



## Standard Test Methods for Autoclavability of Membrane Filters<sup>1</sup>

This standard is issued under the fixed designation D 4199; 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 These test methods deal with tests to determine the autoclavability of membrane filters.

1.2 These test methods are applicable to all membrane filters. Either Test Method A, Test Method B, or both, may be utilized to assess the autoclavability of membrane filters.

Test Method A—Dimensional Stability	Section 8.1
Test Method B—Wetting Characteristics	8.2

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Referenced Documents

#### 2.1 ASTM Standards:

- D 1129 Terminology Relating to Water<sup>2</sup>
- D 1193 Specification for Reagent Water<sup>2</sup>

### 3. Terminology

3.1 *Definitions*—For definitions of terms used in these test methods, refer to Terminology D 1129.

### 4. Summary of Test Methods

4.1 *Test Method A*—Autoclavability is evaluated by measuring the diameter of the membrane filter, across three axes, prior to autoclaving and after autoclaving, to determine dimensional stability.

4.2 *Test Method B*—Wettability is determined by placing samples of autoclaved and nonautoclaved membrane filters in water and measuring the time required for the filters to become completely wet.

### 5. Significance and Use

5.1 These test methods provide information on the dimensional stability and wetting characteristics of autoclaved membrane filters. Excessive dimensional changes caused by autoclaving a constrained membrane filter could crack the filter,

rendering it useless. Increased hydrophobicity, due to autoclaving would result in an increased time to filter a liquid sample.

### 6. Apparatus

- 6.1 *Calipers*, accurate to 0.1 mm.
- 6.2 *Holder*, suitable for membrane filters.
- 6.3 *Autoclave*.
- 6.4 *Petri Dish*.
- 6.5 *Forceps*, nonserrated.
- 6.6 *Stopwatch*, accurate to 0.1 s.

### 7. Purity of Reagents

7.1 Water used in these test methods should be reagent grade Type IV B of Specification D 1193 or higher quality.

### 8. Procedure

#### 8.1 *Test Method A—Dimensional Stability:*

8.1.1 Measure the diameter of nonautoclaved filters, across three axes, with the calipers. Use three disks for each test.

8.1.2 Wrap filters in suitable autoclave packaging and autoclave at 121°C for 10 min.

8.1.3 Remove the packaged filter disks from the autoclave after the slow exhaust cycle and allow to equilibrate to ambient temperature.

8.1.4 Measure the diameter of the disks as in 8.1.1.

#### 8.2 *Test Method B—Wetting Characteristics:*

8.2.1 Partially fill a petri dish with water containing 1 % methylene blue dye. Allow the water to equilibrate to ambient temperature.

8.2.2 Using nonserrated forceps, place a nonautoclaved membrane filter disk onto the water surface.

8.2.3 Start the stopwatch as soon as the filter is placed onto the water surface.

8.2.4 Record the time for filter to wet uniformly. If there are nonwetting areas, refer to 8.2.6.

8.2.5 Repeat wetting test with membrane filters autoclaved as in 8.1.1, 8.1.2, and 8.1.3.

8.2.6 Examine the wetted filters for uniformity of wetting and note whether there are any nonwetting areas on the filter.

### 9. Report

9.1 *Dimensional Stability*—Report the average diameter of each of the three nonautoclaved filters, and report all diameters measured for each filter after autoclaving.

9.2 *Wetting Characteristics*—Report the wetting time for the nonautoclaved filter and the wetting time for the autoclaved

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee D-19 on Water and are the direct responsibility of Subcommittee D19.08 on Membranes and Ion Exchange Materials.

Current edition approved Oct. 29, 1982. Published March 1983.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 11.01.

filter. Report on any wetting irregularities or nonwetting areas observed on either the nonautoclaved or autoclaved filters.

## **10. Precision and Bias**

10.1 No statement is made about either the precision or bias of these test methods for determining autoclaving characteris-

tics of membrane filters, since the results merely state whether there is conformance to the criteria for success specified in the procedure.

## **11. Keywords**

11.1 autoclavability; filter; membrane

*The American Society for Testing and Materials takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.*

*This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.*

*This standard is copyrighted by ASTM, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or [service@astm.org](mailto:service@astm.org) (e-mail); or through the ASTM website ([www.astm.org](http://www.astm.org)).*