



Standard Specification for Perforated-Plate Sieves for Testing Purposes¹

This standard is issued under the fixed designation E 323; 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.

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

^{ε1} NOTE—Keywords were added editorially in March 1996.

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 ASTM Specification E 11 and ASTM Specification E 161, for Precision Electroformed Sieves.²

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.

2. Referenced Documents

2.1 ASTM Standards:

E 11 Specification for Wire-Cloth Sieves for Testing Purposes²

E 161 Specification for Precision Electroformed Sieves (Square Opening Series)²

2.2 Other Documents:

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)³

MIL-STD-129 Marking for Shipment and Storage³

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 4.00 mm and larger shall be made of hardwood or steel and shall be designed to hold 12.0-in. (304.8-mm), 16.0-in. (406.4-mm), or 18.0-in. (457.2-mm) square sieve plates. The use of rectangular, circular, or other shaped frames of other dimensions is not precluded for special purposes. Frames shall have a maximum of a 0.5-in. (12.7-mm) flange on the inside of all four sides for sealing the joint and for mounting the sieve plates. Perforated sieve plates that are square or rectangular in shape shall have a maximum of 0.5-in. (12.7-mm) solid border on all four sides. Perforated sieve plates which are circular in shape may be furnished without solid borders. The sides of the frame must be a minimum of 2.0 in. (50.8 mm) and not over 4.0 in. (101.6 mm) in height.

NOTE 5—The frame may be designed to nest with compatible frames if so specified, but in general, perforated sieve plates are removable from the frame and one frame is used with a series of perforated sieve plates.

4.2 Standard frames for perforated-plate sieves with apertures smaller than 4.00 mm may be designed as above or may be the standard 8.0-in. (203.2-mm) circular sieve frame as described in Specification E 11 for wire-cloth sieve frames.

¹ This specification is under the jurisdiction of ASTM Committee E-29 on Particle Size Measurement.

Current edition approved Dec. 10, 1980. Published January 1981. Originally published as E 323 – 67. Last previous edition E 323 – 70.

² *Annual Book of ASTM Standards*, Vol 14.02.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

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	Alter-native		Stand-ard	Alter-native	gage ^F	
mm	in. ^E	mm	mm	in. ^E	mm	mm	in. ^E	mm	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	2⅞	±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	1⅞	±0.4	35	1⅝	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	7/8	±0.3	29	1⅞	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	5/8	±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	5/8	13 to 17	1.9	0.0747	14	1.0 to 2.0
9.5	3/8	±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	29/64	8.3 to 11.4	1.5	0.0598	16	0.8 to 1.5
6.3 ^G	¼	±0.16	9.5	3/8	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 $\sqrt{2}$ 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.

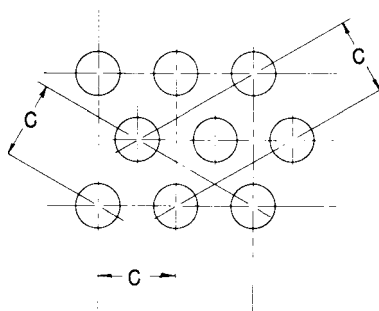


FIG. 1 Arrangement of Round Apertures

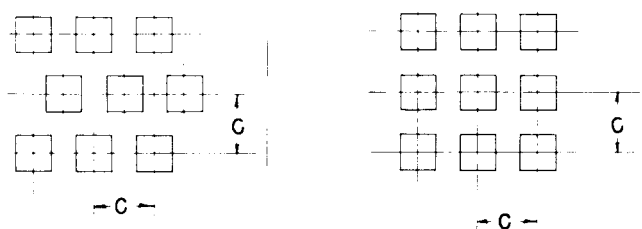


FIG. 2 Arrangement of Square Apertures

NOTE 6—Care should be taken to install the sieve plate in the frame with the side on which the manufacturer has indicated the aperture size uppermost.