



Standard Specification for Precision Electroformed Sieves¹

This standard is issued under the fixed designation E 161; 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 This specification covers the requirements for design and construction of electroformed sieves. These sieves are used to perform particle-size distribution analysis and in preparing narrowly designated particle-size fractions. They may also be used as reference standards when suitably calibrated. A method of calibrating these sieves is included in the Annex.

NOTE 1—Complete instructions and procedures on the use and calibration of testing sieves are contained in ASTM Special Technical Publication STP447B². This publication also contains a list of all published ASTM Standards on sieve analysis procedures for specific materials or industries.

1.2 The sieve analysis results from two testing sieves of the same sieve designation may not be the same because of the variances in sieve opening permitted by this specification. To minimize the differences in sieve analysis results, the use of testing sieves matched on a performance basis is suggested.

NOTE 2—For other types of sieves, see Specifications E 11 and E 323.

1.3 The values stated in SI units shall be considered standard for the dimensions of the electroformed mesh openings and the size of the wires in the electroformed mesh. The values stated in inch units shall be considered standard with regard to the sieve frames.

2. Referenced Documents

2.1 ASTM Standards:

C 430 Test Method for Fineness of Hydraulic Cement by the No. 325 (45 μ m) Sieve³

E 11 Specification for Wire-Cloth Sieves for Testing Purposes⁴

E 323 Specification for Perforated-Plate Sieves for Testing Purposes⁴

2.2 ISO Standard:

ISO 565 Test sieves—Metal wire cloth, perforated plate and electroformed sheet—nominal aperture sizes⁵

3. Ordering Information

3.1 Orders for items under this specification include the following information as necessary:

3.1.1 Name of material (Electroformed Sieve),

3.1.2 ASTM designation and year of issue (ASTM E 161 – XX),

3.1.3 Quantity of each item, and

3.1.4 Standard sieve designation (Table 1, Column 1).

3.1.5 For testing sieves in standard circular frames:

3.1.5.1 Nominal sieve frame diameter, and

3.1.5.2 Nominal sieve frame height.

3.1.6 For sieve cloth not in frames or in non-standard frames:

3.1.6.1 Lateral dimension of sieve mesh, and

3.1.6.2 Description of non-standard frame.

3.1.7 For sieves requiring supporting grid:

3.1.7.1 Support grid desired,

3.1.7.2 Support grid mounted up or down, and

3.1.8 Compatible sieve pans and covers.

4. Sieve Sheet Requirements

4.1 The material used in the manufacture of the sieve sheet shall be nickel or a metal suitable for electrodeposition in a firm crystalline structure. The sheet shall have square or round openings with straight uniform sides and smooth, flat surfaces except for a slight bevel along the edges of the openings. The thickness of the sheet (exclusive of the supporting grid, see 4.2), is governed by the method of manufacture, the size of the openings and the width of material between openings, but in no case shall the thickness of material between the openings be less than 10 μ m (0.0004 in.).

4.2 If a supporting grid is required for durability, the sieve sheet shall be mounted to the supporting metal grid in such a manner that the sheet is firmly bonded to the grid. The supporting grid shall be of suitable thickness and strand width to provide adequate support to the sheet. The sheet shall be mounted on the supporting grid with the openings running in the same direction as those of the supporting grid.

4.3 The finished and mounted sieve sheet from which the sieves are constructed, shall conform to the requirements for opening size and spacing as outlined in Table 1. Extraneous metal formed in or near the corners which does not restrict the passage of a spheroidal particle shall be disregarded. The mean dimension of these openings as defined in Table 1 establishes the designated size of the sieve.

¹ This specification is under the jurisdiction of ASTM Committee E-29 on Particle and Spray Characterization and is the direct responsibility of subcommittee E29.01 on Sieves, Sieving Methods and Screening Media.

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² ASTM STP 447B, Manual on Test Sieving Methods, Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

³ Annual Book of ASTM Standards, Vol 4.01.

⁴ Annual Book of ASTM Standards, Vol 14.02.

⁵ International Organization for Standardization, Geneva, Switzerland.