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JIS A 5528 : 2006

(JISF)

Hot rolled steel sheet piles

ICS 77.140.70; 93.020

Reference number : JIS A 5528 : 2006 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by The Japan Iron and Steel Federation (JISF) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS A 5528** : 2000 is replaced with this Standard.

Being in conformance with this Standard may come under the use of the following patent rights with regard to the hat shape.

(Patent number)	(Title of invention)	(Registration date of establishment of patent right)
1. No. 2689794	Asymmetrical U-form steel sheet pile	1997-08-29
2. No. 2964933	Underground structure and asymmetric U-shaped steel sheet pile	1999-08-13
3. No. 3173389	Asymmetrical steel sheet pile and its hot rolling method	2001-03-30
4. No. 3458109	Hat-shaped steel sheet pile	2003-08-01
5. No. 3488230	Rolled steel sheet pile	2003-10-31
6. No. 3488232	Rolled steel sheet pile	2003-10-31
7. No. 3488233	Hat-shaped steel sheet pile	2003-10-31

Besides, this description does not affect to any extent the validity, the scope and the like of the above patent rights.

The holder of these patent rights gives guarantee to the Japanese Industrial Standards Committee with respect to his willingness to permit anyone to exercise the relevant patent right under the nondiscriminatory and reasonable conditions.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

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Standards Board

Technical Committee on Iron and Steel

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In the event of any doubts arising as to the contents, the original JIS is to be the final authority.

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Contents

Hot rolled steel sheet piles

Introduction This Japanese Industrial Standard has been established in 1967 and has until now undergone revisions in 1983, 1988 and 2000. In this revision, the principal revised point is addition of new shape (hat type) corresponding to the request of the market.

1 Scope This Standard specifies the hot rolled steel sheet piles (hereafter referred to as "steel sheet piles") which are used for sheathing, coffering, structural foundations and other similar applications.

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 0320 *Standard test methods for heat analysis of steel products*

JIS G 0404 *Steel and steel products—General technical delivery requirements*

JIS G 0415 *Steel and steel products—Inspection documents*

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*

3 Classification and symbols Steel sheet piles shall be classified into two types, and their symbols shall be as given in table 1.

Table 1 Classification symbol

Classification symbol
SY295
SY390

4 Chemical composition Sheet piles shall be tested in accordance with **8.1**, and their cast analysis value shall be as given in table 2.

Table 2 Chemical composition

Unit: %

Classification symbol	P	S
SY295	0.040 max.	0.040 max.
SY390	0.040 max.	0.040 max.

Remarks : If necessary, alloy elements other than those given in table 2 may be added.

5 Mechanical properties

5.1 Yield point or proof stress, tensile strength and elongation Steel sheet piles shall be tested in accordance with **8.2**, and their yield point or proof stress, tensile strength and elongation shall be as given in table 3.

Table 3 Yield point or proof stress, tensile strength and elongation

Classification symbol	Yield point or proof stress N/mm^2	Tensile strength N/mm^2	Test specimen	Elongation %
SY295	295 min.	490 min.	No. 1A or No. 4	17 min.
SY390	390 min.	540 min.	No. 1A or No. 4	15 min.

Remarks : 1 N/mm^2 = 1 MPa

5.2 Coupling tensile strength of straight line shape steel sheet piles Straight line shape steel sheet piles shall be tested in accordance with **8.3**, and their coupling tensile strength shall be not less than 3.92 MN/m or not less than 5.88 MN/m, either of which shall apply depending on the designation of the purchaser.

6 Shapes, dimensions and their tolerances and unit mass

a) The sectional shapes of steel sheet piles shall be U shape, Z shape, straight line shape, H shape and hat shape, and the designation of each sectional part shall be as shown in figure 1.

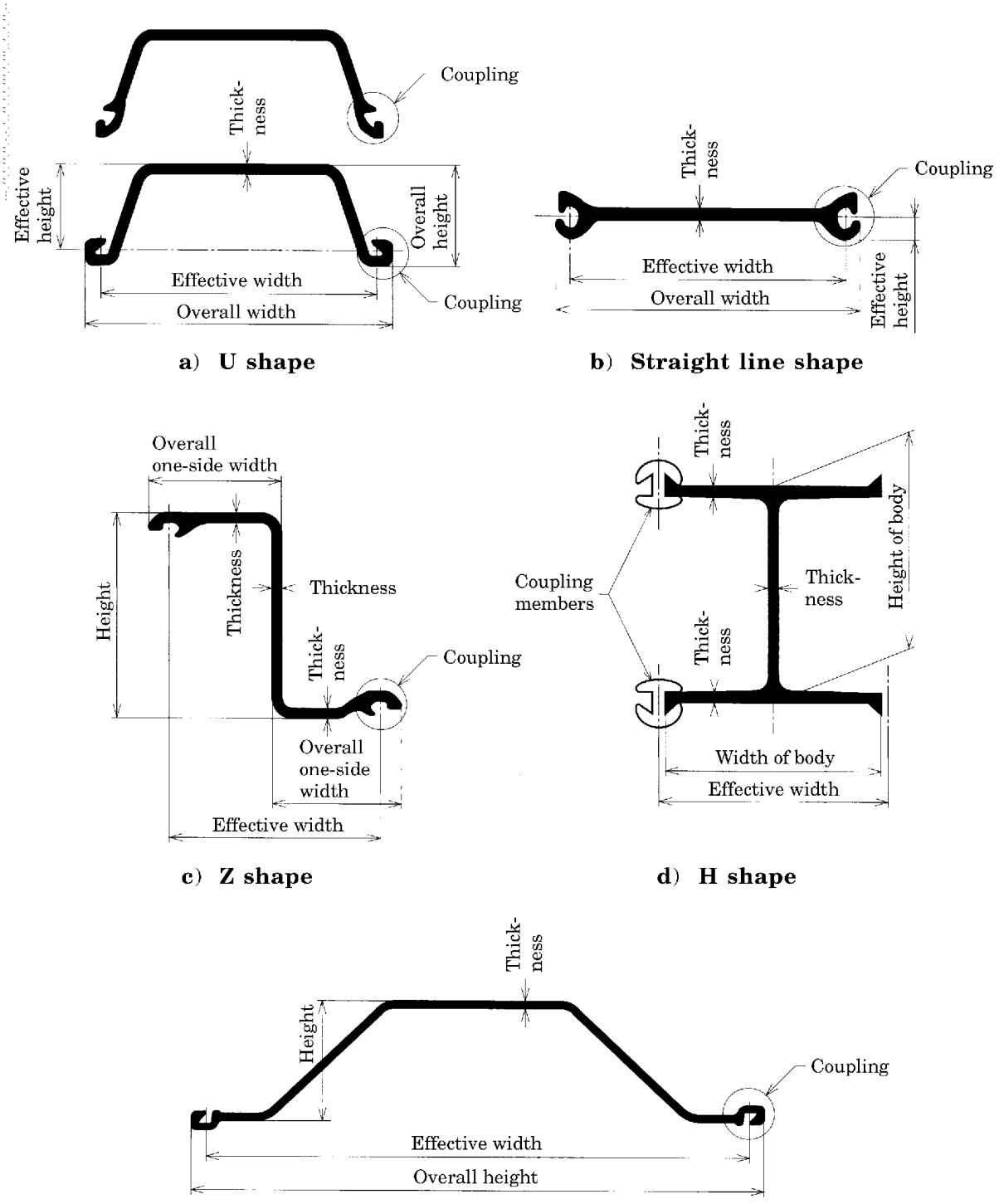

Figure 1 Designation of each sectional part

b) The coupling of steel sheet piles shall have a shape that allows adequate interlocking at the time of piling and easy disengagement at the time of extracting, and should be of a structure that secures watertightness as much as possible.

c) The length of steel sheet piles shall, as a rule, be no less than 6 m and be graduated in 0.5 m.

d) The shape and dimensional tolerances of steel sheet piles shall be as given in table 4.

Table 4 Shape and dimensional tolerances

Items		Sectional shape				
		Straight line shape	U shape	Hat shape	Z shape	H shape
Width		±4 mm	+10 mm − 5 mm		+8 mm −4 mm	±4 mm
Height		—	±4 %		±5 mm	±1.0 %
Thick-ness	Under 10 mm	+1.5 mm −0.7 mm	±1.0 mm			
	10 mm or over to and excl. 16 mm	+1.5 mm −0.7 mm	±1.2 mm			
	16 mm or over	—	±1.5 mm			
Length		Not specified 0				
Deflec-tion	10 m or under in length	Overall length (m) × 0.15 % max.	Overall length (m) × 0.12 % max.		Overall length (m) × 0.15 % max.	
	Over 10 m in length	[(Overall length − 10 m) × 0.10 % + 15 mm] max.	[(Overall length − 10 m) × 0.10 % + 12 mm] max.		[(Overall length − 10 m) × 0.10 % + 15 mm] max.	
Camber	10 m or under in length	Overall length (m) × 0.20 % max.	Overall length (m) × 0.25 % max.		Overall length (m) × 0.15 % max.	
	Over 10 m in length	[(Overall length − 10 m) × 0.10 % + 20 mm] max.	[(Overall length − 10 m) × 0.20 % + 25 mm] max.		[(Overall length − 10 m) × 0.15 % + 15 mm] max.	
Difference in vertically cut sections		4 % of width max.			4 % of height and width max.	

Remarks 1 The applicable places of tolerances on width, height and thickness shall be as shown in figure 1, provided that width tolerances are applied to overall width for a straight line shape, a U shape and a hat shape, to overall one-side width for a Z shape and to the width of body for an H shape. Height tolerances shall be applied to overall height for a U shape and to the height of body for an H shape.

2 Deflection shall be in the parallel direction to a sheet pile wall and camber shall be in the vertical direction to a sheet pile wall.

e) Unit mass shall be subjected to the agreement between the manufacturer and the purchaser.

7 Appearance Steel sheet piles shall be free from defects detrimental to use. However, such defects may be removed or repaired in accordance with clause **9** in **JIS G 3192**.

8 Tests

8.1 Chemical analysis The chemical analysis shall be as follows.

a) Chemical composition shall be obtained from heat analysis, and general requirements for chemical analysis and sampling method shall be as specified in clause **8** of **JIS G 0404**.

b) The heat analysis method shall be as specified in **JIS G 0320**.

8.2 Mechanical test

8.2.1 General test requirements General requirements for mechanical test shall be as specified in clauses **7** and **9** of **JIS G 0404**. The sampling method shall be in accordance with Class A of **7.6**, and the number of test pieces and the sampling position and direction shall be as follows.

a) **Number of tensile test pieces** The steel sheet piles of the same heat, same sectional shape and same dimensions constitute one lot, from which one tensile test piece shall be taken. When the lot exceeds 50 t in mass, two test pieces shall be taken.

b) **Sampling position and sampling direction of tensile test piece** The tensile test piece shall be taken parallel to the rolling direction from the position shown in figure 2. When sampling in figure 2 is impracticable, the test pieces shall be taken as close to the specified position as possible.

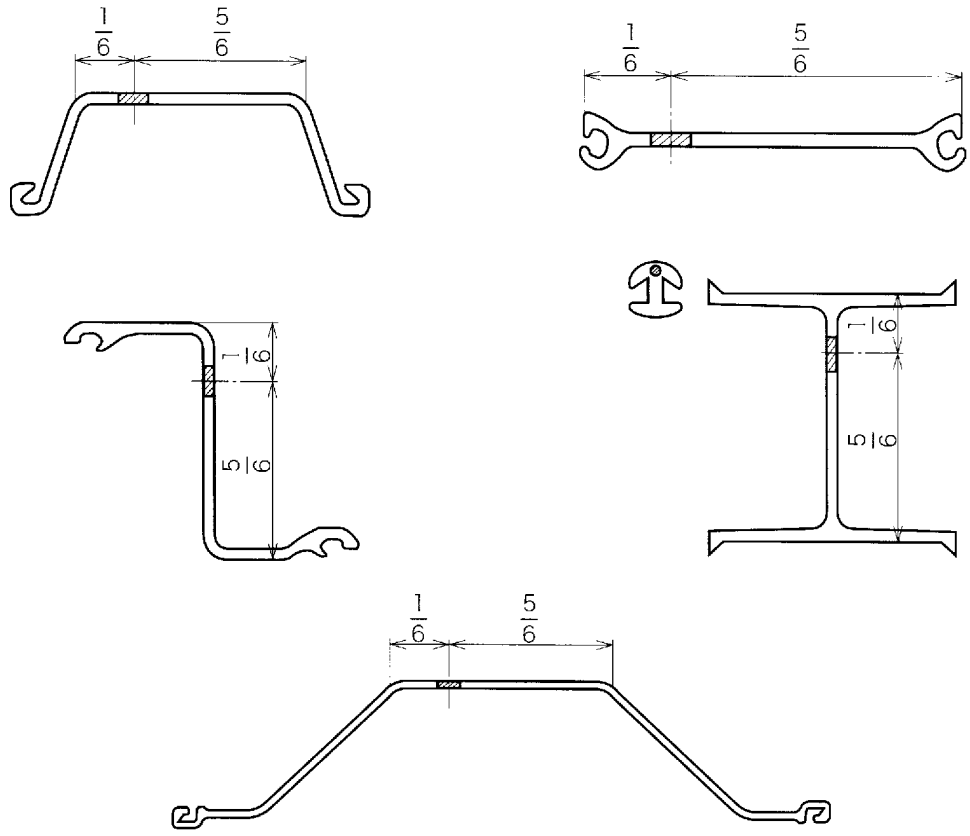

Figure 2 Sampling position of tensile test pieces

8.2.2 Test piece The tensile test piece shall be No. 1A or No. 4 test pieces in **JIS Z 2201**, and No. 4 test piece shall apply to the coupling member of H shape steel sheet piles.

8.2.3 Test method The tensile test method shall be as given in **JIS Z 2241**.

8.3 Coupling tensile test on straight line shape steel sheet pile The coupling tensile test on a straight line shape steel sheet pile shall be as follows.

a) Two coupling tensile test pieces shall be taken at right angles to the rolling direction from each lot of the same heat and the same sectional dimensions. In this case, the dimensions of one test piece shall be about 100 mm in width and about 300 mm in length, and each one of the pair shall have a coupling on one-side and thus representing the couplings on both sides of the steel sheet pile.

b) The coupling tensile test shall be carried out by measuring the disengagement strength of coupling (the breaking strength if the test piece breaks before the disengagement of the coupling) in accordance with **JIS Z 2241**. In this case, the test piece shall be set in such a manner that the two couplings engage each other, with the tensile axis parallel to the axis of the test pieces, as shown in figure 3. The distance between grips shall be not less than 400 mm.

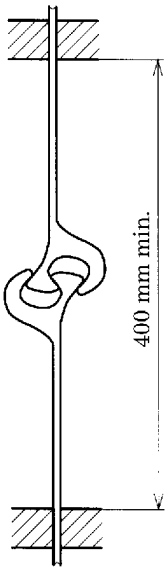

Figure 3 State of test pieces adequately set

9 Inspection The inspection shall be as follows.

a) General requirements for inspection shall conform to **JIS G 0404**.

b) Chemical composition shall comply with the requirements of clause **4**.

c) Mechanical properties shall comply with the requirements of clause **5**.

d) Shapes and dimensions shall comply with the requirements of clause **6**.

e) Appearances shall comply with the requirements of clause **7**.

10 Reinspection For a steel sheet pile having failed to meet the requirements of tensile test or coupling tensile test, a retest may be carried out for acceptance in accordance with **9.8** in **JIS G 0404**.

11 Marking For each steel sheet pile that has passed the inspection, the following items shall be marked by suitable means so as to ensure that those markings remain until the time of pile driving. However, part of the items may be omitted by the agreement between the manufacturer and the purchaser.

a) Classification symbol

b) Heat number or inspection number

c) Simplified symbol (agreed between the manufacturer and the purchaser) expressing the shape and dimensions (or sectional performance)

d) Length

e) Manufacturer's name or its abbreviation

12 Report The report shall be in accordance with the requirements of clause **13** in **JIS G 0404** and the manufacturer shall submit the inspection certificate 3.1.B as specified in **JIS G 0415** to the purchaser. In the case where the purchaser requires any inspection document other than this certificate, the purchaser shall ask the manufacturer for it at the time of ordering.

Further, when any chemical composition other than those given in table 2 is added, the content of the added element shall be appended to the inspection certificate.

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

Errata will be provided upon request, please contact:

Standardization Promotion Department, Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN
TEL. 03-3583-8002 FAX. 03-3583-0462