Australian Standard®

Water microbiology

Method 22: Water quality—Enumeration of *Escherichia coli* and coliform bacteria—Membrane filtration method for waters with low bacterial background flora (ISO 9308-1:2014/Amd 1:2016, MOD)

AS 4276.22:2019

PREFACE

This Standard was prepared by the Standards Australia Committee FT-020, Water Microbiology to supersede AS/NZS 4276.22:2007, *Water microbiology*, Method 22: *Packaged water—Coliform bacteria and Escherichia coli—Membrane filtration method* (ISO 9308-1:2000, MOD).

The objective of this Standard is to specify a method for the enumeration of *Escherichia coli (E. coli)* and coliform bacteria.

This method is not to be used for the enumeration of *E. coli* and coliform bacteria in surface or shallow well waters.

This Standard is an adoption with national modifications and has been reproduced from ISO 9308-1:2014, *Water quality — Enumeration of Escherichia coli and coliform bacteria*, Part 1: *Membrane filtration method for waters with low bacterial background flora* and Amendment 1:2016.

Appendix ZZ lists the variations to ISO 9308-1:2014 for the application of this Standard in Australia.

Appendix ZA provides additional information for Australian conditions.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this ISO Standard' should read 'this Australian Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

(c) Substitute 'mL' for 'ml' wherever it appears.

The terms 'normative' and 'informative' are used in Standards to define the application of the appendices or annexes to which they apply. A 'normative' appendix or annex is an integral part of a Standard, whereas an 'informative' appendix or annex is only for information and guidance.

CONTENTS

INTRODUCTION

The presence and extent of faecal pollution is an important factor in assessing the quality of water and the risk to human health from infection. Examination of water samples for the presence of *Escherichia coli* (*E. coli*), which normally inhabits the bowel of man and other warm-blooded animals, provides an indication of such pollution. Examination for coliform bacteria can be more difficult to interpret because some coliform bacteria live in soil and surface fresh water and are not always intestinal. Therefore, the presence of coliform bacteria, although not a proof of faecal contamination, may indicate failure in treatment, storage, or distribution.

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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 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 staff.

1 Scope

This part of ISO 9308 specifies a method for the enumeration of *Escherichia coli* (*E. coli*) and coliform bacteria. The method is based on membrane filtration, subsequent culture on a chromogenic coliform agar medium, and calculation of the number of target organisms in the sample. Due to the low selectivity of the differential agar medium, background growth can interfere with the reliable enumeration of *E. coli* and coliform bacteria, for example, in surface waters or shallow well waters. This method is not suitable for these types of water.

This part of ISO 9308 is especially suitable for waters with low bacterial numbers that will cause less than 100 total colonies on chromogenic coliform agar (CCA). These may be drinking water, disinfected pool water, or finished water from drinking water treatment plants.

Some strains of *E. coli* which are β-D-glucuronidase negative, such as *Escherichia coli* O157, will not be detected as *E. coli*. As they are β-D-galactosidase positive, they will appear as coliform bacteria on this chromogenic agar.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 purpose of this document, the definitions given in ISO/IEC Guide 2 and the following apply.

