

JIS

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS G 4404 : 2022

(JISF)

Alloy tool steels

ICS 25.100.01 ; 77.140.35

Reference number : JIS G 4404 : 2022 (E)

G 4404 : 2022

Date of Establishment: 1956-04-18

Date of Revision: 2022-05-20

Date of Public Notice in Official Gazette: 2022-05-20

Developed by: The Japan Iron and Steel Federation

Investigated by: The Japan Iron and Steel Federation, Standardization
Center

JIS G 4404 : 2022, First English edition published in 2023-01

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

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

© JSA 2023

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

HN

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbol of grade	3
5 Manufacturing method	3
6 Chemical composition	4
7 Hardness	6
8 Appearance	7
9 Dimensions and dimensional tolerances	7
9.1 Dimensions and dimensional tolerances of hot-rolled round bars	7
9.2 Dimensions and dimensional tolerances of other tool steels than hot-rolled round bars	8
10 Depth of decarburization	8
11 Tests	9
11.1 Chemical analysis	9
11.2 Hardness test	9
11.3 Measurement of depth of decarburization	9
12 Inspection	10
13 Marking	11
14 Information to be supplied by the purchaser	11
15 Report	11
Annex A (informative) Comparable grades between JIS and corresponding International Standard	12
Annex JA (informative) Comparison table between JIS and corresponding International Standard	13

Foreword

This Japanese Industrial Standard has been revised by the Minister of Economy, Trade and Industry based on the provision of Article 14, paragraph (1) of the Industrial Standardization Act applied mutatis mutandis pursuant to the provision of Article 16 of the said Act in response to a proposal for revision of Japanese Industrial Standard with a draft being attached, submitted by The Japan Iron and Steel Federation (JISF), an accredited standards development organization. This edition replaces the previous edition (**JIS G 4404** : 2015), which has been technically revised.

However, **JIS G 4404** : 2015 may be applied in the **JIS** mark certification based on the relevant provisions of Article 30, paragraph (1), etc. of the Industrial Standardization Act until 19 May 2023.

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

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, published patent application or utility model rights. The relevant Minister is not responsible for identifying any of such patent rights, published patent application or utility model rights.

Alloy tool steels

Introduction

This Japanese Industrial Standard has been prepared based on **ISO 4957** : 2018, Edition 3, with some modifications of the technical contents.

The vertical lines on both sides and dotted underlines indicate changes from the corresponding International Standard. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the requirements for alloy tool steels (hereafter referred to as tool steels) manufactured by hot-rolling or hot-forging.

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

ISO 4957 : 2018 *Tool steels* (MOD)

In addition, 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

Part or all of the provisions of the following standards, 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 0201 *Glossary of terms used in iron and steel (Heat treatment)*

JIS G 0202 *Glossary of terms used in iron and steel (Testing)*

JIS G 0203 *Glossary of terms used in iron and steel (Products and quality)*

JIS G 0320 *Standard test method 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 0558 *Steels — Determination of depth of decarburization*

JIS G 0701 *Symbols of forming ratio for steel forging*

JIS G 3191 *Dimensions, mass, shape and permissible variations of hot rolled steel bars and bar in coil*

JIS G 3193 *Dimensions, shape, mass and permissible variations of hot rolled steel plates, sheets and strips*

JIS G 3194 *Dimensions, shape, mass and permissible variations of hot rolled flat steel*

JIS Z 2243-1 *Brinell hardness test — Part 1 : Test method*

JIS Z 2244-1 *Vickers hardness test — Part 1 : Test method*

JIS Z 2245 *Rockwell hardness test — Test method*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions, and those given in **JIS G 0201**, **JIS G 0202** and **JIS G 0203** apply.

3.1

steel bar

tool steel manufactured by hot-rolling steel into a bar

Note 1 to entry This includes bar in coil (3.3).

Note 2 to entry This Standard covers steel bars manufactured by hot-forging.

3.2

round bar

steel bar (3.1) having a circular cross-section

3.3

bar in coil

steel bar (3.1) wound into a coil without cutting to length

Note 1 to entry Bar in coil may be designated as wire rods due to its similarity in appearance to wire rods, though it is generally intended to be used as steel bars and differs from wire rods in both material and applications. In statistical classification, bar in coil is treated as wire rods as it is produced on the same rolling line as the wire rods. Narrowly defined, “bar in coil” means products manufactured from normal steel, to be distinguished from “wire rods” which, in this case, means products manufactured from special steel.

3.4

flat steel

steel bar with a flat rectangular cross-section, hot-rolled or hot-forged on all four sides

Note 1 to entry Flat steels are generally 5 mm or more in thickness, and not more than 2 000 mm in width.

Note 2 to entry Flat steels may be called wide flats.

3.5

forging ratio

degree of metal deformation by forging, expressed by the ratio of the cross-section at the time of casting to that after hot-rolling or hot-forging

Note 1 to entry This is the forging ratio when the cross-sectional area is reduced and the length is increased. In a forging that reduces the cross-section to 1/4, the forging ratio is 4 S.

Note 2 to entry If the metal is subjected to both upset forging and solid forging, the forging ratio is expressed as the ratio of the cross-section after upset forging to that after hot-rolling or hot-forging.

4 Symbol of grade

Tool steels are classified into 20 grades, and their symbols shall be as given in Table 1.

NOTE Comparable grades between JIS and the corresponding International Standard are shown in Annex A.

Table 1 Symbols of grade

Symbol of grade	Remarks (informative)	
	Application	Application examples
SKS2	Mainly used for cutting tool steels	Tap, drill, cutter, press die, thread cutting die, etc.
SKS5		Circular saw, band saw, etc.
SKS51		
SKS7		Hacksaw, etc.
SKS81		Spare edged tool, edged tool, hacksaw, etc.
SKS8		Saw file, set file, etc.
SKS3	Mainly used for cold-rolled moulds	Gauge, shear knife, press die, thread cutting die, etc.
SKS31		Gauge, press die, thread cutting die, etc.
SKS93		Shear knife, gauge, press die, etc.
SKS95		
SKD1		Wire drawing die, press die, brick die, powder forming die, etc.
SKD10		Gauge, thread rolling die, tool for metal, forming roll, press die, etc.
SKD11		
SKD12		
SKD4	Mainly used for hot-rolled moulds	Press die, die-casting die, extrusion tool, shear blade, etc.
SKD61		
SKD62		Press die, extrusion tool, etc.
SKD7		
SKD8		Press die, die-casting die, extrusion tool, etc.
SKT4		Forging die, press die, extrusion tool, etc.

5 Manufacturing method

The manufacturing method shall be as follows.

- a) Tool steels shall be manufactured from killed steels.

- b) Tool steels shall be hot-rolled or hot-forged with a forging ratio of 4S or over.

If the forging ratio becomes smaller than 4S due to the product dimensions, a ratio of 4S or over may be achieved by combining the upset forging and solid forging in accordance with **3.2** of **JIS G 0701**.

- c) Steel plates, sheets and strips, if their thickness are not suitable for hot-rolling, may be manufactured by cold-rolling upon agreement between the purchaser and the manufacturer.
- d) Unless otherwise specified, tool steels shall be subjected to annealing.

6 Chemical composition

Tool steels shall be subjected to the heat analysis specified in **11.1** and satisfy the requirements in Table 2 to Table 4.

Table 2 Chemical composition (for cutting tool steels)

Symbol of grade	Unit: %									
	C	Si	Mn	P	S	Ni	Cr	W	V	Cu
SKS2	1.00 to 1.10	0.35 max.	0.80 max.	0.030 max.	0.030 max.	0.25 max.	0.50 to 1.00	1.00 to 1.50	0.20 max.	0.25 max.
SKS5	0.75 to 0.85	0.35 max.	0.50 max.	0.030 max.	0.030 max.	0.70 to 1.30	0.20 to 0.50	—	—	0.25 max.
SKS51	0.75 to 0.85	0.35 max.	0.50 max.	0.030 max.	0.030 max.	1.30 to 2.00	0.20 to 0.50	—	—	0.25 max.
SKS7	1.10 to 1.20	0.35 max.	0.50 max.	0.030 max.	0.030 max.	0.25 max.	0.20 to 0.50	2.00 to 2.50	0.20 max.	0.25 max.
SKS81	1.10 to 1.30	0.35 max.	0.50 max.	0.030 max.	0.030 max.	0.25 max.	0.20 to 0.50	—	—	0.25 max.
SKS8	1.30 to 1.50	0.35 max.	0.50 max.	0.030 max.	0.030 max.	0.25 max.	0.20 to 0.50	—	—	0.25 max.

Alloy elements not having limit values (indicated with “—”) in this table or not listed in this table shall not be intentionally added for other purposes than finishing the heat.

Table 3 Chemical composition (for cold-rolled moulds)

Symbol of grade	Unit: %								
	C	Si	Mn	P	S	Cr	Mo	W	V
SKS3	0.90 to 1.00	0.35 max.	0.90 to 1.20	0.030 max.	0.030 max.	0.50 to 1.00	—	0.50 to 1.00	—
SKS31	0.95 to 1.05	0.35 max.	0.90 to 1.20	0.030 max.	0.030 max.	0.80 to 1.20	—	1.00 to 1.50	—
SKS93	1.00 to 1.10	0.50 max.	0.80 to 1.10	0.030 max.	0.030 max.	0.20 to 0.60	—	—	—
SKS95	0.80 to 0.90	0.50 max.	0.80 to 1.10	0.030 max.	0.030 max.	0.20 to 0.60	—	—	—
SKD1	1.90 to 2.20	0.10 to 0.60	0.20 to 0.60	0.030 max.	0.030 max.	11.00 to 13.00	—	—	0.30 max.
SKD10	1.45 to 1.60	0.10 to 0.60	0.20 to 0.60	0.030 max.	0.030 max.	11.00 to 13.00	0.70 to 1.00	—	0.70 to 1.00
SKD11	1.40 to 1.60	0.40 max.	0.60 max.	0.030 max.	0.030 max.	11.00 to 13.00	0.80 to 1.20	—	0.20 to 0.50
SKD12	0.95 to 1.05	0.10 to 0.40	0.40 to 0.80	0.030 max.	0.030 max.	4.80 to 5.50	0.90 to 1.20	—	0.15 to 0.35

Alloy elements not having limit values (indicated with “—”) in this table or not listed in this table shall not be intentionally added for other purposes than finishing the heat.

Table 4 Chemical composition (for hot-rolled moulds)

Unit: %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Mo	W	V	Co
SKD4	0.25 to 0.35	0.40 max.	0.60 max.	0.030 max.	0.020 max.	—	2.00 to 3.00	—	5.00 to 6.00	0.30 to 0.50	—
SKD61	0.35 to 0.42	0.80 to 1.20	0.25 to 0.50	0.030 max.	0.020 max.	—	4.80 to 5.50	1.00 to 1.50	—	0.80 to 1.15	—
SKD62	0.32 to 0.40	0.80 to 1.20	0.20 to 0.50	0.030 max.	0.020 max.	—	4.75 to 5.50	1.00 to 1.60	1.00 to 1.60	0.20 to 0.50	—
SKD7	0.28 to 0.35	0.10 to 0.40	0.15 to 0.45	0.030 max.	0.020 max.	—	2.70 to 3.20	2.50 to 3.00	—	0.40 to 0.70	—
SKD8	0.35 to 0.45	0.15 to 0.50	0.20 to 0.50	0.030 max.	0.020 max.	—	4.00 to 4.70	0.30 to 0.50	3.80 to 4.50	1.70 to 2.10	4.00 to 4.50
SKT4	0.50 to 0.60	0.10 to 0.40	0.60 to 0.90	0.030 max.	0.020 max.	1.50 to 1.80	0.80 to 1.20	0.35 to 0.55	—	0.05 to 0.15	—

Alloy elements not having limit values (indicated with “—”) in this table or not listed in this table shall not be intentionally added for other purposes than finishing the heat.

7 Hardness

The hardness requirements shall be as follows.

- a) Annealed tool steels shall be subjected to the hardness test specified in 11.2 and satisfy the requirements in Table 5.

For tool steels not suitable for Brinell hardness measurement, Rockwell hardness or Vickers hardness may be measured. In this case, the required hardness value shall be as agreed between the purchaser and the manufacturer.

- b) Tool steels given other heat treatment than annealing as requested by the purchaser shall be subjected to the hardness test specified in 11.2 and satisfy the hardness requirement agreed between the purchaser and the manufacturer.

Table 5 Hardness (annealed tool steels)

Symbol of grade	Annealing temperature °C (informative)	Hardness HBW	Remarks (informative)
SKS2	750 to 800 slow cooling	217 max.	Mainly used for cutting tool steels
SKS5	750 to 800 slow cooling	207 max.	
SKS51	750 to 800 slow cooling	207 max.	
SKS7	750 to 800 slow cooling	217 max.	
SKS81	750 to 800 slow cooling	212 max.	
SKS8	750 to 800 slow cooling	217 max.	
SKS3	750 to 800 slow cooling	217 max.	Mainly used for cold-rolled moulds
SKS31	750 to 800 slow cooling	217 max.	
SKS93	750 to 780 slow cooling	217 max.	
SKS95	730 to 760 slow cooling	212 max.	
SKD1	830 to 880 slow cooling	248 max.	
SKD10	830 to 880 slow cooling	255 max.	
SKD11	830 to 880 slow cooling	255 max.	
SKD12	830 to 880 slow cooling	241 max.	
SKD4	800 to 850 slow cooling	235 max.	Mainly used for hot-rolled moulds
SKD61	820 to 870 slow cooling	229 max.	
SKD62	820 to 870 slow cooling	229 max.	
SKD7	820 to 870 slow cooling	229 max.	
SKD8	820 to 870 slow cooling	262 max.	
SKT4	740 to 800 slow cooling	248 max.	

8 Appearance

The tool steels shall be free from defects detrimental to practical use. The coiled products (bar in coil) may contain some defects since it is generally difficult to inspect their surfaces throughout the length and treat the defects found. Treatment of any defects detected in coils that are found to be detrimental to service, if required, shall be agreed between the purchaser and the manufacturer.

9 Dimensions and dimensional tolerances

9.1 Dimensions and dimensional tolerances of hot-rolled round bars

9.1.1 Standard dimensions

Standard diameters of hot-rolled round bars shall be as given in Table 6.

Table 6 Standard diameters of hot-rolled round bars

Unit: mm

10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 110, 120, 130, 140, 150
--

9.1.2 Dimensional tolerances

The tolerances on diameter and out-of-roundness for hot-rolled round bars shall be as given in Table 7.

Table 7 Tolerances on diameter and out-of-roundness for hot-rolled round bars

Unit: mm

Diameter	Tolerance on diameter	Out-of-roundness
10 or over to and excl. 16	+0.6 -0.3	Not exceeding 70 % of full range of tolerance on diameter
16 or over to and excl. 30	+0.7 -0.3	
30 or over up to and incl. 150	+2.5 % -1.0 %	
Tolerance on diameter and out-of-roundness for round bars of diameters under 10 mm and over 150 mm shall be agreed between the purchaser and the manufacturer.		

9.2 Dimensions and dimensional tolerances of other tool steels than hot-rolled round bars

The dimensions and dimensional tolerances of other tool steels than hot-rolled round bars shall be as agreed between the purchaser and the manufacturer.

10 Depth of decarburization

Hot-rolled round bars shall be subjected to the test of depth of decarburization specified in 11.3 and satisfy the requirement in Table 8. For other tool steels than hot-rolled round bars, the depth of decarburization shall be as agreed between the purchaser and the manufacturer.

Table 8 Depth of decarburization of hot-rolled round bar

Unit: mm

Diameter	Depth of decarburization
Under 15	0.30 max.
15 or over to and excl. 25	0.50 max.
25 or over to and excl. 50	0.80 max.
50 or over to and excl. 75	1.10 max.
75 or over to and excl. 100	1.40 max.
100 or over to and excl. 130	1.80 max.
130 or over up to and incl. 150	2.00 max.
The limit value for round bars of diameters over 150 mm shall be as agreed between the purchaser and the manufacturer.	

11 Tests

11.1 Chemical analysis

The chemical analysis shall be as follows.

- a) The chemical composition shall be determined by heat analysis. The general requirements for the chemical analysis and the sampling method for the heat analysis are specified in Clause 8 of **JIS G 0404**.
- b) The heat analysis method shall be in accordance with **JIS G 0320**.

11.2 Hardness test

11.2.1 General requirements

General requirements for hardness tests are specified in Clause 7 and Clause 9 of **JIS G 0404**. The sampling method shall be in accordance with Class A in 7.6 of **JIS G 0404**.

11.2.2 Number of test pieces

Take one sample from a unit of tool steels of the same heat, same heat treatment batch and same dimension, and take one test piece from each sample. Being “of the same dimension” means belonging to the same diameter group shown in Table 8 for round bars 150 mm or under in diameter, and having the same thickness for steel plates, sheets and strips, and forged products.

11.2.3 Test methods

The test methods shall be as follows.

- a) The Brinell hardness test method shall be in accordance with **JIS Z 2243-1**.
- b) The Vickers hardness test method shall be in accordance with **JIS Z 2244-1**.
- c) The Rockwell hardness test method shall be in accordance with **JIS Z 2245**.

11.3 Measurement of depth of decarburization

11.3.1 Number of test pieces

The number of test pieces shall be as follows.

- a) For hot-rolled round bars, take one sample from a unit of bars of the same heat, same rolling chance and same dimension, and take one test piece from each sample. Being “of the same dimension” means belonging to the same diameter group shown in Table 8 for hot-rolled round bars 150 mm or under in diameter.
- b) For other tool steels than hot-rolled round bars, the number of test pieces shall be as agreed between the purchaser and the manufacturer.
- c) For tool steels of which the cutting is performed by the manufacturer, the test may be omitted upon agreement between the purchaser and the manufacturer.

11.3.2 Test method

The total decarburized depth shall be measured in accordance with the method given

in 6.1 of JIS G 0558.

When the measurement by a microscope is difficult, the effective decarburized depth may be measured according to 6.2 of JIS G 0558. In this case, the heat treatment on sample shall be as given in Table 9, and the effective decarburized depth shall be the depth from the surface at which the hardness given in Table 9 is attained. The test piece shall be taken including the surface layer.

Table 9 Heat treatment condition, and quenched and tempered hardness of sample (where hardness test is used for measurement)

Symbol of grade	Heat treatment condition °C		Hardness HV	Remarks (informative)
	Quenched	Tempered		
SKS2	860 oil cooling	180 air cooling	720	Mainly used for cutting tool steels
SKS5	830 oil cooling	420 air cooling	446	
SKS51	830 oil cooling	420 air cooling	446	
SKS7	860 oil cooling	180 air cooling	746	
SKS81	790 water cooling	180 air cooling	772	
SKS8	810 water cooling	180 air cooling	772	
SKS3	830 oil cooling	180 air cooling	697	Mainly used for cold-rolled moulds
SKS31	830 oil cooling	180 air cooling	720	
SKS93	820 oil cooling	180 air cooling	772	
SKS95	820 oil cooling	180 air cooling	674	
SKD1	970 air cooling	180 air cooling	746	
SKD10	1 020 air cooling	180 air cooling	720	
SKD11	1 030 air cooling	180 air cooling	653	Mainly used for hot-rolled moulds
SKD12	970 air cooling	180 air cooling	697	
SKD4	1 080 oil cooling	600 air cooling	412	
SKD61	1 020 air cooling	550 air cooling	513	
SKD62	1 020 air cooling	550 air cooling	484	
SKD7	1 040 air cooling	550 air cooling	458	
SKD8	1 120 oil cooling	600 air cooling	484	
SKT4	850 oil cooling	500 air cooling	412	
For all the steel grades, the tolerance on quenching and tempering temperature shall be ± 10 °C.				

NOTE Other than the chemical analysis, hardness test and measurement of depth of decarburization specified in this Standard, a magnetic particle test, ultrasonic test, non-metallic inclusion test, macrostructure test, microstructure test, etc. may be carried out. In this case, the test method or other related matters shall be agreed between the purchaser and the manufacturer.

12 Inspection

The inspection shall be as follows.

- a) The general requirements of the inspections are specified in JIS G 0404.

- b) Chemical composition shall conform to the requirement of Clause 6.
- c) Hardness shall conform to the requirement of Clause 7.
- d) Appearance shall conform to the requirement of Clause 8.
- e) Dimensions shall conform to the requirement of Clause 9.
- f) Depth of decarburization shall conform to the requirement of Clause 10.

13 Marking

The following marking shall be given by a suitable means on each tool steel having passed the inspection. For steel plates, sheets and strips, flat steels, and steel bars and wire rods with a diameter or width across flats under 30 mm, the marking may be given on each bundle of these products by a suitable means. For steel bars with a diameter or width across flats 30 mm or over, the marking may be given on each bundle of bars by a suitable means upon agreement between the purchaser and the manufacturer.

If so agreed between the purchaser and the manufacturer, marking items non-essential to identification of the product may be omitted.

- a) Symbol of grade
- b) Heat number or other manufacture (inspection) number
- c) Name of manufacturer or identifying brand
- d) Dimensions, marked in accordance with Clause 4 of **JIS G 3191** for wire rods, and in accordance with **JIS G 3191**, **JIS G 3193** and **JIS G 3194** for other tool steels.

14 Information to be supplied by the purchaser

To properly specify the requirements of this Standard, the purchaser shall supply the following information to the manufacturer, processor or intermediary at the time of making the order.

- a) Product shape (round bar, plate, sheet, strip or others)
- b) Symbol of grade (Clause 4)
- c) Dimensions

15 Report

When requested by the purchaser, the manufacturer shall submit the inspection document to the purchaser. The report shall be in accordance with Clause 13 of **JIS G 0404**. Unless otherwise specified in the order, the type of the inspection document to be submitted shall be in accordance with 5.1 of **JIS G 0415**.

Annex A (informative)

Comparable grades between JIS and corresponding International Standard

A.1 Comparable grades between JIS and corresponding International Standard

Annex A.1 shows comparable grades between **JIS** and the corresponding International Standard.

NOTE The following is a cross-reference between **JIS** and **ISO** designations of alloy tool steels extracted from the comparison table in **ISO 4957**.

Table A.1 Comparable grades between JIS and corresponding International Standard

Symbol of grade		Remarks (informative)
JIS	Corresponding International Standard	
SKS2	—	Mainly used for cutting tool steels
SKS5	—	
SKS51	—	
SKS7	—	
SKS81	—	
SKS8	—	
SKS3	—	Mainly used for cold-rolled moulds
SKS31	—	
SKS93	—	
SKS95	—	
SKD1	X210Cr12	
SKD10	X153CrMoV12	
SKD11	—	Mainly used for hot-rolled moulds
SKD12	X100CrMoV5	
SKD4	—	
SKD61	X40CrMoV5- 1	
SKD62	X35CrWMoV5	
SKD7	32CrMoV12-28	
SKD8	38CrCoWV18-17-17	Mainly used for hot-rolled moulds
SKT4	55NiCrMoV7	

Annex JA (informative)

Comparison table between JIS and corresponding International Standard

JIS G 4404		ISO 4957 : 2018, (MOD)		
a) No. of clause (JIS)	b) No. of clause (corresponding International Standard)	c) Classification by clause	d) Detail and justification of technical deviation	e) Future measures for the technical deviation
1	1	Deletion	Divide the ISO contents into three separate standards (carbon tool steels, high speed tool steels, alloy tool steels) and cover only alloy tool steels in this Standard.	Carbon tool steels and high speed tool steels are covered by JIS G 4401 and JIS G 4403 , respectively. No measure will be taken.
3	3	Alteration	Replace the ISO terminology standards with JIS 's own terminology standards.	No measure will be taken.
		Addition	Add definitions of terms not covered by the iron and steel terminology standards of JIS .	
4	4	Alteration	Replace ISO 's list of applicable steel grades with JIS 's own. JIS provides 8 grades, out of the 20 grades in total, that need to be specified in ISO as ISO -comparable steel grades, but with slightly different requirements from ISO .	Further harmonization with ISO will be considered as the need for specification in ISO arises.
		Addition	Add 12 steel grades that are unique to JIS so as to provide finer classification than ISO .	
		Deletion	Delete 18 ISO steel grades that are not recognized to have needs in Japan.	
5	6	Alteration	JIS provides a specific heat treatment requirement for clarification of manufacturing method while ISO leaves the choice of heat treatment to agreement. JIS requires that the products be produced from killed steel, hot-rolled or hot-forged at a forging ratio 4 S or more.	No measure will be taken.
6	7.2	Alteration	Slightly change the chemical composition requirements for ISO comparable steel grades.	No measure will be taken.

a) No. of clause (JIS)	b) No. of clause (corresponding International Standard)	c) Classification by clause	d) Detail and justification of technical deviation	e) Future measures for the technical deviation
7	7.2	Alteration	JIS provides hardness values for annealed tool steels and leaves the hardness requirement to agreement for tool steels not given annealing, while ISO provides hardness values for tool steels not given annealing.	Due to difference in standard structure. Current JIS structure will be maintained as changing it may create inconveniences in transactions.
8	7.3.1	Alteration	Delete the reference to ISO 9443 and ISO 7788 and provide the relevant requirements directly in this Standard.	Due to difference in standard structure. Current JIS structure will be maintained as changing it may create inconveniences in transactions.
9	7.4	Alteration	Delete the reference to ISO 1035 (all parts) and ISO 7452 and provide the relevant requirements directly in this Standard.	Due to difference in standard structure. Current JIS structure will be maintained as changing it may create inconveniences in transactions.
10	7.3.2	Alteration	Replace the ISO requirement, "Ground, polished or finished-machined products shall be free from surface decarburization.", with specific limit values of total decarburized depth for hot-rolled round bars.	Due to difference in standard structure. Current JIS structure will be maintained as changing it may create inconveniences in transactions.
11	8.2	Alteration	Replace the references to relevant ISO standards with references to corresponding JISs . JIS specifies chemical analysis as a mandatory test while ISO leaves it to the discretion of the manufacturer.	Due to difference in standard structure. Current JIS structure will be maintained as changing it may create inconveniences in transactions.
12	8.1	Alteration	Replace the references to relevant ISO standards with references to corresponding JISs .	No measure will be taken.
13	8.1	Alteration	Replace the references to relevant ISO standards with references to corresponding JISs .	No measure will be taken.

a) No. of clause (JIS)	b) No. of clause (corresponding International Standard)	c) Classification by clause	d) Detail and justification of technical deviation	e) Future measures for the technical deviation
14	5	Alteration	JIS makes the supply of information a mandatory responsibility of the purchaser while ISO makes the obtaining of information from the purchaser a mandatory responsibility of the manufacturer.	The supply of information is a requirement for purchasers in many relevant ISOs ; no measure will be taken.
15	8.1	Alteration	Replace the references to relevant ISO standards with references to corresponding JISs .	No measure will be taken.
Annex A	Annex C	Alteration	JIS compares grades of alloy tool steels between ISO and JIS , while ISO compares grades of carbon tool steels, high speed tool steels and alloy tool steels among ISO , EN and JIS .	Inadequacies in ISO (omission of comparable grades and inclusion of grades that have gone obsolete) will be addressed at the next revision.
<p>NOTE 1 Symbols in sub-columns of classification by clause in the above table indicate as follows :</p> <ul style="list-style-type: none"> — Deletion : Delete the specification item(s) or content(s) of International Standard(s). — Addition : Add the specification item(s) or content(s) which are not included in International Standard(s). — Alteration : Alter the specification content(s) or structure of International Standard(s). <p>NOTE 2 Symbol of overall degree of correspondence between JIS and International Standard(s) in the above table indicates as follows :</p> <ul style="list-style-type: none"> — MOD : Modify International Standard(s). 				

Blank

Copyrighted material

Errata for **JIS** (English edition) can be downloaded in PDF format at Webdesk (purchase information page) of our website (<https://www.jsa.or.jp/>).

For inquiry, please contact:

Publication and Information Unit, Japanese Standards Association Group

E-mail: csd@jsa.or.jp