



# Standard Practice for Determining the Capacity of Oxygen Removal Ion Exchange Cartridges<sup>1</sup>

This standard is issued under the fixed designation D7903; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This practice covers the determination of the performance of oxygen removal ion exchange resin cartridges in the regenerated form when used for removing dissolved oxygen from water. The test can be used to determine the initial capacity of unused cartridges or the remaining capacity of used cartridges. In this case, performance is defined as oxygen removal capacity (or throughput) to a defined endpoint.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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:*<sup>2</sup>

D888 Test Methods for Dissolved Oxygen in Water

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

## 3. Terminology

3.1 *Definitions*—For definitions of terms related to water, refer to Terminology D1129.

## 4. Summary of Practice

4.1 This practice will evaluate the capacity of an oxygen removal cartridge for water by running a test solution of known oxygen content through a cartridge to a specified endpoint. The volume will enable a determination of the capacity for the cartridge to remove dissolved oxygen in water.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.08 on Membranes and Ion Exchange Materials.

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<sup>2</sup> 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.

## 5. Significance and Use

5.1 This practice can be used to evaluate unused oxygen removal ion exchange cartridges for conformance to specifications.

5.2 This practice provides for the calculation of capacity in terms of the volume of water treated to an end point level of dissolved oxygen.

5.3 The practice as written assumes that the oxygen removal ion exchange resins in the cartridge are either partially or fully regenerated. Regeneration of the resins is not part of this practice.

5.4 This practice provides for the calculation of capacity on a cartridge basis.

5.5 This practice may be used to test different size oxygen removal resin cartridges. The flow rate of test water and the frequency of sampling are varied to compensate for the approximate volume of resin in the test cartridge.

## 6. Apparatus

6.1 *Test assembly* (Fig. 1), consisting of the following:

6.1.1 *Cartridge*, and *pressure vessel*, if required. Connections shall be provided at the top and the bottom for the admission and removal of the exhausting solution as described in 8.3, 8.4, and 8.5.

6.1.2 *Test solution tank*. Adequate means of regulating and measuring flow through the cartridge shall be provided. If the test flow rate (8.2) cannot be obtained by gravity feed, then a pump should be used. Make sure all fittings, connections, and wetted pump portals are secure and tight to the atmosphere.

6.1.3 Measuring oxygen levels of the water in the input and the output of the test cartridge in accordance with Test Methods D888. A continuous recorder is recommended.

## 7. Reagents

7.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society,