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**Water quality — Enumeration of  
*Legionella***

*Qualité de l'eau — Dénombrement des Legionella*



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## 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 on 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 the following URL: [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 second edition of ISO 11731 cancels and replaces ISO 11731:1998 and ISO 11731-2:2004, which have been technically revised.

## Introduction

After the first recognized outbreak of Legionnaires' disease in 1976, the isolated bacterium was named *Legionella pneumophila*. Legionellae are widely found in natural and artificial aquatic environments, soils, composts and can cause legionellosis. Legionellae can grow intracellularly in protozoa like *Acanthamoeba castellanii*, *Hartmannella* species or *Naegleria* species. At least 61 different *Legionella* species have been described. In 26 of these species, some strains infecting humans have been reported. *Legionella pneumophila* can be subtyped into at least 15 different serogroups; nine other species also can be subtyped into at least two separate serogroups. Monitoring for legionellae is important for public health reasons to identify environmental sources which can pose a risk of legionellosis, such as evaporative cooling towers, hot- and cold-water distribution systems in buildings and associated equipment such as spa pools, dental units, air conditioning units, etc. Monitoring is also important for validation of control measures and ongoing verification that controls remain effective.

# Water quality — Enumeration of *Legionella*

**WARNING** — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

**IMPORTANT** — It is absolutely essential that tests conducted in accordance with this document be carried out by suitably qualified and competent staff.

## 1 Scope

This document specifies culture methods for the isolation of *Legionella* and estimation of their numbers in water samples.

These methods are applicable to all kinds of water samples including potable, industrial, waste and natural waters. These methods can be used for water related matrices, e.g. biofilms, sediments, etc.

Not all *Legionella* species are culturable; therefore, the methods described in this document do not recover all species of *Legionella*.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 7704, *Water quality — Evaluation of membrane filters used for microbiological analyses*

ISO 8199, *Water quality — General guidance on the enumeration of micro-organisms by culture*

ISO 11133, *Microbiology of food, animal feed and water — Preparation, production, storage and performance testing of culture media*

ISO 19458, *Water quality — Sampling for microbiological analysis*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 3.1

#### *Legionella*

genus of microorganisms normally capable of growth on buffered charcoal yeast extract (BCYE) agar containing L-cysteine and iron(III) salts

Note 1 to entry: For a more detailed description of *Legionella* species, see [Annex A](#).