



# Standard Test Methods for Physical and Chemical Properties of Powdered Ion Exchange Resins<sup>1</sup>

This standard is issued under the fixed designation D 4456; 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 cover the determination of the physical and chemical properties of powdered ion exchange resins and are intended for use in testing new materials. The following test methods are included:

|                                          | Sections |
|------------------------------------------|----------|
| Test Method A—Particle Size Distribution | 5 to 15  |
| Test Method B—Solids Content             | 16 to 23 |

1.2 *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 consult and 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>
- D 2687 Practices for Sampling Particulate Ion-Exchange Materials<sup>3</sup>
- D 2777 Practice for Determination of Precision and Bias of Applicable Methods of Committee D-19 on Water<sup>2</sup>
- F 322 Method for Determining Quality of Calibration Particles for Automatic Particle Counters<sup>4</sup>
- F 651 Method for Particle Counter Single-Point Calibration by the Median Method<sup>5</sup>
- F 658 Practice for Defining Size Calibration, Resolution, and Counting Accuracy of Liquid-Borne Particle Counter Using Near-Monodisperse Spherical Particulate Material<sup>6</sup>

<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.

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

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 11.02.

<sup>4</sup> Discontinued—See 1989 *Annual Book of ASTM Standards*, Vol 14.02.

<sup>5</sup> Discontinued—See 1986 *Annual Book of ASTM Standards*, Vol 15.03.

<sup>6</sup> *Annual Book of ASTM Standards*, Vol 15.03.

## 3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D 1129.

3.2 *Definitions of Terms Specific to This Standard*: Certain terms that relate specifically to these test methods are described as follows:

3.2.1 *powdered ion exchange resin*—an ion exchange resin that has undergone post-manufacturing size reduction to less than 30 μm.

3.2.2 *resin floc*—that voluminous aggregate formed when powdered anion exchange resin and powdered cation exchange resin are slurried together in an aqueous suspension.

## 4. Purity of Reagents

4.1 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,<sup>7</sup> where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 *Purity of Water*— Unless otherwise indicated, references to water shall be understood to mean Type III reagent water, Specification D 1193.

## TEST METHOD A—PARTICLE SIZE DISTRIBUTION

## 5. Scope

5.1 This test method covers the instrumental determination of the particle-size distribution of powdered ion exchange resins.

<sup>7</sup> *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.