

JIS

JAPANESE INDUSTRIAL STANDARD

Expanded Metals

JIS G 3351—1987

Translated and Published

by

Japanese Standards Association

**In the event of any doubt arising,
the original Standard in Japanese is to be final authority.**

JAPANESE INDUSTRIAL STANDARD

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Expanded Metals

G 3351-1987

1. Scope

This Japanese Industrial Standard specifies steel expanded metals to be used for civil engineering, construction and common use to mining and industry. The metal laths specified in JIS A 5505 are excluded from the application of this standard.

2. Types and Symbols

The types of the steel expanded metals and symbols for them shall be as given in Table 1.

Table 1. Types and Symbols

Type	Symbol
Grating	XG
Standard	XS

Applicable Standards:

JIS A 5505-Metal Lath

JIS G 3101-Rolled Steel for General Structure

JIS G 3131-Hot-rolled Mild Steel Plates, Sheets and Strip

JIS G 3141-Cold Rolled Carbon Steel Sheets and Strip

JIS Z 2201-Test Pieces for Tensile Test for Metallic Materials

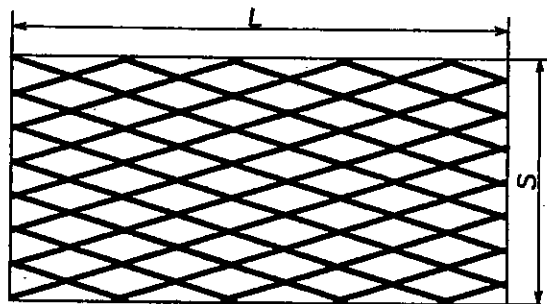
JIS Z 2204-Bend Test Pieces for Metallic Materials

JIS Z 2241-Method of Tensile Test for Metallic Materials

JIS Z 2248-Method of Bend Test for Metallic Materials

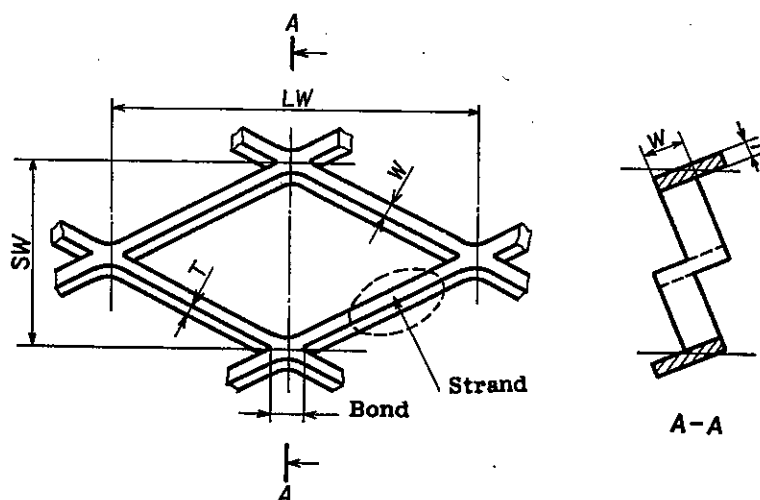
3. Terms of Parts Terms of parts shall conform to Fig. 1 and Fig. 2.

Fig. 1



S : finished length in short diagonal direction of mesh
 L : finished length in long diagonal direction of mesh

Fig. 2



T : plate thickness
 W : slitting width
 SW : intercentral distance in short diagonal direction of mesh
 LW : intercentral distance in long diagonal direction of mesh

4. Quality

4.1 The expanded metal shall be regular in shape, uniform in slitting width " W " without broken strand and free from harmful rust.

4.2 Chemical composition and mechanical properties of steel sheet and plate to be used for the expanded metal shall be in compliance with JIS G 3101, JIS G 3131 and JIS G 3141.

5. Product Number, Dimension and Mass

5.1 Product number, standard dimensions of each part, unit mass, etc. of the expanded metals shall be as given in Table 2.

Table 2. Dimensions and Mass

Symbol	Product number	Dimensions of mesh mm		Dimensions of strand mm		Rate of expansion	Unit mass kg/m ²	Length of bond mm
		SW	LW	T	W			
X G	11	34	135.4	4.5	7.0	2.43	14.5	30 min.
	12	34	135.4	6.0	7.0	2.43	19.4	30 min.
	13	34	135.4	6.0	9.0	1.89	24.9	30 min.
	14	34	135.4	8.0	9.0	1.89	33.2	30 min.
	21	36	101.6	4.5	7.0	2.57	13.7	10 min.
	22	36	101.6	6.0	7.0	2.57	18.3	10 min.
	23	36	101.6	6.0	9.0	2.00	23.6	10 min.
	24	36	101.6	8.0	9.0	2.00	31.4	10 min.
X S	31	12	30.5	1.2	1.5	4.00	2.36	—
	32	12	30.5	1.6	2.0	3.00	4.19	
	33	12	30.5	2.3	3.0	2.00	9.03	
	41	22	50.8	1.6	2.0	5.50	2.28	—
	42	22	50.8	2.3	2.5	4.40	4.10	
	43	22	50.8	3.2	3.5	3.14	8.00	
	51	25	61.0	1.6	2.5	5.00	2.51	—
	52	25	61.0	2.3	3.0	4.17	4.33	
	53	25	61.0	3.2	4.0	3.12	8.05	
	61	34	76.2	2.3	3.0	5.67	3.19	—
	62	34	76.2	3.2	4.0	4.25	5.91	
	63	34	76.2	4.5	5.0	3.40	10.4	
	71	50	152.4	2.3	3.5	7.14	2.53	—
	72	50	152.4	3.2	4.0	6.25	4.02	
	73	50	152.4	4.5	5.0	5.00	7.06	
	81	75	203.2	3.2	4.0	9.38	2.68	—
	82	75	203.2	4.5	5.0	7.50	4.71	
	83	75	203.2	6.0	6.0	6.25	7.54	
	91	115	304.8	3.2	5.0	11.5	2.18	—
	92	115	304.8	4.5	6.0	9.58	3.69	
	93	115	304.8	6.0	7.0	8.21	5.74	

5.2 The standard finished dimensions of the expanded metal shall be as given in Table 3.

Table 3. Standard Finished Dimensions

Standard finished dimension,		Reference
<i>S</i> mm	<i>L</i> mm	Area m ²
1 829	914	1. 672
2 438	914	2. 228
1 829	1 219	2. 230
2 438	1 219	2. 972
2 438	1 524	3. 716
3 048	1 524	4. 645
914	1 829	1. 672
1 219	1 829	2. 230
2 438	1 829	4. 459
914	2 438	2. 228
1 219	2 438	2. 972
1 829	2 438	4. 459
1 524	3 048	4. 645

Remark: In the standard finished dimensions, dimension *S* shall be an integral multiple of *SW*.
L an integral multiple of *LW*/2.

In other finished dimensions, the dimension *S* is an integral multiple of *SW*, but *L* is not always an integral multiple of *LW*/2.

5.3 Tolerance on Dimension and Mass

5.3.1 The dimensional tolerance shall be as given in Table 4.

Table 4. Dimensional Tolerance

Tolerance on <i>SW</i>	± 5 %
Tolerance on <i>LW</i>	± 2 mm
Tolerance on <i>S</i>	+ 25 0 mm
Tolerance on <i>L</i>	Value given in JIS on steel sheet and plate
Tolerance on <i>T</i>	Value given in JIS on steel sheet and plate
Tolerance on <i>w</i>	± 10 %

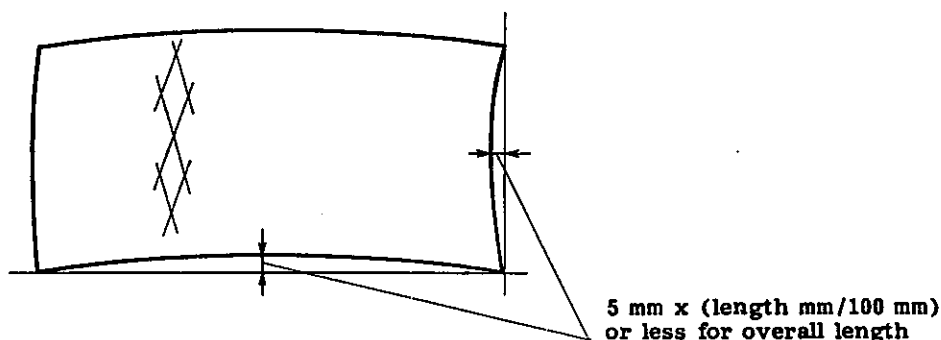
Table 4. (Continued)

Deflection	5 mm or less per 1000 mm, and not more than 5 mm x (length mm/1000 mm) for overall length.
Deviation of length	6 mm or less per XG 1000 mm, and not more than 10 mm per XS 1000 mm.

Remark: Dimensions *SW* and *LW* shall be measured for ten continuous meshes or for the greatest number of meshes in case of not covering ten continuous meshes, and a mean value shall be taken.

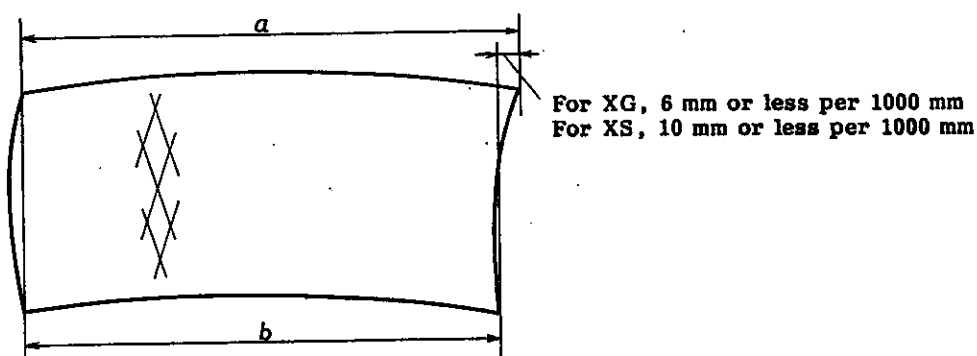
The deflection represents the curvature in the direction of *S* or *L* in a plane parallel to the surface of the sheet, and be measured in the manner as shown in Fig. 3.

Fig. 3



The deviation of length means the difference between the lengths "*a*" and "*b*" of opposite sides in the direction of "*S*", and be measured in the manner as shown in Fig. 4.

Fig. 4



5.3.2 The mass of the expanded metals shall be measured when ordered by the purchaser, and the tolerances on them shall be as given in Table 5.

Table 5. Tolerance on Mass

Devision	Calculated mass of one set	Tolerance %	Remark
Thickness under 3 mm	Under 600 kg	± 10	Expanded metal of same type and same dimensions shall be deal with as one set for calculation.
	600 kg to 2 t excl.	± 7.5	
	2 t or over	± 5	
Thickness 3 mm to 6 mm excl.	1 t or under	± 10	
	Exceeding 1 t	± 5	
Thickness 6 mm or over and S or L under 2500 mm	-	± 9 per sheet	Where 10 sheets or more of same type and same dimensions shall deal with as one set for calculation, 2/3 of the value of left-hand column shall be adopted as tolerance.
Thickness 6 mm or over and S or L 2500 mm or over	-	± 12 per sheet	

5.4 Calculation Method for Mass The mass of the expanded metal shall be calculated as described below:

5.4.1 The mass of the expanded metal shall be calculated by the use of the indicated dimensions.

5.4.2 The unit mass (kg/m^2) of the expanded metal shall be calculated from the following equation:

$$\text{Unit mass of expanded metal} = \frac{\text{Unit mass of steel plate}}{\text{Rate of expansion}}$$

5.4.3 The unit mass of the expanded metal shall be rounded off to a numerical value of upper three places.

5.4.4 The rate of expansion shall be the quotient of $\frac{1}{2} SW$ divided by slitting width W , and be rounded off to a numerical value of two decimal places.

5.4.5 The mass of one sheet of the expanded metal shall be the numerical value of the unit mass multiplied by area (m^2). The area shall be rounded off to a numerical value of upper four places. The mass of one sheet shall be rounded off to a numerical value of upper three places from the calculated value.

5.4.6 The gross mass shall be obtained by multiplying the mass of one sheet of expanded metal by number of sheets of the products of the same dimensions, and be rounded off to an integral value in kg.

6. Manufacture

The expanded metals shall be manufactured of steel sheet and plate by cold slitting and extending.

7. Tests

7.1 Tension Test

7.1.1 The test piece to be used shall be taken from the steel sheet and plate prior to the expanding process, and made up into No. 1 or No. 5 test piece specified in JIS Z 2201.

7.1.2 The test shall follow the method provided in JIS Z 2241.

7.2 Bend Test

7.2.1 The test piece to be used shall be taken from the steel sheet and plate prior to the expanding process, and made up into No. 1 or No. 3 test piece specified in JIS Z 2204.

7.2.2 The test shall follow the method provided in JIS Z 2248.

8. Inspection

8.1 The results of inspection on the appearance, shape, dimensions, mass, chemical composition, tension test and bend test shall comply with the requirements specified in 4. and 5.

8.2 One test piece each for tension and bend tests shall be taken from every 25 t or fraction thereof.

9. Marking

The expanded metal having passed the inspection shall be clearly marked with the particulars described below on each bundle by a suitable means.

- (1) Symbol for type
- (2) Product number
- (3) Dimensions
- (4) Evidential mark of inspection passing
- (5) Name of manufacturer or its abbreviation

10. Designation

The expanded metal shall be designated in the order of the type, product number and finished dimensions. For example, the grating of S 1829 mm, L 914 mm and product number 11 shall be designated as follows:

Example: XG 11 - S 1829 x L 914

11. Report

The manufacturer shall submit the test record of used material upon request of the purchaser.

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Japanese Text

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