

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS G 3127 : 2005

(JISF)

**Nickel steel plates for pressure
vessels for low temperature service**



060808000117

ICS 77.140.30; 77.140.50

Reference number : JIS G 3127 : 2005 (E)

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2006年8月12日

2007年3月 5日

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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 G 3127 : 2000** is replaced with this Standard.

This revision has been made based on **ISO/FDIS 9328-1 : 2003 Steel flat products for pressure purposes—Technical delivery conditions—Part 1: General requirements** and **ISO/DIS 9328-4 : 2003 Steel flat products for pressure purposes—Technical delivery conditions—Part 4: Nickel-alloy steels with specified low temperature properties** for the purpose of making it easier to compare this Standard with International Standard; to prepare Japanese Industrial Standard conforming with International Standard; and to propose a draft of an International Standard which is based on Japanese Industrial Standard.

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.

Date of Establishment: 1977-08-01

Date of Revision: 2005-07-20

Date of Public Notice in Official Gazette: 2005-07-20

Investigated by: Japanese Industrial Standards Committee
Standards Board
Technical Committee on Iron and Steel

JIS G 3127 : 2005, First English edition published in 2006-03

Translated and published by: Japanese Standards Association
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

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

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Printed in Japan

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Nickel steel plates for pressure vessels for low temperature service

Introduction This Japanese Industrial Standard has been prepared based on the second editions of **ISO/FDIS 9328-1** *Steel flat products for pressure purposes — Technical delivery conditions—Part 1: General requirements* and **ISO/DIS 9328-4** *Steel flat products for pressure purposes—Technical delivery conditions—Part 4: Nickel-alloy steels with specified low temperature properties* published in 2003 with some modifications of the technical contents.

The portions given sidelines are the matters modified from the original International Standard. A list of modifications with the explanations is given in Annex (informative).

1 Scope This Standard specifies the hot-rolled nickel steel plates (hereafter referred to as “steel plates”) to be used for pressure vessels and equipment for low temperature service.

Remarks: The International Standards corresponding to this Standard are as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21**.

ISO/FDIS 9328-1:2003 *Steel flat products for pressure purposes —Technical delivery conditions—Part 1: General requirements* (MOD)

ISO/DIS 9328-4:2003 *Steel flat products for pressure purposes —Technical delivery conditions—Part 4: Nickel-alloy steels with specified low temperature properties* (MOD)

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 listed (including amendments) below shall be applied.

- JIS G 0320 *Standard test methods for heat analysis of steel products*
- JIS G 0321 *Product analysis and its tolerance for wrought steel*
- JIS G 0404 *Steel and steel products—General technical delivery requirements*
- JIS G 0415 *Steel and steel products—Inspection documents*
- JIS G 0801 *Ultrasonic examination of steel plates for pressure vessels*
- JIS G 3193 *Dimensions, mass and permissible variations of hot rolled steel plates, 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 2242 *Method for Charpy pendulum impact test of metallic materials*
 JIS Z 2248 *Method of bend test for metallic materials*

3 Classification symbols, applicable thicknesses and lowest service temperature Steel plates shall be classified into seven types, and their symbols, applicable thicknesses and lowest service temperature shall be as given in table 1.

Table 1 Classification symbols, applicable thicknesses and lowest service temperature

Classification symbol	Applicable thickness mm	Lowest service temperature available °C
SL2N255	6 and over up to and incl. 50	-70
SL3N255		-101
SL3N275		-101
SL3N440		-110
SL5N590		-130
SL9N520		-196
SL9N590	6 and over up to and incl. 100	-196

4 Heat treatment and symbols The heat treatment and heat treatment symbols shall be as follows.

4.1 Heat treatment of steel plates The heat treatment of steel plates shall be carried out in accordance with table 2.

Table 2 Heat treatment

Classification symbol	Heat treatment	
SL2N255	Normalizing. However, tempering may be applied after normalizing if necessary. The manufacturer may perform thermo-mechanical controlled processing or appropriate heat treatment by the agreement between the purchaser and the manufacturer.	
SL3N255		
SL3N275		
SL3N440	Quenching and tempering	However, the intermediate heat treatment ⁽¹⁾ may be applied if necessary.
SL5N590	Quenching and tempering	
SL9N520	Normalizing twice followed by tempering.	
SL9N590	Quenching and tempering	

Note ⁽¹⁾ The intermediate heat treatment is an operation of cooling from a dual phase composed of austenite and ferrite which is carried out prior to tempering with the aim of improving toughness.

Remarks: When the purchaser performs heat treatment by the agreement between the purchaser and the manufacturer, the manufacturer may apply heat treatment only for the test pieces and ship the steel plates in the as-rolled condition.

4.2 Designation for heat treatment of steel plates Designation for the heat treatment of steel plates shall be as follows:

- a) The purchaser shall clearly specify the type of heat treatment for steel plates and, if necessary, the conditions and number of heat treatments for the test piece to be conducted by the manufacturer on the order sheet.
- b) When the purchaser performs the heat treatment of steel plates in accordance with Remarks of table 2, this matter shall be specified on the order sheet in which the heat-treatment conditions shall also clearly be stated.

4.3 Heat treatment of test piece The heat treatment of test piece shall be conducted on the specimen taken from a steel plate, and the test piece shall be cut off from the heat-treated specimen. The method of taking the test piece shall be as follows:

- a) **When a test piece is taken from steel plates heat-treated by the manufacturer**
 - 1) When the purchaser requires the manufacturer to apply normalizing, a heat treatment corresponding to the post-weld heat treatment of a vessel or other similar treatments to the test piece, the manufacturer shall apply the required type of heat treatment to the specimen taken from heat-treated steel plates.
 - 2) When the heat-treatment conditions are not specified by the purchaser, the manufacturer shall apply heat treatment to the specimen under the conditions which the manufacturer considers to be appropriate. The manufacturer shall clearly state the conditions of the heat-treatment applied on the specimen to the purchaser.
- b) **When a test piece is taken from steel plates heat-treated by the purchaser**
 - 1) When the purchaser requires the manufacturer to apply normalizing, quenching and tempering, a heat treatment corresponding to the post-weld heat treatment of a vessel or other similar treatments to the test piece, the manufacturer shall apply the required type of heat treatment to the specimen taken from as-rolled steel plates in accordance with the conditions and the number of heat treatments specified by the purchaser.
 - 2) Even when the purchaser does not clearly require the manufacturer to apply heat treatment to the test piece, the manufacturer shall take a specimen from as-rolled steel plates and apply heat treatment to it under the conditions which the manufacturer considers to be appropriate. However, the manufacturer shall clearly state the heat-treatment conditions applied for the specimen to the purchaser.

4.4 Symbol for heat treatment Symbols indicating the heat treatment of steel plates and test pieces to be stated on the order sheet shall be as follows:

- a) When steel plates are subjected to normalizing : N
- b) When steel plates are subjected to normalizing followed by tempering : NT
- c) When steel plates are subjected to thermo-mechanical controlled processing : TMC
- d) When steel plates are subjected to normalizing twice followed by tempering : NNT
- e) When steel plates are subjected to quenching and tempering : Q
- f) When a test piece alone is subjected to normalizing : TN
- g) When a test piece alone is subjected to normalizing followed by tempering : TNT
- h) When a test piece alone is subjected to normalizing twice followed by tempering : T2NT
- i) When a test piece is subjected to heat treatment corresponding to post-weld heat treatment : SR

Examples:

SL2N255N	: When steel plates are subjected to normalizing
SL3N275NT	: When steel plates are subjected to normalizing followed by tempering
SL3N255TMC	: When steel plates are subjected to thermo-mechanical controlled processing
SL9N520NNT	: When steel plates are subjected to normalizing twice followed by tempering
SL9N590Q	: When steel plates are subjected to quenching and tempering
SL3N255NTNSR	: When steel plates are subjected to normalizing, and further the test piece alone is subjected to normalizing and heat treatment once corresponding to post-weld heat treatment
SL3N275N3SR	: When steel plates are subjected to normalizing and further the test piece is subjected to heat treatment three times corresponding to post-weld heat treatment
SL3N255TNSR	: When steel plates are not subjected to normalizing, and the test piece alone is subjected to normalizing and heat treatment once corresponding to post-weld heat treatment

5 Chemical composition Steel plates shall be tested in accordance with 9.1, and their cast analysis values shall be as given in table 3.

Table 3 Chemical composition

Unit: %

Classification	C	Si	Mn	P	S	Ni
SL2N255	0.17 max.	0.03 max.	0.70 max.	0.025 max.	0.025 max.	2.10 to 2.50
SL3N255	0.15 max.	0.03 max.	0.70 max.	0.025 max.	0.025 max.	3.25 to 3.75
SL3N275	0.17 max.	0.03 max.	0.70 max.	0.025 max.	0.025 max.	3.25 to 3.75
SL3N440	0.15 max.	0.03 max.	0.70 max.	0.025 max.	0.025 max.	3.25 to 3.75
SL5N590	0.13 max.	0.03 max.	1.50 max.	0.025 max.	0.025 max.	4.75 to 6.00
SL9N520	0.12 max.	0.03 max.	0.90 max.	0.025 max.	0.025 max.	8.50 to 9.50
SL9N590	0.12 max.	0.03 max.	0.90 max.	0.025 max.	0.025 max.	8.50 to 9.50

Remarks 1 Alloying elements other than those shown in table 3 may be added if necessary.

2 When the product analysis is carried out upon request by the purchaser, the results shall not deviate from the values in table 3 exceeding the tolerances specified in attached table 4 of **JIS G 0321**.

6 Mechanical properties

6.1 Yield point or proof stress, tensile strength, elongation and bendability Steel plates shall be tested in accordance with **9.2**, and their yield point or proof stress, tensile strength, elongation and bendability shall be as given in table 4.

For bendability, there shall not be any crack on the outside of the bend. The bend test, however, may be omitted unless otherwise specified by the purchaser.

Table 4 Yield point or proof stress, tensile strength, elongation and bendability

Classifi- cation symbol	Yield point or proof stress N/mm ²	Tensile strength N/mm ²	Elongation			Bendability		
			Thickness mm	Test piece	%	Bend angle	Inside radius	Test piece
SL2N255	255 min.	450 to 590	6 and over up to and incl. 16	No. 5	24 min.	180°	Thickness × 0.5 for thickness not more than 25 mm Thickness × 1.0 for thickness over 25 mm	No.1
			Over 16	No. 5	29 min.			
			Over 20	No. 4	24 min.			
SL3N255	255 min.	450 to 590	6 and over up to and incl. 16	No. 5	24 min.	180°	Thickness × 0.5 for thickness not more than 25 mm Thickness × 1.0 for thickness over 25 mm	No.1
			Over 16	No. 5	29 min.			
			Over 20	No. 4	24 min.			
SL3N275	275 min.	480 to 620	6 and over up to and incl. 16	No. 5	22 min.	180°	Thickness × 1.0 for thickness not more than 25 mm Thickness × 1.0 for thickness over 25 mm	No.1
			Over 16	No. 5	26 min.			
			Over 20	No. 4	22 min.			
SL3N440	440 min.	540 to 690	6 and over up to and incl. 16	No. 5	21 min.	180°	Thickness × 1.0 for thickness not more than 25 mm Thickness × 1.5 for thickness over 25 mm	No.1
			Over 16	No. 5	25 min.			
			Over 20	No. 4	21 min.			
SL5N590	590 min.	690 to 830	6 and over up to and incl. 16	No. 5	21 min.	180°	Thickness × 1.0 for thickness not more than 19 mm Thickness × 1.5 for thickness over 19 mm	No.1
			Over 16	No. 5	25 min.			
			Over 20	No. 4	21 min.			
SL9N520	520 min.	690 to 830	6 and over up to and incl. 16	No. 5	21 min.	180°	Thickness × 1.0 for thickness not more than 19 mm Thickness × 1.5 for thickness over 19 mm	No.1
			Over 16	No. 5	25 min.			
			Over 20	No. 4	21 min.			
SL9N590	590 min.	690 to 830	6 and over up to and incl. 16	No. 5	21 min.	180°	Thickness × 1.0 for thickness not more than 19 mm Thickness × 1.5 for thickness over 19 mm	No.1
			Over 16	No. 5	25 min.			
			Over 20	No. 4	21 min.			

Remarks: 1 N/mm² = 1 MPa

6.2 Charpy absorbed energy Steel plates shall be tested in accordance with **9.2**, and their Charpy absorbed energy shall be as given in table 5.

Table 5 Charpy absorbed energy

Unit: J

Classifi- cation symbol	Test Temper- ature	Charpy absorbed energy						Test piece
		Average of three test pieces			Individual test pieces			
		Thickness (mm)			Thickness (mm)			
		6 and over up to and excl. 8.5	8.5 and over up to and excl. 11	11 and over	6 and over up to and excl. 8.5	8.5 and over up to and excl. 11	11 and over	
		Thickness × width of test piece (mm)						
		10 × 5	10 × 7.5	10 × 10	10 × 5	10 × 7.5	10 × 10	
SL2N255	−70	11 min.	17 min.	21 min.	10 min.	14 min.	17 min.	V notch, parallel to rolling direction
SL3N255	−101	11 min.	17 min.	21 min.	10 min.	14 min.	17 min.	
SL3N275	−101	11 min.	17 min.	21 min.	10 min.	14 min.	17 min.	
SL3N440	−110	14 min.	22 min.	27 min.	11 min.	17 min.	21 min.	
SL5N590	−130	21 min.	29 min.	41 min.	18 min.	25 min.	34 min.	
SL9N520	−196	18 min.	25 min.	34 min.	14 min.	22 min.	27 min.	
SL9N590	−196	21 min.	29 min.	41 min.	18 min.	25 min.	34 min.	

Remarks: The direction of a test piece may be specified to be vertical to its rolling direction by the agreement between the purchaser and the manufacturer instead of that specified in table 5.

7 Shape, dimensions, mass and their tolerances Shape, dimensions, mass and their tolerances for steel plates shall comply with **JIS G 3193** tolerances on length and cut-edge width of steel plates shall be in accordance with tolerance A in **JIS G 3193** unless otherwise specified and tolerances on thickness of steel plates shall be as given in table 6.

Table 6 Tolerances on thickness

Unit: mm

Thickness	Width					
	Under 1600	1 600 and over up to and excl. 2 000	2 000 and over up to and excl. 2 500	2 500 and over up to and excl. 3 150	3 150 and over up to and excl. 4 000	4 000 and over up to and excl. 5 000
6.00 and over up to and excl. 6.30	+0.75	+0.95	+0.95	+1.25	+1.25	—
6.30 and over up to and excl. 10.0	+0.85	+1.05	+1.05	+1.35	+1.35	+1.55
10.0 and over up to and excl. 16.0	+0.85	+1.05	+1.05	+1.35	+1.35	+1.75
16.0 and over up to and excl. 25.0	+1.05	+1.25	+1.25	+1.65	+1.65	+1.95
25.0 and over up to and excl. 40.0	+1.15	+1.35	+1.35	+1.75	+1.75	+2.15
40.0 and over up to and excl. 63.0	+1.35	+1.65	+1.65	+1.95	+1.95	+2.35
63.0 and over up to and incl. 100	+1.55	+1.95	+1.95	+2.35	+2.35	+2.75

Remarks 1 The minus side tolerance shall be 0.25 mm.

- 2 Tolerances on width 5 000 mm or over shall be agreed upon between the purchaser and the manufacturer.
- 3 When the minus side tolerance is designated as 0 mm by agreement between the purchaser and the manufacturer, the plus side tolerance shall be the numerical value given in table 6 plus 0.25 mm.

8 Appearance The appearance of steel plates shall comply with the requirements of clause 7 in **JIS G 3193**, provided that repair by welding shall preliminarily be approved by the purchaser.

9 Test

9.1 Chemical analysis The chemical analysis shall be as follows:

- a) General requirements of the chemical analysis and sampling of the cast analysis specimen shall be in accordance with clause 8 of **JIS G 0404**.
- b) Sampling of test specimen for product analysis shall be in accordance with clause 4 of **JIS G 0321**. However, the fractured test piece used for the tensile test may be used as a test specimen.
- c) The method of cast analysis shall be in accordance with **JIS G 0320**. The method of product analysis shall be in accordance with **JIS G 0321**.

9.2 Mechanical test

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

The bend test, however, shall be omitted unless otherwise specified by the purchaser.

- a) **Number of test pieces for tensile test and bend test and sampling direction** One test piece shall be taken transversely to the final rolling direction from each steel plate as rolled from an identical slab or directly from an identical ingot and subjected to heat treatment under the same condition.
- b) **Number of impact test pieces and sampling direction** One specimen shall be taken from each steel plate as rolled from an identical slab or directly from an identical ingot and subjected to heat treatment under the same condition. Three test pieces shall be taken from that specimen, parallel to the final rolling direction unless otherwise specified.
- c) **Sampling position of test pieces for tensile test and bend test** The sampling of test pieces shall be made so that the centre of a test piece can be at a quarter-width from the side edge of a specimen and, in the case of No. 4 tensile test piece, also at a quarter-thickness from the surface of the specimen. However, when the centre of a test piece cannot be secured at a quarter-width from the side edge or at a quarter-thickness from the surface, the sampling shall be made at a position as close to the specified position as possible.
- d) **Sampling position of test pieces for impact test** The sampling of test pieces shall be made so that the centre of a test piece can be at a quarter-thickness from the surface of a specimen and also at a quarter-width from the side edge. However, when a test piece cannot be taken from the specified position, the sampling shall be made at a position as close to that position as possible.

9.2.2 Test pieces Test pieces for tensile test, bend test and impact test shall be as follows:

- a) Tensile test piece shall be No. 4 or No. 5 test pieces specified in **JIS Z 2201**
- b) Bend test piece shall be No. 1 test piece specified in **JIS Z 2204**
- c) Impact test piece shall be V-notch test piece or its subsized test piece specified in **JIS Z 2242**. However, the longitudinal direction of the notch base of a test piece shall be perpendicular to the rolled surface.

9.2.3 Test method Methods for tensile test, bend test and impact test shall be as follows:

- a) The tensile test shall be in accordance with **JIS Z 2241**
- b) The bend test shall be in accordance with **JIS Z 2248**
- c) The impact test shall be in accordance with **JIS Z 2242**

10 Inspection The inspection shall be as follows:

- a) General requirements for inspection shall conform to **JIS G 0404**.
- b) The chemical composition shall comply with the requirements of clause 5.
- c) The mechanical properties shall comply with the requirements of clause 6.
- d) The shape, dimensions and mass and their tolerances shall comply with the requirements of clause 7.

- e) The appearance shall comply with the requirements of clause 8.
- f) The purchaser may designate the ultrasonic examination specified in **JIS G 0801** and the like in addition to the inspections of a) to e). In this case, the test method, criteria for acceptance and other requirements shall preliminarily be agreed upon between the purchaser and the manufacturer.

11 Re-inspection The re-inspection shall be as follows:

- a) For a steel plate having failed to meet the requirements of tensile test and bend test, retest may be carried out for acceptance in accordance with 9.8 in **JIS G 0404**.
- b) For a steel plate having failed to meet the requirements of impact test, when the averaged value of results of three test pieces is 85 % or over of the specified value and individual results of two or more test pieces also conform to the specified values in table 5, retest may be carried out for acceptance, using three additional test pieces taken from the identical specimen in the vicinity where the original test pieces have been taken.

In this case, when both the averaged value of six test pieces and the retest results of the three test pieces conform to table 5, all the steel plates as rolled from an identical slab or directly from an identical ingot and subjected to heat treatment under the same condition shall be accepted.
- c) For a steel plate having failed to meet test requirements, reappraisal test may be carried out for final acceptance after it is subjected to heat treatment or reheat treatment.

12 Marking For each steel plate that has passed the inspection, the following items shall be marked by suitable means. However, a part of them may be omitted by agreement between the purchaser and the manufacturer.

- a) Classification symbol (including the symbol for heat treatment in 4.4)
- b) Heat number or inspection number
- c) Dimensions
- d) Manufacturer's name or identifying brand

13 Report The report shall conform to the requirements of clause 13 of **JIS G 0404**. However, unless otherwise specified at the time of ordering, the type of inspection document shall conform to either symbol 2.3 or symbol 3.1.B of table 1 of **JIS G 0415**.

When Remarks 1 of table 3 is applied, the content of added element(s) shall be appended to the test results.

Annex (informative)
Comparison table between JIS and corresponding International Standards

JIS G 3127 : 2005 Nickel steel plates for pressure vessels for low temperature service		ISO/FDIS 9328-1 : 2003 Steel flat products for pressure purposes—Technical delivery conditions—Part 1: General requirements ISO/DIS 9328-4 : 2003 Steel flat products for pressure purposes—Technical delivery conditions—Part 4: Nickel-alloy steels with specified low temperature properties	
(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standards
Clause	Content		Clause
1 Scope	Nickel steel plates for low temperature service	ISO/FDIS 9328-1 ISO/DIS 9328-4	1 Nickel steel plates for low temperature service
2 Normative references	11 standards of JIS are referred to.	ISO/DIS 9328-4	2 30 standards of ISO Standard are referred to.
3 Classification symbols, applicable thickness and lowest service temperature	7 grades are specified.	ISO/DIS 9328-4	4.2 7 grades for European design codes, 5 grades for JIS/ASME type design codes are specified.
4 Heat treatment and symbol	Normalizing, normalizing and tempering, quenching and tempering, thermo-mechanical controlled processing	ISO/DIS 9328-4	6.2 Normalizing, normalizing and tempering, quenching and tempering, thermo-mechanical controlled processing
5 Chemical composition	Chemical composition of 7 grades is specified.	ISO/DIS 9328-4	6.3 Chemical composition of 12 grades is specified.
			Classification by clause
			Detail of technical deviation
			(IV) Classification and details of technical deviation between JIS and the International Standards by clause Location of deviation: text, Annex Indication method: continuous sidelines
			(V) Justification for the technical deviation and future measures
			Harmonization is promoted in each standard referred to.
			Only steels which conform to the domestic technical standard are specified in JIS.
			Only steels which conform to the domestic technical standard are specified in JIS.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standards		(IV) Classification and details of technical deviation between JIS and the International Standards by clause		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
6 Mechanical properties	Tensile properties, bendability and impact properties are specified.	ISO/DIS 9328-4	6.4	Tensile properties, impact properties for 8 grades of steels of European design codes, and for 7 grades of steels of JIS/ASME type design codes are specified.	MOD/deletion	In JIS 8 grades of steels of JIS/ASME type design codes are harmonized.	Only steels which conform to the domestic technical standard are specified in JIS.
7 Shape, dimensions, mass and their tolerances	As specified in JIS G 3193, provided that the minus side tolerance on thickness is 0.25 mm.	ISO/FDIS 9328-1	4	Agree upon between the purchaser and the manufacturer. At the time of agreement, see ISO 7452.	MOD/alteration	JIS G 3193 is harmonized with ISO 7452. However, the minus side tolerance on thickness is different since in ISO Standard it is 0.30 mm.	The minus side tolerance on thickness will be studied keeping eye on future trends of domestic actual conditions, laws and regulations, technical standards.
8 Appearance	As specified in JIS G 3193.	ISO/FDIS 9328-1	8.5	As specified in ISO 7788	MOD/alteration	In ISO Standard the local short thickness of plates at the part of removal of surface imperfections is permitted, but in JIS it is not permitted.	The draft was proposed so that ISO/DIS 7788 includes the standard on steels of JIS/ASME type design codes, and the work for revision is progressing.
9 Test	Chemical analysis and mechanical test are specified.	ISO/FDIS 9328-1	11	Chemical analysis, mechanical test, tensile test at elevated temperature are specified.	IDT		
10 Inspection	The test items which are specified in the standard are inspected.	ISO/FDIS 9328-1	9	The test items which are specified in the standard are inspected.	IDT		
11 Re-inspection	As specified in JIS G 0404.	ISO/FDIS 9328-1	9.3	As specified in ISO 404.	MOD/alteration	For retest of tensile test, IDT. For Charpy impact test MOD/alteration.	Altered to correspond to the demand of the domestic technical standard.

(I) Requirements in JIS		(II) International Standard number	(III) Requirements in International Standards		(IV) Classification and details of technical deviation between JIS and the International Standards by clause Location of deviation: text, Annex Indication method: continuous sidelines		(V) Justification for the technical deviation and future measures
Clause	Content		Clause	Content	Classification by clause	Detail of technical deviation	
12 Marking	Classification symbol, hot number, dimension manufacturer's name etc. are specified.	ISO/FDIS 9328-1	12	Classification symbol and manufacturer's name are marked. Other marking items are marked in accordance with agreement or at the option of the manufacturer.	MOD/addition	In JIS heat number, dimensions also are marked.	In ISO Standard also the content of marking can be added in accordance with agreement.
13 Report	Unless otherwise specified at the time of order, 2.3 or 3.1.B in JIS G 0415 shall be conformed to.	ISO/FDIS 9328-1	9.1	Inspection document (3.1A, 3.1B, 3.1C or 3.2) based on the designation of the purchaser.	IDT	There is no substantial difference since both Standards basically specify the designation of the purchaser.	

Designated degree of correspondence between JIS and International Standards: MOD

Remarks 1 Symbols in sub-columns of classification by clause in the above table indicate as follows:

- IDT : Identical in technical contents.
- MOD/deletion : Deletes the specification item(s) and content(s) of International Standard.
- MOD/addition : Adds the specification item(s) and content(s) which are not included in International Standard.
- MOD/alteration : Alters the specification content(s) which are included in International Standard.

2 Symbol in column of designated degree of correspondence between JIS and International Standards in the above table indicates as follows:

- MOD : Modifies International Standards.

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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:
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