Environmental water quality testing



cytiva

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Introduction

Water is Earth's life force. Whether you work in wastewater, drinking water, or ground and surface water analysis, laboratory testing is a huge part of everyday life.

Environmental water quality and contamination can have significant and wide-ranging impacts on ecosystems, human health, and biodiversity. Contaminants arise from numerous locations including agricultural, industrial, and domestic sources.

Rigorous testing can help ensure that water is safe, fit for purpose, and compliant with relevant regulations. Modern science can detect thousands of harmful chemicals and pathogens in water, and regulations vary from region to region.

Two simple objectives drive the business of laboratory testing: the need for reliable, reproducible results and increased productivity.

Reproducibility is a scientific necessity to ensure the safety of water supply. If results are unreliable laboratories risk non-compliance with local regulations and put public health in danger. It can lead to unnecessary retests, which adds to technicians' workloads and increase costs.

Water testing is expensive, time-consuming, labor-intensive; however, it is entirely necessary. Laboratories must be conscious of ways to reduce costs while prioritizing safety.

This brochure highlights the Cytiva products we offer for environmental water monitoring.

Sources of contamination

Contaminants that have the potential to impact water quality are varied and dependent on geography and localized developments such as human habitation, industrial sites and natural features. What links these contaminants and how they are assessed relies on test methods which are regulated in various countries and regions.

We offer a wide range of filtration products to facilitate reliable, reproducible, and standard requirement acceptance for a range of these tests, including filter papers for suspended solids testing, membranes for microbiology analysis, groundwater sampling capsules, and devices for eDNA analysis.



SEDIMENT

Caused by natural erosion and man-made activities, leads to water turbidity.

ANIMAL WASTE (NATURAL OR FARMING)

Microbial and pathogenic contamination can threaten water-based species and harm humans if they swim in or consume polluted water.

Livestock waste is a potential source of estrogenic and antibiotic contamination.

AGRICULTURAL CONTAMINANTS

Contaminants may include pesticides, fertilizers, herbicides, sediment, and agricultural runoff containing nutrients like nitrogen and phosphorus.

Fertilizer contamination can lead to algae blooms that impact oxygen levels in water.

STORMWATER AND URBAN RUNOFF

Runoff may carry a wide range of chemical and biological contaminants into environmental water supplies.

INDUSTRIAL WASTE

Industrial activities can release heavy metals leading to toxicity for aquatic life and potential bioaccumulation in the food chain.

Effluents may contain chemicals (including PFAS), disinfection by products (DBPs), hydrocarbons, microplastics, and suspended solids.

DOMESTIC WASTE

Untreated blackwater (sewage) and greywater (other domestic) can carry pathogens and chemical contaminants into environmental water supplies.

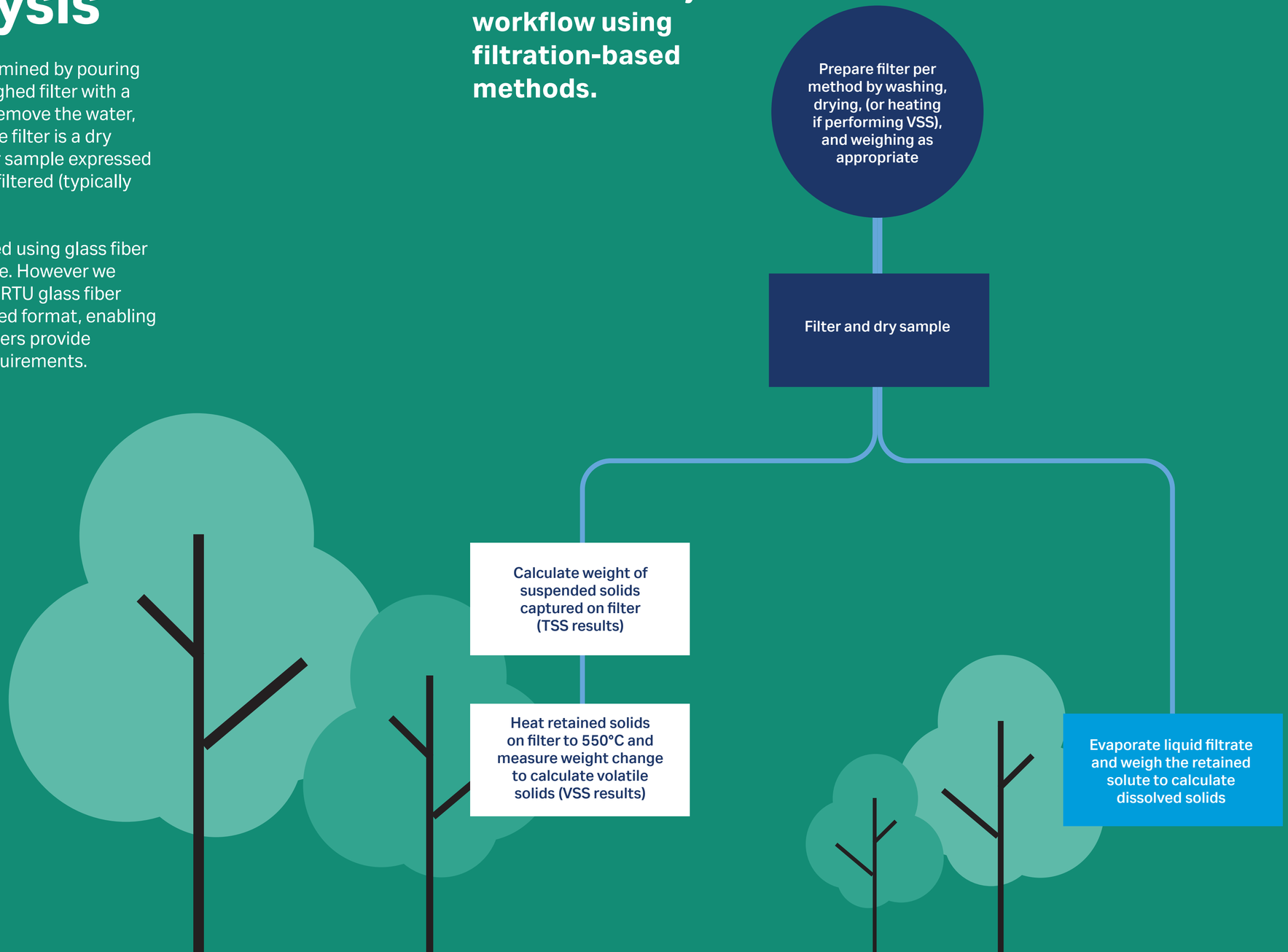
Chemical contamination may include: PFAS, disinfection by-products (DBPs), hormones and drugs.

Particulate analysis

The level of suspended solids in a water sample is determined by pouring a carefully measured volume of water through a preweighed filter with a specified particulate retention size, drying the filter to remove the water, and then weighing the filter again. The weight gain of the filter is a dry weight measure of the particulates present in the water sample expressed in units derived or calculated from the volume of water filtered (typically milligrams per liter).

Suspended solids measurements are typically performed using glass fiber filter circles that need additional preparation prior to use. However we have developed ready-to-use 934-AH™ RTU and GF/C™ RTU glass fiber filters, which are supplied in a prewashed and preweighed format, enabling considerable time savings in the laboratory. Our RTU filters provide reproducible results and conformance to regulation requirements.

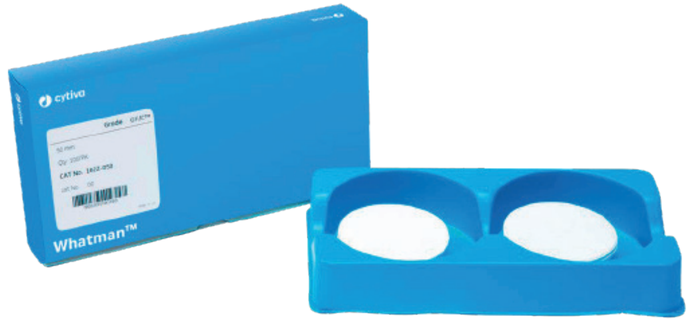
Total solids analysis workflow using filtration-based methods.



Solids testing

What are you testing for?	Product	Characteristics and benefits
Solids, including: • Total suspended solids • Total dissolved solids • Total volatile solids	**GF/C glass fiber filter** **934-AH glass fiber filter** Ordering information page 7	• Conform to requirements of standard methodologies: GF/C for EN 872; 934-AH SM2540 C/D/E • High loading capacity enabling filtration of very turbid samples • Retention of very fine particles
	A/E glass fiber filter	• Borosilicate glass without binder • Suitable for water solids testing and gravimetric analysis • High flow rates, wet strength, and dirt (solids) holding capacities
	934-AH RTU glass microfiber filter **GF/C RTU microfiber glass filter** Ordering information page 7	• Share same benefits as traditional 934-AH and GF/C glass fiber filters • Ready-to-use format saves time • GF/C RTU is pretreated to meet weight loss requirements of EN872 • 934-AH RTU is pretreated according to SM2540 C/D/E. • Each preweighed filter comes in an aluminum pan, with the filter weight clearly noted • Each pan has its own unique barcode





GF/C and 934-AH glass fiber filters meet the requirements of EN872 and EPA 2540D.

Ordering information

Glass fiber filters for solids analysis, 100/pack

	Standard glass microfiber filters Glass fiber filters for solids analysis, 100/pack		Ready-to-use (RTU) glass fiber filters							
Grades	**GF/C**	**934-AH**	**934-AH RTU prewashed, dried, and weighed***	**934-AH RTU economy (prewashed and dried)**	**934-AH RTU prewashed, dried and weighed to 5 decimal places**	**GF/C RTU prewashed, dried, and weighed**	**GF/C RTU economy (prewashed and dried)**	**934-AH prewashed, fired, and weighed**	**934-AH RTU for volatiles economy (prewashed and fired)**	**934-AH RTU prewashed, twice dried and weighed**
Typical particle retention (µm)**	**1.2**	**1.5**	**1.5**	**1.5**	**1.5**	**1.2**	**1.2**	**1.5**	**1.5**	**1.5**
Diameter (mm)	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**	**Product code**
24	-	1827-024	9907-024	-	-	-	-	-	-	-
35	-	1827-035	-	-	-	-	-	3827-035	4827-035	-
42.5	1822-042	1827-042	9907-042	-	-	-	-	3827-042	4827-042	-
47	1822-047	1827-047	9907-047	2827-047	9907-9436	3822-047	2822-047	3827-047	4827-047	9927-047
55	1822-055	1827-055	9907-055	-	-	-	-	-	-	-
70	1822-070	1827-070	9907-070	-	-	3822-070	2822-070	3827-070	4827-070	9927-070
90	1822-090	9907-090	9907-090	-	-	3822-070	2822-090	3827-090	4827-090	9927-090

For A/E glass fiber filter ordering information visit cytiva.com

* Each filter is supplied in an individual aluminum pan. ** Particle retention rating at 98% efficiency.

Microplastics analysis

Microplastics are defined as small plastic particles, typically less than 5 millimeters in size, that can be found in the environment. They originate from various sources, including the breakdown of larger plastic debris, the abrasion of plastic products, and the direct release of micro-sized plastic particles in personal care products or industrial processes. These particles can persist in the environment for long periods and pose risks to ecosystems and organisms.

Filtration is commonly used in microplastics analysis to separate microplastic particles from environmental samples such as water, sediment, or biological tissues. Before filtration a sample may undergo pretreatment steps to remove larger debris, this can involve processes such as sieving, settling, or centrifugation.

The sample is passed through a filter membrane or other filtration media with a specific pore size. The pore size of the filter is chosen to retain microplastics while allowing smaller particles and dissolved materials to pass through. Common pore sizes range from 20 µm down to 1 µm, depending on the study objectives and the expected size range of microplastics in the sample.

The filtration step both collects and concentrates any potential microplastic contaminants. Analysis can be performed using different methods including, microscopic identification (based on physical characteristics, such as size, shape, color, and surface texture) or chemical analysis, for example Fourier-transform infrared spectroscopy (FTIR) or Raman spectroscopy.



Ordering information

Product	Description	Quantity/pack	Product code
Whatman™ glass microfiber filters	Grade GF/A filter, 25 mm circle	100	1820-025
Whatman glass microfiber filters	Grade GF/B filter, 25 mm circle	100	1821-025
Whatman glass microfiber filters	Grade GF/C filter, 25 mm circle	100	1822-025
Whatman glass microfiber filters	Grade GF/D filter, 25 mm circle	100	1823-025
Whatman glass microfiber filters	Grade GF/F filter, 25 mm circle	100	1825-025
Whatman glass microfiber filters	Grade GF/F filter, 47 mm circle	100	1825-047
3-Piece filter funnel	Filter funnel, 3-piece, 25 mm, 16 ml reservoir	1	1950-002
3-Piece filter funnel	Filter funnel, 3-piece, 47 mm, 36 ml reservoir	1	1950-004
Syringe type holders	Syringe type membrane holder, stainless steel, 13 mm	1	1980-001
Whatman Anodisc™ circle with support ring	Anodisc circle with support ring, 25 mm, 0.2 µm pore size	50	6809-6022
Whatman Anopore™ inorganic membranes without support ring	Anodisc circle without support ring, 13 mm, 0.2 µm pore size	100	6809-7023
Whatman non-sterile mixed cellulose ester membranes	Mixed cellulose ester disc, gridded, white/black grid 3.1 mm, 0.45 µm pore size, 47 mm	100	7141-004
Whatman nylon membrane circles	Nylon membrane disc, 0.45 µm pore size, 25 mm	100	7404-002
Whatman non-sterile cellulose nitrate membranes	Cellulose nitrate membrane disc, plain, 5 µm pore size, 47 mm	100	10400212
Whatman PFTE membrane filters TE range	PTFE membrane, TE range (TE 35), 0.2 µm pore size, 25 mm	50	10411405
Whatman pop-top and swin-lok plastic filter holders	Pop-top plastic filter holder, 13 mm	10	420100
Whatman pop-top and swin-lok plastic filter holders	Swin-lok plastic filter holder, 25 mm	10	420200

Chemical analysis

Analytical chemistry plays a crucial role in environmental water monitoring. Through various analytical methods scientists can identify and quantify a wide range of chemical substances, including pollutants. This is critical for monitoring contaminants such as heavy metals, pesticides, pharmaceuticals, and industrial chemicals that can harm ecosystems and human health.

Chemical analysis techniques used frequently include high-performance liquid chromatography (HPLC), liquid chromatography–mass spectrometry (LC–MS), inductively coupled plasma (ICP), and spectrophotometry

Filtration of water samples prior to analysis is good practice in order to remove unwanted particles from the analysis, protecting delicate instruments from potentially damaging contamination.

When performing any chemical analysis an important consideration is ensuring sample preparation does not interfere with the analytes of interest. The choice of sample preparation filter should consider analysis type, regulatory standards, desired filter pore size, sample volume and sample handling.

We provide a wide selection of syringe filters and syringeless filters for analytical sample preparation.

Considerations when selecting analytical sample preparation filtration devices.



1. Analysis type

Consider analysis method and instrumentation

- HPLC/UHPLC
- IC
- LCMS
- General sample preparation

2. Sample type and standards

Review guidance, regulations and standards
Consider chemical compatibility of the sample and filtration device

3. Pore size

Choose the correct pore size based on application and/or analytical

chromatography column packing

- HPLC - 0.45 µm
- UHPLC - 0.2 µm

4. Sample volume and handling

Consider sample volume, device effective filtration area (EFA), hold-up volume and the use of a prefilter

Consider handling - manual, automation or syringeless

HPLC, UHPLC, and other analytical techniques

What are you testing for?	Low solids content		Hard-to-filter samples		HPLC/GC autosamplers	
Product	**Puradisc™ syringe filter** Ordering information page 12	**SPARTAN™ syringe filter** Ordering information page 12	**Whatman GD/X™ syringe filters** Ordering information page 13-14	**Whatman GD/XP syringe filters** Ordering information page 15	**Mini-UniPrep™ syringeless filters** Ordering information page 16-18	**Mini-UniPrep (G2) Syringeless Filters** Ordering information page 16-18
						
Characteristics and benefit	• Wide range of membranes, pore sizes and diameters • Prefilter: no • Diameter: 4, 13, 25, or 30 mm • Available pore sizes: 0.1, 0.2, 0.45, 0.7, 0.8, 1.0, 1.2, 2, 5 µm • Membrane materials available: Cellulose acetate, nylon, PES, PVDF, PTFE, GF, CA, RC, H-PTFE, CN	• HPLC certified • Prefilter: no • Diameter: 13 or 30 mm • Available pore sizes: 0.2 or 0.45 µm • Membrane materials available: Regenerated cellulose	• For hard-to-filter samples • Prefilter: multilayer glass filter • Diameter: 13 or 25 mm • Available pore sizes: 0.2, 0.45, 0.7, 1.0, 1.2, 1.6, 2.7, 5.0 µm • Membrane materials available: Cellulose acetate, nylon, PES, PVDF, PTFE, RC, GF/A, GF/B, GF/C, GF/D, GF/F, 934-AH, H-PTFE • Also available in sterile option	• For hard-to-filter samples where analytes of interest are inorganic ions • Prefilter: Multilayer polypropylene • Diameter: 25 mm • Available pore sizes: 0.45 µm • Membrane materials available: Nylon, PES, PVDF, PTFE, DpPP	• All-in-one filter and polypropylene autosampler vial • Prefilter: no • Slit-septum available • Translucent and amber housing available for light-sensitive samples • Dimensions: Once compressed equivalent to 12 mm × 32 mm vial • Available pore sizes: 0.2 or 0.45 µm • Membrane materials available: PTFE, RC, Nylon, PVDF, PES, GMF, DpPP	• All-in-one filter and borosilicate glass autosampler vial • Prefilter: no • Slit-septum available • Translucent and amber housing available for light-sensitive samples • Dimensions: Once compressed equivalent to 12 mm × 32 mm vial • Available pore sizes: 0.2 or 0.45 µm • Membrane materials available: PTFE

RC = regenerated cellulose, PVDF = polyvinylidene difluoride, PTFE = polytetrafluoroethylene, PES = polyethersulfone,
GMF = glass microfiber filter, GF = glass fiber, CA = cellulose acetate, DpPP = Polypropylene depth filter and H-PTFE = Hydrophilic PTFE

Regenerated cellulose membranes

Suitable for filtration of both aqueous and organic samples. We offer a range of filters for sample preparation for commonly used analytical techniques in water monitoring such as:
- HPLC or UHPLC
- Continuous flow analysis
- Gas chromatography (GC)

Ordering information

Puradisc syringe filters

Membrane type and diameter	Nylon 25 mm	PVDF 25 mm	PTFE 25 mm	PES 25 mm	H-PTFE 25 mm		CA 30 mm	
Pore size (µm)	Product code	Product code	Product code	Product code	Product code	Quantity	Product code	Quantity
0.2	6751-2502	6747-2502	6785-2502	6781-2502	6773-2502	200/pack	10462710	100/pack
0.2	6753-2502	-	6798-2502	6794-2502	6774-2502	1000/pack	10462700	500/pack
0.45	6751-2504	6747-2504	6785-2504	6781-2504	6773-2504	200/pack	10462700	100/pack
0.45	6753-2504	6749-2504	6798-2504	6794-2504	6774-2504	1000/pack	10462600	500/pack

SPARTAN syringe filters

Diameter		13 mm	13 mm with mini-tip	30 mm	
Membrane type	Pore size (µm)	Product code	Product code	Product code	Quantity
Regenerated cellulose	0.2	10463100	10463040	10463060	100/pack
Regenerated cellulose	0.2	10463102	10463042	10463062	500/pack
Regenerated cellulose	0.45	10463110	10463030	10463050	100/pack
Regenerated cellulose	0.45	10463112	10463032	10463052	500/pack



SPARTAN syringe filters.

Ordering information

Whatman GD/X syringe filters

			Non-sterile		Sterile
Membrane*	**Pore size (µm)**	**Diameter (mm)**	**150/pack**	**1500/pack**	**50/pack**
Nylon	0.2	13	6870-1302	6871-1302	-
	0.2	25	6870-2502	6871-2502	-
	0.45	13	6870-1304	6871-1304	-
	0.45	25	6870-2504	6871-2504	-
	5	25	6870-2550	6871-2550	-
PVDF	0.2	13	6872-1302	-	-
	0.2	25	6872-2502	6873-2502	6900-2502
	0.45	13	6872-1304	6873-1304	-
	0.45	25	6872-2504	6873-2504	6900-2504
PTFE	0.2	13	6874-1302	6875-1302	-
	0.2	25	6874-2502	6875-2502	-
	0.45	13	6874-1304	6875-1304	-
	0.45	25	6874-2504	6875-2504	-
PES	0.2	13	6876-1302	-	-
	0.2	25	6876-2502	6905-2502	6896-2502
	0.45	13	6876-1304	-	-
	0.45	25	6876-2504	6905-2504	6896-2504
RC	0.2	25	6887-2502	-	-
	045	25	6882-2504	6883-2504	-

* CA = Cellulose acetate; PES = Polyethersulfone; GF = Glass fiber; PVDF = Polyvinylidene difluoride; GMF = Glass microfiber; PTFE = Polytetrafluoroethylene, RC = Regenerated cellulose



Whatman GD/X syringe filters.

Ordering information

Whatman GD/X syringe filters

			Non-sterile		Sterile	
Membrane*	**Pore size (µm)**	**Diameter (mm)**	**150/pack**	**1500/pack**	**50/pack**	**500/pack**
CA	0.2	13	6870-1302	-	-	-
	0.2	25	6870-2502	-	6901-2502	-
	0.45	13	6870-1304	-	-	-
	0.45	25	6870-2504	-	6901-2504	-
GF/A‡	1.6†	13	6882-1316	-	-	-
	1.6†	25	6882-2516	-	-	-
GF/B‡	1†	13	6884-1310	-	-	-
	1†	25	6884-2510	-	-	-
GF/C‡	1.2†	13	6883-1312	-	-	-
	1.2†	25	6886-2512	-	-	-
GF/D‡	2.7†	13	6888-1327	-	-	-
	2.7†	25	6888-2527	-	-	-
GF/F‡	0.7†	13	6890-1307	-	-	-
	0.7†	25	6890-2507	6891-2507	-	-
	0.7†	13	6894-1304	-	-	-
934-AH‡	1.5†	25	6892-2515	-	-	-
GMF†	0.45†	25	6894-2504	6895-2504	6902-2504	-

* CA = Cellulose acetate; PES = Polyethersulfone; GF = Glass fiber; PVDF = Polyvinylidene difluoride; GMF = Glass microfiber; PTFE = Polytetrafluoroethylene, RC = Regenerated cellulose
† Glass microfiber particle retention rating
‡ Contains GMF 150 without the GF/F prefilter

Ordering information

Whatman GD/XP syringe filters

Product code	Membrane*	Pore size (µm)	Diameter (mm)	Hydrophilic	Solvent resistance	Quantity/pack
6970-2504	Nylon	0.45	25	Yes	Good	150
6971-2504	Nylon	0.45	25	Yes	Good	1500
6972-2504	PVDF	0.45	25	Yes	Good	150
6973-2504	PVDF	0.45	25	Yes	Good	1500
6974-2504	PTFE	0.45	25	No	Very good	150
6994-2504	PES	0.45	25	Yes	Poor	150
6995-2504	PES	0.45	25	Yes	Poor	1500

* PES = Polyethersulfone; PVDF = Polyvinylidene difluoride; PTFE = Polytetrafluoroethylene; DpPP = Polypropylene depth filter



Whatman GD/XP syringe filters.

Ordering information

Mini-UniPrep G2 filter vials with inner glass storage vial
Note: Adjust autosampler needle height to a minimum of 5 mm from the bottom of the Mini-UniPrep (G2) Syringeless Filters.

Membrane*	Pore size (µm)	Housing	Cap	Product code 1000/pack	Product code Starter pack (100/pack + Hand compressor)
PTFE*	0.2	Translucent	Normal	-	GN203NPEDRGSP
PTFE	0.2	Translucent	Slit septum	GS503NPEORG	GS203NPEORGSP
PTFE	0.2	Amber	Normal	-	GN203APEDRGSP
PTFE	0.45	Translucent	Normal	GN503NPUORG	GN203NPUORGSP

Hand compressor	Product code
Mini-UniPrep G2 hand compressor 1/pack	MUPG2HCPWC1

Multi-compressor	Product code
Mini-UniPrep G2 multi-compressor 1/pack, comes with one tray	MUPG2MCPWC8
Mini-UniPrep G2 multi-compressor tray 1/pack	MUPG2MCWT8

* PTFE = polytetrafluoroethylene



Mini-UniPrep G2 hand compressor.

Ordering information

Mini-UniPrep G2 filter vials with polypropylene housing
Note: Adjust autosampler needle height to a minimum of 3 mm from the bottom of the Mini-UniPrep.

Membrane	Pore size (µm)	Housing	Cap	Product code 100/pack	Product code 1000/pack
PTFE*	0.2	Translucent	Standard	UN203NPEORG	UN503NPEORG
PTFE	0.2	Translucent	Slit septum	US203NPEORG	US503NPEORG
PTFE	0.2	Amber	Standard	UN203APEORG	-
PTFE	0.45	Translucent	Standard	UN203NPUORG	UN503NPUORG
PTFE	0.45	Translucent	Slit septum	US203NPUORG	US503NPUORG
PTFE	0.45	Amber	Standard	UN203APUORG	-
PVDF*	0.2	Translucent	Standard	UN203NPEAQU	UN503NPEAQU
PVDF	0.2	Translucent	Slit septum	US203NPEAQU	US503NPEAQU
PVDF	0.45	Translucent	Standard	UN203NPUAQU	UN503NPUAQU
PVDF	0.45	Translucent	Slit septum	US203NPUAQU	US503NPUAQU
PES*	0.2	Translucent	Standard	-	UN503NPEPES
PES	0.2	Translucent	Slit septum	-	US503NPEPES
PES	0.45	Amber	Standard	UN203APUPES	-
PES	0.45	Translucent	Slit septum	-	US503NPUPES
RC*	0.2	Translucent	Standard	UN203NPERC	UN503NPERC
RC	0.45	Translucent	Standard	UN203NPURC	-
Nylon	0.2	Translucent	Standard	UN203NPENYL	UN503NPENYL
Nylon	0.2	Translucent	Slit septum	-	US503NPENYL
Nylon	0.45	Translucent	Standard	UN203NPUNYL	UN503NPUNYL
Nylon	0.45	Translucent	Slit septum	US203NPUNYL	US503NPUNYL

* RC = regenerated cellulose; PVDF = Polyvinylidene difluoride; PTFE = Polytetrafluoroethylene; PES = Polyethersulfone; DpPP = Polypropylene depth filter

Membrane	Pore size (µm)	Housing	Cap	Product code 100/pack	Product code 1000/pack
DpPP*	0.45	Translucent	Standard	UN203NPUDPP	-
Glass fiber	0.45	Translucent	Standard	UN203NPUGMF	US503NPUGMF
Glass fiber	0.45	Translucent	Slit septum	-	US503NPUGMF

* DpPP = Polypropylene depth filter

Multi-compressor

Description	Product code
Mini-UniPrep multi-compressor 1/pack comes with one tray	MUPMCPBC8
Mini-UniPrep multi-compressor tray 1/pack	MUPMCBT



Mini-UniPrep filter vial replaces syringe filter, syringe, autosampler vial, cap, and septum.



Mini-UniPrep multicompressor.

Dissolved ions

Filters for sample preparation prior to ion chromatography testing should feature very low levels of anion leaching.

What are you testing for?	Product	Characteristics and benefits
Dissolved ions	**Anotop™ IC syringe filters**	• Contain a proprietary alumina-based Anopore™ membrane that exhibits very low levels of anion leaching (e.g., fluoride, sulfide, nitrate, nitrite) during ion chromatography (IC) testing • Pigment-free polypropylene housing to eliminate sample contamination • Certified and guaranteed low levels of anion leaching
	Ion chromatography (IC) Acrodisc™ syringe filters	• Optimized to provide consistent results when analyzing ionic species • High flow rates with optimized Supor™ polyethersulfone membrane • Flexibility – available in either 13 mm or 25 mm diameter • Certified for low levels of inorganic extractables, with actual background levels of filter extractables for the first 1.5 mL of filtrate that typically are less than 50ppb for nitrate and less than 20 ppb for chloride, phosphate, and sulfate



Ion chromatography Acrodisc syringe filters.

Ordering information

Anotop IC syringe filters

Membrane, pore size (µm)	Diameter (mm)	Quantity	Product code
Aluminum oxide, 0.2	25	200/pack	6809-9244

Ion chromatography (IC) Acrodisc syringe filters

Membrane, pore size (µm)	Diameter (mm)	Quantity	Product code
Supor, 0.2	13	300/case	4483
Supor, 0.45	13	300/case	4485
Supor, 0.2	13	1000/pack	4683
Supor, 0.45	13	1000/pack	4685
Supor, 0.2	25	200/pack	4583
Supor, 0.45	25	200/pack	4585
Supor, 0.2	25	1000/pack	4783
Supor, 0.45	25	1000/pack	4785

Dissolved heavy metals

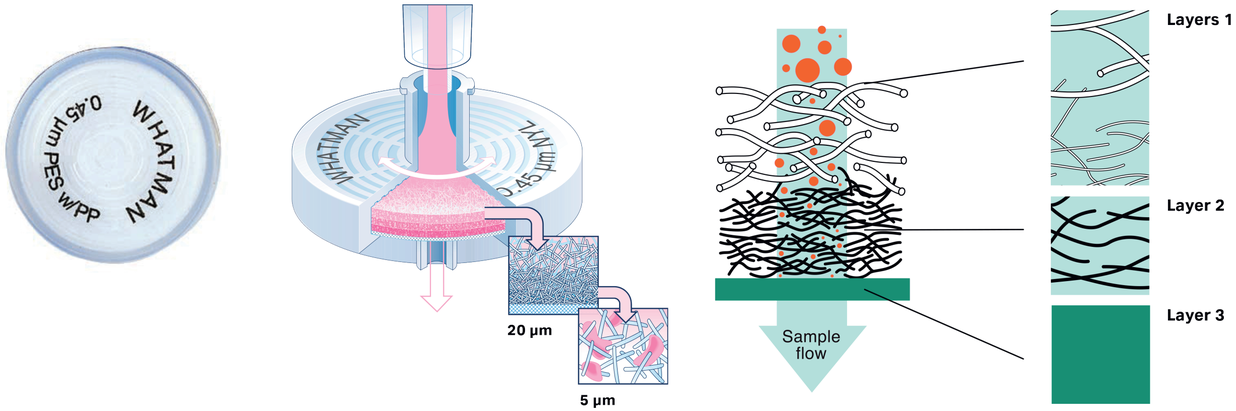
For accurate analysis of heavy metals such as lead or mercury, no interference can be introduced from consumables used in the analytical preparation process. Water samples are often high in particulate matter, which can present filtration challenges because the particulates can block membrane filters. Traditionally, a glass fiber prefilter is used to alleviate this problem. However, filters containing some types of glass fiber can introduce trace metals into the sample. To avoid potential sample contamination, we offer a syringe filter that incorporates an effective prefilter composed of polypropylene rather than glass fiber.

GD/XP syringe filters

GD/XP syringe filters can be used with samples that require inorganic ion analysis (e.g., trace metal analysis using inductively coupled plasma-mass spectrometry (ICP-ICP-OES).

Capsule filters

For dissolved metals analysis of larger volumes and groundwater samples, our disposable groundwater capsules ensure rapid sample filtration with low levels of metals extractables.



GD/XP syringe filters contain multiple filtration layers, which subsequently reduce blockage and increase volume throughput.

Groundwater and metals analysis

What are you testing for?	Product	Characteristics and benefits
Dissolved heavy metals	**GD/XP syringe filters, 25 mm** Ordering information page 22	• Prefilter made of polypropylene for minimization of ion extractables • Integrated prefiltration with a dual-layer prefilter stack and one final 0.45 µm membrane • Easy filtration of hard-to-filter samples • Filtration of larger sample volumes compared to filters without prefilters
	Polydisc™ GW and Polycap™ GW in-line filters Ordering information page 22	• Integrated prefilter • Easy filtration of hard-to-filter samples • Filtration of larger sample volumes compared to filtration devices without prefilters • Suitable for filtration procedure outlined in EPA Method 3005 for ground water analysis
	AquaPrep™ 600 groundwater sampling devices Ordering information page 22	• AquaPrep 600 capsules have 48 metals analysis certification • Meets filtration requirements of the U.S. EPA • Provides four times the filtration area of 142 mm disc filters, reducing the need for multiple filter changes during the sampling process
	GWV high capacity groundwater capsules Ordering information page 22	• 74 metals analysis certification • Meets filtration requirements of the U.S. EPA • GWV capsules provide five times the filtration area of conventional 142 mm filters



Polycap GW (top left), Polydisc GW (top right), GWV high capacity groundwater capsule (bottom left) and AquaPrep 600 groundwater sampling device (bottom right) are designed for sample preparation of ground water samples for the analysis of dissolved heavy metals.

Ordering information

GD/XP syringe filters

Membrane	Nylon	PVDF	DpPP	PES	
Pore size (µm)	Product code	Product code	Product code	Product code	Quantity
0.45	6970-2504	6972-2504	-	6994-2504	150/pack
0.45	6971-2504	6973-2504	6993-2504	6995-2504	1500/pack

In-line filters

Product	Pack size	Product code
Polydisc GW filter 50 mm, nylon with quartz fiber prefilter, 0.45 µm	20	10463400
Polydisc GW filter 50 mm, nylon with quartz fiber prefilter, 0.45 µm	50	10463401
Polycap GW 75, 0.45 µm, PES membrane	1	6714-6004
Polycap GW 75, 0.45 µm, PES membrane	100	6724-6004
AquaPrep 600 capsule, 0.45 µm, Supor membrane	1	12175
AquaPrep 600 capsule, 0.45 µm, Supor membrane	50	12176
GWV high capacity capsule, 0.45 µm, Versapor™ membrane	10	12179
AquaPrep 600 capsule, 0.45 µm, Supor membrane	50	12180



Dissolved organic carbons

Organic matter content is usually measured as dissolved organic carbon (DOC), an important component of the carbon cycle. DOC is defined as the organic matter that can pass through a filter, typically one with a 0.45 µm pore size.

Puradisc Aqua syringe filters are specifically designed for filtration of environmental samples prior to DOC analysis.

What are you testing for?	Product	Characteristics and benefits
Dissolved organic carbons	**Puradisc Aqua 30 syringe filters**	• Contain prewashed membranes (prior to assembly) to reduce organic carbon level and ensure low background • Designed for aqueous samples • Hydrophilic cellulose acetate membrane, 30 mm diameter

Ordering information

Puradisc Aqua syringe filters

Membrane, pore size (µm)	Diameter (mm)	Quantity	Product code
Cellulose acetate, 0.45	30	50/pack	10462656
Cellulose acetate, 0.45	30	100/pack	10462655
Cellulose acetate, 0.45	30	500/pack	10462650



Puradisc Aqua 30 syringe filters.

Microbiology

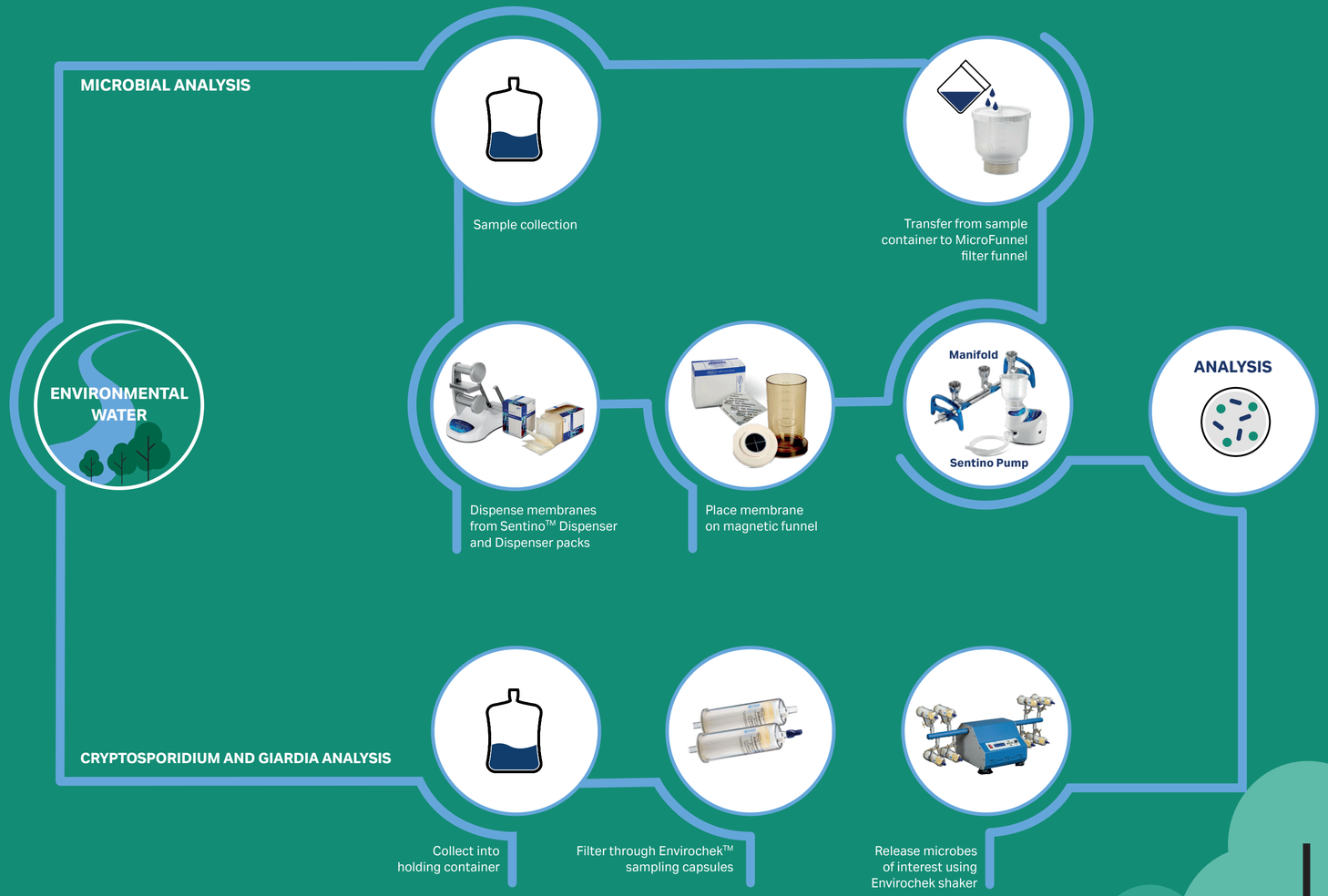
We offer solutions for microbial analysis and the collection and recovery of *Cryptosporidium* oocysts and *Giardia* cysts.

The membrane filtration (MF) technique is an effective and accepted method for testing fluid samples for microbiological contamination. In addition to the available range of pore sizes, diameters, material and color, the MF technique is a popular method for the following reasons:

- Improved sensitivity: Allows for concentration of the content of larger sample volumes onto the surface of a membrane filter.
- Separation from inhibitory substances: Organisms are captured on the membrane and any substance dissolved in the water, such as chlorine compounds or heavy metals, will flow through the membrane.
- Neutralization of inhibitory substances: The use of rinse buffers acts to rinse away and neutralize substances that could impede or inhibit organism growth.
- Isolated colonies: The resulting growth on the membrane surface develops into discrete colonies that can be easily counted and selected for further characterization or identification, if necessary.

The MF technique can be performed by utilizing different laboratory workflows that may implement the use of individual disposable funnels, partially disposable products, or reusable hardware. The choice of workflow needs to consider laboratory efficiency, budget, and contamination risks and meet required standards.

We offer microbiology products that provide efficient solutions for high volume sampling, products that help reduce the risk of sample-to-sample cross contamination, and improved ergonomics while meeting necessary regulatory requirements.



Membranes

We provide a wide and versatile range of filtration membranes that consistently deliver high-quality performance. The appropriate membrane filter choice will depend on the methodology being followed. Choose between sterile or non-sterile membranes and packaging options including individually sealed s-pack and automatic dispenser refill packs.

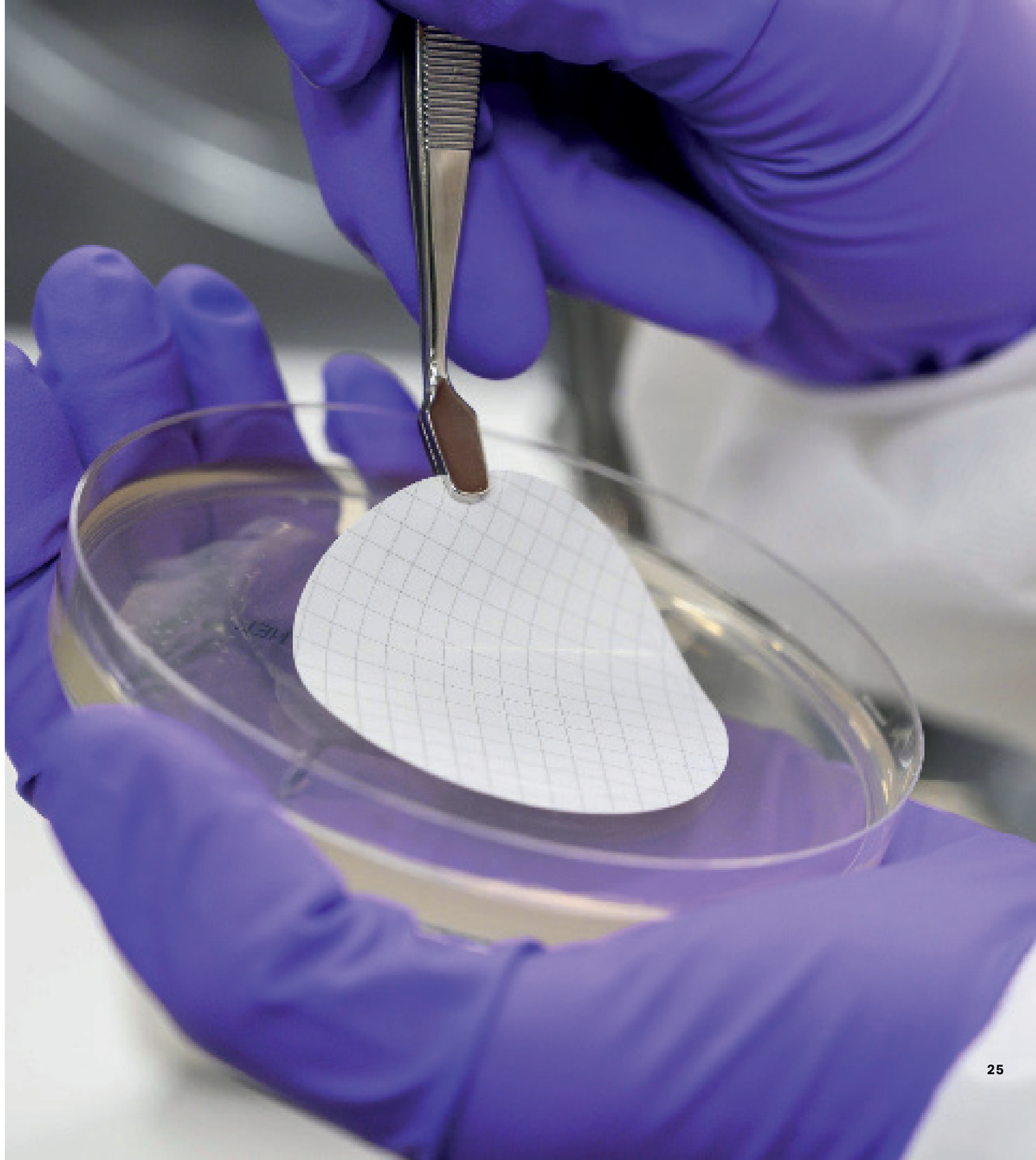
Membrane material	Mixed cellulose ester (MCE)	Polyethersulfone	Polycarbonate
Product name	ME	Supor, Metricel™ black	Nuclepore™
Color	White, black, or green	White or black	White or black
Pore size (µm)	0.2/0.45/0.6/0.8	0.2/0.45/0.8	0.2/0.4 (and other pore sizes)
Application examples	*Enterococcus, E. coli, Clostridia,* Fecal coliforms, *Staphyloccus, Pseudomonas aeruginosa, Legionella* etc		*Legionella*

Filtration considerations

The first consideration for filter selection is often the published method for the particular organism. Some methods are very specific and others allow some range of choice.

Physical properties including pore size, grid line, wettability, colony color vs membrane color, and growth medium can impact colony recoveries and accuracy of results.

Our membrane selection allows you to select the most suitable filter for your microbiological application.



Microbiology products

What are you testing for?	Product	Characteristics and benefits
Bacterial count and/or detection	**Membranes**	• Both sterile and nonsterile options • Range of pore sizes available • Membranes offered non-sterile or sterile in individually sealed s-packs or dispenser refill packs
	Sentino filter dispenser	• Push-button dispense of an individual sterile membrane • Cross-contamination risks are minimized • Used packaging material contained on reels to provide a clutter-free, cleaner workspace
	Other microbiological control accessories: tweezers, autoclaving bags, standard manifolds	• Round-tip tweezers to protect from damage when transferring membrane • 3 or 6-place standard manifolds in durable stainless steel construction accept a #8 stopper for use with a variety of filter funnels • 50 mm gamma irradiated Petri dishes available with and without absorbent pads • 2 mL plastic ampoule media, ready-to-use and easy to dispense • Reuseable plastic filter funnels with magnetic seal for leak-free filtration



Ordering information

Membrane filters

Pore size (µm)					25 mm	47 mm	50 mm	
Membrane	**Pore Size (µm)**	**Color**	**Sterile**	**Dispenser compatible**	**Product code**	**Product code**	**Product code**	**Quantity (pack)**
ME type mixed cellulose ester	0.2	white/black grid	EtO	no	—	10406970	10406972	100
	0.2	white/black grid	EtO	eButler	—	10408712	10408714	400
	0.45	white/black grid	gamma	Sentino	—	68121ME	—	1000
	0.45	white/black grid	EtO	no	—	10406870	10406872	100
	0.45	white/black grid	EtO	no	—	10406871	—	1000
	0.45	white/black grid	EtO	eButler	—	10407312	10407314	400
	0.45	black/white grid	EtO	no	—	10409770	10409772	100
	0.45	black/white grid	EtO	eButler	—	10407332	10407334	400
	0.8	black/white grid	EtO	eButler	—	10407342	—	400
Polyethersulfone	0.2	white/black grid	gamma	Sentino	—	68123	—	1000
	0.45	black/white grid	gamma	Sentino	—	68124	—	1000
	0.8	black/white grid	gamma	Sentino	—	68125	—	1000
Polycarbonate Nuclepore	0.2	natural	no	no	10417006	10417012	10417014	100
	0.4	natural	no	no	10417106	10417112	10417114	100
	0.8	natural	no	no	10417306	10417312	—	100

Ordering information

Accessories for microbiological control

Product	Description	Quantity/pack	Product code
Sentino filter dispenser	Membrane dispenser	1	13184
Forceps	Smooth tip, stainless steel	1	4690
Petri dish	50 mm with pad	100	7245
Petri dish	50 mm no pad	100	7242
Magnetic filter funnel	150 mL	1	4247
Magnetic filter funnel	300 mL	1	4242-N
Magnetic filter funnel	150 mL	1	4238
Laboratory manifold	3-Place manifold including 3 valves, 1 end cap, 1 hose barb cap	1	4889
Laboratory manifold	MicroFunnel filter funnel adapter	3	4890
Laboratory manifold	Sentino funnel adapter	3	4891
Laboratory manifold	Standard adapter	3	4892
Laboratory manifold	Elongated standard adapter	3	4959
Laboratory manifold	Coupling device	1	4893



Laboratory manifold and Sentino filter dispenser

Cryptosporidium and Giardia monitoring

Envirochek HV capsules are used for collection and recovery of *Cryptosporidium* oocysts and *Giardia* cysts in source, finished, or disinfected water including surface water, municipal water supply and effluent, samples in containers, or wells.

The Envirochek HV sampling capsules can be used to filter the water in the field or by shipping a “grab” sample of water back to the lab and filtering it on the bench top. It is generally more cost effective to filter in the field and easier to maintain the right sample preservation temperatures by shipping the capped filters back to the lab. The capsule is then filled with an elution solution, placed on a laboratory shaker, and vigorously shaken to elute any captured oocysts and cysts. The elution solution is decanted and centrifuged to a pellet for further examination by the user’s method of choice.

Envirochek HV capsules are validated and listed in U.S. EPA Methods 1622 and 1623, 1623.1 and 1693 and used for sampling a variety of water for *Cryptosporidium* and *Giardia.* Together, the EPA method and Envirochek HV capsule present a major improvement over the previous string wound cartridge method, offering typically greater than 70% recovery of target organisms. The Envirochek HV capsule is also listed in ISO/DIS 15553.

Envirochek HV capsules are designed for sampling up to 1,000 L of drinking water, up to 50 L of source water and 10 L of disinfected water. The Envirochek HV capsule incorporates a track etched membrane designed to process high volumes of treated water while maintaining high recovery characteristics and meeting U.S. EPA requirements. Envirochek HV capsules are also approved by the United Kingdom DWI standard operating protocols for monitoring drinking water for *Cryptosporidium.*



Envirochek HV capsule for *Cryptosporidium* and *Giardia* monitoring.

Ordering information

Envirochek HV sampling capsules and hardware

Description	Quantity	Product code
Envirochek HV sampling capsule, 1 µm polyester	25	12098
Envirochek HV sampling capsule, 1 µm polyester	1	12099
Laboratory Shaker, 115 V, 50/60 Hz (1/pkg)	1	4821A
Laboratory Shaker, 230 V, 50/60 Hz CE (1/pkg)	1	4822A
Shaker replacement clamp with collar	1	89051
Laureth-12 paste, 50 g bottle	1	4820



eDNA monitoring

Environmental DNA (eDNA) analysis is a powerful and rapidly evolving scientific technique that involves extracting and analyzing DNA from various environmental samples such as water, soil, or air.

The main uses of eDNA analysis include biodiversity monitoring, invasive species detection, endangered species conservation, water quality assessment, environmental impact assessments, forensic applications, biosecurity, and disease monitoring.

eDNA analysis involves several steps starting with sampling, nucleic acid capture and concentration, sample preservation, extraction, amplification, and sequencing. Due to the low concentration and potential complexity of nucleic acid within an eDNA sample, the sample capture and preservation steps are critical to achieve reliable results.

Filtration can be used in the capture step for concentrating nucleic acid samples. Filtration also helps remove particulate matter, leaving behind a cleaner sample for DNA extraction.

The filtration capture step may be actioned onsite (at the sample source) or in the laboratory. When performing the filtration step onsite the desired volume of water is filtered through a filtration device, a preservative added, and the filter unit transported to the laboratory for extraction.

eDNA monitoring process steps.



Ordering information

MicroFunnel filter funnels with polycarbonate membrane

Description	Quantity	Product code
MicroFunnel filter funnel with polycarbonate membrane, 100 mL, 0.4 µm, sterile, individually bagged	50	FMFNL1050
MicroFunnel filter funnel with polycarbonate membrane, 300 mL, 0.4 µm, sterile, individually bagged	20	FMFNL3020



MicroFunnel filter funnels with polycarbonate membrane.

General laboratory accessories

We provide a comprehensive range of accessories for routine work in your laboratory.



1PS phase separator



Grade 105 lens cleaning tissue



Benchkote™ protection paper



pH paper



VACU-GUARD™ pump protection filter

Ordering information

Description	Product name	Dimension	Quantity	Product code
Phase separation paper • Separatory funnel replacement: Automatic cut-off • Ease of use: No special training required	1PS Phase separator paper	Diam. 125 mm Diam. 150 mm	100/pack 100/pack	2200-125 2200-150
Optical lens cleaning tissue • Soft tissue for removing surface moisture and grease from lenses and other optical surfaces	Grade 105	100 × 150 mm 200 × 300 mm	25 wallets of 25 sheets 100/pack	2105-841 2105-862
Benchkote bench protection papers • High-quality, smooth, absorbent Whatman paper • Quickly absorbs liquid spills and protects the working surface • Benchkote Plus is thicker and more absorbent	Benchkote Benchkote Plus	460 × 570 mm 460 mm × 50 m 500 × 600 mm 600 mm × 50 m	50/pack 1/pack 50/pack 1/pack	2300-916 2300-731 2301-6150 2301-6160
Whatman pH indicator paper • Range of pH indicator and test papers for rapid results	Color bonded,0.0 to 14.0 range Standard full range, reel, 1.0 to 14.0 range Standard narrow range, reel, 4.0 to 7.0 range	6 × 80 mm 7 mm × 5 m 7 mm × 5 m	100 strips, 1/pack 1/pack 1/pack	2613-991 2600-100A 2600-102A
Pump protection filters • Protects vacuum pump systems from aqueous aerosols. Hydrophobic PTFE membranes retain 99.99% of airborne particles > 0.1 µm	VACU-GUARD	50 mm	10/pack	6722-5000
Filtration flask for batch filtration • Consists of a 250 mL glass filtration funnel and 1000 mL flask, funnel base, top, and clamp • Good choice for use with Whatman filtration membranes	Whatman GV050/2 vacuum filtration unit			10442200
Pressure filtration apparatus • Stainless steel • Infusion vessel 2200 mL	MD142/5/3	142 mm	1	10451610
Pressure filter holder • TPFE • Infusion vessel 1500 mL	MD142/7/3	142 mm	1	10451710
In-line filtration degasser (IFD) Connects directly into an HPLC line to simultaneously filter and degas the mobile phase as it is being used • Flexibility: available with either nylon or polypropylene membranes • Polypropylene housing with security ring sealing • No need for preliminary mobile phase separation	Aqueous IFD, nylon, ferrule connectors with o-ring for 1/32"- 5/32" tubing Aqueous IFD, Nylon, ferrule connectors for 1/8" tubing Solvent IFD, PP, ferrule connectors with o-ring for 1/32"- 5/32" tubing Solvent IFD, PP, ferrule connectors for 1/8" tubing	50 mm (16 cm² EFA) 50 mm (16 cm² EFA) 50 mm (16 cm² EFA) 50 mm (16 cm² EFA)	10 10 10 10	6726-5002 6726-5002A 6725-5002 6725-5002A
3-piece filter funnel • For quick and easy filtration • Choice of 3 plates	Filter funnel Filter funnel Filter funnel	47 mm 90 mm 70 mm	1 1 1	1950-004 1950-009 1950-017
Membrane holder • Produced from borosilicate glass • Suitable for aqueous and organic solvent filtration	Vacuum-type glass membrane holder Vacuum-type glass membrane holder	47 mm 90 mm	1 1	1960-004 1960-009

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