



JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

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JIS G 4312 : 2011

(JSSA/JSA)

**Heat-resisting steel plate, sheet and strip**

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ICS 77.140.10;77.140.50

Reference number : JIS G 4312 : 2011 (E)

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Date of Establishment: 1964-09-01

Date of Revision: 2011-02-21

Date of Public Notice in Official Gazette: 2011-02-21

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

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JIS G 4312 : 2011, First English edition published in 2012-01

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

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In the event of any doubts arising as to the contents,  
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Printed in Japan

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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 Japan Stainless Steel Association (JSSA)/Japanese Standards Association (JSA) 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 4312:1991** is replaced with this Standard.

However, **JIS G 4312:1991** may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until February 20th, 2012.

This **JIS** document is protected by the Copyright Law.

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 or utility model right 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 or utility model right which have the said technical properties.

# Heat-resisting steel plate, sheet and strip

## Introduction

This Japanese Industrial Standard has been prepared based on the third edition of ISO 4955 published in 2005 with some modifications of the technical contents. As a reference, main usages of heat-resisting steel plate, sheet and strip are shown in Annex JB.

The portions given sidelines or dotted underlines are the matters in which the contents of the original International Standard have been modified. A list of modifications with explanations is given in Annex JC. Annex JA and Annex JB are not stated in the original International Standard.

## 1 Scope

This Standard specifies heat-resisting steel plate and sheet (hereafter referred to as “plate and sheet”) and steel strip (hereafter referred to as “strip”).

NOTE : The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows :

ISO 4955 : 2005 *Heat-resistant steels* (MOD)

The symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

## 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 method 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*

NOTE : Corresponding International Standard : ISO 404 *Steel and steel products — General technical delivery requirements* (MOD)

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

NOTE : Corresponding International Standard : ISO 10474 *Steel and steel products — Inspection documents* (IDT)

JIS G 0567 Method of elevated temperature tensile test for steels and heat-resisting alloys

JIS G 4304 Hot-rolled stainless steel plate, sheet and strip

JIS G 4305 Cold-rolled stainless steel plate, sheet and strip

JIS Z 2241 Metallic materials — Tensile testing — Method of test at room temperature

NOTE : Corresponding International Standard : ISO 6892-1 *Metallic materials — Tensile testing — Part 1 : Method of test at room temperature* (MOD)

JIS Z 2243 Brinell hardness test — Test method

NOTE : Corresponding International Standard : ISO 6506-1 *Metallic materials — Brinell hardness test — Part 1 : Test method* (MOD)

JIS Z 2244 Vickers hardness test — Test method

JIS Z 2245 Rockwell hardness test — Test method

JIS Z 2248 Metallic materials — Bend test

JIS Z 8401 Guide to the rounding of numbers

### 3 Grade and symbol

The plate, sheet and strip shall be classified into 28 grades, and their symbols and classifications shall be as given in table 1.

**Table 1 Symbol of grade and classification**

| Symbol of grade <sup>a) b)</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Classification    | Symbol of grade <sup>a) b)</sup>                      | Classification                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------|-----------------------------------|
| SUH309<br>SUH310<br>SUH330<br>SUH660<br>SUH661                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Austenitic series | SUS317<br>SUS321<br>SUS347<br>SUSXM15J1               | Austenitic series                 |
| SUH21<br>SUH409<br>SUH409L<br>SUH446                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Ferritic series   | SUS405<br>SUS410L<br>SUS430<br>SUS430J1L<br>SUS436J1L | Ferritic series                   |
| SUS302B<br>SUS304<br>SUS309S<br>SUS310S<br>SUS316<br>SUS316Ti                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Austenitic series | SUS403<br>SUS410                                      | Martensitic series                |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   | SUS630<br>SUS631                                      | Precipitation<br>hardening series |
| <p>NOTE : The abolishment of SUH330, SUH661 and SUH446 will be discussed at the revision of next time.</p> <p>Notes <sup>a)</sup> In the case where the products are required to be expressed as the plate and sheet by the symbol, -HP (hot rolled steel plate and sheet) or -CP (cold rolled steel plate and sheet) shall be suffixed to the symbol of grade.<br/>Example : SUH309-HP</p> <p><sup>b)</sup> In the case where the products are required to be expressed as the strip by the symbol, -HS (hot rolled steel strip) or -CS (cold rolled steel strip) shall be suffixed to the symbol of grade.<br/>Example : SUH409-CS</p> |                   |                                                       |                                   |

#### 4 Manufacturing method

The plate, sheet and strip shall be heat-treated after hot rolling or cold rolling followed by pickling or the treatment equivalent to this, then correction, grinding, temper rolling or the combination thereof may be performed, if necessary. The representative heat treatment conditions are shown in Annex JA.

The treatment such as pickling after heat treatment may be omitted upon the agreement between the purchaser and the manufacturer. However, for the heat treatment of SUH660 and SUH661, the type of heat treatment and either the plate and sheet themselves or the test pieces to be heated shall be designated by the purchaser. The heat treatment symbols shall be as given in table 2. When the plate and sheet are used as the material for pipes and pipe fittings which are to be heat treated in the post process, and as the material for rerolling, the heat treatment may be omitted upon the agreement between the purchaser and the manufacturer. In this case, the symbol AR shall be suffixed.

**Table 2 Symbol for heat treatment**

| Heat treatment method                    | Symbol |
|------------------------------------------|--------|
| Solution treatment                       | S      |
| Aging treatment after solution treatment | H      |

## 5 Chemical compositions

### 5.1 Heat analysis value

The plate, sheet and strip shall be subjected to the test of 10.1 and their heat analysis values shall be as given in table 3 and table 4. Those of symbol SUS shall be as specified in **JIS G 4304** and **JIS G 4305**.

### 5.2 Product analysis value

When the product analysis values of plate, sheet and strip are requested by the purchaser, the test of 10.1 shall be performed, and the tolerances thereof shall be as given in table 5 of **JIS G 0321**. The tolerances of chemical compositions other than those specified in table 5 of **JIS G 0321** may be upon the agreement between the purchaser and the manufacturer.