



Standard Test Methods for Sieve Analysis and Water Content of Refractory Materials¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These test methods cover a wet and a dry method for sieve analysis of refractory materials.

1.1.1 *Wet Sieve Analysis*—Water promotes the slaking of clays and helps to separate fine particles, washing them from the larger grains. This method is recommended for use with materials that require water addition, and that slake in normal industrial use.

1.1.2 *Dry Sieve Analysis*—The dry method is not as effective as the wet method in determining the amount of material present in the smaller particle sizes. It is recommended (1) for clays, when the slaking action of water is undesirable, (2) when the material is in the form of coarsely ground grog and calcine, and (3) when the clay is to be used in such a way that the ultimate particle size is of secondary importance.

1.2 These test methods also cover determination of the water content of refractory materials in the wet condition and of air-dried samples as received, so that the sieve analysis can be calculated on the dry basis. Included is a method for obtaining the water content of other refractory materials, such as plastic refractories and wet mixes.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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

2. Referenced Documents

2.1 ASTM Standards:

C 429 Test Method for Sieve Analysis of Raw Materials for Glass Manufacture²

E 11 Specification for Wire-Cloth Sieves for Testing Purposes³

E 105 Practice for Probability Sampling of Materials³

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality for a Lot or Process³

2.2 Other Document:

ASTM STP 447 *Manual on Test Sieving Methods*⁴

3. Significance and Use

3.1 Particle size distribution has a major affect upon most of the refractory properties. These test methods provide a means of measuring the distribution for the purpose of comparison to the desired distribution.

3.2 These test methods also cover determination of the water content of refractory materials in the wet condition and of air-dried samples received, so that the sieve analysis can be calculated on the dry basis.

3.3 These methods can produce data for specification acceptance, design purposes, manufacturing control, and research and development.

3.4 A reference set of standard matched or calibrated sieves⁵ shall be provided for use in checking the set of sieves used in the actual sieve analysis of samples. The sieves for use in sieve analysis may also be standard matched sieves or may be unmatched sieves conforming to the Specification Table in Specification E 11, provided that such sieves will give results that differ by no more than 5 % from those obtained with the reference set when the two sets are compared in accordance with the section of Test Method C 429 on testing of sieves and samples splitters.

4. Apparatus

4.1 ASTM sieves, or the equivalent Tyler Series listed in Table 1, shall be used. The wire cloth for the sieves, described in Specification E 11, shall be woven (not twilled) and

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² *Annual Book of ASTM Standards*, Vol 15.02.

³ *Annual Book of ASTM Standards*, Vol 14.02.

⁴ Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

⁵ Matched sieves such as those supplied by W. S. Tyler, Inc., Mentor, OH 44060, have been found satisfactory.