

JAPANESE INDUSTRIAL STANDARD

JIS G 4308 : 1998

Stainless steel wire rods

January, 2005

ERRATA

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Table 4

The values of Cr for SUS 410 and SUS 410F2 are both corrected as follows :

Error : 11.50 to 13.00

Correct : 11.50 to 13.50

Remarks: This erratum is for correcting the first edition of this Standard.

Japanese Standards Association

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In Table 2, when the symbol of grade is SUS304, the numerical value of C is changed as follows:

Error 0.080

Correct 0.08

Remarks: This erratum is for correcting the first edition of this Standard.

Japanese Standards Association

JIS

JAPANESE
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Ⓜ JIS G 4308 : 1998

Stainless steel wire rods

ICS 77.140.20 ; 77.140.65

Descriptors : wires, materials by form, bars (materials), metal sections, stainless steels,
corrosion-resistant steels

Reference number : JIS G 4308 : 1998 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently JIS G 4308 : 1991 is replaced with JIS G 4308 : 1998.

Date of Establishment: 1959-12-01

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Stainless steel wire rods

Introduction This Standard comes to the present through 6 times revisions since established in 1959. This revision is for the purposes of being reflected changes of techniques and demands since the revision in 1991. Though study for conformance with International Standard have been advanced, the object International Standards (ISO 683-13, ISO 683-16) are decided to be annulled at TC17/SC4 in June, 1996, which have been newly revised to two standards of flat product and long product. However, the contents have not been agreed upon yet. Therefore, this revision is advanced considering that the corresponding International Standard does not exist.

Dimensional tolerances have conformed to International Standard (ISO 1035, *Hot-rolled bars—Part 4: Tolerances*) in the last revision.

Principal revised points are as follows.

- a) **Grades and symbols** SUS303Cu, SUS316F, and SUS431 are added to obtain 36 grades as total by request from domestic customers. Besides, chemical compositions are additively stated.

1 Scope This Japanese Industrial Standard specifies the stainless steel wire rods (hereafter, referred to as "wire rods"). However, this is not applicable to the stainless steel wire rods for welding materials.

2 Normative references The standards listed in Attached Table 1 contain provisions which, through reference in this Standard, constitute provisions of this Standard.

The most recent editions of the standards shall be applied.

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3 Grades and symbols The wire rods shall be classified into 36 grades and the symbols and classification shall be as given in Table 1.

Table 1 Symbols of grades and classification

Symbol of grade	Classification	Symbol of grade	Classification
SUS201	Austenitic series	SUS430	Ferritic series
SUS302		SUS430F	
SUS303		SUS434	
SUS303Se		SUS403	Martensitic series
SUS303Cu		SUS410	
SUS304		SUS410F2	
SUS304L		SUS416	
SUS304N1		SUS420J1	
SUS304J3		SUS420J2	
SUS305		SUS420F	
SUS305J1		SUS420F2	
SUS309S		SUS431	
SUS310S		SUS440C	
SUS316		SUS631J1	Precipitation hardening series
SUS316L			
SUS316F			
SUS317			
SUS317L			
SUS321			
SUS347			
SUS384			
SUSXM7			

Informative reference : In the case where it is required to indicate by symbol that the material is of wire rod, -WR is to be suffixed to the tail end of the symbol of grade.

Example : SUS304-WR

4 Chemical composition

4.1 Ladle analysis Wire rods shall be tested in accordance with 9.1 and the ladle analysis thereof shall be as given in Tables 2 to 5.

Table 2 Chemical composition for austenitic series

Unit : %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Mo	Others
SUS201	0.15 max.	1.00 max.	5.50 to 7.50	0.060 max.	0.030 max.	3.50 to 5.50	16.00 to 18.00	—	N 0.25 max.
SUS302	0.15 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.00 to 10.00	17.00 to 19.00	—	—
SUS303	0.15 max.	1.00 max.	2.00 max.	0.20 max.	0.15 min.	8.00 to 10.00	17.00 to 19.00	(1)	—
SUS303Se	0.15 max.	1.00 max.	2.00 max.	0.20 max.	0.060 max.	8.00 to 10.00	17.00 to 19.00	—	Se 0.15 min.
SUS303Cu	0.15 max.	1.00 max.	3.00 max.	0.20 max.	0.15 min.	8.00 to 10.00	17.00 to 19.00	—	Cu 1.50 to 3.50
SUS304	0.080 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.00 to 10.50	18.00 to 20.00	—	—
SUS304L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00 to 13.00	18.00 to 20.00	—	—
SUS304N1	0.08 max.	1.00 max.	2.50 max.	0.045 max.	0.030 max.	7.00 to 10.50	18.00 to 20.00	—	N 0.10 to 0.25
SUS304J3	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.00 to 10.50	17.00 to 19.00	—	Cu 1.00 to 3.00
SUS305	0.12 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.50 to 13.00	17.00 to 19.00	—	—
SUS305J1	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00 to 13.50	16.50 to 19.00	—	—
SUS309S	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	12.00 to 15.00	22.00 to 24.00	—	—
SUS310S	0.08 max.	1.50 max.	2.00 max.	0.045 max.	0.030 max.	19.00 to 22.00	24.00 to 26.00	—	—
SUS316	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.00 to 14.00	16.00 to 18.00	2.00 to 3.00	—
SUS316L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	12.00 to 15.00	16.00 to 18.00	2.00 to 3.00	—
SUS316F	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.10 min.	10.00 to 14.00	16.00 to 18.00	2.00 to 3.00	—
SUS317	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00 to 15.00	18.00 to 20.00	3.00 to 4.00	—
SUS317L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00 to 15.00	18.00 to 20.00	3.00 to 4.00	—

Table 2 (concluded)

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Mo	Others
SUS321	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00 to 13.00	17.00 to 19.00	—	Ti 5*C% min.
SUS347	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00 to 13.00	17.00 to 19.00	—	Nb 10*C% min.
SUS384	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	17.00 to 19.00	15.00 to 17.00	—	—
SUSXM7	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.50 to 10.50	17.00 to 19.00	—	Cu 3.00 to 4.00

Note (1) 0.60 % or less of Mo may be added.

Table 3 Chemical composition for ferritic series

Symbol of grade	C	Si	Mn	P	S	Cr	Mo
SUS430	0.12 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 18.00	—
SUS430F	0.12 max.	1.00 max.	1.25 max.	0.060 max.	0.15 min.	16.00 to 18.00	(2)
SUS434	0.12 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 18.00	0.75 to 1.25

Unit : %

Note (2) 0.60 % or less of Mo may be added.

Remarks : 0.60 % or less of Ni may be contained.

Table 4 Chemical composition for martensitic series

Unit : %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Mo	Pb
SUS403	0.15 max.	0.50 max.	1.00 max.	0.040 max.	0.030 max.	(³)	11.50 to 13.00	—	—
SUS410	0.15 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	11.50 to 13.00	—	—
SUS410F2	0.15 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	11.50 to 13.00	—	0.05 to 0.30
SUS416	0.15 max.	1.00 max.	1.25 max.	0.060 max.	0.15 min.	(³)	12.00 to 14.00	(⁴)	—
SUS420J1	0.16 to 0.25	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	12.00 to 14.00	—	—
SUS420J2	0.26 to 0.40	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	12.00 to 14.00	—	—
SUS420F	0.26 to 0.40	1.00 max.	1.25 max.	0.060 max.	0.15 min.	(³)	12.00 to 14.00	(⁴)	—
SUS420F2	0.26 to 0.40	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	12.00 to 14.00	—	0.05 to 0.30
SUS431	0.20 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	1.25 to 2.50	15.00 to 17.00	—	—
SUS440C	0.95 to 1.20	1.00 max.	1.00 max.	0.040 max.	0.030 max.	(³)	16.00 to 18.00	(⁵)	—

Notes (³) 0.60 % or less of Ni may be contained.

(⁴) 0.60 % or less of Mo may be added to SUS416 and SUS420F.

(⁵) 0.75% or less of Mo may be added to SUS440C.

Table 5 Chemical composition for precipitation hardening series

Unit : %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Al
SUS631J1	0.09 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	7.00 to 8.50	16.00 to 18.00	0.75 to 1.50

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4.2 Product analysis The product analysis of wire rods shall be obtained in accordance with 9.1 when requested by the purchaser and the permissible variation shall be as given in Table 4 of **JIS G 0321**. However, the values of elements and chemical composition not specified in this table shall be as agreed upon between the parties concerned with delivery.

5 Dimensions and tolerances

5.1 Standard diameter of wire rods The standard diameters of wire rods shall be as given in Table 6.

Table 6 Standard diameter

Unit : mm

5.5, 6.0, 7.0, 8.0, 9.0, 9.5, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
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5.2 Tolerance and permissible ovality on diameter of wire rod The tolerance and permissible ovality on the diameter of wire rods shall be as given in Table 7. However, those for wire rods of over 20 mm diameter shall be as agreed upon between the parties concerned with delivery.

Table 7 Tolerances and permissible ovality on diameter

Unit : mm

Diameter	Tolerance	Permissible ovality ⁽⁶⁾
5.5 or over up to and incl. 15	±0.3	0.5 max.
Over 15 up to and incl. 20	±0.4	0.6 max.

Note (6) The ovality is expressed by the difference between the maximum value and the minimum value on the same section.

6 Appearance The wire rods shall be excellently finished and free from defects such as flaws, cracks, etc. harmful to ordinary use.

7 Depth of flaw When wire rods are tested in accordance with 9.2, the depth of a longitudinal crack-like flaw shall not exceed 0.15 mm for wire rods of 14 mm or under in diameter.

Further, the depth of said flaw for wire rods of over 14 mm in diameter shall be as agreed upon between the parties concerned with delivery.

8 Manufacturing method The wire rods shall be as hot rolled. However, pickling or heat treatment may be processed, as required.

9 Tests

9.1 Analytical test The analytical test shall be as follows.

- a) General items of the analytical test and the sampling method of the ladle analysis sample shall be in accordance with the specifications of 3 of **JIS G 0303**.
- b) The sampling method of the product analysis sample shall be in accordance with the specifications of 3 of **JIS G 0321**.
- c) The analytical method shall be in accordance with any one of the following standards.

**JIS G 1211, JIS G 1212, JIS G 1213, JIS G 1214, JIS G 1215, JIS G 1216,
JIS G 1217, JIS G 1218, JIS G 1219, JIS G 1223, JIS G 1224, JIS G 1228,
JIS G 1233, JIS G 1237, JIS G 1253, JIS G 1256, JIS G 1257**

9.2 Flaw detection test The flaw detection test shall be as follows.

- a) **Sampling method** For the sample to be used for a flaw detection test, each one test piece shall be, as a rule, taken from both ends of each coil.
- b) **Test method** After descaling a test piece by picking or the like, the depth of a surface flaw shall be measured with a measuring instrument of appropriate precision.

10 Inspection The inspection of wire rods shall be as follows.

- a) General items for inspection shall be in accordance with **JIS G 0303**.
- b) The chemical composition shall conform to the requirements specified in 4.
- c) The dimensions shall conform to the requirements specified in 5.
- d) The appearance shall conform to the requirements specified in 6.
- e) The depth of a flaw shall conform to the requirements specified in 7.

11 Marking The wire rods which have passed the inspection shall be marked with the following information on each coil or each handle. However, a part of these may be omitted, agreed upon between the parties concerned with delivery.

- a) Symbol of grade
- b) Diameter of wire rod
- c) Manufacturer's name or its abbreviation
- d) Ladle number or inspection number

12 Report If the orderer requested, the manufacturer shall submit a test result table and a report which are described specified tests and quantity, delivery conditions, etc. of wire rods, respectively.

In the case where any alloying elements have been added in accordance with Note or Remarks of Tables 2 to 4, the contents of the added elements shall be appended to the result table.

8.
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Attached Table 1 Normative references

- JIS G 0303 *General rules for inspection of steel*
- JIS G 0321 *Product analysis and its tolerance for wrought steel*
- JIS G 1211 *Iron and steel – Methods for determination of carbon content*
- 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 1216 *Methods for determination of nickel in iron and steel*
- JIS G 1217 *Methods for determination of chromium in iron and steel*
- JIS G 1218 *Iron and steel – Methods for determination of molybdenum content*
- JIS G 1219 *Methods for determination of copper in iron and steel*
- JIS G 1223 *Methods for determination of titanium in iron and steel*
- JIS G 1224 *Methods for determination of aluminium in iron and steel*
- JIS G 1228 *Iron and steel – Methods for determination of nitrogen content*
- JIS G 1233 *Steel – Method for determination of selenium content*
- JIS G 1237 *Methods for determination of niobium in steel*
- JIS G 1253 *Iron and steel – Method for spark discharge atomic emission spectrometric analysis*
- 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*

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