01 | FP047DF542QANC01 |
| 55 | FP055DF541QANC01 | FP055DF540QANC01 | FP055DF542QANC01 |
| 70 | FP070DF541QANC01 | FP070DF540QANC01 | FP070DF542QANC01 |
| 90 | FP090DF541QANC01 | FP090DF540QANC01 | FP090DF542QANC01 |
| 110 | FP110DF541QANC01 | FP110DF540QANC01 | FP110DF542QANC01 |
| 125 | FP125DF541QANC01 | FP125DF540QANC01 | FP125DF542QANC01 |
| 150 | FP150DF541QANC01 | FP150DF540QANC01 | FP150DF542QANC01 |
| 185 | FP185DF541QANC01 | FP185DF540QANC01 | FP185DF542QANC01 |
| 240 | FP240DF541QANC01 | FP240DF540QANC01 | FP240DF542QANC01 |
| 320 | FP320DF541QANC01 | FP320DF540QANC01 | FP320DF542QANC01 |

Equivalence Table

| GVS | Filtration Speed | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|------------------|--------------|--------------|--------------|--------------|
| DF541 | Fast | 541 | 1505 | 1640w | 1388 |
| DF540 | Medium | 540 | 1506 | 1640m | 1392 |
| DF542 | Slow | 542 | 1507 | 1640de | 1391 |



Qualitative filter paper

1. Ashless hardened filter paper for qualitative analysis



These filter papers are used for qualitative analysis. Qualitative filters are made of refined pulp and pure cotton linters with an alpha-cellulose content of nearly 100%, which gives them a number of diverse filtration properties.

The ash content of less than 0.06% is not reduced by post-treatment. Qualitative filter papers are available in sheets, discs and folded filters.

DXF04 GRADE - Very fast filtration

Very high rate of filtration with excellent retention of coarse precipitates such as metal hydroxides and sulphides or gelatinous substances.

Preferably used as rapid filter for various organic metal precipitates, routine cleanup of biological fluids, food industry analysis, air pollution monitoring (high rates and the fine particles collection is not critical).

DME07 GRADE - Fast filtration

A standard grade filter used for a wide variety of analytical routine applications in different industries These cellulose filters are used in qualitative analytical techniques to determine and identify materials. Pre-pleated qualitative filters are also available, which give improved flow rate and increased loading capacity compared to equivalent flat filters.

DME01 GRADE - Medium filtration

The most widely used filter paper in the GVS range. Medium retention and flow rate. This grade covers a wide range of laboratory applications and is frequently used for clarifying liquids. Traditionally this grade is used in qualitative analytical separations for routine laboratory work as well as rapid filtration of fine precipitates such as lead sulphate, calcium oxalate (hot) and calcium carbonate.

In agriculture, it is used for soil analysis and seed testing procedures.

In the food industry, Grade DME01 is used for numerous routine techniques to separate solid foodstuffs from associated liquid or extracting liquid.

It is widely used in education for teaching simple qualitative analytical separations.

In air pollution monitoring, using circles or rolls, atmospheric dust is collected from airflow and the stain-intensity measured photometrically.

For gas detection, the paper is impregnated with a chromogenic reagent and color formation quantified by optical reflectance.

DMS02 GRADE - Medium-slow filtration

Slightly more retentive and absorbent than Grade DME01 and therefore with a moderate to slow filtration speed.

In addition to general filtration this grade DMS02 is used for monitoring specific contaminants in the atmosphere, filtration of fine precipitates, soil testing, it is often used as a folded filter in an analytical funnel.

DMS03 GRADE - Medium-slow filtration (thick)

Medium to low rate of filtration with double the thickness comparing with GVS Grade DME01 .

Fine particle retention and excellent loading capacity. The extra thickness gives increased wet strength and allows a higher solute loading.

Preferably used for liquids hard to clarify, essences, oils, tinctures.

DNS06 GRADE - Slow filtration

Similar particle retention as Grade DXS05 with higher filtration speed.

Often used for boiler water analysis.

DXS05 GRADE - Very slow filtration

Lowest rate of filtration in the GVS qualitative range and maximum degree of fine particle filtration or retention.

Preferably used as a clarifying filter for cloudy suspensions and water and soil analysis. Particularly used in difficult filtration conditions and extra fine-grained precipitates such as barium sulphate, cupreous oxide, often specified for clarification of wine.

| Grade | Applications |
|-------|---|
| DXF04 | Coarse and gelatinous precipitates such as iron hydroxide, aluminium hydroxide and chromium hydroxide Silica determination in steel and iron analysis Food analysis Monitoring of air pollution when the collection of fine particles is not critical Routine clean-up of biological fluids or organic extracts |
| DME07 | Filtration of a wide range of routine laboratory applications Food analysis. Determination of fat content Beverage analysis. Removal of carbon dioxide and turbidity from beer and other beverages |
| DME01 | Filtration of a wide range of routine laboratory applications for medium retention Filtration of fine precipitates such as lead sulphate, calcium oxalate, calcium carbonate and other metal sulphates Soil analysis and seed testing Food analysis Education Used in the beer and malt control quality production according to EBC. |
| DMS02 | Monitoring specific contaminants in the atmosphere Filtration of fine precipitates such as lead dioxide, calcium fluoride, nickel sulphide and zinc sulphide Soil analysis |
| DMS03 | Particularly useful for use in Büchner funnels Preferably used for liquids hard to clarify, essences, oils and tinctures |
| DNS06 | Filtration of very fine crystalline precipitates Beverage analysis. Sample preparation and removal of carbon dioxide for beverages Monitoring specific contaminants in the atmosphere Soil analysis |
| DXS05 | Filtration in very difficult conditions Filtration for extra fine-grained precipitates such as barium sulphate, cupreous oxide often specified usedfor clarification of wine |

Technical Specifications

| GVS | Filtration Speed | Weight (g/m²) | Thickness (µm) | Retention Range (µm) | Ash Content (%) |
|-------|-------------------|---------------|----------------|----------------------|-----------------|
| DXF04 | Very fast | 84 | 190-230 | 12-15 | <0.06 |
| DME07 | Fast | 84 | 190-230 | 8-12 | <0.06 |
| DME01 | Medium | 84 | 160-190 | 7-11 | <0.06 |
| DMS02 | Medium-Slow | 97 | 190 | 5-8 | <0.06 |
| DMS03 | Medium-Slow/Thick | 200 | 320 | 5-7 | <0.06 |
| DXS05 | Very Slow | 80 | 170 | 1-2 | <0.06 |

Ordering information

| Diameter (mm) | DXF04 | DME07 | DME01 | DMS02 | DMS03 | DNS06 | DXS05 |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 100 Circles/Box | | | | | | | |
| 37 | FP037DXF04QALC00 | FP037DME07QALC01 | FP037DME01QALC01 | - | FP037DMS03QLTC01 | - | - |
| 42.5 | FP042DXF04QALC01 | FP042DME07QALC01 | FP042DME01QALC01 | FP042DMS02QALC01 | FP042DMS03QLTC01 | - | FP042DXS05QALC01 |
| 47 | FP047DXF04QALC01 | FP047DME07QALC01 | FP047DME01QALC01 | FP047DMS02QALC01 | FP047DMS03QLTC01 | - | FP047DXS05QALC01 |
| 55 | FP055DXF04QALC01 | FP055DME07QALC01 | FP055DME01QALC01 | FP055DMS02QALC01 | FP055DMS03QLTC01 | - | FP055DXS05QALC01 |
| 70 | FP070DXF04QALC01 | FP070DME07QALC01 | FP070DME01QALC01 | FP070DMS02QALC01 | FP070DMS03QLTC01 | - | FP070DXS05QALC01 |
| 90 | FP090DXF04QALC01 | FP090DME07QALC01 | FP090DME01QALC01 | FP090DMS02QALC01 | FP090DMS03QLTC01 | - | FP090DXS05QALC01 |
| 110 | FP110DXF04QALC01 | FP110DME07QALC01 | FP110DME01QALC01 | FP110DMS02QALC01 | FP110DMS03QLTC01 | - | FP110DXS05QALC01 |
| 125 | FP125DXF04QALC01 | FP125DME07QALC01 | FP125DME01QALC01 | FP125DMS02QALC01 | FP125DMS03QLTC01 | - | FP125DXS05QALC01 |
| 150 | FP150DXF04QALC01 | FP150DME07QALC01 | FP150DME01QALC01 | FP150DMS02QALC01 | FP150DMS03QLTC01 | - | FP150DXS05QALC01 |
| 185 | FP185DXF04QALC01 | FP185DME07QALC01 | FP185DME01QALC01 | FP185DMS02QALC01 | FP185DMS03QLTC01 | FP185DNS06QALC0F | FP185DXS05QALC01 |
| 240 | FP240DXF04QALC01 | FP240DME07QALC01 | FP240DME01QALC01 | FP240DMS02QALC01 | FP240DMS03QLTC01 | - | FP240DXS05QALC01 |
| 320 | FP320DXF04QALC01 | FP320DME07QALC01 | FP320DME01QALC01 | FP320DMS02QALC01 | FP320DMS03QLTC01 | - | FP320DXS05QALC01 |

Note: for folded format or other sizes packaging, please contact local representatives.

Equivalence Table

| GVS | Filtration Speed | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|------------------|--------------|--------------|--------------|--------------|
| DXF04 | Very fast | 4 | 604 | 1670/617 | 288 |
| DME07 | Fast | - | 597 | - | 289 |
| DME01 | Medium | 1 | 593/595 | 616/615 | 292 |
| DMS02 | Medium-slow | 2 | - | 616md | 292a |
| DMS03 | Medium/thick | 3 | 591 | 618 | 3 S/h |
| DXS05 | Very slow | 5 | 602eh | 619de | 293 |

Qualitative filter paper

2. General-purpose qualitative filter paper

These general-purpose filters have a high wet strengthened.

They are made of high-purity cotton linters and other virgin fibers. These filter papers have either fast or very fast filtration rates, and are particularly useful in filtering coarse precipitates or relatively straightforward substances.

DME93 GRADE - Very fast filtration

Smooth Grade DME93 is a general-purpose filter paper for qualitative analysis.

This wet strengthened paper is used for general filtration and sample preparation for food, sugar processing plants, hospitals, educational and research centres, colleges, universities and labs (with a very high usage and less critical analysis), etc.

DXF55 GRADE - Very fast filtration

General-purpose filter paper, smooth and similar to DME93 with less weight.

DXF13 GRADE - Extra-fast filtration. Thick

High particle retention and extremely high loading capacity.

Preferably used for filtration of gelatine, resin solutions and other viscous liquids, such as syrups, oils, essences and fats.

The folded format enables bigger volumes to be dealt at atmospheric pressures.

DME91 GRADE - Very fast filtration. Crêped

Crêped surface filter paper with a very fast flow rate.

For general laboratory use in less-critical analyses.

Used around the world in laboratories to assay sugar cane or beet. The fruit is mashed and further analyzed according to the aluminium sulphur method.

| Grade | Applications |
|-------|--|
| DME93 | General filtration and sample preparation in different kind of laboratories General filtration and sample preparation in food and sugar processing plants |
| DXF55 | General-purpose filtration |
| DXF13 | Filtration of gelatines, resin solutions and other viscous liquids such as syrups, dense oils, essences and fats |
| DME91 | Determination of sucrose in the sugar cane or beet |

Technical Specifications

| GVS | Filtration Speed | Weight (g/m²) | Thickness (µm) | Retention Range (µm) | Ash Content (%) |
|-------|------------------|---------------|----------------|----------------------|-----------------|
| DME93 | Very Fast | 80 | 170 | 43-48 | <0.1 |
| DXF55 | Very Fast | 65 | 145 | 6-9 | <0.1 |
| DXF13 | Extra-Fast/Thick | 160 | 470 | 60-68 | <0.1 |
| DME91 | Very Fast/Crêped | 65 | 160 | 34-42 | <0.1 |

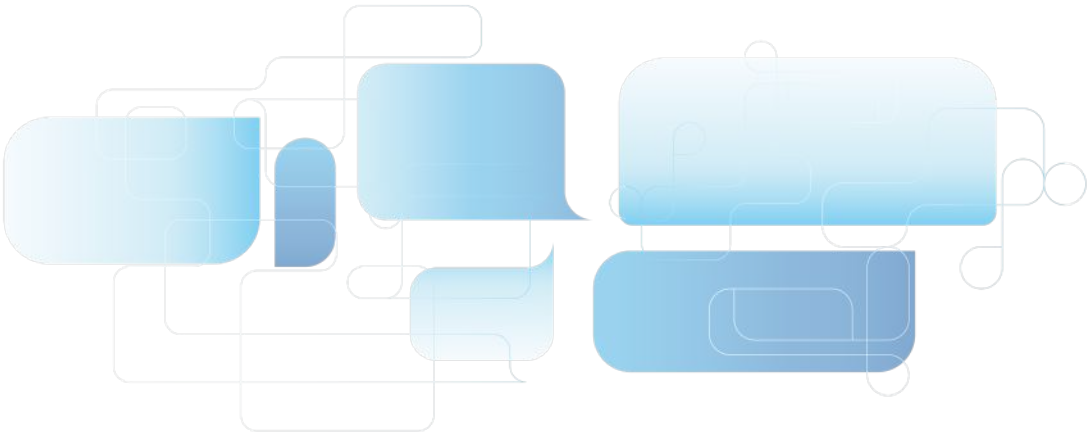
Ordering information

| Diameter(mm) | DME93 | DXF55 | DXF13 | DME91 |
|-----------------|------------------|------------------|------------------|------------------|
| 100 Circles/Box | | | | |
| 42.5 | FP042DME93QALC01 | - | - | FP042DME91QALC01 |
| 47 | FP047DME93QALC01 | - | - | FP047DME91QALC01 |
| 55 | FP055DME93QALC01 | - | - | FP055DME91QALC01 |
| 70 | FP070DME93QALC01 | - | - | FP070DME91QALC01 |
| 90 | FP090DME93QALC01 | - | - | FP090DME91QALC01 |
| 110 | FP110DME93QALC01 | FP110DXF55CREC01 | - | FP110DME91QALC01 |
| 125 | FP125DME93QALC01 | FP125DXF55CREC01 | - | FP125DME91QALC01 |
| 130 | - | FP130DXF55CREC01 | - | - |
| 150 | FP150DME93QALC01 | FP150DXF55CREC01 | - | FP150DME91QALC01 |
| 185 | FP185DME93QALC01 | FP185DXF55CREC01 | - | FP185DME91QALC01 |
| 200 | - | FP200DXF55CREC01 | - | - |
| 240 | FP240DME93QALC01 | FP240DXF55CREC01 | FP240DXF13QALC0F | FP240DME91QALC01 |
| 250 | - | FP250DXF55CREC01 | - | - |
| 270 | - | FP270DXF55CREC01 | - | - |
| 300 | - | FP300DXF55CREC01 | - | - |
| 320 | FP320DME93QALC01 | FP320DXF55CREC01 | - | FP320DME91QALC01 |

Note: for folded format or other sizes packaging, please contact local representatives.

Equivalence Table

| GVS | Filtration Speed | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|------------------|--------------|--------------|--------------|--------------|
| DME93 | Very fast | 93 | 860 | 617 | 4b |
| DXF55 | Very fast | - | - | - | 3m/N |
| DXF13 | Extra-fast/Thick | - | 3144L | - | - |
| DME91 | Very fast/Crêped | 91 | 0856 | - | 601/N |



Special Filter Papers

1. Filter paper with diatomaceous

Filter paper with low filtration speed. Made with a mixture of cellulose fibers and diatomaceous soils (diatomaceous algae), the main property is its microporous structure, up to 0.5 µm.

The land production process begins with open pit mining. Subsequently, a drying phase follows and it is subjected to high temperatures to eliminate any remaining residue. Finally, it is crushed for industrial use.

This filter paper combines excellent retention of very fine or semi-colloidal particles with a faster filtration speed than any slow filtration cellulose filter paper.

Applications

- Filtration of samples for spectrophotometric analysis
- Clay samples
- Separation of samples with Cu oxides
- Protein samples

Technical Specifications

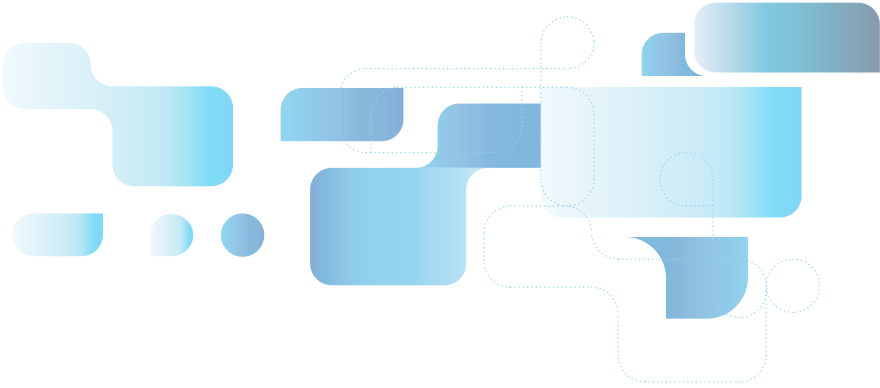
| GVS | Filtration Speed | Weight (g/m²) | Thickness (µm) |
|-------|------------------|---------------|----------------|
| DMS60 | Slow | 140 | 320 |

Ordering information

| Diameter(mm) | Product Code | Quantity/Box |
|--------------|------------------|--------------|
| 150 | FP150DMS60KSLG0F | 100 |
| 185 | FP185DMS60KSLG0F | 100 |
| 240 | FP240DMS60KSLG0F | 100 |

Equivalence Table

| GVS | Filtration Speed | Equivalent 1 | Equivalent 2 |
|-------|------------------|--------------|--------------|
| DMS60 | Slow | 287 | MN660 |



Glass microfiber filters

GVS offers a wide range of glass microfiber filters made of 100% borosilicate glass fibers with and without binders. The depth structure of the filter's large surface area, provides an outstanding impurity retention capacity combined with a low filter resistance. Glass fiber filters adsorb the finest particles down to 1 µm from liquids and <1 µm in air and gases (even aerosols with this particle diameter are separated), as the electrostatic interaction between the glass fibers and gases is better than between glass fibers and liquids. Temperature resistant up to 500°C (in the case of organic binders up to 180°C).

1. Glass microfiber filters without binders

DFAFA GRADE (1.6 µm)

Particularly suited for atmospheric pollution controls, intake controls and ozone level measurements.

This product is used in testing with algae in water, for general water controls and waste water analysis.

Its use for filtering solvents in high-resolution laboratories is recommended.

DAM10 GRADE (1.0 µm)

It is mainly used in membrane pre-filtration and for biochemical assays.

Suitable for filtration of large sample volumes.

DMEFC GRADE (1.2 µm)

This is the most suitable filter to test for solids in

suspension in water in accordance with the parameters set by the EN-872:2005 European regulation and American Standard Methods norm 2540D. In general, it is suitable for any work in water control or wastewater analysis, including clarification processes.

Within biochemical tests, it is very useful for analysing carbohydrates, cellular cultures, etc.

DAM27 GRADE (2.7 µm)

The most widespread use of this filter is in membrane pre-filtering.

Its high particle retention ensures that the sample is properly clarified before passing through surface filters (membrane filters).

DSLFF GRADE (0.7 µm)

This is the filter with the highest retention performance of the range. It is particularly suited to filter samples and solvents for HPLC, being this pre-filtration the most important for ensuring the success of the test. It is also suitable for biochemical tests, such as clarifications, protein filtrations, cellular cultures, etc.

DFAAH GRADE (1.5 µm)

Suitable for atmospheric pollution control, particularly in testing for air intake levels. It is also appropriate for wastewater controls, testing for solids in suspension, dissolved solids and volatile matter in accordance with the parameters set by the American Standard Methods norm 2540D.

It is also suitable for cellular cultures.

| Grade | Applications |
|-------|--|
| DFAFA | Atmospheric pollution controls, intake controls and ozone level measurements Filtration for algae in water, foodstuff analysis, bacteria cultures, proteins |
| DAM10 | Used in membrane pre-filtration Biochemical assays Suitable for filtration of large volumes |
| DMEFC | Determination of suspended soils in water in accordance with European regulations Clarification and monitoring water and wastewater analysis Analysis of carbohydrates, cellular cultures in biochemical tests where cellulose fiber is an inconvenience |
| DAM27 | Used as a membrane pre-filter Determination of contaminants in fats according to LMBG |
| DSLFF | Highest retention performance of the range Filtration of samples and solvents prior to HPLC Biochemical assays and clarifications of protein solutions |
| DFAAH | Filtration of suspended solids in water, wastewater analysis Total suspended solids analysis Atmospheric pollution control It is also suitable for cellular cultures |

Technical Specifications

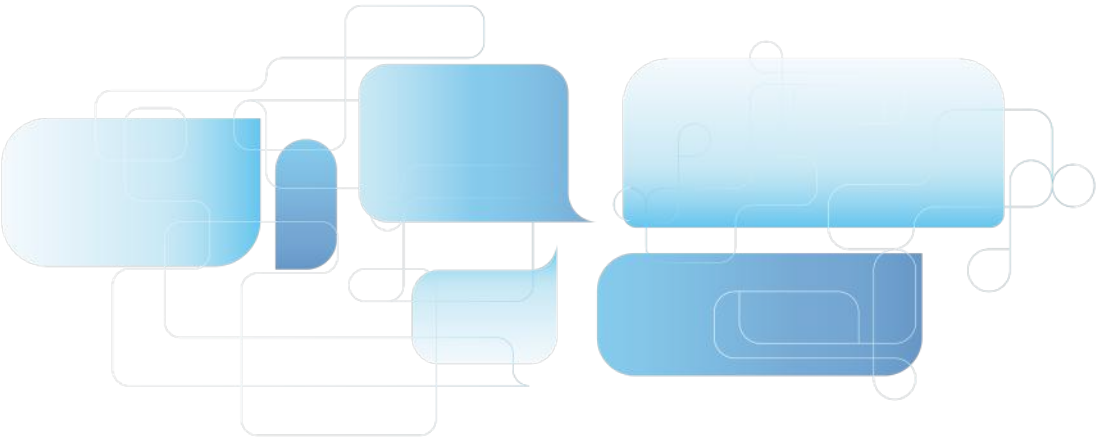
| GVS | Retention Range (µm) | Weight (g/m²) | Thickness (µm) | Retention Drop(*) (%) | Binder |
|-------|----------------------|---------------|----------------|-----------------------|--------|
| DFAFA | 1.6 | 52 | 260 | 99.998 | NO |
| DAM10 | 1.0 | 143 | 700 | 99.998 | NO |
| DMEFC | 1.2 | 53 | 260 | 99.998 | NO |
| DAM27 | 2.7 | 120 | 530 | 99.998 | NO |
| DSLFF | 0.7 | 75 | 450 | 99.998 | NO |
| DFAAH | 1.5 | 65 | 280 | 99.998 | NO |

Ordering information

| Diameter (mm) | DFAFA | DAM10 | DMEFC | DAM27 | DSLFF | DFAAH |
|-----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| 100 Circles/Box | | | | | | |
| 21 | FP021DFAFAGLFC01 | FP021DAM10GLFC01 | FP021DMEFCGLFC01 | FP021DAM27GLFC01 | FP021DSLFFGLFC01 | FP021DFAAHGLFC01 |
| 25 | FP025DFAFAGLFC01 | FP025DAM10GLFC01 | FP025DMEFCGLFC01 | FP025DAM27GLFC01 | FP025DSLFFGLFC01 | FP025DFAAHGLFC01 |
| 37 | FP037DFAFAGLFC01 | FP037DAM10GLFC01 | FP037DMEFCGLFC01 | FP037DAM27GLFC01 | FP037DSLFFGLFC01 | FP037DFAAHGLFC01 |
| 47 | FP047DFAFAGLFC01 | FP047DAM10GLFC01 | FP047DMEFCGLFC01 | FP047DAM27GLFC01 | FP047DSLFFGLFC01 | FP047DFAAHGLFC01 |
| 50 | FP050DFAFAGLFC01 | FP050DAM10GLFC01 | FP050DMEFCGLFC01 | FP050DAM27GLFC01 | FP050DSLFFGLFC01 | FP050DFAAHGLFC01 |
| 55 | FP055DFAFAGLFC01 | FP055DAM10GLFC01 | FP055DMEFCGLFC01 | FP055DAM27GLFC01 | FP055DSLFFGLFC01 | FP055DFAAHGLFC01 |
| 70 | FP070DFAFAGLFC01 | FP070DAM10GLFC01 | FP070DMEFCGLFC01 | FP070DAM27GLFC01 | FP070DSLFFGLFC01 | FP070DFAAHGLFC01 |
| 90 | FP090DFAFAGLFC01 | FP090DAM10GLFC01 | FP090DMEFCGLFC01 | FP090DAM27GLFC01 | FP090DSLFFGLFC01 | FP090DFAAHGLFC01 |
| 110 | FP110DFAFAGLFC01 | FP110DAM10GLFC01 | FP110DMEFCGLFC01 | FP110DAM27GLFC01 | FP110DSLFFGLFC01 | FP110DFAAHGLFC01 |
| 125 | FP125DFAFAGLFC01 | FP125DAM10GLFC01 | FP125DMEFCGLFC01 | FP125DAM27GLFC01 | FP125DSLFFGLFC01 | FP125DFAAHGLFC01 |
| 150 | FP150DFAFAGLFC01 | FP150DAM10GLFC01 | FP150DMEFCGLFC01 | FP150DAM27GLFC01 | FP150DSLFFGLFC01 | FP150DFAAHGLFC01 |
| 240 | FP240DFAFAGLFC01 | FP240DAM10GLFC01 | FP240DMEFCGLFC01 | FP240DAM27GLFC01 | FP240DSLFFGLFC01 | FP240DFAAHGLFC01 |
| Size (mm) | DFAFA | DAM10 | DMEFC | DAM27 | DSLFF | DFAAH |
| 100 Sheets/Pack | | | | | | |
| 203x254 | FP203RFAFAGLFC01 | FP203RAM10GLFC01 | FP203RMEFCGLFC01 | FP203RAM27GLFC01 | FP203RSLFFGLFC01 | FP203RFAAHGLFC01 |

Equivalence Table

| GVS | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|--------------|--------------|--------------|--------------|
| DFAFA | GF-A | GF 50 | GF1 | MGA |
| DAM10 | GF-B | GF 51 | GF2 | MGB |
| DMEFC | GF-C | GF 52 | GF3 | MCG |
| DAM27 | GF-D | GF 53 | GF4 | MGD |
| DSLFF | GF-F | GF 55 | GF5 | MGF |
| DFAAH | 934-AH | GF 30 | GF6 | 550-HA |



2. Glass microfiber filters with binders

These glass microfiber filters are mostly used for monitoring air and gas or as prefilter. They have extreme mechanical and chemical stability because they are manufactured with synthetic binders to ensure that the filter has a defined strength. They have a temperature resistance of up to 180°C.

Technical Specifications

| GVS | Retention Range (µm) | Weight (g/m²) | Thickness (µm) | Binder |
|-------|----------------------|---------------|----------------|--------|
| DAM64 | 1.0 | 85 | 450 | YES |

| Grade | Applications |
|-------|---|
| DAM64 | Pre-filtration and clarification for Biopharmaceutical and Food & Beverage industry Filtration in ink industry Brine filtration |

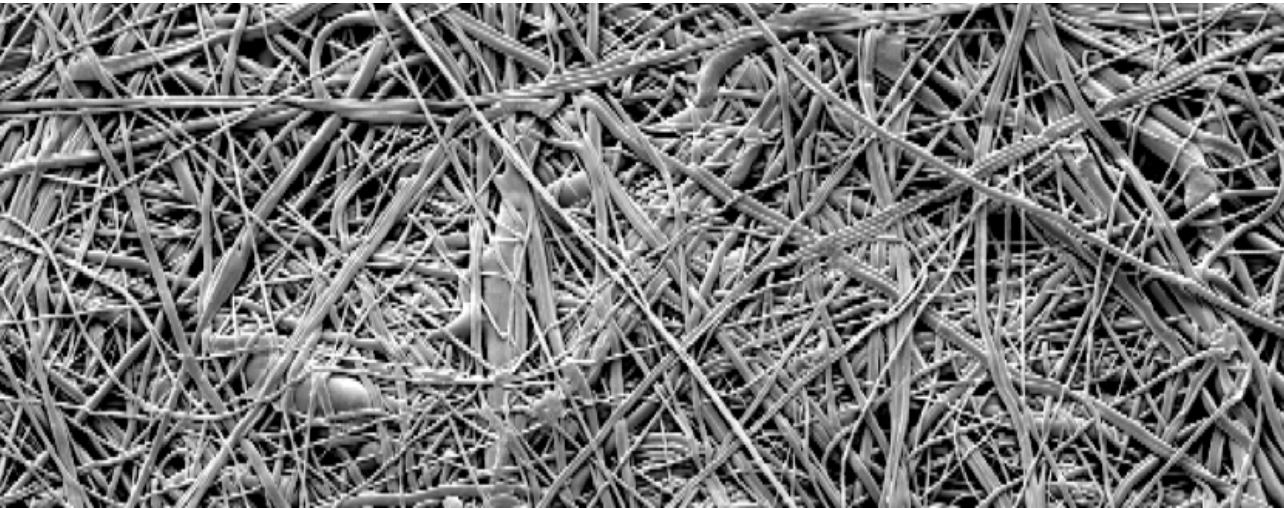
Ordering information

| Diameter (mm) | DAM64 |
|-----------------|------------------|
| 100 Circles/Box | |
| 25 | FP025DAM64GLFC01 |
| 37 | FP037DAM64GLFC01 |
| 47 | FP047DAM64GLFC01 |
| 50 | FP050DAM64GLFC01 |
| 90 | FP090DAM64GLFC01 |
| 150 | FP150DAM64GLFC01 |

Note: for paper filter roll, please contact local representatives.

Equivalence Table

| GVS | Equivalent 1 | Equivalent 2 |
|-------|--------------|--------------|
| DAM64 | GF6 | GF6 |



Quartz microfiber filters

The GVS quartz microfiber filters are made with pure quartz microfibers and are free of binders or additives of any kind. These filters have retention, loading and air permeability features similar to those of the glass microfiber filters. However, since they have greater chemical resistance at high temperatures, they can be used in environments where extreme conditions are present, replacing the glass microfiber filters in such cases.

- D0QF1 Standard grade
- D0QF2 Very pure filter/very low trace levels of heavy metals

Features

- High-purity quartz microfiber filters (SiO₂) free of binding elements or additives
- Excellent retention levels for very fine particles
- Very high air permeability
- High temperature stability. It is very good up to 900°C, some loss of their usual properties setting in beyond that point
- Excellent chemical stability with practically no filter-mass losses through chemical reactions under extreme conditions with the presence of acid gases (HCl, SO₂, SO₃, H₂, SO₄, NO and NO₃)

Applications

- Determination of suspended particles on the atmosphere
- Emissions monitoring in industrial chimneys
- Gravimetric determination in gases
- Monitoring the level of heavy metals in atmospheric pollution studies
- Incinerators
- When the temperature of emissions is higher than the temperature that the glass microfiber can beat, it is used quartz microfiber
- Analysis of acid gases
- Microplastic sample preparation and separation before chromatographic analysis

Technical Specifications

| Grade | Weight (g/m²) | Thickness (µm) | Retention Dop (*) (%) | Maximum Temperature (°C) | Binder |
|-------|---------------|----------------|-----------------------|--------------------------|--------|
| D0QF1 | 85.0 | 440 | 99,998 | 900 | NO |
| D0QF2 | 85.0 | 430 | 99,998 | 900 | NO |

(*) Retention of a Dyoptil Ophtalate fog with 0.3 µm particles

Ordering Information

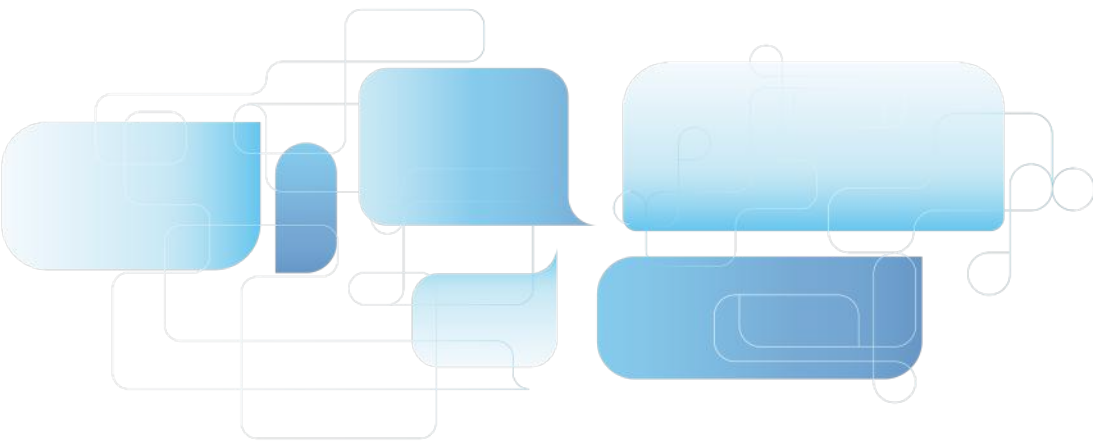
| Diameter (mm) | D0QF1 | D0QF2 |
|-----------------|------------------|------------------|
| 25 Circles/Box | | |
| 25 | FP025D0QF1QUFC01 | - |
| 37 | FP037D0QF1QUFC01 | - |
| 47 | FP047D0QF1QUFC01 | FP047D0QF2QUFC01 |
| 50 | FP050D0QF1QUFC01 | FP050D0QF2QUFC01 |
| 55 | FP055D0QF1QUFC01 | FP055D0QF2QUFC01 |
| 70 | FP070D0QF1QUFC01 | - |
| 90 | FP090D0QF1QUFC01 | FP090D0QF2QUFC01 |
| 110 | FP110D0QF1QUFC01 | - |
| 125 | FP125D0QF1QUFC01 | - |
| 150 | FP150D0QF1QUFC01 | FP150D0QF2QUFC01 |
| 100 Sheets/Pack | | |
| 203X254 | FP203R0QF1QUFC01 | - |

Equivalence Table

| GVS | Equivalent 1 | Equivalent 2 | Equivalent 3 | Equivalent 4 |
|-------|--------------|--------------|--------------|--------------|
| D0QF1 | QM-A | QF20 | QF10 | T293 |
| D0QF2 | - | - | - | MK360 |

Trace elements in ppm

| Element | D0QF1 | D0QF2 | Element | D0QF1 | D0QF2 | Element | D0QF1 | D0QF2 |
|---------|-------|-------|---------|-------|--------|---------|-------|-------|
| Al | 50 | 25 | Fe | 30 | 20 | Pb | 0.75 | 0.3 |
| As | 0.75 | 0.2 | Hg | <0.05 | <0.025 | Sb | 1.25 | <1 |
| Cd | 1.5 | <0.02 | Mg | 25 | 15 | Sn | 0.5 | <0.5 |
| Co | 1 | <0.5 | Mn | 1.25 | 1 | Tl | 2.5 | 1.5 |
| Cr | 5 | 3.5 | Na | 40 | 10 | V | 0.5 | <0.5 |
| Cu | 1.25 | <1 | Ni | 2 | 0.5 | Zn | 5 | 3 |



Agriculture Specialty Products

GVS provides specialized products for the scientific industry, with a particular focus on solutions for the agriculture sector. Our products are developed in close collaboration with researchers and developers to ensure they meet the essential performance requirements of our customers.

Seed testing paper

- GVS offers non-toxic papers for use in the seed industry and agricultural research laboratories. Seed testing papers are made of cotton linters and/or pure cellulose; they do not contain any substances which could influence the growth of seeding. The pH range is between 6.0 and 7.5. Their special structure prevents fine seed roots from growing through the paper.
- A broad weight range enables the seed technician to maintain the required moisture level for the whole duration of the germination test period. Our filter paper can be supplied in a variety of formats and is available in white and three shades of blue and yellow to make the evaluation of fine roots easier.
- Our papers comply with ISTA (International Seed Testing Association) and AOSA (Association for official seed analysis) requirements.

GVS offer various formats for each procedure:

- TP: Top of paper
- BP: Between the paper
- PP: Pleated paper

Features

- High purity cellulose grades
- Highest intra and inter-lot consistency
- Wide range of white and colored papers
- Comply with ISTA and AOSA requirements
- Customized sizes and shapes available



Ordering information

| Grade | Description, Surface | Weight g/m2 | Thickness mm | ISTA* Method | AOSA** Method | Type of seeds | Standard Size mm |
|------------------|--|-------------|--------------|--------------|---------------|--|------------------|
| GP20001101765C01 | Pleated strips, white, 50 double pleats, plain | 120 | 0.22 | PP | PP | For pelleted, medium and large seeds | 2000x110 |
| GP20001101766C01 | | | | | | | |
| GP07000037NC01 | | | | | | | Ø70 |
| GP58058037NC01 | White,creped | 135 | 0.5 | TP | P,TC | | 580*580 |
| GP19040034NC01 | | | | | | | |
| GP30040034NC01 | | | | | | | 220x400 |
| GP33040034NC01 | White,creped | 60 | 0.2 | TP,BP | T,TC | Small specimens in petri dishes or Jacobsen Tanks with grass or flowers | 190x400 |
| GP19040034NM01 | | | | | | | |
| GP0301604BC01 | | | | | | | |
| GP1202104BC01 | White,plain | 75 | 0.15 | TP | | | 30x160 |
| GP2204004BC01 | | | | | | | |
| GP3004004BC01 | | | | | | | |
| GP3304004BC01 | | | | | | | |
| GP102102194C01 | Filter board, dark blue, plain | 430 | 0.68 | TP, BP | | All specimens like vegetable, herbs and flowers | Ø50 |
| GP119120194C01 | | | | | | | Ø82.6 |
| GP050000194C01 | | | | | | | 102x102 |
| GP082000194C01 | | | | | | | 119x120 |
| GP190400140PEC01 | PE-coated paper, plain | 140 | 0.27 | TP, BP | | Cereals, towelling; the coating is minimizing root break-though and spread of the mold | 190x400 |
| GP190400140PEM01 | | | | | | | |

*BP: Between papers, Pp: Pleated paper, TP: Top of paper
**B: Between blotters, T: Paper towelling, p: Cover petri dishes, TB: Top of blotters pp: pleated filter paper, TC: Top of creped cellulose paper.
Customized shapes and sizes are available on demand. Other seed testing grades available, please contact us for further information.

Soil testing paper

- Soil analysis plays a crucial role in the evaluation of land’s capabilities for different forms of agriculture and determines the most suitable type and quantity of fertilizer to maximize crop production.
- To optimize plants growth, it is essential to determine the presence of nutrients and trace elements. An optimal filtration is the initial step to ensure rigorous and reliable results.
- For this purpose, GVS offers a high-purity range of products, specifically designed for gravimetric analysis of soil nutrients and sample preparation for instrumental analysis.



Ordering information

| Main grades | Basis weight g/m2 | Retention µm | Filtration Speed Herzberg s/100ml | Characteristics |
|----------------|-------------------|--------------|-----------------------------------|---|
| On demand | 80 | 5-8 | 100 | Low phosphate and potassium content |
| On demand | 80 | 8-10 | 450 | Low phosphate and potassium content |
| GP090000292C01 | 87 | 5-8 | 500 | Low nitrogen content |
| GP220400292C01 | | | | |
| On demand | 97 | 5-8 | 650 | Low nitrogen content |
| On demand | 84 | 2-3 | 1200 | Very fine particle retention, particularly suitable for ICP-MS analysis |
| On demand | 84 | 2-3 | 1200 | Suitable for colorimetry for phosphorous analysis |

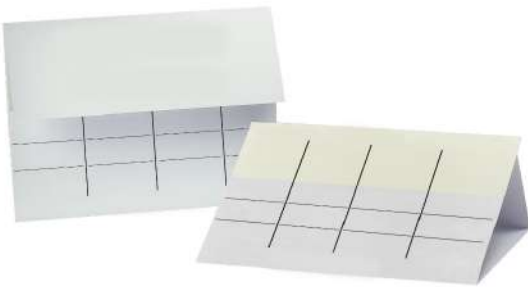
Rolls, sheets and final discs formats available in various sizes.

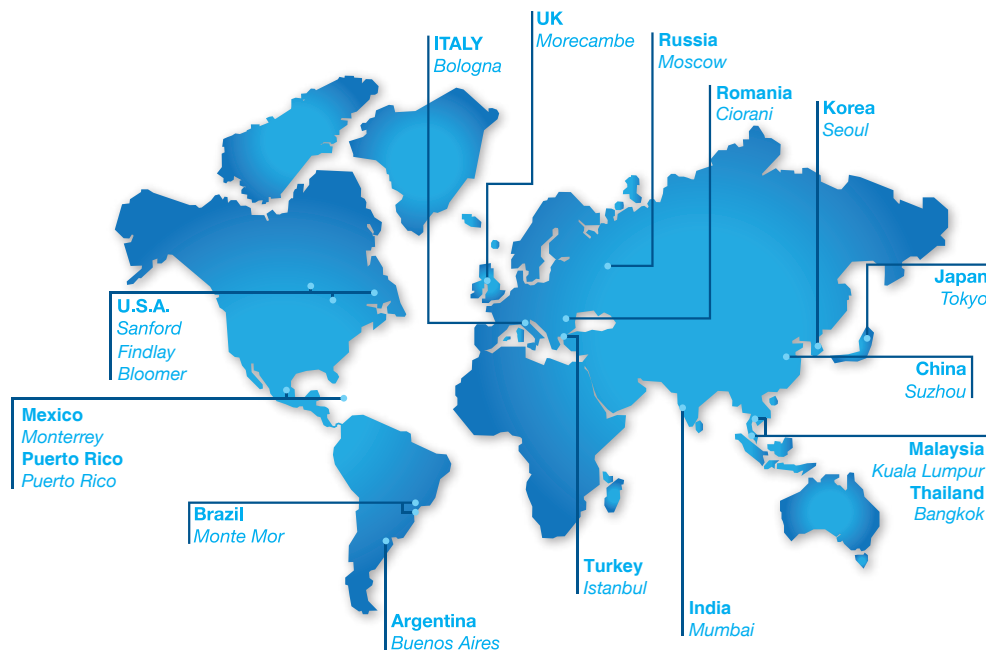
Discover our new specimen collection card

Our new collection card is designed to capture diverse small Eukaryotic organisms including plants, fungi, insects, and parasites. Engineered with a protective cover, the card allows for live collection and direct crushing of organisms onto the specialized collection paper eliminating the need for complex preparations beforehand. Our collection paper is made from pure cotton material and treated with chemicals to ensure long-term preservation of nucleic acids at ambient temperatures for over two decades. The innovative design features four distinct areas, enabling the collection of multiple samples of the same nature or repeated samples of the identical specimen(replicates). This not only enhances result accuracy but facilitates. Also, higher quantities of DNA recovery.

Features

- DNA-free card for higher accuracy of the results
- High quality STR profiling and NGs studies
- Direct-multiplex PCR and Quantitative PCR
- Long-term storage and transportation of samples at ambient temperature
- User-friendly design to facilitate collection, avoid cross-contamination and to protect the bio samples
- Customizable upon request





WORLDWIDE

EUROPE

Italy Office
Headquarters
GVS S.p.A.
Via Roma 50
40069 Zola Predosa (BO) - Italy
Tel. +39 051 6176311
gvs@gvs.com

Russia
GVS Russia LLC.
Profsoyuznaya Street, 25-A, office 102
117418, Moscow
Russian Federation (Russia)
Tel. +7 495 0045077
gvsrussia@gvs.com

United Kingdom
GVS Filter Technology UK Ltd.
Caton Road, Lancaster, Lancashire,
LA1 3PE, UK.
Tel. +44 (0) 1524 847600
gvsuk@gvs.com

Romania
GVS Microfiltrazione srl
Sat Ciorani de Sus 1E - Comuna Ciorani
Prahova România
Tel. (+40) 244 463044
gvsro@gvs.com

Turkey
GVS Türkiye
Nidakule Merdivenköy Mahallesi
Bora Sokak No:1 Kat:7 - 34732 Istanbul
Tel. +90 216 504 47 67
gvsurkey@gvs.com

PRODUCT COLLECTION -
Disc and Sheet Membranes
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ASIA

China
GVS Technology (Suzhou) Co., Ltd.
No.8 Taishan Road, 215129
Suzhou New District, Suzhou, Jiangsu, China
Tel. +86 512 6661 9880
lifesciences.cn@gvs.com

GVS Shanghai Transfusion Technology Co., Ltd.
No.500 Youdong Rd
40069 Shanghai, China
Tel. +86 21 3415 3961

Japan
GVS Japan K.K.
KKD Building 4F, 7-10-12 Nishishinjuku
Shinjuku-ku, Tokyo 160-0023 Japan
Tel. +81 3 5937 1447
gvsjapan@gvs.com

Korea
GVS Korea Ltd
#315 Bricks Tower
368 Gyungchun-ro(Gaun-dong),
Namyangju-si, Gyunggi-do,
Tel: +82 31 563 9873
gvs-korea@gvs.com

India
GVS Filter India Pvt Ltd
Unit No 35 & 36 on First Floor
Ratna Jyot Industrial Premises Irla Lane,
Irla Vile Parle, Mumbai 400056, India
gvsindia@gvs.com

Malaysia
GVS Filtration Sdn.Bhd
Lot No 10F-2B, 10th Floor, Tower 5 @ PFCC
Jalan Puteri 1/2, Bandar Puteri
47100 Puchong, Selangor, Malaysia
Tel: +60 3 7800 0062
gvs-malaysia@gvs.com

Thailand
GVS Thailand
88 Ratchadaphisek Rd,
Office 10E03 - Khlong Toei,
Bangkok 10110
gvs-thailand@gvs.com

AMERICA

U.S.A.
GVS North America
63 Community Drive
Sanford, ME 04073 - USA
Tel. +1 866 7361250
gvsusa@gvs.com

GVS Filtration Inc.
2150 Industrial Drive
Findlay, OH. 45840 - USA
Tel. +1.419.423.9040
gvsfiltration@gvs.com

2200 W 20th Avenue
Bloomer, WI 54724 - USA
Tel. +1.715.568.5944
gvsfiltration@gvs.com

Puerto Rico
GVS Puerto Rico, LLC
98 Carr 194 - Fajardo,
Puerto Rico, 00738-2988, USA
Tel. +1.787.355.4100
gvspuertorico@gvs.com

México
GVS Filter Technology de Mexico
Universal No. 550, Vynmsa Aeropuerto Apodaca
Industrial Park, Ciudad Apodaca, Nuevo León, C.P.
66626 - México
Tel. +52 81 2282 9003
gvs-mex@gvs.com

Argentina
GVS Argentina S.A.
Avenida Rivadavia 13.332
1704 Ramos Mejía,
Buenos Aires - Argentina
Tel. + 5411 48614750
lifesciences.ar@gvs.com

Brazil
GVS do Brasil Ltda.
Rodovia Conego Cyriaco Scaranello Pires 251
Jardim Chapadão, CEP 13193-580
Monte Mor (SP) - Brasil
Tel. +55 19 38797200
gvs@gvs.com.br