

This is a preview of "ISO 8199:2018". [Click here to purchase the full version from the ANSI store.](#)

Third edition  
2018-10

---

---

## **Water quality — General requirements and guidance for microbiological examinations by culture**

*Qualité de l'eau — Exigences et lignes directrices générales pour les  
examens microbiologiques sur milieu de culture*



Reference number  
ISO 8199:2018(E)

© ISO 2018



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

This is a preview of "ISO 8199:2018". Click here to purchase the full version from the ANSI store.

## Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vii</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Principle</b> .....	<b>4</b>
<b>5 General measurement requirements</b> .....	<b>4</b>
5.1 Uniformity of temperatures.....	4
5.2 Incubation times.....	4
5.3 Volumes and masses.....	4
<b>6 Diluents and culture media</b> .....	<b>5</b>
6.1 General.....	5
6.2 Quality requirements of ingredients.....	5
6.3 Diluents.....	5
<b>7 Sterilization and decontamination</b> .....	<b>5</b>
7.1 Sterilization of apparatus and glassware.....	5
7.2 Sterilization of consumables.....	6
7.3 Decontamination of glassware and materials after use.....	6
7.4 Waste management.....	6
<b>8 Samples and sample handling</b> .....	<b>6</b>
8.1 Sampling.....	6
8.2 Sample preparation.....	7
8.2.1 Waters and other aqueous matrices.....	7
8.2.2 Swabs.....	7
<b>9 Enumeration (quantitative) methods</b> .....	<b>8</b>
9.1 Inoculation of test portions in (or on) solid media.....	8
9.1.1 General.....	8
9.1.2 Pour plate technique.....	8
9.1.3 Spread plate technique.....	9
9.1.4 Membrane filtration technique.....	10
9.1.5 Incubation.....	12
9.1.6 Counting and confirmation from solid media.....	12
9.1.7 General guidance for calculation of results.....	13
9.1.8 Expression of results.....	14
9.2 Enumeration using a liquid medium.....	24
9.2.1 General.....	24
9.2.2 Procedure.....	25
9.2.3 Choice of inoculation system.....	25
9.2.4 Incubation.....	26
9.2.5 Interpretation of results.....	26
9.2.6 Uncertainty of test results.....	27
9.2.7 Determination of MPN values.....	27
<b>10 Detection (qualitative) methods</b> .....	<b>30</b>
10.1 General.....	30
10.2 Procedure.....	31
10.3 Uncertainty of test results.....	31
<b>11 Performance characteristics of methods</b> .....	<b>31</b>
<b>12 Analytical quality control</b> .....	<b>32</b>
12.1 General.....	32

This is a preview of "ISO 8199:2018". [Click here to purchase the full version from the ANSI store.](#)

12.2	Internal quality control.....	32
12.2.1	General.....	32
12.2.2	Process controls.....	32
12.3	External quality assessment.....	33
<b>Annex A</b>	<b>(informative) Criteria for the choice of technique.....</b>	<b>35</b>
<b>Annex B</b>	<b>(informative) Confidence intervals for colony count technique and choice of method of calculation in special cases.....</b>	<b>40</b>
<b>Annex C</b>	<b>(normative) Counting and calculations with two Petri dishes per dilution.....</b>	<b>44</b>
<b>Annex D</b>	<b>(normative) Composition, preparation and performance testing of diluents.....</b>	<b>51</b>
<b>Bibliography</b>	.....	<b>55</b>

This is a preview of "ISO 8199:2018". Click here to purchase the full version from the ANSI store.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 4, *Microbiological methods*.

This third edition cancels and replaces the second edition (ISO 8199:2005), which has been technically revised. The main changes compared with the previous edition are as follows.

- Clauses have been added for terms and definitions, detection (qualitative) methods, performance characteristics and analytical quality control (AQC).
- The clauses referencing culture media and diluent preparation and QC have been revised to align with ISO 11133 and have been included in a new [Annex D](#).
- The subclause on general guidance for the calculation of results for solid media techniques has been updated to reflect the changes in ISO 7218:2007/Amd.1:2013<sup>[9]</sup> on which the relevant clauses and subclauses in the second edition were based. Modifications have been made, however, to take account of water microbiology techniques (e.g. membrane filtration) and to allow for dilutions other than ten-fold dilutions.
- [Annex B](#) has been added to give guidance on confidence intervals when calculating special cases, relating to the update of the subclause on general guidance for the calculation of results for solid media techniques.
- [Annex C](#) has been added to describe calculations when using duplicate dishes per dilution, relating to the update of the subclause on general guidance for the calculation of results for solid media techniques.
- The subclause relating to enumeration using liquid media had been expanded and includes additional guidance on the use of MPN calculators. The former [Annex B](#) containing MPN tables has been removed.
- The title of this document has been amended to reflect these changes.

This is a preview of "ISO 8199:2018". [Click here to purchase the full version from the ANSI store.](#)

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

This is a preview of "ISO 8199:2018". [Click here to purchase the full version from the ANSI store.](#)

## Introduction

Techniques for the detection and enumeration of microorganisms based on their ability to grow on or in specified culture media are an important and widely used means of assessing the microbiological quality of water. The purpose of this document is to gather in a single document the information common to the various techniques. This reduces repetition of technical details in individual standards and facilitates choice of the technique most suitable for a particular situation. Other guidance has been included on general topics of relevance to these techniques, such as analytical quality control, method performance characteristics and uncertainty of test results.