
Translated English of Chinese Standard: GB/T4237-2015

www.ChineseStandard.net

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 77.140.50

H 46

GB/T 4237-2015

Replacing GB/T 4237-2007

Hot rolled stainless steel plate, sheet and strip

不锈钢热轧钢板和钢带

GB/T 4237-2015 How to BUY & immediately GET a full-copy of this standard?

1. www.ChineseStandard.net;
2. Search --> Add to Cart --> Checkout (3-steps);
3. No action is required - Full-copy of this standard will be automatically & immediately delivered to your EMAIL address in 0~25 minutes.
4. Support: Sales@ChineseStandard.net. Wayne, Sales manager

Issued on: September 11, 2015

Implemented on: June 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection
and Quarantine of the People's Republic of China;**

**Standardization Administration of the People's Republic of
China.**

Table of Contents

Foreword	3
1 Scope	5
2 Normative references	5
3 Classification and code	8
4 Order content	8
5 Dimension, shape, weight and allowable deviation.....	9
6 Technical requirements	15
7 Test methods	33
8 Inspection rules	36
9 Packing, marking and quality certificate	37
Annex A (informative) Comparing table of stainless steel grades in different countries	38
Annex B (informative) Characteristics and uses of stainless steels.....	43
Annex C (informative) Heat treatment system of stainless steels	57

Foreword

This Standard is drafted according to the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 4237-2007 “Hot rolled stainless steel plate, sheet and strip”. Compared with the GB/T 4237-2007, the main technical changes are as follows:

- ADD “edge state” in the order content;
- ADD the width range and its corresponding dimension precision of steel plates;
- ADD the thickness range and its corresponding dimension precision of wide steel coils;
- MODIFY the allowable deviation of thick steel plates and wide steel strips’ width;
- ADD 23 steel grades and related technical requirements;
- ADJUST the chemical composition of 5 steel grades;
- REVISE the mechanical properties of 13 steel grades;
- CHANGE the original steel grade, 022Cr18NbTi, TO 022Cr18Nb;
- ADD the grain size requirement for 4 steel grades of in the special requirements;
- MODIFY the reinspection and determination rules;
- ADD the mechanical properties and rules of rounding off for chemical composition test results;
- ADD the informative Annex A “Comparing table of stainless steel and heat-resistant steel grades in different countries”.

This Standard is proposed by the China Iron and Steel Association.

The Standard shall be under the jurisdiction of the National Technical Committee on Steel of the Standardization Administration of China (SAC/TC 183).

Main drafting organizations of this Standard: Shanxi Taigang Stainless Steel Co., Ltd., Baosteel Stainless Steel Co., Ltd., Metallurgical Industry Information Standards Research Institute, Sichuan Southwest Stainless Steel Co., Ltd., Shandong Taishan Iron and Steel Group Co., Ltd.

Main drafters of this Standard: Liu Hongtao, Wu Qiang, Xu Zhongjie, Dong Li, Wang Jun, Chen Peidun, Zhang Jiansheng, Wang Xiaohu, Zhang Li, Li Liuyi, Li Xiongfei, Luan Yan, Zhang Weixu.

Hot rolled stainless steel plate, sheet and strip

1 Scope

This Standard specifies the classification, code, order content, dimension, shape, weight and allowable deviation, technical requirements, test methods, inspection rules, packaging, marking and product quality certificates of hot rolled stainless steel plates, sheets and strips.

This Standard applies to corrosion-resistant hot-rolled thick stainless steel plates (hereinafter referred to as thick steel plates), corrosion-resistant hot-rolled wide stainless steel strips (hereinafter referred to as wide steel strips) and their roll-cutting specified-length steel plates (hereinafter referred to as roll-cutting steel plates) and slitting wide steel strips, also applies to corrosion-resistant hot-rolled narrow stainless steel strips (hereinafter referred to as narrow steel strips) and their roll-cutting specified-length steel strips (hereinafter referred to as roll-cutting steel strips).

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 223.3 Methods for chemical analysis of iron, steel and alloy - The diantipyrylmethane phosphomolybdate gravimetric method for the determination of phosphorus content

GB/T 223.4 Alloyed steel - Determination of manganese content - Potentiometric or visual titration method

GB/T 223.5 Steel and iron - Determination of acid-soluble silicon and total silicon content - Reduced molybdosilicate spectrophotometric method

GB/T 223.8 Methods for chemical analysis of iron, steel and alloy - The sodium fluoride separation-EDTA titration method for the determination of aluminium content

GB/T 223.9 Iron steel and alloy - Determination of aluminium content - Chrom azurol S photometric method

GB/T 223.11 Iron steel and alloy - Determination of chromium content - Visual titration or potentiometric titration method

GB/T 223.16 Methods for chemical analysis of iron, steel and alloy - The chromotropic acid photometric method for the determination of titanium content

GB/T 223.18 Methods for chemical analysis of iron, steel and alloy - The sodium thiosulfate separation iodimetric method for the determination of copper content

GB/T 223.19 Methods for chemical analysis of iron steel and alloy - The neocuproine-chloroform extraction photometric method for the determination of copper content

GB/T 223.23 Iron steel and alloy - Determination of nickel content - The dimethylglyoxime spectrophotometric method

GB/T 223.25 Methods for chemical analysis of iron, steel and alloy - The dimethylglyoxime gravimetric method for the determination of nickel content

GB/T 223.26 Iron steel and alloy - Determination of molybdenum content - The thiocyanate spectrophotometric method

GB/T 223.28 Methods for chemical analysis of iron steel and alloy - The α -denzoinoxime gravimetric method for the determination of molybdenum content

GB/T 223.33 Methods for chemical analysis of iron, steel and alloy - The chlorophosphonazo mA photometric method for the determination of cerium content after extraction separation

GB/T 223.36 Methods for chemical analysis of iron, steel and alloy - The neutral titration method for the determination of nitrogen content after distillation separation

GB/T 223.40 Iron steel and alloy - Determination of niobium content by the sulphochlorophenol S spectrophotometric method

GB/T 223.53 Methods for chemical analysis of iron, steel and alloy - The flame atomic absorption spectrophotometric method for the determination of copper content

GB/T 223.58 Methods for chemical analysis of iron, steel and alloy - The sodium arsenite-sodium nitrite titrimetric method for the determination of manganese content

GB/T 223.60 Methods for chemical analysis of iron, steel and alloy - The perchloric acid dehydration gravimetric method for the determination of silicon content

GB/T 223.61 Methods for chemical analysis of iron, steel and alloy - The ammonium phosphomolybdate volumetric method for the determination of phosphorus content

GB/T 223.68 Methods for chemical analysis of iron, steel and alloy - The potassium iodate titration method after combustion in the pipe furnace for the determination of sulfur content

GB/T 223.69 Iron steel and alloy - Determination of carbon contents - Gas-volumetric method after combustion in the pipe furnace

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1: Test method

GB/T 232 Metallic materials - Bend test

GB/T 247 General rule of package mark and certification for steel plates (sheets) and strips

GB/T 709-2006 Dimension, shape, weight and tolerances for hot-rolled steel plates and sheets

GB/T 2975 Steel and steel products - Location and preparation of test pieces for mechanical testing

GB/T 4334 Corrosion of metals and alloys - Test methods for intergranular corrosion of stainless steels

GB/T 4340.1 Metallic materials - Vickers hardness test - Part 1: Test method

GB/T 6394 Metal - Methods for estimating the average grain size

GB/T 8170 Rules of rounding off for numerical values & expression and judgement of limiting values

GB/T 11170 Stainless steel - Determination of multi-element contents - Spark discharge atomic emission spectrometric method (Routine method)

GB/T 17505 Steel and steel products - General technical delivery requirements

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition

GB/T 20123 Steel and iron - Determination of total carbon and sulfur content
Infrared absorption method after combustion in an induction furnace (routine method)

GB/T 20124 Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas

GB/T 20878-2007 Stainless and heat-resisting steels - Designation and chemical composition

3 Classification and code

3.1 Classification by edge state is as follows:

- a) edge-trimming, EC;
- b) non-edge-trimming, EM.

3.2 Classification by dimension and shape precision grade is as follows:

- a) thickness general precision, PT.A;
- b) thickness higher precision, PT.B;
- c) unevenness general grade, PF.A;
- d) unevenness higher grade, PF.B.

4 Order content

The contract or order according to this Standard shall include the following contents:

- a) standard number;
- b) product name;
- c) steel grade or unified digital code;
- d) dimension and precision;
- e) weight (quantity) of the delivery;
- f) surface processing type;
- g) edge state;

5.2.2 The camber of narrow steel strips and roll-cutting steel strips shall comply with the specifications in Table 12.

Table 12 Camber of narrow steel strips and roll-cutting steel strips

In millimeters

Roll-cutting steel strip	Nominal thickness	Nominal width	Camber on any length of 2000 mm ^a
	≥ 2	< 40	≤ 10
		40 ~ < 600	≤ 8
	< 2	according to supply and demand agreement	
Narrow steel strip	Agreed upon by supply and demand parties		
^a The camber of the roll-cutting steel strips with length less than 2000 mm adopts 2000 mm.			

5.2.3 The tangential inclination of thick steel plates, roll-cutting steel plates and roll-cutting steel strips shall not be more than 1% of the nominal width.

5.2.4 Unevenness

5.2.4.1 The unevenness of thick steel plates shall comply with the specifications in Table 13.

Table 13 Unevenness of thick steel plates

In millimeters

Thickness	Unevenness per meter
≤ 25	≤ 15
> 25	Agreed upon by supply and demand parties

5.2.4.2 The unevenness of roll-cutting steel plates shall comply with the specifications of general grade (PF.A) in Table 14. The higher grade (PF.B) may be applied if required by the demand party and indicated in the contract.

Table 14 Unevenness of roll-cutting steel plates

In millimeters

Nominal thickness	Nominal width	Unevenness	
		PF.A	PF.B
≤ 25.4	$600 \sim 1200$	26	23
	$> 1200 \sim 1500$	33	30
	> 1500	42	38

5.2.4.3 The unevenness of roll-cutting steel strips at any length of 2000 mm shall not be more than 15 mm; when the length is less than 2000 mm, the unevenness of roll-cutting steel strips shall not be more than 15 mm.

5.2.5 Shape

The steel coil shall be firmly rolled and kept as cylindrical as possible without curling.

The trunnion of edge-trimming (slitting) steel coils shall not be more than 35 mm, and the trunnion of the non-edge-trimming steel coils shall not be more than 70 mm.

5.2.6 Weight

5.2.6.1 Steel plates are delivered in theoretical or actual weight. The steel density shall comply with the specifications in Annex A of GB/T 20878-2007 when calculating the weight. If not specified, it shall be determined through consultation between supply and demand parties.

5.2.6.2 Steel strips shall be delivered in actual weight.

6 Technical requirements

6.1 Smelting methods

Steel shall adopt the primary smelting of molten steel and furnace refining process.

6.2 Chemical composition

6.2.1 The classification, grade and chemical composition (melting analysis) of steels shall comply with the specifications in Tables 15 to 19. See Annex A for stainless steel grades in different countries. See Annex B for characteristics and uses of stainless steels.

6.2.2 The allowable deviation of the chemical composition of steel plates, sheets and strips shall comply with the specifications of GB/T 222.

								20.00			0.16	
S30478	06Cr19Ni9NbN	0.08	1.00	2.50	0.045	0.030	7.50 ~ 10.50	18.00 ~ 20.00	—	—	0.15 ~ 0.30	Nb: 0.15
S30510	10Cr18Ni12 ^a	0.12	0.75	2.00	0.045	0.030	10.50 ~ 13.00	17.00 ~ 19.00	—	—	—	—
S30859	08Cr21Ni11Si2CeN	0.05 ~ 0.10	1.40 ~ 2.00	0.80	0.040	0.030	10.00 ~ 12.00	20.00 ~ 22.00	—	—	0.14 ~ 0.20	Ce: 0.03 ~ 0.08
S30908	06Cr23Ni13 ^a	0.08	0.75	2.00	0.045	0.030	12.00 ~ 15.00	22.00 ~ 24.00	—	—	—	—
S31008	06Cr25Ni20	0.08	1.50	2.00	0.045	0.030	19.00 ~ 22.00	24.00 ~ 26.00	—	—	—	—
S31053	022Cr25Ni22Mo2N ^a	0.020	0.50	2.00	0.030	0.010	20.50 ~ 23.50	24.00 ~ 26.00	1.60 ~ 2.60	—	0.09 ~ 0.15	—
S31252	015Cr20Ni18Mo6CuN	0.020	0.80	1.00	0.030	0.010	17.50 ~ 18.50	19.50 ~ 20.50	6.00 ~ 6.50	0.50 ~ 1.00	0.18 ~ 0.25	—
S31603	022Cr17Ni12Mo2 ^a	0.030	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	0.10	—
S31608	06Cr17Ni12Mo2 ^a	0.08	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	0.10	—
S31609	07Cr17Ni12Mo2 ^a	0.04 ~ 0.10	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	17	—
S31653	022Cr17Ni12Mo2N ^a	0.030	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	0.10 ~ 0.16	—
S31658	06Cr17Ni12Mo2N ^a	0.08	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	0.10 ~ 0.16	—
S31668	06Cr17Ni12Mo2Ti ^a	0.08	0.75	2.00	0.045	0.030	10.00 ~	16.00 ~	2.00 ~	—	—	Ti ≥ 5 x C

							14.00	18.00	3.00			
S31678	06Cr17Ni12Mo2Nb ^a	0.08	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00	—	0.10	Nb: 10 x C ~ 1.10
S31688	06Cr18Ni12Mo2Cu2	0.08	1.00	2.00	0.045	0.030	10.00 ~ 14.00	17.00 ~ 19.00	1.20 ~ 2.75	1.00 ~ 2.50	—	—
S31703	022Cr19Ni13Mo3 ^a	0.030	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	—	0.10	—
S31708	06Cr19Ni13Mo3 ^a	0.08	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	—	0.10	—
S31723	022Cr19Ni16Mo5N ^a	0.030	0.75	2.00	0.045	0.030	13.50 ~ 17.50	17.00 ~ 20.00	4.00 ~ 5.00	—	0.10 ~ 0.20	—
S31753	022Cr19Ni13Mo4N ^a	0.030	0.75	2.00	0.045	0.030	11.00 ~ 15.00	18.00 ~ 20.00	3.00 ~ 4.00	—	0.10 ~ 0.22	—
S31782	015Cr21Ni26Mo5Cu2	0.020	1.00	2.00	0.045	0.035	23.00 ~ 28.00	19.00 ~ 23.00	4.00 ~ 5.00	1.00 ~ 2.00	0.10	—
S32168	06Cr18Ni11Ti ^a	0.08	0.75	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	—	—	0.10	Ti ≥ 5 x C
S32169	07Cr19Ni11Ti ^a	0.04 ~ 0.10	0.75	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00	—	—	—	Ti: 4 x (C + N) ~ 0.70
S32652	015Cr24Ni22Mo8Mn3CuN	0.020	0.50	2.00 ~ 4.00	0.030	0.005	21.00 ~ 23.00	24.00 ~ 25.00	7.00 ~ 8.00	0.30 ~ 0.60	0.45 ~ 0.55	—
S34553	022Cr24Ni17Mo5Mn6NbN	0.030	1.00	5.00 ~ 7.00	0.030	0.010	16.00 ~ 18.00	23.00 ~ 25.00	4.00 ~ 5.00	—	0.40 ~ 0.60	Nb: 0.10
S34778	06Cr18Ni11Nb ^a	0.08	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~ 19.00	—	—	—	Nb: 10 x C ~ 1.00
S34779	07Cr18Ni11Nb ^a	0.04 ~	0.75	2.00	0.045	0.030	9.00 ~ 13.00	17.00 ~	—	—	—	Nb: 8 x C ~ 1.00

		0.10						19.00				
S38367	022Cr21Ni25Mo7N	0.030	1.00	2.00	0.040	0.030	23.50 ~ 25.50	20.00 ~ 22.00	6.00 ~ 7.00	0.75	0.18 ~ 0.25	—
S38926	015Cr20Ni25Mo7CuN	0.020	0.50	2.00	0.030	0.010	24.00 ~ 26.00	19.00 ~ 21.00	6.00 ~ 7.00	0.50 ~ 1.50	0.15 ~ 0.25	—

Note: For the composition listed in the table, except for those indicate the scope or the minimum value, the rest are the maximum value.

^a The steel grade with adjusted chemical composition comparing that in GB/T 20878-2007.

Table 16 Chemical composition of austenitic - ferritic steels

Unified digital code	Steel grade	Chemical composition (mass fraction)/%										
		C	Si	Mn	P	S	Ni	Cr	Mo	Cu	N	Other elements
S21860	14Cr18Ni11Si4AlTi	0.10 ~ 0.18	3.40 ~ 4.00	0.80	0.035	0.030	10.00 ~ 12.00	17.50 ~ 19.50	—	—	—	Ti: 0.40 ~ 0.70 Al: 0.10 ~ 0.30
S21953	022Cr19Ni5Mo3Si2N	0.030	1.30 ~ 2.00	1.00 ~ 2.00	0.030	0.030	4.50 ~ 5.50	18.00 ~ 19.50	2.50 ~ 3.00	—	0.05 ~ 0.10	—
S22053	022Cr23Ni5Mo3N	0.030	1.00	2.00	0.030	0.020	4.50 ~ 6.50	22.00 ~ 23.00	3.00 ~ 3.50	19	0.14 ~ 0.20	—
S22152	022Cr21Mn5Ni2N	0.030	1.00	4.00 ~ 6.00	0.040	0.030	1.00 ~ 3.00	19.50 ~ 21.50	0.60	1.00	0.05 ~ 0.17	—
S22153	022Cr21Ni3Mo2N	0.030	1.00	2.00	0.030	0.020	3.00 ~ 4.00	19.50 ~ 22.50	1.50 ~ 2.00	19	0.14 ~ 0.20	—
S22160	12Cr21Ni5Ti	0.09 ~ 0.14	0.80	0.80	0.035	0.030	4.80 ~ 5.80	20.00 ~ 22.00	—	—	—	Ti: 5 x (C - 0.02) ~ 0.80
S22193	022Cr21Mn3Ni3Mo2N	0.030	1.00	2.00 ~ 4.00	0.040	0.030	2.00 ~ 4.00	19.00 ~ 22.00	1.00 ~ 2.00	—	0.14 ~ 0.20	—
S22253	022Cr22Mn3Ni2MoN	0.030	1.00	2.00 ~ 3.00	0.040	0.020	1.00 ~ 2.00	20.50 ~ 23.50	0.10 ~ 1.00	0.50	0.15 ~ 0.27	—
S22293	022Cr22Ni5Mo3N	0.030	1.00	2.00	0.030	0.020	4.50 ~ 6.50	21.00 ~ 23.00	2.50 ~ 3.50	—	0.08 ~ 0.20	—
S22294	03Cr22Mn5Ni2MoCuN	0.04	1.00	4.00 ~ 6.00	0.040	0.030	1.35 ~ 1.70	21.00 ~ 22.00	0.10 ~ 0.80	0.10 ~ 0.80	0.20 ~ 0.25	—
S22353	022Cr23Ni2N	0.030	1.00	2.00	0.040	0.010	1.00 ~ 2.80	21.50 ~ 24.00	0.45	—	0.18 ~ 0.26	—

												+ N) ~ 0.80
S11863	022Cr18Ti	0.030	1.00	1.00	0.040	0.030	0.50	17.00 ~ 19.00	—	—	0.030	Ti: [0.20 + 4 x (C + N)] ~ 1.10 Al: 0.15
S11873	022Cr18N ^b	0.030	1.00	1.00	0.040	0.015	—	17.50 ~ 18.50	—	—	—	Ti: 0.10 ~ 0.60 Nb ≥ 0.30 + 3 x C
S11882	019Cr18CuN ^b	0.025	1.00	1.00	0.040	0.030	0.60	16.00 ~ 20.00	—	0.30 ~ 0.80	0.025	Nb: 8 x (C + N) ~ 0.8
SI 1972	019Cr19Mo2NbTi	0.025	1.00	1.00	0.040	0.030	1.00	17.50 ~ 19.50	1.75 ~ 2.50	—	0.035	Ti + Nb: [0.20 + 4 x (C + N)] ~ 0.80
S11973	022Cr18NbTi	0.030	1.00	1.00	0.040	0.030	0.50	17.00 ~ 19.00	—	—	0.030	Ti + Nb: [0.20 + 4 x (C + N)] ~ 0.75 Al: 0.15
S12182	019Cr21CuTi	0.025	1.00	1.00	0.030	0.030	—	20.50 ~ 23.00	—	0.30 ~ 0.80	0.025	Ti, Nb, Zr or their combination: 8 x (C + N) ~ 0.80
S12361	019Cr23Mo2Ti	0.025	1.00	1.00	0.040	0.030	—	21.00 ~ 24.00	1.50 ~ 2.50	0.60	0.025	Ti, Nb, Zr or their combination: 8 x (C + N) ~ 0.80
S12362	019Cr23MoTi	0.025	1.00	1.00	0.040	0.030	—	21.00 ~ 24.00	0.70 ~ 1.50	0.60	0.025	Ti, Nb, Zr or their combination: 8 x (C + N) ~ 0.80
S12763	022Cr27Ni2Mo4NbTi	0.030	1.00	1.00	0.040	0.030	1.00 ~ 3.50	25.00 ~ 28.00	3.00 ~ 4.00	—	0.040	Ti + Nb: 0.20 ~ 1.00 and Ti + Nb ≥ 6 x (C + N)
S12791	008Cr27Mo _a	0.010	0.40	0.40	0.030	0.020	—	25.00 ~ 27.50	0.75 ~ 1.50	—	0.015	Ni + Cu ≤ 0.50
S12963	022Cr29Mo4NbTi	0.030	1.00	1.00	0.040	0.030	1.00	28.00 ~ 30.00	3.60 ~ 4.20	—	0.045	Ti + Nb: 0.20 ~ 1.00 and Ti + Nb ≥ 6 x (C + N)
S13091	008Cr30Mo2 ^{a,b}	0.010	0.40	0.40	0.030	0.020	0.50	28.50 ~ 32.00	1.50 ~ 2.50	0.20	0.015	Ni + Cu ≤ 0.50

Note: For the composition listed in the table, except for those indicate the scope or the minimum value, the rest are the maximum value.

^a The steel grade with adjusted chemical composition comparing that in GB/T 20878-2007.

^b May contain one of several elements of V, Ti and Nb.

								18.00				
S51570	07Cr15Ni7Mo2Al	0.09	1.00	1.00	0.040	0.030	6.50 ~ 7.75	14.00 ~ 16.00	2.00 ~ 3.00	—	—	Al: 0.75 ~ 1.50
S51750	09Cr17Ni5Mo3N ^a	0.07 ~ 0.11	0.50	0.50 ~ 1.25	0.040	0.030	4.00 ~ 5.00	16.00 ~ 17.00	2.50 ~ 3.20	—	0.07 ~ 0.13	—
S51778	06Cr17Ni7AlTi	0.08	1.00	1.00	0.040	0.030	6.00 ~ 7.50	16.00 ~ 17.50	—	—	—	Al: 0.40 Ti: 0.40 ~ 1.20

Note: For the composition listed in the table, except for those indicate the scope or the minimum value, the rest are the maximum value.

^a The steel grade with adjusted chemical composition comparing that in GB/T 20878-2007.

6.3 Delivery state

6.3.1 After hot rolling, steel plates, sheets and strips can be delivered after heat treatment and pickling or similar treatment. If the demand party agrees, the treatment such as pickling can be omitted. See Annex C for heat treatment.

6.3.2 For the heat treatment of precipitation-hardening steels, the demand party shall indicate in the contract the type of heat treatment of the steel plate or specimen, steel strip or specimen, and if not indicated, it shall be delivered in solid solution.

6.4 Mechanical properties

6.4.1 The mechanical properties of heat treated steel plates, sheets and strips shall comply with the specifications of 6.4.3 to 6.4.8.

6.4.2 For the hardness test, choose one of the test methods according to different dimensions and states of steel plates, sheets and strips. When carrying out bending tests to annealed ferritic and martensitic steel plates, sheets and strips, there shall be no visible cracks on the outer surface.

6.4.3 The mechanical properties of austenitic steel plates, sheets and strips after solid solution treatment shall comply with the specifications in Table 20.

Table 20 Mechanical properties of austenitic steel plates, sheets and strips after solid solution treatment

Unified digital code	Steel grade	Specified plastic elongation strength $R_{p0.2}/\text{MPa}$	Tensile strength R_m/MPa	Elongation after fracture ^a $A/\%$	Hardness value		
					HBW	HRB	HV
		Not less than			Not more than		
S30103	022Cr17Ni7	220	550	45	241	100	242
S30110	12Cr17Ni7	205	515	40	217	95	220
S30153	022Cr17Ni7N	240	550	45	241	100	242
S30210	12Cr18Ni9	205	515	40	201	92	210
S30240	12Cr18Ni9Si3	205	515	40	217	95	220
S30403	022Cr19Ni10	180	485	40	201	92	210
S30408	06Cr19Ni10	205	515	40	201	92	210
S30409	07Cr19Ni10	205	515	40	201	92	210
S30450	05Cr19Ni10Si2CeN	290	600	40	217	95	220
S30453	022Cr19Ni10N	205	515	40	217	95	220
S30458	06Cr19Ni10N	240	550	30	217	95	220
S30478	06Cr19Ni9NbN	275	585	30	241	100	242
S30510	10Cr18Ni12	170	485	40	183	88	200

			15 °C ± 3 °C 566 °C ± 6 °C					
		2 ~ < 5 5 ~ 16	954 °C ± 8 °C -73 °C ± 6 °C 510 °C ± 6 °C	1310 1240	1450 1380	4 6	44 43	— 401
S51570	07Cr15Ni7Mo2Al	2~ <5 5~16	760 °C ± 15 °C 15 °C ± 3 °C 566 °C ± 6 °C	1170 1170	1310 1310	5 4	40 40	— 375
S51570	07Cr15Ni7Mo2Al	2~ <5 5~16	954 °C ± 8 °C -73 °C ± 6 °C 510 °C ± 6 °C	1380 1380	1550 1550	4 4	46 45	— 429
S51750	09Cr17Ni5Mo3N	2~5	455 °C ± 10 °C	1035	1275	8	42	—
		2~5	540 °C ± 10 °C	1000	1140	8	36	—
S51778	06Cr17Ni7AlTi	2~ <3 ≥3	510 °C ± 10 °C	1170 1170	1310 1310	5 8	39 39	— 363
		2~ <3 ≥3	540 °C ± 10 °C	1105 1105	1240 1240	5 8	37 38	— 352
		2~ <3 ≥3	565 °C ± 10 °C	1035 1035	1170 1170	5 8	35 36	— 331
^a The recommended heat treatment temperature, the supply party shall provide recommended heat treatment system to the demand party. ^b Applicable to the test in the width direction, perpendicular to the rolling direction and parallel to the surface of the steel plate. ^c Use A_{50mm} samples when the thickness is not more than 3 mm.								

6.4.8 The flexural properties of the precipitation-hardening steel plates, sheets and strips after solid solution treatment shall comply with the specifications in Table 26.

S30408	06Cr19Ni10	Solid solution treatment (delivery state)	Intergranular corrosion cracking is not allowed
S30409	07Cr19Ni10		
S31608	06Cr17Ni12Mo2		
S31688	06Cr18Ni12Mo2Cu2		
S31708	06Cr19Ni13Mo3		
S30403	022Cr19Ni10	Sensitization treatment	Intergranular corrosion cracking is not allowed
S31603	022Cr17Ni12Mo2		
S31668	06Cr17Ni12Mo2Ti		
S31703	022Cr19Ni13Mo3		
S32168	06Cr18Ni11Ti		
S34778	06Cr18Ni11Nb		

6.5.7 According to the requirements of the demand party, through the consultation between supply and demand parties, other corrosion tests may be carried out on steel plates, sheets and strips. The test methods and requirements shall be determined through consultation between supply and demand parties and indicated in the contract.

6.6 Grain size

According to the requirements of the demand party, through the consultation between supply and demand parties, and indicated in the contract, the stainless steel with the steel grade of 07Cr19Ni10, 07Cr17Ni12Mo2, 07Cr19Ni11Ti and 07Cr18Ni11Nb shall be carried out grain size inspection, the average grain size shall be grade 7 or more coarse.

6.7 Surface processing and quality requirements

6.7.1 Type of surface processing for steel plates, sheets and strips

The type of surface treatment for steel plates, sheets and strips is shown in Table 31. The demand party shall specify the type of surface processing in accordance with the use requirements. The type of surface processing other than Table 31 may be provided through the consultation of supply and demand parties and indicating in the contract.

Table 31 Surface processing type

Abbreviation	Processing type	Surface state	Note
1U	Hot rolling, no heat treatment, no scaling	With rolling scaling	For further processing, such as re-rolling of steel strip
1C	Hot rolling, heat treatment, no scaling	With rolling scaling	For further descaling or machined parts, or for certain heat-resistant applications

32	S30908	06Cr23Ni13	0Cr23Ni13	S30908, 309S	SUS309S	X12CrNi23-13	X12CrNi23-13,1.4833
35	S31008	06Cr25Ni20	0Cr25Ni20	S31008, 310S	SUS310S	X8CrNi25-21	X8CrNi25-21,1.4845
36	S31053	022Cr25Ni22Mo2N	—	S31050, 310MoLN	—	X1CrNiMoN25-22-2	X1CrNiMoN25-22-2,1.4466
37	S31252	015Cr20Ni18Mo6CuN	—	S31254	SUS312L	X1CrNiMoN20-18-7	X1CrNiMoN20-18-7,1.4547
38	S31608	06Cr17Ni12Mo2	0Cr17Ni12Mo2	S31600, 316	SUS316	X5CrNiMo17-12-2	X5CrNiMo17-12-2,1.4401
39	S31603	022Cr17Ni12Mo2	00Cr17Ni14Mo2	S31603, 316L	SUS316L	X2CrNiMo17-12-2	X2CrNiMo17-12-2,1.4404
40	S31609	07Cr17Ni12Mo2	1Cr17Ni12Mo2	S31609, 316H	—	—	X6CrNiMo17-13-2,1.4918
41	S31668	06Cr17Ni12Mo2Ti	0Cr18Ni12Mo3Ti	S31635, 316Ti	SUS316Ti	X6CrNiMoTi17-12-2	X6CrNiMoTi17-12-2,1.4571
42	S31678	06Cr17Ni12Mo2Nb	—	S31640,316Nb	—	X6CrNiMoNb17-12-2	X6CrNiMoNb17-12-2,1.4580
43	S31658	06Cr17Ni12Mo2N	0Cr17Ni12Mo2N	S31651,316N	SUS316N	—	—
44	S31653	022Cr17Ni12Mo2N	00Cr17Ni13Mo2N	S31653, 316LN	SUS316LN	X2CrNiMoN17-12-3	X2CrNiMoN17-11-2,1.4406
45	S31688	06Cr18Ni12Mo2Cu2	0Cr18Ni12Mo2Cu2	—	SUS316J1	—	—
48	S31782	015Cr21Ni26Mo5Cu2	—	N08904, 904L	SUS890L	X1NiCrMoCu25-20-5	X1NiCrMoCu25-20-5,1.4539
49	S31708	06Cr19Ni13Mo3	0Cr19Ni13Mo3	S31700, 317	SUS317	—	—
50	S31703	022Cr19Ni13Mo3	00Cr19Ni13Mo3	S31703, 317L	SUS317L	X2CrNiMo19-14-4	X2CrNiMo18-15-4,1.4438
53	S31723	022Cr19Ni16Mo5N	—	S31726, 317LMN	—	X2CrNiMoN18-15-5	X2CrNiMoN17-13-5,1.4439
54	S31753	022Cr19Ni13Mo4N	—	S31753, 317LN	SUS317LN	X2CrNiMoN18-12-	X2CrNiMoN18-12-

							4,1.4410
77	S27603	022Cr25Ni7Mo4WCuN	—	S3 2760	—	X2CrNiMoWN25-7-4	X2CrNiMoWN25-7-4,1.4501
—	S22153	022Cr21Ni3Mo2N	—	S32003	—	—	41
—	S22294	03Cr22Mn5Ni2MoCuN	—	S32101	—	X2CrMnNiN21-5-1	X2CrMnNiN21-5-1,1.4162
—	S22152	022Cr21Mn5Ni2N	—	S32001	—	—	—
—	S22193	022Cr21Mn3Ni3Mo2N	—	S81921	—	—	—
—	S22253	022Cr22Mn3Ni2MoN	—	S82011	—	X2CrMnNiN21-5-1	—
—	S22353	022Cr23Ni2N	—	S32202	—	—	—
—	S22493	022Cr24Ni4Mn3Mo2CuN	—	S82441	—	—	—
78	S11348	06Cr13Al	0Cr13Al	S40500, 405	SUS405	X6CrA113	X6CrAl13,1.4002
80	S11163	022Cr11Ti	—	S40920	SUH409L	X2CrTi12	X2CrTi12,1.4512
81	S11173	022Cr11NbTi	—	S40930	41	41	41
82	S11213	022Cr12Ni	—	S40977	41	X2CrNi12	X2CrNi12,1.4003
83	S11203	022Cr12	00Cr12	41	SUS410L	41	41
84	S11510	10Cr15	1Cr15	S42900, 429	SUS429	41	41
85	S11710	10Cr17	1Cr17	S43000, 430	SUS430	X6Cr17	X6Cr17,1.4016
87	S11763	022Cr17NbTi	00Cr17	S43035, 439	SUS430LX	X3CrTi17	X3CrTi17,1.4510
88	S11790	10Cr17Mo	1Cr17Mo	S43400, 434	SUS434	X6CrMo17-1	X6CrMo17-1,1.4113
90	S11862	019Cr18MoTi	—	—	SUS436L	—	—
91	S11873	022Cr18Nb	—	S43940	—	X2CrTiNb18	X2CrTiNb18,1.4509
92	S11972	019Cr19Mo2NbTi	00Cr18Mo2	S44400, 444	SUS444	X2CrMoTi18-2	X2CrMoTi18-2,1.4521
94	S12791	008Cr27Mo	00Cr27Mo	S44627, XM-27	SUSXM27	—	—
95	S13091	008Cr30Mo2	00Cr30Mo2	—	SUS447J1	—	—
—	S12182	019Cr21CuTi	—	—	SUS443J1	—	—
—	S11973	022Cr18NbTi	—	S43932	—	—	—

Annex B

(informative)

Characteristics and uses of stainless steels

See Table B.1 for characteristics and uses of stainless steels.

Table B.1 Characteristics and uses of stainless steels

Type	Unified digital code	Steel grade	Characteristics and uses
Austenitic type	S30110	12Cr17Ni7	With high strength after cold working. Used for railway vehicles, conveyor belt bolts and nuts, etc.
	S30103	022Cr17Ni7	Ultra-low carbon steel of 12Cr17Ni7, with good intergranular corrosion resistance and weldability; used for railway vehicles
	S30153	022Cr17Ni7N	Ultra-low carbon nitrogen steel of 12Cr17Ni7, with high strength, good intergranular corrosion resistance and weldability; used for structural parts
	S30210	12Cr18Ni9	With high strength after cold working and slightly worse elongation than 12Cr17Ni7. Used for building decoration parts
	S30240	12Cr18Ni9Si3	With better oxidation resistance than 12Cr18Ni9; with the same oxidation resistance and strength with 06Cr25Ni20 at below 900 °C. Used for automotive exhaust purification devices, industrial furnaces and other high-temperature device components
	S30408	06Cr19Ni10	Most widely used as the heat-resistant stainless steel, for food equipment, general chemical equipment, atomic energy industry, etc.
	S30403	022Cr19Ni10	Steel with lower carbon content than 06Cr19Ni10, superior intergranular corrosion resistance, and no heat treatment after welding
	S30409	07Cr19Ni10	With good plasticity, toughness and cold workability among the solid solution steels; with good corrosion resistance in oxidizing

	S30908	06Cr23Ni13	With better corrosion resistance than 06Cr19Ni10, but mostly used as heat-resistant steel in fact
	S31008	06Cr25Ni20	With better oxidation resistance than 06Cr23Ni13, but mostly used as heat-resistant steel in fact
	S31053	022Cr25Ni22Mo2N	Add nitrogen in the steel to improve the pitting corrosion resistance of the steel, and make the steel has a higher strength and a stable austenite structure. Applicable to the structural material in the stripping tower of urea production, with a far better performance than 022Cr17Ni12Mo2
	S31252	015Cr20Ni18Mo6CuN	A high cost-effective super austenitic stainless steel, with lower C content and high Mo and N content, to make it has good intergranular corrosion resistance, pitting corrosion resistance and crevice corrosion resistance, mainly used for marine development, desalination, heat exchangers, pulp production, flue gas desulfurization equipment and other fields
	S31608	06Cr17Ni12Mo2	With better corrosion resistance than 06Cr19Ni10 in seawater and various media. Mainly used for pitting corrosion-resistant materials
	S31603	022Cr17Ni12Mo2	Ultra-low carbon steel of 06Cr17Ni12Mo2. Ultra-low carbon austenitic stainless steel has a good corrosion resistance to a variety of inorganic acids, bases, salts (such as sulfurous acid, sulfuric acid, phosphoric acid, acetic acid, formic acid, chloride, halogen, sulfite, etc.). Because of low carbon content, it has good weldability, which makes it suitable for multi-layer welding, generally need no heat treatment after welding, and has no knife-edge corrosion tendency after welding. It can be used in the manufacturing of synthetic fibers, petrochemical, textile, fertilizer, printing and atomic energy and other industrial equipment, such as towers, tanks, pipes, pipes, etc.

	S31753	022Cr19Ni13Mo4N	Add nitrogen in 022Cr19Ni13Mo3; with high strength and high corrosion resistance; used for tanks, containers, etc.
	S32168	06Cr18Ni11Ti	Add titanium to improve intergranular corrosion resistance; it is not recommended for decorative parts
	S32169	07Cr19Ni11Ti	Compared with 06Cr18Ni11Ti, the C content of the steel grade is adjusted from 0.08% to 0.04% ~ 0.10%, the high temperature resistance is improved, so that it can be used in the boiler industry
	S32652	015Cr24Ni22Mo8Mn3CuN	Belongs to super austenitic stainless steels, high Mo, high N and high Cr make it has excellent pitting corrosion resistance, crevice corrosion resistance; mainly used for marine development, desalination, pulp production, flue gas desulfurization devices, etc.
	S34553	022Cr24Ni17Mo5Mn6NbN	A high-strength and corrosion-resistant super austenitic stainless steel, with excellent pitting corrosion resistance and crevice corrosion resistance in the chloride environment. This steel is recommended for desalination, offshore oil platforms and flue gas desulfurization devices of power plant, etc.
	S34778	06Cr18Ni11Nb	Add Nb to improve the stability of austenitic stainless steel. Because of its good corrosion resistance and weldability, it is widely used in petrochemical, synthetic fibers, food, papermaking and other industries. In the thermal power plants and nuclear power industry, it is used for large boiler heaters, reheaters, steam pipes, shafts and various types of welding structure parts
	S34779	07Cr18Ni11Nb	Compared with 06Cr18Ni11Nb, the C content of the steel grade is adjusted from 0.08% to 0.04% ~ 0.10%, the high temperature resistance is improved, so that it can be used in the boiler industry

			weldability; with a wide range of uses in the petrochemical, shipbuilding, papermaking, desalination, nuclear power and other fields
	S22053	022Cr23Ni5Mo3N	Low-alloy dual-phase stainless steel, with high strength, which can replace S30403 and S31603, and can be used for boilers and pressure vessels, pipelines of chemical plants and refineries
	S23043	022Cr23Ni4MoCuN	With dual-phase structure, excellent stress corrosion cracking resistance, other forms of corrosion resistance and good weldability. Mainly used in petroleum and petrochemical, papermaking, desalination and other industries
	S22553	022Cr25Ni6Mo2N	With better corrosion resistance fatigue performance than S31603 (urea grade); it has important reference value for the selection of urea methylamine pump material under low stress and low frequency alternating load. Mainly used in chemical, fertilizer, petrochemical and other fields, and more for the manufacturing of heat exchangers, evaporators, etc.; domestically, mainly used in urea devices, and can also be used for seawater corrosion resistant parts
	S25554	03Cr25Ni6Mo3Cu2N	The steel has good mechanical properties and local corrosion resistance, in particular, is better in wear corrosion resistance than ordinary stainless steels. The ideal material in seawater environment, which is applicable to propellers, shafts, submarine seals, etc. for ships, and used in chemical, petrochemical, natural gas, pulp, papermaking and other industries
	S25073	022Cr25Ni7Mo4N	The steel with the best local corrosion resistance in dual-phase stainless steels, especially with the best pitting corrosion resistance and characteristic of high strength, chloride stress corrosion resistance and weldability. Very suitable for heat transfer equipment using river water, groundwater and sea water as the cooling

			even better pitting corrosion resistance and uniform corrosion resistance than 022Cr17Ni12Mo2; the stress corrosion resistance is also significantly improved; it is the ideal alternative of 022Cr17Ni12Mo2; used for the construction, storage tanks, papermaking, petrochemical and other fields
	S22253	022Cr22Mn3Ni2MoN	Contains higher Cr and N, the pitting corrosion resistance and uniform corrosion resistance are better than those of 022Cr19Ni10, and equivalent to those of 022Cr17Ni12Mo2; the stress corrosion resistance is significantly improved; with good weldability; it can replace 022Cr19Ni10 and 02Cr17Ni12Mo2; used for construction, storage tanks, petrochemicals, energy and other fields
	S22353	022Cr23Ni2N	Replace Ni with higher N, and Mo content is lower, so the cost is significantly reduced. Because of containing about 23% of Cr and about 0.2% of N, the pitting corrosion resistance and corrosion resistance are equivalent to or even higher than those of 022Cr17Ni12Mo2, the stress corrosion resistance is significantly improved, the weldability is good; it can replace 022Cr17Ni12Mo2. Used in construction, storage tanks, petrochemical, and other fields
	S22493	022Cr24Ni4Mn3Mo2CuN	Ni is replaced with higher N and a certain content of Mn, Cr content is lower, so the cost is reduced. Because of containing about 24% Cr and about 0.25% N, the pitting corrosion resistance and uniform corrosion resistance are better than those of 022Cr17Ni12Mo2, and close to those of 022Cr19Ni13Mo3, the stress corrosion resistance is significantly improved, the weldability is good; it can replace 022Cr17Ni12Mo2. Used for petrochemical, papermaking, construction, storage tanks and other fields

			automotive exhaust systems, interior and exterior decorations
	S11862	019Cr18MoTi	Add Mo in the steel to improve the pitting corrosion resistance, crevice corrosion resistance and strength
	S11873	022Cr18Nb	Add not less than 0.3% of Nb and 0.1% ~ 0.6% of Ti, reduce the carbon content, to improve the workability and weldability, and improve the high temperature performance; used for oven tubes, automotive exhaust systems, gas hoods and other fields
	S11972	019Cr19Mo2NbTi	Contains more Mo than 022Cr18MoTi; the corrosion resistance is improved, the stress corrosion cracking resistance is good; used for water storage tank solar water heaters, heat exchangers, food machineries, dyeing machineries, etc.
	S12791	008Cr27Mo	Used for similar purposes with 008Cr30Mo2 that shares similar performances, uses, corrosion resistance and soft magnetic properties
	S13091	008Cr30Mo2	With high Cr-Mo system; C, N is reduced to very low. With good corrosion resistance, halogen ion stress corrosion cracking resistance and pitting corrosion resistance. Used for equipment relating to the manufacturing of acetic acid, lactic acid and other organic acids, and for equipment for manufacturing caustic soda
	S12182	019Cr21CuTi	With close corrosion resistance, formability and weldability with 06Cr19Ni10. Used for interior and exterior decoration materials, elevators, home appliances, vehicle parts, stainless steel products, solar water heaters, etc.
	S11973	022Cr18NbTi	C in 10Cr17 is reduced, Nb, Ti are compositely added; the high temperature performance is better than 022Cr11Ti; used for vehicle components, kitchen equipment, interior and exterior decorations of buildings
	S11863	022Cr18Ti	C in 10Cr17 is reduced and Ti is added alone, to improve the corrosion resistance,

	S41595	04Cr13Ni5Mo	With main strengthening means of having low-carbon martensite with high toughness and supplement of nickel, molybdenum and other alloying elements; with high strength and good toughness, weldability and corrosion resistance. Applicable to thick section dimension and requires use conditions with good welding performance, such as large-scale hydropower station runners and lower wheels of runners, etc.
	S42020	20Cr13	Quenching the state of high hardness, good corrosion resistance. For steam turbine blades
	S42030	30Cr13	With high hardness than 20Cr13 after quenching; used for cutting tools, nozzles, valve seats, valves, etc.
	S42040	40Cr13	With high hardness than 30Cr13 after quenching; used for cutting tools, nozzles, valve seats, valves, etc.
	S43120	17Cr16Ni2	One of martensitic stainless steels with highly matched strength and toughness, having good corrosion resistance to oxidizing acid, most organic acids and aqueous solution of organic salts. Used for the manufacture of parts, containers and equipment with a certain degree of resistance to nitric acid, organic acid corrosion
	S44070	68Cr17	At hardening state, it is hard and with high toughness; used for cutting tools, measuring tools and bearings
	S46050	50Cr15MoV	C content is increased to 0.5%, Cr content is increased to 15%; add molybdenum and vanadium; the hardness after quenching may be up about HRC56; with good corrosion resistance, processability and grinding performance; used in tool industry
Precipitation hardening type	S51380	04Cr13Ni8Mo2Al	With high strength, excellent fracture toughness, good transverse mechanical property and stress corrosion resistance in the marine environment; used for

Annex C

(informative)

Heat treatment system of stainless steels

See Tables C.1 ~ C.5 for heat treatment system of stainless steels.

Table C.1 Heat treatment system of austenitic steels

Unified digital code	Steel grade	Heat treatment temperature and cooling method
S30110	12Cr17Ni7	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30103	022Cr17Ni7	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30153	022Cr17Ni7N	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30210	12Cr18Ni9	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30240	12Cr18Ni9Si3	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30408	06Cr19Ni10	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30403	022Cr19Ni10	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30409	07Cr19Ni10	$\geq 1095\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30450	05Cr19Ni10Si2CeN	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30458	06Cr19Ni10N	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30478	06Cr19Ni9NbN	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30453	022Cr19Ni10N	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30510	10Cr18Ni12	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S30908	06Cr23Ni13	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S31008	06Cr25Ni20	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods
S31053	022Cr25Ni22Mo2N	$\geq 1040\text{ }^{\circ}\text{C}$ water cooling or other rapid cooling methods

Table C.3 Heat treatment system of ferritic steels

Unified digital code	Steel grade	Annealing treatment temperature and cooling method
S11348	06Cr13Al	780 °C ~ 830 °C rapid cooling or slow cooling
S11163	022Cr11Ti	800 °C ~ 900 °C rapid cooling or slow cooling
S11173	022Cr11NbTi	800 °C ~ 900 °C rapid cooling or slow cooling
S11213	022Cr12Ni	700 °C ~ 820 °C rapid cooling or slow cooling
S11203	022Cr12	700 °C ~ 820 °C rapid cooling or slow cooling
S11510	10Cr15	780 °C ~ 850 °C rapid cooling or slow cooling
S11710	10Cr17	780 °C ~ 800 °C air cooling
S11763	022Cr17NbTi	780 °C ~ 950 °C rapid cooling or slow cooling
S11790	10Cr17Mo	780 °C ~ 850 °C rapid cooling or slow cooling
S11862	019Cr18MoTi	800 °C ~ 1050 °C rapid cooling
S11873	022Cr18Nb	800 °C ~ 1050 °C rapid cooling
S11972	019Cr19Mo2NbTi	800 °C ~ 1050 °C rapid cooling
S12791	008Cr27Mo	900 °C ~ 1050 °C rapid cooling
S13091	008Cr30Mo2	800 °C ~ 1050 °C rapid cooling
S12182	019Cr21CuTi	800 °C ~ 1050 °C rapid cooling
S11973	022Cr18NbTi	780 °C ~ 950 °C rapid cooling or slow cooling
S11863	022Cr18Ti	780 °C ~ 950 °C rapid cooling or slow cooling
S12362	019Cr23MoTi	850 °C ~ 1050 °C rapid cooling
S12361	019Cr23Mo2Ti	850 °C ~ 1050 °C rapid cooling
S12763	022Cr27Ni2Mo4NbTi	950 °C ~ 1150 °C rapid cooling
S12963	022Cr29Mo4NbTi	950 °C ~ 1150 °C rapid cooling
S11573	022Cr15NbTi	780 °C ~ 1050 °C rapid cooling or slow cooling
S11882	019Cr18CuNb	800 °C ~ 1050 °C rapid cooling

Table C.4 Heat treatment system of martensitic steels

Unified digital code	Steel grade	Annealing treatment	Quenching	Tempering
S40310	12Cr12	About 750 °C rapid cooling or 800 °C ~ 900 °C slow cooling	—	—
S41008	06Cr13	About 750 °C rapid cooling or 800 °C ~ 900 °C slow cooling	—	—
S41010	12Cr13	About 750 °C rapid cooling or 800 °C ~ 900 °C slow cooling	—	—
S41595	04Cr13Ni5Mo	—	—	—

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----