

英訳版

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鉄 鋼 II

日本規格協会

JIS HANDBOOK

2000

鉄鋼 II
Ferrous Materials & Metallurgy II

Ferrous Materials & Metallurgy II

Steel Bars, Sections, Plates, Sheets and Strip

Steel Tubular Products

Wire Rods and Their Secondary Products

2000



日本規格協会

Japanese Standards Association

- (2) Heat number or inspection number
- (3) Dimensions (height, side, thickness and length)
- (4) Manufacturer's name or identifying mark

10. Report The manufacturer shall submit an inspection certificate to the purchaser.

Further, where the specification of Remarks of Table 2 has been applied, the content of added element shall be stated in the inspection certificate.

Attached Table 1. Cited standards

JIS G 0303	General rules for inspection of steel
JIS G 1211	Methods for determination of carbon in iron and steel
JIS G 1212	Methods for determination of silicon in iron and steel
JIS G 1213	Methods for determination of manganese in iron and steel
JIS G 1214	Methods for determination of phosphorus in iron and steel
JIS G 1215	Iron and steel — Methods for determination of sulfur content
JIS G 1253	Method for photoelectric emission spectrochemical analysis of iron and steel
JIS G 1256	Method for X-ray fluorescence spectrometric analysis of iron and steel
JIS G 1257	Iron and steel — Methods for atomic absorption spectrometric analysis
JIS G 1258	Method for inductively coupled plasma emission spectrochemical analysis of steel
JIS G 3192	Dimensions, mass and permissible variations of hot rolled steel sections
JIS Z 2201	Test pieces for tensile test for metallic materials
JIS Z 2241	Method of tensile test for metallic materials

Hot Rolled Steel Sheet Piles

1. Scope

This Japanese Industrial Standard specifies the hot rolled steel sheet piles, hereinafter referred to as the "steel sheet piles", used for sheathing, cofferdam and foundation of structure and the like.

Remark: The units and numerical values given in { } in this Standard are based on the International System of Units (SI) and are appended for informative reference.

Further, the traditional units accompanied by numerical values in this Standard shall be converted to the SI units and numerical values on Jan. 1, 1991.

2. Classification and Symbols

The steel sheet piles shall be classified in two classes and their symbols shall be as given in Table 1-1 or Table 1-2.

Table 1-1. Symbols of Classes
(Applicable till the end of 1990)

Symbols of classes
SY 30
SY 40

Table 1-2. Symbols of Classes
(Applicable on and after Jan. 1, 1991)

Symbols of classes
SY 295
SY 390

3. Chemical Components

The steel sheet piles shall be tested in accordance with 7.1 and the resulting ladle analysis values shall be as specified in Table 2-1 or Table 2-2.

Table 2-1. Chemical Components
(Applicable till the end of 1990)

Symbol of class	Chemical component %		
	P	S	Cu
SY 30	0.040 max.	0.040 max.	0.25 min.
SY 40	0.040 max.	0.040 max.	0.25 min.

Remark: Alloy elements other than those given in the above Table may be added as required.

Table 2-2. Chemical Components
(Applicable on and after Jan. 1, 1991)

Symbol of class	Chemical component %		
	P	S	Cu
SY 295	0.040 max.	0.040 max.	0.25 min.
SY 390	0.040 max.	0.040 max.	0.25 min.

Remark: Alloy elements other than those given in the above Table may be added as required.

4. Mechanical Properties

4.1 The steel sheet piles shall be tested in accordance with 7.2 and their resulting tensile strength, yield point and elongation shall conform to Table 3-1 or Table 3-2.

Table 3-1. Mechanical Properties
(Applicable till the end of 1990)

Symbol of class	Tensile strength kgf/mm ² {N/mm ² }	Yield point kgf/mm ² {N/mm ² }	Elongation %
			Test piece No. 1 A or No. 4
SY 30	50{490} min.	30{294} min.	17 min.
SY 40	55{539} min.	40{392} min.	15 min.

Table 3-2. Mechanical Properties
(Applicable on and after Jan. 1, 1991)

Symbol of class	Tensile strength N/mm ²	Yield point N/mm ²	Elongation %
			Test piece No. 1 A or No. 4
SY 295	490 min.	295 min.	17 min.
SY 390	540 min.	390 min.	15 min.

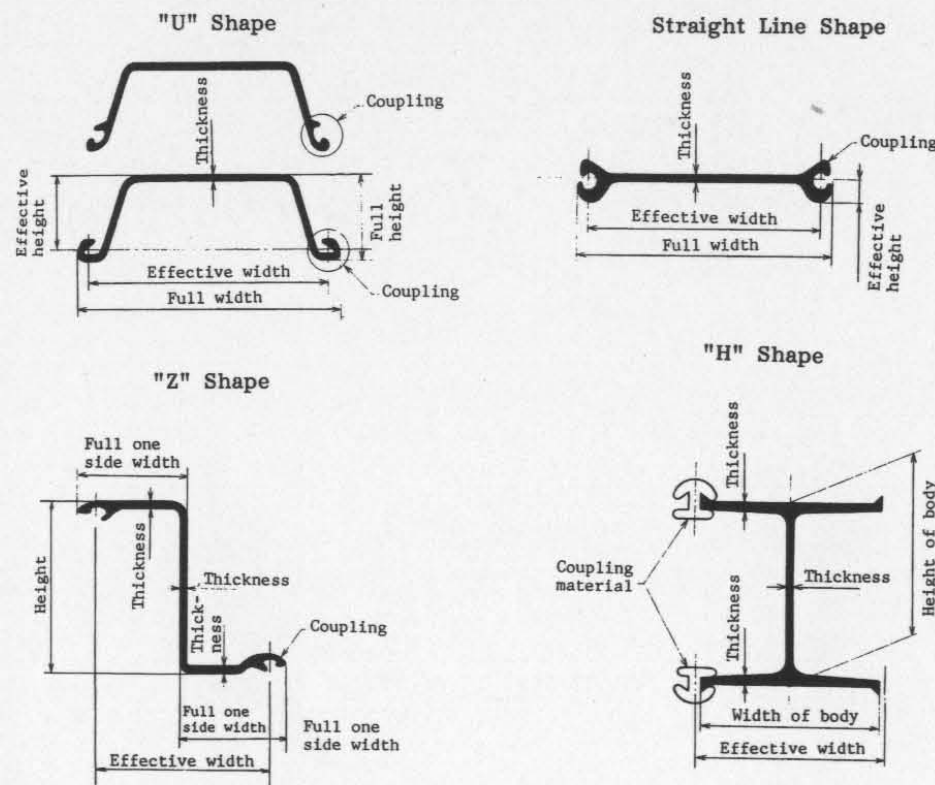
4.2-1 (Applicable till the end of 1990) The steel sheet piles of a straight line shape shall be tested in accordance with 7.3 and their resulting coupling tensile strength shall be either not less than 400 tf/m {3.923 MN/m} or not less than 600 tf/m {5.884 MN/m} and the preference shall be left to the specification of the purchaser.

4.2-2 (Applicable on and after Jan. 1, 1991) The steel sheet piles of a straight line shape shall be tested in accordance with 7.3 and their resulting coupling tensile strength shall be either not less than 3.92 MN/m or not less than 5.88 MN/m and the preference shall be left to the specification of the purchaser.

5. Shapes, Dimensions and Their Tolerances

5.1 The sectional shape of the steel sheet piles shall be "U" shape, "Z" shape, straight line shape and "H" shape and the designation of each part shall be as shown in Fig. 1.

Fig. 1. Designation of Each Part of Section



5.2 The coupling of the steel sheet piles shall have a shape adapted to cause its two parts to bite each other adequately at the time of piling and to separate easily at the time of extracting and further should preferably be of such a structure as to secure watertightness.

5.3 The length of the steel sheet piles shall be not less than 6 m as a rule and be graduated in 0.5 m.

5.4 The shapes and dimensional tolerances of the steel sheet piles shall be as specified in Table 4.

Table 4. Shapes and Dimensional Tolerances

Sectional shape Tolerances		Straight line shape	"U" shape	"Z" shape	"H" shape
Width		± 4 mm	+ 10 mm - 5 mm	+ 8 mm - 4 mm	± 4 mm
Height		—	± 4 %	± 5 mm	± 1.0 %
Thickness	Under 10 mm	+ 1.5 mm - 0.7 mm	± 1.0 mm		
	10 mm to 16 mm excl.	+ 1.5 mm - 0.7 mm	± 1.2 mm		
	16 mm and over	—	± 1.5 mm		
Length		+ not specified 0			
Deflection	10 m and under in length	Full length (m) × 0.15 % max.	Full length (m) × 0.12 % max.	Full length (m) × 0.15 % max.	
	Over 10 m in length	(Full length - 10 m) × 0.10 % + 15 mm max.	(Full length - 10 m) × 0.10 % + 12 mm max.	(Full length - 10 m) × 0.1 % + 15 mm max.	
Camber	10 m and under in length	Full lenght (m) × 0.20 % max.	Full length (m) × 0.25 % max.	Full length (m) × 0.15 % max.	
	Over 10 m in length	(Full length - 10 m) × 0.10 % + 20 mm max.	(Full length - 10 m) × 0.20 % + 25 mm max.	(Full length - 10 m) × 0.15 % + 15 mm max.	
Difference in vertically cut sections		Within 4 % of width		Within 4 % of height and width	

Remarks 1. The applicable places of the tolerances on width, height and thickness shall be as shown in Fig. 1, provided that the tolerances on width shall be applied to the full width for the straight line shape and the "U" shape, to the full one side width for the "Z" shape, and to the width of body for the "H" shape.

Further, the tolerances on height shall be applied to the full height for the "U" shape, and to the height of body for the "H" shape.

2. The deflection shall be in the direction parallel to the sheet pile wall and the camber shall be in the direction vertical to the sheet pile wall.

6. Appearance

The steel sheet piles shall be free from defects injurious to use. However, they may be removed or repaired in accordance with 9.2 of JIS G 3192.

7. Tests

7.1 Analysis Test The analysis test shall be as follows:

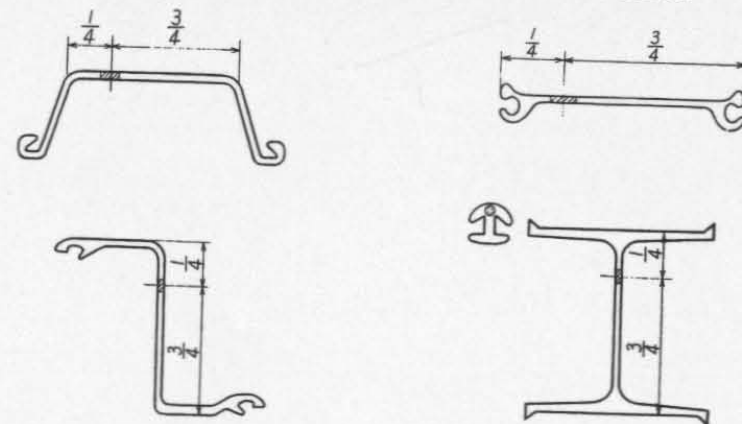
- (1) General matters of analytical tests and the methods of sampling analysis samples shall be as specified in 3. of JIS G 0303.
- (2) The analysis method shall be as in accordance with one of the following Standards:

JIS G 1214 JIS G 1215 JIS G 1219 JIS G 1253
JIS G 1256 JIS G 1257

7.2 Tension Test The tension test shall be as follows:

- (1) General matters of tension test shall be as specified in 4. of JIS G 0303. However, the sampling of specimen shall be in accordance with Class A and the number of test pieces and the sampling position shall be as follows:
 - (1.1) Take one test piece from each lot of the same heat, same sectional shape and same sectional dimensions. However, take two test pieces from each lot exceeding 50 t in weight.
 - (1.2) The test piece shall be taken in the rolling direction from the positions shown in Fig. 2. Where Fig. 2 is impracticable, the test piece shall be taken from the position as near to this point as possible.

Fig. 2. Sampling Positions of Tensile Test Pieces

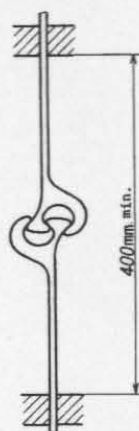


- (2) The tensile test pieces shall be No. 1 A and No. 4 test pieces specified in JIS Z 2201, and No. 4 test piece shall be applied to the members of coupling part of the "H" shape steel sheet pile.
- (3) The method of tension test shall be as specified in JIS Z 2241.

7.3 Coupling Tension Test of Steel Sheet Pile of Straight Line Shape

- (1) Take two coupling tensile test pieces at right angles to the rolling direction from each lot of the same heat and the same sectional dimensions. In this case, make the dimensions of one test piece about 100 mm in width and about 300 mm in length, and take one group of test pieces having a coupling each on one side and representing the members on both sides of the steel sheet pile.
- (2) The coupling tension test shall measure the separating strength of coupling (the breaking strength if the test piece has broken before the separation of the coupling) in accordance with JIS Z 2241. In this case, the test piece shall be so set the two members engage each other as shown in Fig. 3 and the tensile axis becomes parallel to the axis of the test piece. The distance of grips shall be not less than 400 mm.

Fig. 3. State of Set of Test Pieces



8. Inspection

The inspection shall be as follows:

- (1) The results of tests of chemical components, tensile strength, yield point, elongation, coupling tensile strength, shape, dimensions, and appearance shall comply with the requirements of 3., 4., 5. and 6.
- (2) The steel sheet piles having failed to pass the tension test or the coupling tension test may be retested in accordance with 4.4 of JIS G 0303 for final acceptance.

9. Marking

The steel sheet pile accepted by the inspection shall be clearly marked with the following items for each pile by an adequate method toward off erasure until the time of pile driving. However, where the consent of the purchaser is obtained, part of the items may be omitted.

- (1) Symbol of class
- (2) Heat number or inspection number
- (3) Simplified symbol expressing the shape and dimensions (or sectional performance)
- (4) Length
- (5) Manufacturer's name or its abbreviation

10. Report

The manufacturer shall submit an inspection certificate to the purchaser.

Further, where Remark of Table 2-1 or Table 2-2 has been applied, the content of added element shall be stated in the inspection certificate.