IS 412 (1975): Expanded Metal Steel Sheets for General Purposes [MTD 4: Wrought Steel Products]

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IS : 412 - 1975
(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR EXPANDED METAL STEEL SHEETS FOR GENERAL PURPOSES

(Second Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *March* 1976

AMENDMENT NO. 1 JUNE 1980

TO

IS:412-1975 SPECIFICATION FOR EXPANDED METAL STEEL SHEETS FOR GENERAL PURPOSES

(Second Revision)

Addenda

(*Page 7, clause* 5.2.3) - Add the following new clause after 5.2.3:

'5.2.4 The following tolerances shall apply for thickness and width of strands:

Dimension	*Tolerance*
Thickness	As per IS:1852-1973†
Width of strand	± 0.25 mm'

(*Page 7, foot-note with* '*' *mark*) - Add the following foot-note after '*' mark:

'†Specification for rolling and cutting tolerances for hot rolled steel products (*second revision*).'

(SMDC 5)

Indian Standard

SPECIFICATION FOR EXPANDED METAL STEEL SHEETS FOR GENERAL PURPOSES

(Second Revision)

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(*Continued on page* 9)

Indian Standard

SPECIFICATION FOR EXPANDED METAL STEEL SHEETS FOR GENERAL PURPOSES

(Second Revision)

0. FOREWORD

0.1 This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 20 November 1975, after the draft finalized by the Wrought Steel Products Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 This standard was first issued in 1954 and subsequently revised in 1962. In this revision, the following modifications have been made:

a) Permissible variations for product analysis has been specified,

b) A new size of mesh 9·5 × 28·5 mm has been included, and

c) The tolerances on size of mesh have been modified.

0.3 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.

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1. SCOPE

1.1 This specification covers expanded metal steel sheets used for general purposes.

2. SUPPLY OF MATERIAL

2.1 General requirements relating to the supply of expanded metal steel sheets shall conform to IS : 1387-1967†.

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

†General requirements for the supply of metallurgical materials (*first revision*).

3. MANUFACTURE

3.1 Blank steel sheets and plates used in the manufacture of expanded metal steel sheets shall be made from steel manufactured by the open-hearth, electric, duplex, basic-oxygen or a combination of these processes. In case any other process is employed by the manufacturer, prior approval of the purchaser should be obtained. If basic-oxygen process is employed for manufacture, the nitrogen content of the steel shall not exceed 0·007 percent.

NOTE — The nitrogen content of steel should be ensured by the manufacturer by occasional product analysis.

3.2 The ladle analysis of steel for manufacture of expanded metal sheets, when analysed in accordance with IS : 228 (Part III)-1972* and IS : 228 (Part IX)-1972† shall be as follows:

	Percent, Max
Sulphur	0·050
Phosphorus	0·050

3.2.1 Permissible variation in the product analysis from the limits specified under **3.2** shall be as follows:

	Permissible Variation Over the Specified Limits, Percent
Sulphur	+ 0·005
Phosphorus	+ 0·005

3.3 Blank steel sheets and plates shall be supplied with or without guaranteed mechanical properties as required by the purchaser.

3.3.1 When blank steel sheets and plates are supplied with guaranteed mechanical properties they shall have a tensile strength between 280 MN/m^2 and 380 MN/m^2 when tested in accordance with IS : 1663-1972‡.

NOTE — 1 N/mm^2 = 1 MN/m^2 = 0·102 0 kgf/mm^2.

3.3.1.1 A test piece cut from the blank sheets and plates when tested in accordance with IS : 1692-1974§, shall withstand without crack, being doubled over, when cold, either by pressure or by blows from a hammer, until the two sides of the test piece are parallel and the internal radius is not greater than 1·5 times the thickness of the test piece.

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*Methods of chemical analysis of steels: Part III Determination of phosphorus by alkalimetric method (*second revision*).

†Methods of chemical analysis of steels: Part IX Determination of sulphur in plain carbon steels by evolution method (*second revision*).

‡Method for tensile testing of steel sheet and strip of thickness 0·5 mm to 3 mm (*first revision*).

§Method for simple bend testing of steel sheet and strip less than 3 mm thick (*first revision*).

.4 The tolerances on weights and dimensions of blank sheets and plates ıall be as agreed to between the supplier of blank sheets and plates, and ıe manufacturer of expanded metal.

.5 The blank steel sheets and plates shall be cleanly rolled. They shall e free from cracks; surface flaws; laminations; rough, jagged and imperfect dges; and all other harmful surface defects.

. SIZE OF MESH

.1 The size of mesh of expanded metal sheets shall be based on the ıeasurements of the shortway and the longway of the diamond as shown ə Fig. 1.

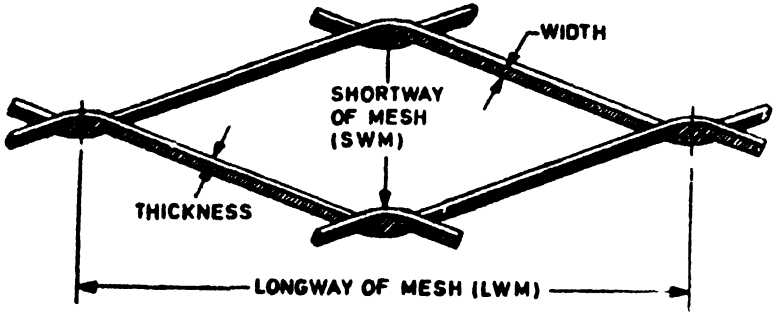

FIG. 1 SIZE OF MESH

. PROPERTIES AND DIMENSIONS

.1 The properties and dimensions of expanded metal sheets shall be as iven in Table 1.

.2 Tolerances

5.2.1 *Dimensions* — When expanded metal sheets are required to be cut o specified dimensions, the limits of tolerances shall be as follows:

On nominal specified dimension	± 10 mm
On minimum specified dimension	− 0 mm + 10 mm

TABLE 1 PROPERTIES AND DIMENSIONS OF EXPANDED METAL SHEETS FOR GENERAL PURPOSES

(*Clause* 5.1)

Ref No.	Size of Mesh (Nominal)		Dimensions of Strands (Nominal)		Nominal Mass per Square Metre	Cross-Sectional Area of Strands per Metre	Largest Standard Size of Sheets		Size of Sheet Normally Stocked
	SWM	LWM	Width	Thickness		SWM	LWM	SWM	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	mm	mm	mm	mm	kg	cm²	m	m	m
1	100	250	6·25	3·15	3·082	3·93	3·75	10·97	
2	100	250	5·00	3·15	2·470	3·15	3·75	14·63	
3	100	250	3·25	3·15	1·599	2·04	3·75	21·94	
4	75	200	6·50	3·15	4·282	5·46	3·75	7·30	
5	75	200	5·00	3·15	3·294	4·20	3·75	7·30	2·50 × 3·75
6	75	200	3·25	3·15	2·141	2·73	3·75	14·60	
7	40	115	6·50	3·15	8·023	10·23	2·50	3·75	
8	40	115	5·00	3·15	6·172	7·87	2·50	4·85	
9	40	75	5·00	3·15	6·172	7·87	2·50	4·85	
10	40	75	3·25	2·24	2·854	3·64	2·50	7·30	
11	40	115	3·25	3·15	4·007	5·11	2·50	7·30	2·50 × 3·75 & 1·25 × 3·75
12	40	75	3·25	3·15	4·007	5·11	3·75	7·30	
13	40	115	3·25	1·60	2·039	2·60	2·50	7·30	
14	40	75	3·25	1·60	2·039	2·60	3·75	7·30	
15	25	75	3·25	3·15	5·529	7·04	2·50	4·85	2·50 × 3·75
16	25	75	3·25	2·24	3·931	5·01	2·50	4·85	2·50 × 3·75 & 1·25 × 3·75
17	25	75	3·25	1·60	2·808	3·58	2·50	4·85	
18	25	75	3·25	1·25	2·194	2·80	2·50	4·85	
19	20	60	3·25	3·15	7·152	9·11	2·50	3·75	2·50 × 3·75
20	20	50	3·25	3·15	7·152	9·11	3·75	3·75	
21	20	60	3·25	2·24	5·086	6·48	2·50	3·75	
22	20	50	3·25	2·24	5·086	6·48	3·75	3·75	
23	20	60	3·25	1·60	3·633	4·63	2·50	3·75	2·50 × 3·75 & 1·25 × 3·75
24	20	50	3·25	1·60	3·633	4·63	3·75	3·75	
25	20	60	2·50	1·25	2·183	2·78	2·50	4·85	
26	20	50	2·50	1·25	2·183	2·78	3·75	3·75	
27	12·5	50	3·25	1·60	5·037	6·42	2·50	3·00	
28	12·5	40	3·25	1·60	5·037	6·42	3·75	3·00	
29	12·5	50	2·50	1·60	4·000	5·10	2·50	3·00	2·50 × 2·75 & 1·25 × 2·75
30	12·5	50	2·50	1·25	3·125	3·98	2·50	3·00	
31	12·5	40	2·50	1·25	3·125	3·98	3·75	3·00	
32	12·5	50	2·50	1·00	2·500	3·18	2·50	3·00	
33	12·5	40	2·50	1·00	2·500	3·18	3·75	3·00	
34	10	40	3·25	1·60	5·976	7·61	2·50	2·00	
35	10	40	2·50	1·25	3·591	4·58	2·50	2·00	
36	10	40	2·50	1·00	2·873	3·66	2·50	2·00	
37	9·5	28·5	3·25	1·60	5·19	6·61	2·50	2·00	2·50 × 1·75 & 1·25 × 1·75
38	9·5	28·5	2·50	1·25	2·81	3·58	2·50	2·00	
39	9·5	28·5	2·50	1·00	2·09	2·66	2·50	2·00	
40	6	25	3·25	1·60	7·551	9·62	2·50	2·00	
41	6	25	2·50	1·25	4·887	6·21	2·50	2·00	
42	6	25	2·50	1·00	3·901	4·97	2·50	2·00	
43	5	20	2·50	1·00	5·008	6·39	2·50	1·50	2·50 × 1·25
44	3	15	1·50	1·00	4·278	5·45	2·50	1·50	

5.2.2 *Mass* — The tolerance on nominal mass of expanded metal sheets shall be ±10 percent.

5.2.2.1 The nominal mass of expanded metal sheets shall be calculated on the basis that steel weighs 7 650 kg/m³.

5.2.3 *Size of Mesh* — The tolerances on sizes of mesh shall be as follows:

	Tolerances
On SWM	
Up to 20 mm	± 1 mm
Over 20 mm	± 2 mm
On LWM	
Up to 60 mm	± 2 mm
Over 60 mm	± 4 mm

6. SELECTION OF TEST SAMPLES

6.1 For every lot of 10 tonnes expanded metal sheets or less, two sheets shall be selected for bend test.

6.2 One bend test piece shall be cut from each of the two sheets.

6.2.1 The test piece shall preferably be cut from the edge of the sheet to avoid wastage.

7. PHYSICAL TESTS

7.1 Cold Bend Test — Cold bend test shall be carried out in accordance with IS : 1692-1974*. The test piece (strands) cut from the meshes of expanded metal sheets shall withstand, without crack, being doubled over either by pressure or by blows from a hammer, until the two sides of the strands are parallel, and the internal radius of the bend is not greater than 1·5 time the thickness of the test piece.

8. RETESTS

8.1 Should any of the test pieces first selected fail to pass any of the tests specified, two further samples shall be selected for testing in respect of each failure. Should the test pieces from both of these additional samples pass, the material represented by the test samples shall be deemed to comply with the requirements of that particular test. Should the test pieces from either of these additional samples fail, the material represented by the test samples shall be liable for rejection.

9. FREEDOM FROM DEFECTS

9.1 The finished expanded metal sheets shall be free from flaws, joints, welds, broken strands, laminations and all other harmful surface defects.

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*Method for simple bend testing of steel sheet and strip less than 3 mm thick (*first revision*).

10. PRESERVATIVE TREATMENT

10.1 Expanded metal sheets shall be given a suitable protective coating to prevent corrosion.

11. PACKING

11.1 Unless specified otherwise by the purchaser, expanded metal sheets shall be supplied in rolls or with any other suitable packing that can withstand transit.

12. MARKING

12.1 Expanded metal sheets shall be securely bundled and a metal tag attached to each bundle and marked with manufacturer's name or trademark.

12.1.1 The product may also be marked with Standard mark.

12.1.2 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 details of conditions under which the licence for the use of Standard Mark may be granted to manufactures or producers may be obtained from the Bureau of Indian Standards.

(*Continued from page* 2)

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