



Designation: E323 – 09

Standard Specification for Perforated-Plate Sieves for Testing Purposes¹

This standard is issued under the fixed designation E323; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

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

1. Scope

1.1 This specification covers perforated plate with either round or square apertures, normally mounted in a frame for use as sieves in precision testing in the classification of materials according to designated nominal particle size. A method for checking the accuracy of perforated sieve plates is included as information in [Appendix X1](#).

NOTE 1—The perforated-plate sieves covered by this specification are intended for general precision testing. Some industries may require more restricted specifications for sieves for special testing purposes.

NOTE 2—For other types of sieves see Specifications [E11](#) and [E161](#).

NOTE 3—Complete instructions and procedures on the use of test sieves are contained in *ASTM STP 447, Manual on Test Sieving Methods*. This manual also contains a list of all ASTM published standards on sieve analysis procedures for specific materials or industries.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered 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:*²

[E11 Specification for Woven Wire Test Sieve Cloth and Test Sieves](#)

[E161 Specification for Precision Electroformed Sieves](#)

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

Current edition approved Nov. 1, 2009. Published December 2009. Originally approved in 1967. Last previous edition approved in 2004 as E323 – 80 (2004). DOI: 10.1520/E0323-09.

² 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.

2.2 *Other Documents:*

[Fed. Std. No. 123 Marking for Shipment \(Civil Agencies\)](#)³

[MIL-STD-129 Marking for Shipment and Storage](#)³

3. Perforated Sieve Plates

3.1 Materials used in the manufacture of perforated sieve plates shall be steel, stainless steel, brass, bronze, or other rigid material and shall not be painted, plated, or otherwise coated. The thickness of materials used for perforated sieves plates shall conform to the requirements of column (7) in [Table 1](#), but may vary within the limits shown in column (10).

3.2 Round apertures shall be arranged with their centers nominally at the vertices of equilateral triangles as shown in [Fig. 1](#). The diameter of any aperture shall not vary from the nominal diameter given in columns (1) and (2) of [Table 1](#) by more than the maximum variation given in column (3). The preferred centers for round apertures shall be as given in column (4) of [Table 1](#) but may vary within the range given in column (6).

3.3 Square apertures shall be arranged in a staggered pattern with their midpoints nominally at the vertices of isosceles triangles whose bases shall equal their heights or shall be arranged in line with their midpoints nominally at the vertices of squares as shown in [Fig. 2](#). The midsection of any aperture shall not vary from the nominal midsection dimension given in columns (1) and (2) of [Table 1](#) by more than the maximum variation given in column (3). The preferred centers for square apertures shall be as given in column (4) of [Table 1](#), but may vary within the range given in column (6).

NOTE 4—The percentage of open area for square apertures is identical for both staggered and straight-line patterns.

4. Sieve Plate Frames

4.1 Standard frames for perforated-plate sieves with apertures 0.16 in. (4.00 mm) and larger shall be made of hardwood or steel and shall be designed to hold 12.0-in. (304.8-mm),

³ Available from Standardization Documents Order Desk, DODSSP, Bldg. 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, <http://dodssp.daps.dla.mil>.

TABLE 1 Nominal Dimensions, Permissible Variations, and Ranges for Perforated Plate in Standard Sieves

Sieve Designation and Aperture Size ^A		Maximum Variation of Aperture Size ^B	Centers			Plate Thickness			
			Preferred		Permissible Range ^C	Preferred		Permissible Range	
Stand-ard ^D	Alternative	mm	Stand-ard	Alter-native		mm	Stand-ard		Alternative
mm	in. ^E	mm	mm	in. ^E	mm	mm	in. ^E	gage ^F	mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
125	5	±1.0	160	6¼	144 to 184	3.4	0.1345	10	2.5 to 4.0
106	4¼	±0.9	135	5¼	122 to 155	3.4	0.1345	10	2.5 to 4.0
100 ^G	4	±0.9	128	5	115 to 147	3.4	0.1345	10	2.5 to 4.0
90	3½	±0.8	111	4¾	100 to 128	2.7	0.1046	12	2.5 to 4.0
75	3	±0.7	95	3¾	86 to 109	2.7	0.1046	12	2.5 to 4.0
63	2½	±0.6	80	3⅛	72 to 92	2.7	0.1046	12	2.5 to 4.0
53	2⅛	±0.6	68	2⅝	61 to 78	2.7	0.1046	12	2.5 to 4.0
50 ^G	2	±0.5	64	2½	58 to 73	2.7	0.1046	12	2.5 to 4.0
45	1¾	±0.5	57	2¼	51 to 65	1.9	0.0747	14	1.5 to 2.5
37.5	1½	±0.4	48	1⅞	43 to 55	1.9	0.0747	14	1.5 to 2.5
31.5	1¼	±0.4	41	1⅝	37 to 47	1.9	0.0747	14	1.5 to 2.5
26.5	1⅛	±0.4	35	1⅜	31 to 40	1.9	0.0747	14	1.5 to 2.5
25.0 ^G	1	±0.4	32	1¼	29 to 37	1.9	0.0747	14	1.5 to 2.5
22.4	⅞	±0.3	29	1⅛	26 to 33	1.9	0.0747	14	1.5 to 2.5
19.0	¾	±0.3	25	1	22 to 29	1.9	0.0747	14	1.5 to 2.5
16.0	⅝	±0.27	21	1⅜	19 to 24	1.9	0.0747	14	1.5 to 2.5
13.2	17/32	±0.25	18	¾	16 to 20	1.9	0.0747	14	1.0 to 2.0
12.5 ^G	½	±0.24	17	1⅜	15 to 20	1.9	0.0747	14	1.0 to 2.0
11.2	7/16	±0.23	15	⅝	13 to 17	1.9	0.0747	14	1.0 to 2.0
9.5	⅜	±0.20	13.0	½	11.3 to 14.9	1.9	0.0747	14	1.0 to 2.0
8.0	5/16	±0.19	11.0	7/16	9.5 to 12.6	1.9	0.0747	14	1.0 to 2.0
6.7	17/64	±0.17	9.9	25/64	8.3 to 11.4	1.5	0.0598	16	0.8 to 1.5
6.3 ^G	¼	±0.16	9.5	⅜	8.0 to 10.9	1.5	0.0598	16	0.8 to 1.5
5.6	7/32	±0.15	8.7	11/32	7.2 to 10.0	1.5	0.0598	16	0.8 to 1.5
4.75	3/16	±0.14	6.8	¼	5.8 to 7.8	1.5	0.0598	16	0.8 to 1.5
4.00	5/32	±0.13	5.9	7/32	5.0 to 6.8	1.5	0.0598	16	0.8 to 1.5
3.35	0.127(1/8)	±0.12	4.9	3/16	4.2 to 5.7	1.5	0.0598	16	0.8 to 1.5
2.80	7/64	±0.11	4.4	11/64	3.7 to 5.1	1.5	0.0598	16	0.8 to 1.5
2.36	3/62	±0.10	3.8	5/32	3.2 to 4.4	1.5	0.0598	16	0.8 to 1.5
2.00	0.078	±0.09	3.3	1/8	2.8 to 3.8	1.5	0.0598	16	0.8 to 1.5
1.70	0.066	±0.08	2.9	7/64	2.5 to 3.3	0.8	0.0299	22	0.4 to 0.8
1.40	0.055	±0.08	2.6	0.100	2.2 to 3.0	0.8	0.0299	22	0.4 to 0.8
1.18	0.045	±0.07	2.2	0.090	1.9 to 2.5	0.8	0.0299	22	0.4 to 0.8
1.00	0.039	±0.07	2.0	0.077	1.7 to 2.3	0.8	0.0299	22	0.4 to 0.8

^A The values shown in this table refer to both round and square apertures. In general, square-aperture perforated-sieve plates are available only in 3.35 mm and larger.

^B This permissible variation applies to both the standard aperture sizes and the alternative aperture sizes.

^C A range of ±15 % is allowed except that in no case shall the minimum bridge (bar between apertures) be less than one half of the difference between the nominal aperture and the preferred center.

^D These standard designations, progressing from a base of 1 mm in the ratio of approximately $4\sqrt{2}$ to 1, correspond to the values for test sieve apertures recommended by the International Organization for Standardization, Geneva, Switzerland.

^E Only approximately equivalent to the standard values.

^F The gage values are for carbon steel. For other materials, the gage used should be the nearest decimal equivalent of the U.S. standard gage for steel.

^G These sieves are not in the standard series but they have been included because they are in common usage.