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Standard Specification for Wire Cloth and Sieves for Testing Purposes[1]

This standard is issued under the fixed designation E 11; 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 testing sieves using a medium of woven wire cloth mounted in a frame for use in testing for the classification of materials according to designated particle size (See Note 1 and Note 2), and wire cloth, meeting the specifications of Table 1, to be designated test grade wire cloth. All subsequent references to wire cloth shall mean test grade wire cloth. Methods for checking testing sieves and wire cloth for conformance to this specification are included in the annex.

NOTE 1—Complete instructions and procedures on the use and calibration of testing sieves are contained in *ASTM STP447B*.[2] Note that 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. *ASTM STP447B*[2] also contains a list of all published ASTM standards on sieve analysis procedures for specific materials or industries. This list may be referenced to obtain statements of precision and bias for sieve analysis of specific materials.

NOTE 2—For other types of sieves, see Specification E 323 and Specification E 161.

1.2 The values stated in SI units shall be considered standard for the dimensions of the wire cloth openings and the diameter of the wires used in the wire cloth. The values stated in inch-pound units shall be considered standard with regard to the sieve frames.

1.3 The following precautionary statement refers only to the test method portion, Annex A1, of this specification: *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 430 Test Method for Fineness of Hydraulic Cement by the 45-µm No. 325 Sieve[3]

E 161 Specification for Precision Electroformed Sieves (Square-Opening Series)[4]

E 323 Specification for Perforated-Plate Sieves for Testing Purposes[4]

E 437 Specifications for Industrial Wire Cloth and Screens (Square Opening Series)[4]

2.2 *Federal Standard:*

Fed. Std. No. 123 Marking for Shipment (Civil Agencies)[5]

2.3 *Military Standard:*

MIL-STD-129 Marking for Shipment and Storage[5]

3. Ordering Information

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

3.1.1 Name of material (U.S.A. Standard Testing Sieves or U.S.A. Standard sieve cloth),

3.1.2 ASTM designation and year of issue (ASTM E 11 – 95),

3.1.3 Quantity of each item,

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

3.1.5 Alternative sieve designation if needed (see Table 1, Column 2),

3.1.6 For testing sieves in standard circular frames:

3.1.6.1 Nominal sieve frame diameter (see 5.2 and 5.3),

3.1.6.2 Nominal sieve frame height (see Table 2),

3.1.7 For sieve cloth not in frames or in nonstandard frames:

3.1.7.1 Lateral dimensions of sieve cloth,

3.1.7.2 Description of nonstandard frame,

3.1.8 For U.S. Government purchases, if supplementary requirements apply,

3.1.9 Compatible sieve pans and covers, and

3.1.10 Special requirements (specific type of metal for sieve cloth and frames, matched sieves, for example).

4. Sieve Cloth Requirements

4.1 Wire cloth used in U.S.A. standard testing sieves meeting the specifications shown in Table 1 shall be designated "test grade". Test grade sieve cloth shall be woven from stainless steel, brass, bronze, or other suitable wire with a plain weave, except that cloth with openings of 63 µm (No. 230) and finer

[1] This specification is under the jurisdiction of ASTM Committee E-29 on Particle Size Measurement and is the direct responsibility of Subcommittee E29.01 on Sieves, Sieving Methods, and Screening Media.

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[2] *Manual on Testing Sieving Methods, ASTM STP 447B.* Available from ASTM Headquarters.

[3] *Annual Book of ASTM Standards*, Vol 04.01.

[4] *Annual Book of ASTM Standards*, Vol 14.02.

[5] 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 for Wire Cloth of Standard Test Sieves (U.S.A.) Standard Series

Sieve Designation		Nominal Sieve Opening, in.[A]	Permissible Variation of Average Opening from the Standard Sieve Designation	Opening Dimension Exceeded By Not More Than 5 % of the Openings	Maximum Individual Opening	Nominal Wire Diameter, mm[B]
Standard[C]	Alternative					
(1)	(2)	(3)	(4)	(5)	(6)	(7)
125 mm	5 in.	5	±3.70 mm	130.0 mm	130.9 mm	8.00
106 mm	4.24 in.	4.24	±3.20 mm	110.2 mm	111.1 mm	6.30
100 mm[D]	4 in.[D]	4	±3.00 mm	104.0 mm	104.8 mm	6.30
90 mm	3½ in.	3.5	±2.70 mm	93.6 mm	94.4 mm	6.30
75 mm	3 in.	3	±2.20 mm	78.1 mm	78.7 mm	6.30
63 mm	2½ in.	2.5	±1.90 mm	65.6 mm	66.2 mm	5.60
53 mm	2.12 in.	2.12	±1.60 mm	55.2 mm	55.7 mm	5.00
50 mm[D]	2 in.[D]	2	±1.50 mm	52.1 mm	52.6 mm	5.00
45 mm	1¾ in.	1.75	±1.40 mm	46.9 mm	47.4 mm	4.50
37.5 mm	1½ in.	1.5	±1.10 mm	39.1 mm	39.5 mm	4.50
31.5 mm	1¼ in.	1.25	±1.00 mm	32.9 mm	33.2 mm	4.00
26.5 mm	1.06 in.	1.06	±.800 mm	27.7 mm	28.0 mm	3.55
25.0 mm[D]	1.00 in.[D]	1	±.800 mm	26.1 mm	26.4 mm	3.55
22.4 mm	⅞ in.	0.875	±.700 mm	23.4 mm	23.7 mm	3.55
19.0 mm	¾ in.	0.750	±.600 mm	19.9 mm	20.1 mm	3.15
16.0 mm	⅝ in.	0.625	±.500 mm	16.7 mm	17.0 mm	3.15
13.2 mm	0.530 in.	0.530	±.410 mm	13.83 mm	14.05 mm	2.80
12.5 mm[D]	½ in.[D]	0.500	±.390 mm	13.10 mm	13.31 mm	2.50
11.2 mm	7⁄16 in.	0.438	±.350 mm	11.75 mm	11.94 mm	2.50
9.5 mm	⅜ in.	0.375	±.300 mm	9.97 mm	10.16 mm	2.24
8.0 mm	5⁄16 in.	0.312	±.250 mm	8.41 mm	8.58 mm	2.00
6.7 mm	0.265 in.	0.265	±.210 mm	7.05 mm	7.20 mm	1.80
6.3 mm[D]	¼ in.[D]	0.250	±.200 mm	6.64 mm	6.78 mm	1.80
5.6 mm	No. 3½[E]	0.223	±.180 mm	5.90 mm	6.04 mm	1.60
4.75 mm	No. 4	0.187	±.150 mm	5.02 mm	5.14 mm	1.60
4.00 mm	No. 5	0.157	±.130 mm	4.23 mm	4.35 mm	1.40
3.35 mm	No. 6	0.132	±.110 mm	3.55 mm	3.66 mm	1.25
2.80 mm	No. 7	0.110	±.095 mm	2.975 mm	3.070 mm	1.12
2.36 mm	No. 8	0.0937	±.080 mm	2.515 mm	2.600 mm	1.00
2.00 mm	No. 10	0.0787	±.070 mm	2.135 mm	2.215 mm	0.900
1.7 mm	No. 12	0.0661	±.060 mm	1.820 mm	1.890 mm	0.800
1.4 mm	No. 14	0.0555	±.050 mm	1.505 mm	1.565 mm	0.710
1.18 mm	No. 16	0.0469	±.045 mm	1.270 mm	1.330 mm	0.630
1.00 mm	No. 18	0.0394	±.040 mm	1.080 mm	1.135 mm	0.560
850 µm[F]	No. 20	0.0331	±35 µm	925 µm	970 µm	0.500
710 µm	No. 25	0.0278	±30 µm	775 µm	815 µm	0.450
600 µm	No. 30	0.0234	±25 µm	660 µm	695 µm	0.400
500 µm	No. 35	0.0197	±20 µm	550 µ m	585 µm	0.315
425 µm	No. 40	0.0165	±19 µm	471 µm	502 µm	0.280
355 µm	No. 45	0.0139	±16 µm	396 µm	426 µm	0.224
300 µm	No. 50	0.0117	±14 µm	337 µm	363 µm	0.200
250 µm	No. 60	0.0098	±12 µm	283 µm	306 µm	0.160
212 µm	No. 70	0.0083	±10 µm	242 µm	263 µm	0.140
180 µm	No. 80	0.0070	±9 µm	207 µm	227 µm	0.125
150 µm	No. 100	0.0059	±8 µm	174 µm	192 µm	0.100
125 µm	No. 120	0.0049	±7 µm	147 µm	163 µm	0.090
106 µm	No. 140	0.0041	±6 µm	126 µm	141 µm	0.071
90 µm	No. 170	0.0035	±5 µm	108 µm	122 µm	0.063
75 µm	No. 200	0.0029	±5 µm	91 µm	103 µm	0.050
63 µm	No. 230	0.0025	±4 µm	77 µm	89 µm	0.045
53 µm	No. 270	0.0021	±4 µm	66 µm	76 µm	0.036
45 µm	No. 325	0.0017	±3 µm	57 µm	66 µm	0.032
38 µm	No. 400	0.0015	±3 µm	48 µm	57 µm	0.030
32 µm	No. 450	0.0012	±3 µm	42 µm	50 µm	0.028
25 µm[D]	No. 500	0.0010	±3 µm	34 µm	41 µm	0.025
20 µm[D]	No. 635	0.0008	±3 µm	29 µm	35 µm	0.020

[A] Only approximately equivalent to the metric values in Column 1.

[B] The average diameter of the wires in the x and y direction, measured separately, of any wire cloth shall not deviate from the nominal values by more than ±15 %.

[C] These standard designations correspond to the values for test sieve openings recommended by the International Standards Organization, Geneva, Switzerland, except where noted.

[D] These sieves are not in the standard series but they have been included because they are in common usage.

[E] These numbers (3½ to 635) are the approximate number of openings per linear in. but it is preferred that the sieve be identified by the standard designation in millimetres or micrometres.

[F] 1000 µm—1 mm.

may be woven with a twill weave. For definitions of "plain" and "twill" weave, refer to Specification E 437. The wire shall not be coated or plated.

4.2 The openings of the sieve cloth of successive sieves progress from a base of 1 mm in the ratio of approximately 4 $\sqrt{2}$:1.

4.3 All measurements of openings and wire diameters shall