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Designation: D 4199 – 82 (Reapproved 1998)

Standard Test Methods for Autoclavability of Membrane Filters[1]

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.

	Section
Test Method A—Dimensional Stability	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[2]

D 1193 Specification for Reagent Water[2]

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.

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[1] 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.

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[2] *Annual Book of ASTM Standards*, Vol 11.01.

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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 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 characteristics 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

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