International Standard ISO 7704

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Water quality — Evaluation of membrane filters used for microbiological analyses

Qualité de l'eau — Évaluation des membranes filtrantes utilisées pour des analyses microbiologiques

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7704 was prepared by Technical Committee ISO/TC 147, *Water quality*.

Water quality — Evaluation of membrane filters used for microbiological analyses

0 Introduction

Many membrane filter comparison studies which have been reported in the literature indicate that there are significant differences between various chemical compositions, brands and batches of membranes in their ability to recover bacteria from water samples.

Thus, it is very important that one of the basic tools of aquatic microbiology, the membrane filter, be standardized as much as possible, not only to provide consistent results, but also to enable the development of standardized procedures for enumerating specific micro-organisms.

1 Scope

1.1 This International Standard specifies a method for the evaluation and comparison of water-testing membrane filters intended for the enumeration of specific organisms and mixed microbial populations.

1.2 The method provides general guidelines for comparative testing of the recoveries of bacteria, yeasts and other fungi on membrane filters, as compared to recoveries by the spread plate and pour plate techniques.

2 Field of application

2.1 This method is applicable to the user's evaluation of any microporous filter intended for use with aquatic samples. Its range covers any pore size filter which may be useful in a specific application.

2.2 For specific applications, it is expected that suitable media, incubation temperature, incubation duration, incubation atmosphere and controls (spread or pour plate) will be used. Results obtained from one species or group of micro-organisms may not be valid for other groups.

3 Definition

For the purpose of this International Standard, the following definition applies.

membrane filter : A thin non-fibrous filtration medium for liquids and gases, having a mean pore size larger than 0,01 μm in diameter, on which particles larger than the rated pore size are retained at or near the delivery surface when suction or pressure is applied.

4 Principle

4.1 Filtration of aqueous or pure cultures in liquid suspension through test membrane filters, using conventional procedures. Five replicates are minimum sample requirements; a total of 200 colonies is considered the minimum number for statistical comparison.

4.2 Evaluation of the efficiency of each type of membrane filter by

a) counts obtained on non-selective medium using spread or pour plate technique versus membrane filtration technique counts on the same medium (experience indicates that under these conditions the best membrane filter counts are 80 to 90 % of those obtained by plate counts) ;

b) results for specific organisms obtained on selective membrane filter medium using spread or pour plate techniques versus membrane filtration technique on the same medium.

NOTE — Pour plate control may provide fewer colonies than spread plate control.

5 Diluent, culture media and reagent

5.1 Basic material

In order to improve the reproducibility of the results, it is recommended that, for the preparation of the diluents and culture media, dehydrated basic components or complete dehydrated media be used. The manufacturer's instructions shall be rigorously followed.

The chemical products used for the preparation of the culture media and the reagents shall be of recognized analytical quality.

The water used shall be distilled or deionized water, free from substances that might inhibit the growth of micro-organisms under the test conditions.

Measurements of pH shall be made using a pH meter, measurements being referred to room temperature.

If the prepared culture media are not used immediately, they shall, unless otherwise stated, be stored in the dark at 4 ± 2 °C, for no longer than 1 month, in conditions which do not produce any change in their composition.