thermo scientific

Safe. Clean. ISO compliant.

Guide to microbiological testing of drinking water according to ISO standards

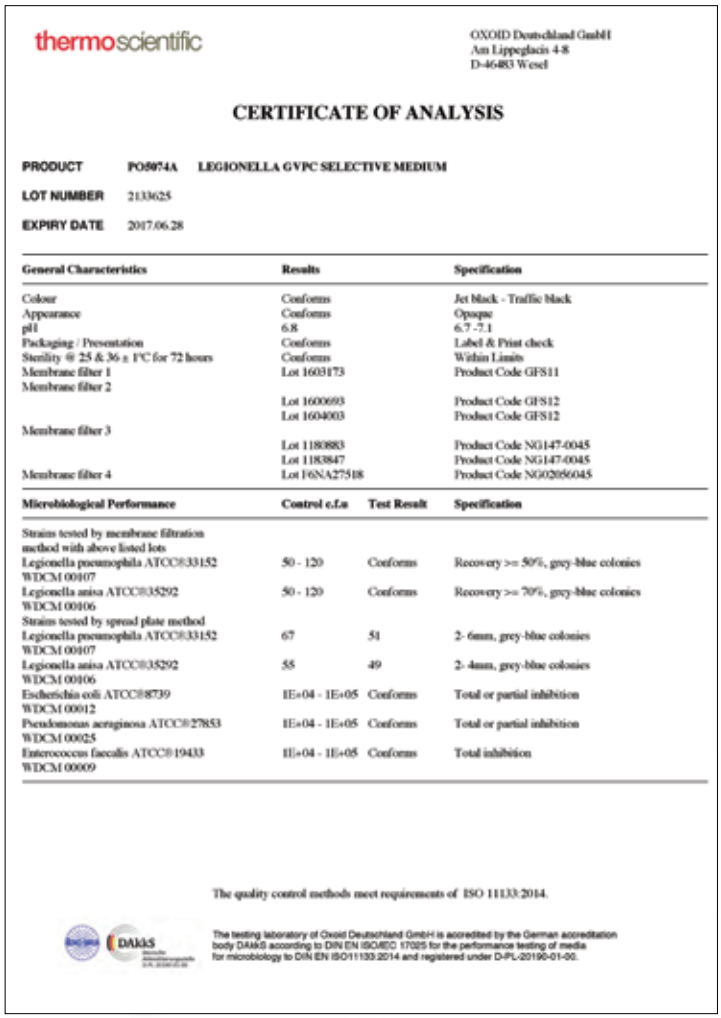
ThermoFisher SCIENTIFIC

Simple and complete testing

As a food or beverage manufacturer, contract laboratory for testing drinking water or a hospital you know the importance of safeguarding the purity of the water you use in manufacturing processes and the products you deliver to your customers. Adherence to published standards is paramount. This Guide to microbiological testing of drinking water provides an overview of the standard procedures, and illustrates how our extensive range of microbiology products for the isolation, identification and enumeration of waterborne pathogens meets your testing needs.

Our range of products for water testing includes dehydrated and prepared media, membrane filters, quality control organisms and proficiency testing, as well as the equipment you need to deliver reliable results.

- **Safe**—media formulations that are compliant with ISO Standards for the testing of drinking water
- **Conform to ISO standard**—quality control testing methods are accredited in accordance with ISO 17025
- **Proven and certified**—all Certificates of Analysis (CoAs) confirm testing in accordance with the ISO 11133:2014 standard, including membrane filter testing
- **Support**—our team of microbiology experts is at hand to help with your technical queries



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OXOID Deutschland GmbH
Am Lippeglacis 4-8
D-46483 Wesel

CERTIFICATE OF ANALYSIS

PRODUCT PO5074A LEGIONELLA GVPC SELECTIVE MEDIUM

LOT NUMBER 2133625

EXPIRY DATE 2017.06.28

General Characteristics	Results	Specification
Colour	Conforms	Jet black - Traffic black
Appearance	Conforms	Opaque
pH	6.8	6.7 -7.1
Packaging / Presentation	Conforms	Label & Print check
Sterility @ 25 & 36 ± 1°C for 72 hours	Conforms	Within Limits
Membrane filter 1	Lot 1603173	Product Code GFS11
Membrane filter 2	Lot 1600693	Product Code GFS12
	Lot 1604003	Product Code GFS12
Membrane filter 3	Lot 1180883	Product Code NG147-0045
	Lot 1183847	Product Code NG147-0045
Membrane filter 4	Lot F6NA27518	Product Code NG02056045

Microbiological Performance	Control c.f.u	Test Result	Specification
Strains tested by membrane filtration method with above listed lots			
Legionella pneumophila ATCC®33152 WDCM 00107	50 - 120	Conforms	Recovery >= 50%, grey-blue colonies
Legionella anisa ATCC®35292 WDCM 00106	50 - 120	Conforms	Recovery >= 70%, grey-blue colonies
Strains tested by spread plate method			
Legionella pneumophila ATCC®33152 WDCM 00107	67	51	2- 6mm, grey-blue colonies
Legionella anisa ATCC®35292 WDCM 00106	55	49	2- 4mm, grey-blue colonies
Escherichia coli ATCC®8739 WDCM 00012	1E+04 - 1E+05	Conforms	Total or partial inhibition
Pseudomonas aeruginosa ATCC®27853 WDCM 00025	1E+04 - 1E+05	Conforms	Total or partial inhibition
Enterococcus faecalis ATCC®19433 WDCM 00009	1E+04 - 1E+05	Conforms	Total inhibition

The quality control methods meet requirements of ISO 11133:2014.

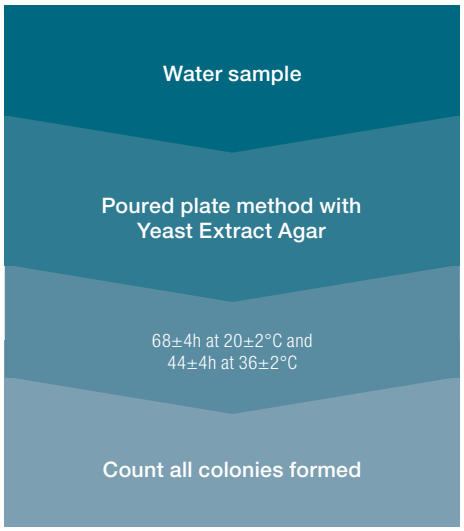
DAkkS

The testing laboratory of Oxoid Deutschland GmbH is accredited by the German accreditation body DAkkS according to DIN EN ISO/IEC 17025 for the performance testing of media for microbiology to DIN EN ISO11133:2014 and registered under D-PL-20190-01-00.

Figure 1. Example of Certificate of Analysis (Legionella GVPC Selective Medium)

Detection of microorganisms – Colony counts at 22°C and 36°C

Method according to EN ISO 6222

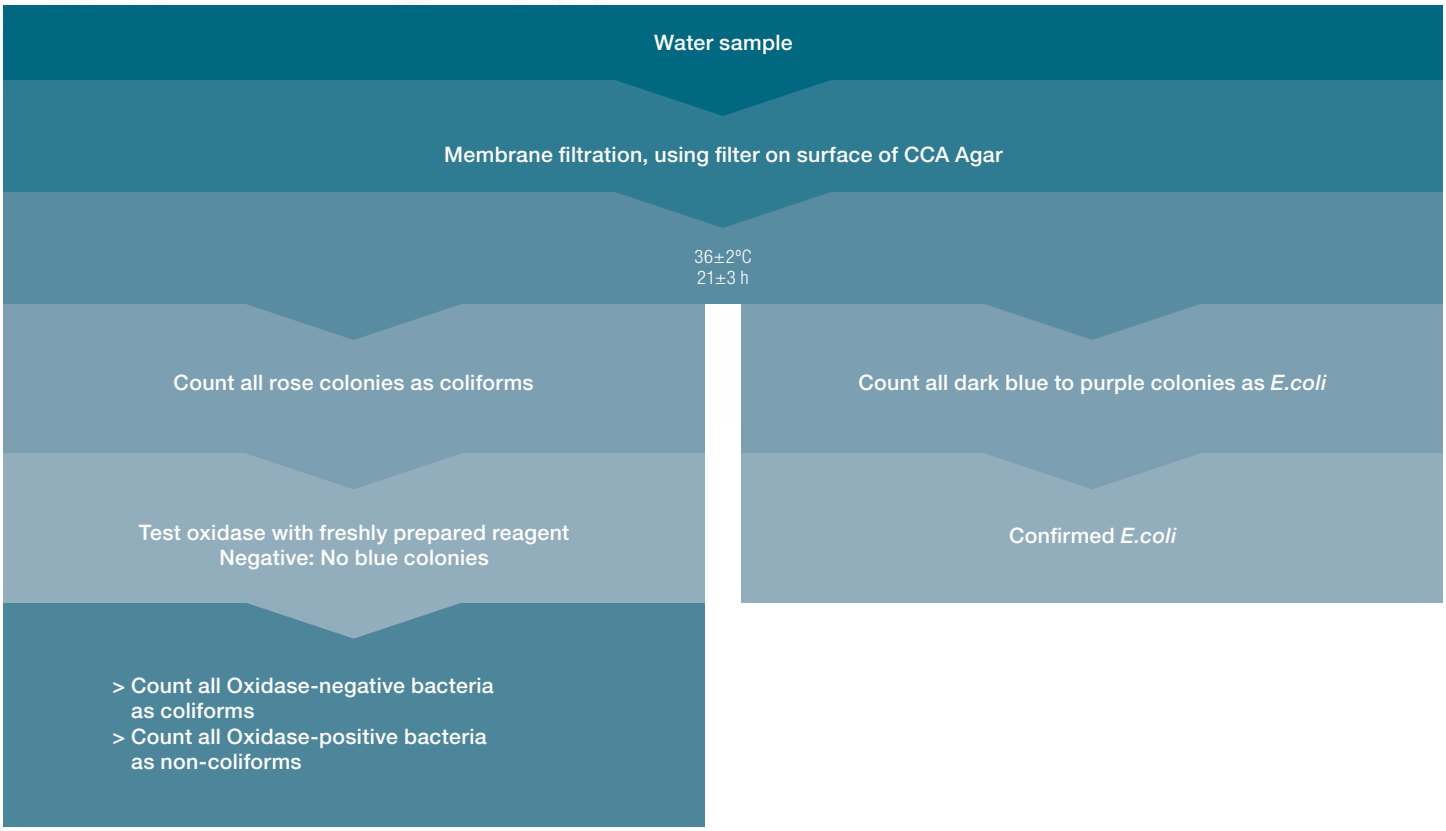


Detection of microorganisms – Colony count number at 22°C and 36°C

Regulation	Method	Media	Product	Dehydrated culture media		Prepared media	
				Product code	Format	Product code	Format
EN ISO 6222	Pour plate	Yeast Extract Agar	Plate Count Agar for water testing (ISO)	CM1012B	500 g		
			Plate Count Agar (ISO)			BO0055M	10 x 100 mL bottles
						BO0055R	10 x 200 mL bottles

Escherichia coli / Coliform bacteria

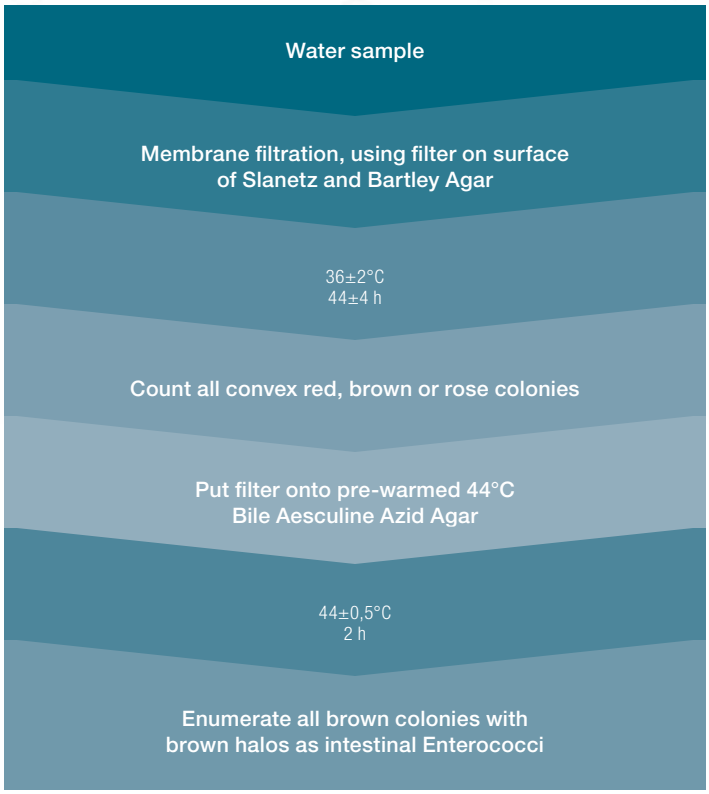
Method according to ISO 9308-1



***Escherichia coli* and coliform**							
Regulation	**Method**	**Media**	**Product**	**Dehydrated culture media**		**Prepared media**	
				Product code	**Format**	**Product code**	**Format**
EN ISO 9308-1 Standard test	Membrane filtration	CCA Agar	Thermo Scientific™ Chromogenic Coliform Agar	CM1205B	500 g	PO5318A PO5428J	10 x 90 mm plates 10 x 55 mm plates
	Oxidase test	Tryptone Soya Agar (TSA)	CASO Agar (TSA)	CM0131B/T	500 g / 5 kg	PO5012A	10 x 90 mm plates
		Oxidase Reagent	Thermo Scientific™ BactiDrop™ Oxidase Reagent Thermo Scientific™ Microbact™ Oxidase Strips	R21540 MB0266A	50 vials 50 strips	PO5321A	10 x 90 mm plates

Enterococci

Method according to ISO 7899-2



Enterococci							
Regulation	**Method**	**Media**	**Product**	**Dehydrated culture media**		**Prepared media**	
				Product code	**Format**	**Product code**	**Format**
EN ISO 7899-2	Membrane filtration	Slanetz Bartley Agar	Slanetz Bartley Agar	CM0377B	500 g	PO5018A PO5410J* PO5423J*	10 x 90 mm plates 10 x 55 mm plates 10 x 55 mm plates
	Confirmation	Bile Aesculine Azide Agar	Enterococcus Selective Medium (Bile Aesculine Azid Agar)[1] or Kanamycin Aesculin Azide Agar Base[2]	 CM0591B	 500 g	PO5062A PO5059A	10 x 90 mm plates 10 x 90 mm plates

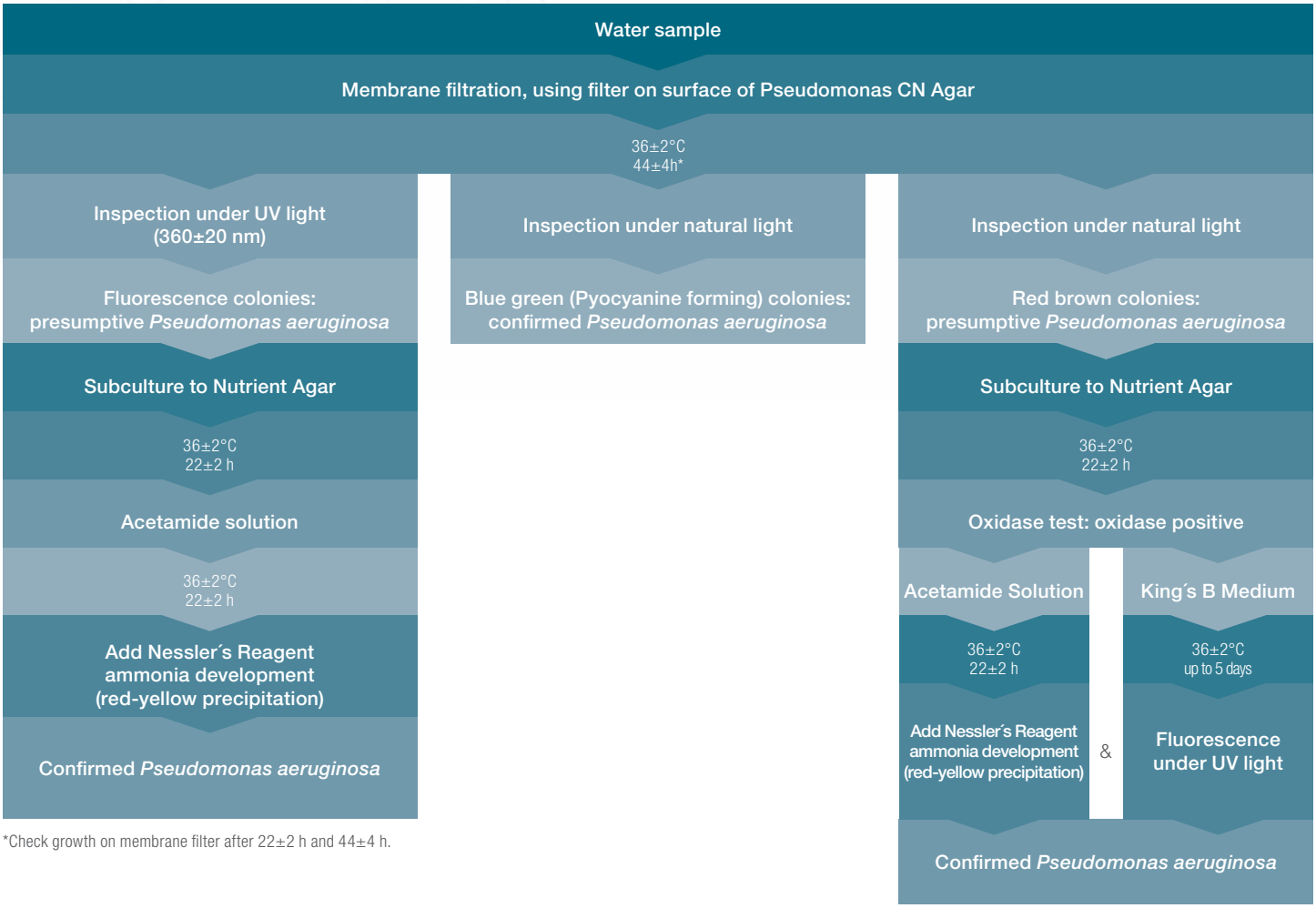
* Minimum order quantity required.

[1] This medium is slightly different to the media formulation according to ISO 7899-2. The medium has additional sodium citrate and 20g/l ox bile instead of 10g/l and 0.55 g/l sodium azide instead of 0.15 g/l.

[2] This medium is slightly different to the media formulation according to ISO 7899-2 ab. It contains sodium citrate instead of ox bile and Kanamycin.

Pseudomonas aeruginosa

Method according to ISO 16266



*Check growth on membrane filter after 22±2 h and 44±4 h.

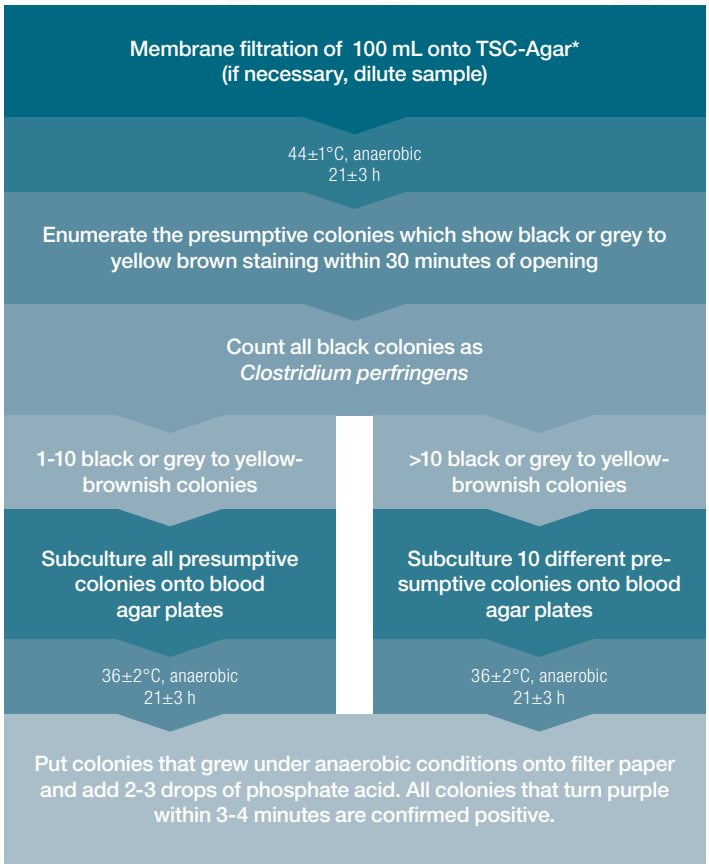
Pseudomonas aeruginosa

Regulation	Method	Media	Product	Dehydrated culture media Product code	Format	Prepared media Product code	Format
EN ISO 16266	Membrane filtration	Pseudomonas Selective Agar / CN Agar	Pseudomonas Centrimide Selective Agar			PO5076A	10 x 90 mm plates
						PO5413J*	10 x 55 mm plates
			Pseudomonas Agar Base	CM0559B	500 g		
			CN Selective Supplement	SR0102E	10 tubes		
	Confirmation						
	Fluorescence	King´s B Media					
	Hydrolysis of acetamide to ammonia	Acetamide Solution					
		Nessler Reagent					
	Oxidase Test	Nutrient Agar	Nutrient Agar	CM0003B	500 g		
		Oxidase Reagent	BactiDrop Oxidase Reagent	R21540	50 vials		
			Microbact Oxidase Strips	MB0266A	50 strips		

* Minimum order quantity required.

Clostridium perfringens (including spores)

Method according to ISO 14189:2013



*ATTENTION: Alternatively, a thin layer (approximately 5 mL to 10 mL) of molten TSC Agar (TV5204G TSC Agar Base), as an overlay on the filter can be used. Allow to solidify before anaerobic incubation. This method may enhance the blackening of the colonies. Medium without cycloserine; e.g. TV5204G TSC Agar Base, 20 mL.

Melt TSC Agar in a water bath and put melted agar onto filter on the plate.

Melt agar in a water bath at 95°C for approx. 10-15 minutes	Cool medium to 45°C	Shake tube carefully and pour a thin layer of molten agar

Clostridium perfringens

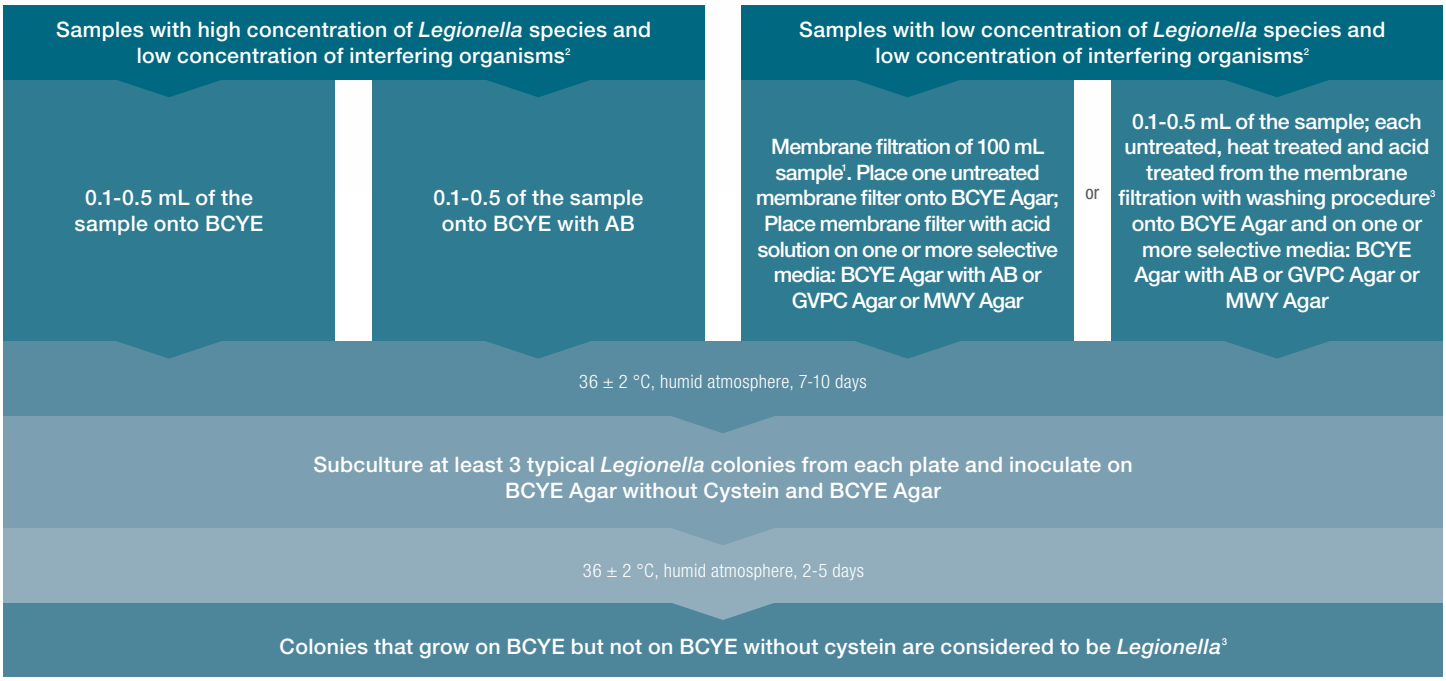
Regulation	Method	Media	Product	Dehydrated culture media Product code	Format	Prepared media Product code	Format
ISO 14189	Membrane filtration	TSC Agar	TSC Selective Agar			PO5315A	10 x 90 mm plates
			TSC Agar Base +	CM0587B	500 g	TV5204G	50 tubes
			TSC Selective Supplement	SR0088E	10 tubes	BO0634M	10 x 100 mL bottles
						plus SR0088E	10 tubes
	Anaerobic atmosphere		Thermo Scientific™ AnaroGen™ System			AN0025A	10 sachet
			Thermo Scientific™ AnaroJar™ 2,5 L Anaerobic System			AG0025A	1 pot
			Thermo Scientific™ AnaeroBox™ Rectangular Anaerobic System			AB0025A	1 pot

Legionella

Methods according to ISO 11731:2017

Sample preparation

Heat treated—Put sample into water bath for 30+/-2 minutes at 50°C
Acid treated—1 part sample to 9 parts of acid buffer. Mix well and leave it for 5+/- 0.5 minutes.
Acid treated filter—Put 30 mL of acid solution onto the membrane filter. Leave it for 5 +/- 0.5 minutes and remove the solution by filtration. Wash with 20 mL of either sterile Aqua dest., Pages Saline, Ringer Solution or PBS.



[1] 10 – 1000 mL sample volume according to ISO 11731-2.
[2] The choice of the method for the enumeration of *Legionella* species depends on the origin/characteristics of the sample and the reason for sampling or investigation. A decision matrix can be found in the ISO 11731:2017, Annex J.
[3] Further information, please see ISO ISO11731:2017.

Legionella							
Regulation	**Method**	**Media**	**Product**	**Dehydrated culture media**		**Prepared media**	
				Product code	**Format**	**Product code**	**Format**
ISO 11731:2017 and EN ISO 111731-2	Sample preparation	Acid Buffer	Legionella Acid Buffer Solution			GFB01	6 x 1 L bottles
	Direct and membrane filtration	GVPC Agar	Legionella GVPC Selective Agar			PO5074A PO0245A*	10 x 90 mm plates 10 x 90 mm plates
			Legionella CYE Agar-Basis + Legionella BCYE Supplement + Legionella GVPC Selektive Supplement	CM0655B SR0110C SR0152E	500 g 10 tubes (500 mL) 10 tubes (500 mL)		
		BCYE Agar with antibiotics	BCYE Agar with antibiotics			PO5325A	10 x 90 mm plates
		BCYE Agar	BCYE Agar			PO5072A	10 x 90 mm plates
		MWY Agar	MWY Agar			PO5071A	10 x 90 mm plates
	Subculture	BCYE Agar without Cystein	BCYE Agar without Cystein			PO5028A PO0255A*	10 x 90 mm plates 10 x 90 mm plates
		BCYE Agar	BCYE Agar			PO5072A	10 x 90 mm plates

* UK only

Legionella proficiency testing and QC organisms

Thermo Scientific™ Culti-Loops™ Reference Strains for the quality control testing of GVPC Agar according to ISO 11133:2014

***Legionella* Quality Control Organisms**		
Product code	**Product name**	**WDCM no.**
R4603950	*Legionella pneumophila* ATCC® 33152™*	WDCM 00107
R4601990	*Enterococcus faecalis* ATCC® 19433™*	WDCM 00009
R4607030	*Enterococcus faecalis* ATCC® 29212™*	WDCM 00087
R4607060	*Pseudomonas aeruginosa* ATCC® 27853™*	WDCM 00025
R4605210	*Pseudomonas aeruginosa* ATCC® 9027™*	WDCM 00026
R4607085	*Escherichia coli* ATCC® 8739™*	WDCM 00012
R4607050	*Escherichia coli* ATCC® 25922™*	WDCM 00013

External quality assessment (EQA) of *Legionella* isolation for laboratories that examine waters for *Legionella* spp.

Detection, enumeration and identification of Legionella spp.		
Product code	**Product name**	**Sample numbers**
LEG01D01	*Legionella* isolation scheme LEG01 sample 1	2 each
LEG01D02	*Legionella* isolation scheme LEG01 sample 2	2 each
LEG01D03	*Legionella* isolation scheme LEG01 sample 3	2 each
LEG01D04	*Legionella* isolation scheme LEG01 sample 4	2 each
***Legionella* spp. by molecular methods only**		
LM01D01	*Legionella* Molecular Scheme LM01 sample 1	2 each
LM01D02	*Legionella* Molecular Scheme LM01 sample 2	2 each

Not available in all EU countries. Please check availability with your local sales office.

Thermo Scientific Nalgene Analytical Test Filter Funnels and Membranes

Thermo Scientific™ Nalgene™ Membrane Filters are cellulose nitrate membranes that are certified for microbiological QC testing and analysis of water.

Nalgene Disposable Analytical Funnels equipped with membrane filter		
Product code	**Product name**	**Pack size**
NG145-0045	Sterile Analytical Filter Units, 100 mL, 47 mm, 0.45 µm, white/black	50 pieces
NG145-2045	Sterile Analytical Filter Units, 250 mL, 47 mm, 0.45 µm, white/black	50 pieces
NG147-0045	Sterile Analytical Filter Units, 100 mL, 47 mm, 0.45 µm, grey/black	50 pieces
NG147-2045	Sterile Test Filter Funnel, 250 mL, 0.45 uL	50 pieces
Membrane filter		
NG0205-4045	Membrane Filter for water testing, sterile, CN, 47 mm, 0,45 µm, white/black	100 pieces
NG0210-6045	Membrane Filter for water testing, sterile, CN, 47 mm, 0,45 µm, grey/black	100 pieces
Accessories		
NG0345-0001	Vacuum Manifold	1 piece
NG0396-0080	Filter Stopper, non-sterile, no. 8 rubber	3 pieces
NG0399-0001	Filter Forceps, bent tip	1 piece
NG0399-0002	Filter Forceps, straight tip	1 piece
NG0397-0010	Filter Funnel Adapter, non-sterile	25 pieces
NG0395-0708	Vacuum Gasket, non-sterile thermoplastic elastomer	6 pieces

Nalgene Reusable Analytical Filters and accessories		
Product code	**Product name**	**Sample numbers**
NG0315-0047	Filter Funnels with Clamp, 250 mL	1 piece
NG0300-4000	Filter Holders with Receiver, 500 mL, 500 mL	4 pieces
NG0300-4050	Filter Holders with Receiver, 250 mL, 250 mL	4 pieces
NG0300-4100	Filter Holders with Receiver, 500 mL, 1000 mL	4 pieces
NG0310-4000	Filter Holders with Funnel, 250 mL	1 piece
NG0310-4050	Filter Holders with Funnel, 500 mL	1 piece
NG0320-2545	Reusable Bottle Top Filters, 250 mL	1 piece
NG0320-5033	Reusable Bottle Top Filters, 500 mL	1 piece
NG0320-5045	Reusable Bottle Top Filters, 500 mL	1 piece

Culti-Loops QC Organisms

for quality control testing according to ISO 11133:2014

Product code	Product name	Sample numbers
Escherichia coli QC Organisms for testing of CCA Agar		
R4607085	*Escherichia coli* ATCC® 8739™*	WDCM 00012
R4607050	*Escherichia coli* ATCC® 25922™*	WDCM 00013
R4607080	*Enterobacter aerogenes* ATCC® 13048™*	WDCM 00175
R40607060	*Pseudomonas aeruginosa* ATCC® 27853™*	WDCM 00025
R4607060	*Pseudomonas aeruginosa* ATCC® 9027™*	WDCM 00026
R4605210	*Enterococcus faecalis* ATCC® 19433™*	WDCM 00009
R4601990	*Enterococcus faecalis* ATCC® 29212™*	WDCM 00087
Enterococci QC Organisms for testing of Slanetz and Bartley Agar		
R4607085	*Escherichia coli* ATCC® 8739™*	WDCM 00012
R4607050	*Escherichia coli* ATCC® 25922™*	WDCM 00013
R4607016	*Staphylococcus aureus* subsp. aureus ATCC® 6538™*	WDCM 00032
R4607010	*Staphylococcus aureus* subsp. aureus ATCC® 25923™*	WDCM 00034
R4607030	*Enterococcus faecalis* ATCC® 29212™*	WDCM 00087
R4601990	*Enterococcus faecalis* ATCC® 19433™*	WDCM 00009
Pseudomonas aeruginosa QC Organisms for testing of Pseudomonas CN Agar		
R4607060	*Pseudomonas aeruginosa* ATCC® 27853™*	WDCM 00025
R4605210	*Pseudomonas aeruginosa* ATCC® 9027™*	WDCM 00026
R4607065	*Pseudomonas aeruginosa* ATCC® 10145™*	WDCM 00024
R4607085	*Escherichia coli* ATCC® 8739™*	WDCM 00012
R4607050	*Escherichia coli* ATCC® 25922™*	WDCM 00013
R4601990	*Enterococcus faecalis* ATCC® 19433™*	WDCM 00009
R4601990	*Enterococcus faecalis* ATCC® 29212™*	WDCM 00087
Clostridium perfringens QC Organisms for testing of TSC Agar		
R4601221	*Bacillus subtilis* ATCC 6633	WDCM00003
Prepared Media for the Quality Control testing according to ISO 11133:2014		
PO5321A	CASO Agar (ISO 11133)	

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