This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: D5392 – 19

Standard Test Method for Isolation and Enumeration of *Escherichia coli* in Water by the Two-Step Membrane Filter Procedure[1]

This standard is issued under the fixed designation D5392; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method describes a membrane filter (MF) procedure for the detection and enumeration of *Escherichia coli*, a bacterium found exclusively in the feces of humans and other warm-blooded animals. The presence of these microorganisms in water is an indication of fecal pollution and the possible presence of enteric pathogens. These bacteria are found in water and wastewater in a wide range of densities. The detection limit of this procedure is one colony forming unit (CFU) per volume filtered.

1.2 This test method has been used successfully with temperate fresh and marine ambient waters, and wastewaters. It is the user's responsibility to ensure the validity of this test method for waters of other types.

1.3 The values stated in SI units are to be regarded as standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* For specific hazard statements, see Section 9.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D3370 Practices for Sampling Water from Flowing Process Streams

D3870 Practice for Establishing Performance Characteristics for Colony Counting Methods in Microbiology (Withdrawn 2000)[3]

D5465 Practices for Determining Microbial Colony Counts from Waters Analyzed by Plating Methods

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *Escherichia coli (E. coli), n*—a species of bacteria that is a member of the total coliform group and known to originate in the feces of warm-blooded animals.

3.3 *Performance Characteristics (Practice D3870):*

3.3.1 *accuracy, n*—the proportion of the observed count to the true density of a sample.

3.3.2 *bias, n*—the persistent positive or negative deviation of the average value of the test method from the assumed or accepted true value.

3.3.3 *precision, n*—the degree of agreement of repeated measurements of the same parameter expressed quantitatively as the standard deviation or as the 95 % confidence limits of the mean computed from the results of a series of controlled determinations.

3.3.4 *specificity, n*—the ability of a test method to select or distinguish, or both, the target bacteria in the same water sample; the specificity characteristic of the method is usually reported as the percent of false positive and false negative results.

3.3.5 *upper counting limit (UCL), n*—that colony count above which there is an unacceptable counting error; the error may be due to overcrowding or antibiosis.

[1] This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.24 on Water Microbiology.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] The last approved version of this historical standard is referenced on www.astm.org.

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