



## **Standard Specification for Industrial Wire Cloth and Screens (Square Opening Series)<sup>1</sup>**

This standard is issued under the fixed designation E 437; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

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

### **INTRODUCTION**

Industrial wire cloth can be produced in many thousands of combinations of size and shape of opening, wire diameter, type of weave, and metal. Such variety is most confusing and, to the vast majority of wire cloth users, unnecessary, since each usually requires only a very few specifications.

The purpose of this specification is to simplify this problem by a condensed table of recommended specifications covering the entire range of openings in which industrial wire cloth is made with several recommended wire diameters for each opening, for various grades of service.

By making selections from this standard, the user will be guided to specifications that are normally carried in stock or are being regularly produced, thus avoiding inadvertent selection of specifications that, because of little or no demand, are unobtainable, except on special order (usually quite expensive unless the quantity ordered is sufficient to justify the cost of the special manufacturing set-up).

If a user has a specific application for industrial wire cloth that cannot be solved by a selection from this standard, it is recommended that he consult his wire cloth supplier on the availability of an acceptable alternative specification.

### **1. Scope**

1.1 This specification covers the sizes of square opening wire cloth and screens for general industrial uses, including the separating or grading of materials according to designated nominal particle size, and lists standards for openings from 5 in. (125 mm) and finer, woven with wire diameters for various grades of service. Methods of checking and calibrating industrial wire cloth and screens are included as information in the Appendixes.

1.2 This specification does not apply to wire cloth with rectangular openings or to any of the following special-purpose wire cloth:

- Testing Sieve Cloth
- Fourdrinier and Cylinder Cloth
- Dutch Weave Filter Cloth
- Spiral Weave Wire Cloth
- Welded Wire Screen

1.3 The values stated in inch-pound units are to be regarded as the standard.

### **2. Referenced Documents**

#### *2.1 ASTM Standards:*

<sup>1</sup> 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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E 11 Specification for Wire-Cloth Sieves for Testing Purposes<sup>2</sup>

#### *2.2 Other Documents:*

- Fed. Std. 123 Marking for Shipment (Civil Agencies)<sup>3</sup>
- MIL-STD-129 Marking for Shipment and Storage<sup>3</sup>

### **3. Standard Specifications**

3.1 Standard specifications for industrial wire cloth and screens are listed in Table 1 and Table 2. Table 1 lists standard specifications for wire cloth that is used primarily for the separation and grading of materials according to particle size. Table 2 lists the standard specifications for general industrial use for wire cloth that is not commonly used for grading of materials according to particle size and is commonly sold by mesh rather than opening size.

3.2 *Openings*—The series of standard openings listed in Table 1 correspond to those of the USA Standard Sieve Series, Specification E 11, and to the ISO Recommended Apertures for Sieves<sup>4</sup> with supplemental openings.

3.3 *Wire Diameters*—A choice of four wire diameters is shown for each standard opening from 5 in. (125 mm) to 0.0117 in. (300 $\mu$ m) opening, inclusive. For practical reasons, the number of wire diameters or grades for openings finer than

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 14.02.

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

<sup>4</sup> ISO Recommended Apertures for Sieves, ISO/TC 24, R565-1967, augmented to include R-40/3 Series, ISO/TC 24, Doc. 54/76, July 1969.

**TABLE 1 USA Standard Specifications for Industrial Wire Cloth and Screens (Square Opening Series)**

Opening Designation			D Medium Light				C Medium				B Medium Heavy				A Heavy		
Standard (Metric)	USA Industrial Standard	Mesh	Wire Diam- eter, in.	Open- ing, in.	Open Area, %	Mesh	Wire Diam- eter, in.	Open- ing, in.	Open Area, %	Mesh	Wire Diam- eter in.	Open- ing, in.	Open Area, %	Mesh	Wire Diam- eter, in.	Open- ing, in.	Open Area, %
(1)	(2)		(3)				(4)				(5)				(6)		
125 mm	5.0in.	...	0.500	5	82.8	...	0.625	5	79.1	...	0.750	5	75.5	...	1.00	5	69.5
106	4.24	...	0.500	4¼	80.0	...	0.625	4¼	76.0	...	0.750	4¼	72.2	...	1.00	4¼	65.1
100	4.0	...	0.4375	4	81.3	...	0.625	4	74.8	...	0.750	4	70.9	...	1.00	4	64.0
90	3.5	...	0.375	3½	81.6	...	0.500	3½	76.6	...	0.750	3½	67.8	...	0.875	3½	63.9
75	3.0	...	0.375	3	79.0	...	0.500	3	73.5	...	0.625	3	68.5	...	0.750	3	64.0
...	...	...	0.375	2¾	77.4	...	0.500	2¾	71.6	...	0.625	2¾	66.4	...	0.750	2¾	61.7
63	2.5	...	0.375	2½	75.6	...	0.4375	2½	72.4	...	0.625	2½	64.0	...	0.750	2½	59.2
...	...	...	0.3125	2¼	77.1	...	0.4375	2¼	70.1	...	0.500	2¼	66.9	...	0.625	2¼	61.2
53	2.12	...	0.3125	2⅛	75.9	...	0.375	2⅛	72.2	...	0.500	2⅛	65.5	...	0.625	2⅛	59.7
50	2.0	...	0.283	2	76.7	...	0.375	2	70.9	...	0.500	2	64.0	...	0.625	2	58.0
45	1.75	...	0.283	1¾	74.1	...	0.375	1¾	67.8	...	0.4375	1¾	64.0	...	0.500	1¾	60.5
37.5	1.5	...	0.250	1½	73.4	...	0.3125	1½	68.5	...	0.375	1½	64.0	...	0.500	1½	56.3
...	...	...	0.250	1⅓	71.6	...	0.3125	1⅓	66.4	...	0.375	1⅓	61.7	...	0.500	1⅓	53.8
31.5	1.25	...	0.225	1¼	71.8	...	0.283	1¼	66.5	...	0.375	1¼	59.2	...	0.4375	1¼	54.8
...	...	...	0.207	1⅙	71.3	...	0.283	1⅙	63.8	...	0.3125	1⅙	61.2	...	0.4375	1⅙	51.8
26.5	1.06	...	0.192	1⅙	71.7	...	0.250	1⅙	65.5	...	0.3125	1⅙	59.7	...	0.375	1⅙	54.6
25	1.0	...	0.177	1	72.2	...	0.250	1	64.0	...	0.283	1	60.8	...	0.375	1	52.9
22.4	0.875	...	0.162	¾	71.2	...	0.225	¾	63.3	...	0.283	¾	57.1	...	0.375	¾	49.0
19	0.750	...	0.135	¾	71.8	...	0.192	¾	63.4	...	0.250	¾	56.3	...	0.3125	¾	49.8
16	0.625	...	0.120	⅝	70.3	...	0.177	⅝	60.7	...	0.225	⅝	54.0	...	0.283	⅝	47.4
...	...	...	0.120	⅙	67.9	...	0.177	⅙	57.7	...	0.192	⅙	56.0	...	0.250	⅙	47.9
13.2	0.530	...	0.105	0.530	69.2	...	0.162	0.530	58.6	...	0.192	0.530	53.9	...	0.250	0.530	46.2
12.5	0.500	...	0.105	½	68.3	...	0.162	½	57.1	...	0.192	½	52.2	...	0.250	½	44.4
11.2	0.4375	...	0.092	⅞	68.3	...	0.135	⅞	58.4	...	0.177	⅞	50.7	...	0.225	⅞	43.6
9.5	0.375	...	0.092	⅝	64.5	...	0.120	⅝	57.4	...	0.162	⅝	48.7	...	0.192	⅝	43.8
8.0	0.312	...	0.080	⅙	63.4	...	0.105	⅙	56.0	...	0.135	⅙	48.8	...	0.177	⅙	40.8
6.7	0.265	3	0.072	0.261	61.3	2¾	0.105	0.259	50.7	2½	0.120	0.280	49.0	2¼	0.162	0.282	40.3
6.3	0.250	...	0.072	¼	60.3	...	0.092	¼	53.4	...	0.105	¼	49.6	...	0.135	¼	42.2
5.6	0.223	3½	0.063	0.223	60.9	3¼	0.080	0.228	54.9	3	0.105	0.228	46.8	2¾	0.135	0.229	39.7
4.75	0.187	4	0.063	0.187	56.0	3¼	0.072	0.195	53.5	3½	0.092	0.194	46.1	3¼	0.120	0.188	37.3
4.00	0.157	5	0.047	0.153	58.5	4¾	0.054	0.157	55.6	4	0.092	0.158	39.9	3¾	0.105	0.162	36.9
3.35	0.132	6	0.041	0.126	57.2	5½	0.047	0.135	55.1	5	0.072	0.128	41.0	4½	0.092	0.130	34.2
...	...	...	0.041	⅙	56.7	...	0.047	⅙	52.8	...	0.072	⅙	40.3	...	0.092	⅙	33.2
2.80	0.111	7	0.035	0.108	57.2	6½	0.041	0.113	53.0	6	0.063	0.104	38.9	5	0.092	0.108	29.2
...	...	...	0.032	⅝	55.6	...	0.041	⅝	48.4	...	0.054	⅝	40.3	...	0.080	⅝	29.2
2.36	0.0937	8	0.032	0.093	55.4	7½	0.041	0.092	47.6	7	0.054	0.089	38.8	6	0.072	0.095	32.5
2.00 mm	0.0787in.	9½	0.028	0.077	53.5	8¾	0.035	0.079	48.1	8	0.047	0.078	38.9	7	0.063	0.080	31.4
1.70	0.0661	11	0.025	0.066	52.7	10	0.032	0.068	46.2	9	0.047	0.064	33.2	8½	0.054	0.064	29.6
...	...	...	0.023	⅙	53.4	...	0.035	⅙	41.1	...	0.041	⅙	36.4	...	0.054	⅙	28.7
1.40	0.0555	13	0.023	0.054	49.3	12	0.028	0.055	43.6	11	0.035	0.056	37.9	10	0.047	0.053	28.1
1.18	0.0469	15	0.018	0.049	54.0	14	0.025	0.046	41.5	13	0.032	0.045	34.2	11	0.041	0.050	30.3
1.00	0.0394	18	0.016	0.0396	50.8	16	0.023	0.0395	39.9	15	0.028	0.039	34.2	13	0.035	0.042	29.8
850 µm	0.0331	22	0.014	0.0315	48.0	19	0.020	0.0331	39.6	18	0.025	0.0306	30.3	15	0.032	0.035	27.6
710	0.0278	24	0.013	0.0287	47.4	22	0.018	0.0275	36.6	20	0.023	0.0270	29.2	...	...	...	...
600	0.0234	30	0.010	0.0233	48.9	26	0.015	0.0235	37.3	24	0.018	0.0237	32.4	...	...	...	...
500	0.0197	35	0.009	0.0196	47.1	30	0.0135	0.0198	35.3	28	0.016	0.0197	30.4	...	...	...	...
425	0.0165	40	0.0085	0.0165	43.6	35	0.012	0.0166	33.8	32	0.014	0.0173	30.6	...	...	...	...
355	0.0139	45	0.0085	0.0137	38.0	42	0.010	0.0138	33.6	38	0.013	0.0133	25.5	...	...	...	...
300	0.0117	55	0.0065	0.0117	41.4	50	0.0085	0.0115	33.1	45	0.0105	0.0117	27.7	...	...	...	...
250	0.0098	70	0.005	0.0093	42.4	60	0.007	0.0097	33.9	...	...	...	...	...	...	...	...
212	0.0083	80	0.004	0.0085	46.2	70	0.006	0.0083	33.8	...	...	...	...	...	...	...	...
180	0.0070	94	0.0035	0.0071	45.0	80	0.0055	0.0070	31.4	...	...	...	...	...	...	...	...
150	0.0059	120	0.0026	0.0057	47.3	100	0.0040	0.0060	36.0	...	...	...	...	...	...	...	...
125	0.0049	145	0.0022	0.0047	46.4	120	0.0035	0.0048	33.2	...	...	...	...	...	...	...	...
106	0.0041	165	0.0019	0.0042	47.1	140	0.0030	0.0041	32.9	...	...	...	...	...	...	...	...
90	0.0035	200	0.0016	0.0034	46.2	170	0.0024	0.0035	35.1	...	...	...	...	...	...	...	...
75	0.0029	230	0.0014	0.0029	46.0	200	0.0021	0.0029	33.6	...	...	...	...	...	...	...	...
63	0.0025	...	...	...	...	230	0.0018	0.0025	34.3	...	...	...	...	...	...	...	...
53	0.0021	...	...	...	...	280	0.0015	0.0021	34.6	...	...	...	...	...	...	...	...
45	0.0017	...	...	...	...	350	0.0012	0.0017	35.4	...	...	...	...	...	...	...	...
38	0.0015	...	...	...	...	400	0.0010	0.0015	36.0	...	...	...	...	...	...	...	...

0.0117 in. is progressively reduced.

3.4 *Relationship of Grades*—The purpose of the several grades is to provide combinations of opening and wire diam-

eter for various types of service, from medium light to heavy. The entire standard series has been designed for logical

TABLE 2 USA Standard Specifications for General Industrial Use Wire Cloth

Mesh	D Light			C Medium Light			B Medium			A Medium Heavy					
	Wire Diameter, in.	Opening, in.	Open Area, %	Mesh	Wire Diameter, in.	Opening, in.	Open Area, %	Mesh	Wire Diameter, in.	Opening, in.	Open Area, %	Mesh	Wire Diameter, in.	Opening, in.	Open Area, %
	(3)			(4)			(5)			(6)					
1	0.063	0.937	87.8	1	0.080	0.920	84.6	1	0.105	0.895	80.1	1	0.120	0.880	77.4
2	0.041	0.459	84.3	2	0.063	0.437	76.4	2	0.080	0.420	70.6	2	0.105	0.395	62.4
2½	0.035	0.365	83.3	2½	0.047	0.353	77.9	2½	0.063	0.337	71.0	2½	0.080	0.320	64.0
3	0.032	0.301	81.5	3	0.041	0.292	76.7	3	0.054	0.279	70.1	3	0.063	0.270	65.6
4	0.025	0.225	81.0	4	0.035	0.215	74.0	4	0.041	0.209	69.9	4	0.047	0.203	65.9
5	0.023	0.177	78.3	5	0.032	0.168	70.6	5	0.035	0.165	68.1	5	0.041	0.159	63.2
6	0.020	0.147	77.8	6	0.025	0.142	72.6	6	0.032	0.135	65.6	6	0.035	0.132	65.6
8	0.017	0.108	74.6	8	0.020	0.105	70.6	8	0.028	0.097	60.2	8	0.035	0.090	51.8
10	0.015	0.085	72.3	10	0.018	0.082	67.2	10	0.025	0.075	56.3	10	0.032	0.068	46.2
12	0.014	0.069	68.6	12	0.017	0.066	62.7	12	0.023	0.060	51.8	12	0.028	0.055	43.6
14	0.013	0.058	65.9	14	0.016	0.055	59.3	14	0.020	0.051	51.0	14	0.025	0.046	41.5
16	0.012	0.051	65.3	16	0.015	0.048	57.8	16	0.018	0.045	50.7	16	0.023	0.040	39.9
18	0.011	0.045	64.4	18	0.014	0.042	56.1	18	0.017	0.039	48.3	18	0.020	0.036	41.1
20	0.010	0.040	64.0	20	0.013	0.037	54.8	20	0.016	0.034	46.2	20	0.018	0.032	41.0
22	0.009	0.037	64.5	22	0.012	0.034	54.3	22	0.015	0.031	45.0	22	0.017	0.029	39.3
24	0.008	0.034	65.4	24	0.011	0.031	54.3	24	0.014	0.028	44.2	24	0.016	0.026	38.0
26	0.0075	0.031	65.0	26	0.010	0.029	54.9	26	0.013	0.026	44.0	26	0.015	0.024	37.3
28	0.0075	0.028	62.3	28	0.010	0.026	51.8	28	0.012	0.024	44.0	28	0.014	0.022	36.9
30	0.007	0.026	62.4	30	0.010	0.023	48.9	30	0.011	0.022	44.8	30	0.013	0.020	37.1
35	0.007	0.022	57.2	35	0.009	0.020	47.1	35	0.010	0.019	42.4	35	0.011	0.018	37.9
40	0.006	0.019	57.8	40	0.007	0.018	51.8	40	0.009	0.016	41.0	40	0.010	0.015	36.0
								50	0.0075	0.013	39.1	50	0.009	0.011	30.3
								60	0.0065	0.010	37.5	60	0.0075	0.009	30.5
												70	0.0065	0.008	29.8
												80	0.0055	0.007	31.4
												90	0.005	0.006	30.1
												100	0.0045	0.006	30.3

relationship of wire diameter to opening in each grade and between the grades.

3.5 *Equivalent Metric Specification*—Table X1.1, in the Appendix, shows the equivalent metric specifications to the USA Standard, woven from standard ISO metric wire diameters, for grading of materials according to particle size.

4. Types of Weave

4.1 The following types of weave are those most generally used for the industrial wire cloth covered by this specification:

- Plain weave (Fig. 1)
- Lock crimp (Fig. 2)
- Intercripped (Fig. 3)

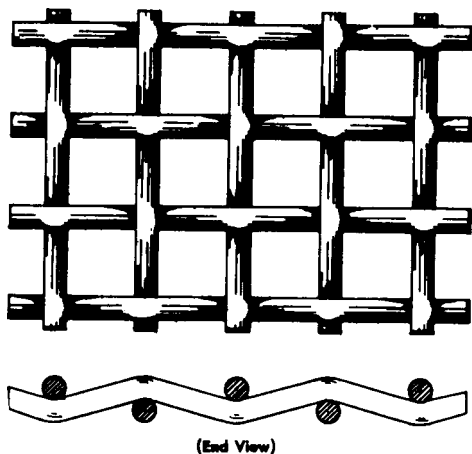


FIG. 1 Plain Weave

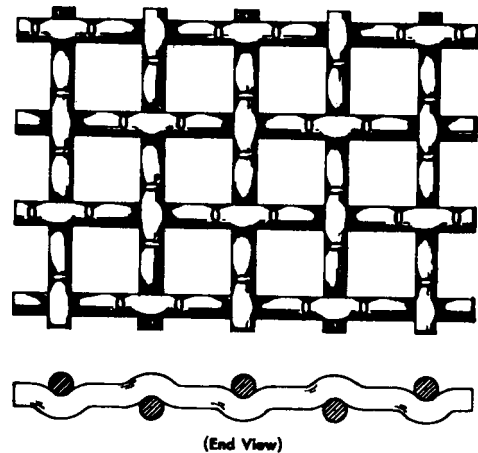


FIG. 2 Lock Crimp

- Flat top (Fig. 4)
- Twilled weave (Fig. 5)

For definitions of these and other types of weave used for industrial wire cloth and screens, see X4.2 in the Appendix.

5. Metal Composition of Wire

5.1 Industrial wire cloth can be woven from a great variety of metals and alloys, but the following are the most commonly used:

- Steel, low-carbon
- Steel, high-carbon, spring-grade
- Steel, high-carbon, oil- or lead-tempered
- Steel, electroplated with zinc, nickel, or copper before