Water analysis: *Legionella*

Materials and methods according to ISO 11731:2017

Biosigma Dutscher group

WHO ARE WE

Il marchio italiano sinonimo di qualità e innovazione nel rispetto dell'ambiente.

Founded in 1988 and located near Venice, **Biosigma S.p.A.** is today a reference point in the production of materials and instruments for microbiology and molecular biology.

With more than 12,000 m^2 of production facilities, two clean rooms and a state-of-the-art machine park, the company guarantees high quality standards in compliance with the strictest international regulations.

Although mainly known for the production of plastic materials, the company offers a much broader range of products. In the field of microbiological quality control, it provides a comprehensive catalogue: culture media, bacterial strains for performance verification, consumables, and instruments required to complete the entire analytical process.

To further strengthen its commitment to microbiological safety, Biosigma has developed a product line entirely dedicated to the monitoring of Legionella, offering a complete range of solutions in compliance with **ISO 11731:2017**.

Our contribution in the monitoring of *Legionella*

The detection of *Legionella* according to **ISO 11731:2017**, is a complex process, in which procedures and materials vary depending on the nature of the sample and the purpose of the analysis.

To ensure reliable, reproducible, and safe results, it is essential that all materials and procedures involved comply with the relevant regulatory standards.

For this reason, Biosigma has developed a structured offering that includes:

- **Diluents and culture media**, both dehydrated and ready-to-use, manufactured in compliance with **ISO 11133:2020**, including all media for *Legionella* with varying degrees of selectivity (BCYE, BCYE w/o-cys, BCYE+AB, GVPC, MWY);
- **RM bacterial strains** to verify the productivity and selectivity of culture media, supplied by a manufacturer accredited to **ISO 17034:2017**;
- **Filter membranes** produced in accordance with **ISO 7704:2023**;
- **Consumables and instruments** in line with the requirements of **ISO 11731:2017**.

This product line is designed to cover the various analytical scenarios, from samples with low bacterial load to those with a higher level of interfering flora.

The value of choosing Biosigma

Choosing Biosigma means relying on an Italian manufacturer that combines **experience**, **innovation** and **quality**.

All production processes, both in-house and of selected partners, are subject to strict controls according to the highest quality standards, ensuring the absence of contamination and full product conformity.

CSQ ISO 13485 · SYSTEM CERTIFICATION ISO 14001 SGS · SYSTEM CERTIFICATION ISO 45001 SGS · ISO 27001 INFORMATION SECURITY ISO 27001

ACT. The Environmental Impact Factor Label · ISCC International Sustainability & Carbon Certification

FDA U.S. FOOD & DRUG ADMINISTRATION · isber INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

ESBB European, Middle Eastern & African Society for Biopreservation and Biobanking

CONFINDUSTRIA VENEZIA AREA METROPOLITANA DI VENEZIA E ROVIGO

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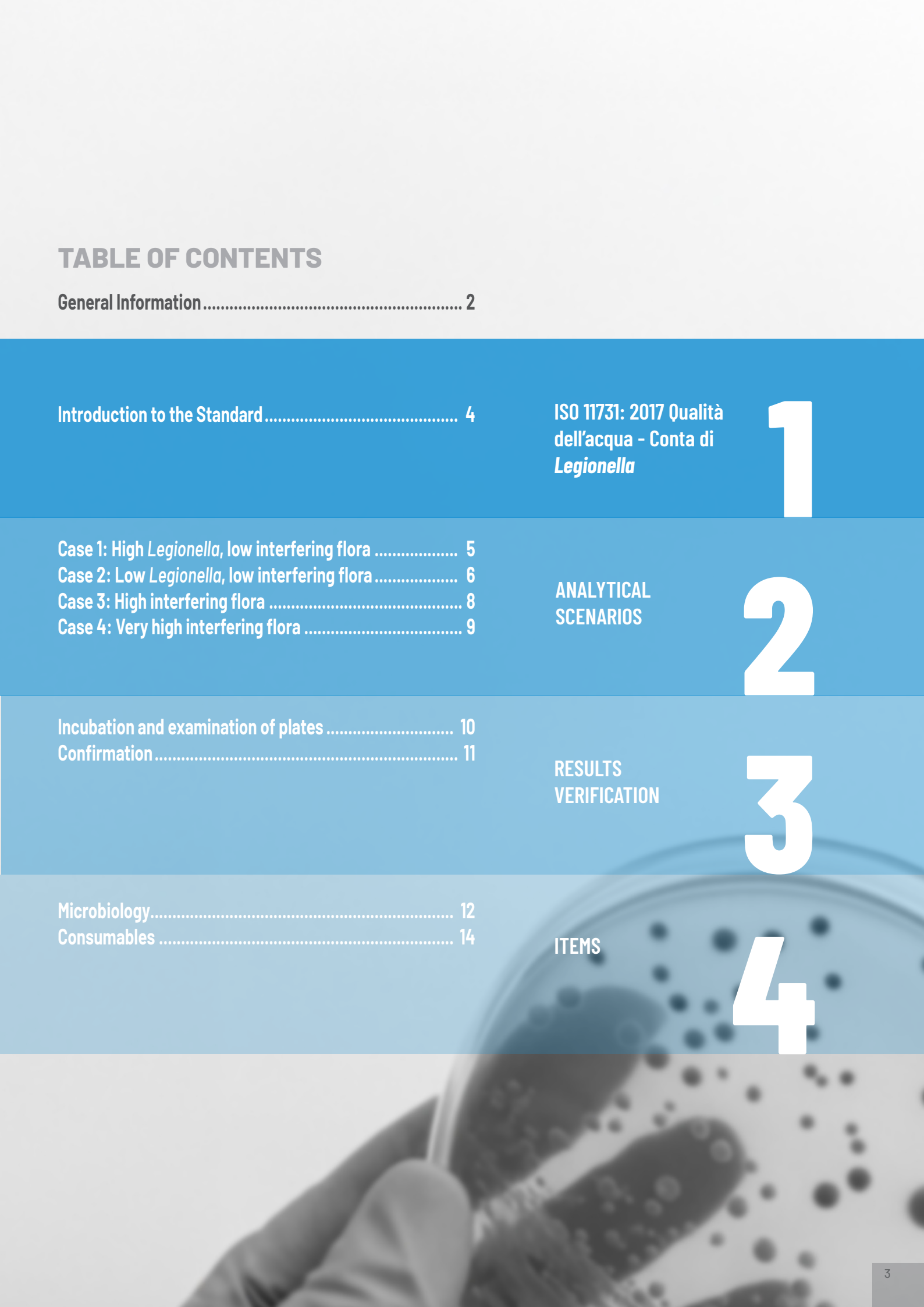
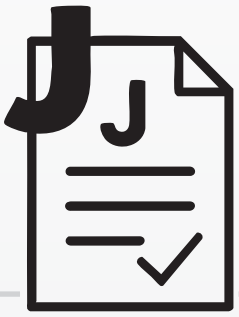


ISO 11731: 2017 Water quality - *Legionella* count

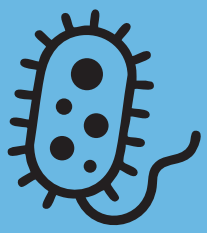
INTRODUCTION TO THE STANDARD

ISO 11731 outlines methods for the detection and enumeration of *Legionella spp*. in various types of water samples, as well as other water-related matrices (such as sediments or biofilms).

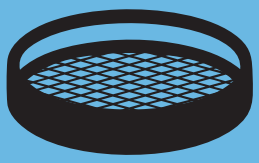
Annex J of the standard includes a decision matrix to identify the most appropriate method for each case, based on the following parameters:



Nature of the sample



Expected concentration of *Legionella*



Expected concentration of background flora

Purpose of the analysis

From the combination of these parameters, four scenarios emerge, each corresponding to one of the main methods illustrated in the following pages:

Case 1:
Expected high concentration of *Legionella* with low concentration of interfering flora

Case 2:
Expected low concentration of *Legionella* with low concentration of interfering flora (two approaches)

Case 3:
High concentration of interfering flora

Case 4:
Very high concentration of interfering flora

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CASE 1:
Expected high concentration of *Legionella* with low concentration of interfering flora

Example: Tap water collected following a legionellosis outbreak

Analysis procedure

When the **estimated concentration exceeds 10^4 CFU/liter**, there is no need to proceed with a concentration step on the sample.

It is possible to directly inoculate the sample onto the culture media.

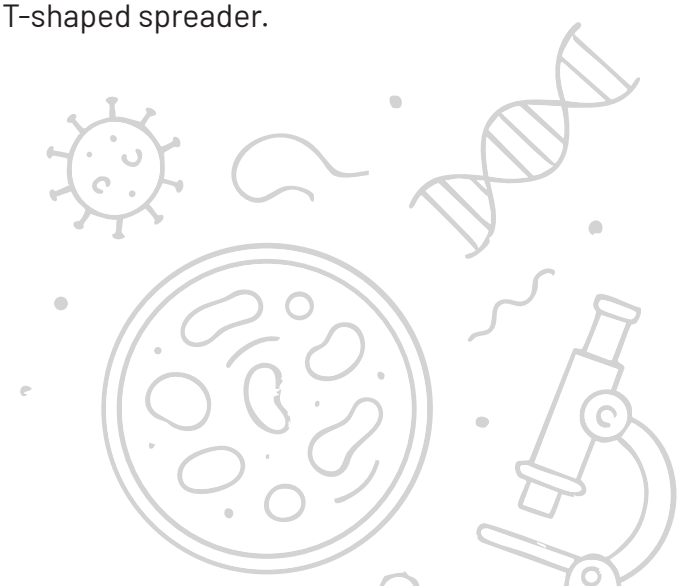
BCYEA

Inoculate 0.1-0.5mL of the sample onto BCYEA medium.

BCYEA + AB

In parallel, inoculate 0.1-0.5mL of the sample onto BCYEA+AB medium (moderately selective for *Legionella*).

Distribute the inoculum using an L-shaped or T-shaped spreader.



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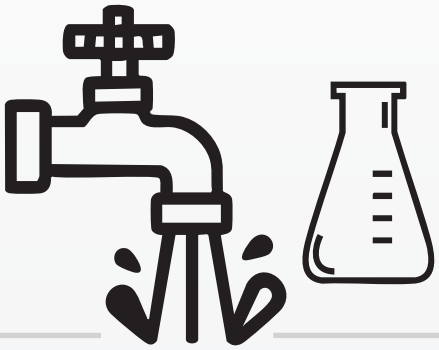
CASO 2:

Expected low concentration of *Legionella* with low concentration of interfering flora

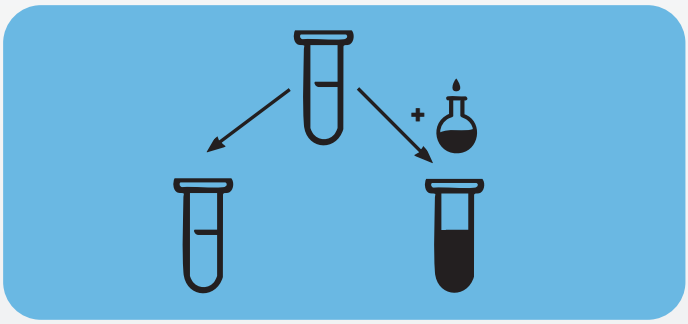
Example: Routine analysis of tap water



The sample is filtered to increase the microbial concentration.

Two approaches are possible:

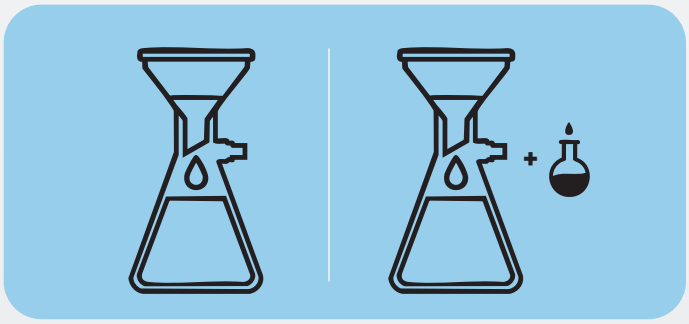
Approach 1 - Analysis procedure:



Culturing of the membranes

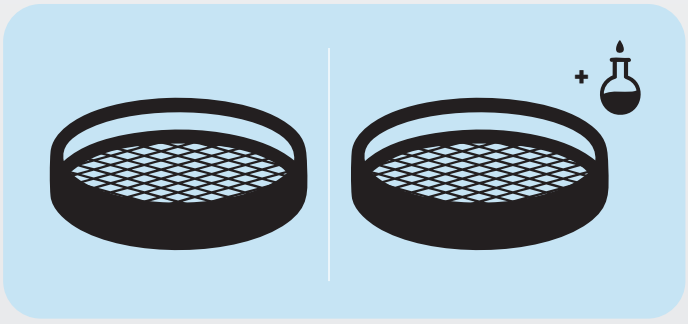
1. The sample is divided. One portion is left untreated, while the other undergoes acid treatment: it is diluted by adding nine volumes of acid solution for *Legionella*, mixed, and left to stand for 5 ± 0.5min*.

*alternatively, the treatment can be performed directly on the membrane in the filtration funnel by adding 30mL of acid solution, allowing it to act for 5 ± 0.5 minutes, removing the acid, and then rinsing with 20mL of diluent



Filtration

2. The two portions of the sample are filtered separately onto NC or MEC membranes, with a diameter of 47-50mm and a pore size of 0.2-0.45µm.



Membrane collection

3. The membranes are collected and placed onto culture media:
   - onto BCYEA medium for the untreated portion of the sample
   - onto a selective medium for *Legionella* (BCYE+AB, GVPC, MWY) for the portion treated with acid solution.

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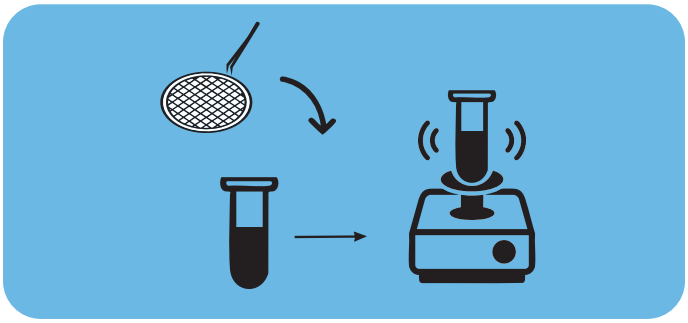
Approach 2 - Analysis procedure:

Filtration

1. The sample is filtered through a PES or polycarbonate membrane with a diameter of 47–142mm and a pore size of 0.2µm.

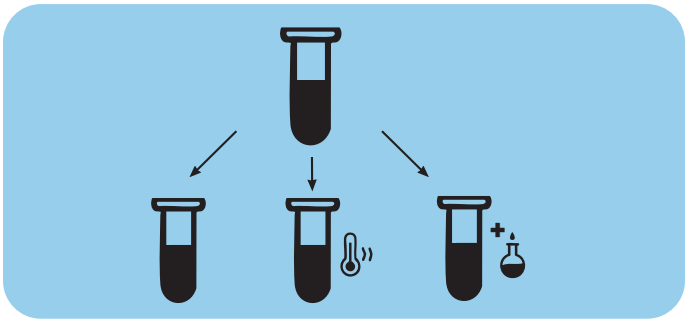


Membrane recovery and shaking

2. The membrane is recovered and "washed" by placing it face down in a sterile container with 5-10mL of sterile diluent (optionally, with sterile glass beads with a diameter of 2-3mm).

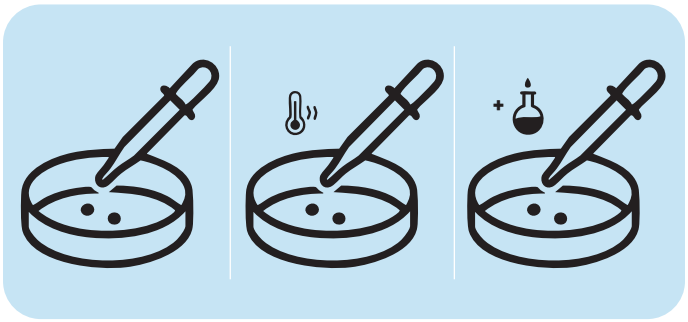
   Shake for 2 minutes using a vortex mixer or an ultrasonic bath.*

* alternatively, a sterile scraper can be used to recover the sample from the membrane



Division

3. The sample recovered from the previous step is divided into 3 portions:
   - one portion is left untreated;
   - one portion is treated with acid solution (1:10);
   - one portion undergoes heat treatment in a sterile container at 50 ± 1°C for 30 ± 2 min.



Plating

From each portion, 0.1–0.5mL are plated onto BCYE-A, and an equivalent volume is plated onto one or more selective media for *Legionella* (BCYE+AB, GVPC, MWY).

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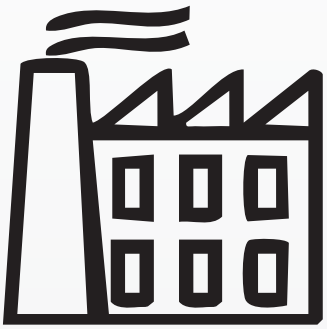
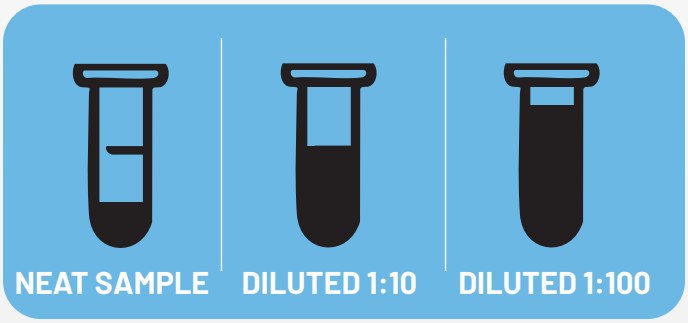
CASO 3:

High concentration of interfering flora

Example: Water from cooling towers

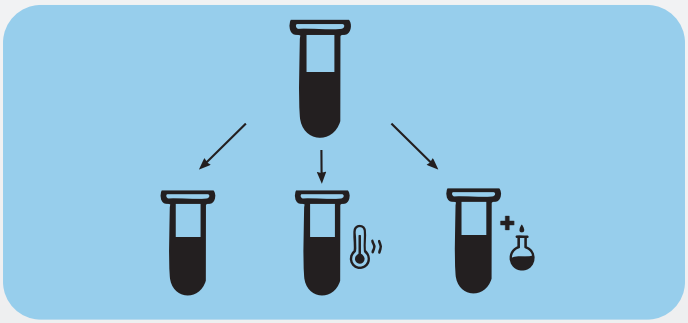


Analysis procedure:



First division

1. The sample is divided into 3 portions:
   - one portion is left at the original concentration
   - one portion is concentrated by filtration
   - one portion is diluted 1:10



Second division

2. The resulting sub-samples are further divided into 3 portions:
   - one portion is left untreated
   - one portion undergoes an acid treatment
   - one portion undergoes a heat treatment

Plating

3. From each portion, 0.1-0.5mL are plated and spread with an L-shaped or T-shaped spreader onto GVPC or MWY medium.

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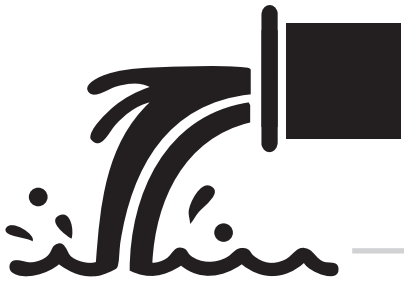
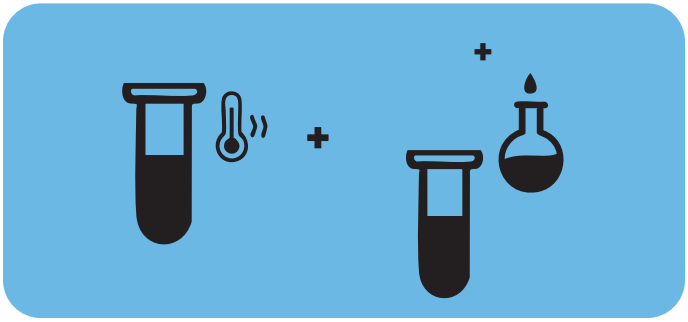
CASO 4:

Very high concentration of interfering flora

Example: Wastewater

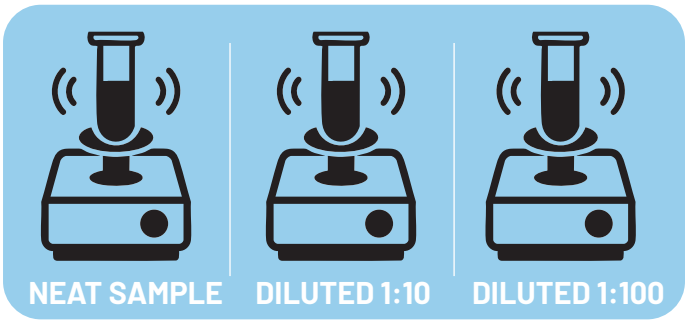


Analysis procedure:



Double treatment

1. The sample is subjected to a double treatment:
   - The heat treatment is performed and the sample is allowed to cool
   - The acid treatment is then performed



Sample shaking

2. The treated sample is diluted at 1:10 and 1:100.

- The undiluted sample and the two dilutions are then shaken using a vortex mixer or an ultrasonic bath, optionally adding a layer of glass beads at the bottom of the container.

Inoculation

3. From each dilution, 0.1–0.5 mL are inoculated onto selective GVPC or MWY medium.

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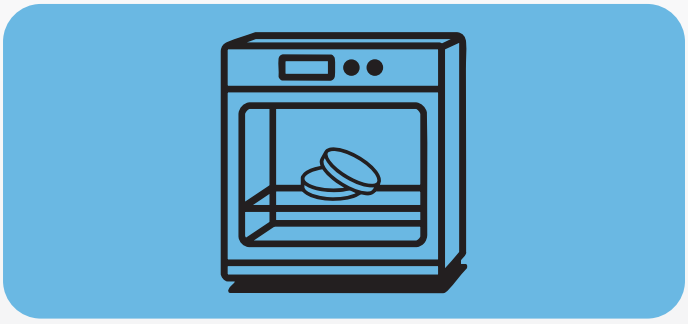
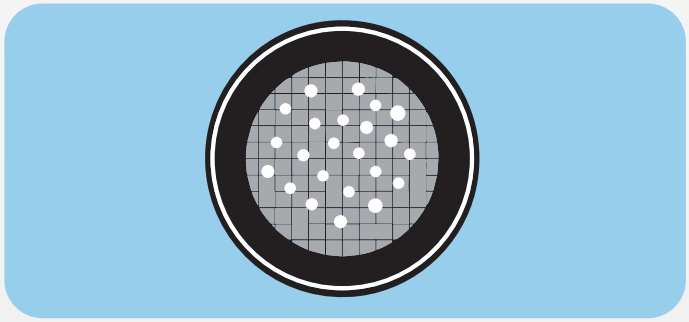
INCUBATION AND PLATE EXAMINATION

Regardless of the method and media used, the incubation parameters for the plates are the same:



Incubation

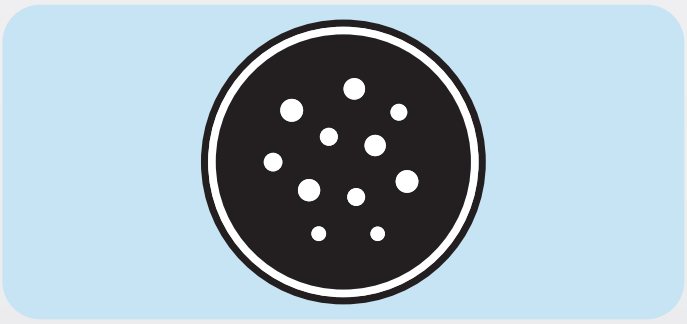
1. All plates should be incubated in an inverted position (at 36 ± 2°C) for 7-10 days, ensuring that dehydration is prevented.



Inspection

2. The plates should be inspected before the end of the incubation period to ensure the absence of confluent growth:

- Colonies usually appear white-grey in colour (occasionally with other pigmentation), have a smooth texture, rounded edges, and a frosted glass appearance



Inspection

- Colonies of certain species present autofluorescence when exposed to UV light, with colours varying depending on the species

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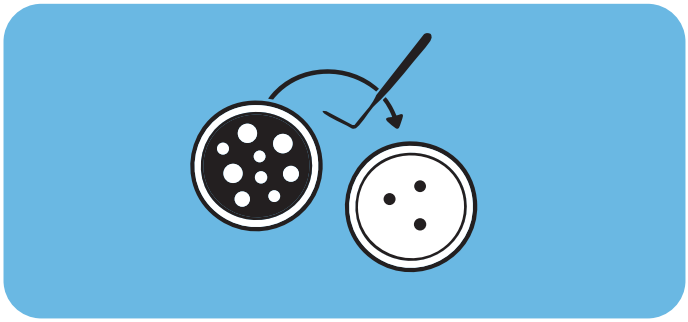
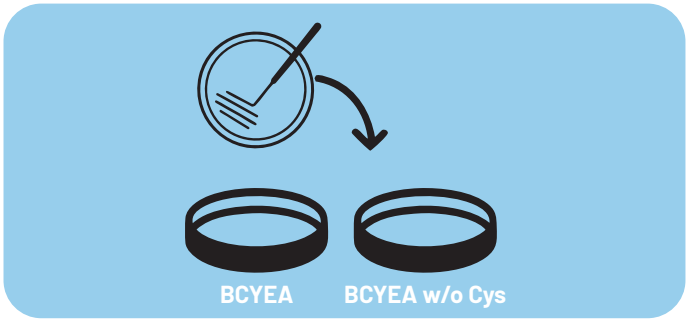
CONFIRMATION



Subculture

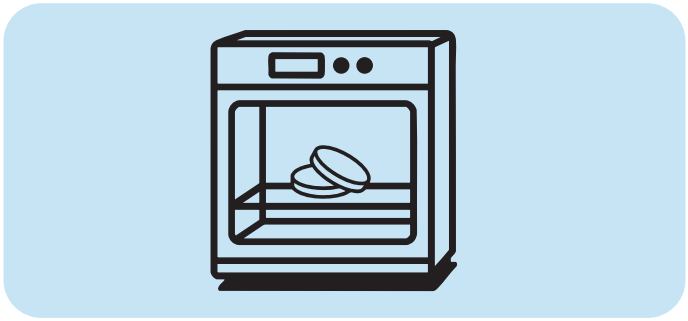
1. Presumptive *Legionella* colonies are subcultured (3 colonies if only one morphology is present; one colony per morphology if multiple morphologies are observed).



Plating

2. Colonies are collected from the plates showing the highest number of presumptive *Legionella* colonies.

   They should be plated in parallel on BCYEA and BCYEA w/o Cys (alternatively, on TSA, Blood Agar, or Nutrient Agar instead of the latter).



Incubation

3. The plated media should be incubated at 36 ± 2°C for 2-5 days.

Colonies that grow on BCYEA but not on BCYEA without cysteine after this incubation period are to be considered *Legionella* spp.
If the first subcultures do not confirm the presence of *Legionella* spp., additional presumptive colonies from different plates (involving differently treated samples or other culture media) should be analysed.

DILUENTS FOR MICROBIOLOGY:

Item	Description	Tipo	Format	Sales unit
BLK85000	Acid Buffer pH 2.2	Ready-to-use bottle	1 x 1000mL	1
BLK63666	Page's Saline Solution	Ready-to-use bottle	12 x 200mL	1
BLK70426	Ringer Solution ¼	Ready-to-use bottle	12 x 200mL	1
BLK63715	PBS (Phosphate Buffered Saline)	Ready-to-use bottle	12 x 200mL	1
BLK63415	PBS (Phosphate Buffered Saline)	Ready-to-use bottle	6 x 100mL	1
BLK5210/20P	PBS (Phosphate Buffered Saline)	Ready-to-use tubes	20 x 9mL	1

MICROBIOLOGY CULTURE MEDIA:

Item	Description	Tipo	Format	Packaging	Sales unit
BLK10119	*Legionella* CYE Agar base	Dehydrated	1 x 500g	1	1
BLK16089	*Legionella* BCYE Alfa-Growth supplement	Supplement	10 x 500mL	10	1
BLK16138	*Legionella* BCYE-Alfa growth supplement (W/O L-cysteine)	Supplement	10 x 500mL	10	1
BLK16222	*Legionella* AB supplement *	Supplement	5 x500mL	5	1
BLK16083	*Legionella* GVPC supplement *	Supplement	10 x 500mL	10	1
BLK16134	*Legionella* MWY supplement *	Supplement	10 x 500mL	10	1
BLK1554183/20	*Legionella* BCYE 20x90mm	Ready-to-use plates	20 x 90mm	20	1
BLK1592308/20	*Legionella* BCYE w/o L-Cysteine	Ready-to-use plates	20 x 90mm	20	1
BLK3250656/20	*Legionella* selective Agar BCYE+ AB	Ready-to-use plates	20 x 90mm	20	1
BLK1601604/20	*Legionella* selective Agar GVPC	Ready-to-use plates	20 x 90mm	20	1
BLK3250606/20	*Legionella* selective Agar MWY**	Ready-to-use plates	20 x 90mm	20	1
BLK10195	TSA (Tryptic Soy Agar)	Dehydrated	1 x 500g	1	1
BLK2954369/20	TSA (Tryptic Soy Agar)	Ready-to-use plates	20 x 90mm	20	1

* used together with code **BLK16089**
** minimum order of 5 pcs

IDENTIFICATION TESTS:

Item	Description	Format	Sales unit
BLKM45	Latex *Legionella* test	50	1

TURBIDITY STANDARD:

Item	Description	Standard	Sales unit
BLK8450	MC Farland Turbidity	0,5 - 1,0 - 2,0 - 3.0 - 4,0	5

QUALITY CONTROL STRAINS FOR CULTURE MEDIA (ISO 17034-accredited supplier):

CRYO-BACTERIA
Non titolated - RM

Frozen

DISC-BACTERIA
Non titolated - RM

Plate

LYO-BACTERIA
Non titolated / Titolated- RM

Lyophilized

Each tube **contains approximately 20-25** porous ceramic **beads**, each carrying an aliquot of the bacterial colony, preserved and transported at -20/-40°C.

DISC culture plates are MR ready to use, refrigerated at 2/8°C and sealed with parafilm. Each plate **contains at least 5 colonies** of the target microorganism.

LYO lyophilized products are **10g of loose powder** containing the target strain.

Item	WDCM	Description	Type	Title	Sales unit
BAC-C-EF02	00009	Enterococcus faecalis	Frozen	-	1
BAC-D-EF02	00009	Enterococcus faecalis	Plate	-	1
BAC-L-EF02	00009	Enterococcus faecalis	Lyophilized	-	5
BAC-LT-EF02B1	00009	Enterococcus faecalis	Lyophilized	10^1	5
BAC-LT-EF02M2	00009	Enterococcus faecalis	Lyophilized	10^2	5
BAC-LT-EF02M3	00009	Enterococcus faecalis	Lyophilized	10^3	5
BAC-LT-EF02M4	00009	Enterococcus faecalis	Lyophilized	10^4	5
BAC-LT-EF02A5	00009	Enterococcus faecalis	Lyophilized	10^5	5
BAC-LT-EF02A6	00009	Enterococcus faecalis	Lyophilized	10^6	5
BAC-LT-EF02A7	00009	Enterococcus faecalis	Lyophilized	10^7	5
BAC-C-EF01	00087	Enterococcus faecalis	Frozen	-	1
BAC-D-EF01	00087	Enterococcus faecalis	Plate	-	1
BAC-L-EF01	00087	Enterococcus faecalis	Lyophilized	-	5
BAC-LT-EF01B1	00087	Enterococcus faecalis	Lyophilized	10^1	5
BAC-LT-EF01M2	00087	Enterococcus faecalis	Lyophilized	10^2	5
BAC-LT-EF01M3	00087	Enterococcus faecalis	Lyophilized	10^3	5
BAC-LT-EF01M4	00087	Enterococcus faecalis	Lyophilized	10^4	5
BAC-LT-EF01A5	00087	Enterococcus faecalis	Lyophilized	10^5	5
BAC-LT-EF01A6	00087	Enterococcus faecalis	Lyophilized	10^6	5
BAC-LT-EF01A7	00087	Enterococcus faecalis	Lyophilized	10^7	5
BAC-C-EC01	00012	Escherichia coli	Frozen	-	1
BAC-D-EC01	00012	Escherichia coli	Plate	-	1
BAC-L-EC01	00012	Escherichia coli	Lyophilized	-	5
BAC-LT-EC01B1	00012	Escherichia coli	Lyophilized	10^1	5
BAC-LT-EC01M2	00012	Escherichia coli	Lyophilized	10^2	5
BAC-LT-EC01M3	00012	Escherichia coli	Lyophilized	10^3	5
BAC-LT-EC01M4	00012	Escherichia coli	Lyophilized	10^4	5
BAC-LT-EC01A5	00012	Escherichia coli	Lyophilized	10^5	5
BAC-LT-EC01A6	00012	Escherichia coli	Lyophilized	10^6	5
BAC-LT-EC01A7	00012	Escherichia coli	Lyophilized	10^7	5

Item	WDCM	Description	Type	Title	Sales unit
BAC-C-EC02	00013	Escherichia coli	Frozen	-	1
BAC-D-EC02	00013	Escherichia coli	Plate	-	1
BAC-L-EC02	00013	Escherichia coli	Lyophilized	-	5
BAC-LT-EC02B1	00013	Escherichia coli	Lyophilized	10^1	5
BAC-LT-EC02M2	00013	Escherichia coli	Lyophilized	10^2	5
BAC-LT-EC02M3	00013	Escherichia coli	Lyophilized	10^3	5
BAC-LT-EC02M4	00013	Escherichia coli	Lyophilized	10^4	5
BAC-LT-EC02A5	00013	Escherichia coli	Lyophilized	10^5	5
BAC-LT-EC02A6	00013	Escherichia coli	Lyophilized	10^6	5
BAC-LT-EC02A7	00013	Escherichia coli	Lyophilized	10^7	5
BAC-C-LA01	00106	*Legionella* anisa	Frozen	-	1
BAC-D-LA01	00106	*Legionella* anisa	Plate	-	1
BAC-L-LA01	00106	*Legionella* anisa	Lyophilized	-	5
BAC-LT-LA01B1	00106	*Legionella* anisa	Lyophilized	10^1	5
BAC-LT-LA01M2	00106	*Legionella* anisa	Lyophilized	10^2	5
BAC-LT-LA01M3	00106	*Legionella* anisa	Lyophilized	10^3	5
BAC-LT-LA01M4	00106	*Legionella* anisa	Lyophilized	10^4	5
BAC-LT-LA01A5	00106	*Legionella* anisa	Lyophilized	10^5	5
BAC-LT-LA01A6	00106	*Legionella* anisa	Lyophilized	10^6	5
BAC-LT-LA01A7	00106	*Legionella* anisa	Lyophilized	10^7	5
BAC-C-LP01	00107	*Legionella* pneumophila	Frozen	-	1
BAC-D-LP01	00107	*Legionella* pneumophila	Plate	-	1
BAC-L-LP01	00107	*Legionella* pneumophila	Lyophilized	-	5
BAC-LT-LP01B1	00107	*Legionella* pneumophila	Lyophilized	10^1	5
BAC-LT-LP01M2	00107	*Legionella* pneumophila	Lyophilized	10^2	5
BAC-LT-LP01M3	00107	*Legionella* pneumophila	Lyophilized	10^3	5
BAC-LT-LP01M4	00107	*Legionella* pneumophila	Lyophilized	10^4	5
BAC-LT-LP01A5	00107	*Legionella* pneumophila	Lyophilized	10^5	5
BAC-LT-LP01A6	00107	*Legionella* pneumophila	Lyophilized	10^6	5
BAC-LT-LP01A7	00107	*Legionella* pneumophila	Lyophilized	10^7	5

CONSUMABLES:

Selection of high quality laboratory products.
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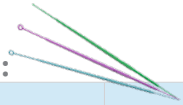
INOCULATION LOOPS:



Item	Description	Packaging	Sales unit
BSV120	Microloops - 10µL	peel pack 20pcs	10.000
BSV1200	Microloops - 10µL	peel pack 10pcs	12.000
BSV1201	Microloops - 10µL	peel pack 1pc	2.100
BSV1205	Microloops - 10µL	peel pack 5pcs	4.000
BSV121	Microloops - 1µL	peel pack 20pcs	10.000
BSV1210	Microloops - 1µL	peel pack 10pcs	12.000
BSV1211	Microloops - 1µL	peel pack 1pc	2.100
BSV1215	Microloops - 1µL	peel pack 5pcs	4.000

SPREADERS:

Item	Description	Packaging	Sales unit
BSM0230	L-shaped spreader	10pcs	500
BSM0231	L-shaped spreader	individually wrapped	200
BSM0235	L-shaped spreader	5pcs	500
BSM0240	T-shaped spreader	10pcs	500
BSM0241	T-shaped spreader	individually wrapped	200
BSM0245	T-shaped spreader	5pcs	500

SCRAPER:

Item	Description	Length (cm)	Sales unit
010154B	Cell scraper blade	25	200

GLASS BALLS:

Item	Description	Packaging (kg)	Sales unit
952446	Glass ball - 2mm	1	1
952447	Glass ball - 3mm	1	1

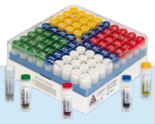
PLATES:

Item	Description	Diameter (mm)	Sales unit
BSM2120	Petri dishes with vents	90	480
BSM200	Petri dishes without vents	60	1.080
BSM201	Petri dishes with vents	55	1.200

CONTENITORI:

Item	Description	Volume (mL)	Sales unit
BSC199	Urine container with screw cap - sterile	200	200
BSC258	Urine container with screw cap - sterile	120	250

CLEARSTABLE:



Item	Description	Cryoprotectant	Sales unit
CL1D25/MIX	Tubes 1D - 2mL with treated beads, sterile (rack)	Yes	25
CLDR1D25/MIX	Tubes 1D - 2mL with treated beads, sterile (rack)	No	25
CL1D80/MIX	Tubes 1D - 2mL with treated beads, sterile (rack)	Yes	80
CLDR1D80/MIX	Tubes 1D - 2mL with treated beads, sterile (rack)	No	80

MEMBRANES:

Item	Description	Packaging	Sales unit
CL040	CN membrane filter, white with black grid, sterile, pore size 0.22µm, ø 47mm	individually wrapped	100
CL041	CN membrane filter, white with black grid, sterile, pore size 0.45 µm, ø 47mm	individually wrapped	100
CL043	CN membrane filter, white with black grid, sterile, pore size 0.45 µm, ø 47mm	Individually wrapped on tape	150
CL044	MCE membrane filter, white with black grid, sterile, pore size 0.22µm, ø 47mm	individually wrapped	100
CL045	MCE membrane filter, white with black grid, sterile, pore size 0.45 µm, ø 47mm	individually wrapped	100
CL047	MCE membrane filter, black with white grid, sterile, pore size 0.45 µm, ø 47mm	individually wrapped	100
CL048	MCE membrane filter, white with black grid, sterile, pore size 0.45 µm, ø 47mm	Individually wrapped on tape	150
CL049	PES membrane filter, black with white grid, sterile, pore size 0.22µm, ø 47mm	individually wrapped	100
CL050	PES membrane filter, white with black grid, sterile, pore size 0.22µm, ø 47mm	Individually wrapped on tape	150
CL052	PES membrane filter, white without grid, sterile, pore size 0.22µm, ø 47mm	individually wrapped	100

CENTRIFUGE TUBES:

Item	Description	Packaging	Sales unit
CL474	Centrifuge conical tube - 50mL sterile	bag	500
CL475	Centrifuge conical tube - 50mL sterile	rack	500
CL477	Centrifuge self-standing tube - 50mL sterile	bag	500
CL482	Centrifuge conical tube - 15mL sterile	bag	500
CL490	Centrifuge conical tube - 15mL sterile	rack	500

CONSUMABLES:

For additional information visit our website. You can find updated certificates, descriptions, and technical sheets.

PIPETTOR:

Item	Description	Sales unit
BS400200	Electronic pipettor BiPette	1
861001	Red manual pipettor	1
861003	Yellow manual pipettor	1

SEROLOGICAL PIPETTES:

Item	Description	Volume (mL)	Sales unit
CL100	Serological pipette, sterile	1	1000
CL101	Serological pipette, sterile	2	800
CL102	Serological pipette, sterile	5	300
CL103	Serological pipette, sterile	10	200
CL111	Serological pipette, sterile	25	200
CL112	Serological pipette, sterile	50	100
CL113	Serological pipette, sterile	10	50

MICROPIPETTE:

Item	Description	Volume (µL)	Sales unit
ABS124HPA	Fully autoclavable micropipette - fixed volume	200	1
ABS125HPA	Fully autoclavable micropipette - fixed volume	1.000	1
ABS131HPA	Fully autoclavable micropipette - variable volume	20-200	1
ABS132HPA	Fully autoclavable micropipette - variable volume	200-1.000	1

TIPS:

Item	Description	Volume (µL)	Sales unit
BSR0412	Yellow tip for micropipette - rack	0-200	960
BSR0422	Yellow tip for micropipette - rack	200-1000	960

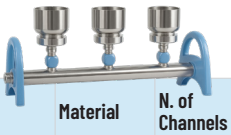
GLASS BOTTLES:

Item	Description	Volume (mL)	Sales unit
257065	SLS Select borosilicate glass bottle	500	10
257066	SLS Select borosilicate glass bottle	1000	10

WATER SAMPLING:

Item	Description	Volume (mL)	Sales unit
BLP001	Graduated sterile water sampling bottle with thiosulphate	500	120
BLP003	Graduated sterile water sampling bottle with thiosulphate	1000	72

FILTRATION RAMPS:



Item	Description	Material	N. of Channels	Sales unit
886196	Filtration MB ramp with 100mL funnel	Stainless steel	3	1
886197	Filtration MB ramp with 100mL funnel	Stainless steel	6	1
886039	Filtration MB ramp (without funnel)	Stainless steel	3	1
886040	Filtration MB ramp (without funnel)	Stainless steel	6	1
886037	Filtration MB ramp (head with silicone stopper no. 8)	Stainless steel	3	1
886036	Filtration MB ramp (head with silicone stopper no. 8)	Stainless steel	6	1
886038	Filtration MB ramp (head with silicone stopper no. 8)	Aluminium	3	1

FUNNELS:

Item	Description	Material	Filter (mm)	Sales unit
886169	Filtration funnel 100mL	Stainless steel	47	1
886170	Filtration funnel 300mL	Stainless steel	47	1
886171	Filtration funnel 500mL	Stainless steel	47	1

LID FOR FUNNEL:

Item	Description	Material	Sales unit
886172	Lid for filtration funnel 100mL	Stainless steel	1
886173	Lid for filtration funnel 300mL e 500mL	Stainless steel	1

PUMP:

Item	Description	Sales unit
886127	Pump for Alligator 200 Filtration System	1

GLOVES:

Item	Description	Size	Sales unit
BSI0801R	Nitrile gloves without powder	XS	100
BSI081R	Nitrile gloves without powder	S	200
BSI082R	Nitrile gloves without powder	M	200
BSI083R	Nitrile gloves without powder	L	200
BSI084R	Nitrile gloves without powder	XL	200

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