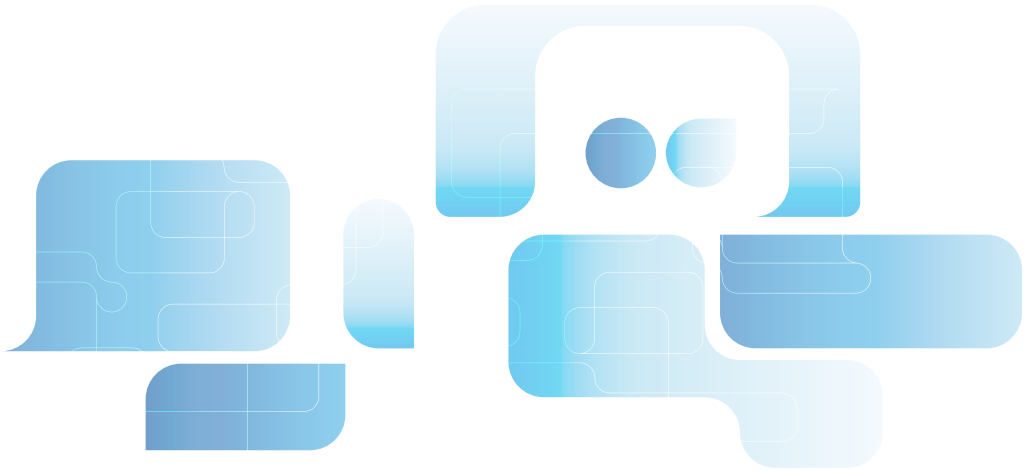
DISC AND SHEET MEMBRANES PRODUCT COLLECTION



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.

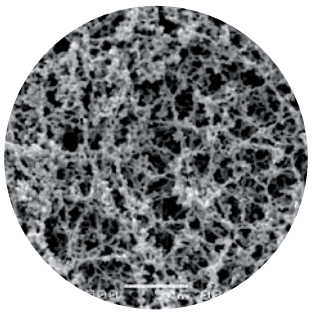
Global growth

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

Disc and Sheet Membranes Index

Cellulose Acetate (CA) Membrane



ACETATE Cellulose Acetate Membrane Plus

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.

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

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

Pore sizes	Dimensions Packaging	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
	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

Polyethersulfone (PES) Membrane

ULTRASep Polyethersulfone 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

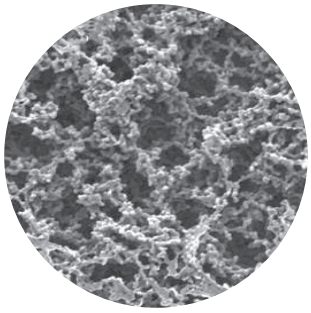
Pore Size (µm)	Flow Time (s)	Volume/Vacuum (mL/ in Hg)	Flow Rate (mL/min/cm^2 @ 10 psi)	Bubble Point (psi)
0.03	200-500	250/20	3.18-7.95	90-110
0.1	100-200	250/20	7.95-15.91	70-90
0.2	35-70	250/20	22.72-45.45	50-70
0.4	20-40	250/20	39.77-79.53	35-50
0.6	12-25	250/20	63.63-132.55	21-32
0.8	80-160	500/5	80-159	13-28
1.2	65-130	500/5	98-196	11-22

Ordering information

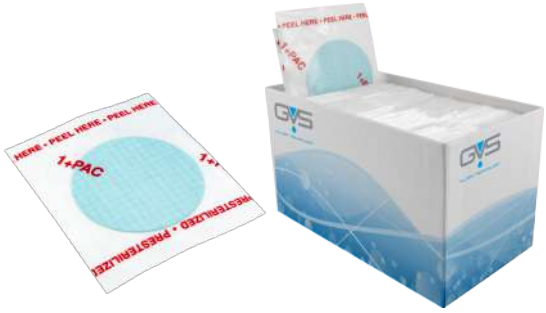
Pore sizes: Dimensions Packaging	13 mm 100/pk	25 mm 100/pk	47 mm 100/pk	47 mm 200/pk	90 mm 25/pk	142 mm 25/pk	293 mm 25/pk	200x200 mm 5/pk	30 cmx3 m 1/pk
0.03 µm	3032875	3032876	3029505		3018505			1235748	3057106
0.1 µm			1214756		1222230			1225881	3026365
0.22 µm		1214193	1214465	1226158*	1214920	1214169	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	1214171		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



MICRON NC (MCE) Membrane Sep



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**	**47 mm 1000/pk**	**50 mm 1000/pk**
Color	**white**	**black**	**white**	**black**	**white**
Pore sizes					
0.22 µm	1216720		1214396		
0.45 µm	1216721	1216719	1214923	1213643	1222980
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			

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
- 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 mantain 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.

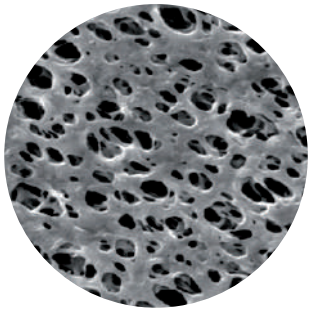
Black MCE with White Grids provide color contrast between the filter and white or beige microorganisms without the need for counter-stain. Commonly used for bottled water, carbonated beverages, beer and wine analysis. The contrasting grid lines facilitate counting of colonies.

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

Nylon 66 (NY) Membrane



MAGNA
Nylon 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

Disc and Sheet Membranes

Nylon 66 (NY) Membrane, white
Ordering information

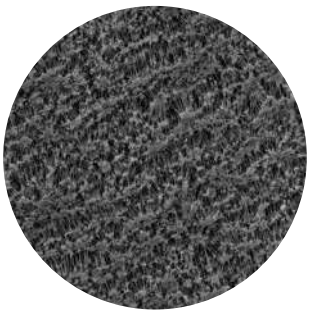
Pore sizes Dimensions Packaging	13 mm 100/pk	25 mm 100/pk	37 mm 100/pk	47 mm 100/pk	47 mm 1000/pk	47 mm Gridded 100/pk
0.1 µm	1213760	1213761		1213762	3026917*	
0.22 µm	1213766	1213768		1213769		
0.45 µm	1213774	1213775		1213776 1220671*		1213825 1213845
0.65 µm		1213782		1213783		
0.8 µm	1213788	1213789	1214881	1213790		3013826
1.2 µm	1213794	1213796	1230356	1213797		1214880
5.0 µm	1213810	1213811		1213812		3048260

***sterile**

Pore sizes Dimensions Packaging	90 mm 25/pk	142 mm 25/pk	293 mm 25/pk	200x200 mm 5/pk	30 cm x3 m 1/pk
0.1 µm	1213763	1213764	1213765	1222859	1241477
0.22 µm	1213770	1213771	1213772	1222858	1224690
0.45 µm	1213778	1213779	1213780	1222857	1225982
0.65 µm	1213784	1213786		1222856	3052148
0.8 µm	1213791	1213792	1213793	1222855	
1.2 µm	1213798	1213799	1213800	1222854	1214956
5.0 µm	1213813	1213815	1213816	1222851	1221441

***sterile**

Polytetrafluoroethylene (PTFE) Membrane



PTFE Sep
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

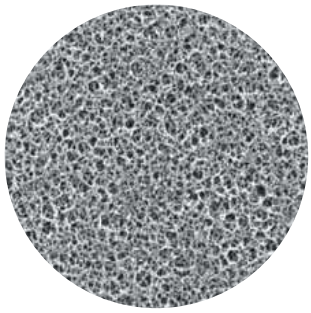
Pore Size (µm)	Bubble Point (EtOH) (kPa)	Flow Time (MeOH) (sec)	Thickness (µm)
0.22	107.9 -152.0	80 -140	100 -180
0.45	63.7-103.0	40 - 75	100 -180

Ordering information

Pore sizes	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

Pore sizes	Dimensions Packaging	90 mm 25/pk	142 mm 25/pk	293 mm 25/pk	200x200 mm 5/pk	305x305 mm 50/pk
	0.22 µm	1215488	1215489		3026028	1267681
	0.45 µm	1215494	1215495	1215496	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 mechanically 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

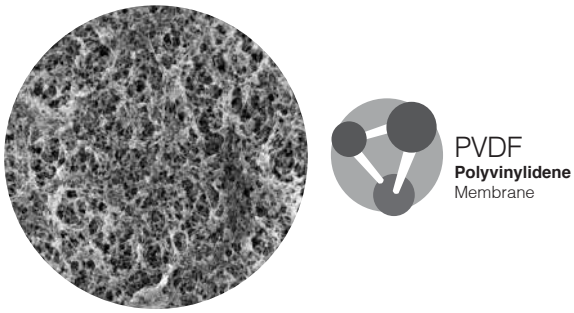
Performance

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

Pore sizes	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.

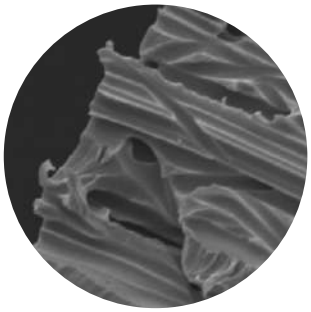
Performance

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

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

Polycarbonate Track Etched (PCTE) Membrane



PORETICS
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	4×10^4	3	1	1000	11 (g)
14	5×10^4	6	0.2	1400	63.5 (g)
12	1×10^5	8	0.4	1250	63.5 (g)
10	1×10^5	10	0.5	1150	34.5 (g)
8	1×10^5	7	0.7	1000	30 (g)
5	4×10^5	10	1.2	700	30 (g)
3	2×10^6	9	2	440	37.5 (g)
2	2×10^6	10	3	300	16.5 (f)
1	2×10^7	11	6	130	20 (f)
0.8	3×10^7	9	7	90	18 (f)
0.6	3×10^7	9	9	60	7.5 (f)
0.4	1×10^8	10	12	33	7.5 (f)
0.2	3×10^8	10	20	10	3 (f)
0.1	4×10^8	6	30	2.5	1.5 (f)
0.08	4×10^8	6	38	0.6	0.75 (f)
0.05	6×10^8	6	50	0.4	0.37 (f)
0.03	6×10^8	6	NA	0.2	0.075 (f)
0.01	6×10^8	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 AOX Hydrophilic Membrane
Ordering information

Pore sizes: Dimensions / Packaging	25 mm 100/pk	47 mm 100/pk
0.4 µm	3026431	1215071

PCTE Hydrophilic Black Membrane
Ordering information

Pore sizes: 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	3022140	
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

PCTE Hydrophilic Membrane - Sheets and Rolls
Ordering information

Pore sizes 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

Pore sizes Dimensions Packaging	13 mm 100/pk	25 mm 100/pk	47 mm 100/pk	90 mm 30/pk	203x254 mm 30/pk	203x254 mm 30/pk	25x80 mm 50/pk
0.01 µm			1226494		3032133		
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 Hydrophilic Membrane - Disks
Ordering information

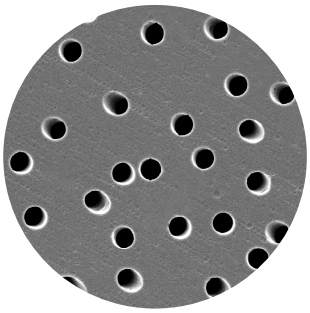
Pore sizes Dimensions Packaging	13 mm 100/pk	19 mm 100/pk	25 mm 100/pk	37 mm 100/pk	47 mm 100/pk
0.01 µm	1215046		1215321		1215068
0.03 µm	1215047	1227353	1215057		1215069
0.05 µm	1215048	1221229	1220868		1215070
0.08 µm	1222092	1220668	1215058		1222093
0.1 µm	1215605	1215056	1215606		1215608
0.2 µm	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

Pore sizes 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		

Polyester Track Etched (PETE) Membrane



PORETICS
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	1×10^5	9	0.5	1150	34.5 (g)
8	1×10^5	7	0.7	1000	30 (g)
5	4×10^5	10	1.2	700	30 (g)
3	2×10^6	9	2	440	37.5 (g)
2	2×10^6	10	3	300	16.5 (f)
1	2×10^7	11	6	130	20 (f)
0.8	3×10^7	9	7	90	18 (f)
0.6	3×10^7	9	9	60	7.5 (f)
0.4	1×10^8	10	12	33	7.5 (f)
0.2	3×10^8	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)

Disc and Sheet Membranes

PETE Membrane - Disks and Sheets
Ordering information

Pore sizes	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
	0.2 µm	1220969	1221383	1215288	1222240	1221385		1220886
	0.4 µm	1221387	1221388	1215373	1220702	1221389		1222242
	0.8 µm		1221398	1215374	1221399		1221401	1222246
	1.0 µm	1215379	1215308	1220871	1221402	1222248	1222249	1221334
	2.0 µm		1221404	1221405				1222251
	3.0 µm	1221409	1221410	1215367	1222253	1221411	1221412	1222254
	5.0 µm	1215324	1221413	1215183	1221414	1221415	1221416	1222256
	8.0 µm	1221417	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
1238010	100/pk	Drain Disc, 37 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.

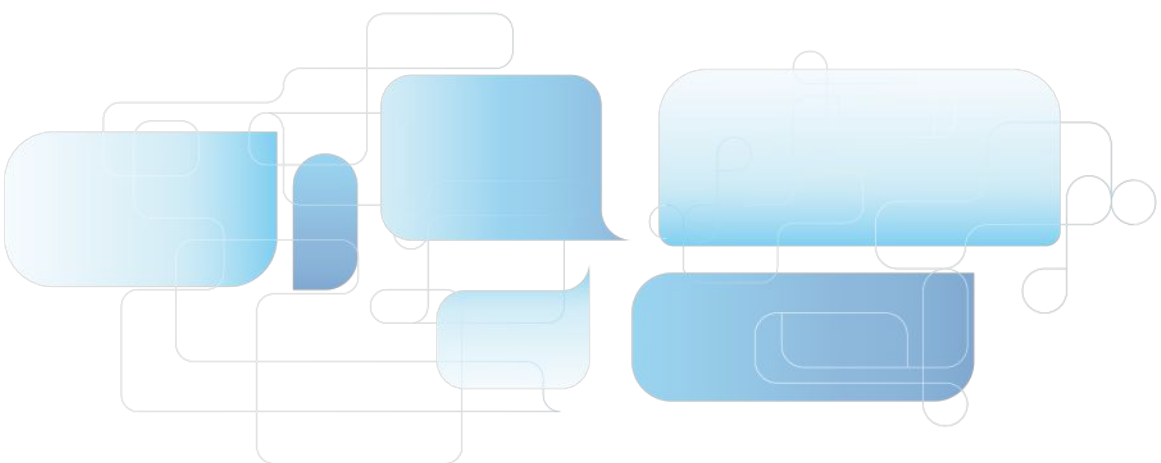
Typical analytical precipitates such as cold barium sulphate, lead sulphate, zinc and nickel sulphides, etc.

Disc and Sheet Membranes

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_2O_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



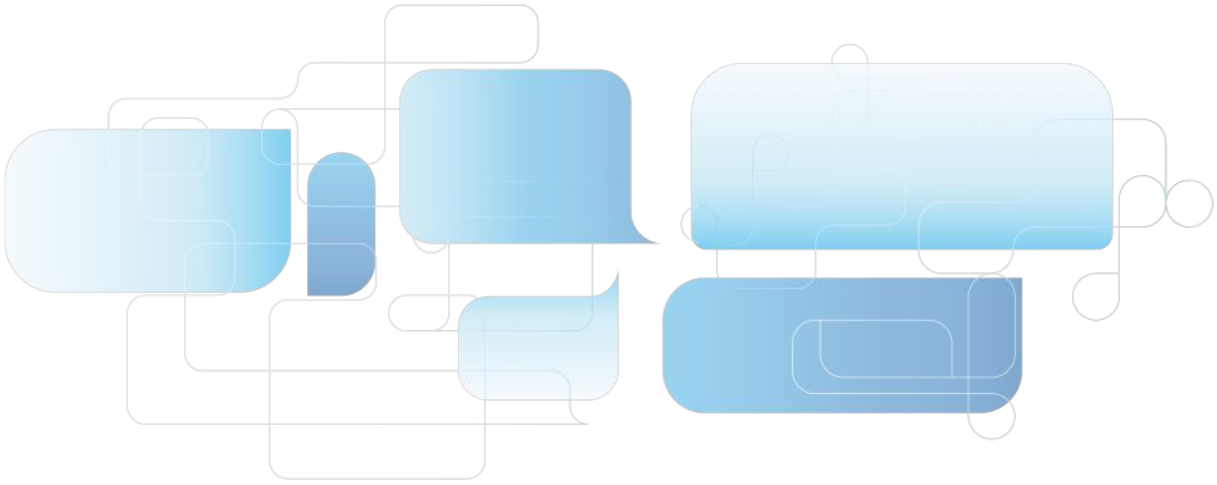
Disc and Sheet Membranes

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 analist 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/m^2)	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

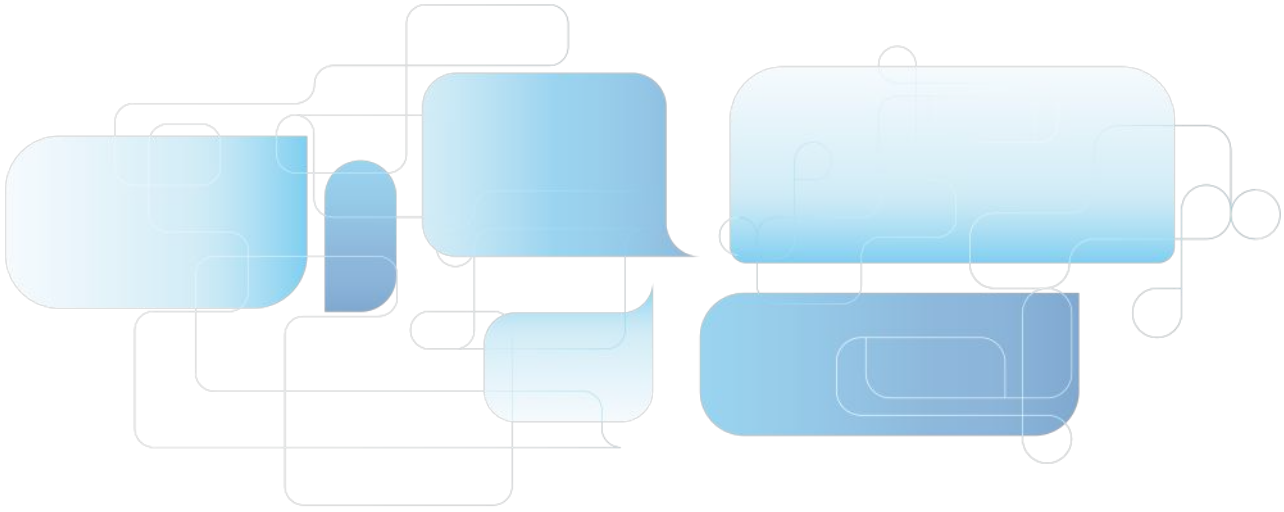
Disc and Sheet Membranes

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.

Disc and Sheet Membranes

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/m^2)	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

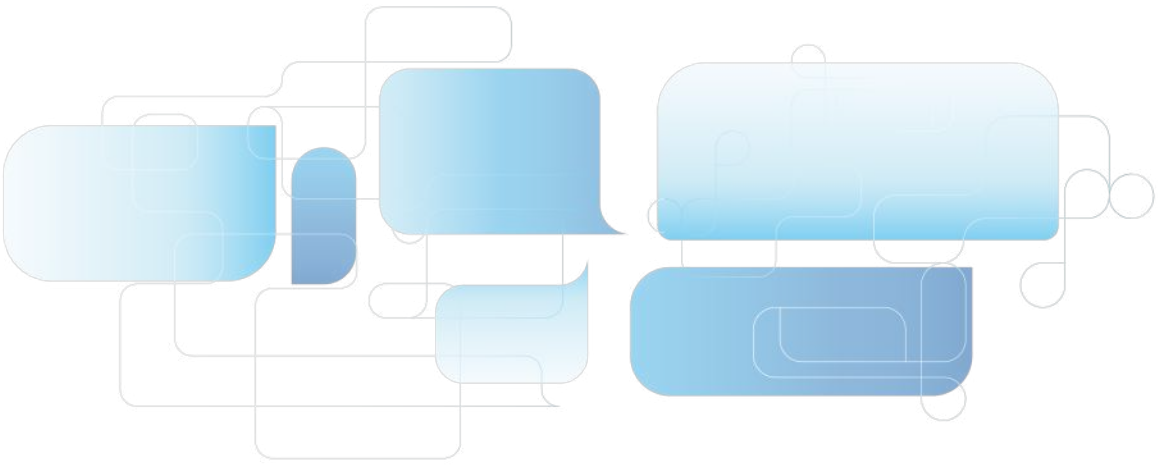
Ordering information

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.

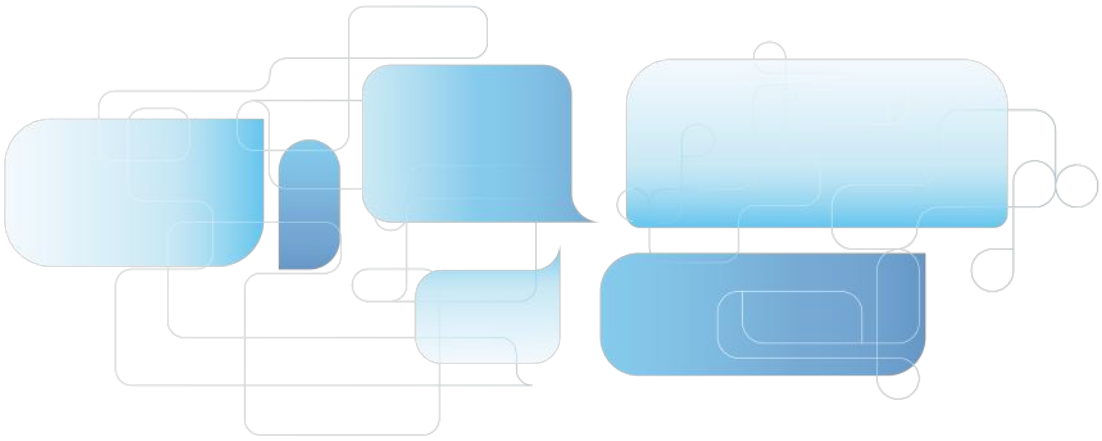
DME91 GRADE - Very fast filtration. Crêped

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



Disc and Sheet Membranes

Technical Specifications

GVS	Filtration Speed	Weight (g/m^2)	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

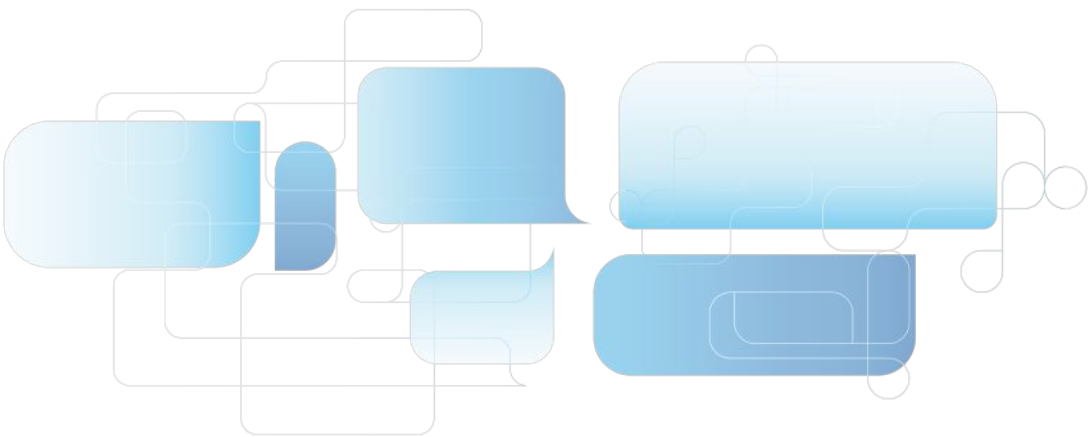
Ordering information

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/m^2)	Thickness (µm)
DMS60	Slow	140	320

Ordering information

Diameter(mm)	Product Code	Quanity/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.

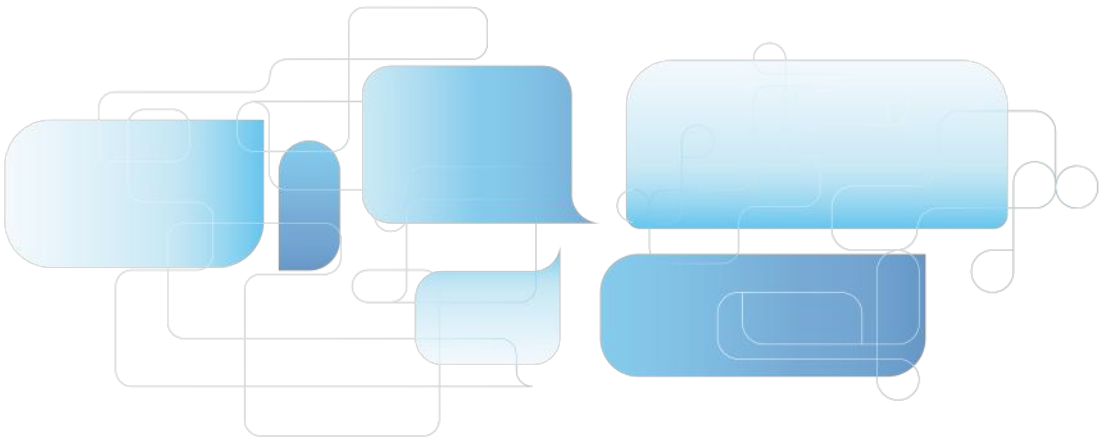
It is also suitable for cellular cultures.

Disc and Sheet Membranes

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	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



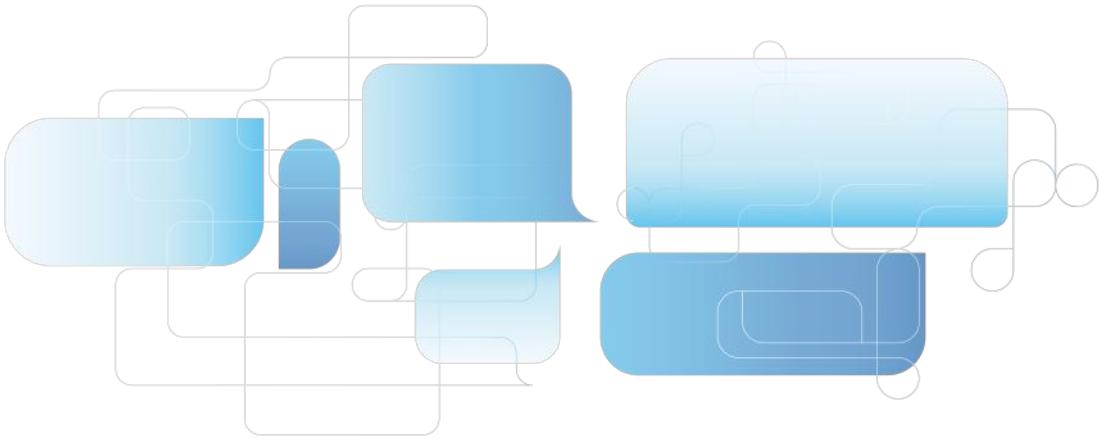
Disc and Sheet Membranes

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/m^2)	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

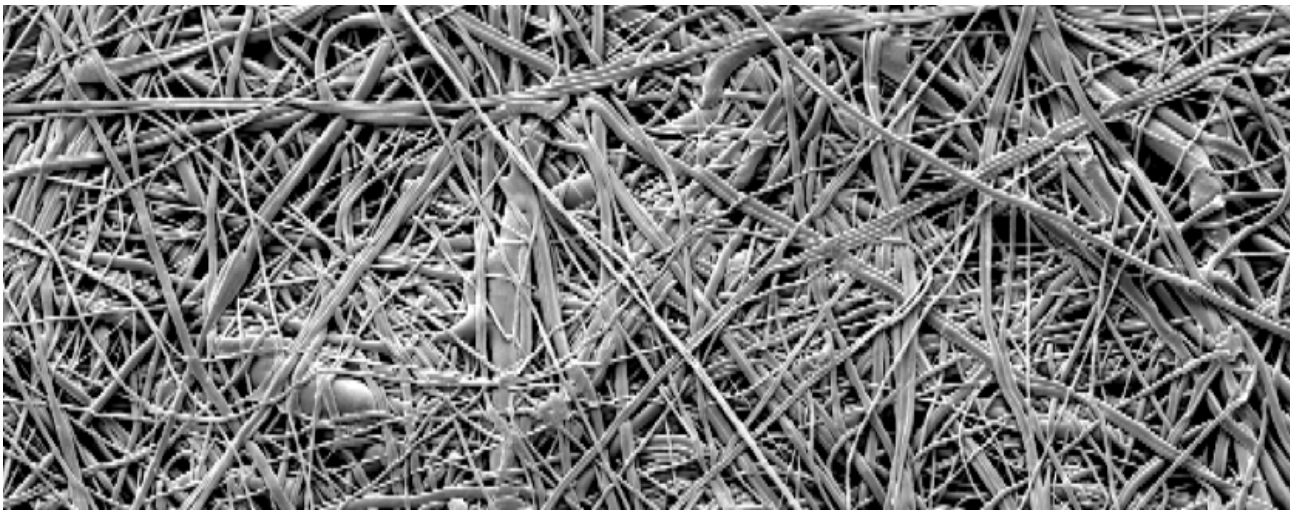
Ordering information

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 (SiO_2) 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 900ºC, 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, SO_2, SO_3, H2, SO_4, NO and NO_3)

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/m^2)	Thickness (µm)	Retention Dop (*) (%)	Maximum Temperature (ºC)	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

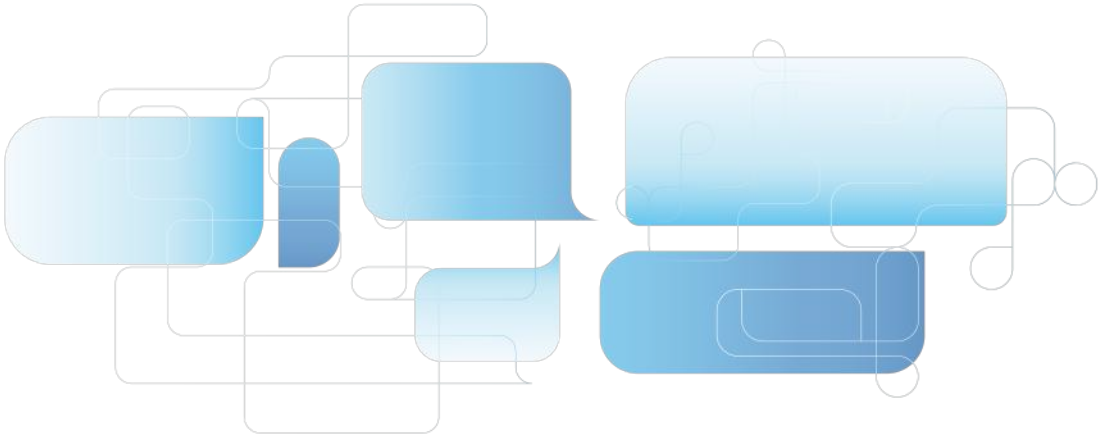
GVS	Equivalent 1	Equivalent 2	Equivalent 3	Equivalent 4
D0QF1	QM-A	QF20	QF10	T293
D0QF2	-	-	-	MK360

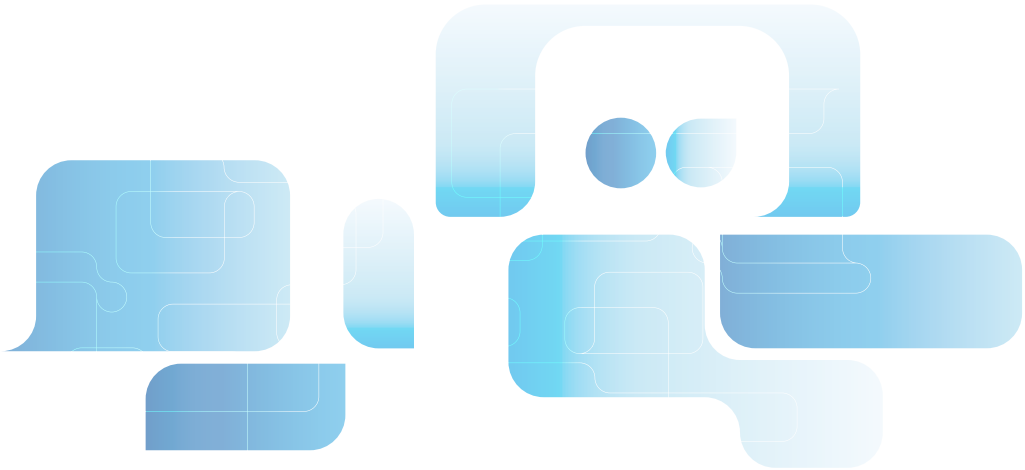
Trace elements in ppm

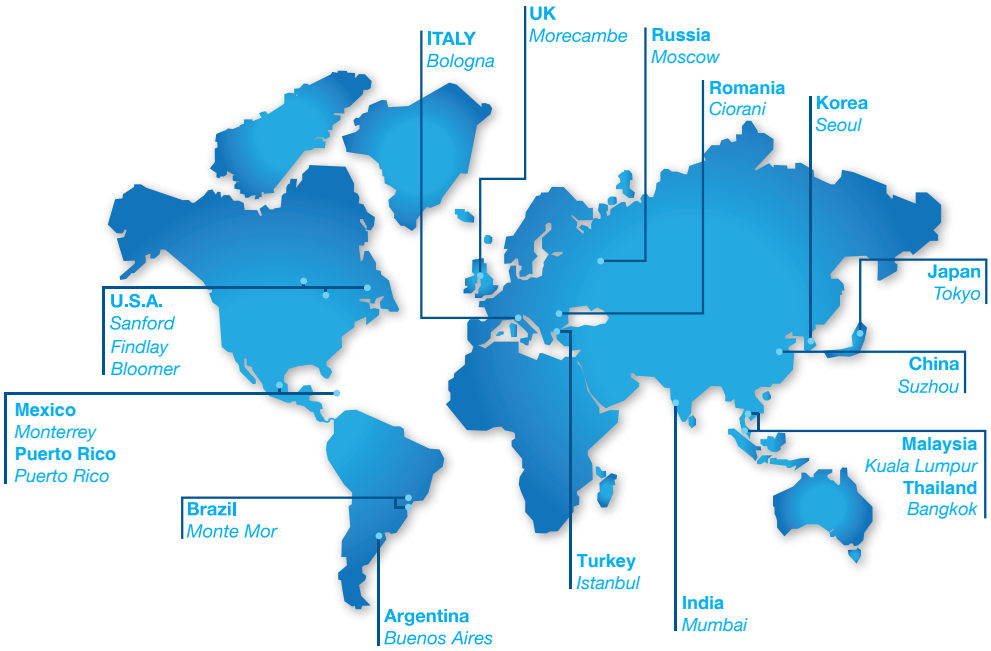
Element	D0QF1	D0QF2
Al	50	25
As	0.75	0.2
Cd	1.5	<0.02
Co	1	<0.5
Cr	5	3.5
Cu	1.25	<1

Element	D0QF1	D0QF2
Fe	30	20
Hg	<0.05	<0.025
Mg	25	15
Mn	1.25	1
Na	40	10
Ni	2	0.5

Element	D0QF1	D0QF2
Pb	0.75	0.3
Sb	1.25.	<1
Sn	0.5	<0.5
Tl	2.5	1.5
V	0.5	<0.5
Zn	5	3







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