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IS 2405-1 (1980): industrial sieves, Part 1: Wire cloth sieves [CED 55: Sieves, Sieving and other Sizing Methods]



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(Reaffirmed 1992)

Indian Standard

SPECIFICATION FOR INDUSTRIAL SIEVES

PART I WIRE CLOTH SIEVES

(First Revision)

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BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR INDUSTRIAL SIEVES

PART I WIRE CLOTH SIEVES

(First Revision)

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Indian Standard

SPECIFICATION FOR INDUSTRIAL SIEVES

PART I WIRE CLOTH SIEVES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (Part I) (First Revision) was adopted by the Indian Standards Institution on 30 January 1980, after the draft finalized by the Sieves, Sieving and Other Sizing Methods Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Industrial sieves made of wire cloth as well as of perforated plates are widely used for grading of stones, in the manufacture of cement and sugar and for a variety of other industrial purposes. These are produced in a number of combinations of size and shape of aperture, wire diameter or plate thickness, and metal. Such variety is most confusing and to the vast majority of users, unnecessary; since each usually requires only a very few of these.

0.3 This standard was first issued in 1963, with a view to cover the requirements of wire cloth and perforated plates having round and square apertures in the sizes most commonly used in a number of industries. This revision of the standard has been prepared in two parts; Part I dealing with wire cloth sieves and Part II dealing with perforated plates.

0.3.1 In this part (Part I), the entire range of apertures in which industrial wire cloth is made with a choice of four to five wire diameters for each aperture, for various grades of service, have been included to bring them in line with R20 series of ISO 2194-1972 'Wire screens and plate screens for industrial purposes nominal sizes of apertures' and ISO/DIS 4783/1 to 3 'Industrial wire screens and woven wire cloth — Guide to the choice of aperture size and wire diameter combinations', issued by the International Organization for Standardization.

0.4 In the formulation of this standard due weightage has been given to international coordination among the standards and practices prevailing

in different countries in addition to relating it to the practices in the field in this country. This has been met by referring to E 437-1971 'Standard specification for industrial wire cloth and screens (square opening series)' issued by the American Society for Testing and Materials.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2 - 1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part I) lays down the requirements regarding material, construction, dimension and finish of woven wire cloth and wire screens with square apertures for general industrial uses. It covers the aperture sizes from 125 mm to 20 μ m. Methods of checking and calibrating industrial wire cloth and the screens are included as information in Appendix A.

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

- a) Testing sieve cloth,
- b) Mill screen cloth,
- c) Light wire bolting cloth,
- d) Fourdrinier and cyclinder cloth,
- e) Dutch weave filter cloth,
- f) Spiral weave wire cloth, and
- g) Welded wire screen.

2. TERMINOLOGY

2.0 For the purpose of this standard, the definitions given in IS : 5742 (Part I) - 1970†, and the following shall apply.

2.1 Aperture Size — Dimension defining an opening.

2.2 Open Area — Ratio of the total area of the aperture to the total area of the sieving medium.

*Rules for rounding off numerical values (*revised*).

†Terms and symbols for sieve bottoms, Part I Woven and welded wire screens.

3. TYPES OF WEAVE

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

- a) Plain weave
- b) Lock crimp
- c) Intermediate crimp
- d) Flat top
- e) Twilled weave

3.1.1 For diagrams for different types of weaves, IS : 5742 (Part I) - 1970* may be referred.

4. METAL COMPOSITION OF WIRE

4.1 Unless otherwise specified by the purchaser, the wire cloth shall be made from wire of the material specified below:

<i>Size of Aperture</i>	<i>Material of Wire</i>
20 μ m to 224 μ m (both inclusive)	Phosphorbronze or stainless steel or monel
250 μ m to 900 μ m (both inclusive)	Phosphorbronze, or stainless steel or monel or brass (Cu70Zn30)
1.00 mm to 3.35 mm (both inclusive)	Phosphorbronze, brass (Cu70Zn30), steel, stainless steel
4.00 mm to 5.50 mm (both inclusive)	Brass (Cu70Zn30) or steel
6.30 mm and above (both inclusive)	Steel

4.1.1 All materials used shall conform to the relevant Indian Standards.

4.1.2 The wire cloth shall be regularly woven to produce uniform square apertures.

5. APERTURE SIZE AND WIRE DIAMETER COMBINATIONS

5.1 Depending upon different grades of service from heavy duty to light duty, a choice of five wire diameters is given for each standard aperture in Table 1. An industrial sieve made of woven wire cloth or screen shall have any one of the combinations of aperture size and wire diameter listed in Table 1. For each combination, the open area percentage has also been given.

*Terms and symbols for sieve bottoms: Part I Woven and welded wire screens.

6. TOLERANCES

6.1 Apertures — Permissible variations in average aperture sizes shall be in accordance with those listed in Table 2.

6.1.1 No individual aperture size shall exceed the nominal size by more than the values given in col 3 of Table 2.

6.2 Wire Diameter — Tolerances for wire diameters shall be in accordance with those listed in Table 3. The tolerance limits shall apply to diameters of both the warp and weft wires separately.

7 FINISH

7.1 The wire cloth shall have smooth surface.

7.2 There shall be no obvious defects in the cloth.

8. MARKING

8.1 Wire cloth shall have permanently attached label on which the following information shall be marked:

- a) Manufacturer's name or trade-mark;
- b) Width of aperture (w);
- c) Diameter of wire (d);
- d) Dimensions of wire cloth;
- e) Material of wire;
- f) Type of weave; and
- g) Particulars of margins, if required.

8.1.1 The wire cloth may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. DESIGNATION OF INDUSTRIAL SIEVES

9.1 Industrial sieve shall be designated as below:

“Designation of the sieve shall comprise its aperture size and wire diameter in mm or micrometer as the case may be followed by the inscription IS industrial sieve”.

For example : $\left\{ \begin{array}{l} w-5.6 \text{ mm} \\ d-1.6 \text{ mm} \end{array} \right\}$ IS Industrial Sieve }

TABLE 1 APERTURE SIZE AND WIRE DIAMETER COMBINATIONS

(Clause 5.1)

WIDTH OF APERTURE (R 20 SERIES)	HEAVY		MEDIUM HEAVY		MEDIUM		MEDIUM LIGHT		LIGHT	
	Wire Diameter	Open Area	Wire Diameter	Open Area	Wire Diameter	Open Area	Wire Diameter	Open Area	Wire Diameter	Open Area
(1) mm	(2) mm	(3) Percent	(4) mm	(5) Percent	(6) mm	(7) Percent	(8) mm	(9) Percent	(10) mm	(11) Percent
125	25.0	69	20.0	74	16.0	79	12.5	83	10.0	86
112	—	—	20.0	72	16.0	77	12.5	81	10.0	84
100	25.0	64	20.0	69	16.0	74	12.5	79	10.0	83
90	20.0	67	16.0	72	12.5	77	10.0	81	—	—
80	20.0	64	16.0	69	12.5	75	10.0	79	—	—
71	20.0	61	16.0	67	12.5	72	10.0	77	—	—
63	16.0	64	12.5	70	10.0	74	8.00	79	—	—
56	16.0	61	12.5	67	10.0	72	8.00	77	—	—
50	16.0	57	12.5	64	10.0	69	8.00	74	6.30	79
45	16.0	54	12.5	61	10.0	67	8.00	72	6.30	77
40	12.5	58	10.0	64	8.00	69	6.30	75	—	—
35.5	10.0	61	8.0	67	6.30	73	5.00	77	—	—
31.5	10.0	58	8.0	64	6.30	70	5.00	75	—	—
28	10.0	54	8.0	60	6.30	67	5.00	72	—	—
25	10.0	51	8.0	57	6.30	64	5.00	69	4.00	74
22.4	8.00	54	6.30	61	5.00	67	4.00	72	—	—
20	8.00	51	6.30	58	5.00	64	4.00	69	3.15	74
18	8.00	48	6.30	55	5.00	61	4.00	67	3.15	72
16	6.30	51	5.00	58	4.00	64	3.15	69	2.50	75
14	6.30	48	5.00	54	4.00	60	3.15	66	2.50	72
12.5	6.30	44	5.00	51	4.00	57	3.15	60	2.50	69
11.2	5.00	48	4.00	54	3.55	57	3.15	60	2.50	67
10	5.00	44	4.00	51	3.15	57	2.50	64	2.00	69
9	4.00	48	3.15	54	2.50	61	2.24	65	1.80	69
8	4.00	44	3.55	48	3.15	51	2.50	58	2.00	64
7.1	3.15	48	2.50	55	2.00	61	1.80	64	1.60	67
6.3	3.15	44	2.50	51	2.00	58	1.60	64	1.40	67
5.6	3.15	40	2.50	48	2.00	54	1.60	60	1.40	64
5.0	3.15	37	2.50	44	2.00	51	1.60	57	1.40	61
4.5	2.50	41	2.24	45	1.80	51	1.40	58	1.25	61
4.0	2.50	38	2.24	42	2.00	45	1.60	51	1.25	58
3.55	2.00	41	1.80	44	1.60	48	1.40	51	1.25	55
3.15	2.00	37	1.80	41	1.60	44	1.40	48	1.12	54
2.8	1.80	37	1.40	45	1.12	51	0.900	57	0.800	60
2.5	1.60	37	1.40	41	1.25	44	1.12	48	1.00	51
2.24	1.40	38	1.12	44	0.900	51	0.710	58	0.630	61
2.0	1.25	38	1.12	41	0.900	48	0.800	51	0.710	54
1.8	1.40	32	1.12	38	0.900	45	0.710	51	0.630	55
1.6	1.00	38	0.800	44	0.630	51	0.500	58	0.450	61
1.4	0.900	37	0.710	44	0.560	51	0.450	57	0.315	66
1.25	0.800	37	0.630	44	0.500	51	0.400	57	0.315	63
1.12	0.710	37	0.560	44	0.450	51	0.400	54	0.355	57
1.00	0.710	34	0.630	38	0.500	44	0.400	51	0.355	54
(μ m)										
900	0.500	41	0.450	45	0.355	51	0.315	54	0.250	61
800	0.500	38	0.450	41	0.315	51	0.280	55	0.250	58
710	0.560	31	0.450	37	0.355	44	0.315	48	0.280	51
630	0.400	37	0.315	44	0.280	48	0.250	51	0.180	60
560	0.355	37	0.280	44	0.244	52	0.160	60	—	—
500	0.400	31	0.315	37	0.250	44	0.200	51	0.160	57
450	0.315	34	0.250	41	0.200	48	0.140	58	—	—
400	0.280	35	0.250	38	0.224	42	0.180	48	0.125	58
355	0.355	25	0.280	31	0.200	41	0.180	44	0.125	55
315	0.250	31	0.200	37	0.160	44	0.112	54	—	—
280	0.224	31	0.180	37	0.160	40	0.112	51	—	—
250	0.180	34	0.160	37	0.140	41	0.125	44	0.100	51
224	0.180	31	0.160	34	0.125	41	0.100	48	0.090	51
200	0.160	31	0.140	35	0.125	38	0.090	48	—	—
180	0.140	32	0.125	35	0.112	38	0.090	44	—	—
160	0.125	32	0.112	35	0.100	38	0.071	48	—	—
140	0.112	31	0.100	34	0.090	37	0.063	48	—	—
125	0.100	31	0.090	34	0.080	37	0.063	44	—	—
112	0.090	31	0.080	34	0.071	38	0.056	44	—	—
100	0.080	31	0.071	34	0.063	38	0.050	44	—	—
90	0.071	31	0.063	35	0.056	38	0.045	44	—	—
80	0.063	31	0.056	35	0.050	38	0.045	41	—	—
71	0.056	31	0.050	34	0.045	38	0.040	41	—	—
63	0.050	31	0.045	34	0.040	37	0.036	41	—	—
56	0.045	31	0.040	34	0.036	37	0.032	41	—	—
50	0.040	31	0.036	34	0.032	37	0.028	41	—	—
45	0.036	31	0.032	34	—	—	—	—	—	—
40	0.032	31	0.030	33	0.025	38	—	—	—	—
36	0.030	30	0.028	32	—	—	—	—	—	—
32	0.028	28	0.025	32	—	—	—	—	—	—
28	0.025	28	—	—	—	—	—	—	—	—
25	0.025	26	0.022	28	—	—	—	—	—	—
22	0.022	25	—	—	—	—	—	—	—	—
20	0.020	25	—	—	—	—	—	—	—	—

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**TABLE 2 TOLERANCES ON APERTURE WIDTHS FOR
INDUSTRIAL WIRE CLOTH AND SCREENS**

(Clause 6.1 and 6.1.1)

NOMINAL APERTURE SIZE	TOLERANCES IN AVERAGE APERTURE	MAXIMUM PERMISSIBLE VARIATION IN INDIVIDUAL APERTURE SIZE
(1)	(2)	(3)
125 mm	± 3.8 mm	8 mm
Under 125 mm to 90 mm	± 3.5 mm	6.3 mm
Under 90 mm to 63 mm	± 2.54 mm	5 mm
Under 63 mm to 35.5 mm	± 1.9 mm	3.2 mm
Under 35.5 mm to 25 mm	± 1.14 mm	2.4 mm
Under 25 mm to 18 mm	± 0.76 mm	1.8 mm
Under 18 mm to 12.5 mm	± 0.51 mm	1.4 mm
Under 12.5 mm to 9 mm	± 0.43 mm	1.2 mm
Under 9 mm to 6.3 mm	± 0.38 mm	0.85 mm
Under 6.3 mm to 4.5 mm	± 0.30 mm	0.75 mm
Under 4.5 mm to 3.15 mm	± 0.25 mm	0.60 mm
Under 3.15 mm to 2.24 mm	± 0.18 mm	0.42 mm
Under 2.24 mm to 1.60 mm	± 0.13 mm	0.32 mm
Under 1.60 mm to 1.00 mm	± 88 μ m	0.25 mm
Under 1.00 mm to 500 μ m	± 54 μ m	180 μ m
Under 500 μ m to 250 μ m	± 27 μ m	110 μ m
Under 250 μ m to 125 μ m	± 14 μ m	75 μ m
Under 125 μ m to 71 μ m	± 8 μ m	56 μ m
Under 71 μ m to 56 μ m	± 6 μ m	45 μ m
Under 56 μ m to 36 μ m	± 5 μ m	36 μ m
Under 36 μ m to 20 μ m	± 4 μ m	20 μ m

**TABLE 3 TOLERANCES FOR WIRE DIAMETERS FOR
INDUSTRIAL WIRE CLOTH AND SCREENS**

(Clause 6.2)

WIRE DIAMETERS	TOLERANCE
(1)	(2)
mm	mm
25·0 to 12·5	± 0·102
Under 12·5 to 3·55	± 0·076
Under 3·55 to 2·0	± 0·050
Under 2·0 to 0·90	± 0·025
Under 0·90 to 0·71	± 0·020
Under 0·71 to 0·51	± 0·015
Under 0·51 to 0·40	± 0·013
Under 0·40 to 0·28	± 0·010
Under 0·28 to 0·152	± 0·008
Under 0·152 to 0·114	± 0·005
Under 0·114 to 0·051	± 0·004
Under 0·051	± 0·003

10. SAMPLING

10.1 Lot— All the rolls of wire cloth or all the wirecloth sieves made from wire cloth rolls belonging to the same aperture designation, same nominal diameter, same type and manufactured from material of same metal composition under identical conditions of manufacture, shall be grouped together to constitute a lot.

10.2 Each lot shall be taken up separately for determining conformity to the requirements of this specification. For this purpose sample rolls or sieves shall be taken depending upon the size of the lot in accordance with **10.2.1**.

10.2.1 The number of sample rolls or sieves from a lot shall be in accordance with level IV of Table 1 of IS : 2500 (Part I)-1973*. The AQL level 2·5 percent in Table 2 of IS : 2500 (Part I)-1973* shall be used to determine conformity or otherwise of the lot to the requirements of this specification.

*Sampling inspection tables, Part I Inspection by attributes and by count of defects (first revision).

APPENDIX A

(Clause 1.1)

TESTING OF INDUSTRIAL WIRE CLOTH AND SCREENS

A-1. TESTING

A-1.0 For testing industrial wire cloth, it is necessary to determine following:

- a) The diameter of the wire in both warp and weft directions, and
- b) The aperture in both warp and weft directions.

A-1.1 Wire Diameter — The diameter of the warp and of the weft wire shall be determined separately by the use of a suitable measuring instrument such as optical projector, a microscope in combination with coordinate measuring table, a micrometer or vernier caliper, keeping in view the nominal diameter of wire and tolerance specified for it.

A-1.2 Aperture Width

A-1.2.1 For apertures 125 to 25 mm, measure the aperture with a steel rule or an inside caliper graduated to 0.1 mm.

A-1.2.2 For apertures 22.4 mm and below determine the space by ten apertures and ten wires (using optical projector or microscope or other suitable means where necessary), divide by 10 and from the result subtract the diameter of one wire to obtain the aperture of the cloth. These measurements shall be carried out for at least five positions widely dispersed on the cloth in each direction and the average reading of these five positions should conform to the requirements of 6.1 in each direction.

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