



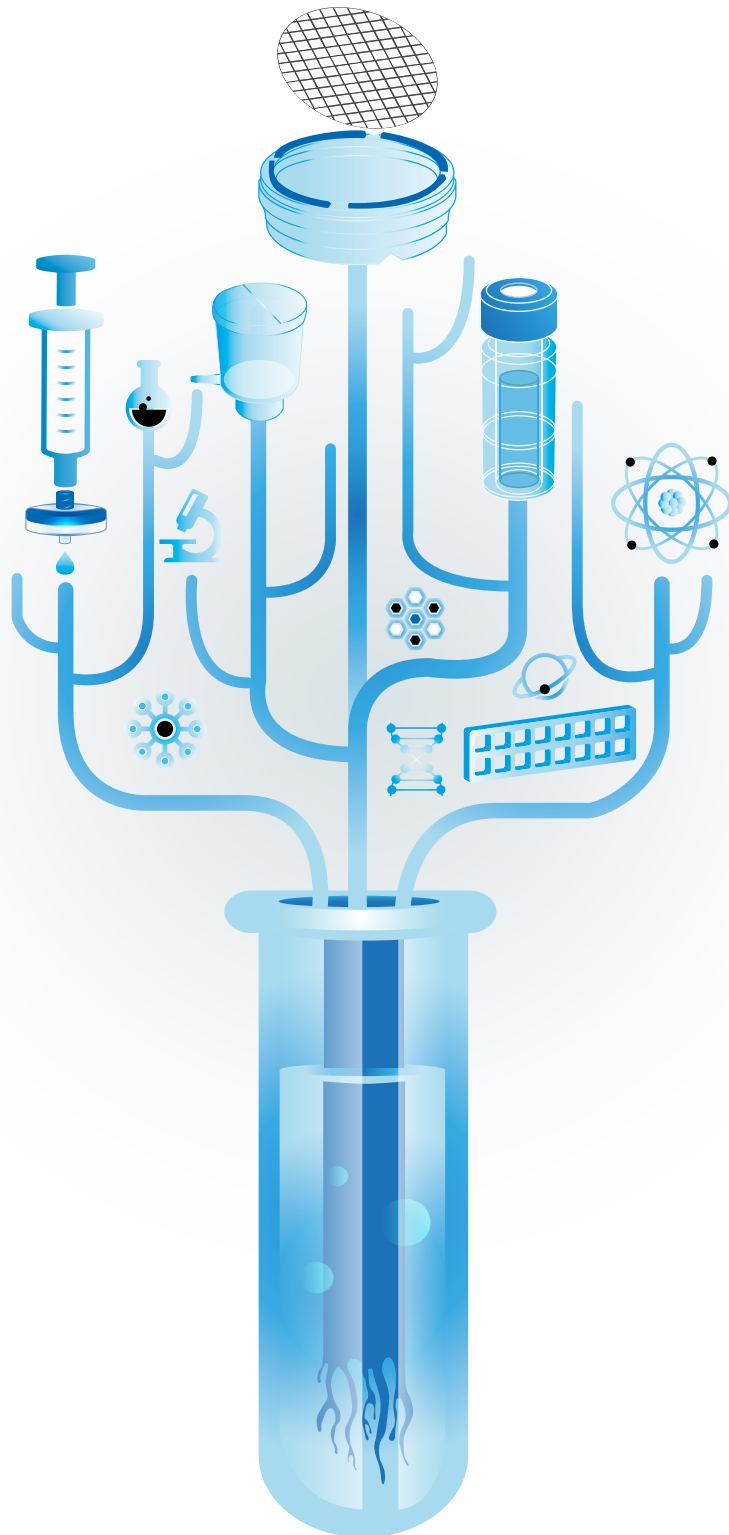
FILTER TECHNOLOGY

# MICROBIOLOGY PRODUCT COLLECTION





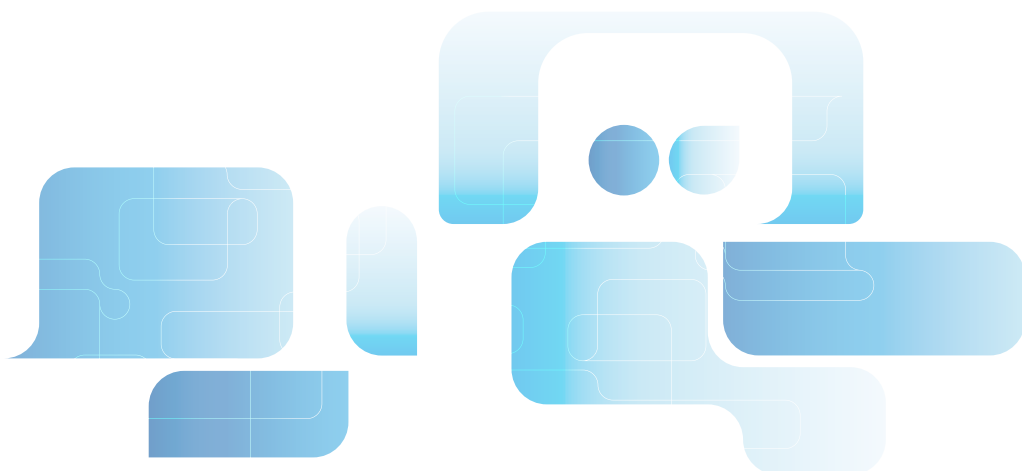
FILTER TECHNOLOGY



# Microbiology

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# GVS Filter Technology is a fully integrated producer and supplier of microbiological solutions for the laboratory and testing community.

Microbiological testing includes the controlled analysis of water, beverage, food, pharmaceuticals and other consumer products and their processing equipment to evaluate for the presence of micro-organisms that may cause harm to the user or reduce the product quality or performance.

Microbiological testing is a crucial requirement across many industries worldwide where product, process and human health are influenced by the presence of micro-organisms: living bacteria, viruses, yeasts and molds that are too small to be visible to the naked eye.

International test procedures and standard lab practices have been established to provide strict methods for micro-organism analysis and identification.

Micro-organisms can be harmful or beneficial to the product or process under analysis.

Some diseases of human, animals and plants are caused by unwanted bacteria, yeasts and mold. Other beneficial yeasts and molds are responsible for numerous desirable processes in beer, wine, and food production and biotechnology.



**GVS products for microbiological testing include applications and testing for:**

◆ **Contamination of work surfaces and equipment**

◆ **Microbiological analysis of:**

- Potable water
- Beer and wine
- Waste water
- Dairy products
- Soft drink and concentrates
- Fruit juices
- Fermented products

◆ **Detection of:**

- Bacteria, fungi, molds
- Escherichia coli (E.Coli)
- Fecal streptococci and fecal coliforms
- Staphylococci
- Listeria
- Enterococci
- Pseudomonas aeruginosa
- Legionella

# MICROBIOLOGY INTRODUCTION

**GVS supplies a comprehensive suite of filtration and culturing products used for filtration, isolation and culturing of samples for analysis of micro-organism presence. GVS products meet strict quality and sterility requirements and are designed to quickly and accurately test for the presence of airborne, surface, and liquid micro-organisms.**

## **Sterility:**

For Microbiological analysis the sterility of the analysis equipment, including the membranes and culturing media, is important to maintain a clean contaminant free zone. GVS ensures the sterility of its microbiological products through gamma radiation and steam sterilization. All products are labeled with lot number and expiration date for additional control and security.

## **Product Quality Control:**

Microbiological Analysis for good and bad micro-organisms present in processing, production and finished products

Contaminants and organisms are quantified and qualified at selected control points throughout the production steps and in the finished product. The main parameter of concern depends on the industry and the finished product under review. Leading parameters are yeast and mold, total bacteria count and E. coli as well as coliforms, fecal streptococci and Pseudomonas aeruginosa.

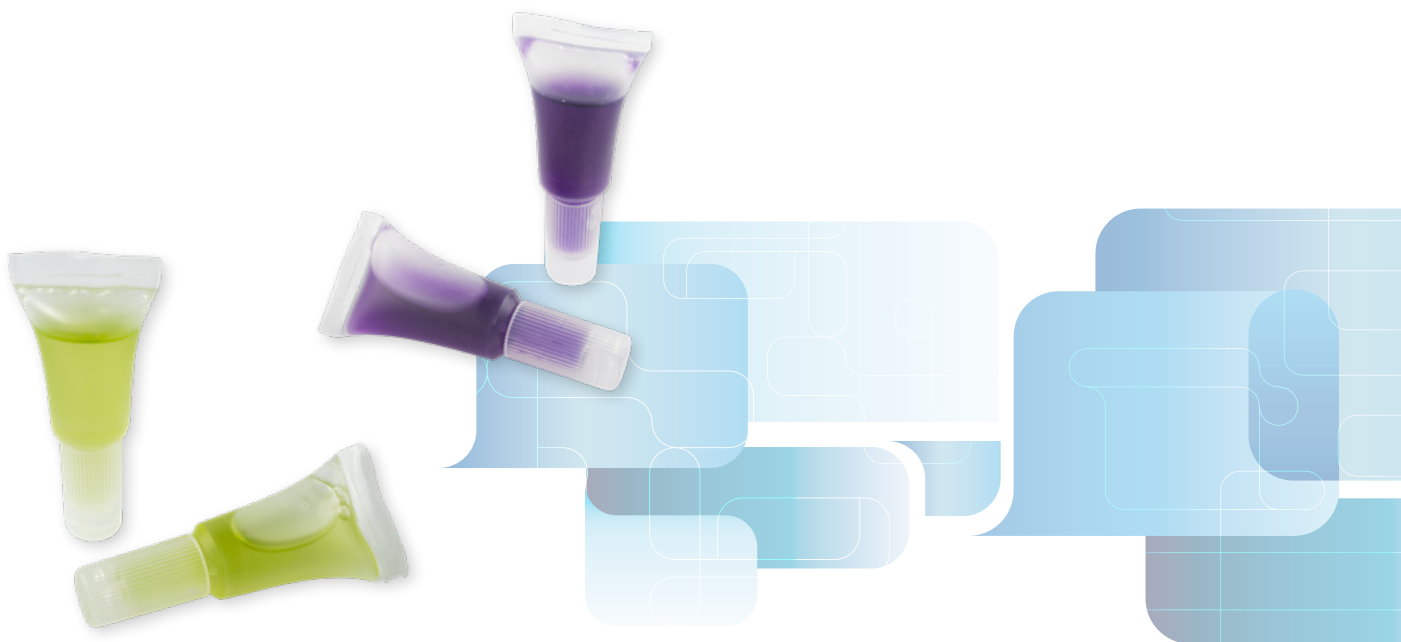
## **The Workflow for Microbiological Analysis breaks down into 5 simple steps:**

- 1) Obtain sample for analysis
- 2) Filter the sample
- 3) Add Nutrient media
- 4) Incubate and culture
- 5) Analyze and enumerate the results

## **Preparation for Microbiological Analysis includes selection of:**

- 1) membrane type and pore size
- 2) Nutrient media
- 3) Filtering Equipment

This GVS Catalog provides guidance on the selection of membranes, nutrient media and equipment and details the microbiological products available from GVS.



# MEMBRANES FOR FILTRATION

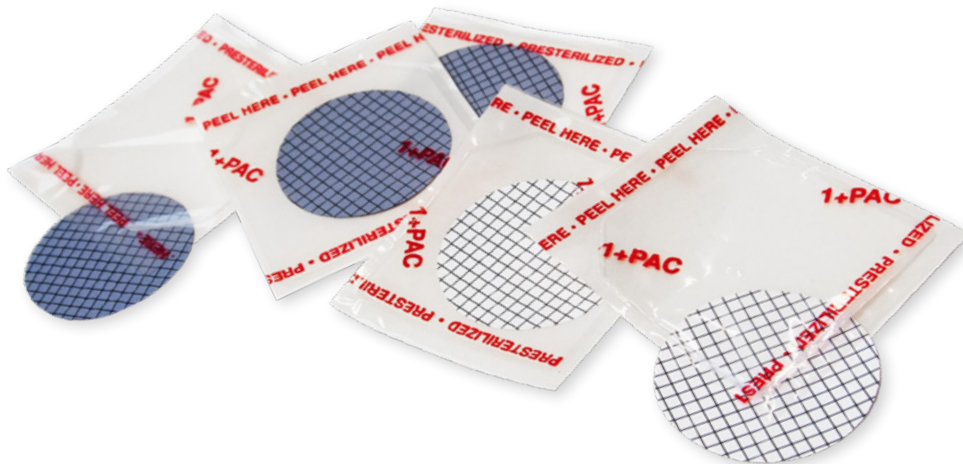
## Pore size selection guide

The technical requirements for membranes used in microbiological quality control are subject to strict national and international standards. At the same time the requirements of the market is continually changing as a result of the introduction of new products.

GVS provides a wide and versatile range of membrane filter products to supply the market needs. Our R&D department is continually developing new products for the evolving markets. All GVS membranes consist of high quality materials with a high degree of biocompatibility and are manufactured in ISO certified facilities to ensure reliable performance each and every time.

Test strains: Bacteria/Yeasts	Pore size [µm]			Used for Validation	Standards
	0,2	0,45	0,8		
Brevundimonas diminuta	x				DSM 1635
Pseudomonas diminuta	x			x	ATCC 19146
Escherichia coli (E. coli)	o	x		x	ATCC 29522
Lactobacillus fermentum	o	x			ATCC 9338
Pseudomonas aeruginosa	x				ATCC 10145
Staphylococcus aureus	o	x		x	ATCC 25923
Enterococcus faecalis	o	x			ATCC 19433
Enterobacter aerogenes	o	x			ATCC 13048
Serratia marcescens	o	x		x	ATCC 14756
Streptococcus faecalis	o	x			ATCC 19433
Pediococcus cerevisiae	o	o	x		ATCC 43013
Pediococcus acidilactici	o	x			ATCC 33314
Legionella pneumophila	x				ATCC 33153
Bacillus subtilis	o	o	x	x	ATCC 6633
Salmonella abony	o	x			NCTC 6017
Saccharomyces cerevisiae	o	o	x	x	DSM 1848
Candida albicans	o	o	x		ATCC 10231
Zygosaccharomyces bailii	o	o	x		ATCC 42476
Aspergillus niger	o	o	x		ATCC 16404
Total count detection		x			

x=recommended pore size  
o=alternative pore size



# Speed Pack Sterile MCE Membrane 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

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

#### Recommended to use with GVS Column KM-B

#### Funnel Ordering information

Code	Description	Quantity
FUNNELK100S	PP Funnel 100 ml sterile for Speed-Pack	100
FUNNELK250S	PP Funnel 250 ml sterile for Speed-Pack	100



# MEMBRANES FOR FILTRATION

## Sterile MCE Membranes single-packed



**1+PAC**

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 bioburden and sterility testing.

### Characteristics

- ▲ High flow rate: fast filtration rates
- ▲ Uniform pore structure: consistent flow and diffusion rates
- ▲ Lot-to-lot consistency
- ▲ Microbiological and particulate analysis
- ▲ Black for food and beverage applications

### Consistent Uniformity Improves Control and Performance

Packaged individually for convenience, handling, economy and integrity, each 1+PAC includes a 47 mm presterilized MCE membrane filter. They are available with or without an absorbent nutrient pad in either white or black. This all-in-one pack permits individual testing, eliminating the possibility of contaminating a large supply of presterilized filters. Filters, pads and envelopes are presterilized by gamma irradiation.

### Performance

Pore Size (µm)	Flow Time (s)	Volume/Vacuum (ml/in Hg)	Flow Rate (ml/min/cm <sup>2</sup> @ 10 psi)	Bubble Point (psi)
0.2	60-136	250/20	11.70-26.51	52-65
0.45	23-46	250/20	34.58-69.16	30-42
0.8	5-18	250/20	88.37-318.13	11-19

### White 1+ PAC

White gridded discs are designed for the recovery and retention of E. coli bacteria in water / waste-water analysis as well as other microbiological tests. The filters are certified to meet specifications listed in APHA Standard Methods. The 1+PAC is also ideal for sterility and bioburden testing in QC/QA laboratories.

### Black 1+ PAC

GVS offers black MCE filters specifically manufactured and tested for quality assurance testing in food and beverage analysis. Without proper microbiological testing, the taste, odor and appearance of the final product can be ruined, resulting in lost production time, expensive in-line cleanup and end product loss due to spoilage. The black filters provide a superb contrast for early and accurate colony counting for total bacteria, yeast and mold organisms. The filters are certified to meet specifications listed in the APHA Standard Methods. For a certificate of analysis, please request it on your purchase order.

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

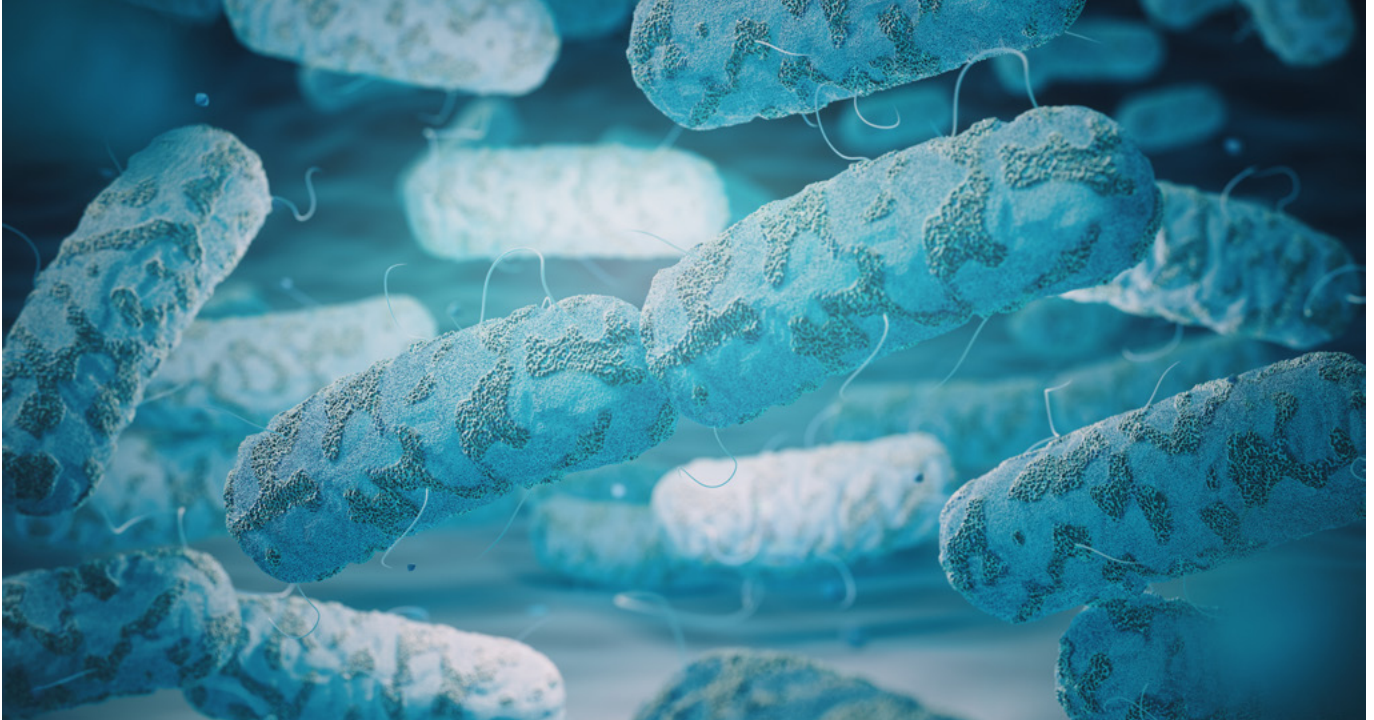
	Individually Packaged						
	47 mm 100/pk	47 mm 100/pk	47 mm 1000/pk	47 mm 1000/pk	50 mm 100/pk	50 mm 100/pk	50 mm 1000/pk
Color	white	black	white	black	white	black	white
Pore sizes	0.2 µm	1216720	1214396				
	0.45 µm	1216721	1216719	1214923	1213643	7699946	7699941 1222980

Recommended to use with GVS Column RA-S2 or KM-N (+ KSL System)



# ENUMERATION OF LEGIONELLA

Legionella is a bacterial micro-organism responsible for Legionellosis disease.



The ISO 11731 International Standard Water Quality - Enumeration of Legionella specifies the culture and analysis methods for the isolation of Legionella and enumeration in water samples. Test methods include concentration by membrane filtration, dilution or directly plated.

For direct plating on culture media, ISO 11731 recommends the use of nitrocellulose (NC) or mixed cellulose ester (MCE) membranes for culturing media; diameter of 47mm or 50mm with rated pore sizes of 0.2µm or 0.45µm.

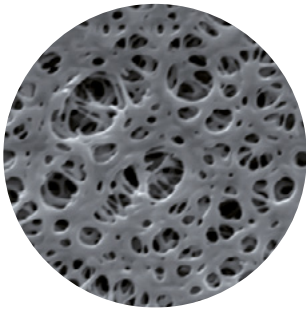
For concentration and elution: ISO 11731 recommends the use of PCTE or PES membrane filters, diameter 47mm to 142 mm with rated pore sizes of 0.2 µm for concentration followed by a washing procedure.

GVS supplies Sterile membranes for both ISO 11731 Methods in NC(MCE), PCTE and PES.

Determination Method	Membrane
Legionella ISO11731: Concentration Method	PCTE or PES Membrane, 47mm, 0.2µm pore size
Legionella ISO11731: Direct Culturing Method	NC or MCE Membrane, 47mm, 0.2µm or 0.45µm pore size

# MEMBRANES FOR FILTRATION

## Polyethersulfone (PES) Membrane



**ULTRA***Sep*  
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.

### 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
- ◆ 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

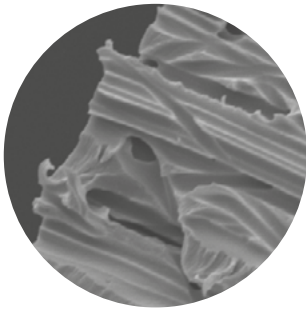
Pore Size (µm)	Flow Time (s)	Volume/Vacuum (mL/in Hg)	Flow Rate (mL/min/cm <sup>2</sup> @ 10 psi)	Bubble Point (psi)
0,2	35-70	250/20	22.72-45.45	50-70

### Ordering information

Product Code	Pore Size (µm)	Dimension (mm)	Description	Packaging
1226158	0.2 µm	47 mm	PES white sterile single packed	200/pk
1226159	0.4 µm	47 mm	PES white sterile single packed	200/pk

Recommended to use with GVS Column RA-S2 or KM-N (+ KSL System)

# Polycarbonate Track Etched (PCTE) Membrane



**PORETICS**  
PCTE Membrane

## Characteristics

- ◆ Smooth, thin, glass-like surface is suitable for microscopy and cellular applications
- ◆ Superior strength allows for aggressive handling
- ◆ Resists chemical staining to ease microscopic visualization

## Typical Applications

- ◆ Legionella test (UNI EN ISO 11731\_2017)

GVS Life Sciences Polycarbonate Track Etched (PCTE) Membrane is made from a thin polycarbonate film with precisely defined pores. The proprietary manufacturing process provides increased control over pore size and density for absolute size separation. This unique process ensures the physical properties of each membrane precisely fit specification.

### Nominal Product Characteristics

Thickness	10 µm
Optical Properties	Semi-translucent
Maximum Operating Temperature	284°F (140°C)
Sterilization	Gamma Irradiation or Ethylene Oxide (EtO)
Autoclavable	Yes
Wetting Characteristics	Hydrophilic



### Ordering information

Product Code	Pore Size (µm)	Dimension (mm)	Description	Packaging
1226157	0.2 µm	47 mm	PCTE white sterile single packed	200/pk
1226156	0.4 µm	47 mm	PCTE white sterile single packed	200/pk

**Recommended to use with GVS Column RA-S2 or KM-N (+ KSL System)**

## Nutrient Liquid Media for Culturing and Enumeration

GVS provides an extensive range of culture broths and solutions for the cultivation, detection and enumeration of bacteria, yeast, fungi, viruses, pathogens and molds. Each nutrient rich liquid media is specifically developed for use in the analysis of drinking water, surface water, milk, juice, beverages, sugar based drinks, food and pharmaceutical samples. These ready to use liquid medias are packaged in individual pre-portioned ampoules for ease of use. All liquid medias undergo detailed quality control checks in accordance with standard methods, guaranteeing uniform preparation every time. Comprehensive end product testing ensures a stable sterile liquid media for optimal culture growth.

### Quick Media Selection Guide for Common Evaluation Processes and Micro-Organisms

#### Water, wastewater and purified water

Quality control systems for wastewater analysis and production systems using water. Typical organisms include Pseudomonads, Escherichia coli, Staphylococci, spore formers, yeasts and molds.

Selective microorganism	Positive test organism	Media	Product No.
Acid-tolerant micro-organisms Lactic-acid bacteria	Lactobacillus fermentum (ATCC 9338) Candida albicans (ATCC 10231)	Orange Serum Broth	10496104
Aerobic bacteria	Escherichia coli (E.coli) (ATCC 25922)	HPC Broth HPC Broth with TTC M-TGE Total Count Broth Total Count Media with TTC	10496164 10496151 10496102 10496113
Total Coliforms and Escherichia coli	Escherichia coli (E.coli) (ATCC 25922)	Brilliant Green Bile Broth EC Broth M-Endo Coliform Broth M-FC Broth M-FC Broth with Rosolic Acid MI Broth MI Agar EC Broth with MUG M-TGE Total Count Broth	10496710 10496714 10496103 10496124 10496114 10496192 10496847 10496709 10496102
Enterococci	Enterococci faecalis (ATCC 19433)	Enterococcus Broth	10496120
Fecal Streptococci	Escherichia coli (E.coli) (ATCC 25922) Streptococcus faecalis (ATCC 19433)	KF-Streptococcus Broth	10496125
Pseudomonas aeruginosa	Pseudomonas aeruginosa (ATCC 10145)	Cetrimide Broth Pseudomonas Broth	10496146 10496119
Staphylococci	Staphylococcus aureus (ATCC 25923)	Mannitol Salt Broth	10496121
Yeast and Mold	Zygosaccharomyces bailii (ATCC 58445) Candida albicans (ATCC 10231)	PRY Broth (Preservative Resistant Yeast) M-Green Select Broth M-Green Yeast and Mold Broth	10496106 10496116 10496101

#### Soft drinks, fruit juices, concentrates and sugar products

Due to different pHs and carbonation levels the nutrient media for detection of these contaminants are very specific.

Selective microorganism	Positive test organism	Media	Product No.
Acid-tolerant micro-organisms Lactic-acid bacteria Lactobacillus, Oenococcus (product spoiling organisms)	Lactobacillus fermentum (ATCC 9338) Candida albicans (ATCC 10231)	Orange Serum Broth Wallerstein Differential Broth (WLD)	10496104 10496109
Aerobic bacteria	Escherichia coli (E.coli) (ATCC 25922)	HPC Broth HPC Broth with TTC M-TGE Total Count Broth Total Count Media with TTC	10496164 10496151 10496102 10496113
Total Coliform and Escherichia coli	Saccharomyces cerevisiae (ATCC 9763)	Brilliant Green Bile Broth M-Endo Coliform Broth MI Broth MI Agar EC Broth with MUG M-TGE Total Count Broth	10496710 10496103 10496192 10496847 10496709 10496102

Selective microorganism	Positive test organism	Media	Product No.
Pseudomonas aeruginosa	Pseudomonas aeruginosa (ATCC 10145)	Cetrimide Broth Pseudomonas Broth	10496146 10496119
Yeast and Mold	Zygosaccharomyces baillii (ATCC 58445) Candida albicans (ATCC 10231)	PRY Broth (Preservative Resistant Yeast) M-Green Select Broth M-Green Yeast and Mold Broth	10496106 10496116 10496101
Staphylococci	Staphylococcus aureus (ATCC 25923)	Mannitol Salt Broth	10496121

## Beer and Wine

Beer quality control is focused on beer spoiling bacteria like Lactobacilli and Pediococci as well as wild yeast.

Wine quality control is focussed on taste spoiling organisms including acid tolerant species like acetic acid bacterial and lactic acid bacterial as well as yeast and mold.

Selective microorganism	Positive test organism	Media	Product No.
Acetobacter		Orange Serum Broth (add 5-8% ethanol)	10496104
Aerobic bacteria	Escherichia coli (E.coli) (ATCC 25922)	Total Count Media with TTC	10496113
Bacteria in fermentation processes		Wallerstein Differential Broth (WLD)	10496109
Total Coliform and Escherichia coli	Saccharomyces cerevisiae (ATCC 9763) Escherichia coli (E.coli) (ATCC 25922)	M-Endo Coliform Broth M-Endo Coliform Broth MI Broth MI Agar	10496103 10496103 10496192 10496847
Lactobacilli, Pediococci (beer spoiling organisms)	Lactobacillus fermentum (ATCC 9338) Candida albicans (ATCC 10231)	Orange Serum Broth Wallerstein Differential Broth (WLD)	10496104 10496109
Yeast and Mold	Zygosaccharomyces baillii (ATCC 58445) Saccharomyces cerevisiae (ATCC 9763)	PRY Broth (Preservative Resistant Yeast) Wallerstein Nutrient Broth (WLN)	10496106 10496108

## Dairy Products

Dairy quality control is focused on the presence of bacteria, yeasts and mold and milk borne diseases. E.coli and Streptococci in dairy products may cause illness or spoilage. Other beneficial bacteria may be specifically added to milk for fermentation to produce products like yogurt and cheese.

Selective microorganism	Positive test organism	Media	Product No.
Aerobic bacteria	Escherichia coli (E.coli) (ATCC 25922)	HPC Broth HPC Broth with TTC M-TGE Total Count Broth Total Count Media with TTC	10496164 10496151 10496102 10496113
Total Coliform and Escherichia coli	Saccharomyces cerevisiae (ATCC 9763) Escherichia coli (E.coli) (ATCC 25922)	M-Endo Coliform Broth Brilliant Green Bile Broth EC Broth MI Broth MI Agar	10496103 10496710 10496714 10496192 10496847
Enterococci	Enterococci faecalis (ATCC 19433)	Enterococcus Broth	10496120
Fecal Streptococci	Streptococcus faecalis (ATCC 19433)	KF-Streptococcus Broth	10496125
Lactobacillus	Lactobacillus plantarum (ATCC 8014) Lactobacillus fermentum (ATCC 9338)	MRS Broth Wallerstein Differential Broth (WLD)	10496112 10496109

## Food

Quality control systems for raw materials and final product. Typical organisms include Pseudomonads, Escherichia coli, Staphylococci, Streptococci, yeasts and molds.

Selective microorganism	Positive test organism	Media	Product No.
Acid-tolerant micro-organisms	Lactobacillus fermentum (ATCC 9338) Candida albicans (ATCC 10231)	Orange Serum Broth	10496104
Aerobic, facultative, anaerobic bacteria and fungi	Escherichia coli (E.coli) (ATCC 25922)	Total Count Media with TTC Trypticase Soy Broth (TSB)- Single Strength Trypticase Soy Broth (TSB) - Double Strength	10496113 10496707 10496708
Total Coliform and Escherichia coli	Saccharomyces cerevisiae (ATCC 9763) Escherichia coli (E.coli) (ATCC 25922)	M-Endo Coliform Broth Brilliant Green Bile Broth EC Broth EC Broth with MUG MI Broth MI Agar	10496103 10496710 10496714 10496709 10496192 10496847
Enterococci	Enterococci faecalis (ATCC 19433)	Enterococcus Broth	10496120
Fecal Streptococci	Streptococcus faecalis (ATCC 19433)	KF-Streptococcus Broth	10496125
Lactobacillus, especially in meat	Lactobacillus plantarum (ATCC 8014) Lactobacillus fermentum (ATCC 9338)	MRS Broth	10496112
Pseudomonas aeruginosa	Pseudomonas aeruginosa (ATCC 10145)	Cetrimide Broth Pseudomonas Broth	10496146 10496119
Yeast and Mold	Zygosaccharomyces bailii (ATCC 58445) Saccharomyces cerevisiae (ATCC 9763)	PRY Broth (Preservative Resistant Yeast) Wallerstein Nutrient Broth (WLN)	10496106 10496108

## Pharmaceuticals, Raw Materials, Cosmetics

Quality control systems for raw materials and production systems using water. Typical organisms include Pseudomonads, Escherichia coli, Staphylococci, Streptococci, yeasts and molds.

Selective microorganism	Positive test organism	Media	Product No.
Aerobic, facultative, anaerobic bacteria and fungi	Escherichia coli (E.coli) (ATCC 25922)	Total Count Media with TTC Trypticase Soy Broth (TSB)- Single Strength Trypticase Soy Broth (TSB) - Double Strength	10496113 10496707 10496708
Total Coliform and Escherichia coli	Saccharomyces cerevisiae (ATCC 9763) Escherichia coli (E.coli) (ATCC 25922)	M-Endo Coliform Broth MI Broth MI Agar	10496103 10496192 10496847
Enterococci	Enterococci faecalis (ATCC 19433)	Enterococcus Broth	10496120
Fecal Streptococci	Streptococcus faecalis (ATCC 19433)	KF-Streptococcus Broth	10496125
Pseudomonas aeruginosa	Pseudomonas aeruginosa (ATCC 10145)	Cetrimide Broth Pseudomonas Broth	10496146 10496119
Staphylococci	Staphylococcus aureus (ATCC 25923)	Mannitol Salt Broth	10496121
Yeast and Mold	Zygosaccharomyces bailii (ATCC 58445) Saccharomyces cerevisiae (ATCC 9763)	PRY Broth (Preservative Resistant Yeast) Wallerstein Nutrient Broth (WLN)	10496106 10496108

# LIQUID MEDIA

## Nutrient Liquid Media



2 mL ampouled media

### Features & Benefits

- ◆ Wide range of products satisfies even special customer requirements
- ◆ Optimal media stability, sterility, and reproducibility
- ◆ Less time-consuming, higher productivity
- ◆ Batch-specific quality certificate in each pack

### Liquid Media Descriptions

#### Brilliant Green Bile Broth 2%

Brilliant Green Bile Broth is used to detect coliforms in water, milk and other samples. BGGB contains two inhibitors of both gram-positive and selected gram-negative organisms, namely, oxgall and brilliant green dye. Fermentation is detected by gas production.

#### Cetrimide Broth

Cetrimide Broth is used for selective cultivation of *Pseudomonas aeruginosa*. *Pseudomonas aeruginosa* is characterized by the production of pyocyanin (a blue green, water soluble, non-fluorescent, phenazine pigment) which is stimulated by the inclusion of magnesium chloride and potassium sulfate in the broth. Cetrimide (N-cetyl-NNN-trimethylammonium bromide) is added to inhibit bacteria other than *Pseudomonas aeruginosa*. Its action as a quaternary ammonium cationic detergent causes nitrogen and phosphorous to be released from bacterial cells other than *Pseudomonas aeruginosa*.

#### EC Broth

EC (*Escherichia coli*) Broth is used to detect coliforms and *E. coli*. EC Broth contains casein peptone as a source of nutrients. Lactose provides the carbohydrate fermented by coliform bacteria and *Escherichia coli*. In addition, lactose-positive bacteria metabolize lactose with gas formation. Gram-positive bacteria are inhibited by the mixture of bile salts.

#### EC Broth with MUG

EC Broth with MUG is used to detect *Escherichia coli* in water, milk and food. The presence of fluorescence using a long-wave UV light source confirms the presence of *Escherichia coli* and no further confirmation is required. MUG detects anaerogenic strains, which may not be detected in the conventional procedure. Lactose is a source of energy. Casein peptone provides additional nutrients. The mixture of bile salts is inhibiting for gram-positive bacteria, particularly bacilli and fecal streptococci. The substrate 4-methylumbelliferyl-b-D-glucuronide is hydrolyzed by an enzyme, b-glucuronidase, possessed by most *Escherichia coli* and a few strains of *Salmonella*, *Shigella* and *Yersinia*, to produce a fluorescent end product, 4-methylumbelliferone.

### Liquid Media

Ready-to-use media considerably reduces the preparation time in quality control laboratories and also effectively reduces the risks of cross contamination.

GVS Life Sciences is cooperating closely with quality assurance managers in the industry in the development of its own media and test kits.

This intensive product development has produced a range of products that is being used to monitor production plants and conduct microbiological checks on raw materials through to final product release in laboratories.

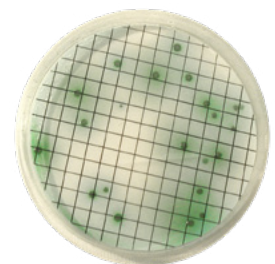
### Typical Applications

#### Microbiological analysis of:

- ◆ Drinking water
- ◆ Surface water
- ◆ Recreational water
- ◆ Purified water
- ◆ Beverage distilled and non distilled



Brilliant Green Bile Broth



*Pseudomonas* Media: Typical Growth of *Pseudomonas aeruginosa* ATCC 10145



EC-Broth: Vial Left: Control; Vial Right: Broth inoculated with *Escherichia coli* ATCC 25922

### Enterococcus Broth

Enterococcus Broth is a modified version of the improved media described by Slanetz and Bartley with triphenyltetrazolium chloride (TTC). The membrane filtration method is simple to perform, does not require confirmation and permits a direct count of enterococci in 48 hours.

### Heterotrophic Plate Count (HPC) Broth with or without TTC

HPC Broth and HPC Broth with TTC Heterotrophic Plate Count (HPC) Broth is used to determine live heterotrophs in drinking water and other media at incubation temperatures of 35°C. All bacteria grow on HPC with indicator media and produce a red color. This is a result of the precipitation of formazan following the reduction of 2,3,5- TTC by bacteria.

### KF-Streptococcus Broth

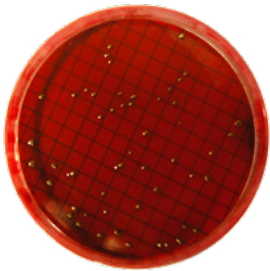
KF-Streptococcus Broth is selective for the determination of fecal streptococci in polluted surface waters. Maltose and lactose are fermentable carbohydrates, sodium azide is the selective agent and brom cresol purple is the indicator dye.

### Mannitol Salt Broth

Mannitol Salt Broth is used to detect presumptive pathogenic Staphylococci. Because of the amount of peptones and beef extract, Mannitol Salt is a nutrient rich medium. Most bacteria (other than staphylococci) are inhibited by the high concentration of sodium chloride. Organisms capable of fermenting mannitol, e.g., Staphylococcus aureus, cause a pH change in the media. With phenol red as the pH indicator the colonies appear with a yellow coloration.

### M-Endo Coliform Broth

M-endo Broth is used to detect coliform in water samples. M-Endo is a red colored media, which needs to be stored in the dark to prevent discoloration. Gram-positive bacteria are inhibited on this media by the deoxycholate and lauryl sulfate. The addition of ethanol increases the antibacterial nature of the formulation. Lactose fermenting organisms form aldehydes, which react with Schiff's reagent (basic fuchsin and sodium sulfite) to give red colored zones around the colonies. Coliform colonies are therefore red with a characteristic metallic sheen.



M-Endo Coliform Broth

### M-FC Broth

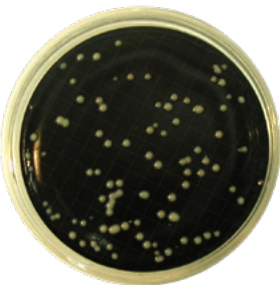
M-FC (fecal coliform) Broth allows the development of fecal coliforms at elevated temperatures (44.5°C).

### M-FC with Rosolic Acid

M-FC with Rosolic Acid acts and functions in the same way as M-FC Broth. Rosolic acid inhibits bacterial growth in general, except for fecal coliforms.

### M-Green Yeast and Mold Broth and M-Green Yeast and Mold Agar

M-Green Yeast and Mold Broth is used to detect yeast and mold in beverages and food. M-Green Yeast and Mold Broth is an improved modification of the liquid media. The addition of bromocresol green, which diffuses into fungal colonies as an alkaline reaction, allows them to be easily identified. Metabolic by-products from the developing colonies diffuse into the surrounding medium, further reducing the pH which aids in the inhibition of bacterial growth, but also produces an acid reaction that causes residual bromocresol green to change to yellow.



M-Green Yeast and Mold Broth:  
Typical Growth of Candida Albicans  
ATCC-10231 on a Black Membrane

### M-Green Select Broth

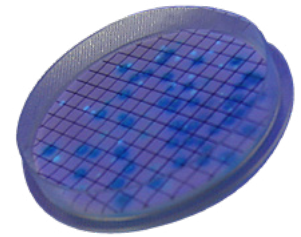
M-Green Select Broth was developed to improve efficiency of detection and enumeration of fungi in sugar based drinks using the membrane filtration method. This medium has a low pH, which inhibits bacterial growth. The addition of chloramphenicol further inhibits the growth of bacteria to allow for the development and enumeration of yeast and mold.



# LIQUID MEDIA

## MI Broth and MI Agar

MI Broth detects the presence of coliform bacteria by the production of b-galactosidase, which cleaves the substrate MUGal to produce 4-methylumbelliferone, which fluoresces on exposure to UV light. Non-coliforms do not produce this enzyme and therefore do not fluoresce on the medium. Escherichia coli is detected by the compound IBDG. The b-glucuronidase produced by Escherichia coli cleaves the substrate to produce a blue indigo color in the colonies. As Escherichia coli is also a total coliform, and also produces b-galactosidase, it will also fluoresce. The antibiotic cefsulodin is present to inhibit the growth of gram-positive bacteria and some non-coliform gram-negative bacteria that can cause false positive reactions.



MI-Media: Pure Culture of Escherichia coli ATCC 25922 with UV Light

## MRS Broth

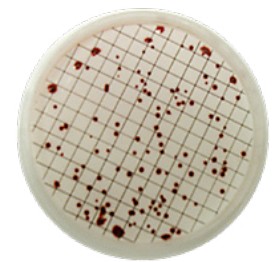
MRS medium supports luxuriant growth of all lactobacilli, even the slow growing species.

## M-TGE Total Count Media

All bacteria develop on TGE media and produce a range of different colored and sized colonies.

## Orange Serum Media

Orange Serum Broth is used to detect aciduric microorganisms. Organisms known to grow in single strength and concentrated juices are lactic acid and acetic acid bacteria and yeast. Lactobacilli, Leuconostoc and yeast have all been identified as spoilage organisms by numerous authors. Orange serum at pH 5.4 to 5.6 has been reported to yield maximum counts of all types of spoilage organisms in mixed cultures and in single culture comparison tests.



Total Count Media with Indicator. Escherichia coli ATCC 25922 and Staphylococcus aureus ATCC 25923 can be easily detected according to their red to pink colonies

## PRY Broth

Preservative Resistant Yeast Broth is a low pH selective medium for the detection of spoilage microorganism in beverages and water.

## Pseudomonas Broth

Pseudomonas aeruginosa is characterized by the production of pyocyanin (a blue green, water soluble, non-fluorescent, phenazine pigment) which is stimulated by the inclusion of magnesium chloride and potassium sulfate in the broth. Irgasan, an antimicrobial agent, selectively inhibits gram-positive and gram-negative bacteria other than pseudomonads. Glycerol both serves as an energy source and helps in the promotion of pyocyanin.

## Total Count Media with TTC

All bacteria develop on Total Count Media with indicator and produce a red color as a result of the precipitation of formazan following the reduction of 2,3,5- TTC by bacteria.

## Trypticase Soy Broth – Single Strength

General purpose medium used in qualitative procedures for the cultivation of fastidious and non-fastidious microorganisms. Trypticase Soy Broth – Single Strength complies with the demands of the DIN Norm 10167 for the detection of Escherichia coli serotype O157:H7 in foods and FDA-BAM for the isolation of enterohemorrhagic Escherichia coli (EHEC). In addition the media conforms to the formula of the US Pharmacopoeia.

## Trypticase Soy Broth – Double Strength

TSB is a medium that will support the growth of a wide variety of microorganisms including aerobic, facultative, and anaerobic bacteria and fungi.

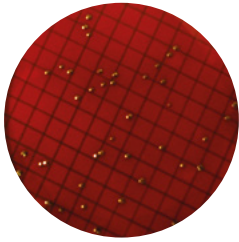
## Wallerstein Nutrient Broth (WL) and WL Differential Broth (WLD)

WL Nutrient Broth is for the cultivation and enumeration of yeast and WL Differential Broth is for determination of bacterial count. Use of the medium at pH 5.5 and incubation at 25°C will give reliable counts for brewer's yeast. Adjustment of the pH to 6.5 and incubation at 30°C allows for the selective growth of baker's and distiller's yeast.

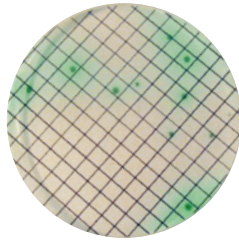


Trypticase Soy Broth Double Strength (not inoculated)

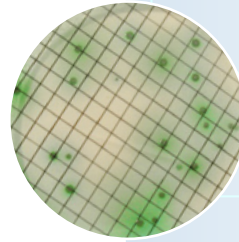
# LIQUID MEDIA SELECTION GUIDE



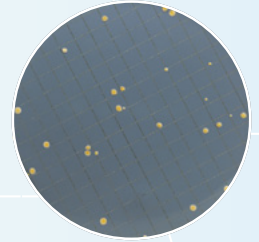
**M-Endo Coliform Broth**  
Cat. No. 10 496 103  
Coliform bacteria  
*E. coli* ATCC 25922,  
*E. aerogenes* ATCC 13048,  
*P. aeruginosa* ATCC 10145



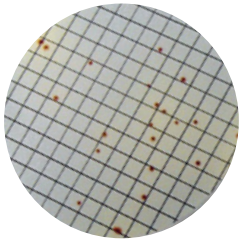
**Cetrimide Broth**  
Cat. No. 10 496 146  
*Pseudomonas aeruginosa*  
*P. aeruginosa* ATCC 10145



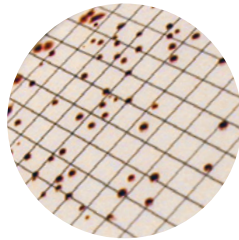
**Pseudomonas Broth**  
Cat. No. 10 496 119  
*Pseudomonas*  
*P. aeruginosa* ATCC 10145,  
*P. aeruginosa* ATCC 27853



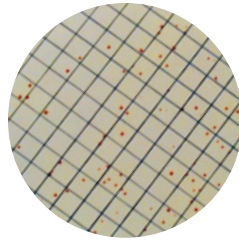
**PRY Broth**  
Cat.No. 10 496 106  
PRY  
*Z.Baillii* ATCC 58445



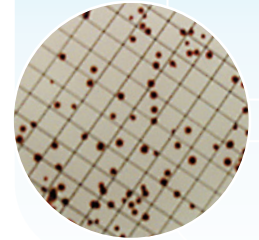
**Enterococcus Broth**  
Cat. No. 10 496 120  
Enterococci  
*E. faecalis* ATCC 19433



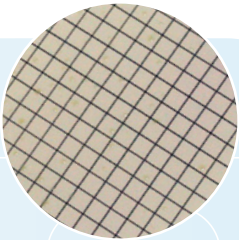
**HPC Broth with TTC**  
Cat. No. 10 496 151  
Heterotrophic Plate Count  
*E. coli* ATCC 25922, *E. faecalis*  
ATCC 29212, *S. aureus* ATCC 25923



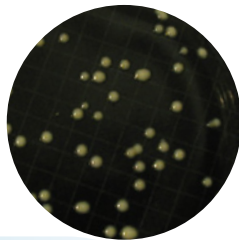
**KF-Streptococcus Broth**  
Cat. No. 10 496 125  
Fecal streptococci  
*E. faecalis* ATCC 29212,  
*E. faecalis* ATCC 19433



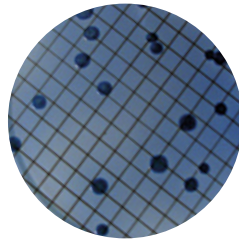
**Total Count Media with TTC**  
Cat. No. 10 496 113  
All aerobic bacteria  
*E. coli* ATCC 25922, *S. aureus* ATCC 25923,  
*P. aeruginosa* ATCC 10145,  
*E. faecalis* ATCC 29212



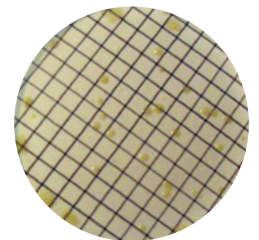
**Mannitol Salt Broth**  
Cat. No 10 496 121  
Staphylococci  
*S. aureus* ATCC 25923,  
*S. epidermidis* ATCC 12228



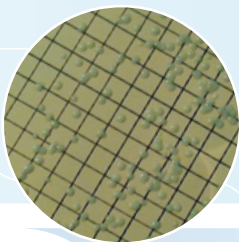
**Wallerstein Nutrient Broth**  
Cat. No. 10 496 108  
*Saccharomyces cerevisiae*  
*E. coli* ATCC 25922,  
*L. fermentum* ATCC 9338,  
*S. cerevisiae* ATCC 9763



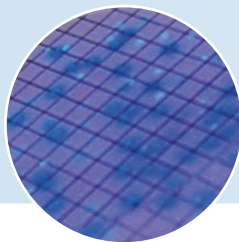
**M-FC Broth/M-FC Broth with Rosolic Acid**  
Cat. No. 10 496 124/114 Fecal coliforms  
*E. coli* ATCC 25922,  
*E. aerogenes* ATCC 13048



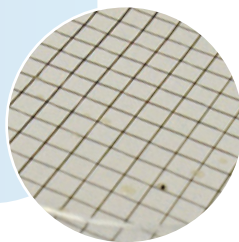
**M-TGE Total Count Media**  
Cat. No. 10 496 102  
All aerobic bacteria  
*E. coli* ATCC 25922,  
*S. aureus* ATCC 25923



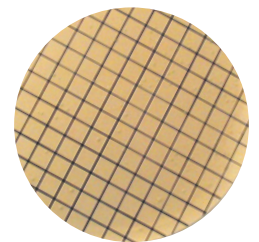
**M-Green Yeast and Mold**  
Cat. No. 10 496 101  
Yeast and Mold  
*C. albicans* ATCC 10231,  
*S. cerevisiae* ATCC 9763



**MI Broth and MI Agar**  
Cat. No. 10 496 192/847  
Coliform bacteria and *Escherichia coli*  
*E. coli* ATCC 25922,  
*E. aerogenes* ATCC 13048

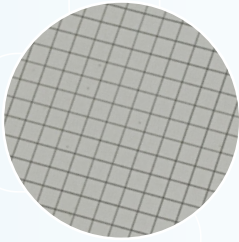


**MRS Broth**  
Cat. No. 10 496 112  
Lactobacilli  
*L. plantarum* ATCC 8014



**Orange Serum Media**  
Cat. No. 10 496 104 Various  
*L. acidophilus* ATCC 314,  
*S. cerevisiae* ATCC 9763





**Wallerstein Differential Broth**  
 Cat. No. 10 496 109  
 Lactobacillus plantarum  
 E. coli ATCC 25922,  
 L. fermentum ATCC 9338,  
 S. cerevisiae ATCC 9763



**Trypticase Soy Broth**  
 Single Strength  
 Cat. No. 10 496 707  
 B. subtilis ATCC 6633,  
 C. albicans ATCC 10231,  
 E. coli ATCC 25922,  
 S. aureus ATCC 25923



**Trypticase Soy Broth**  
 Double Strength  
 Cat. No. 10 496 708  
 B. subtilis ATCC 6633,  
 C. albicans ATCC 10231,  
 E. coli ATCC 25922,  
 S. aureus ATCC 25923



**Brilliant Green Bile Broth 2%**  
 Cat. No. 10 496 710  
 Coliform bacteria  
 E. coli ATCC 25922,  
 E. aerogenes ATCC 13048



**EC Broth**  
 Cat. No. 10 496 714  
 Coliform bacteria  
 E. coli ATCC 25922,  
 E. aerogenes ATCC 13048



**EC Broth with MUG**  
 Cat. No. 10 496 709  
 Escherichia coli  
 E. coli ATCC 25922



**Hygiene SwabCheck**  
 Cat. No. 10 498 407



**Coliform SwabCheck**  
 Cat. No. 10 498 406



**Listeria SwabCheck**  
 Cat. No. 10 498 408



**Buffer Swabs**  
 Cat. No. 10 498 305/10 498 306



**Neutralizing Buffer Swabs**  
 Cat. No. 10 498 303/10 498 304



## Legend

- Water
- Beverages
- Food
- Wastewater

- Dairy
- Pharmaceutical
- Cosmetics

# LIQUID MEDIA

## 2 mL Ampoules Ordering information

Product Code	Description	Packaging
10496146	Cetrimide Broth	50/pk
10496120	Enterococcus Broth	50/pk
10496164	Heterotrophic Plate Count (HPC) Broth with TTC	50/pk
10496151	HPC Broth	50/pk
10496125	KF-Streptococcus Broth	50/pk
10496121	Mannitol Salt Broth	50/pk
10496103	M-Endo Coliform Broth	50/pk
10496124	M-FC media	50/pk
10496114	M-FC Broth with rosolic acid	50/pk
10496116	M-Green Select Broth	50/pk
10496101	M-Green Yeast and Mold Broth	50/pk
10496192	MI-Broth Media	50/pk
10496112	MRS Broth	50/pk
10496102	M-TGE Broth	50/pk
10496104	Orange Serum Broth	50/pk
10496106	PRY Broth	50/pk
10496119	Pseudomonas Broth	50/pk
10496113	Total Count Broth with TTC	50/pk
10496108	Wallerstein Broth	50/pk
10496109	Wallerstein Differential Broth	50/pk

## 9 mL Vials Ordering information

Product Code	Description	Packaging
10496710	Brilliant Green Bile Bottled Broth, with Durham tubes	20/pk
10496714	EC Bottled Broth, with Durham tubes	20/pk
10496709	EC with MUG, Bottled Broth	20/pk

## Bottled Media Ordering information

Product Code	Description	Packaging
10496851	MI Media, Bottled Broth, 50 mL	1/pk
10496847	MI Media, Bottled Agar, 50 mL	1/pk
10496705	M-Green Yeast and Mold Bottled Agar, 100 mL	1/pk
10496707	Trypticase Soy Broth (TSB) Single strength, Bottled Broth, 100 mL	1/pk
10496708	Trypticase Soy Broth (TSB) Double strength, Bottled Broth, 100 mL	1/pk
10496744	ColiCheck with MUG, Presence-Absence (P-A) Test Kit with Sample Bottles	30/pk

## SwabCheck™



### SwabCheck: how to use

Open the sterile pack, remove the swab and wipe it over an area of about 10 x 10 cm. Then twist off the cap of the medium tube and insert the swab so that the cap fits tightly. Label the sample tube and incubate at the appropriate temperature.

A change in color indicates the presence of the microorganism in question. The quicker the color change occurs, the higher the bioburden. If no color change has been observed after the maximum incubation period has elapsed, then the corresponding microorganism is not present. GVS Life Sciences offers SwabCheck in packs of 25 pieces. With a shelf-life of 12 months.

### Neutralizing Buffer Swabs

Neutralizing buffer swabs are used in the monitoring of surfaces for total bacterial count. Neutralizing buffer inactivates the bactericidal and bacteriostatic effects of chlorine and quaternary ammonium detergents. Without exhibiting toxic effects on microorganisms. This permits the transfer of swabbed organisms to the laboratory without loss in viability. Neutralizing buffer is not designed to culture and enumerate microorganisms.

### Buffer Swabs

Buffer Swabs are used for the collection of surface contamination from flat or convoluted surfaces prior to transport to a laboratory for culture and enumeration. Buffer swabs contain no bacteriostatic or bactericidal compounds and cannot suppress the action of detergents.

### SwabCheck

SwabCheck is used as an indication of hygiene on contact surfaces. SwabCheck changes color from purple to yellow. The color change is based on acid reaction with the indicator. The more rapid the color change, the higher the level of bacteria in the sample. SwabCheck is useful in determining the sanitation levels of preparation surfaces, filling ports, and processing areas in beverage and food processing plants, dairies, restaurants, and healthcare facilities.

### Coliform SwabCheck

Escherichia coli and coliforms are used traditionally as indicator organisms for fecal contamination in water and other environmental samples. Detection of these organisms usually points to poor hygiene at some stage in the production process or pollution of water at source. The presence of coliforms is indicated by a color change from brown to yellow. The more rapid the color change the higher the level of coliform bacteria.

### Hygiene SwabCheck

Easy to use: The Hygiene SwabCheck shows an obvious color change from red to yellow. The time taken for this change is an indication of the level of contamination. This should be used in conjunction with known specification levels of your process/product. Rapid screening hygiene test is a same day test that will detect gross bacterial and fungal contamination of work surfaces, equipment machinery or other sampling sites.

### The SwabCheck principle

The surface is wiped with a cellulose swab and any bacteria collected are transferred via the swab into a tube containing a special medium with an indicator dye, which is then incubated. A single bacterium is sufficient to cause a color change. This means that SwabCheck is about 1000 times more sensitive than the conventional ATP method. This accuracy is particularly important in the food industry. With this simple method, it is possible to identify microorganisms such as *Listeria monocytogenes*, which must not be present in any concentration in food and beverages.

### Features & Benefits:

- ◆ The right test for each type of contamination
- ◆ Qualitative and semi-quantitative hygiene control
- ◆ Sterile packed and ready-for-use
- ◆ Easy to handle
- ◆ Rapid results
- ◆ Long shelf-life

Total Count Swab Kit



Coliform SwabCheck



## Listeria SwabCheck

Listeria Isolation SwabCheck is designed to be used alongside traditional selective methods to improve the quality system and minimize the risk of Listeria contamination. This simple to use diagnostic test can be applied anywhere in the environment and on foodstuffs where the presence of Listeria species would be critical.

Listeria sp and specifically Listeria monocytogenes are rapidly becoming the most important pathogen in the food industry; regulatory bodies from around the world are insisting that all food products are Listeria free. Listeria Isolation SwabCheck works on an enhanced Esculin media formulation. The hydrolysis of esculin gives a distinctive black/brown precipitate. Inhibitors and antibiotics are present in the media, which will inhibit the growth of non-Listeria species.

## SwabCheck Escherichia coli

SwabCheck Escherichia coli is used for the detection of Escherichia coli on surfaces. The presence of fluorescence using a longwave UV light source confirms the presence of Escherichia coli and any further confirmation is not required. MUG detects anaerogenic strain that may not be detected in the conventional procedure. Lactose is a source of energy. Casein peptone provides additional nutrients. The mixture of bile salts is inhibiting for gram-positive bacteria, particularly bacilli and fecal streptococci. The substrate 4-methylumbelliferyl-b-D-glucuronide is hydrolyzed by an enzyme, b-glucuronidase, possessed by most Escherichia coli and a few strains of Salmonella, Shigella, and Yersinia, to produce a fluorescent end product, 4-methylumbelliferone. The presence of Escherichia coli is detected by the appearance of fluorescence throughout the tube.

## Total Count Swab Kit

Total Count Swab Kit is used for the non-selective development and enumeration of all aerobic bacteria on surfaces in accordance with Hazard Analysis and Critical Control Points (HACCP). The kit includes the swabs and culture medium, packaged with a membrane device, providing a quantitative result. All bacteria develop on TGE media and produce a range of different colored and sized colonies. It is not possible using TGE to presumptively identify any bacteria. Identification can only be undertaken using traditional microbiology techniques following initial colony development.

## Yeast and Mold Swab Kit

Yeast and Mold Swab Kit is used for the enumeration of yeast and molds on surfaces in accordance with HACCP. The kit includes the swabs and culture medium, packaged with a membrane device, providing a quantitative result. M-Green yeast and mold is an improved modification of the liquid medium, and was developed to improve efficiency of detection and enumeration of fungi in sugar based drinks using the membrane filtration method. This medium has a low pH, which inhibits bacterial growth. The addition of bromocresol green, which diffuses into fungal colonies as an alkaline reaction, allows them to be easily identified. Metabolic by-products from the developing colonies diffuse into the surrounding medium, further reducing the pH that aids in the inhibition of bacterial growth, but also produces an acid reaction that causes residual bromocresol green to change to yellow. Green opaque colonies against a yellow background are indicative of the growth of yeasts. Mold colonies are green and filamentous.

## Polywipe Sponge

Polywipe Sponge is used for the recovery of microorganisms from a surface. Polywipe is a blue sponge that is premoistened with neutralizing buffer to neutralize the effects of surface disinfectants. The sponge material is selected to be free of the preservatives found in commercially available sponges, which can inhibit microorganism growth. Polywipe sponges are biocide free and tested for zero toxicity to microorganisms. Each sponge is individually wrapped in a peel pouch and gamma irradiated to ensure sterility.

Hygiene SwabCheck



Listeria SwabCheck



Yeast and Mold Swab Kit



Polywipe Sponge



# BUFFERS

## Buffers Ordering information

Product Code	Description	Volume	Quantity
10498303	Neutralizing Buffer Swabs	4 mL	125/pk
10498304	Neutralizing Buffer Swabs	4 mL	500/pk
10498305	Buffer Swabs	4 mL	125/pk
10498306	Buffer Swabs	4 mL	500/pk

## SwabCheck Ordering information

Product Code	Description	Volume	Quantity
10498404	SwabCheck	4 mL/tube	125/pk
10498402	SwabCheck Escherichia coli	4 mL/tube	125/pk
10498315	Total Count Swab Kit	2.8 mL/tube and membrane device	30/pk
10498316	Yeast and Mold Swab Kit	2.8 mL/tube and membrane device	30/pk
10498406	Coliform SwabCheck	Individually wrapped package	25/pk
10498407	Hygiene SwabCheck	Individually wrapped package	25/pk
10498408	Listeria SwabCheck	Individually wrapped package	25/pk
10498521	Polywipe Sponge	Individually wrapped pre-moistened sponge	50/pk

## Dilution Bottles



Prefilled sterile dilution bottles are designed for sample dilution of water, dairy products, foods, and pharmaceuticals prior to microbiological testing. Final pH for all solutions is 7.2 pH  $\pm$ 0.2 pH at 25°C. They come in an easy open, flip-top, plastic container with a tamper-evident seal.

Butterfield's Phosphate Buffer contains monobasic potassium phosphate and is used extensively in the food, dairy, and pharmaceutical industries. Offered in 90 ml and 99 ml volumes for easy 1:10 and 1:100 dilutions. It is recommended as a general diluent in laboratory procedures by the Federal Drug Administrations and in the Bacteriological Analytical Manual. This product is prepared according to Standard Methods for the Examination of Water and Wastewater for use in water testing. Phosphate Buffer with magnesium chloride is used as the diluents for the preparation of dilutions in plate counts in the dairy and food industries. It is recommended by APHA for the recovery of injured microorganisms from dairy and food samples. Contains deionized water, monopotassium phosphate, and magnesium chloride.

## Ordering information

Product Code	Description	Volume	Quantity
10498503	Dilution Bottle, Butterfield's Buffer	99 mL	72/pk
10498504	Dilution Bottle, Butterfield's Buffer	90 mL	72/pk
10498505	Dilution Bottle, Phosphate Buffer Magnesium Chloride	99 mL	72/pk

# ANALYTICAL FUNNELS

GVS microbiological monitors and analytical funnels provide a complete system solution for liquid sample preparation. Each single-use, pre-sterilized filtering unit consists of a measured filter funnel, base, pad, membrane, removable lid and plug. This all-in-one system easily converts from the 100 mL filtration unit to a petri dish, which can be labeled and incubated for culturing. The GVS funnels meet the standard method requirements for a disposable device.

Each sterile analytical funnel includes a removable NC membrane.

**Analytical funnels are ready-to-use 100 ml filtration units with membrane and culturing devices.**

After filtration the membrane of the analytical funnel can be used for a wide range of qualitative and quantitative biological analysis.



Step 1



Step 2



Step 3



Step 4

## Workflow

1. Sample filtration
2. Remove the upper part from the base
3. Put the base on the membrane lifting device
4. Separate the membrane from the pad and transfer the membrane into a petri dish with a sterile pad

## Advantages

- ◆ **Saves up to 50% in time**
  - No flaming
  - Ready-to-use
  - Presterilized
- ◆ **Safety at work**
  - No flaming
  - Minimizes the risk of cross-contamination
- ◆ **Easy Handling**
  - Ready-to-use filtration unit
  - Easy release of membrane

## Ordering information

Product Code	Description	Quantity
10497507	Funnel, Nitrocellulose, White/Black Grid Sterile 0.2 µm	50/pk
10497510	Funnel, Nitrocellulose, White/Black Grid Sterile 0.2 µm , individually packaged	50/pk
10497504	Funnel, Nitrocellulose, White/Black Grid Sterile 0.45 µm	50/pk
10497506	Funnel, Nitrocellulose, White/Black Grid Sterile 0.45 µm, individually packaged	50/pk
10497508	Funnel, Nitrocellulose, Black/White Grid Sterile 0.45 µm	50/pk
10497509	Funnel, Nitrocellulose, Black/White Grid Sterile 0.45 µm, individually packaged	50/pk

**Recommended to use with GVS Column KM-B**



# MICROBIOLOGICAL MONITORS

GVS microbiological monitors and analytical funnels provide a complete system solution for liquid sample preparation. Each single-use, pre-sterilized filtering unit consists of a measured filter funnel, base, pad, membrane, removable lid and plug. This all-in-one system easily converts from the 100 mL filtration unit to a petri dish, which can be labeled and incubated for culturing. The GVS funnels meet the standard method requirements for a disposable device.

Each sterile monitor includes a NC membrane fixed and welded to the dish.

**Monitors are single use, pre-sterilized filtering units with welded fixed membranes and culturing devices.**

Microbiological Monitors are ideal for monitoring contaminants in liquid samples from raw materials to finished products. After the filtration is complete, 2 ml of microbiological media is added and the unit is converted into a petri dish for culturing the contaminants collected.



Step 1



Step 2



Step 3



Step 4

## Workflow

1. Sample filtration
2. Remove the funnel
3. Add 2 ml of microbiological media
4. Replace the lid and incubate

## Advantages

- ◆ **Saves up to 70% in time**
  - No flaming
  - Ready-to-use
  - Presterilized
- ◆ **Safety at work**
  - No flaming
  - Minimizes the risk of cross-contamination
- ◆ **Easy Handling**
  - Ready-to-use filtration unit

## Ordering information

Product Code		Description	Quantity
47 mm	56 mm		
10497511	10497603	Monitor, Nitrocellulose, 0.2 µm, white/black grid, sterile	50/pk
10497500	10497600	Monitor, Nitrocellulose, 0.45 µm, white/black grid, sterile	50/pk
10497501	n/a	Monitor, Nitrocellulose, 0.45 µm, white/black grid, sterile, individually packaged	50/pk
10497502	10497601	Monitor, Nitrocellulose 0.45 µm, black/white grid, sterile	50/pk
10497503	10497602	Monitor, Nitrocellulose, 0.8 µm, black/white grid, sterile	50/pk

Recommended to use with GVS Column KM-B

# FILTER HOLDERS



## 47 mm Filter Holder - Gravi-Seal™



locking devices to manipulate.

The durable and break-resistant polysulfone (PS) unit is autoclavable and chemically resistant for use in cell culturing and microbiological applications and filtering.

The unit includes graduated up to 350 mL with 50 mL intervals. Each unit is supplied with a #8 rubber stopper to allow use with standard 1L filter flasks or vacuum systems such as the GVS 3- or 6- place Manifold.

### Features & Benefits

- ◆ Durable - break resistant, no extra parts to break or wear out
- ◆ Uses a 47 mm depth filter disc
- ◆ One-handed operation
- ◆ Only two parts
- ◆ No clamps, wheel locks, or magnets to wear out
- ◆ Solid, stable and easy to use

### Typical Applications

- ◆ Filtering liquids for sterility
- ◆ Particle removal
- ◆ General filtration
- ◆ Autoclavable

The GVS polysulfone 47 mm autoclavable filter holder combines The Gravi-Seal filter holder uses a unique gravity held design that allows for one-handed operation with no danger of filter by-pass or sample leakage even when using depth filters.

The filter holder combines the key features and benefits needed in one simple unit, making it a tremendous value. The funnel includes only two components with no required clamps or

### Ordering information

Product Code	Description	Quantity
1213865	Gravi-Seal PS Analytical Filter Holder (complete unit): 47 mm	1/pk
1214124	Gravi-Seal PS Analytical Filter Holder (complete unit): 47 mm	3/pk
1213883	Gravi-Seal PS Analytical Filter Holder, Base Only	1/pk
1213882	Gravi-Seal PS Analytical Filter Holder, Funnel Only	1/pk

### Recommended to use with GVS Column KM-N



# MANIFOLD

## Componible Modular Filtration Manifold



- ◆ Different sizes: 1, 3, 4 and 6 places
- ◆ It can be easily dismantled for the cleaning operations or to check each part.
- ◆ The assembling is even possible according to user's needs, choosing among various uniform type, different type or mixed form type columns
- ◆ The base structural materials is in satin Stainless Steel with sides handles in anodized aluminium
- ◆ One side is fitted with hose-barb for 2 different diameters of vacuum hoses  $\varnothing$  8 and 12 mm, the opposite side is fitted with a stopper.
- ◆ Hose-barb and stopper are interchangeable to facilitate the proximity to the vacuum source
- ◆ Each part is easily disassembled, inspectable, autoclavable at 121°C for 30 minutes, washable, sanitizable or sterilizable

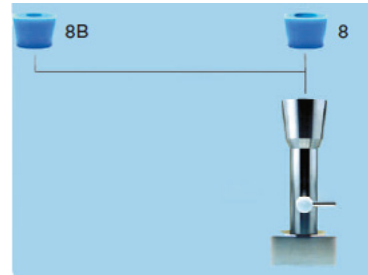
### Ordering information

Product Code	Description	Quantity
MANIFOLDKRAMP1	1 Position filtration Manifold base	1/pk
MANIFOLDKRAMP3	3 Position filtration Manifold base	1/pk
MANIFOLDKRAMP4	4 Position filtration Manifold base	1/pk
MANIFOLDKRAMP6	6 Position filtration Manifold base	1/pk

# MANIFOLD

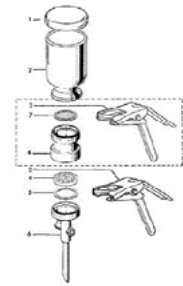
## Universal column for assembled filter holders KM-N

- ◆ This is the most commonly known and used column as it was the first one to be introduced on the market.
- ◆ It accepts all filtration holders available on the market as long as slipped into a stopper #8 (upper Ø 41 mm)
- ◆ Available Silicone stopper #8 with 15 mm hole and Silicone stopper #8B with 10 mm hole



## Stainless steel Device of diameter 47/50 mm

- ◆ Devices for routine filtration
- ◆ Without tap at the base, for mounting on ramps
- ◆ With a stainless steel membrane support
- ◆ Available Aisi 316 stainless steel devices of various capacities
- ◆ The 500 ml is equipped with a stainless steel lid



### Ordering information

Product Code	Description	Quantity
COLUMNKMM-N	Universal conical column for stopper #8 KM-N	1/pk
SILISTOPPERK8-15	Silicone stopper 15 mm #8	1/pk
SILISTOPPERK8B-10	Silicone stopper 10 mm #8B	1/pk
KSL47500	Assembled filter holder KSL 47/50 mm - 500 ml	1/pk
KSL47250	Assembled filter holder KSL 47/50 mm - 250 ml	1/pk
KSL47100	Assembled filter holder KSL 47 mm - 100 ml	1/pk

## Universal column for 47 / 50 mm membranes RA-S2

- ◆ This mushroom shaped column with polished inner part is supplied with a membrane support disc in sintered SS Ø 40 mm removable with a finger
- ◆ it's possible to mount funnels with different form, held by a clamp



## Stainless steel Device of diameter 47/50 mm

- ◆ Stainless Steel 500 ml, (optional lid), graduated 250 e 500 ml
- ◆ Stainless Steel 250 ml, (optional lid) clamp not required, graduated every 50 ml
- ◆ Stainless Steel 100 ml, clamp not required, graduated at 50 ml
- ◆ Available Prefilter devices, that provides a physical separation on two filters which have been set up in series, to clarify first then to refine.



### Ordering information

Product Code	Description	Quantity
COLUMNKRA-S2	Universal mushroom column for membrane diam. 47/50mm RA-S2	1/pk
STEELFUNNK500	Steel Funnel 500ml for RA-S2 column (clamp to be purchased separately)	1/pk
STEELFUNNK250	Steel Funnel 250ml for RA-S2 column	1/pk
STEELFUNNK100	Steel Funnel 100ml for RA-S2 column	1/pk
STEELCOVERK500	Steel cover for 500ml Funnel	1/pk
STEELCOVERK250	Steel cover for 250ml Funnel	1/pk

# MANIFOLD

## Column for Speed Pack or 1+Pac and funnels RA-A2

- ◆ This mushroom shaped column with polished inner part is supplied with a membrane support disc in sintered SS Ø 40 mm removable with a finger



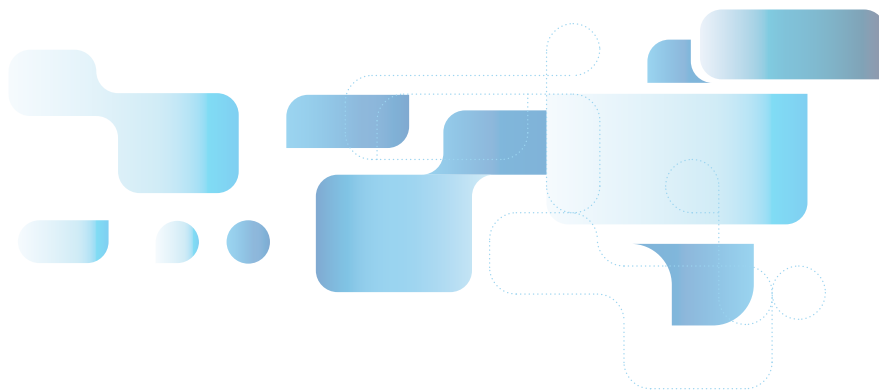
## PP disposable funnels for separated membrane

- ◆ PP funnels 100 and 200 capacity, graduated
- ◆ In packs of 100 pieces divided into 10 sterile boxes of 10 pieces
- ◆ Disposable type, easy to use



### Ordering information

Product Code	Description	Quantity
COLUMNKRA-A2	Universal mushroom column for membrane diam. 47/50mm RA-S2	1/pk
FUNNELK100S	PP funnel 100 ml sterile for Speed-Pack - 100 pcs	1/pk
FUNNELK250S	PP Funnel 250 ml sterile for Speed-Pack - 100 pcs	1/pk



## Column for Analytical Funnel and Monitors KM-B

- ◆ On this mushroom shaped column are mounted graduated filtration devices as GVS Analytical Funnel and Microbiologic Monitor, with inner Ø 46,5.
- ◆ Devices are mounted simply by a light finger pressure
- ◆ Analytical Funnel and Microbiologic Monitor
- ◆ Pouring the sample
- ◆ Removing the cylinder
- ◆ Petri ready for incubation



### Ordering information

Product Code	Description	Quantity
COLUMNKKB	Special mushroom column for GVS monitor and analytical funnel KM-B	1/pk

## Column to connect remote devices KM-P

- ◆ This column is Ø 8 or 12 mm hose barb shaped.
- ◆ It allows an independent connection with different remote devices that need vacuum for its performance



### Ordering information

Product Code	Description	Quantity
COLUMNKKB	Special column Hose Barb connector 8-12mm inner diam. KM-P	1/pk

# VACUUM PUMPS

## Oil-Free Piston Vacuum Pumps

- ◆ No air pollution, maintenance free (driven by Piston, without the need of lubricant, regular oil changes and maintenance)
- ◆ The oil-free piston vacuum pump provides continuous, reliable, high flow vacuum for your container
- ◆ Pumps are equipped with vacuum regulator to adjust vacuum
- ◆ Pumps has a built-in thermal protection device to shut off the pump automatically when overheated and then resume working when the temperature cools down



Product Service

Products certificated for sales in EU, US and Asia Pacific

Model	V300	V400	V410
Power (V/Hz)	220 / 50	220 / 50	220 / 50
Max. power (W)	60	80	80
Max. current (A)	0.3	0.4	0.4
Max. vacuum (mbar)	100	100	30
Max. flow rate (L/min)	17	34	19
Motor rotation (RPM)	1450	1450	1450
Port thread (mm)	9	9	9
Dimension WxDxH (mm)	272 x 142 x 165	310 x 152 x 165	310 x 152 x 165
Weight (kg)	4.4	5.4	5.4
Noise level (dB)	50	60	50

### Ordering information

Product Code	Description	Quantity
OFPV300L17	Oil-Free Piston Vacuum Pumps V300 100mbar; Max. Flow Rate: 17 l/min	1/pk
OFPV400L34	Oil-Free Piston Vacuum Pumps V400 100mbar; Max. Flow Rate: 34 l/min	1/pk
OFPV410L19	Oil-Free Piston Vacuum Pumps V410 30mbar; Max. Flow Rate: 19 l/min	1/pk

Available Voltage : 110V or 220V

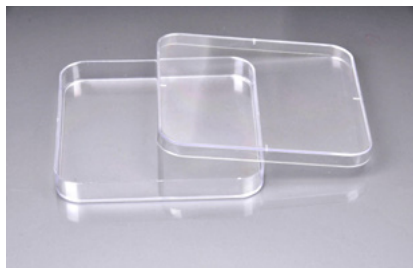
Plug-Type : EU, US, UK, Australian, India, Japan, Switzerland



# BACTERIOLOGICAL PETRI DISHES

## Petri Dishes, Plastic Material

- ◆ Non-cytotoxic virgin polystyrene, excellent optical clarity
- ◆ Engineered for optimum flatness to provide uniform agar thickness
- ◆ Single or more vents are available: no-vent for anaerobic and long-term work, single vent for limiting gas exchange, multi vents for improving gas exchange



### General petri Dishes

90 and 150mm Petri dishes are manufactured in accordance with standard ISO 24998:2008, ideal for use with most automatic filling machine.

Product Code	Description	Quantity
PETRIDPC035151NVS	Ø 35x15 mm, 1 Room	10 pcs / polybag, 300 pcs / carton
PETRIDPC049131NVS	Ø 49 x13 mm, 1 Room	10 pcs / polybag, 1,000 pcs / carton
PETRIDPC055151NVS	Ø 55x15 mm, 1 Room	10 pcs / polybag, 1,000 pcs / carton
PETRIDPC0601513VS	Ø 60x15mm, 1 Room / 3 vents	10 pcs / polybag, 1,000 pcs / carton
PETRIDPC070151NVS	Ø 70 x 15 mm, 1 Room	20 pcs / polybag, 800 pcs / carton
PETRIDPC0901513VS	Ø 90 x 15 mm, 1 Room / 3 vents	10 pcs / polybag, 500 pcs / carton
PETRIDPC1501513VS	Ø 150 x 15 mm, 1 Room / 3 vents	10 pcs / polybag, 200 pcs / carton

### Compartmented Dishes

Ideal for different media on same dish, or meet the requirement of saving incubator space.

Product Code	Description	Quantity
PETRIDPC0901523VS	Ø 90 x 15mm, 2 Rooms / 3 vents	10 pcs / polybag, 500 pcs / carton
PETRIDPC0901533VS	Ø 90 x 15mm, 3 Rooms / 3 vents	10 pcs / polybag, 500 pcs / carton

### Square Dishes

Noncompartmented, ideal for antibiotic sensitivity testing.

Product Code	Description	Quantity
PETRIDPS130151NVS	Ø 130 x 130 x 15 mm, 1 Room	10 pcs / polybag, 150 pcs / carton

### Contact Plates

10x10mm counting net, alphanumeric, facilitates colony counting and locating.

Product Code	Description	Quantity
PETRIDPC0651513VS	Ø 65 x 15 mm, 1 Room / 3 vents	10 pcs / polybag, 1,000 pcs / carton

# BACTERIOLOGICAL PETRI DISHES

## Petri Dishes, Glass Material

3.3 Borosilicate glass, withstand repeated sterilization (wet or dry).



Product Code	Description	Quantity
PETRIDGC060151NVS	Ø 60 mm x 15 mm	288/pk
PETRIDGC075151NVS	Ø 75 mm x 15 mm	288/pk
PETRIDGC090181NVS	Ø 90 mm x 18 mm	192/pk
PETRIDGC100201NVS	Ø 100 mm x 20 mm	192/pk

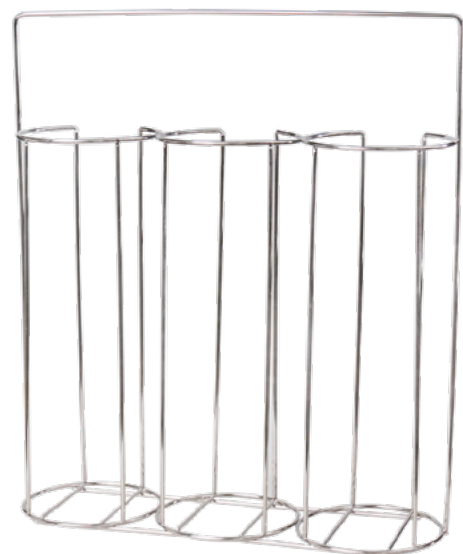
## Petri Dish Carrier Rack

Designed for holding and carrying plastic or glass petri dishes.

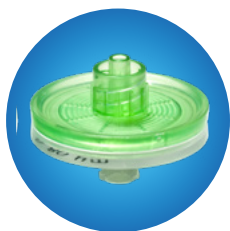
- Made of STAINLESS STEEL Material
- Autoclavable and resistant to universal chemicals
- Highly polished surface, no edges and sharps
- Lightweight, easy to load, safe for transporting

**Packing:** 1 pc / inner box, 5 pcs / carton

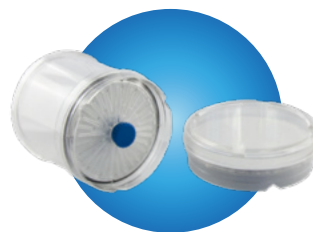
Product Code	Dimensions	Description
PETRIDC340110380330	340 × 110 × 380 mm	3 sections, holds 30 petri dishes



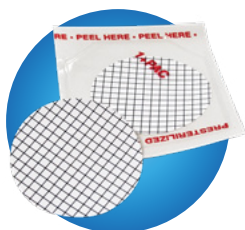
## Life Sciences products and capabilities



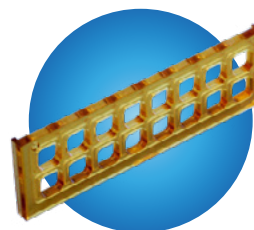
◆ **MICROFILTRATION PRODUCTS:** Syringe Filters, Vent Filters, Capsule Filters, Centrifugal Filters, Bottle Top, Filter Holders for Membranes, Filter Funnels



◆ **MICROBIOLOGY:** Microbiological Monitors, Analytical Monitors, Nutrient Liquid Media, Swab Kits, Dilution Bottles, Sterile Membranes



◆ **FILTRATION MEMBRANES:** Discs, Sheets and Roll, available in a wide range of media: CA, NC, NY, PES, PP, PTFE, RC, PE, Hydrophobic and Hydrophilic PVDF, PCTE, PETE, Silver, Drain Discs, Filter Papers, Glass Fiber/Quartz



◆ **FAST® PROTEIN MICROARRAY**



◆ **MEMBRANES in ROLL STOCKS**



◆ **CUSTOMIZED DEVICES AND COMPONENTS**



◆ **TRANSFER (blotting) MEMBRANES** for nucleic acid and protein analysis

**For more information on the lifesciences product collection please visit [www.gvs.com](http://www.gvs.com)**



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