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Safeguarding your water with Readycult®

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EPA approved

Millipore®

Preparation, Separation, Filtration & Monitoring Products

Readycult®

Our fast, convenient, and cost-effective chromogenic solutions enables the simultaneous detection of total coliforms and *E. coli*, and of enterococci in water.

The most commonly tested microbiological parameters for drinking water quality are Coliforms, Escherichia coli, and Enterococci. Total coliform count is used as indicator of the general sanitary quality of treated drinking water supplies. Coliform bacteria represent a broadly defined group of organisms with a long history in water quality assessment. The presence of *E. coli* in water indicates fecal origin contamination as result of recent sewage or animal waste.

Enterococci serve as an indicator of water treatment efficiency. They are often used as a secondary indicator for resampling after detecting Coliforms or *E. coli* in distribution systems, and as an indicator in routine monitoring after new water mains is laid or after repairs.. Enterococci tests provide supplementary data on the bacteriological quality of natural water systems, because they rarely multiply in water. In the US, enterococci may be used as indicators when monitoring marine recreational water samples due to their ability to survive in high salt concentrations as compared to *E. coli*.

US EPA-approved Readycult® testing for coliforms and *E. coli*

Readycult® Coliforms is a qualitative test method for the simultaneous detection of coliforms and *E. coli* within 18-24 hours, in a convenient and easy to open snap-pack format of our FluoroCult® LMX Broth. It contains pre-weighed, irradiated, granulated LMX broth medium and is available as Readycult® Coliform 50 for the preparation of 50 mL broth or Readycult® Coliform 100 for the preparation of 100 mL broth or 50 mL double strength broth.

Readycult® Coliforms 50 and 100 allow immediate on-site testing. The content of one snap pack can be directly added to the water sample at the site of testing.

The dehydrated culture medium is supplemented with 5-bromo-4-chloro-3-indolyl-β-D-galactopyranoside (X-Gal) and 4-methylumbelliferyl-ß-D-glucuronide (MUG). The ability to cleave X-Gal enzymatically, which changes the color of the medium to blue-green, is characteristic of 96% to 97% of coliform bacteria. MUG is cleaved specifically by an enzyme in *E. coli*, releasing a fluorogen visible under UV light.

FluoroCult® LMX and Readycult® Coliforms are convenient, cost-saving methods approved by the US Environmental Protection Agency (EPA) according to CFR 40 part 141 under the Total Coliform Rule for detecting coliform bacteria and the hygiene indicator organism Escherichia coli in drinking water.

Testing procedure

1

Add the content of a Readycult® Coliform snap pack to your water sample, then mix and incubate at 34.5 °C to 37 °C.

2

If no color change is visible after 24 hours, the test result is negative.

3

Any color change in the broth from yellow to blue-green, even if only at the top, indicates the presence of coliform bacteria. Turbidity without color change shall not be interpreted as positive result.

4

If *E. coli* is present, a light blue fluorescence is visible under UV light at 366 nm.

5

OPTIONAL: In case of any doubtful result or if an UV lamp is missing, perform an indole test directly in the same broth by adding Kovács reagent (or Bactident® Indole). An immediate red ring verifies the presence of *E. coli*. About 99% of *E. coli* are indole-positive. This simple test is not possible with similar tests from other suppliers due to different media formulations.

Readycult® testing for enterococci and D-streptococci

Readycult® Enterococci 100 is a dehydrated selective enrichment medium for detecting Enterococcus and the formerly Group D Streptococcus species in water samples after a 24-hour incubation period at 35 °C to 37 °C. While allowing rapid growth of the target organisms, the sodium azide in Readycult® Enterococci 100 largely inhibits accompanying flora, especially Gram-negative bacteria. In a characteristic reaction, the chromogenic substrate X-GLU (5-bromo-4-chloro-3-indolyl-ß-D-glucopyranoside) is cleaved, causing the broth to turn blue-green in all or part of the medium. For a positive test result, this color must remain after shaking.

The color change of the broth largely confirms the presence of enterococci or former D-streptococci in water. The presence of Enterococcus spp. can be verified by growth in Brain Heart Infusion (BHI) with 6.5% NaCl at 45 °C.

Testing procedure

- Add 100 mL of water sample sterile, transparent, sealable container.
- Take one snap pack, tap briefly to ensure the granules are at the bottom. Bend the upper part of the snap pack until it breaks open.
- Add the entire content of the snap pack to the water sample. Seal the vessel and shake to dissolve the granules completely.
- Incubation: 18-24 h at 35-37 °C or up to 48 h at 20-25 °C at room temperature.
- Test results:
  - Negative: No color change, broth remains slightly yellow
  - Positive: Any color change of the broth to blue-green, even if only in the upper section, confirms the presence of Enterococci (X-GLU reaction).

Negative Positive

Readycult: A convenient, fast and cost-effective solution

Readycult® Coliforms and Enterococci tests are supplied in ready-to-use, irradiated snap-pack format with many advantages:

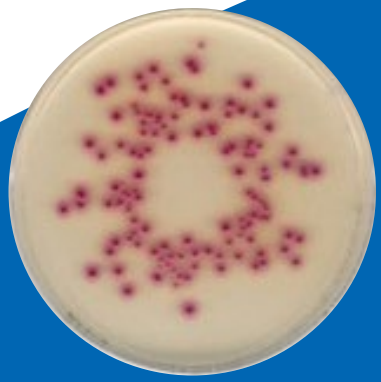
- **Easy to perform:** No media preparation required, no special skills needed, only a few minutes of hands-on time required.
- **Easy to read:** Result interpretation by color formation, no color comparator cards needed.
- **Low cost:** No need for subculturing or further biochemical tests. In case of doubt , optional quick confirmation of *E. coli* by a simple indole test within 1 minute.
- **Convenient to store:** Room temperature shelf life of 3 years from the production date.
- **Superior safety:** For doubtful result, optional quick confirmation of *E. coli* by a simple indole test within 1 minute (Readycult® Coliforms)
- **Compliant:** Method approved as Presence/Absence Method by the EPA according to Standard Method 9223 under the Revised Total Coliform Rule (Readycult® Coliforms).
- Approved by leading global beverage company (Readycult® Enterococci)

Ordering Information

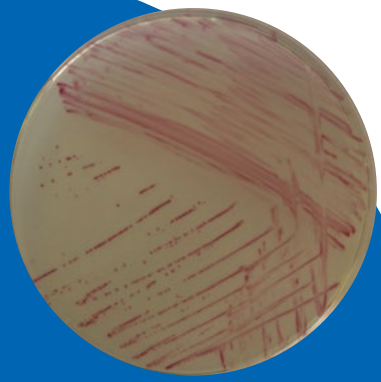
Item	Pack size	Cat. No.
Readycult® Coliforms 50, irradiated (for 50 mL water samples)	1x 20 tests	**1012950001**
Readycult® Coliforms 100, irradiated (for 100 mL water samples)	1x 20 tests	**1012980001**
Readycult® Coliforms 100, irradiated (for 100 mL water samples)	10x 20 tests	**1012980003**
Readycult® Enterococci 100, irradiated (for 100 mL water samples)	1x 20 tests	**1012990001**
Readycult® 120 mL Sample Bottle, irradiated	1x 100 bottles (1 case)	**1120SB0101**
Readycult® 120 mL Sample Bottle with dechlorinating agent (sodium thiosulfate), irradiated contains 50 mg sodium thiosulfate	1x 100 bottles (1 case)	**1120SB0102**
Readycult® 150 mL Sample Bottle, irradiated	1x 120 bottles (1 case)	**1150PS0101**
Readycult® 150 ml Sample Bottle with dechlorinating agent (sodium thiosulfate), -irradiated contains 50 mg sodium thiosulfate	1x 120 bottles (1 case)	**1150PS0102**
Fluorocult® LMX broth modified acc. MANAFI and OSSMER	500 g	**1106200500**
UV Lamp (366 nm)	1 ea	**1132030001**
UV Lamp 6 watts		**Z169609**
Bactident® Indole (KOVÁCS Indole reagent) acc ISO and FDA-BAM	30 mL (dropper bottle)	**1113500001**
Bactident® Indole (KOVÁCS Indole reagent) acc ISO and FDA-BAM	100 mL	**1092930100**
CULTURA® Mini-Incubator (100-110 V)	1 ea	**1155330001**
CULTURA® Mini-Incubator (220-235 V)	1 ea	**1133110001**
Ready-to-use test strains for Readycult Coliforms:		
Escherichia coli WDCM 00090 (15-80 CFU*)		**VT000902-10EA**
Citrobacter freundii WDCM 8090 (30-120 CFU)		**RM09750L-10EA**
Salmonella enterica subsp. Enterica serovar Typhimurium WDCM 00031 (15-80 CFU)		**VT000312-10EA**
Pseudomonas aeruginosa WDCM 00024 (1,000-10,000 CFU)		**VT000246-10EA**
Ready-to-use test strains for Readycult Enterococci:		
Enterococcus faecalis WDCM 00009 (15-80 CFU)		**VT000092-10EA**
Staphylococcus aureus subsp. aureus WDCM 00034 (15-80 CFU)		**VT000342-10EA**
Related products for enumeration of *E. coli* and Coliforms, and for Enterococci		
Chromocult® Coliform agar acc. ISO 9308-1 + *E. coli* / Coliform Selective Supplement US-EPA approved chromogenic agar for simultaneous enumeration of Coliforms (red colonies) and *E. coli* (blue-violet colonies)	500 g	**1104260500**
	1 x 10 vials	**1008980010**
1009500500 Chromocult® Enterococci agar German Federal Ministry for the Environment and announced Chromocult® Enterococci agar as alternative procedure to § 15 Abs. Drinking Water Regulation 2001 for enumeration of enterococci (red colonies) in drinking water.	500 g	**1009500500**

*CFU = colony forming units

E. coli ATCC 11775 on Chromocult® Coliform agar



Citrobacter freundii ATCC 8090 on Chromocult® Coliform agar



Enterococcus durans ATCC 6056 on Chromocult® Enterococci agar

More information about our Certified Reference Microorganisms portfolio-Vitroids™ and LENTICULE® discs:
SigmaAldrich.com/mibi-crm

References

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3. Manafi, M & Rosman, H.: Identification of bacterial strains isolated from drinking water by means of FluoroCult® LMX and Readycult® Coliforms.10th General Meeting American Society of Microbiology, Poster. (2000)
4. Sing, M., Taneja, N., Baththtim D. & Sharma, M.: Comparison of Readycult® Coliform 50 with conventional methods for detection of total coliforms and faecal Escherichia coli in drinking water samples Eco. • Env. Cons. 81, 15-20. (2002)

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