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DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON D. C.

Letter
Circular
LC 74
(Revised Edition)

(October 1, 1926)

STANDARD SPECIFICATIONS FOR SIEVES "STANDARD SIEVE SERIES"

1. Although it has been recognized for many years that a series of standard sieves should be based upon a definite and logical succession of sieve openings, it was not until 1916 that definite steps were taken to establish and publish specifications for a complete series of testing sieves. After studying the problem and consulting both manufacturers and users, a conference was held at the Bureau of Standards on April 20, 1916 at which a tentative standard scale for all testing sieves was adopted. Since then certain revisions have been made to increase the usefulness and availability of this sieve series, and these revised specifications are the basis of certification of all sieves submitted to the Bureau of Standards for test.

2. Although this sieve scale was, in its conception, essentially metric, since the sieve having an opening of 1 mm was the basic one for calculating the series of nominal openings, the relation of consecutive sieves in the series being one to the fourth root of two, it may also be considered as essentially in the customary units by those who so prefer. The series has been made large enough, it is hoped, to meet the needs of all industries. Some industries may have occasion to use all the sieves in a certain section of the series and none of the others, while in other industries it may be desirable to use only certain sieves selected from the whole range of the series. In making such selections it is recommended that this be done on some systematic plan, as for example, the selection of every other sieve or of every fourth one in the series. In the former case the ratios of each opening to the next smaller one would be as $\sqrt{2}$:1, in the latter case 2:1.

3. Because of the wide range of openings in sieves now manufactured which is possible with a given number of meshes per unit length by the use of wires of different diameters, and the consequent confusion and uncertainty which arises in designating sieves by the number of meshes per unit length, it is recommended that all reference to mesh be avoided in the designation of the sieves, but that for convenience each sieve be given an abstract number which will indicate the approximate position of the sieve in the series. The proper designation of a sieve is the size of the opening, supplemented by the wire diameter, but it is well recognized that few users of sieves will be able to carry the sizes of the various openings in mind without reference to a

printed table. All that the users of sieves desire to know in general is that the sieves are "standard", that is, that they conform to established specifications, and therefore the only designation required is a simple one which will suggest the degree of fineness or coarseness of the material passing or retained upon any given sieve. Such a designation is an abstract number which is approximately the number of meshes per linear inch. The advantage of such a designation is readily apparent. Thus the sieve, which has a 0.105 mm opening, is given the number 140, which may be regarded simply as a fixed arbitrary number indicating that the sieve has approximately 140 meshes per inch. The fact that a sieve of nominal opening and wire diameter has actually 141.9 meshes per inch or 55.9 meshes per centimeter is of no importance; the number 140 merely indicates to those who are familiar with the old sieves what order of separation this sieve would give in testing any graded material. It is urgently recommended that all users of sieves in the future designate these standard sieves by these arbitrary numbers approximately the mesh per inch, and that the manufacturers mark and list the sieves in this manner, together with the size of the openings and the wire diameters in both millimeters and inches.

4. The Bureau of Standards tests sieves of this series to determine whether they conform to specifications given below. This test will consist of the examination of the openings of both the warp and shoot of the cloth to ascertain whether they come within the tolerance allowed, of measurements of the diameter of wires in each direction to determine the average diameter and a measurement of any large openings to ascertain whether they exceed the limits of these specifications, and of an examination of the sieve to discover any imperfections of the sieve which may seriously affect the sieving value. Sieves which pass the specifications will be stamped with the seal of the Bureau of Standards.

5. The tolerances on wire diameter and average opening have been made sufficiently liberal to make this sieve series one which can be obtained. The idea has also been kept well in mind that these specifications are for standard testing sieves and not for market grade sieve cloth. It is possible that at a later date it may be feasible to reduce these tolerances somewhat. It is believed that sieves whose wire diameters agree with the nominal values within 15% will give better service than sieves whose wire diameters are farther from the nominal values.

6. For the present a certificate will be furnished for each sieve that passes the requirements. For sieves which fail to meet the specifications, reports will be rendered showing wherein they do not conform to the standard. The sieving value of a full-height No. 200 sieve is included in the certificate or report.

7. For more detailed information as to sieve specifications reference should be made to Bureau of Standards Technological Paper No. 321, entitled "A Study of Sieve Specifications" by Lewis V. Judson. Copies of this paper may be obtained for 5 cents each on application to the Superintendent of Documents, Government Printing Office, Washington, D. C.

8. The present Sieve Specifications of the American Society for Testing Materials bear their serial number E 11-26 and are identical in the specification of the nominal dimensions and tolerances with the United States Standard Sieve Series. The designation of the A.S.T.M. sieves is by the nominal size of the sieve opening expressed in microns (1 micron = 0.001 mm). Section III of the A.S.T.M. specifications gives specific requirements as to the sieve label. The Bureau of Standards at present has no requirements as to sieve label except that it shall adequately describe the sieve and not be deceptive.

9. Specifications for 3-inch paint sieves are given in letter circular 57 of this Bureau. Copies may be obtained on application to this Bureau.

10. A schedule of fees covering the testing of sieves and sieve cloth is appended.

BUREAU OF STANDARDS SPECIFICATIONS FOR SIEVES
UNITED STATES STANDARD SIEVE SERIES

1. Wire cloth for standard sieves shall be woven (not twilled, except that the cloth of No. 230, No. 270, and the No. 325 sieve, may be twilled until further notice) from brass, bronze, or other suitable wire and mounted on the frames without distortion. To prevent the material being sieved from catching in the joint between the cloth and the frame, the joint shall be smoothly filled with solder, or so made that the material will not catch. The sieve frames should be circular, about 20 cm (8 inches) in diameter, and either about 5 cm (2 inches) or 2.5 cm (1 inch) between the top of the frame and the cloth. Sieves having a height of 5 cm (2 inches) are designated as full-height sieves; those having a height of 2.5 cm (1 inch) are designated as half-height sieves.

2. The average opening between the adjacent warp and the adjacent shoot wires, taken separately, shall be that given in column 2 of the following table, within the "tolerance in average opening" given in column 6. The average diameter of the warp and of the shoot wires, taken separately, of the cloth of any given sieve shall be that given in column 4 of the attached table within the "tolerance in wire diameter" given in column 7. The maximum opening between adjacent parallel wires shall not exceed the nominal width of opening for that sieve by more than the "tolerance in maximum opening" given in column 8 of the table.

3. Sieves may be rejected for obvious imperfections in the sieve cloth or its mounting, as, for example, punctured, loose, or wavy cloth, imperfections in soldering, etc., also for an excessive number of large openings.

(1) Sieve number	(2) Sieve opening	(3) Sieve opening	(4) Wire diameter	(5) Wire diameter	(6) Tolerance in average opening	(7) Tolerance in wire diameter	(8) Tolerance in maximum opening
	Millimeters	*Inches*	*Millimeters*	*Inches*	*Per cent*	*Per cent*	*Per cent*
4	4. 76	0. 187	1. 27	0. 050	±3	−15 to +30	10
5	4. 00	. 157	1. 12	. 044	±3	−15 to +30	10
6	3. 36	. 132	1. 02	. 040	±3	−15 to +30	10
7	2. 83	. 111	. 92	. 036	±3	−15 to +30	10
8	2. 38	. 0937	. 84	. 0331	±3	−15 to +30	10
10	2. 00	. 0787	. 76	. 0299	±3	−15 to +30	10
12	1. 68	. 0661	. 69	. 0272	±3	−15 to +30	10
14	1. 41	. 0555	. 61	. 0240	±3	−15 to +30	10
16	1. 19	. 0469	. 54	. 0213	±3	−15 to +30	10
18	1. 00	. 0394	. 48	. 0189	±3	−15 to +30	10
20	. 84	. 0331	. 42	. 0165	±5	−15 to +30	25
25	. 71	. 0280	. 37	. 0146	±5	−15 to +30	25
30	. 59	. 0232	. 33	. 0130	±5	−15 to +30	25
35	. 50	. 0197	. 29	. 0114	±5	−15 to +30	25
40	. 42	. 0165	. 25	. 0098	±5	−15 to +30	25
45	. 35	. 0138	. 22	. 0087	±5	−15 to +30	25
50	. 297	. 0117	. 188	. 0074	±6	−15 to +35	40
60	. 250	. 0098	. 162	. 0064	±6	−15 to +35	40
70	. 210	. 0083	. 140	. 0055	±6	−15 to +35	40
80	. 177	. 0070	. 119	. 0047	±6	−15 to +35	40
100	. 149	. 0059	. 102	. 0040	±6	−15 to +35	40
120	. 125	. 0049	. 086	. 0034	±6	−15 to +35	40
140	. 105	. 0041	. 074	. 0029	±8	−15 to +35	60
170	. 088	. 0035	. 063	. 0025	±8	−15 to +35	60
200	. 074	. 0029	. 053	. 0021	±8	−15 to +35	60
230	. 062	. 0024	. 046	. 0018	±8	−15 to +35	90
270	. 053	. 0021	. 041	. 0016	±8	−15 to +35	90
325	. 044	. 0017	. 036	. 0014	±8	−15 to +35	90

GOVERNMENT PRINTING OFFICE 11—7446