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International Standard ISO 3310/2

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Test sieves — Technical requirements and testing — Part 2 : Test sieves of metal perforated plate

Tamis de contrôle — Exigences techniques et vérifications — Partie 2 : Tamis de contrôle en tôles métalliques perforées

Second edition — 1982-08-15

UDC 621.928.028.2 **Ref. No. ISO 3310/2-1982 (E)**

Descriptors : grain size, size determination, sieve analysis, sieves, sieve plates, hole size, specifications, dimensions.

Price based on 5 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3310/2 was developed by Technical Committee ISO/TC 24, *Sieves, sieving and other sizing methods*, and was circulated to the member bodies in March 1981.

It has been approved by the member bodies of the following countries :

Australia	India	Romania
Belgium	Ireland	South Africa, Rep. of
Brazil	Italy	Spain
Canada	Japan	Switzerland
Egypt, Arab Rep. of	Korea, Dem. P. Rep. of	United Kingdom
France	Netherlands	USA
Germany, F.R.	Portugal	USSR

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 3310/2-1975).

This International Standard is a revision of ISO 3310/2-1975 with addition of clause 3.1.2 "Test sieve frame" from ISO 2591-1973, as it is considered desirable to state requirements for the sieve frame alongside those for the sieving medium.

Printed in Switzerland

Test sieves — Technical requirements and testing — Part 2 : Test sieves of metal perforated plate

0 Introduction

Since the accuracy of test sieving depends largely on the dimensional accuracy of the test sieve apertures, it is considered particularly important to keep the permissible tolerances for the dimensions of apertures in perforated as close as possible. Other requirements, however, such as pitch of holes and plate thickness, have not been limited more closely than necessary, since the influence of these criteria on test sieving is of minor importance and excessively strict requirements may make manufacturing unnecessarily difficult and expensive.

Special importance has been attached to the provision of appropriate test methods for perforated plate in test sieves. The so-called "handicap method" is considered a reliable and economic test for a first survey of aperture size.

1 Scope and field of application

This International Standard specifies the technical requirements and corresponding examination methods for test sieves of metal perforated plate.

It applies solely to test sieves having

— round holes from 125 mm down to 1 mm aperture size, or

— square holes from 125 mm down to 4 mm aperture size.

2 References

ISO 3, *Preferred numbers — Series of preferred numbers.*

ISO 497, *Guide to the choice of preferred numbers and of series containing more rounded values of preferred numbers.*

ISO 565, *Test sieves — Woven metal wire cloth and perforated plate — Nominal sizes of apertures.*

ISO 2395, *Test sieves and test sieving — Vocabulary.*

ISO 2591, *Test sieving*

ISO 3310/1, *Test sieves — Technical requirements and testing — Part 1 : Test sieves of metal wire cloth.*

3 Designation

Test sieves of metal perforated plate are designated by the nominal size of aperture, expressed in millimetres.

4 Metal perforated plate

4.1 Requirements

Table 1 — Aperture tolerances and aperture pitches

Values in millimetres

Nominal aperture sizes w				Tolerance on individual aperture size (see 4.1.1)	Nominal pitch of apertures (see 4.1.2)		
Table 1 of ISO 565		Table 2 of ISO 565					
Principal sizes R 20/3	Supplementary sizes R 20	Principal sizes R 20/3	Supplementary sizes R 40/3		Preferred nominal pitch	Permissible range of choice	
				±	p	p_{max}	p_{min}
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
125	125	125	125	1,00	160	184	143
	112			0,95	140	161	126
			106	0,90	132	152	119
	100			0,85	125	144	113
90,0	90,0	90,0	90,0	0,80	112	129	101
	80,0			0,70	100	115	90
			75,0	0,70	95	109	85
	71,0			0,65	90	103	81
63,0	63,0	63,0	63,0	0,60	80	92	72
	56,0			0,55	71	82	63,5
			53,0	0,55	67	77	60
	50,0			0,55	63	72,5	56,5
45,0	45,0	45,0	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
	35,5			0,40	45	51,7	40,5
31,5	31,5	31,5	31,5	0,40	40	46	36
	28,0			0,35	35,5	40,8	31,8
			26,5	0,35	33,5	38,5	30
	25,0			0,35	31,5	36	28,5
22,4	22,4	22,4	22,4	0,30	28	32,2	25,5
	20,0			0,30	25	29	22,5
			19,0	0,29	23,6	27,1	21,3
	18,0			0,28	22,4	25,8	20,2
16,0	16,0	16,0	16,0	0,27	20	23	18
	14,0			0,26	18	20,7	16
			13,2	0,25	17	19,5	15,1
	12,5			0,24	16	18,4	14,3
11,2	11,2	11,2	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
	9,00			0,20	11,6	13,3	9,8
8,00	8,00	8,00	8,00	0,19	10,4	12	9,2
	7,10			0,18	9,4	10,8	8
			6,70	0,17	8,9	10,2	7,5
	6,30			0,17	8,5	9,8	7,2
5,60	5,60	5,60	5,60	0,15	7,7	8,9	6,6
	5,00			0,14	6,9	7,9	5,9
			4,75	0,14	6,6	7,6	5,6
	4,50			0,14	6,3	7,2	5,3
4,00	4,00	4,00	4,00	0,13	5,8	6,7	4,9
	3,55			0,12	5,2	6	4,4
			3,35	0,11	5	5,7	4,2
	3,15			0,11	4,7	5,3	3,9

Table 1 (*Concluded*)

Values in millimetres

Nominal aperture sizes w				Tolerance on individual aperture sizes (see 4.1.1)	Nominal pitch of apertures (see 4.1.2)		
Table 1 of ISO 565		Table 2 of ISO 565			Preferred nominal pitch	Permissible range of choice	
Principal sizes R 20/3	Supplementary sizes R 20	Principal sizes R 20/3	Supplementary sizes R 40/3	±	p	p_{max}	p_{min}
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2,80	2,80	2,80	2,80	0,11	4,35	5	3,6
	2,50			0,11	3,9	4,5	3,3
			2,36	0,11	3,75	4,3	3,2
	2,24			0,10	3,6	4,1	3,1
2,00	2,00	2,00	2,00	0,09	3,3	3,8	2,8
	1,80			0,08	3,1	3,6	2,7
			1,70	0,08	3	3,4	2,5
	1,60			0,08	2,75	3,2	2,3
1,40	1,40	1,40	1,40	0,08	2,6	3	2,2
	1,25			0,08	2,45	2,9	2,1
			1,18	0,07	2,4	2,7	2
	1,12			0,07	2,22	2,5	1,8
1,00	1,00	1,00	1,00	0,07	2	2,3	1,7

NOTES

1 The nominal sizes of apertures are taken from ISO 565, table 1 with series R 20/3 as principal sizes and R 20 as supplementary sizes and table 2 with series R 20/3 as principal sizes and R 40/3 as supplementary sizes of preferred numbers given in ISO 3.

2 The lower limit of the nominal aperture size for square holes is 4 mm.

4.1.1 Aperture tolerances

4.1.1.1 The aperture tolerance as given in column 5 of table 1 applies to each mid-section of any square hole, and to any diameter of any round hole.

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

4.1.2 Pitch (Dimension p, see figures 1 and 2)

4.1.2.1 The pitches given in table 1 apply to either round or square holes.

4.1.2.2 The nominal pitches given in column 6 of table 1 are preferred.

The nominal pitch as specified in national standards may, however, depart from these values within the limits a_{max} and a_{min} (columns 7 and 8). These are defined by a permissible range of choice of approximately ± 15 % of the preferred nominal pitch, provided that the minimum width of any bridge is not less than one-half of the value calculated from the nominal aperture width (columns 1 to 4) and its preferred pitch in column 6.

4.1.3 Plate thickness

The nominal sizes of plate thickness given in column 3 of table 2 are preferred. The nominal sizes of plate thickness specified in national standards may, however, depart from the sizes in column 3 within the limits given in columns 4 and 5 of table 2.

Table 2 — Nominal sizes of plate thickness

Dimensions in millimetres

Aperture size		Nominal plate thickness		
		Preferred thickness	Permissible range of choice	
from	to		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

4.1.4 Arrangement of holes

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 figure 1)

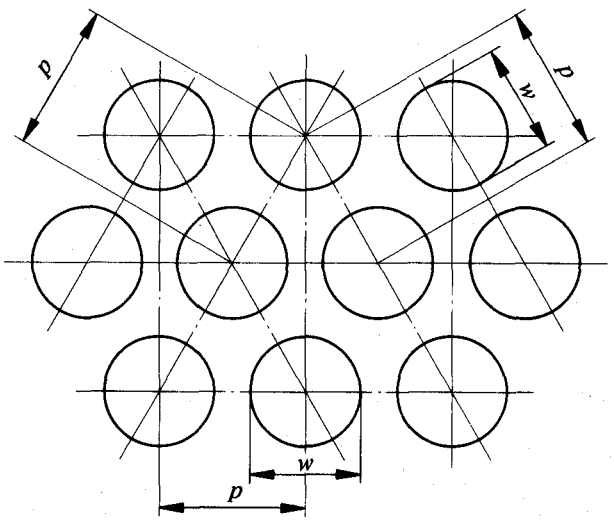

Figure 1

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

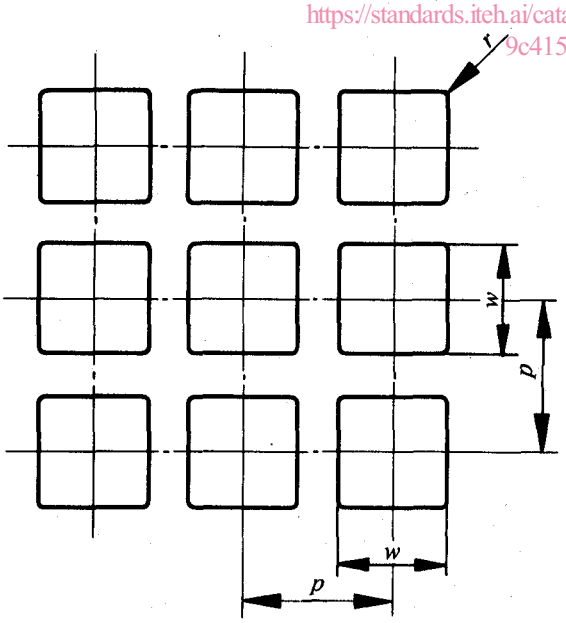

Figure 2

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

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

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

4.2 Test methods

Every aperture in the perforated plate in a sieve is eligible for inspection for compliance with the requirements given in sub-clause 4.1.

Test 1 — Examination of general condition of the perforated plate

The same approach shall be made as in the inspection of a woven wire sieve (see ISO 3310/1), i.e. the "handicap" test in which each aperture and each pitch is subjected to careful and methodical examination for uniformity against an illuminated background. If obvious faults are found, the sieve is unacceptable.

Test 2 — Measurement of apertures

The dimensions of the apertures shall be checked, over any selected area of the sieve plate, along two straight lines in different directions, each of at least 10 cm length and including at least 5 holes along each direction.

The angle between the two straight lines shall be :

for round holes : 90° or 60° (see figure 3)

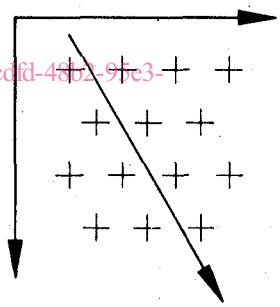

Figure 3

for square holes : 90° (see figure 4)

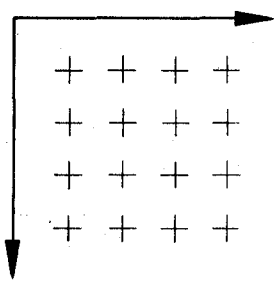

Figure 4

Alternatively, with square holes, a single direction following the diagonal of the holes may be chosen, but the length of the diagonal shall be at least 15 cm and shall include at least 8 holes (see figure 5).

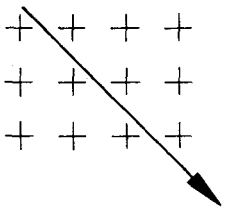

Figure 5

If the minimum number of holes prescribed for examination in the one or two directions is not available in the plate, all the holes in the sieve shall be checked.

Tolerances on individual apertures are listed in table 1.

Test 3 — Examination of the pitch of the apertures

The pitch of the apertures shall be checked. This can be done at the same time as test 2.

Test 4 — Plate thickness

The thickness of the plate shall be measured for compliance with table 2.

5 Test sieve frame

5.1 Shape and size

Table 3 — Recommended shapes and sizes

Dimensions in millimetres

Test sieve		Diameter or length of effective sieving surface		Approximate depth
shape	nominal size			
	D	min.	max.	H
round	200	185	200	50
round	300	275	300	75
square	300	275	300	75

5.1.1 It is recommended that the 200 mm round frame should be used as far as possible.

For large aperture sizes the 300 mm round or square sieve may be required, or even larger sieves for aperture sizes greater than 25 mm and large sample quantities. The shape and size of the sieve have little effect on the results of the sieving operation.

5.1.2 According to custom in different countries the size of the 300 mm sieves may by exceeded by 15 mm, but the diameter or the length of the effective sieving surface shall be within the tolerances indicated in table 3.

NOTE — It is recognized that in countries where the 203 mm (8 in) diameter test sieve has been established as a standard by long tradition, some considerable time may elapse before a transition can be made to 200 mm exclusively by the users of such test sieves.

5.2 *Construction of frame, lid and receiver*

The test sieves shall nest snugly with each other and with the lid and the receiver of the same shape and size. The frame shall be smooth and the seal of the sieve so constructed as to prevent lodging of the material to be sieved.

5.3 Marking of the frame

A metal label permanently attached to the sieve shall give the following information:

a) the nominal aperture size;

b) a reference to the standard(s) with which the test sieve is claimed to comply;

c) the material of the perforated plate and the material of the frame;

d) the name of the firm (manufacturer or vendor) taking responsibility for the sieve;

e) an identification number.

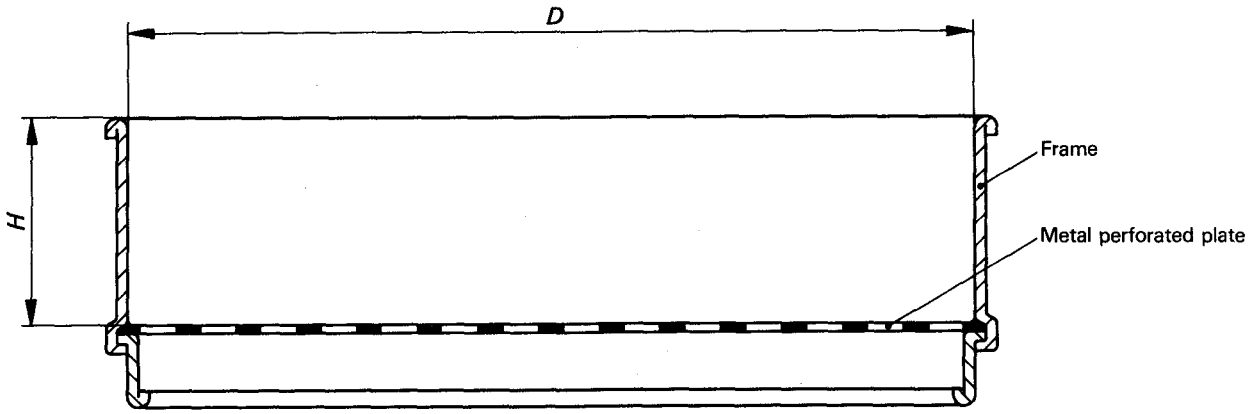

Figure 6 — Example of test sieve