

Water Safety and Quality Reference Guide

BIO-RAD

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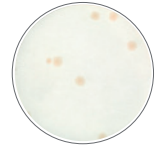
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Total Flora



Bacteria



PCA without Dextrose

ISO Standard

ISO 6222:1999

Water quality

Enumeration of culturable microorganisms

Colony count by inoculation in a nutrient agar culture medium

Ordering Information

Catalog # Description

Plate Count Agar (PCA) without Dextrose

3554437 200 ml × 6 bottles
3564474 500 g, dehydrated

Pour Plate Method

Water sample (preparation)



PCA without Dextrose



22 ± 2°C
68 ± 4 hr

Reading/enumeration



36 ± 2°C
44 ± 4 hr

Reading/enumeration

Escherichia coli

ISO Standard

ISO 9308-3:1998

Water quality

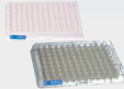
Detection and enumeration of *E. coli* and coliforms


Part 3: Miniaturized method (most probable number [MPN]) for the detection and enumeration of *E. coli* in surface and residual water

Water sample
(dilutions in **DSM** or **EDS**)



MUG/EC Microplates



 $44 \pm 0.5^{\circ}\text{C}$
36–72 hr

Reading ($\lambda = 366 \text{ nm}$ — UV light)

UV Lamp



Calculation and interpretation

Fluoplate 2 Software



Ordering Information

Catalog # Description

Special Microplate Diluent (DSM) with Bromophenol Blue

3554282 18 ml × 60 tubes

Special Microplate Diluent (DSM)

3553784 100 g, dehydrated

Sterile Distilled Water (EDS) for Microplates

3554283 18 ml × 60 tubes

Fluoplate 2 Software

3591790 Data management software for the statistical estimation of MPN and confidence interval.

Please contact your local Bio-Rad representative for more information.

MUG/EC Microplates for *E. coli* Testing

3553785 25 opaque white plates with sealers

3553782 25 transparent plates with sealers

UV Lamp

1660500 1 compact, portable lamp (366 nm, requires 4 AA batteries)

Wood Lamp

3550717 1 chamber

3550718 1 UV tube (366 nm)

Key Benefits

- Statistical control of the input values
- Creation of a database easily exportable into Excel or Access
- Multi-language software and reports: English, French, Spanish, Italian, and German
- NF EN ISO/IEC 17025 validated

Alternative Method

XplOrer64 System

Automated real-time and continuous quantification of *E. coli* in bathing (coastal sea and inland water), waste, and drinking water

Ordering Information

Catalog # Description

XplOrer64 System without PC (220 V)

3593451 XplOrer64 System (220 V) for up to 64 samples, CheckN'Safe temperature control cells, cleaning box, and 4 racks

CheckN'Safe *E. coli* Kit

3554720 9 ml × 60 tests

CheckN'Safe Screw Caps

3593457 Sterile caps (1 bag of 30 units)

Please contact your local Bio-Rad representative for more information.

Key Benefits

- Easy-to-use and automated method to quantify *E. coli* in real time, without confirmation
- Random access for up to 64 samples analyzed simultaneously
- Fast results:
 - 2,000 *E. coli*/100 ml sample detected in 4 hr 20 min
 - 500 *E. coli*/100 ml sample detected within 5 hr
- Automatic expression of results according to 76/160/EEC or 2006/7/EC European Directive
- Accurate alternative method compared to miniaturized MUG/EC Microplates

Samples with Low Suspended Matter (SM) Level
100 ml Protocol

Samples with High SM Level
10 ml Protocol

Nonfilterable Water Samples
1 ml Protocol

Bathing water (sea, inland)
Treated wastewater
Drinking water

Treated or untreated wastewater

Untreated wastewater



Water sample filtration



Membrane inserted into CheckN'Safe *E. coli*



Pipetting of 1 ml of water sample



Direct inoculation CheckN'Safe *E. coli*



Automated detection or quantification with XplOrer64 System



Total *E. coli* analysis cycle:

- Bathing water: 8 hr
- Wastewater: 12 hr
- Drinking water: 12 hr



Automated real-time results analysis and interpretation with XplOrer64 Software



E. coli/Coliforms

Ordering Information

Catalog # Description

Bromocresol Purple (BCP) Lactose Broth

3553414 10 ml × 25 tubes

Brilliant Green Bile Lactose Broth (BG/BLB)

3578024 10 ml × 25 tubes

Kovacs Reagent (for Indole Detection)

3555313 15 ml × 2 bottles

Tergitol 7 (0.2%) Supplement

3562632 50 ml × 1 bottle

TTC (0.05%) Supplement

3562652 50 ml × 1 bottle

TTC Tergitol 7 Agar, Base Medium

3554687 200 ml × 6 bottles
3564454 500 g, dehydrated

TTC Tergitol 7 Agar, Complete Medium

3563706 55 mm × 10 dishes

Trypto-Casein-Soy Agar (TSA)

3563884B 90 mm × 20 dishes
3564554 500 g, dehydrated

Tryptophan Broth

3554194 3 ml × 25 tubes

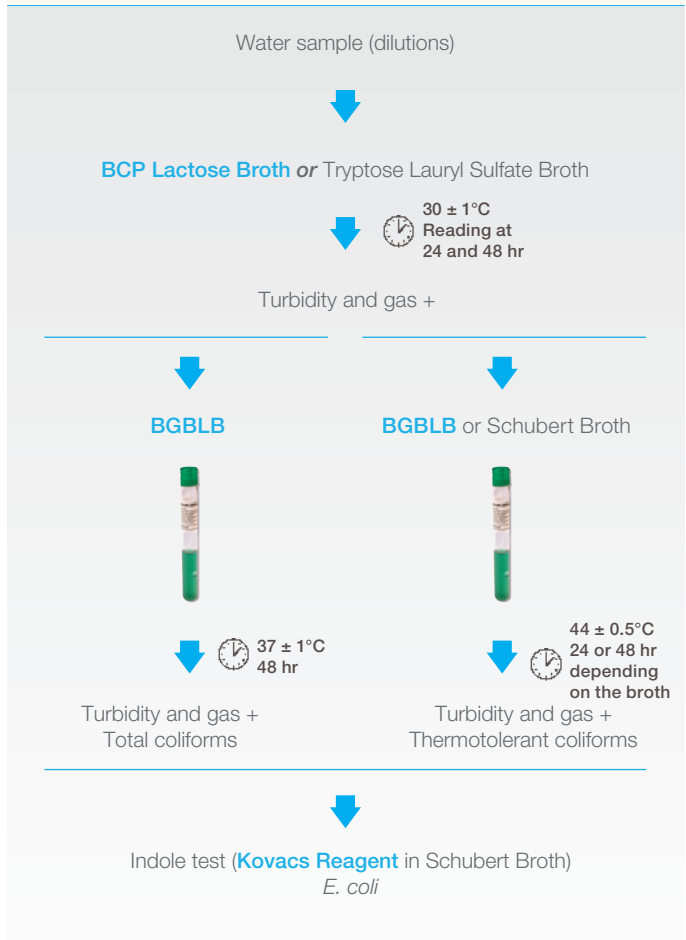
NF Standards

NF T90-413 (1985)

Water testing

Detection and enumeration of coliforms and thermotolerant coliforms

General method by culture in liquid media (MPN)



NF EN ISO 9308-1:2000

Water quality

Detection and enumeration of *E. coli* and coliforms

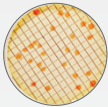
Part 1: Membrane filtration method

Water sample filtration



Membrane

Standard test **TTC Tergitol 7**



36 ± 2°C, 21 ± 3 hr
(up to 44 ± 4 hr
if absence of
typical colonies)

10 yellow colonies with
yellow area

Rapid test **TSA**

36 ± 2°C
4–5 hr

Transfer the membrane
on tryptone bile agar

44 ± 0.5°C
19–20 hr

Membrane on
indole paper + UV

10–30
min

TSA
10 tubes

**Tryptophan
Broth**
10 tubes

36 ± 2°C
21 ± 2 hr

44 ± 0.5°C
21 ± 3 hr

Oxidase test

Indole test
**Kovacs
Reagent**

Red colonies

ISO Standard

ISO 9308-1:2014

Water quality

Enumeration of *E. coli* and
coliforms

**Part 1: Membrane filtration method
for waters with low bacterial
background flora**

Water sample filtration



Membrane

36 ± 2°C
21–24 hr
for *E. coli* and
coliforms

Chromogenic Coliform Agar

Enumeration of typical
colonies

- Pink colonies = coliforms
- Violet colonies = *E. coli*
- Confirmation: minimum
10 colonies, oxidase
test of at least 10 coliform
colonies

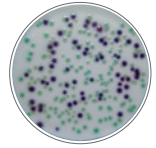
E. coli/Coliforms



E. coli



Other Coliforms



Total Coliforms

RAPID'E.coli 2

Alternative Method

RAPID'E.coli 2 for Water Testing


Chromogenic agar medium for the direct detection and enumeration of *E. coli* and coliforms by membrane filtration



EPA validation

Water sample filtration



Membrane  36°C
for *E. coli* and coliforms
21 ± 3 hr (NF VALIDATION)
24 ± 2 hr (EPA validation)



RAPID'E.coli 2 Agar for Water Testing



Enumeration of typical colonies

- Green colonies = coliforms
- Grey blue to violet colonies = *E. coli*

Ordering Information

Catalog # Description

RAPID'E.coli 2 Agar Kit for Water Testing

17005373 6 bottles of agar and
6 vials of supplement

RAPID'E.coli 2 Agar for Water Testing

3563982 55 mm × 20 dishes

Ready to use (to be supplemented)

3555297 200 ml × 6 bottles

3555299 100 ml × 6 bottles

Dehydrated base

3564024 500 g

Supplement

12008041 6 vials

Key Benefits

- Certified by NF VALIDATION and U.S. EPA
- A single plate for simultaneous *E. coli* and coliform testing with the same incubation temperature
- Strong colony coloration contrast for rapid and easy reading
- No confirmation step required for rapid results

Enterococcus

ISO Standard

ISO 7899-1:1988

Water quality

Detection and enumeration of intestinal *Enterococci* in surface and wastewater

Miniaturized method (most probable number) by inoculation in liquid medium

Water sample
(dilutions in **DSM** or **EDS**)



MUD/SF Microplates



44 ± 0.5°C
36–72 hr

Reading ($\lambda = 366 \text{ nm}$ — UV light)
UV Lamp



Calculation and interpretation
Fluoplate 2 Software



Ordering Information

Catalog # Description

Special Microplate Diluent (DSM) with Bromophenol Blue

3554282 18 ml × 60 tubes

Special Microplate Diluent (DSM)

3553784 100 g, dehydrated

Sterile Distilled Water (EDS) for Microplates

3554283 18 ml × 60 tubes

Fluoplate 2 Software

3591790 Data management software for the statistical estimation of MPN and its confidence interval.

Please contact your local Bio-Rad representative for more information.

MUD/SF Microplates for *Enterococcus* Testing

3553786 25 opaque white plates with sealers

3553783 25 transparent plates with sealers

UV Lamp

1660500 1 compact, portable lamp (366 nm, requires 4 AA batteries)

Wood Lamp

3550717 1 chamber

3550718 1 UV tube (366 nm)

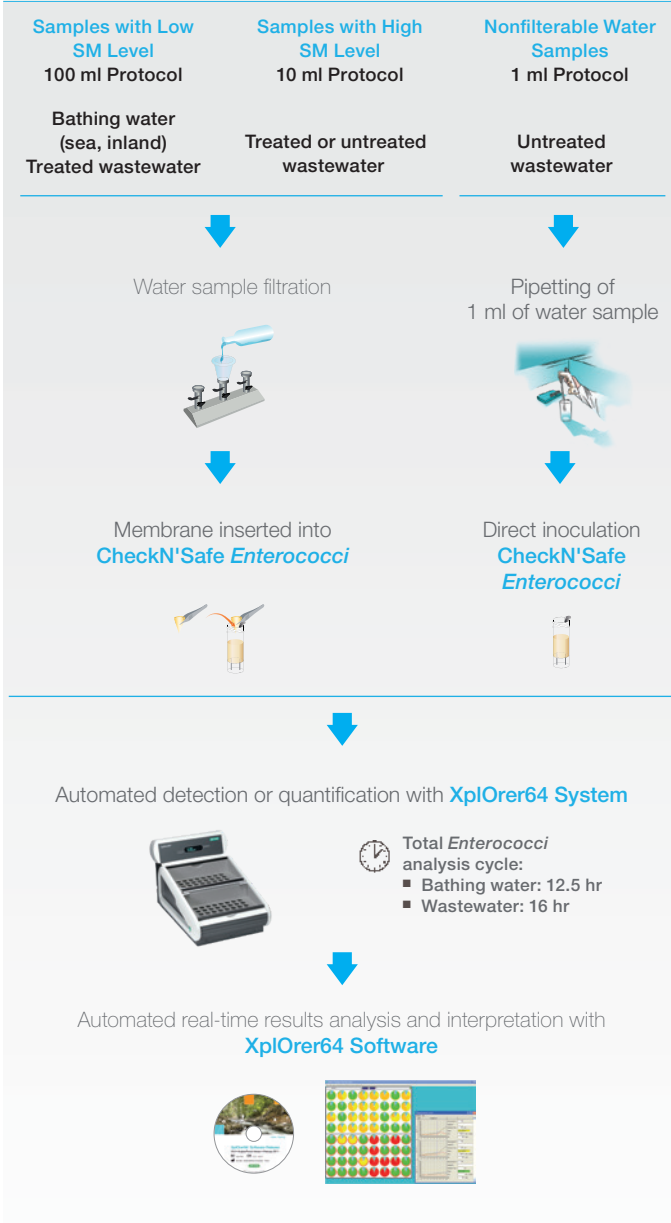
Key Benefits

- Statistical control of the input values
- Creation of a database easily exportable into Excel or Access
- Multi-language software and reports: English, French, Spanish, Italian, and German
- NF EN ISO/IEC 17025 validated

Alternative Method

XplOrer64 System

Automated real-time and continuous quantification of intestinal *Enterococci* in bathing (coastal sea and inland water) and wastewater



Ordering Information

Catalog # Description

XplOrer64 System without PC (220 V)

3593451 XplOrer64 System (220 V) for up to 64 samples, CheckN'Safe temperature control cells, cleaning box, and 4 racks

Please contact your local Bio-Rad representative for more information.

CheckN'Safe Enterococci Kit

3554721 9 ml x 60 tests

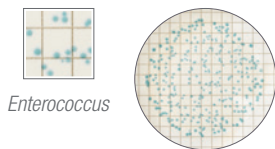
CheckN'Safe Screw Caps

3593457 Sterile caps (1 bag of 30 units)

Key Benefits

- First alternative method certified by NF VALIDATION for bathing and wastewater monitoring
- Easy-to-use and automated method to quantify in real time, without confirmation
- Random access for up to 64 samples analyzed simultaneously
- Fast results:
 - 400 *Enterococci*/100 ml sample detected in 8 hr 30 min
 - 250 *Enterococci*/100 ml sample detected within 9 hr
- Automatic expression of results according to 76/160/EEC or 2006/7/EC European Directive
- Accurate alternative method compared to miniaturized MUD/SF Microplates

Enterococcus



ISO Standard

ISO 7899-2:2000

Water quality

Detection and enumeration of intestinal *Enterococci*

Part 2: Membrane filtration method

Alternative Method

RAPID *Enterococcus*

Chromogenic agar for the direct detection and enumeration of intestinal *Enterococci* by membrane filtration

Ordering Information

Catalog # Description

Bile Esculin Azide (BEA) Agar

3563994 90 mm × 20 dishes

3564184 500 g, dehydrated

TTC (0.2%) Supplement

3562665 5 ml × 1 vial

Slanetz and Bartley Agar, Base Medium

3554819 100 ml × 6 bottles

3564934 500 g, dehydrated

Slanetz and Bartley Agar, Complete Medium

3563716 55 mm × 10 dishes

3563981 55 mm × 100 dishes

RAPID *Enterococcus* Agar for Water Testing

3554409 100 ml × 6 bottles

Key Benefits

- Direct identification and enumeration of *Enterococci*
- No confirmation step required
- Ready-to-use medium
- Time and material savings

Water sample filtration



Membrane



Slanetz and Bartley



36 ± 2°C
44 ± 4 hr

Reading

Transfer the membrane on **BEA**



44 ± 0.5°C
2 hr

Reading/enumeration

Water sample filtration



Membrane



RAPID *Enterococcus*



8–10 ml per
55 mm plate



44 ± 1°C
44 ± 4 hr

Enumeration of typical colonies

- Blue colonies = *Enterococcus*

Sulfite-Reducing Anaerobes (*Clostridium*)

NF Standard

NF T90-415 (1985)

Water testing

Detection and enumeration of spores of sulfite-reducing anaerobic bacteria and *Clostridium*

General method by incorporation of agar in deep tubes

Water sample (preparation)



Meat-Liver Sulfite Iron



Anaerobic conditions



Reading

Anaerobic conditions



Reading/enumeration

ISO Standards

ISO 6461-1:1986

Water quality

Detection and enumeration of spores of sulfite-reducing anaerobic microorganisms (*Clostridia*)

Part 1: Method by enrichment in a liquid medium

Water sample (preparation)



Differential Reinforced Clostridial Medium (DCRM)



Interpretation



TSC without D-Cycloserine



Anaerobic conditions



Confirmation

Columbia Agar

Anaerobic conditions



Reading/enumeration

ISO 6461-2:1986

Water quality

Detection and enumeration of the spores of sulfite-reducing anaerobes (*Clostridia*)

Part 2: Membrane filtration method

Water sample (preparation)



Water sample filtration



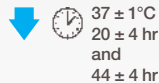
Membrane



TSC without D-Cycloserine



Anaerobic conditions



Reading/enumeration

ISO 14189:2013

Water quality

Enumeration of *Clostridium perfringens*

Membrane filtration method

Water sample (preparation)



Water sample filtration



Membrane



TSC with D-Cycloserine

Anaerobic conditions



Reading/enumeration



Confirmation
Columbia Agar



Acid phosphatase test

Ordering Information

Catalog # Description

Columbia Agar

3564674 500 g, dehydrated

3564678 5 kg, dehydrated

Meat-Liver Sulfite Iron Agar, Complete Medium

3554777 20 ml × 25 tubes

3569654 500 g, dehydrated

TSC without D-Cycloserine Agar, Base Medium

3554419 100 ml × 6 bottles

3569644 500 g, dehydrated

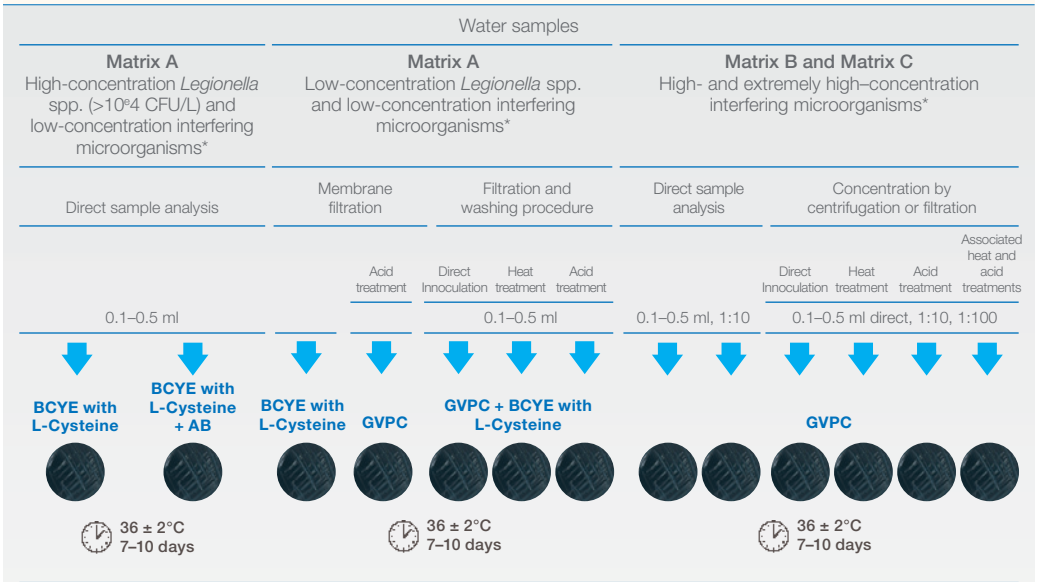
Legionella spp. and Legionella pneumophila

ISO Standard

ISO 11731:2017

Water quality

Enumeration of Legionella



Confirmation of *Legionella* spp. or *Legionella pneumophila* colonies



* A decision matrix can be found in ISO 11731:2017, Annex J.

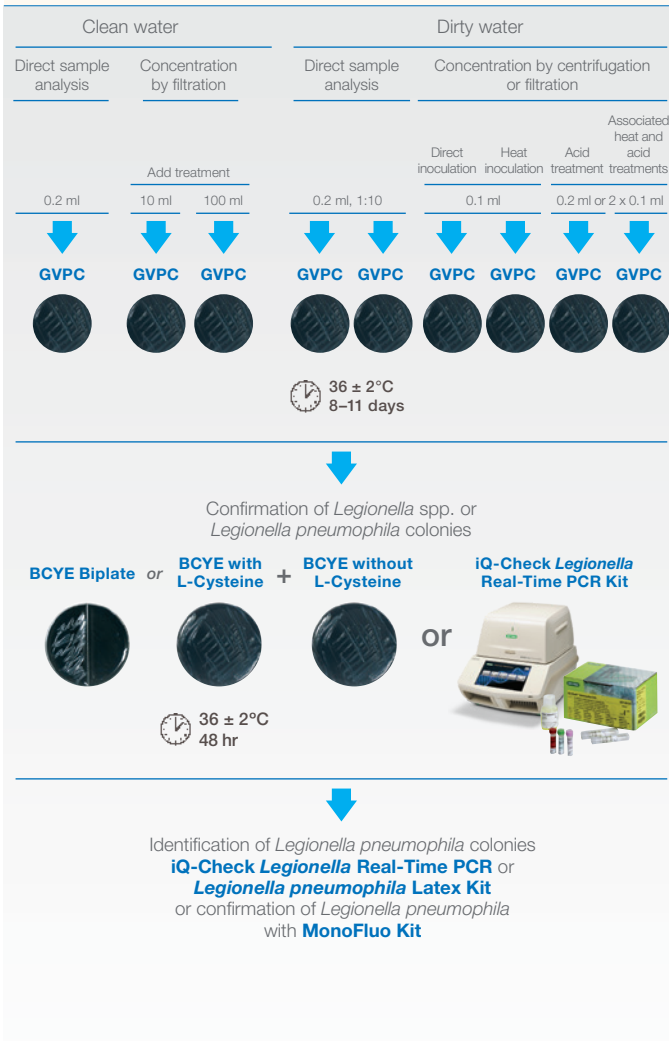
NF Standard

NF T90-431 (2017)

Water quality

Detection and enumeration of *Legionella* spp. and *L. pneumophila*

Method by direct inoculation and, after concentration, by membrane filtration or centrifugation



Ordering Information

Catalog # Description

BCYE Biplate Agar

3563718 90 mm × 20 dishes

BCYE with L-Cysteine Agar

3563720 90 mm × 20 dishes

BCYE without L-Cysteine Agar

3563722 90 mm × 20 dishes

GVPC Agar

3563717 90 mm × 20 dishes

3563719 90 mm × 100 dishes

Legionella pneumophila Latex Kit

3562790 50 tests

Legionella pneumophila and Legionella Species Latex Kit

3562795 50 tests

MonoFluo Legionella pneumophila Kit

3532514 24 tests

UV Lamp

1660500 1 compact, portable lamp (366 nm, requires 4 AA batteries)

Wood Lamp

3550717 1 chamber

3550718 1 UV tube (366 nm)

Legionella spp. and Legionella pneumophila

Alternative Method

Aquadien DNA Extraction Kit

NF VALIDATION certified according to NF T90-471 (2015) and ISO/TS 12869:2019

Water quality

Detection and quantification of *Legionella* spp. and/or

L. pneumophila by concentration and amplification by real-time PCR



Aerosol sample Biofilm sample Water sample



Standard Protocol

Short Protocol

Water sample filtration



Water sample filtration

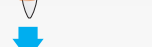


Lysis of bacteria using thermal shock
Aquadien Kit



Optional treatment with
Aquadien W2 Wash Solution
for dirty water samples

Purification of DNA using ultrafiltration



Elution of DNA for real-time PCR analysis



Optional treatment with
iQ-Check Free DNA Removal Solution

Lysis of bacteria using thermal shock + centrifugation
Aquadien Kit



Optional treatment with
Aquadien W2 Wash Solution
for dirty water samples

Purification of DNA using ultrafiltration



Elution of DNA for real-time PCR analysis



Alternative Method: Real-Time PCR

iQ-Check *Legionella* spp. Real-Time PCR Detection Kit
 iQ-Check *L. pneumophila* Real-Time PCR Detection Kit

NF VALIDATION certified according to NF T90-471 (2015) and ISO/TS 12869:2019

Water quality

Detection and quantification of *Legionella* spp. and/or
L. pneumophila by concentration and amplification by real-time PCR



DNA extraction
 Aquadien Kit



Real-time PCR amplification



Screening

iQ-Check Screen *Legionella* spp.
 iQ-Check Screen *L. pneumophila*

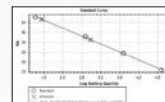
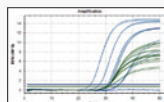


Quantification

iQ-Check Quanti *Legionella* spp.
 iQ-Check Quanti *L. pneumophila*



Automatic results analysis and interpretation



Legionella spp. and Legionella pneumophila

Ordering Information

Catalog # Description

Aquadien Bacterial DNA Extraction and Purification Kit

3578121 96 tests

Also available:

Protocol for dirty samples

Aquadien W2 Wash Solution

3578119 48 tests

Aquadien Lysis Solution

3578125 100 ml × 1 bottle,
sufficient for
32 air samples

Real-Time PCR Kits and Reagents

iQ-Check Quanti

Legionella spp. Kit

3578102 96 tests

iQ-Check Quanti

L. pneumophila Kit

3578103 96 tests

iQ-Check Screen

Legionella spp. Kit

3578104 96 tests

iQ-Check Screen

L. pneumophila Kit

3578105 96 tests

iQ-Check Free DNA Removal Solution

3594970 1 vial lyophilized iQ-Check
Free DNA Removal
Reagent (to make 10 ml)
and 1 vial iQ-Check 10x
Activation Buffer (9 ml)

Legionella DNA Free Water

12006823 1 L

Catalog # Description

Documentation

Method Validation Guide: NF T90-471 (2015) and ISO/TS 12869:2019

Please contact your local Bio-Rad
representative for more information.

Key Benefits

- High extraction yield
- Compatible with all types of water (drinking as well as cooling tower water)
- Just 4 hours to results without confirmation
- Detection of *Legionella* spp. and *L. pneumophila* in the same assay
- Fully automated results analysis
- Reference material provided
- Connected to the standard reference material
- NF VALIDATION certified, including protocol for management of free DNA in the sample

Pseudomonas aeruginosa

ISO Standard

ISO 16266:2006

Water quality

Detection and enumeration of *P. aeruginosa*

Membrane filtration method

Water sample filtration



Membrane

CN



36 ± 2°C
44 ± 4 hr

Reading/enumeration

Reading ($\lambda = 366 \text{ nm}$ — UV light)

UV Lamp

Nutrient Agar for Water Testing

Acetamide Broth

36 ± 2°C
22 ± 2 hr

Nessler reagent

Reading/enumeration of
ammonia-producing colonies

Oxidase test

36 ± 2°C
22 ± 2 hr

King B

36 ± 2°C
5 days

Reading at $\lambda = 366 \text{ nm}$

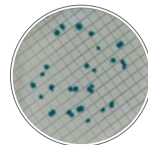
UV Lamp

Enumeration of fluorescent colonies

Pseudomonas aeruginosa



P. aeruginosa



RAPID *P.aeruginosa*

Alternative Method

RAPID *P.aeruginosa*

Chromogenic agar medium for the direct detection and enumeration of *P. aeruginosa* by membrane filtration



Water sample filtration

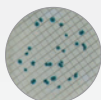


Membrane



36 ± 2°C
22–30 hr

RAPID *P.aeruginosa*



Enumeration of typical colonies:
blue to blue-green colonies

Ordering Information

Catalog # Description

Acetamide Broth

3554355 5 ml × 25 tubes

CN Agar

3563915 55 mm × 10 dishes

3556034 200 ml × 6 bottles

3564899 500 g, dehydrated

UV Lamp

1660500 1 compact, portable lamp (366 nm, requires 4 AA batteries)

Wood Lamp

3550717 1 chamber

3550718 1 UV tube (366 nm)

King B Agar

12018502 7 ml × 25 tubes

RAPID *P.aeruginosa* Agar for Water Testing

3563984 55 mm × 20 dishes

3564900 500 g, dehydrated

Key Benefits

- High specificity for direct enumeration of *P. aeruginosa*
- Complete results in 22–30 hr
- Strong colony coloration contrast for rapid and easy reading
- No confirmation step required for rapid results

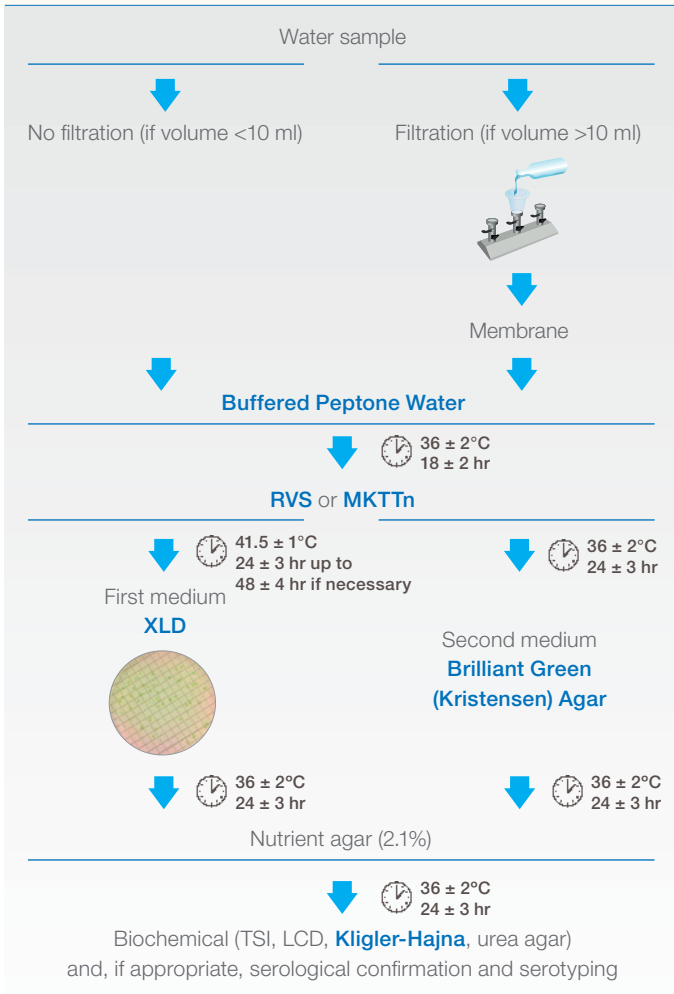
Salmonella spp.

ISO Standard

ISO 19250:2010

Water quality

Detection of *Salmonella* spp.



Ordering Information

Catalog # Description

Brilliant Green (Kristensen) Agar

3554464 500 g, dehydrated

Buffered Peptone Water (BPW)

BPW Plus

Ready to use

3554179 225 ml x 6 bottles

3555795 3 L x 4 bags

3555790 5 L x 2 bags

Dehydrated

3564684 500 g

3564686 5 kg

BPW Standard

Ready to use

12013260 5 L x 2 bags

Dehydrated

12013259 500 g

12013258 5 kg

Buffered Peptone Water Broth

3554179 225 ml x 6 bottles

3564684 500 g, dehydrated

Kligler-Hajna Agar

3555378 10 ml x 25

slanted tubes

LDC-ODC-ADH Broth

12017489 5 ml x 3 bottles

Muller-Kauffmann Tetrathionate

Novobiocin (MKTTn) Broth

3556140 10 ml x 50 tubes

3564714 500 g, dehydrated

Physiological Sterile Water (0.85%)

3554164 9 ml x 25 tubes

Rappaport Vassiliadis Soya (RVS) Broth

3555773 10 ml x 25 tubes

3564324 500 g, dehydrated

Xylose Lysine Desoxycholate (XLD) Agar

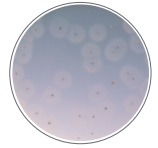
3541751 90 mm x 20 dishes

3569124 500 g, dehydrated

Staphylococcus aureus



S. aureus



S. aureus

NF Standard

NF T90-412 (2016)

Water quality

Enumeration of pathogenic staphylococci

Membrane filtration method

Water sample filtration



Membrane



BP + RPF



$36 \pm 2^\circ\text{C}$

First reading: 21 ± 3 hr

If no colonies, continue incubation

Second reading: 44 ± 4 hr

Direct enumeration of black or gray colonies surrounded by a whitish opaque halo/gram-positive bacteria



Confirmation by
microscopic observation

For transfer membrane methods



Confirmation
Pastorex Staph Plus



Coagulation reading
Rabbit Plasma

Ordering Information

Catalog # Description

Baird-Parker Agar, Base Medium

3564814 500 g, dehydrated

Baird-Parker Agar, Complete Medium

3563991 90 mm × 20 dishes

Baird-Parker Agar with Rabbit Plasma Fibrinogen (RPF), Complete Medium

3563996 90 mm × 20 dishes

3578618 90 ml × 6 bottles and
6 vials of supplement

Brain Heart Infusion (BHI) Broth

3553664 10 ml × 25 tubes

3564014 500 g, dehydrated

Egg Yolk with Potassium Tellurite Supplement

3554205 25 ml × 1 bottle

Pastorex Staph Plus Kit

3556353 5 × 50 tests

3556356 50 tests

Rabbit Plasma Kit

3556352 Pack for 20
reactions

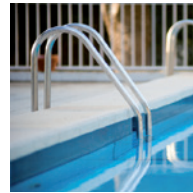
RPF Supplement

3564618 10 vials

Sulfamethazine Solution (0.2%) Supplement

3562682 2.5 ml × 1 vial

Microorganisms Detected According to Sample Origin and Method



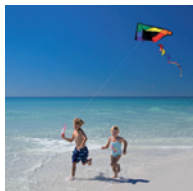
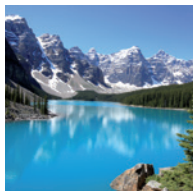
Treated Water

| Water Characteristic | Network Tap | Industrial Process | Artificial Surface | Bottled |
|-----------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------|
| Origin of water | Drinking water | Treated cooling towers, process, sanitary water | Spa, hydrotherapy, swimming pool, whirlpools | Natural mineral and source water |
| Turbidity | + | + | + | + |
| Microbial load | + | + | + | + |
| Typical methods | MF (Europe) P/A (U.S.) PCR | MF PCR | MF PCR | MF |
| Typical quality indicators | Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> | Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> | Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> <i>Legionella</i> | Total flora Coliforms (<i>E. coli</i>) |
| Typical pathogens | <i>Legionella</i> <i>P. aeruginosa</i> <i>Salmonella</i> SRA | <i>Legionella</i> <i>P. aeruginosa</i> <i>Salmonella</i> SRA | <i>P. aeruginosa</i> <i>S. aureus</i> <i>Salmonella</i> SRA | <i>P. aeruginosa</i> |

+, low; ++, medium; +++, high; +++++, very high.

MF, membrane filtration; MPN, most probable number; P/A, presence/absence; PCR, polymerase chain reaction; SRA, sulfite-reducing anaerobes.

Visit [bio-rad.com/water](https://www.bio-rad.com/water) for more information.



Nontreated Water

| Surface | Bathing | Waste | Cooling Towers | Aerosols |
|-------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------|--------------------------------------|
| Lakes, rivers | Coastal sea, estuarine, inland water | Residual raw waters, sludge, soil, treatment plant effluents | Nontreated cooling towers | Drops from cooling towers, tap water |
| +++ | +++ | +++ | ++++ | ++ |
| ++ | ++ | +++ | +++ | +++ |
| MF/MPN | MF/MPN Impedance | MPN/PCR Impedance | MPN/PCR | PCR |
| Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> | Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> | Total flora <i>E. coli</i> Coliforms <i>Enterococcus</i> | Total flora | Total flora |
| <i>Salmonella</i> SRA | — | <i>Legionella</i> <i>Salmonella</i> | <i>Legionella</i> | <i>Legionella</i> |

Validations



| Kit or Agar Method | AFNOR NF VALIDATION* | EPA** |
|-------------------------------------------------------------|----------------------|----------|
| CheckN'Safe <i>Enterococci</i> Kit | BRD 07/19-11/09 | |
| iQ-Check <i>Legionella</i> spp. Real-Time PCR Detection Kit | BRD 07/15-12/07 | |
| iQ-Check <i>L. pneumophila</i> Real-Time PCR Detection Kit | BRD 07/16-12/07 | |
| RAPID'E.coli 2 Agar Kit for Water Testing | BRD 07/20-03/11 | Approved |
| RAPID'P.aeruginosa Agar for Water Testing | BRD 07/21-04/12 | |

* Go to nf-validation.afnor.org/en/water-analysis/ for alternative analytical methods for water.

** Method approval certification available at epa.gov.

Quality and Certification

Our quality policy, which is the result of our dedicated efforts to food and water environmental and surface testing, is based on a constant commitment to improvement.

Within the scope of the CE labeling process for all of its medical diagnostic activities, a number of Bio-Rad sites received ISO 13485 certification in 2002. Bio-Rad's ISO 9001 version 2000 certification is also maintained for all of its activities.

United States Department of Agriculture (USDA) and Food and Drug Administration (FDA) inspections have confirmed Bio-Rad's quality systems' and products' compliance with U.S. regulatory standards.

Production

From the delivery of raw materials right up to marketing of the finished products, Quality Assurance applies to every product manufactured by Bio-Rad. Each batch of finished products undergoes strict quality control testing and is marketed only if it complies with acceptance criteria.

All documentation relating to the production and quality control of a given batch is archived.

Distribution

Stock is maintained in a temperature-controlled environment with barcode readings of code, batch, expiration date, product status, commercial validity, and country authorization verified at each step in product storage and distribution.

Normally, products are transported at room temperature. Bio-Rad takes shipping-related stress conditions into account when developing reagents. This allows reagents to be carried via standard shipping services. For those rare instances when a product's performance cannot be guaranteed under these conditions, Bio-Rad offers specialized methods of transport.

Traceability

All Bio-Rad products can be traced electronically, making it possible to identify the customer(s) linked with a specific product and/or batch or serial number.

As part of the company's "reagent vigilance," this traceability makes it possible to inform clients when there's a problem with a particular batch or lot number, to indicate any actions to be taken based on the results, and, where applicable, to recall a given product.

Documents and Certificates

Technical Data Sheets

For more information about our products, please refer to the technical data sheets.

Depending on the products, our technical sheets include:

- Applications of the product
- Corresponding standard references
- Product description
- Presentation or type(s) of packaging offered
- Stock status
- Typical formula
- Necessary product(s) or material(s) that are not supplied
- Detailed protocols
- Special precautions for use
- Quality controls indicating test strains and expected results

All of our technical data sheets are available on our website.

Quality Control Certificates

These certificates have been established for every product and indicate all the control tests carried out on the finished product, the expected specifications, and the results obtained.

These documents can be consulted online and can be downloaded in PDF format by using a product code and batch number.

ISO/IEC 17025 Accreditation

ISO/IEC 17025 accreditation allows solution manufacturers and user laboratories to demonstrate that they operate competently and use reliable and valid products for reliable and valid results. The Bio-Rad culture media quality control laboratory in Steenvoorde, France is ISO/IEC 17025 accredited (N° 1-6642 by COFRAC Essais). Scope of accreditation is available at [cofrac.fr](https://www.cofrac.fr).

Safety Data Sheets

These are established by our Department of Regulatory Affairs for every product containing hazardous substances and are recorded in the product reference information. These safety data sheets are available upon request.

Certificates of Health and Origin

These documents, available during audit, are delivered to us by our suppliers for peptones of animal origin when they are elements in the composition of a product.

Brochure

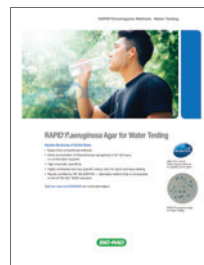


Legionella Testing Solutions Brochure
Bulletin 16414

Fliers



RAPID'*E.coli* 2 Agar
for Water Testing Flier
Bulletin 6944



RAPID'*P.aeruginosa* Agar
for Water Testing Flier
Bulletin 6945

Visit [bio-rad.com/water](https://www.bio-rad.com/water) for more information.

Videos



Visit the Bio-Rad Food Science video library, which includes product tutorials, technical information, and more.

[bio-rad.com/FoodScienceVideos](https://www.bio-rad.com/FoodScienceVideos)

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