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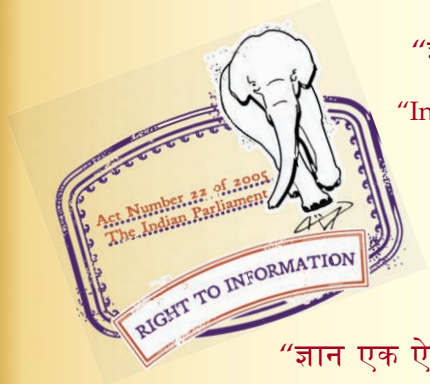

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SPECIFICATION FOR TEST SIEVES

PART 2 PERFORATED PLATE TEST SIEVES

(Third Revision)

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Indian Standard

SPECIFICATION FOR TEST SIEVES

PART 2 PERFORATED PLATE TEST SIEVES

(Third Revision)

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*Dr P. C. Jain was Chairman of the meeting when this standard was finalized

(*Continued on page* 2)

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SPECIFICATION FOR TEST SIEVES

PART 2 PERFORATED PLATE TEST SIEVES

(Third Revision)

0. FOREWORD

0.1 This Indian Standerd (Part 2) (Third Revision) was adopted by the Indian Standards Institution on 20 February 1985, 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 This standard was first issued in 1953 and revised in 1962 and 1978. The 1978 revision of this standard was published in three parts, namely, Part 1 dealing with wire cloth test sieves, Part 2 dealing with perforated plate test sieves and Part 3 dealing with methods of examination of test sieves whether made from wire cloth or perforated plates for determining their compliance with Part 1 and Part 2 of this standard. The revision of the standard (Part 2) has been taken up in view of the experiences gained during the course of implementation of this standard and also to bring it in conformity with the following International Standards published by the International Organization for Standardization (ISO):

ISO 565-1983 Test Sieves — Woven metal wire cloth, perforated plate and electroformed sheet — Nominal sizes of openings.

ISO 3310/2-1982 Test Sieves — Technical requirements and testing — Part 2: Test sieves of metal perforated plate.

0.3 In this revision the number of aperture sizes have been considerably increased. The committee while revising the standard felt that the change in the sieve sizes above 5·6 mm from R 20 series in 1962 version to R 40/3 in 1978 has created difficulties in the implementation, as was evident from the various comments received from the users, since no time period was given for change over for modifying the test procedure and specification followed at various levels for over 15 years. The sieve sizes specified in 1962 version are still in vogue. The Committee, therefore, decided to

permit these sieve sizes given in 1962 version temporarily for a period of about 5 years with suitable precautionary note in the standard so that users could get acquainted with the new sizes along with the old sizes and take appropriate steps to switch over to the R 40/3 sizes in course of their use. It is intended to withdraw the additional sizes in the next revision of the standard because the international standard ISO 565-1983 recommends that the principal sizes should be used where possible, but where a closer series is required, it should be drawn from one of the supplementary series only, that is R 20 or R 40/3, and not from both. The Committee also felt the need for discouraging the use of non-ISO sizes. The British Standard, ASTM and other overseas specifications have recommended ISO sizes to facilitate international coordination. Therefore, there is greater need for the adoption of the preferred sizes given in this standard.

0.3.1 Further, in this revision the material requirements for perforated plate as well as frames have been clearly specified. The thickness of covers and receivers have been modified. Mild steel has been deleted from the materials for perforated plate and frame, and the requirements for effective sieving surface also modified.

0.3.2 The Committee also felt that the usage of non-ISO sizes should be considered only where the nearest equivalent ISO sizes are not available. Keeping this in view the committee accepted the non-ISO sizes beyond 125 mm for perforated plate test sieves with round holes only.

0.4 This standard contains **9.1** under which the purchaser is required to supply certain information with enquiry and order for procurement of test sieves to suit his requirements.

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 2) covers test sieves, with screening medium of perforated plate having either round or square apertures, for use in testing in the classification of materials according to particle size.

1.2 It applies to test sieves having:

a) round holes from 125 mm down to 1 mm aperture size;

b) square holes from 125 mm down to 4 mm aperture size; and

c) round holes from 200 mm down to 140 mm aperture size (non-ISO sizes).

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

2. DESIGNATION

2.1 Test sieves of metal perforated plate are designated by the nominal size of aperture, expressed in millimetres followed by the inscription 'IS Sieve (*C*)' or 'IS Sieve (*R*)' where '*C*' stands for square holes and '*R*' stands for round holes.

Examples:

a) 90-mm IS Sieve (*C*)

b) 5·6 mm IS Sieve (*R*)

3. SIEVING MEDIUM

3.1 Materials for Sieving Media — The perforated plates for test sieves shall be manufactured from any of the materials given in Table 1.

NOTE — The grades of materials used shall be declared by the manufacturer if so desired by the purchaser.

TABLE 1 MATERIALS FOR PERFORATED PLATES AND FRAMES

(*Clauses* 3.1 *and* 4.1)

SL No.	MATERIALS	CONFORMING TO
(1)	(2)	(3)
i)	Brass sheet	IS : 410-1977*
ii)	Stainless steel sheet	IS : 6911-1972†
iii)	Galvanized steel sheet	IS : 277-1972‡
iv)	Electroplated steel sheet: Sheet material	IS : 513-1973§

*Specification for cold-rolled brass sheet, strip and foil (*third revision*).
†Specification for stainless steel sheets and strips.
‡Specification for galvanized steel sheets (plain and corrugated)
§Specification for cold rolled carbon steel sheets (*second revision*).

3.2 Aperture Tolerances

3.2.1 The nominal aperture *w* (*see* Fig. 1 and 2) andt olerance as given in col 1 and 2 of Table 2 applies to each mild-section of any square hole, and to any diameter of any round hole.

3.2.2 The tolerance applies to any one measurement of any aperture.

3.2.3 In addition, the following non-ISO sizes (round holes only) with tolerances as indicated are permitted:

Nominal Aperture Size	*Tolerance on Individual Aperture Size*
mm	mm
200	± 1·55
180	± 1·45
160	± 1·25
140	± 1·10

3.3 Pitch

3.3.1 The nominal pitches *P* (*see* Fig. 1 and 2) given in Table 2 apply to either round or square holes.

TABLE 2 APERTURE TOLERANCES AND APERTURE PITCHES

(Clauses 3.2.1, 3.3.1 *and* 3.3.2)

All dimensions in millimetres.

Nominal Aperture Size, *w*	Tolerance on Individual Aperture Size ±	Nominal Pitch of Apertures		
		Preferred Nominal Pitch	Permissible Range of Choice	
		p	*p*max	*p*min
(1)	(2)	(3)	(4)	(5)
		(*a*) *For Round and Square Holes*		
*125	1·00	160	184	143
106	0·90	132	152	119
†100	0·85	125	144	113
*90·0	0·80	112	129	101
†80·0	0·70	100	115	90
75·0	0·70	95	109	85
*63·0	0·60	80	92	72
53·0	0·55	67	77	60
†50·0	0·55	63	72·5	56·5
*45·0	0·50	56	64·5	50·5
†40·0	0·45	50	57·5	45
37·5	0·45	47·5	54·6	42·5
*31·5	0·40	40	46	36
26·5	0·35	33·5	38·5	30
†25·0	0·35	31·5	36	28·5
*22·4	0·30	28	32·2	25·5

(*Conttnued*)

TABLE 2 APERTURE TOLERANCES AND APERTURE PITCHES — *Contd*

Nominal Aperture Size, w	Tolerances on Individual Aperture Size ±	Nominal Pitch of Aperture		
		Preferred Nominal Pitch	Permissible Range of Choice	
		p	p_{max}	p_{min}
(1)	(2)	(3)	(4)	(5)
†20·0	0·30	25	29	22·5
19·0	0·29	23·6	27·1	21·3
*16·0	0·27	20	23	18
13·2	0·25	17	19·5	15·1
†12·5	0·24	16	18·4	14·3
*11·2	0·23	14	16·1	12·6
†10·0	0·21	12·6	14·5	11·3
9·50	0·21	12·1	13·8	10·2
*8·00	0·19	10·4	12	9·2
6·70	0·17	8·9	10·2	7·5
†6·3	0·17	8·5	9·8	7·2
*5·60	0·15	7·7	8·9	6·6
4·75	0·14	6·6	7·6	5·6
*4·00	0·13	5·8	6·7	4·9
		(*b*) *For Round Holes Only*		
3·35	0·11	5	5·7	4·2
*2·80	0·11	4·35	5	3·6
2·36	0·11	3·75	4·3	3·2
*2·00	0·09	3·3	3·8	2·8
1·70	0·08	3	3·4	2·5
*1·40	0·08	2·6	3	2·2
1·18	0·07	2·4	2·7	2
*1·00	0·07	2	2·3	1·7

NOTE 1 — Sizes indicated by '†' have been permitted temporarily only. It is intended to withdraw these sizes in the next revision of the standard. The users are therefore, advised to switch over to other sizes permitted in the table in due course of their use.

NOTE 2 — Sizes indicated by '*' are the principal sizes of ISO 565-1983.

3.3.2 The nominal pitches given in Col 3 of Table 2 are preferred. The nominal pitch as specified may, however, depart from these values within the limits of P_{max} and P_{min} (col 4 and 5 of Table 2).

NOTE — The limits are defined by a permissible range of choice of approximately ± 15 percent of the preferred nominal pitch, provided that the minimum width of any bridge is not less than one-half of the value obtained by nominal aperture size from the preferred nominal pitch.

3.3.3 The test sieves having non-ISO aperture sizes (*see* **3.2.3**) shall be made as single ring gauges.

3.4 Plate Thickness

3.4.1 The nominal sizes of plate thickness shall conform to Table 3.

TABLE 3 NOMINAL PLATE THICKNESS

All dimensions in millimetres.

APERTURE SIZE		NOMINAL PLATE THICKNESS		
from	to	Preferred Thickness	Permissible Range of Choice	
			max	*min*
(1)	(2)	(3)	(4)	(5)
125	50·0	3	4	2·5
45·0	16·0	2	2·5	1·5
14·0	8·00	1·5	2	1
7·10	2·00	1	1·25	0·8
Smaller than 2·00		0·5	0·63	0·4

3.4.2 The test sieves having non-ISO aperture sizes (*see* **3.2.3**) shall have minimum plate thickness of 4 mm.

3.5 Arrangement of Holes

3.5.1 The arrangement of holes in perforated plates in test sieves shall be as follows:

a) Round holes with their centres at the apices of equilateral triangles (*see* Fig. 1)

b) Square holes in line, with their mid-points at the vertices of squares (*see* Fig. 2)

3.5.2 The maximum value of r, the corner radius of any square hole, is given in millimetres by the formula:

$$r_{max} = 0{\cdot}05\ w + 0{\cdot}30$$

where, w is the nominal size of aperture in millimetres.

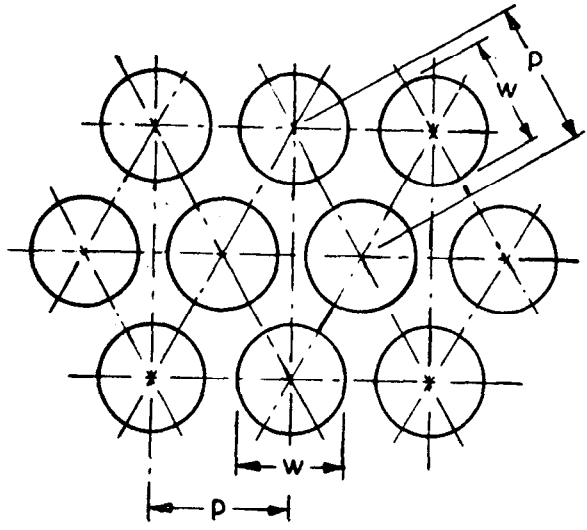

FIG. 1 ARRANGEMENT OF ROUND HOLES

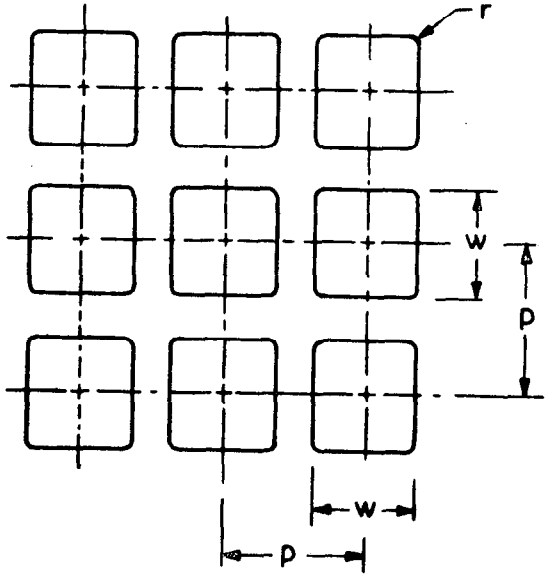

FIG. 2 ARRANGEMENT OF SQUARE HOLES

3.6 Workmanship

3.6.1 The perforated plates used in the manufacture of test sieves shall have uniformly and cleanly punched holes. It is preferable to punch the holes in the plates in such a way as to avoid part apertures showing after mounting.

4. TEST SIEVE FRAME

4.1 Material — The frames of test sieves shall be manufactured from any of the materials given in Table 1.

NOTE — The grades of materials shall be declared by the manufacturer, if so desired by the purchaser.

4.1.1 The brass sheet and stainless steel sheet are recommended for all sizes of frames. But galvanized steel sheets and electroplated steel sheets are permitted for frame sizes 300 mm and above.

4.2 Shape and Size — The commonly used shapes and sizes are given in Table 4 (*see* Fig. 3).

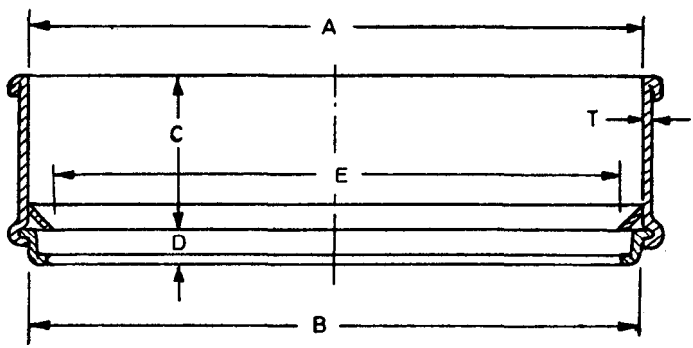

FIG. 3 DIMENSIONS OF FRAME FOR TEST SIEVE

NOTE — The use of special size and shape frames, however, is discouraged where the standard frames can be used.

4.3 It is recommended that the 200 mm round fame should be used as far as possible. For large aperture size the 300 mm round or square sieve may be required, or even larger sieves of 450 mm size for aperture sizes greater than 25 mm and large sample quantities.

NOTE — The shape and size of the sieves have little effect on the results of sieving operation.

4.4 Cover and Receiver — When specified by the purchaser a cover and receiver shall be provided for sieves of the same metal and thickness as the sieve frame (*see* Fig. 4). The cover of the sieve shall be double-walled. The depth of the receiver shall be the dimension (*C*) specified in Table 4.

TABLE 4 RECOMMENDED SHAPES AND SIZES OF TEST SIEVE FRAMES

(*Clauses* 4.2 *and* 4.4)

All dimensions in millimetres.

Sl No.	Shape	Nominal Size	Top Internal Diameter/ Length	Bottom External Diameter/ Length	Minimum Thickness	Diameter or Length of Effective Sieving Surface		Depth From Top Edge to Sieving Surface	Depth From Bottom Edge to Sieving Surface
			*A**	*B**	*T*	*E*		*C*	*D*
						Min	*Max*		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
i)	Round	200	$200 \begin{smallmatrix}+1\\-0\end{smallmatrix}$	$200 \begin{smallmatrix}+0\\-1\end{smallmatrix}$	0·45	185	200	50	15
ii)	Round or Square	300	$300 \begin{smallmatrix}+1\\-0\end{smallmatrix}$	$300 \begin{smallmatrix}+0\\-1\end{smallmatrix}$	1·00	275	300	75	15
iii)	Round or Square	450	$450 \begin{smallmatrix}+1\\-0\end{smallmatrix}$	$450 \begin{smallmatrix}+0\\-1\end{smallmatrix}$	1·00	425	450	100, *Min*	20

NOTE — Where so desired, sieves having 25 mm depth from top edge to the sieving surface may also be supplied.

*A and B shall be such as to make the sieves nestable as specified in **6.1**.

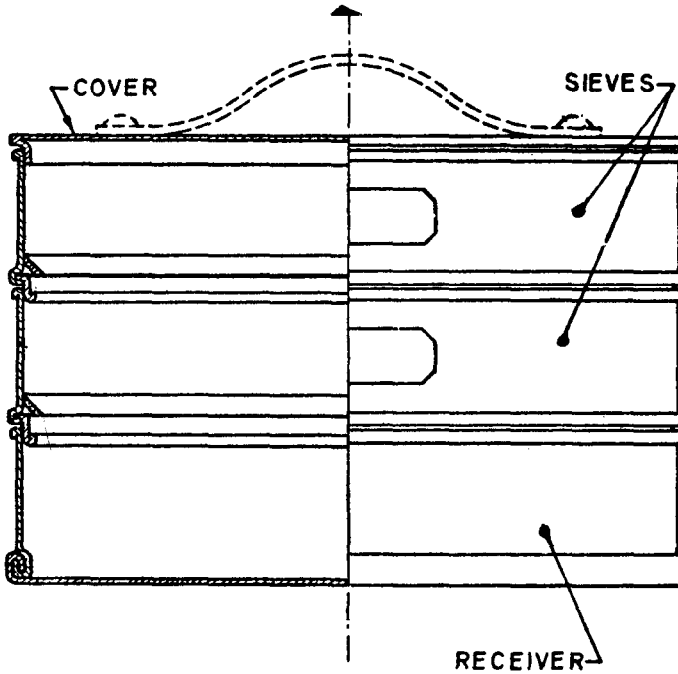

FIG. 4 NEST OF TEST SIEVES WITH COVER AND RECEIVER

5. FINISH

5.1 The sieving surface, frame receiver, and cover shall be smoothly finished. The seal between frame and sieving medium shall be so formed as to prevent lodging of the material to be sieved. There shall be no lacquer on surfaces which come into contact with the sample.

6. TESTING

6.1 The test sieves shall nest snugly with each other and with the lid and receiver of the same shape and size.

7. MOUNTING

7.1 The perforated plate shall be mounted with the punch entry side upper most that is burr down.

8. TESTING

8.1 Each of the perforated plate test sieves shall be tested to meet the requirements of this standard. The apertures of the test sieves shall be

examined in accordance with IS : 460 (Part 3)-1985*. If calibration test is required to be performed, it shall be clearly stated in the enquiry and order.

9. INFORMATION TO BE SUPPLIED BY THE PURCHASER

9.1 The purchaser should state the following with any enquiry and order:

a) Designation of the sieve;
b) Sieving medium: Material and shape of holes;
c) Frame shape, size and material;
d) Whether a receiver is required;
e) Whether a cover is required;
f) Whether calibration test is to be performed; and
g) Whether statement on thickness of plate is required.

10. MARKING

10.1 A label shall be fixed to the frame of each sieve complying with this standard, legibly marked with the following information (*see* Fig. 5) for an example of the label :

a) Designation (the figures shall be bold and easily readable at the left hand side of the label);
b) The material of the perforated plate;
c) The material of the sieve frame;
d) The maker's name or trade-mark;
e) An identification number; and
f) The thickness of the plate, when the purchaser requests.

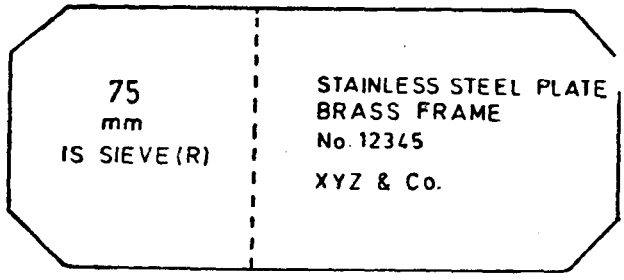

FIG. 5 TYPICAL ILLUSTRATION OF SPECIMEN LABEL

*Specification for test sieves: Part 3 Methods of examination of test sieves *(third revision)*.

10.2 Each test sieve may also be marked with the Standard Mark.

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard 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 BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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