

Translated English of Chinese Standard: Q/BQB303-2014

www.ChineseStandard.net

Sales@ChineseStandard.net

ENTERPRISE STANDARD OF
BAOSTEEL GROUP CORPORATION

Q/BQB 303-2014

Replacing Q/BQB 303-2009

**Continuously hot-rolled steel sheet and strip for
general structure**

一般结构用热连轧钢板及钢带

Q/BQB 303-2014 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: May 5, 2014

Implemented on: September 1, 2014

Issued by: Baosteel Group Corporation

Table of Contents

Foreword.....	3
1 Scope	5
2 Normative references	5
3 Classification and code	6
4 Order required information	7
5 Size, shape, weight and tolerance.....	8
6 Technical requirements	8
7 Inspection and test	18
8 Packaging, marks and inspection documents	20
9 Rounding rules	20
10 Annex	20
Annex A	21

Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009 *Directives for standardization - Part 1: Structure and drafting of standards*.

This Standard referred to JIS G 3101-2010, JIS G 3106-2008, JIS G 3132-2011, EN 10025-2:2004, EN 10113-2:1993, DIN 17100-80 and combined with the actual conditions of BaoSteel to formulate.

This Standard replaces Q/BQB 303-2009.

Compared with Q/BQB 303-2009, the main changes in this Standard are as follows:

- modified the standard name to “Continuously hot-rolled steel sheet and strip for general structure”;
- synchronously modified the “Scope” of this Standard with the change of standard name, and deleted “part used for mechanical structure after further processing and heat treatment”;
- updated the versions of normative references;
- deleted the designations in the brackets in Table 1, Table 3;
- modified “structure used” in the “category” of Table 1 to “general structure used”;
- expanded SM400A, SM400B, SM490A nominal thickness of which the upper limit was expanded to 20 mm;
- deleted C22, C35, S20C, S35C, S45C designations used for mechanical structure and technical requirements; and added the content into Q/BQB 360-2014;
- deleted C22, C35, S20C, S35C and S45C recommended heat treatment system, the comparison table of similar designations with relevant standards in the annex;
- made other editorial modifications.

This Standard was proposed by Manufacturing Management Department of BaoSteel Group Corporation.

This Standard shall be under the jurisdiction of Manufacturing Management Department of BaoSteel Group Corporation.

Continuously hot-rolled steel sheet and strip for general structure

1 Scope

This Standard specifies the size, shape, technical requirements, testing and inspection, packaging, marks and inspection documents, etc. of continuously hot-rolled steel sheet and strip for general structure.

This Standard is applicable to the continuously hot-rolled steel sheet and strip for general structure manufactured by BaoSteel Group Corporation as well as cross-cutting steel plate and longitudinal cutting strip thereby (hereinafter referred to as steel plate and steel). The products are mainly used for structural parts in construction, bridges, ships, vehicles, etc.

2 Normative references

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

GB/T 222-2006 *Permissible Tolerances for Chemical Composition of Steel Products*

GB/T 223 *Methods for Chemical Analysis of Iron, Steel and Alloy*

GB/T 228.1-2010 *Metallic materials - Tensile testing - Part 1 : Method of test at room temperature*

GB/T 229-2007 *Metallic Materials - Charpy Pendulum Impact Test Method*

GB/T 232-2010 *Metallic materials - Bend test*

GB/T 2975-1998 *Steel and Steel Products - Location and Preparation of Test Pieces for Mechanical Testing*

GB/T 4336-2002 *Standard Test Method for Spark Discharge Atomic Emission Spectrometric Analysis of Carbon and Low-Alloy Steel (Routine Method)*

GB/T 4340.1-2009 *Metallic materials - Vickers hardness test - Part 1: Test*

method

GB/T 8170-2008 *Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 20066-2006 *Steel and Iron-Sampling and Preparation of Samples for the Determination of Chemical Composition*

GB/T 20123-2006 *Steel and iron - Determination of total carbon and sulfur content Infrared absorption method after combustion in an induction furnace (routine method)*

Q/BQB 300 *General rules for the packaging, marks and inspection documents of hot rolled steel sheets and strip*

Q/BQB 301 *Hot-rolled steel sheets and strips - Dimensions, shape, weight and tolerances*

3 Classification and code

3.1 Designation, nominal thickness and use of steel plate and strip are shown in Table 1.

3.2 Classify according to surface treatment method into:

pickling surface

rolling surface

3.3 Classify according to surface quality grade into:

ordinary surface FA

higher surface FB

3.4 Classify according to product category into:

hot-rolled steel strip

hot-rolled steel plate

hot-rolled longitudinal cutting steel strip

hot-rolled pickling steel strip

hot-rolled pickling steel plate

6.1.1 The designation and chemical composition (melting analysis) of steel shall comply with the provisions of Table 3 ~ Table 5.

6.1.2 The content of residual elements in steel shall comply with the following provisions:

$Cu \leq 0.20\%$, $Cr \leq 0.15\%$, $Ni \leq 0.15\%$; however, if the supplier can ensure that the contents of Cu, Cr, Ni, the residual elements, in steel comply with the aforementioned provisions, the chemical analysis of these elements may not be carried out.

6.1.3 The tolerance of finished chemical composition of steel plate and strip shall comply with the provisions of GB/T 222.

6.2 Smelting method

The steel used for steel plate and strip uses oxygen converter smelting.

6.3 Delivery state

The steel plate and strip shall be delivered in hot-rolling state or controlled rolling state.

Table 3

Designation	Chemical composition ^a (mass fraction) %						
	C	Si	Mn	P	S	N ^b	Ceq ^c
SS330	≤ 0.15	≤ 0.30	≤ 0.95	≤ 0.035	≤ 0.035	-	-
SS400	≤ 0.21	≤ 0.30	≤ 1.40			-	-
SS490	≤ 0.22	≤ 0.25	≤ 1.40			-	-
SS540	≤ 0.30	≤ 0.25	≤ 1.60			-	-
S185	-	-	-	≤ 0.040	≤ 0.040	-	-
S235JR	≤ 0.17	≤ 0.35	≤ 1.40	≤ 0.035	≤ 0.035	≤ 0.012	≤ 0.35
S235J0				≤ 0.030	≤ 0.030		
S235J2				≤ 0.025	≤ 0.025	-	
S275JR	≤ 0.21	≤ 0.35	≤ 1.50	≤ 0.035	≤ 0.035	≤0.012	≤ 0.40
S275J0	≤ 0.18			≤ 0.030	≤ 0.030		
S275J2	≤ 0.18			≤ 0.025	≤ 0.025	-	
E295	≤ 0.30	≤ 0.35	≤ 1.60	≤ 0.035	≤ 0.035	≤ 0.012	-
S355JR	≤ 0.24	≤ 0.55	≤ 1.60	≤0.035	≤0.035	≤0.012	≤ 0.45
S355J0	≤ 0.20			≤ 0.030	≤ 0.030		
S355J2	≤ 0.20			≤ 0.025	≤ 0.025	-	
S355K2	≤ 0.20			≤ 0.025	≤ 0.025		

Table 5

Designation	Chemical composition (mass fraction) %					
	C	Si	Mn	P	S	Other ^a
SPHT1	≤ 0.10	≤ 0.35	≤ 0.50	≤ 0.035	≤ 0.035	-
SPHT2	≤ 0.18		≤ 0.60			
SPHT3	≤ 0.25		0.30 ~ 0.90			
SPHT4	≤ 0.30		0.30 ~ 1.00			
^a Other alloying elements can be added as required.						

6.4 Surface treatment method

6.4.1 Surface treatment of steel plate and strip can use two methods: rolling surface and pickling surface.

6.4.2 The steel plate and strip of pickling surface can be delivered in oiled state or un-oiled state. The oiled pickling steel plate and strip, under normal packaging, transport, handling and storage conditions, the supplier shall ensure that the product shall not have rust within three months since the date of production, and the oil film shall be removed by alkaline aqueous solution. If the buyer requires the delivery in un-oiled pickling steel plate and strip, it shall be indicated in the contract. It is easy for the un-oiled pickling steel plate and strip to have rust and abrasion during transport and processing and the supplier does not guarantee this.

6.5 Mechanical and processing properties

6.5.1 The mechanical and processing properties of steel plate and strip should comply with the corresponding provisions in Table 6 ~ Table 10.

6.5.2 After bending test, there shall be no visible cracks at the outer surface of the specimen. If the supplier can ensure qualified bending test, it may not carry out this test.

6.5.3 The impact energy value is the average value of a set of three test specimens. The test result of one specimen is allowed to be less than the predetermined value but not less than 70% of the predetermined value.

6.5.4 The impact test specified in Table 6 ~ Table 8 is only applicable to the product of which the thickness $t \geq 12.0$ mm. If the user requires to carry out the impact test for the product of which the thickness $t < 12.0$ mm, it shall be indicated in the contract based on the negotiation between both parties to use 10 mm × 7.5 mm specimen or 10.0 mm × 5.0 mm specimen. The minimum impact energy required at this time shall be respectively 5/6 or 2/3 of the impact energy listed in Table 6 ~ Table 8.

6.5.5 According to buyer's requirements, after negotiating between both parties and specifying in the contract, it shall supplement to carry out other

Table 6

Designation	Tensile test ^a						180° Bending test ^b d - Diameter of Bending Center a - specimen thickness	V-type impact test ^c	
	Upper yield strength R _{eH} / MPa		Tensile strength R _m / MPa	Elongation at break %				Temperature °C	Impact energy J
				L ₀ =50 mm b=25mm	L ₀ =200mm b=40mm				
	Nominal thickness mm			Nominal thickness mm					
	≤ 16	> 16		≤ 5	> 5~16	> 16			
SS330	≥ 205	≥ 195	330~430	≥ 26	≥ 21	≥ 26	d=1a	-	-
SS400	≥ 245	≥ 235	400~510	≥ 21	≥ 17	≥ 21	d=3a		
SS490	≥ 285	≥ 275	490~610	≥19	≥ 15	≥ 19	d=4a		
SS540	≥ 400	≥ 390	≥ 540	≥ 16	≥ 13	≥ 17	d=4a		
SM400A	≥ 245	≥ 235	400~510	≥ 23	≥ 18	≥ 22	d=2a	-	-
SM400B								0	≥ 27
SM400C								0	≥ 47
SM490A	≥ 325	≥ 315	490~610	≥ 22	≥ 17	≥ 21	d=3a	-	-
SM490B								0	≥ 27
SM490C								0	≥ 47
SM490YA	≥ 365	≥ 355	490~610	≥ 19	≥ 15	≥ 19	d=3a	-	-
SM490YB								0	≥ 27
SM520B	≥ 365	≥ 355	520~640	≥ 19	≥ 15	≥ 19	d=3a	0	≥ 27
SM520C								0	≥ 47
SM570	≥ 460	-	570~720	≥19 d		-	d=3a	-5	≥ 47
BSM590	≥ 450	-	590~710	≥20 d		-	d=2a	-5	≥ 47

E295	≥ 295	≥ 285	490 ~ 660	470 ~ 610	≥ 12	≥ 13	≥ 14	≥ 18	-	-	-	-
S355JR d	≥ 355	≥ 345	510 ~ 680	470 ~ 630	≥ 14	≥ 15	≥ 16	≥ 20	d=2.5a	d=3a	+20	≥ 27
S355J0									d=2.5a	d=3a	0	
S355J2									d=2.5a	d=3a	-20	
S355K2									d=2.5a	d=3a	-20	≥ 40
a Tensile test takes horizontal specimen. When yield phenomenon is not obvious, it shall use $R_{p0.2}$. b Bending test takes horizontal specimen. The width of bending specimen $b \geq 20$ mm, and $b=20$ mm during arbitration test. c Impact test takes longitudinal specimen. d For S235JR, S275JR and S355JR, the impact test shall be carried out only when buyer requires and it is indicated in the contract.												

Table 8

Designation	Tensile test ^a			180° Bending test ^{a,b} d - Diameter of Bending Center a - specimen thickness	V-type impact test ^a	
	Yield strength ^c R _e / MPa	Tensile strength R _m / MPa	Elongation at break $L_0 = 5.65\sqrt{S_0}$ %		Test temperature °C	Impact energy J
StE255 ^d	≥ 255	360 ~ 480	≥ 25	d=1a	20	≥ 31
StE285 ^d	≥ 285	390 ~ 510	≥ 24	d=2a	0	≥ 31
StE355 ^d	≥ 355	490 ~ 630	≥ 22	d=3a	-10	≥ 24
					-20	≥ 21
B520JJ	≥ 365	≥ 520	≥ 20	d=2a	-	-
B590GJA	≥ 450	590 ~ 710	≥ 20	d=2a	0	≥ 47
B590GJB					-10	≥ 47
^a The predetermined values listed in the Table are applicable to horizontal specimen.						

6.6 Surface quality

6.6.1 Steel plate and strip surface shall not have cracks, scarring, folding, bubbles and inclusions which are harmful defects on the use. Steel plates and strip shall not be delaminated. On the pickling surface of the steel and strip, there shall be no parking spots.

6.6.2 Steel plate and strip is divided into two grades according to surface quality, as shown in Table 11.

6.6.3 For steel strip, because there is no chance to remove the defective parts, the steel strip can be delivered with defects. However, the defective parts must not exceed 6% of the total length of each roll.

Table 11

Grade	Appropriate surface treatment method	Characteristics
Ordinary surface (FA)	Rolling surface Pickling surface	Surface allows to have pitting, concave, scratches and other minor, partial defects which do not exceed half thickness tolerance; however, it shall ensure the allowable minimum thickness of steel plate and strip.
Higher surface (FB)	Pickling	Surface allows to have partial defects which do not affect the formability, such as minor scratches, minor indentations, slight pitting, slight roll marks and color differences.

7 Inspection and test

7.1 Visually inspect the appearance of steel plate and strip.

7.2 It should use appropriate measurement tools to inspect the size and shape of steel plate and strip.

7.3 When the inspection document type selects the specified inspection and test, it shall comply with the provisions of 7.4 ~ 7.6.

7.4 The inspection items, specimen quantity, sampling method, test method required by each batch of steel plate and strip shall comply with the provisions of Table 12.

been inspected in this batch can be submitted for testing and acceptance.

8 Packaging, marks and inspection documents

The packaging, marks and inspection documents of steel plate and strip shall comply with the provisions of Q/BQB 300.

9 Rounding rules

The rounding rules shall comply with the provisions of GB/T 8170.

10 Annex

The comparison tables between this Standard and similar designations of relevant standards are shown in Annex A (informative).

Table A.4

Q/BQB 303-2014	JIS G 3132-2011	GB/T 912-2008, GB/T 3274-2007 GB/T 710-2008, GB/T 711—2008
SPHT1	SPHT1	08
SPHT2	SPHT2	15, Q215
SPHT3	SPHT3	Q275A
SPHT4	SPHT4	Q390A

Table A.5

Q/BQB 303-2014	JIS G 3106-2008	GB/T 912-2008, GB/T 3274-2007
SM400A	SM400A	Q235A, Q235B
SM400B	SM400B	Q235C
SM400C	SM400C	Q235D
SM490A	SM490A	Q345A, Q345B
SM490B	SM490B	Q345C
SM490C	SM490C	Q345D
SM490YA	SM490YA	Q390B
SM490YB	SM490YB	Q390C
SM520B	SM520B	Q420A, Q420B
SM520C	SM520C	Q420C
SM570, BSM590	SM570	Q460C, Q460D
B590GJA, B590GJB	-	Q460C, Q460D

END

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 -----