

JIS

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JAPANESE INDUSTRIAL STANDARD

Hot rolled stainless steel plates, sheets and strip

☎ JIS G 4304—1991

Translated and Published

by

Japanese Standards Association

**In the event of any doubt arising,
the original Standard in Japanese is to be final authority**

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1. Scope

This Japanese Industrial Standard specifies the hot rolled stainless plates and sheets (hereafter, referred to as plates) and the hot rolled stainless steel strip (hereafter, referred to as strip).

Remarks 1. Applicable standards in this Standard are shown in Attached Table 1.

2. Corresponding International Standards in this Standard are shown as follows:.

ISO 683-13: 1986 Heat-treatable steels, alloy steels and free-cutting steels - Part 13: Wrought stainless steels

ISO 683-16: 1976 Heat-treated steels, alloy steels and free-cutting steels - Part 16: Precipitation hardening stainless steels

2. Grades and symbols

Plates and strip shall be classified into 59 grades, and their symbols and classification shall be as given in Table 1.

Table 1. Symbol of grade and classification

Symbol of grade	Classification	Symbol of grade	Classification	Symbol of grade	Classification		
SUS201 SUS202 SUS301 SUS301L SUS301J1 SUS302 SUS302B SUS304 SUS304L SUS304N1 SUS304N2 SUS304LN SUS304J1 SUS304J2 SUS305 SUS309S SUS310S SUS316 SUS316L SUS316N SUS316LN	Austenitic series	SUS316T1 SUS316J1 SUS316J1L SUS317 SUS317L SUS317LN SUS317J1 SUS317J2 SUS317J3L SUS317J4L SUS317J5L SUS321 SUS347 SUSXM15J1	Austenitic series	SUS429 SUS430 SUS430LX SUS430J1L SUS434 SUS436L SUS436J1L SUS444 SUS447J1 SUSXM27	Ferritic series		
		SUS329J1 SUS329J3L SUS329J4L		Austenitic-ferritic series		SUS403 SUS410 SUS410S SUS420J1 SUS420J2 SUS429J1 SUS440A	Martensitic series
		SUS405 SUS410L		Ferritic series		SUS630 SUS631	

Remarks 1. In the case where it is required to indicate by a symbol that the product is a plate, -HP shall be suffixed to the symbol of grade.

Example SUS 304-HP

2. In the case where it is required to indicate by a symbol that the product is a strip, -HS shall be suffixed to the symbol of grade.

Example: SUS 304-HS

3. Chemical composition

3.1 Ladle analysis value The plates and strip shall be subjected to the ladle analysis test of 10.1 and the analysis test values shall be as given in Tables 2 to 6.

3.2 Product analysis value When the product analysis value of plates and strip are required by the purchaser, the product analysis test of 10.1 shall be carried out and the values of permissible variation shall be as given in Table 4 of JIS G 0321. However, the values of the elements and chemical composition not specified in this Table shall be as agreed upon between the parties concerned with delivery.

Table 2. Chemical composition of austenitic series

Symbol of grade	C	Si	Mn	P	S	Ni
SUS201	0.15 max.	1.00 max.	5.50to7.50	0.060 max.	0.030 max.	3.50to 5.50
SUS202	0.15 max.	1.00 max.	7.50to10.00	0.060 max.	0.030 max.	4.00to 6.00
SUS301	0.15 max.	1.00 max.	2.00max.	0.045 max.	0.030 max.	6.00to 8.00
SUS301L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	6.00to 8.00
SUS301J1	0.08to0.12	1.00 max.	2.00 max.	0.045 max.	0.030 max.	7.00to 9.00
SUS302	0.15 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.00to10.00
SUS302B	0.15 max.	2.00to3.00	2.00 max.	0.045 max.	0.030 max.	8.00to10.00
SUS304	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.00to10.50
SUS304L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00to13.00
SUS304N1	0.08 max.	1.00 max.	2.50 max.	0.045 max.	0.030 max.	7.00to10.50
SUS304N2	0.08 max.	1.00 max.	2.50 max.	0.045 max.	0.030 max.	7.50to10.50
SUS304LN	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	8.50to11.50
SUS304J1	0.08 max.	1.70 max.	3.00 max.	0.045 max.	0.030 max.	6.00to 9.00
SUS304J2	0.08 max.	1.70 max.	3.00to5.00	0.045 max.	0.030 max.	6.00to 9.00
SUS305	0.12 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.50to13.00
SUS309S	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	12.00to15.00
SUS310S	0.08 max.	1.50 max.	2.00 max.	0.045 max.	0.030 max.	19.00to22.00
SUS316	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.00to14.00
SUS316L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	12.00to15.00
SUS316N	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.00to14.00
SUS316LN	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.50to14.50
SUS316Ti	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.00to14.00
SUS316J1	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	10.00to14.00
SUS316J1L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	12.00to16.00
SUS317	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00to15.00
SUS317L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00to15.00
SUS317LN	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00to15.00
SUS317J1	0.040 max.	1.00 max.	2.50 max.	0.045 max.	0.030 max.	15.00to17.00
SUS317J2	0.06 max.	1.50 max.	2.00 max.	0.045 max.	0.030 max.	12.00to16.00
SUS317J3L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	11.00to13.00
SUS317J4L	0.030 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	24.00to26.00
SUS317J5L	0.020 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	23.00to28.00
SUS321	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00to13.00
SUS347	0.08 max.	1.00 max.	2.00 max.	0.045 max.	0.030 max.	9.00to13.00
SUSXM15J1	0.08 max.	3.00to5.00	2.00 max.	0.045 max.	0.030 max.	11.50to15.00

Unit: %

Cr	Mo	Cu	N	Others	Symbol of grade
16.00to18.00	—	—	0.25 max.	—	SUS201
17.00to19.00	—	—	0.25 max.	—	SUS202
16.00to18.00	—	—	—	—	SUS301
16.00to18.00	—	—	0.20 max.	—	SUS301L
16.00to18.00	—	—	—	—	SUS301J1
17.00to19.00	—	—	—	—	SUS302
17.00to19.00	—	—	—	—	SUS302B
18.00to20.00	—	—	—	—	SUS304
18.00to20.00	—	—	—	—	SUS304L
18.00to20.00	—	—	0.10to0.25	—	SUS304N1
18.00to20.00	—	—	0.15to0.30	Nb 0.15 max.	SUS304N2
17.00to19.00	—	—	0.12to0.22	—	SUS304LN
15.00to18.00	—	1.00to3.00	—	—	SUS304J1
15.00to18.00	—	1.00to3.00	—	—	SUS304J2
17.00to19.00	—	—	—	—	SUS305
22.00to24.00	—	—	—	—	SUS309S
24.00to26.00	—	—	—	—	SUS310S
16.00to18.00	2.00to3.00	—	—	—	SUS316
16.00to18.00	2.00to3.00	—	—	—	SUS316L
16.00to18.00	2.00to3.00	—	0.10to0.22	—	SUS316N
16.50to18.50	2.00to3.00	—	0.12to0.22	—	SUS316LN
16.00to18.00	2.00to3.00	—	—	Ti 5×C% min.	SUS316Ti
17.00to19.00	1.20to2.75	1.00to2.50	—	—	SUS316J1
17.00to19.00	1.20to2.75	1.00to2.50	—	—	SUS316J1L
18.00to20.00	3.00to4.00	—	—	—	SUS317
18.00to20.00	3.00to4.00	—	—	—	SUS317L
18.00to20.00	3.00to4.00	—	0.10to0.22	—	SUS317LN
16.00to19.00	4.00to6.00	—	—	—	SUS317J1
23.00to26.00	0.50to1.20	—	0.25to0.40	—	SUS317J2
20.50to22.50	2.00to3.00	—	0.18to0.30	—	SUS317J3L
19.00to24.00	5.00to7.00	—	0.25 max.	—	SUS317J4L
19.00to23.00	4.00to5.00	1.00to2.00	—	—	SUS317J5L
17.00to19.00	—	—	—	Ti 5×C% min.	SUS321
17.00to19.00	—	—	—	Nb 10×C% min.	SUS347
15.00to20.00	—	—	—	—	SUSXM15J1

Remarks: Alloying elements other than those given in Table 2 may be added to SUSXM15J1, if required.

Table 3. Chemical composition of austenitic - ferritic series

Unit: %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Mo	N
SUS329J1	0.08 max.	1.00 max.	1.50 max.	0.040 max.	0.030 max.	3.00 to 6.00	23.00 to 28.00	1.00 to 3.00	-
SUS329J3L	0.030 max.	1.00 max.	2.00 max.	0.040 max.	0.030 max.	4.50 to 6.50	21.00 to 24.00	2.50 to 3.50	0.08 to 0.20
SUS329J4L	0.030 max.	1.00 max.	1.50 max.	0.040 max.	0.030 max.	5.50 to 7.50	24.00 to 26.00	2.50 to 3.50	0.08 to 0.30

Remarks: Alloying elements other than those given in Table 3 may be added, if required.

Table 4. Chemical composition of ferritic series

Unit: %

Symbol of grade	C	Si	Mn	P	S	Cr	Mo	N	Others
SUS405	0.08 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.50 to 14.50	-	-	Al 0.20 to 0.30
SUS410L	0.030 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.00 to 13.50	-	-	-
SUS429	0.12 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	14.00 to 16.00	-	-	-
SUS430	0.12 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 18.00	-	-	-
SUS430LX	0.030 max.	0.75 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 19.00	-	-	Ti or Nb 0.10 to 1.00
SUS430JLL	0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 20.00	-	0.025 max.	Nb 8 x (C % + N %) to 0.80 Cu 0.30 to 0.80
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	-	-
SUS436L	0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 19.00	0.75 to 1.25	0.025 max.	Ti, Nb, Zr or their combination 8 x (C % + N %) to 0.80
SUS436JLL	0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	17.00 to 20.00	0.40 to 0.80	0.025 max.	Nb 8 x (C % + N %) to 0.80
SUS444	0.025 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	17.00 to 20.00	1.75 to 2.50	0.025 max.	Ti, Nb, Zr or their combination 8 x (C % + N %) to 0.80
SUS447J1	0.010 max.	0.40 max.	0.40 max.	0.030 max.	0.020 max.	28.50 to 32.00	1.50 to 2.50	0.015 max.	-
SUSXM27	0.010 max.	0.40 max.	0.40 max.	0.030 max.	0.020 max.	25.00 to 27.50	0.75 to 1.50	0.015 max.	-

Remarks 1. The classes other than SUS447J1 and SUSXM27 may contain 0.60 % max. of Ni.

2. SUS447J1 and SUSXM27 may contain 0.50 % max. of Ni, 0.20 % max. of Cu and 0.50 % max. of Ni + Cu.
In addition, alloying elements others than those given in Table 4 may be added to SUS447J1, SUSXM27 and SUS430JLL, if required.

Table 5. Chemical composition of martensitic series

Unit: %

Symbol of grade	C	Si	Mn	P	S	Cr
SUS403	0.15 max.	0.50 max.	1.00 max.	0.040 max.	0.030 max.	11.50 to 13.00
SUS410	0.15 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.50 to 13.50
SUS410S	0.08 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	11.50 to 13.50
SUS420J1	0.16 to 0.25	1.00 max.	1.00 max.	0.040 max.	0.030 max.	12.00 to 14.00
SUS420J2	0.26 to 0.40	1.00 max.	1.00 max.	0.040 max.	0.030 max.	12.00 to 14.00
SUS429J1	0.25 to 0.40	1.00 max.	1.00 max.	0.040 max.	0.030 max.	15.00 to 17.00
SUS440A	0.60 to 0.75	1.00 max.	1.00 max.	0.040 max.	0.030 max.	16.00 to 18.00

Remarks 1. 0.60 % max. of Ni may be contained.

2. 0.75 % max. of Mo may be added to SUS440A.

Table 6. Chemical composition of precipitation hardening series

Unit: %

Symbol of grade	C	Si	Mn	P	S	Ni	Cr	Cu	Others
SUS630	0.07 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	3.00 to 5.00	15.00 to 17.50	3.00 to 5.00	Nb 0.15 to 0.45
SUS631	0.09 max.	1.00 max.	1.00 max.	0.040 max.	0.030 max.	6.50 to 7.75	16.00 to 18.00	-	Al 0.75 to 1.50

4. Mechanical properties

The plates and strip heat-treated shall be subjected to the mechanical test of 10.2 and the mechanical properties shall be as follows. However, mechanical properties of strip for rerolling shall be as agreed upon between the parties concerned with delivery.

- (1) Mechanical properties of austenitic series The proof stress, tensile strength, elongation and hardness of the plates and strip processed by solution treatment shall be as given in Table 7. However, the proof stress shall be applied only when particularly designated by the purchaser.

Table 7. Mechanical properties under solution treated condition
(Austenitic series)

Symbol of grade	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness		
				HB	HRB	HV
SUS201	245 min.	640 min.	40 min.	241 max.	100 max.	253 max.
SUS202	245 min.	590 min.	40 min.	207 max.	95 max.	218 max.
SUS301	205 min.	520 min.	40 min.	207 max.	95 max.	218 max.
SUS301L	215 min.	550 min.	45 min.	187 max.	90 max.	200 max.
SUS301J1	205 min.	570 min.	45 min.	187 max.	90 max.	200 max.
SUS302	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS302B	205 min.	520 min.	40 min.	207 max.	95 max.	218 max.
SUS304	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS304L	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS304N1	275 min.	550 min.	35 min.	217 max.	95 max.	220 max.
SUS304N2	345 min.	690 min.	35 min.	248 max.	100 max.	260 max.
SUS304LN	245 min.	550 min.	40 min.	217 max.	95 max.	220 max.
SUS304J1	155 min.	450 min.	40 min.	187 max.	90 max.	200 max.
SUS304J2	155 min.	450 min.	40 min.	187 max.	90 max.	200 max.
SUS305	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS309S	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS310S	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS316	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS316L	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS316N	275 min.	550 min.	35 min.	217 max.	95 max.	220 max.
SUS316LN	245 min.	550 min.	40 min.	217 max.	95 max.	220 max.
SUS316Ti	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS316J1	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS316J1L	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS317	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS317L	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS317LN	245 min.	550 min.	40 min.	217 max.	95 max.	220 max.
SUS317J1	175 min.	480 min.	40 min.	187 max.	90 max.	200 max.
SUS317J2	345 min.	690 min.	40 min.	250 max.	100 max.	260 max.
SUS317J3L	275 min.	640 min.	40 min.	217 max.	96 max.	230 max.
SUS317J4L	205 min.	520 min.	35 min.	217 max.	96 max.	230 max.
SUS317J5L	215 min.	490 min.	35 min.	187 max.	90 max.	200 max.
SUS321	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUS347	205 min.	520 min.	40 min.	187 max.	90 max.	200 max.
SUSXM15J1	205 min.	520 min.	40 min.	207 max.	95 max.	218 max.

(2) Mechanical properties of austenitic - ferritic series The proof stress, tensile strength, elongation and hardness of the plates and strip processed by solution treatment shall be as given in Table 8. However, the proof stress shall be applied only when particularly designated by the purchaser.

Table 8. Mechanical properties under solution treated condition
(Austenitic - ferritic series)

Symbol of grade	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness		
				HB	HRB	HV
SUS329J1	390 min.	590 min.	18 min.	277 max.	29 max.	292 max.
SUS329J3L	450 min.	620 min.	18 min.	302 max.	32 max.	320 max.
SUS329J4L	450 min.	620 min.	18 min.	302 max.	32 max.	320 max.

(3) Mechanical properties of ferritic series The proof stress, tensile strength, elongation, hardness and bendability of the plates and strip annealed shall be as given in Table 9. However, the proof stress shall be applied only when particularly designated by the purchaser.

Further, as regards bendability, cracks shall not be generated on the outside of the bent corner.

Table 9. Mechanical properties under annealed condition
(Ferritic series)

Symbol of grade	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness			Bendability	
				HB	HRB	HV	Bending angle	Inside radius
SUS405	175 min.	410 min.	20 min.	183 max.	88 max.	200 max.	180°	0.5 time the thickness for under 8 mm in thickness 1.0 time the thickness for 8 mm min, in thickness
SUS410L	195 min.	360 min.	22 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS429	205 min.	450 min.	22 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS430	205 min.	450 min.	22 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS430LX	175 min.	360 min.	22 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS430J1L	205 min.	390 min.	22 min.	192 max.	90 max.	200 max.	180°	1.0 time the thickness
SUS434	205 min.	450 min.	22 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS436L	245 min.	410 min.	20 min.	217 max.	96 max.	230 max.	180°	1.0 time the thickness
SUS436J1L	245 min.	410 min.	20 min.	192 max.	90 max.	200 max.	180°	1.0 time the thickness
SUS444	245 min.	410 min.	20 min.	217 max.	96 max.	230 max.	180°	1.0 time the thickness
SUS447J1	295 min.	450 min.	22 min.	207 max.	95 max.	220 max.	180°	1.0 time the thickness
SUSXM27	245 min.	410 min.	22 min.	192 max.	90 max.	200 max.	180°	1.0 time the thickness

(4) Mechanical properties of martensitic series Mechanical properties of martensitic series shall be as follows.

- (a) The proof stress, tensile strength, elongation, hardness and bendability of the plates and strip annealed shall be as given in Table 10. However, the proof stress shall be applied only when particularly designated by the purchaser.

Further, as regards bendability, cracks shall not be generated on the outside of the bent corner.

- (b) The hardness of the plates and strip processed by quench hardening and tempering shall be as given in Table 11.

Table 10. Mechanical properties under annealed condition
(Martensitic series)

Symbol of grade	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness			Bendability	
				HB	HRB	HV	Bending angle	Inside radius
SUS403	205 min.	440 min.	20 min.	201 max.	93 max.	210 max.	180°	1.0 time the thickness
SUS410	205 min.	440 min.	20 min.	201 max.	93 max.	210 max.	180°	1.0 time the thickness
SUS410S	205 min.	410 min.	20 min.	183 max.	88 max.	200 max.	180°	1.0 time the thickness
SUS420J1	225 min.	520 min.	18 min.	223 max.	97 max.	234 max.	-	-
SUS420J2	225 min.	540 min.	18 min.	235 max.	99 max.	247 max.	-	-
SUS429J1	225 min.	520 min.	18 min.	241 max.	100 max.	253 max.	-	-
SUS440A	245 min.	590 min.	15 min.	255 max.	HRC 25 max.	269 max.	-	-

Table 11. Hardness under quench hardened and tempered condition
(Martensitic series)

Symbol of grade	HRC
SUS420J2	40 min.
SUS440A	

- (5) Mechanical properties of precipitation hardening series The proof stress, tensile strength, elongation and hardness of the plates and strip processed by solution treatment and those of the test piece processed by precipitation hardening by designation of the purchaser shall be as given in Table 12. However, the proof stress shall be applied only when particularly designated by the purchaser.

Table 12. Mechanical properties of precipitation hardening series

Symbol of grade	Symbol of heat treatment	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness			
					HBS (or HBW)	HRC	HRB	HV
SUS630	S	-	-	-	363 max.	38 max.	-	-
	H900	1175 min.	1310 min.	5.0 mm max. in thickness	5 min.	375 min.	40 min.	-
				Over 5.0 mm up to and incl. 15.0 mm in thickness	8 min.			
				Over 15.0 mm in thickness	10 min.			
	H1025	1000 min.	1070 min.	5.0 mm max. in thickness	5 min.	331 min.	35 min.	-
				Over 5.0 mm up to and incl. 15.0 mm in thickness	8 min.			
				Over 15.0 mm in thickness	12 min.			
	H1075	860 min.	1000 min.	5.0 mm max. in thickness	5 min.	302 min.	31 min.	-
				Over 5.0 mm up to and incl. 15.0 mm in thickness	9 min.			
				Over 15.0 mm in thickness	13 min.			
	H1150	725 min.	930 min.	5.0 mm max. in thickness	8 min.	277 min.	28 min.	-
				Over 5.0 mm up to and incl. 15.0 mm in thickness	10 min.			
Over 15.0 mm in thickness				16 min.				

Table 12. (Continued)

Symbol of grade	Symbol of heat treatment	Proof stress N/mm ²	Tensile strength N/mm ²	Elongation %	Hardness			
					HBS (or HBW)	HRC	HRB	HV
SUS631	S	380 max.	1030 max.	20 min.	192 max.	-	92 max.	200 max.
	TH1050	960 min.	1140 min.	3.0 mm max. in thickness	-	35 min.	-	345 min.
				Over 3.0 mm in thickness				
	RH950	1030 min.	1230 min.	3.0 mm max. in thickness	-	40 min.	-	392 min.
Over 3.0 mm in thickness				4 min.				

Remarks: Mechanical properties of SUS630 processed by heat treatments other than those given in Table 37 may be as agreed upon between the parties concerned with delivery.

5. Corrosion resistance

When the corrosion resistance by an intergranular corrosion test is particularly designated by the purchaser, a test method to be applied shall be selected from the test methods of 10.3 as agreed upon between the parties concerned with delivery. When the test is performed, the obtained corrosion resistance shall be as follows.

- (1) Discrimination by the etched structure obtained by 10 % oxalic acid etching test shall be as given in Table 13.

Table 13. Discrimination by 10 % oxalic acid etching test

Symbol of grade	Condition	Structure to which ferric sulfate - sulfuric acid test is applied	Structure to which 65 % nitric acid test is applied	Structure to which nitric hydrofluoric acid test is applied	Structure to which copper sulfate - sulfuric acid test is applied
SUS304	As received (solution treatment)	Ditch structure	Ditch structure Pitting structure II	-	Ditch structure
SUS316 SUS316J1 SUS317			-	Ditch structure	
SUS304L	Sensitization	Ditch structure	Ditch structure Pitting structure II		Ditch structure
SUS316L SUS316J1L SUS317L			-	Ditch structure	
SUS321 SUS347		-	-		

- (2) The corrosion rate by the ferric sulfate - sulfuric acid test shall be as given in Table 14.

Table 14. Corrosion rate by ferric sulfate - sulfuric acid test

Symbol of grade	Condition	Corrosion rate g/m ² ·h
SUS304 SUS316 SUS316J1 SUS317	As received (solution treatment)	To be as agreed upon between the parties concerned with delivery.
SUS304L SUS316L SUS316J1L SUS317L	Sensitization	To be as agreed upon between the parties concerned with delivery.

- (3) The corrosion rate by the 65 % nitric acid test shall be as given in Table 15.

Table 15. Corrosion rate by 65 % nitric acid test

Symbol of grade	Condition	Corrosion rate g/m ² ·h
SUS304	As received (solution treatment)	To be as agreed upon between the parties concerned with delivery.
SUS304L	Sensitization	To be as agreed upon between the parties concerned with delivery.

- (4) The corrosion ratio by the nitric acid - hydrofluoric acid corrosion test shall be as given in Table 16.

Table 16. Corrosion rate ratio by nitric - hydrofluoric acid corrosion test

Symbol of grade	Corrosion rate ratio
SUS316	1.5 max.
SUS316J1	1.5 max.
SUS317	1.5 max.
SUS316L	1.5 max.
SUS316J1L	1.5 max.
SUS317L	1.5 max.

- (5) The condition of the bent surface by the copper sulfate - sulfuric acid test shall be as given in Table 17.

Table 17. Condition of bent surface by copper sulfate - sulfuric acid test

Symbol of grade	Condition	Condition of bent surface
SUS304 SUS316 SUS316J1 SUS317	As received (solution treatment)	To be free from inter-granular corrosion crack.
SUS304L SUS316L SUS316J1L SUS317L SUS321 SUS347	Sensitization	To be free from inter-granular corrosion crack.

6. Surface finish

The surface finish of plates and strip shall be as given in Table 18.

Table 18. Surface finish

Symbol of surface finish	Remarks
No. 1	The surface finished by heat treatment and pickling or processes corresponding thereto after hot rolling.

Remarks: Surface finishes other than No. 1 may be agreed upon between the parties concerned with delivery.

7. Shape, dimensions, mass and tolerances thereon

7.1 Standard dimensions

7.1.1 Standard dimensions of plates The standard dimensions of plates shall be as given in Table 19.

Table 19. Standard dimensions of plates
Unit: mm

Thickness			Width x length
3.0	8.0	20.0	1000 x 2000
4.0	9.0	25.0	1219 x 2438
5.0	10.0	30.0	1219 x 3048
6.0	12.0	35.0	1500 x 3000
7.0	15.0		1524 x 3048

7.1.2 Standard thickness of strip The standard thickness of a strip shall be as given in Table 20.

Table 20. Standard thickness of strip
Unit: mm

2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0
-----	-----	-----	-----	-----	-----	-----	-----

7.2 Mass of plates The mass of plates shall be, as a rule, in accordance with JIS G 4310.

7.3 Tolerances on thickness of plate The tolerances on the thickness of plates shall be as follows.

- (1) The tolerances (symbol A) on thickness shall be as given in Table 21. However, the purchaser may designate the tolerances (symbol B) on thickness of Table 22.

Tolerances on 2.0 mm or over to and excl. 2.5 mm thickness may be as degrees upon between the parties concerned with delivery.

Further, the position for measuring thickness shall be an arbitrary point 15 mm or over inside the edge of the plate for the plate of cut edge. However, in the case of the plate of mill edge, it shall be an arbitrary point 25 mm or over inside the edge of the plate for a cut plate from the strip and an arbitrary point inside the planned cutting line of width for other plates.

Table 21. Tolerances on thickness of plates (symbol A)

Unit: mm

Thickness	Width						
	Under 1000	1000 or over to and excl. 1250	1250 or over to and excl. 1600	1600 or over to and excl. 2000	2000 or over to and excl. 2500	2500 or over to and excl. 3150	3150 or over to and excl. 4000
2.50 or over to and excl. 3.15	+0.25	+0.30	+0.35	-	-	-	-
3.15 or over to and excl. 4.00	+0.30	+0.35	+0.40	-	-	-	-
4.00 or over to and excl. 5.00	+0.38	+0.40	+0.45	+0.60	+0.80	+1.0	-
5.00 or over to and excl. 6.00	+0.45	+0.45	+0.50	+0.70	+0.90	+1.1	-
6.00 or over to and excl. 8.00	+0.55	+0.60	+0.60	+0.75	+1.0	+1.2	+1.4
8.00 or over to and excl. 10.0	+0.65	+0.65	+0.65	+0.80	+1.2	+1.5	+1.6
10.0 or over to and excl. 16.0	+0.70	+0.70	+0.70	+0.85	+1.2	+1.5	+1.6
16.0 or over to and excl. 25.0	+0.80	+0.80	+0.80	+0.95	+1.3	+1.5	+1.6
25.0 or over to and excl. 40.0	+0.90	+0.90	+0.90	+1.1	+1.3	+1.5	+1.6
40.0 or over to and excl. 63.0	+1.0	+1.0	+1.2	+1.2	+1.4	+1.5	+1.6
63.0 or over to and excl. 100	+1.1	+1.2	+1.3	+1.3	+1.5	+1.6	+1.7
100 or over to and excl. 160	+1.3	+1.3	+1.4	+1.4	+1.6	+1.7	+1.8
160 or over to and excl. 200	+1.6	+1.6	+1.7	+1.7	+1.9	+2.0	+2.1

Table 22. Tolerances on thickness of plates (symbol B)

Unit: mm

Thickness	Width						
	Under 1000	1000 or over to and excl. 1250	1250 or over to and excl. 1600	1600 or over to and excl. 2000	2000 or over to and excl. 2500	2500 or over to and excl. 3150	3150 or over to and excl. 4000
2.50 or over to and excl. 3.15	+0.25	+0.35	+0.45	-	-	-	-
3.15 or over to and excl. 4.00	+0.35	+0.45	+0.55	-	-	-	-
4.00 or over to and excl. 5.00	+0.51	+0.55	+0.65	+0.95	+1.35	+1.75	-
5.00 or over to and excl. 6.00	+0.65	+0.65	+0.75	+1.15	+1.55	+1.95	-
6.00 or over to and excl. 8.00	+0.85	+0.95	+0.95	+1.25	+1.75	+2.15	+2.55
8.00 or over to and excl. 10.0	+1.05	+1.05	+1.05	+1.35	+2.15	+2.75	+2.95
10.0 or over to and excl. 16.0	+1.15	+1.15	+1.15	+1.45	+2.15	+2.75	+2.95
16.0 or over to and excl. 25.0	+1.35	+1.35	+1.35	+1.65	+2.35	+2.75	+2.95
25.0 or over to and excl. 40.0	+1.55	+1.55	+1.55	+1.95	+2.35	+2.75	+2.95
40.0 or over to and excl. 63.0	+1.75	+1.75	+2.15	+2.15	+2.55	+2.75	+2.95
63.0 or over to and excl. 100	+1.95	+2.15	+2.35	+2.35	+2.75	+2.95	+3.15
100 or over to and excl. 160	+2.35	+2.35	+2.55	+2.55	+2.95	+3.15	+3.35
160 or over to and excl. 200	+2.95	+2.95	+3.15	+3.15	+3.55	+3.75	+3.95

Remarks: Tolerance on minus side shall be 0.25 mm.

- (2) When the mass of plates is calculated by using Table 22, the numerical values obtained by adding the numerical values of Table 23 to the marked thickness shall be used instead of the marked thickness.

Table 23. Values to be added for calculation of mass of plates
Unit: mm

Thickness	Width						
	Under 1000	1000 or over to and excl. 1250	1250 or over to and excl. 1600	1600 or over to and excl. 2000	2000 or over to and excl. 2500	2500 or over to and excl. 3150	3150 or over to and excl. 4000
2.50 or over to and excl. 3.15	0	0.05	0.10	-	-	-	-
3.15 or over to and excl. 4.00	0.05	0.10	0.15	-	-	-	-
4.00 or over to and excl. 5.00	0.13	0.15	0.20	0.35	0.55	0.75	-
5.00 or over to and excl. 6.00	0.20	0.20	0.25	0.45	0.65	0.85	-
6.00 or over to and excl. 8.00	0.30	0.35	0.35	0.50	0.75	0.95	1.15
8.00 or over to and excl. 10.0	0.40	0.40	0.40	0.55	0.95	1.25	1.35
10.0 or over to and excl. 16.0	0.45	0.45	0.45	0.60	0.95	1.25	1.35
16.0 or over to and excl. 25.0	0.55	0.55	0.55	0.70	1.05	1.25	1.35
25.0 or over to and excl. 40.0	0.65	0.65	0.65	0.85	1.05	1.25	1.35
40.0 or over to and excl. 63.0	0.75	0.75	0.95	0.95	1.15	1.25	1.35
63.0 or over to and excl. 100	0.85	0.95	1.05	1.05	1.25	1.35	1.45
100 or over to and excl. 160	1.05	1.05	1.15	1.15	1.35	1.45	1.55
160 or over to and excl. 200	1.35	1.35	1.45	1.45	1.65	1.75	1.85

Remarks: The value to be added for 2.0 mm or over to and excl. 2.5 mm thickness shall be as agreed upon between the parties concerned with delivery.

7.4 Tolerances on width of plates The tolerances on width of plates shall be as given in Table 24 for the cut edge plates and shall be as given in Table 25 for the mill edge plates.

Table 24. Tolerances on width of cut edge plates

Unit: mm

Classification by cutting method	Width Length Thickness	Under 2000			2000 and over		
		3500 max.	Over 3500 up to and incl. 6000	Over 6000	3500 max.	Over 3500 up to and incl. 6000	Over 6000
Plates by mechanical cutting	Under 10.0	+ 5 0	+15 0	+20 0	+15 0	+15 0	+25 0
	10.0 or over to and excl. 20.0	+10 0	+20 0	+20 0	+20 0	+20 0	+25 0
	20.0 or over up to and incl. 28.0	+15 0	+20 0	+20 0	+20 0	+20 0	+25 0
Plates by flame cutting	2.50 or over to and excl. 100	+ 5 to +30	+ 5 to +45	+ 5 to +55	+ 5 to +45	+ 5 to +50	+ 5 to +60
	100 or over to and excl. 200	+ 5 to +60	+ 5 to +60	+ 5 to +60	+ 5 to +60	+ 5 to +60	+ 5 to +60

Table 25. Tolerances on width of mill edge plates

Unit: mm

Width	Cut plate from mill edge plate	Steel plate as rolled
Under 100	+ 1 0	-
100 or over to and excl. 250	+ 2 0	-
250 or over to and excl. 400	+ 5 0	+ not specified 0
400 or over to and excl. 630	+20 0	+ not specified 0
630 or over to and excl. 1000	+25 0	+ not specified 0
1000 or over	+30 0	+ not specified 0

7.5 Tolerances on length Tolerances on length of plates shall be as given in Table 26.

Table 26. Tolerances on length of plates

Unit: mm

Classification by cutting method	Length	3500 max.		Over 3500 up to and incl. 6000		Over 6000	
		Under 2000	2000 or over	Under 2000	2000 or over	Under 2000	2000 or over
	Width Thickness						
Plates by mechanical cutting	Under 10.0	+10 0	+15 0	+15 0	+20 0	+30 0	+35 0
	10.0 or over to and excl. 20.0	+15 0	+20 0	+20 0	+25 0	+35 0	+40 0
	20.0 or over up to and incl. 28.0	+15 0	+20 0	+20 0	+25 0	+35 0	+40 0
Plates by flame cutting	2.50 or over to and excl. 100	+5 to +30	+5 to +45	+5 to +45	+5 to +50	+5 to +60	+5 to +60
	100 or over to and excl. 200	+5 to +60	+5 to +60	+5 to +60	+5 to +60	+5 to +60	+5 to +60

7.6 Flatness of plates The maximum value for flatness of plates shall be as given in Table 27.

Further, the purchaser may designate the flatness of the symbol EF.

Table 27. Maximum value of flatness of plates

Unit: mm

Width	Length	Maximum value of flatness	Maximum value of flatness (Symbol EF)
1000 max.	2000 max.	15	3
	Over 2000	20	6
Over 1000 up to and incl. 1600	2000 max.	20	6
	Over 2000	20	6
Over 1600 up to and incl. 2000	2000 max.	25	-
	Over 2000	35	-
Over 2000 up to and incl. 2500	Over 2000	40	-
Over 2500 up to and incl. 3150	Over 2500	45	-
Over 3150	Over 3150	50	-

Remarks 1. Table 27 applies to an arbitrary length of 3500 mm, and in the case of under 3500 mm length, it applies to overall length.

2. Table 27 applies to cut plates from mill edge strip and to cut edge plates.

7.7 Tolerances on thickness of strip Tolerances on the thickness of a strip shall be as given in Table 28. However, the purchaser may designate the tolerances (symbol ET) of thickness of Table 29.

Further, they do not apply to abnormal portions of strip at the fore and core parts.

Positions for measuring thickness shall be an arbitrary point 25 mm or over inside the edge for mill edge strip of 50 mm or over width and shall be its center for under 50 mm in width. In the case of cut edge strip, the measuring position shall be an arbitrary point 15 mm or over inside the edge and shall be its center for under 30 mm in width.

Table 28. Tolerances on thickness of strip

Unit: mm

Thickness	Width		
	Under 1000	1000 or over to and excl. 1250	1250 or over to and excl. 1600
2.00 or over to and excl. 2.50	± 0.25	± 0.30	-
2.50 or over to and excl. 3.15	± 0.30	± 0.35	± 0.40
3.15 or over to and excl. 4.00	± 0.35	± 0.40	± 0.45
4.00 or over to and excl. 5.00	± 0.40	± 0.45	± 0.50
5.00 or over to and excl. 6.00	± 0.50	± 0.55	± 0.60
6.00 or over up to and incl. 8.00	± 0.60	± 0.65	± 0.70

Table 29. Tolerances on thickness of strip (symbol ET)

Unit: mm

Thickness	Width						
	Under 250	250 or over to and excl. 400	400 or over to and excl. 630	630 or over to and excl. 800	800 or over to and excl. 1000	1000 or over to and excl. 1250	1250 or over to and excl. 1600
2.00 or over to and excl. 2.50	± 0.16	± 0.17	± 0.18	± 0.20	-	-	-
2.50 or over to and excl. 3.15	± 0.18	± 0.19	± 0.20	± 0.23	± 0.25	± 0.30	± 0.35
3.15 or over to and excl. 4.00	± 0.20	± 0.21	± 0.23	± 0.26	± 0.30	± 0.35	± 0.40
4.00 or over to and excl. 5.00	± 0.22	± 0.24	± 0.26	± 0.29	± 0.38	± 0.40	± 0.45
5.00 or over to and excl. 6.00	± 0.25	± 0.27	± 0.29	± 0.32	± 0.45	± 0.45	± 0.50
6.00 or over up to and incl. 8.00	-	-	-	-	± 0.55	± 0.60	± 0.60

7.8 Tolerances on width of strip Tolerances on the width of a strip shall be as given in Table 30. However, in the case of cut edge strip, the purchaser may designate the tolerances (symbol EW) on width of Table 31.

Table 30. Tolerances on width of strip

Unit: mm

Classification by edge	Thickness	Width						
		Under 100	100 or over to and excl. 160	160 or over to and excl. 250	250 or over to and excl. 400	400 or over to and excl. 630	630 or over to and excl. 1000	1000 or over
Mill edge	-	+1	+2	+2	+5	+20 0	+25 0	+30 0
Cut edge	Under 6.00	+5 0	+5 0	+5 0	+5 0	+10 0	+10 0	+10 0
	6.00 or over	+10 0	+10 0	+10 0	+10 0	+10 0	+10 0	+15 0

Table 31. Tolerances on width of strip (Symbol EW)

Unit: mm

Thickness	Width		
	Under 160	160 or over to and excl. 250	250 or over and excl. 630
Under 3.15	+0.3	+0.4	+0.5
3.15 or over to and excl. 6.00	+0.5	+0.5	+0.5

7.9 lateral warp of strip The maximum value of the lateral warp of a strip shall be as given in Table 32. However, this table does not apply to the abnormal portions of strip at the fore and core parts.

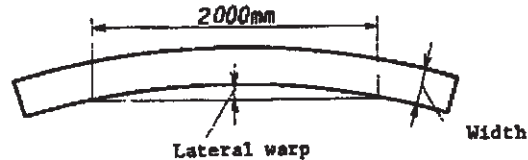
Table 32. Maximum value of lateral warp of strip

Unit: mm

Width	Maximum value of lateral warp
Under 40	10 per 2000 of arbitrary length
40 or over to and excl. 630	8 per 2000 of arbitrary length
630 or over	5 per 2000 of arbitrary length

Remarks: Application of the lateral warp of a strip shall be as shown in Fig. 1.

Fig. 1. Application of lateral warp of strip



8. Appearance

The plates and strip shall be free from harmful defects to use. However, since the strip has generally no chance for removing defects, some abnormal parts may be contained.

9. Manufacturing method

After hot rolling, plates are heat treated in accordance with Tables 33 to 37. After pickling or treatments equivalent thereto, they are suitably levelled as required.

Further, treatments such as pickling or the like may be omitted as agreed upon between the parties concerned with delivery. However, in the case where plates are used as materials for pipes and pipe fittings to be solution treated and as materials for rerolling, solution treatment may be omitted as agreed upon between the parties concerned with delivery. In that case, the symbol AR shall be suffixed.

Strips are used as hot rolled and otherwise, as required, they are processed by heat treatment, pickling, etc. in accordance with Tables 33 to 37. However, conditions for heat treatment of strips for rerolling may be agreed upon between the parties concerned with delivery.

Further, for heat treatments for plates and strips of precipitation hardening series, the purchaser specifies the class of heat treatment (symbol for heat treatment of Table 37) and further designates which is to be heat treated plate (strip) itself or the test piece.

The manufacturer may vary the upper limits of the temperature ranges of Tables 33 to 37 so as to obtain specific mechanical properties, as required.

Table 33. Heat treatments for austenitic series

Symbol of grade	Solution treatment °C	Symbol of grade	Solution treatment °C
SUS201	1010 to 1120 quenching	SUS316L	1010 to 1150 quenching
SUS202	1010 to 1120 quenching	SUS316N	1010 to 1150 quenching
SUS301	1010 to 1150 quenching	SUS316LN	1010 to 1150 quenching
SUS301L	1010 to 1150 quenching	SUS316Ti	920 to 1150 quenching
SUS301J1	1010 to 1150 quenching	SUS316J1	1010 to 1150 quenching
SUS302	1010 to 1150 quenching	SUS316J1L	1010 to 1150 quenching
SUS302B	1010 to 1150 quenching	SUS317	1010 to 1150 quenching
SUS304	1010 to 1150 quenching	SUS317L	1010 to 1150 quenching
SUS304L	1010 to 1150 quenching	SUS317LN	1010 to 1150 quenching
SUS304N1	1010 to 1150 quenching	SUS317J1	1030 to 1180 quenching
SUS304N2	1010 to 1150 quenching	SUS317J2	1030 to 1180 quenching
SUS304LN	1010 to 1150 quenching	SUS317J3L	1030 to 1180 quenching
SUS304J1	1010 to 1150 quenching	SUS317J4L	1030 to 1180 quenching
SUS304J2	1010 to 1150 quenching	SUS317J5L	1030 to 1180 quenching
SUS305	1010 to 1150 quenching	SUS321	920 to 1150 quenching
SUS309S	1030 to 1150 quenching	SUS347	980 to 1150 quenching
SUS310S	1030 to 1180 quenching	SUSXM15J1	1010 to 1150 quenching
SUS316	1010 to 1150 quenching		

Remarks 1. The purchaser may specify stabilizing treatment to SUS316Ti, SUS321 and SUS347.

Heat treatment temperature in that case shall be 850 to 930°C.

2. When especially agreed upon by the purchaser, heat treatment in which solution treatment is performed on a rolling line and immediately thereafter, quenching is performed, is contained. In that case, the symbol LS shall be suffixed.

Table 34. Heat treatments of austenitic ferritic series

Symbol of grade	Solution treatment °C
SUS329J1	950 to 1100 quenching
SUS329J3L	950 to 1100 quenching
SUS329J4L	950 to 1100 quenching

Table 35. Heat treatment of ferritic series

Symbol of grade	Annealing °C	Symbol of class	Annealing °C
SUS405	780 to 830 quenching or slow cooling	SUS434	780 to 850 quenching or slow cooling
SUS410L	700 to 820 quenching or slow cooling	SUS436L	800 to 1050 quenching
SUS429	780 to 850 quenching or slow cooling	SUS436J1L	800 to 1050 quenching
SUS430	780 to 850 quenching or slow cooling	SUS444	800 to 1050 quenching
SUS430LX	780 to 950 quenching or slow cooling	SUS447J1	900 to 1050 quenching
SUS430J1L	800 to 1050 quenching	SUSXM27	900 to 1050 quenching

Table 36. Heat treatment of martensitic series

Symbol of grade	Heat treatment °C		
	Annealing °C	Quench hardening	Tempering
SUS403	Approx. 750 quenching or 800 to 900 slow cooling	-	-
SUS410	Approx. 750 quenching or 800 to 900 slow cooling	-	-
SUS410S	Approx. 750 quenching or 800 to 900 slow cooling	-	-
SUS420J1	Approx. 750 air cooling or 800 to 900 slow cooling	-	-
SUS420J2	Approx. 750 air cooling or 800 to 900 slow cooling	980 to 1040 quenching	150 to 400 air cooling
SUS429J1	Approx. 750 air cooling or 800 to 900 slow cooling	-	-
SUS440A	Approx. 750 air cooling or 800 to 900 slow cooling	1010 to 1070 quenching	150 to 400 air cooling

- Remarks 1. Quench hardening and tempering may be applied to SUS420J2 and SUS440A as particularly designated by the purchaser. In that case, the symbol shall be Q.
2. The annealing may be replaced by the quench hardening and tempering which ensures specified mechanical properties.

Table 37. Heat treatment by precipitation hardening series

Symbol of grade	Heat treatment		
	Classification	Symbol	Conditions
SUS630	Solution treatment	S	1020 to 1060°C quenching
	Precipitation hardening heat treatment	H900	After S treatment, 470 to 490°C air cooling
		H1025	After S treatment, 540 to 560°C air cooling
		H1075	After S treatment, 570 to 590°C air cooling
		H1150	After S treatment, 610 to 630°C air cooling
SUS631	Solution treatment	S	1000 to 1100°C quenching
	Precipitation hardening heat treatment	TH1050	After S treatment, hold at $760 \pm 15^\circ\text{C}$ for 90 min, cool to 15°C or lower within 1 h, hold for 30 min, and after holding at $565 \pm 10^\circ\text{C}$ for 90 min, air cool.
		RH950	After S treatment, hold at $955 \pm 10^\circ\text{C}$ for 10 min, air cool to room temperature, hold at $-73 \pm 6^\circ\text{C}$ for 8 h within 24 h, and after holding at $510 \pm 10^\circ\text{C}$ for 60 min, air cool.

Remarks: As regards SUS630, heat treatments other than those as given in Table 37 may be agreed upon between the parties concerned with delivery.

10. Tests

10.1 Analytical test The analytical test shall be as follows:

- (1) General items for the analytical test and the sampling method for ladle analysis shall be in accordance with 3. (Chemical composition) of JIS 0303.
- (2) The sampling for product analysis shall be in accordance with 3. (sampling method for analytical sample). However, tensile test pieces after rupture may be reused as specimens.
- (3) 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 1232, JIS G 1237, JIS G 1253,
JIS G 1256, JIS G 1257

10.2 Mechanical tests

10.2.1 Tests in general General items of mechanical tests shall be in accordance with 4. (mechanical properties) of JIS G 0303.

10.2.2 Sampling of test specimen One test specimen shall be sampled for each lot of the same ladle and the same heat treatment conditions.

10.2.3 Number of test pieces One test piece shall be taken from each test specimen.

10.2.4 Test piece The tensile test piece, hardness test piece, and bend test piece shall be as follows:

- (1) Any one of the No. 10 test piece, No. 13 B test piece, No. 14 A test piece and No. 14 B test piece of JIS Z 2201 shall be used as a tensile test piece.

Further, No. 4 test piece or No. 5 test piece may also be used.

- (2) A part of the tensile test piece or bend test piece may be used as a hardness test piece.
- (3) The No. 3 test piece or No. 5 test piece of JIS Z 2204 shall be used as a bend test piece.

10.2.5 Test methods The methods for tensile test, hardness test, and bend test shall be as follows:

- (1) The tensile test method shall be in accordance with JIS Z 2241. However, a test temperature of $20 \pm 5^{\circ}\text{C}$ shall be as standard, and as to measurement of tensile strength other than martensitic series, strain increasing rate at parallel part of a test piece to become 40 to 80 %/min, shall be used.
- (2) The hardness test method shall be in accordance with any one of the following standards. However, a test temperature of $20 \pm 5^{\circ}\text{C}$ shall be standard.

JIS Z 2243, JIS Z 2244, JIS Z 2245

- (3) The bend test method shall be in accordance with JIS Z 2248. However, a test temperature of $20 \pm 5^{\circ}\text{C}$ shall be standard.

10.3 Corrosion tests

10.3.1 Sampling of test specimen One test specimen shall be sampled from each plate or strip of the same ladle and the same heat treatment condition.

10.3.2 Number of test pieces One test piece shall be taken from each test specimen.

10.3.3 Test methods The corrosion test method shall be in accordance with any one of the following methods:

JIS G 0571, JIS G 0572, JIS G 0573, JIS G 0574, JIS G 0575

11. Inspection

The inspection of the plates and strip shall be as follows.

- (1) General items for inspection shall be in accordance with JIS G 0303.
- (2) The chemical composition shall conform to the requirements specified in 3.
- (3) The mechanical properties shall conform to the requirements specified in 4. However, a part or all of the methods for tensile test, impact test, and hardness test may be omitted as agreed upon between the parties concerned with delivery.
- (4) The corrosion resistance shall conform to the requirements specified in 5.
- (5) The surface finish shall conform to the requirements specified in 6.
- (6) The shape and dimensions shall conform to the requirements specified in 7.
- (7) The appearance shall conform to the requirements specified in 8.

12. Marking

The plates and strip which have passed inspection shall be marked with the following items on either of each plate or each bundle for the plates and on each bundle for the strip. However, a part of the items may be omitted as agreed upon between the parties concerned with delivery.

- (1) Symbol of grade
- (2) Dimensions
- (3) Symbol of tolerance (the tolerance symbols applying ET, EW, and EF shall be clearly stated.)
- (4) Symbol of heat treatment (exclusively in the cases of omitting solution treatment, of solution treatment on rolling line, of precipitation hardening series, and of quench hardening and tempering particularly designated by the purchaser for SUS420J2 and SUS440A of the martensitic series.)
- (5) Manufacturer's name or its abbreviation
- (6) Ladle number or inspection number.

13. Report

The manufacturer shall submit the report of the plates or strip to the purchaser in which the results of test specified or designated and, as required, dimensions, quantity, delivery conditions, etc. are stated.

Further, in the case where any alloying elements have been added in accordance with the Remarks of Tables 2 to 5, contents of the added elements shall be appended to the test result table.

Attached Table 1. Applicable standards

- JIS G 0303-General Rules for Inspection of Steel
- JIS G 0321-Product Analysis and its Tolerance for Wrought Steel
- JIS G 0571-Method of 10 per cent Oxalic Acid Etch Test for Stainless Steels
- JIS G 0572-Method of Ferric Sulfate-Sulfuric Acid Test for Stainless Steels
- JIS G 0573-Method of 65 per cent Nitric Acid Test for Stainless Steels
- JIS G 0574-Method of Nitric-Hydrofluoric Acid Test for Stainless Steels
- JIS G 0575-Method of Copper Sulfate-Sulfuric Acid Test for Stainless Steels
- JIS G 1211-Methods for Determination of Carbon in Iron and Steel
- 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-Methods for Determination of Sulfur in Iron and Steel
- 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-Methods for Determination of Molybdenum in Iron and Steel
- 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-Methods for Determination of Nitrogen in Iron and Steel
- JIS G 1232-Methods for Determination of Zirconium in Steel
- JIS G 1237-Methods for Determination of Niobium in Steel
- JIS G 1253-Method for Photoelectric Emission Spectrochemical Analysis of Iron and Steel

- JIS G 1256-Method for X-Ray Fluorescence Spectrometric Analysis of Iron and Steel
- JIS G 1257-Atomic Absorption Spectrochemical Analysis of Iron and Steel
- JIS G 4310-Method of Mass Calculation of Stainless Steel Plates and Sheets
- 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 2243-Method of Brinell Hardness Test
- JIS Z 2244-Method of Vickers Hardness Test
- JIS Z 2245-Method of Rockwell and Rockwell Superficial Hardness Test
- JIS Z 2248-Method of Bend Test for Metallic Materials

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