



# Heavy Plate

## 厚 板

[www.baosteel.com](http://www.baosteel.com)

宝山钢铁股份有限公司  
BAOSHAN IRON & STEEL CO., LTD.



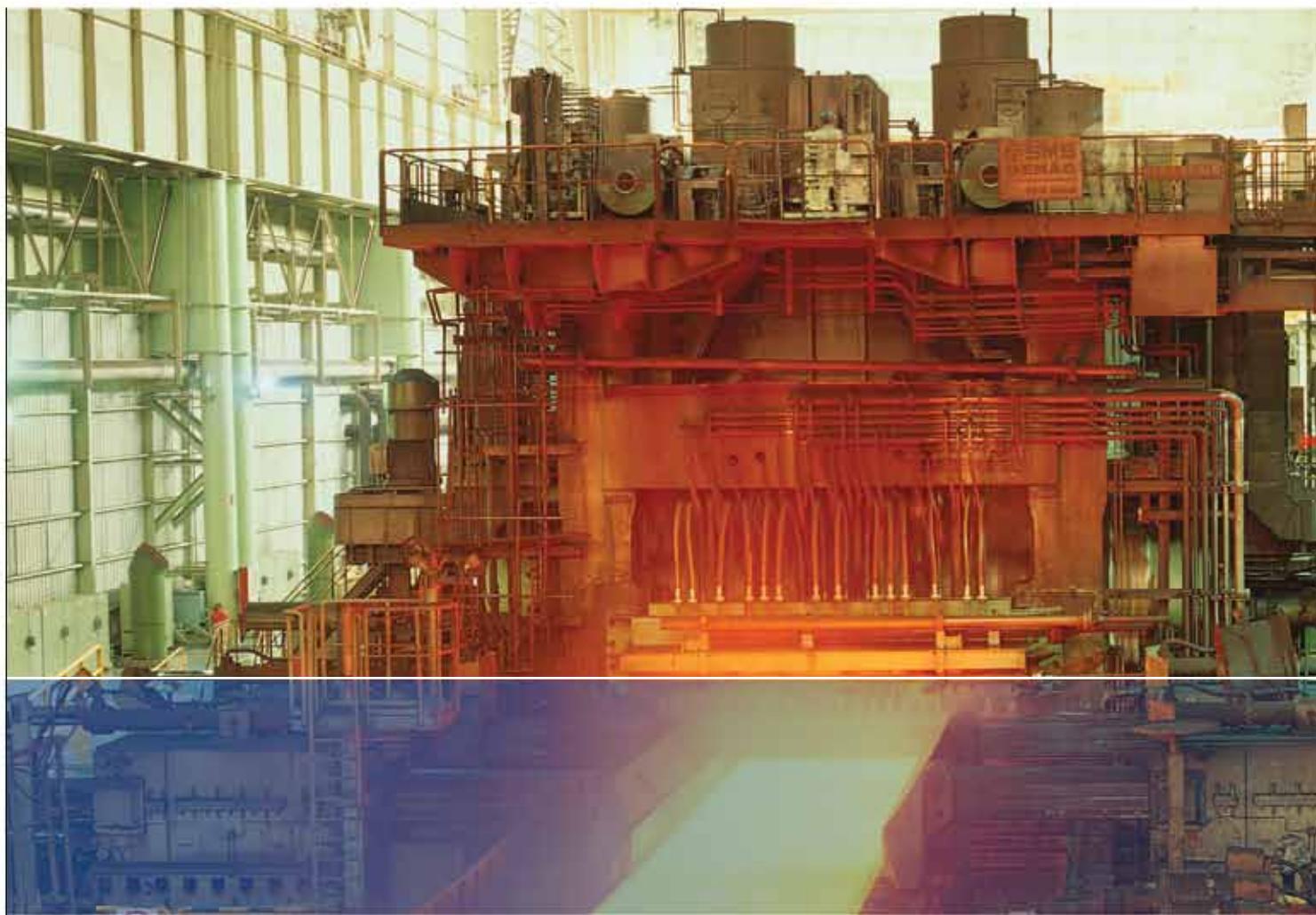
Build Baosteel into the most  
competitive iron & steel enterprise in the world

建成全球最具竞争力的钢铁企业



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宝钢 5m 厚板轧机工程是宝钢股份公司“十五”规划建设的最大项目，厚板轧机产品定位是高等级船舶及海洋工程用钢、高等级管线用钢、高强韧结构钢、锅炉压力容器及核电用钢等厚板产品。

5m 厚板轧机工程分两期建设，一期建设一架精轧机，05 年 3 月建成，年生产规模为 140 万吨；二期增建一架粗轧机，08 年建成，年生产规模为 180 万吨。

5m 厚板产线广泛采用当今厚板领域最新技术及装备：包括高精度轧制技术、DQ 技术、TMCP 技术、在线自动化探伤技术、自动化剪切技术、强力矫直自动化控制技术、无氧化热处理技术、预矫直机、综合板型测量仪、自动标记等，以满足用户对高等级厚钢板的高尺寸精度、高性能的要求。

5m 厚板产线在线冷却系统可分为高压喷嘴喷射冷却系统和 U 形管层流冷却系统，能够实现从普通冷却和 DQ 强冷的冷却模式，高压段最大水量可达到  $7,000\text{m}^3/\text{h}$ ，从而保证了更宽的冷却范围。采用加速冷却的 DQ 工艺及 TMCP 工艺能够实现在线淬火及低碳当量高强钢的生产，显著提高钢板的强度并改善钢板的低温韧性。

5m 厚板产线现有三条连续式热处理线。设备由德国 LOI 公司设计制造。1#、2# 热处理炉采用辐射管加热的无氧化炉，3# 热处理炉为明火加热专用回火炉。三条热处理线均采用数学模型控制温度，实行全自动化生产，温度控制精度高，钢板温度均匀。1# 热处理炉后带有辊压式淬火机，淬火工艺采用数学模型控制。热处理线可组织生产调质、正火、正火加回火、回火工艺的钢板。

## 宝钢 5 米厚板产线简介 Introduction of 5-meter Heavy Plate Mill



The 5-meter heavy plate mill is the largest project in 'tenth five-year plan' of Baosteel. The steel grades, which the heavy plate rolling mill can produce, aim at ship and ocean engineering steel plates, high grade pipeline steel plates, high strength and ductility structural steel plates and steel plates for boilers ,pressure vessels and nuclear power plant.

The heavy plate mill project is built in two phases. At the first phase, a set of finish rolling mill has been built with the annual capacity of 1.4 million tons. At the second phase, a set of rough rolling mill has been built and completed at the end of 2008, and the annual capacity will be expanded to 1.8 million tons.

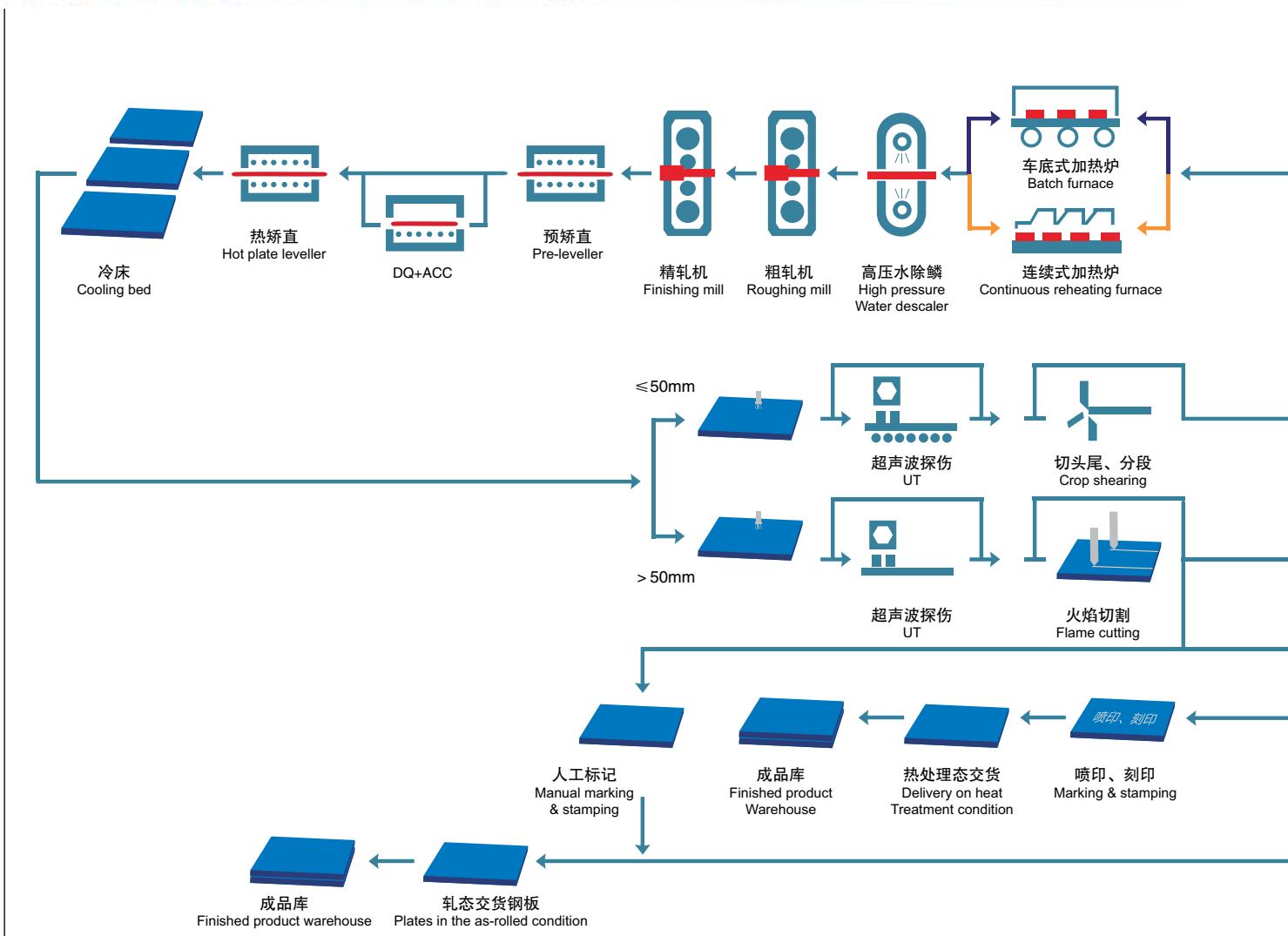
The 5-meter heavy plate mill is extensively adopted the state-of-the-art heavy plate technologies and facilities in the world, including high precision of rolling technique, DQ technology, TMCP technology, automatic online ultrasonic detective technique, automatic cutting technique, automatic control technique for strong leveling process, non-oxidation heat treatment technique, pre-leveling straightener, comprehensive plate surface measuring apparatus and automatic marking, etc. In this way, the requirements of high dimensional accuracy and mechanical property for high grade heavy steel plates from customers can be satisfied.

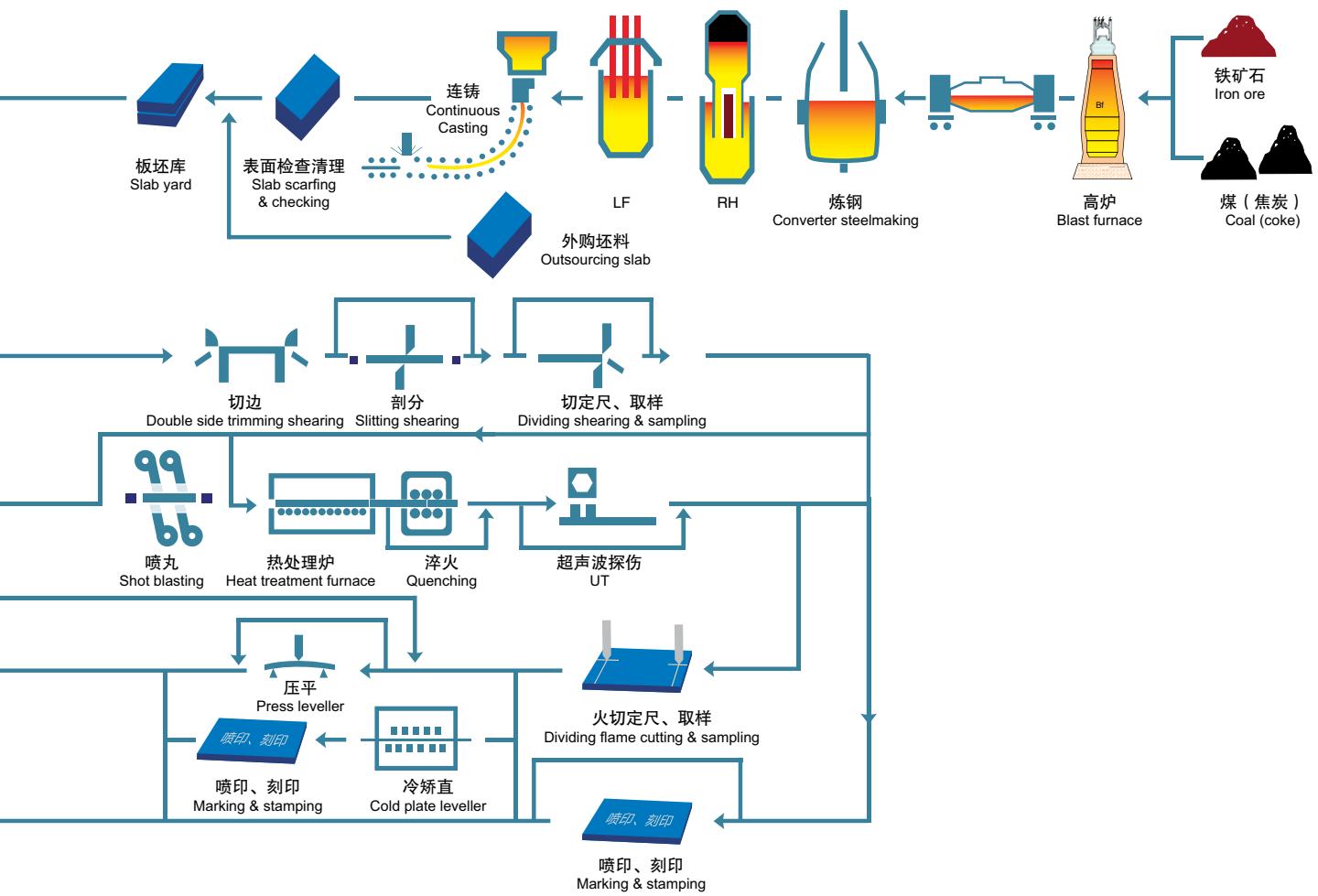
The on-line cooling system of 5-meter heavy plate mill can be classified into high pressure injection cooling system and U shape Laminar flow cooling system, which can realize normal ACC and DQ cooling module. The maximal water amount of high pressure section can reach 7000m<sup>3</sup>/h, thus the wider cooling scope can be guaranteed. The DQ technique and TMCP technique with the accelerated cooling can produce the directed quench and low carbon equivalent steel. With the technique, the strength and low temperature ductility was greatly improved.

At present the 5-meter heavy plate mill is equipped with three continuous heat treatment furnaces designed and manufactured by German LOI Company. 1 # and 2 # heat treatment furnaces are non-oxidation furnace with radiation tubes. And 3 # heat treatment furnace is tempering furnace. These three heat treatment furnaces use mathematical models to control temperature, bearing the advantages of fully automatic manufacture, high precision of temperature control and even temperature of steel plates. The quenched machine which was controlled with mathematical models was set behind 1#heat treatment furnace. The product line of heat treatment can manufacture steel plates with quenching and tempering, normalizing, normalizing and tempering, tempering.

# 制造工艺流程

## Process Flow







宝钢厚板 5m 产线主要生产船舶及海洋工程用钢、管线钢、结构钢、锅炉压力容器及核电用钢等，具有成分均匀、性能稳定、板型良好、表面质量优良等优点。

#### 1、钢水纯净度高：

宝钢转炉对脱磷、脱硫、脱氮等工艺进行了研究和开发，形成了转炉低磷、低硫、低氮冶炼工艺技术。并通过 RH、VD、LF、CAS、KIP 等精炼设备，确保钢水的化学成分控制稳定，波动小，钢中不可去除有害元素 As、Sn、Te、Sb、Bi 含量极低。钢水纯净度能够达到 [S] ≤ 10ppm、[P] ≤ 50ppm、[O] ≤ 20ppm、[H] ≤ 1.5ppm 的世界一流水平。

#### 2、铸坯内质优良：

宝钢厚板连铸机通过全过程密封浇注技术防止钢水在连铸过程中发生二次氧化、通过铸坯的多点矫直、多点弯曲和压缩铸造技术有效的防止板坯产生鼓肚变形、表面裂纹等缺陷，通过结晶器液面自动检测和控制技术有效的减少了钢水在结晶器内的波动，通过小辊密排 / 轻压下技术，改善板坯成分偏析、夹杂物、疏松和内裂，通过动态幅切的气 – 雾冷却技术和高频小振幅液压振动技术，改善板坯表面质量。

#### 3、尺寸精度高：

宝钢厚板精轧机采用高精度多点式设定模型，高响应液压 AGC 技术，具有监控 AGC、绝对 AGC 等功能，并在水平机架出口侧近距离布置  $\gamma$  射线测厚仪，减小监控 AGC 控制盲区，实现高厚度精度控制。钢板厚度同板差 ≤ 0.5mm，船舶及海工产品厚度正公差增重

量 ≤ 1.5%。计算机自动组板、控制切割，钢板厚度可按 0.1mm 进级，长度、宽度可按 1mm 进级，提高用户的材料利用率。

#### 4、平面形状控制好：

采用 MAS 轧制法控制钢板的平面形状。同时配置与水平机架成近距离布置的立辊机架，采用立辊机架的 AWC 短行程 (SSC) 功能，进一步改善钢板平面形状，提高宽度绝对精度。

#### 5、板型控制好：

通过高精度设定模型，实现多点设定、道次间自适应，多功能 AGC 控制技术及 CVC<sup>PLUS</sup> 板型控制技术，获得良好平面形状。热矫直机采用预应力立柱及高刚性框架，矫直辊上辊系采用高响应伺服阀液压下装置，具有动态控制功能。上辊系能够整体前后倾动，左右倾动，预设定正、负弯辊，以尽可能改善平直度。

#### 6、表面质量优：

通过加热工艺优化减少板坯一次氧化铁皮的产生，轧制时通过高压水喷射除去轧制过程的二次氧化铁皮。调质钢板热处理前进行抛丸处理保证表面质量，氮气保护热处理炉中进行热处理，提供无氧化铁皮的热处理厚钢板。

#### 7、产品交付能力强：

能够提供多种交货状态包括普通轧制态 AR、控制轧制态 CR、正火轧制态 NR、控轧控冷态 TMCP、正火态 N、正火加回火态 N+T、调质态 QT 等；产品最大宽度达 4800mm，最大厚度为 400mm，最大长度为 25m，最大单重 24 吨。

## 产线特色 Process Features



Baosteel 5m heavy plate mill mainly produces ship and ocean engineering steel plates,pipeline steel plates,structure steel plates, and steel plates for boilers ,pressure vessels and nuclear power plant.All the products of Baosteel have the advantage of even composition ,stable quality,excellent flatness and nice surface quality.

1、High purity of liquid steel:Baosteel takes the research and development on dephosphorization、desulfurization and denitrogenation of converter, and the relative smelting technique was made. The chemical composition of liquid steel was stable with ladle refining equipment RH、VD、LF、CAS、KIP.The harmful elements of As、Sn、Te、Sb、Bi which can not be avoid in the steel was very low in the steel .The purity of steel can reach  $[S] \leq 10\text{ppm}$ ,  $[P] \leq 50\text{ppm}$ ,  $[O] \leq 20\text{ppm}$ ,  $[H] \leq 1.5\text{ppm}$ .

2、Excellent metallurgical properties of the slab:The secondary oxidation of liquid steel can be prevented with the hermetic casting technique, the bulging deformation and surface crack can be prevented with the multipoint leveling and bending, the fluctuation of liquid steel can be reduced with the crystallizer liquid surface automatic inspection and control technique, the segregation、inclusion、porosity、crack of the slab can be improved, the surface quality of the slab can be improved with the dynamic gas-frog cooling technique and high frequency low amplitude hydraulic vibration technique.

3、High precise of size control:The finishing mill takes the multipoint setting module with high precise,high response hydraulic AGC technique and the  $\gamma$ -ray thickness meter was set near the exit of horizontal stander, the monitor AGC control blind area can be reduced .The deviation of the thickness can be less than 0.5mm, the

extra mass of the shipment and offshore product can be less than 1.5%.The thickness can be ordered with 0.1mm with the automatic computer design and control cutting technique, the length and width can be order with 1mm which can improve the utility of the steel.

4、The excellent control of shape:The MAS rolling method can control the shape of the plate, and the vertical mill was set near the horizontal stander, with the AWC SSC function, the shape of the plate and the definite accuracy of the width was further improved .

5、The excellent control of flatness: With the high precise setting mold, the multifunction AGC control technique and the CVC<sup>PLUS</sup> flatness control technique, the excellent flatness was got. The hot leveling was set with stress upright post and high rigidity frame, the roller was set with high response servovalve hydraulic roll screwdown equipment which has the dynamic control function. The upper roller can tilt in all direction to improve the flatness.

6、The excellent surface quality: The first scale sinter was removed with the optimized heating technique, and the secondary scale sinter was removed during the rolling process with the high pressure water injection. The surface was shot blasted before heat treatment to guarantee the quality, and the heat treatment heavy plate without scale sinter was processed in the nitrogen protection heat treatment furnace.

7、The strong delivery capacity of products: Baosteel can offer all the delivery conditions such as:as rolled,controlled rolled,normalized rolled,TMCP,normalized, normalized and tempered,quenched and tempered;the maximal width can reach 4800mm,the maximal thickness can reach 400mm,the maximal length can reach 25m, and the maximal quality can reach 24 tons.



宝钢拥有化学、力学、物理性能检测实验室，有热轧试验机、拉伸试验机、冲击试验机、光学显微镜、透射电镜、热模拟试验机等大型检测设备近百台，为宝钢厚板新产品的开发提供了有力的支持。并获得中国合格评审国家认可委员会实验室认可证书。

Baosteel possesses chemical, mechanical and physics testing laboratory which are equipped with nearly one hundred sets of large scale testing devices such as hot rolling testing machines, tensile testing machines, impact testing machines, optical microscopes, and hot stimulating testing machines, etc. They supply the strong support for the available product testing and new heavy plate product developed by Baosteel. The laboratory certification was given by China National Accreditation Service for Conformity Assessment.



数控双头铣  
Double Head Milling Machine

检测设备  
Testing Devices and Equipments



## 产品标识 Product Marking



1

### 产品标识 / Product marking

钢板表面可以根据用户和标准要求进行喷印、刻印，钢板侧面可以进行侧喷，以便于用户识别。

Paint marking and punch marking can be done on the surface of steel plate according to the requirements of customers and standards. Edge marking can also be offered for customers' convenience.

2

### 喷印 / Paint marking

可选择喷印宝钢标记、公司名称、第三方检验机关标记、协会机关标记、牌号、炉号、板号、制造年月、UT 标准、用户管理号、钢板尺寸、重量、产品认证号、最终用户代码、交货期等。

Available paint marking: Baosteel logo, company name, label of third-party inspectors, logo of associations, grade, heat number , plate number, date of production, UT standard, management number for customers, size, weight, certificate number of products, code of final users and delivery terms, etc.

3

### 刻印 / Hard punch marking

可选择刻印宝钢标记、第三方检验机关标记、协会机关标记、牌号、炉号、板号、UT 标准、用户管理号、钢板尺寸等。

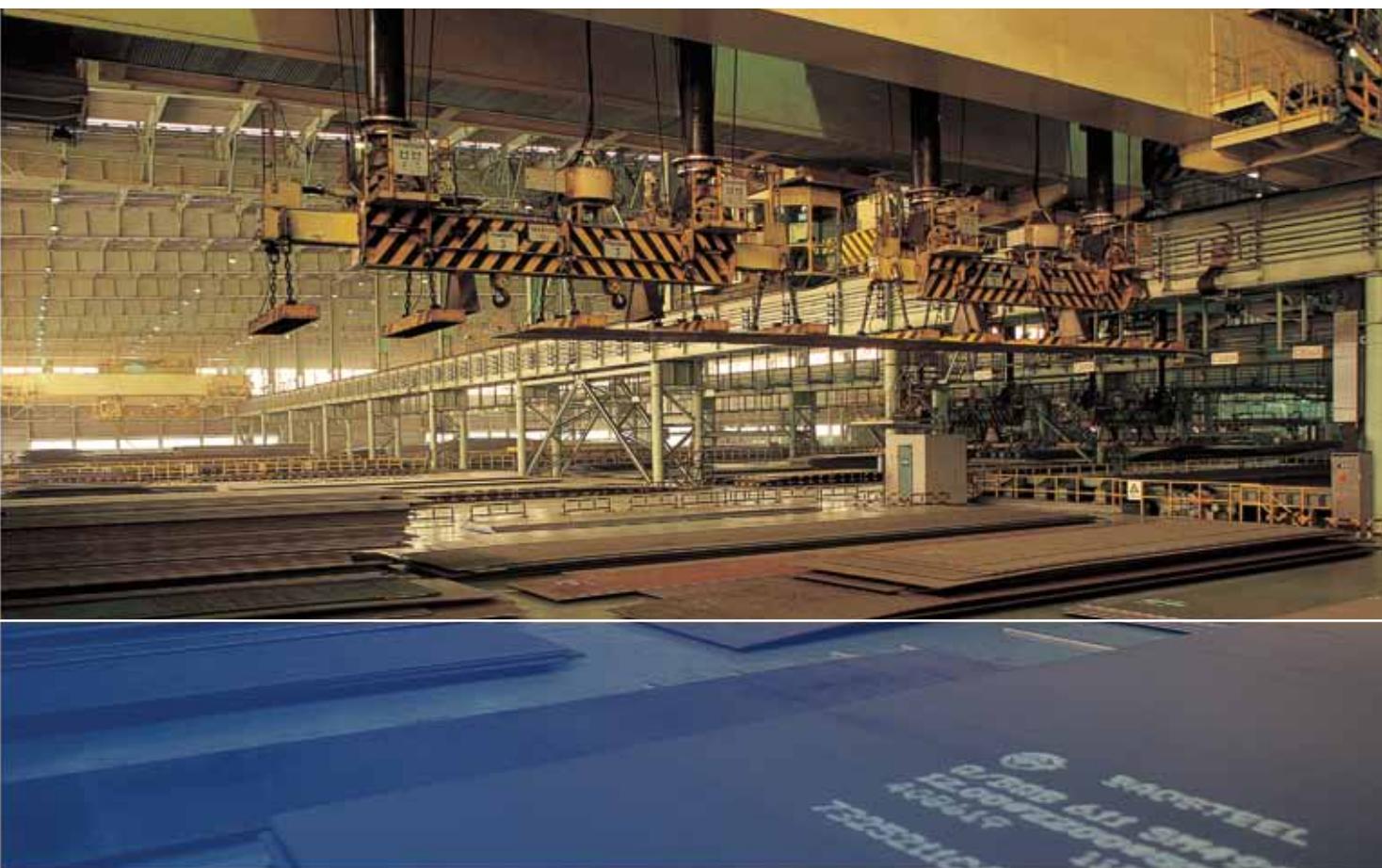
Available punch marking: Baosteel logo, label of third-party inspectors, logo of associations, grade, heat number, plate number, UT standard, management number for customers, size, etc.

4

### 侧标 / Edge marking

可喷印牌号、钢板号、合同号、用户管理号、一贯管理番号、尺寸等。

Available edge marking: grade, plate number, contract number, management number for customers, management number of going through and size, etc.



#### 宝钢厚板产品注册商标

- 优质焊接结构钢: 注册商标为“BWELDY” 和 “宝威迪”。  
如: BWELDY™700QL2
- 装甲用钢: 注册商标为“BARMOY” 和 “宝甲迪” 。  
如: BARMONY™300
- 工具钢: 注册商标为“BTOOLY” 和 “宝拓迪” 。  
如: BTOOLY™ 33
- 耐磨钢: 注册商标为“BHARDY” 和 “宝赫迪” 。  
如: BHARDY™ 450

#### Trade mark for the grade of Baosteel steel plates

- High quality steels for welded structure: its registered trademark is “BWELDY” and “宝威迪” .  
Example: BWELDY™700QL2
- Steels for armored vehicle: its registered trademark is “BARMONY” and “宝甲迪” .  
Example: BARMONY™300
- Tool steels: its registered trademark is “BTOOLY” and “宝拓迪” .  
Example: BTOOLY™ 33
- Wear resistant steels: its registered trademark is “BHARDY” and “宝赫迪” .  
Example: BHARDY™ 450

## 产品规格 Available Sizes

产品 Product	厚度 Thickness mm	宽度 Width mm	长度 Length mm	单重 Unit weight t	最大厚度差 Thickness difference mm
普通轧制产品 As rolled product	5 ~ 400			max.24	
TMCP产品 TMCP product	8 ~ 100			max.24	
热处理产品（包括正火、 调质及回火等热处理工艺 生产的产品） Heat treatment product (including products treated by normalizing, quenching and tempering process)	5 ~ 200	900 ~ 4,800	max.25,000	max.24	-
涂漆产品 Painting product	6 ~ 100			max.24	
楔形板（LP板）产品 Longitudinal profiled steel plate (LP plate)	10 ~ 80	max.4,800		max.24	45

注：产品既可以切边和定尺状态交货，也可根据用户要求，以毛边状态交货。

Remarks: The delivery condition of the products can either be edge-cutting and cut-to-length, or raw edge required by the customer.



**连铸普通材成品极限规格**  
Range of sizes as continuous casting as rolled products

不可供

厚度(mm) Thickness		宽度/width (mm)																																						
≤t≤	≥t	≤1300	≤1400	≤1600	≤1800	≤1900	≤2000	≤2100	≤2200	≤2300	≤2400	≤2500	≤2600	≤2700	≤2800	≤2900	≤3000	≤3100	≤3200	≤3300	≤3400	≤3500	≤3600	≤3700	≤3800	≤3900	≤4000	≤4100	≤4200	≤4300	≤4400	≤4500	≤4600	≤4700	≤4800					
6.0	≤t≤	6.5																																						
6.5	<t≤	7.0																																						
7.0	<t≤	7.5																																						
7.5	<t≤	8.0																																						
8.0	<t≤	8.5																																						
8.5	<t≤	9.0																																						
9.0	<t≤	10.0																																						
10.0	<t≤	11.0																																						
11.0	<t≤	12.0																																						
12.0	<t≤	14.0																																						
14.0	<t≤	16.4																																						
16.4	<t≤	17.0																																						
17.0	<t≤	18.0																																						
18.0	<t≤	19.0																																						
19.0	<t≤	20.0																																						
20.0	<t≤	22.0																																						
22.0	<t≤	25.0																																						
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26.0	<t≤	28.0																																						
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36.0	<t≤	38.0																																						
38.0	<t≤	40.0																																						
40.0	<t≤	45.0																																						
45.0	<t≤	50.0	23	22	22	23	21	23	22	23	22	21	20	19	18	17	16	16	15	14	14	14	14	13	13	12	12	11	11	10	10	9	9	9	9	9	9			
50.0	<t≤	55.0	21	20	20	21	19	21	20	21	20	19	18	18	17	16	16	15	14	14	14	13	13	12	12	11	11	11	11	10	10	9	9	9	9	9	9			
55.0	<t≤	60.0	19	18	19	19	18	19	18	19	18	19	18	17	17	16	16	15	15	14	14	14	13	13	12	12	11	11	11	10	10	9	9	9	9	9	9			
60.0	<t≤	65.0	17	17	17	17	16	17	17	17	18	17	18	17	16	15	15	14	14	13	13	12	12	11	11	11	11	10	10	9	9	9	9	9	9	9	9			
65.0	<t≤	70.0	16	16	16	15	16	15	16	15	16	15	14	14	14	14	13	13	12	12	11	11	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
70.0	<t≤	75.0	15	15	15	14	15	14	15	14	15	14	14	14	14	14	13	13	12	12	11	11	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
75.0	<t≤	80.0	14	14	14	14	13	14	13	14	13	14	13	14	13	14	13	13	12	12	11	11	10	10	9	9	9	9	9	9	9	9	9	9	9	9	9	9		
80.0	<t≤	85.0	13	13	13	13	12	13	13	12	13	13	12	12	11	11	10	10	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
85.0	<t≤	90.0	12	12	12	12	12	12	12	12	12	12	11	11	11	10	10	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
90.0	<t≤	95.0	12	11	12	11	12	11	12	11	12	11	11	11	10	10	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
95.0	<t≤	100.0	11	11	11	10	11	11	11	10	10	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8

Range of sizes as continuous casting controlled rolled products

厚度(mm) Thickness		宽度/width (mm)																													
1300	1400	1600	1800	2000	2100	2200	2300	2400	2500	2600	2700	2800	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800
6.0	<t≤ 6.5	6.5																													
6.5	<t≤ 7.0	7.0																													
7.0	<t≤ 7.5	7.5																													
7.5	<t≤ 8.0	8.0																													
8.0	<t≤ 9.0	9.0																													
9.0	<t≤ 10.0	10.0																													
10.0	<t≤ 11.0	11.0																													
11.0	<t≤ 12.0	12.0																													
12.0	<t≤ 14.0	14.0																													
14.0	<t≤ 16.0	16.0																													
16.0	<t≤ 17.0	17.0																													
17.0	<t≤ 18.0	18.0																													
18.0	<t≤ 19.0	19.0																													
19.0	<t≤ 20.0	20.0																													
20.0	<t≤ 22.0	22.0																													
22.0	<t≤ 25.4	25.4																													
25.4	<t≤ 26.0	26.0																													
26.0	<t≤ 28.0	28.0																													
28.0	<t≤ 30.0	30.0																													
30.0	<t≤ 32.0	32.0																													
32.0	<t≤ 34.0	34.0																													
34.0	<t≤ 36.0	36.0																													
36.0	<t≤ 38.0	38.0																													
38.0	<t≤ 40.0	40.0																													
40.0	<t≤ 45.0	45.0																													
45.0	<t≤ 50.0	50.0	23	22	23	21	23	22	23	21	20	19	18	17	16	16	15	15	14	14	13	13	12	12	11	11	10	10	9		
50.0	<t≤ 55.0	55.0	21	20	21	19	21	20	21	20	19	18	17	16	16	15	15	14	14	13	13	12	12	11	11	10	10	9			
55.0	<t≤ 60.0	60.0	19	18	19	19	18	19	18	19	18	17	16	15	15	14	14	13	13	12	12	11	11	11	10	10	10	9			
60.0	<t≤ 65.0	65.0	17	17	17	16	17	17	17	17	18	17	16	15	15	14	14	13	13	12	12	11	11	10	10	10	10	9			
65.0	<t≤ 70.0	70.0	16	16	16	15	16	15	16	15	16	16	15	14	14	13	13	12	12	12	11	11	10	10	10	9	9	8			
70.0	<t≤ 75.0	75.0	15	15	15	15	14	15	14	15	14	15	14	14	13	13	12	12	12	11	11	10	10	10	9	9	8	8			
75.0	<t≤ 80.0	80.0	14	14	14	14	13	14	13	14	13	14	14	13	12	12	11	11	10	10	9	9	8	8	8	8	7	7			
80.0	<t≤ 85.0	85.0	13	13	13	12	13	13	13	12	12	11	11	10	10	9	9	8	8	8	8	8	7	7	7	7	7	7			
85.0	<t≤ 90.0	90.0	12	12	12	12	12	12	12	12	12	12	12	11	11	10	10	9	9	8	8	8	8	7	7	7	7	6			
90.0	<t≤ 95.0	95.0	12	11	12	12	11	12	11	12	11	12	11	11	10	10	9	9	8	8	8	8	7	7	7	7	6				
95.0	<t≤ 100.0	100.0	11	11	11	11	11	11	11	11	11	10	10	9	9	8	8	8	8	8	8	7	7	7	7	6	6				

不可供

连铸 TMCP(ACC) 材成品极限规格  
Range of sizes as continuous casting TMCP(ACC) products

厚度(mm) Thickness	宽度/width (mm)																																
	≤1300	≤1400	≤1600	≤1800	≤1900	≤2000	≤2100	≤2200	≤2300	≤2400	≤2500	≤2600	≤2700	≤2800	≤2900	≤3000	≤3100	≤3200	≤3300	≤3400	≤3500	≤3600	≤3700	≤3800	≤3900	≤4000	≤4100	≤4200	≤4300	≤4400	≤4500	≤4600	≤4700
16.0 ≤ t ≤ 17.0																																	
17.0 < t ≤ 18.0																																	
18.0 < t ≤ 19.0																																	
19.0 < t ≤ 20.0																																	
20.0 < t ≤ 22.0																																	
22.0 < t ≤ 25.4																																	
25.4 < t ≤ 26.0																																	
26.0 < t ≤ 28.0																																	
28.0 < t ≤ 30.0																																	
30.0 < t ≤ 32.0																																	
32.0 < t ≤ 34.0																																	
34.0 < t ≤ 36.0																																	
36.0 < t ≤ 38.0																																	
38.0 < t ≤ 40.0																																	
40.0 < t ≤ 45.0																																	
45.0 < t ≤ 50.0																																	
50.0 < t ≤ 55.0																																	
55.0 < t ≤ 60.0																																	
60.0 < t ≤ 65.0																																	
65.0 < t ≤ 70.0																																	
70.0 < t ≤ 75.0																																	
75.0 < t ≤ 80.0																																	

不可供

连铸 TMR 树成品极限规格  
Range of sizes as continuous casting TMR products

不可供

连铸正火材成品极限规格 Range of sizes as continu

Range of sizes as continuous casting normalized products

厚度(mm) Thickness	宽度/width (mm)		不可供 不可供
	<=1300	>1300	
6.0 <t< 6.5	25	25	
6.5 <t< 7.0	25	25	
7.0 <t< 7.5	25	25	
7.5 <t< 8.0	25	25	
8.0 <t< 8.5	25	25	
8.5 <t< 9.0	25	25	
9.0 <t< 10.0	25	25	
10.0 <t< 11.0	25	25	
11.0 <t< 12.0	25	25	
12.0 <t< 14.0	25	25	
14.0 <t< 16.0	25	25	
16.0 <t< 17.0	25	25	
17.0 <t< 18.0	25	25	
18.0 <t< 19.0	25	25	
19.0 <t< 20.0	25	25	
20.0 <t< 22.0	25	25	
22.0 <t< 25.4	25	25	
25.0 <t< 26.0	25	25	
26.0 <t< 28.0	25	25	
28.0 <t< 30.0	25	25	
30.0 <t< 32.0	25	25	
32.0 <t< 34.0	25	25	
34.0 <t< 36.0	25	25	
36.0 <t< 38.0	25	25	
38.0 <t< 40.0	25	25	
40.0 <t< 45.0	25	25	
45.0 <t< 50.0	25	25	
50.0 <t< 55.0	25	25	
55.0 <t< 60.0	25	25	
60.0 <t< 65.0	25	25	
65.0 <t< 70.0	25	25	
70.0 <t< 75.0	25	25	
75.0 <t< 80.0	25	25	
80.0 <t< 85.0	25	25	
85.0 <t< 90.0	25	25	
90.0 <t< 95.0	25	25	
95.0 <t< 100.0	25	25	
100.0 <t< 111.0	25	25	
111.0 <t< 122.0	25	25	
122.0 <t< 133.0	25	25	
133.0 <t< 144.0	25	25	
144.0 <t< 155.0	25	25	
155.0 <t< 166.0	25	25	
166.0 <t< 177.0	25	25	
177.0 <t< 188.0	25	25	
188.0 <t< 199.0	25	25	
199.0 <t< 210.0	25	25	
210.0 <t< 220.0	25	25	
220.0 <t< 230.0	25	25	
230.0 <t< 240.0	25	25	
240.0 <t< 250.0	25	25	
250.0 <t< 260.0	25	25	
260.0 <t< 270.0	25	25	
270.0 <t< 280.0	25	25	
280.0 <t< 290.0	25	25	
290.0 <t< 300.0	25	25	
300.0 <t< 310.0	25	25	
310.0 <t< 320.0	25	25	
320.0 <t< 330.0	25	25	
330.0 <t< 340.0	25	25	
340.0 <t< 350.0	25	25	
350.0 <t< 360.0	25	25	
360.0 <t< 370.0	25	25	
370.0 <t< 380.0	25	25	
380.0 <t< 390.0	25	25	
390.0 <t< 400.0	25	25	
400.0 <t< 410.0	25	25	
410.0 <t< 420.0	25	25	
420.0 <t< 430.0	25	25	
430.0 <t< 440.0	25	25	
440.0 <t< 450.0	25	25	
450.0 <t< 460.0	25	25	
460.0 <t< 470.0	25	25	
470.0 <t< 480.0	25	25	

不可供

Range of sizes as continuous casting quenched and tempered products

厚度(mm) Thickness	宽度/width (mm)									
	≤1300	1400	1600	1800	1900	2000	2100	2200	2400	≥2500
10.0 ≤t≤ 11.0										
11.0 <t≤ 12.0										
12.0 <t≤ 14.0										
14.0 <t≤ 16.0										
16.0 <t≤ 17.0										
17.0 <t≤ 18.0										
18.0 <t≤ 19.0										
19.0 <t≤ 20.0										
20.0 <t≤ 22.0										
22.0 <t≤ 25.4										
25.4 <t≤ 26.0										
26.0 <t≤ 28.0										
28.0 <t≤ 30.0										
30.0 <t≤ 32.0										
32.0 <t≤ 34.0										
34.0 <t≤ 36.0										
36.0 <t≤ 38.0										
38.0 <t≤ 40.0										
40.0 <t≤ 45.0										
45.0 <t≤ 50.0	23	22	22	23	21	23	22	23	24	23
50.0 <t≤ 55.0	21	20	20	21	19	21	20	19	18	17
55.0 <t≤ 60.0	19	18	19	19	18	19	18	17	17	16
60.0 <t≤ 65.0	17	17	17	17	16	17	17	16	15	15
65.0 <t≤ 70.0	16	16	16	15	16	15	16	15	14	14
70.0 <t≤ 75.0	15	15	15	14	15	14	15	14	13	13
75.0 <t≤ 80.0	14	14	14	13	14	13	14	14	12	12
80.0 <t≤ 85.0	13	13	13	12	13	13	13	12	11	11
85.0 <t≤ 90.0	12	12	12	12	12	12	12	11	11	10
90.0 <t≤ 95.0	11	11	12	12	11	12	11	11	10	10
95.0 <t≤ 100.0	11	11	11	11	11	11	11	10	10	9

不可供

模铸普通材成品极限规格 Range of sizes as ingot casting as rolled products

厚度(mm) Thickness		宽度/width (mm)										不可供	
<1350		≤1350											
50.0 <t≤ 55.0		≤55.0											
55.0 <t≤ 60.0		≤60.0											
60.0 <t≤ 65.0		≤65.0											
65.0 <t≤ 70.0		≤70.0											
70.0 <t≤ 75.0		≤75.0											
75.0 <t≤ 80.0		≤80.0											
80.0 <t≤ 85.0		≤85.0											
85.0 <t≤ 90.0		≤90.0											
90.0 <t≤ 95.0		≤95.0											
95.0 <t≤ 100.0		≤100.0											
100.0 <t≤ 105.0		≤105.0											
105.0 <t≤ 110.0		≤110.0											
110.0 <t≤ 115.0		≤115.0											
115.0 <t≤ 120.0		≤120.0											
120.0 <t≤ 125.0		≤125.0											
125.0 <t≤ 130.0		≤130.0											
130.0 <t≤ 135.0		≤135.0											
135.0 <t≤ 140.0		≤140.0											
140.0 <t≤ 145.0		≤145.0											
145.0 <t≤ 150.0		≤150.0											
协 商													

不可供

连铸调质材成品极限规格  
Range of sizes as continuous casting quenched and tempered products

协 商 ■

不可供 ■

需确认 ■

厚度(mm) Thickness		宽度/width (mm)																			
50.0 < t ≤ 55.0	25	25	23	21	20	19	18	18	17	16	15	14	13	12	11	11	11	10	10	10	9
55.0 < t ≤ 60.0	25	23	21	20	19	18	17	16	15	14	13	12	11	11	10	10	10	9	9	9	8
60.0 < t ≤ 65.0	25	22	19	18	17	16	16	15	14	13	12	11	11	10	10	9	9	9	8	8	8
65.0 < t ≤ 70.0	23	20	18	17	16	15	14	14	13	12	11	11	10	10	9	9	9	8	8	7	7
70.0 < t ≤ 75.0	21	19	16	16	15	14	13	13	12	11	11	10	10	9	9	9	8	8	7	7	6
75.0 < t ≤ 80.0	20	17	15	15	14	13	13	12	11	11	10	10	9	9	9	8	8	8	7	7	6
80.0 < t ≤ 85.0	19	16	14	14	13	12	12	11	10	10	9	9	9	8	8	8	8	7	7	6	6
85.0 < t ≤ 90.0	18	15	14	13	12	12	11	11	10	10	9	9	9	8	8	8	8	7	7	6	6
90.0 < t ≤ 95.0	17	15	13	12	12	11	10	10	10	9	9	9	8	8	8	8	8	7	7	6	6
95.0 < t ≤ 100.0	16	14	12	12	11	10	10	9	9	9	8	8	8	7	7	6	6	6	6	6	6
100.0 < t ≤ 105.0	15	13	12	11	10	9	9	9	8	8	8	8	7	7	6	6	6	5	5	5	5
105.0 < t ≤ 110.0	14	13	11	10	9	9	8	8	8	7	7	6	6	6	5	5	5	5	5	5	5
110.0 < t ≤ 115.0	14	12	11	10	9	9	8	8	7	7	7	6	6	6	5	5	5	5	5	5	5
115.0 < t ≤ 120.0	13	11	10	10	9	9	8	8	7	7	7	6	6	6	5	5	5	5	5	5	5
120.0 < t ≤ 125.0	13	11	10	9	9	8	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5
125.0 < t ≤ 130.0	12	11	9	9	8	8	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5
130.0 < t ≤ 135.0	12	10	9	8	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5	5	5
135.0 < t ≤ 140.0	11	10	9	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5	5	5	5
140.0 < t ≤ 145.0	11	9	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5
145.0 < t ≤ 150.0	10	9	8	8	7	7	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5

不可供

模铸普通材成品极限规格 Range of sizes as ingot casting as rolled products

可供  
不可

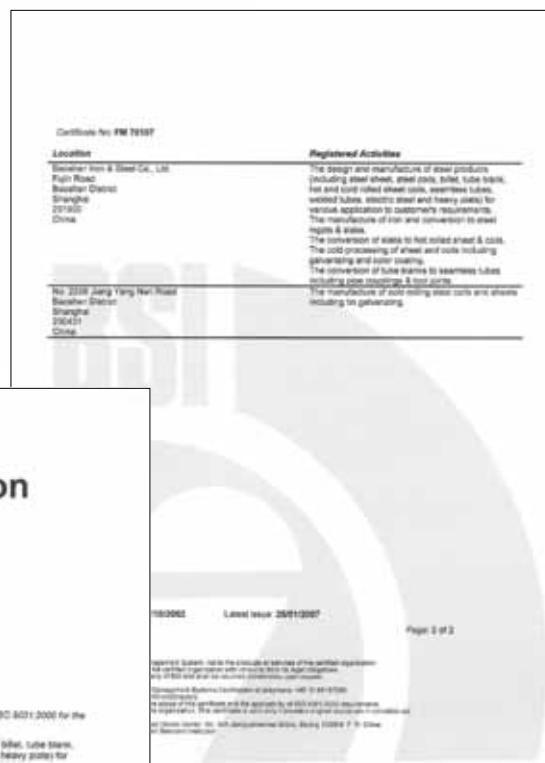
# 质量保证体系

## Quality Assurance System

宝钢 5m 厚板部 05 年 3 月投产以来，通过全体员工的不懈努力，

建立和完善各项管理机制，05 年 11 月获得了 ISO9001、ISO14001、OHSAS18001 等体系的认证。

Since its being put into production in March, 2005, the 5-meter heavy plate plant has established and improved different kinds of management mechanism. Certificates of system registration such as ISO9001, ISO14001 and OHSAS18001 have been gained in November 2005.





# 质量保证体系

## Quality Assurance System



产品认证  
Approved Product Certificate



通过认证的产品  
Approved Products

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产品证书  
Product Certificates

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## 通过认证的产品

## Approved Products

### 1. 通过船级社认证的钢级及规格

The steel grades and specifications approved by classification of society

#### ■ 船舶工程钢板 / Ship steel plates

船级社 Classification of Society	品种 Steel type	牌号 Steel Grade	厚度 Thickness mm	交货状态 Delivery Condition	厚度方向性能 Through-thickness Characteristics
ABS BV CCS DNV GL KR LR NK RINA	普通船板 Ordinary-strength hull structural steel plates	A/B	≤50	AR	Z25/Z35
			≤130	N	
		D	≤35	AR	
			≤130	N	
		E	≤130	N	
	高强船板 High-strength hull structural steel plates	AH32/DH32	≤20	AR	
			≤40	CR(NR)	
			≤100	N	
		AH36/DH36	≤20	AR	
			≤40	CR(NR)	
			≤100	N	
		EH32/EH36	≤100	N	
		AH/DH/EH32/36	≤80	TM	
		AH40/DH40/EH40	≤68	TM	
	高韧性船板 High-toughness hull structural steel plates	FH32/FH36/FH40	≤68	TM	

#### ■ 特殊船板及海洋用钢板 / Special ship plate and ocean engineering plate

船级社/标准 Classification of Society	品种 Steel type	牌号 Steel Grade	厚度 Thickness mm	交货状态 Delivery Condition	厚度方向性能 Through-thickness Characteristics
ABS CCS DNV LR	超高强度船板 Ultra high-strength ship steel plates	A47/D47/E47	≤80	TM	Z25/Z35
		A/D/EQ43/47/51 A/D/E420/460/500	≤80	TM	
		A/D/EQ43/47/51/56 A/D/E420/460/500/550	≤88	QT	

船级社 / 标准 Classification of Society	品种 Steel type	牌号 Steel Grade	厚度 Thickness mm	交货状态 Delivery Condition	厚度方向性能 Through-thickness Characteristics	
ABS CCS DNV GL	海洋工程钢板 Ocean engineering steel plates	AQ/DQ/EQ63/70 A/D/E620/690	≤178	QT	Z25/Z35	
ASTM A514/517		A514/517Q	≤178	QT		
API		API 2H GR42/GR50	≤100	N		
		API 2Y GR50/GR60	≤80	QT		
EN10225		API 2W GR50/GR60	≤80	TM		
		S355G2	≤20	N		
		S355G3	≤40	N		
		S355G5	≤20	TM		
		S355G6	≤40	TM		
		S355G7/8/9/10+N	≤100	N		
		S355G7/8/9/10+M	≤80	TM		
DNV	船用锅炉压力容器钢板 Boiler and pressure vessel steel plates for shipbuilding	NV360-0F,1F,2F	≤50	AR	-	
		NV410-0F,1F	≤80	N		
		NV460-0F,1F	≤40	NR		
		NV490-0F,1F				
		NV510-0F,1F	≤80	N		
LR	船用锅炉压力容器钢板 Boiler and pressure vessel steel plates for shipbuilding	360FG/410FG/460FG/490/ 510FG	≤20	AR	-	
		360FG/410FG	≤60	N		
		460FG/490FG/510FG	≤50	N		
		410FG/460FG/490FG	≤35	NR		
		360FG/410FG/460FG/490/ 510FG	≤50	TM		
CCS	压力容器用高强度钢板 High strength heavy steel plates for pressure vessels	B610CF(07MnMoVR)	≤50	QT	-	
		B610CF-L1(07MnNiMoVDR)				
		B610CF-L2(07MnNiMoVDR)				

注: 1. AR- 轧态, CR ( NR ) - 控轧 ( 正火轧制 ), N- 正火, TM(TMCP)- 热机械轧制, QT- 调质。

2. 如用户有要求, 也可按照 GB 712 供货;

3. B610CF, B610CF-L1, B610CF-L2 为宝钢企业标准 Q/BQB660 中牌号。

4. 宝钢股份分别通过了 ABS 船级社的 QA( Quality Assurance )认证, BV 船级社的 Model I 认证, CCS 船级社的 QA 认证、LR 船级社的 MQS (Material quality Scheme) 认证、NK 船级社的 QA 认证、KR 船级社的 QA 和 DNV 船级社的 MSA 认证。

Remarkss: 1. AR-as rolled, CR-control rolling, N-normalized, TM-Thermomechanical control process, QT-quenched and tempered.

2. GB 712 is also available if the customer requires.

3. B610CF, B610CF-L1 and B610CF-L2 are the steel grades exclusively included in Baosteel enterprise standard Q/BQB660.

4. Baoshan Iron and Steel company has obtained the approval certificate of QA (Quality Assurance) of ABS,CCS, NK and KR, MQS (Material quality Scheme) of LR, NK, KR and MSA of DNV respectively.

## 通过认证的产品

### Approved Products

#### 2. 通过国家特种设备制造许可认证钢种及规格

The steel grades and specifications which are approved or authorized manufacture license for special equipment by national related administrative or institutes

产品名称 Product Name	牌号 Steel Grade	规格(mm) Specification	标准 Standard	交货状态 Delivery conditions
锅炉和压力容器用钢板 Steel plates for boilers and pressure vessels	Q245R, Q345R, Q370R, 18MnNbR, 13MnNiMoR, 15CrMoR, 12Cr1MoVR 14Cr1MoR, 12Cr2Mo1R	(6-150) × (900-4800) × L	GB 713-2008	热轧、控轧、正火、正火加回火 As rolled, Controlled rolled, Normalized, Normalized and Tempered.
低温压力容器用低合金钢钢板 Low alloy steel plates for low temperature pressure vessels	16MnDR, 15MnNiDR, 09MnNiDR	(6-150) × (900-4800) × L	GB 3531-2008	正火或正火加回火 Normalized or Normalized and Tempered.
压力容器用调质高强度钢板 High strength Q&T steel plates for pressure vessels	07MnCrMoVR, 07MnNiMoVDR 12MnNiVR	(12-60) × (900-4800) × L	GB 19189-2003	淬火加回火 Quenched and Tempered

注：GB 713-2008 替代 GB 713-1997 和 GB 6654-1996，于 2008 年 9 月 1 日起实施。

Remark : The GB 713-2008 has replaced GB 713-1997 and GB 6654-1996, and has been implemented from September 1, 2008.

#### 3. 通过全国锅炉压力容器委员会技术评审钢种及规格

The steel grades and specifications approved by the China Standardization Committee on Boilers and Pressure Vessels(CSCBPV)

产品名称 Product Name	牌号 Steel Grade	规格 Specification	使用温度 Service Temperature	标准 Standard
低温压力容器用钢板 Steel plates for low temperature pressure vessels	09MnNiDR	6-120mm	-70°C -350°C	GB 3531-2008
	15MnNiDR	6-60mm	-45°C -200°C	
低温压力容器用镍合金厚钢板 Ni alloy steel plates for low temperature pressure vessels	06Ni9DR(9Ni)	5-40mm	-196°C -100°C	Q/BQB 665-2011
	08Ni3DR(3.5Ni)	5-80mm	-100°C -100°C	
锅炉和压力容器用钢板 Steel plates for boilers and pressure vessels	12Cr2Mo1R、14Cr1MoR	≤100mm	-	GB 150, GB 713-2008
	13MnNiMoR	30-150mm	0°C -400°C	Q/BQB 6670-2010
球形储罐用钢 Steel plates for spherical tank	B610CF	12-50mm	-20°C -100°C	Q/BQB 660-2010
	B610CF-L1	12-50mm	-40°C -100°C	
	B610CF-L2	12-50mm	-50°C -100°C	
大线能量焊接用高强度钢板 Welded high strength steel plates with high energy	B610E (12MnNiVR, 08MnNiVR)	12-45mm	-20°C -100°C	Q/BQB 660-2010

注：95mm 厚 12Cr2Mo1R (H) 钢板可用于制造相应设计参数的临氢设备。

Remarks: 12Cr2Mo1R (H) with the thickness of 95mm can be used to manufacture the equipment for critical hydrogen with corresponding design parameters .

#### 4. 通过 JIS 标志认证钢种及规格

The steel grades and specifications approved by JIS

产品名称 Product Name	牌号 Steel Grade	规格 Specification	标准 Standard
一般结构用轧制钢板 Rolled steel plates for general structure	SS330, SS400, SS490	6-100mm	JIS G3101
	SS540	6-40mm	
焊接结构用轧制钢板 Welded structural rolled	SM400A/B/C, SM490A/B/C, SM490YA/B, SM520B/C, SM570	6-100mm	JIS G3106
建筑结构钢轧制钢板 Heavy steel plates for construction	SN400A/B/C, SN490B/C	6-100mm	JIS G3136

#### 5. 通过欧盟 CE 认证钢种及规格

The steel grades and specifications approved by EU CE

认证规范 Authentication Specification	证书号 Certificate Number	牌号 Steel Grade	厚度范围 Thickness (mm)	标准 Standard	交货状态 Delivery Condition
CPD 89/106/EEC	0035-CPR-A201	S235JR, S235J0, S235J2 S275JR, S275J0, S275J2 S355JR, S355J0, S355J2 S355K2	6-150mm	EN 10025-2: 2004	U, CR, N
		S275N, S275NL S355N, S355NL	6-150mm	EN 10025-3: 2004	CR, N
		S275M, S275ML S355M, S355ML S420M, S420ML	10-80mm	EN 10025-4: 2004	TM
		S460Q, S460QL, S460QL1 S500Q, S500QL, S500QL1 S550Q, S550QL, S550QL1 S620Q, S620QL, S620QL1 S690Q, S690QL, S690QL1	10-130mm	EN 10025-6: 2004	V
PED97/23/EC AD2000- WO/TRD 100	01 202CHN/Q-06 0200	P235GH, P265GH P295GH, P355GH	6-180mm	EN 10028-2	U, N
		16Mo3	6-150mm	EN 10028-2	N
		P275NH, P275NL1, P275NL2 P355N, P355NH, P355NL1, P355NL2	6-150mm	EN 10028-3	U, N
		S235JRG1, S235JRG2, S235J2G3, S275JR, S275J2G3, S355J2G3& S355K2G3	6-150mm	EN 10025-1993	U, N
		S235JR, S235J0, S235J2 S275JR, S275J0, S275J2 S355JR, S355J0, S355J2 S355K2	6-150mm	EN 10025-6: 2004	U, N
		Gr.55/ Gr.60/ Gr.65/ Gr.70	6-150mm	ASTM/ASME A/SA516	U, N

注: U- 轧态, CR- 控轧, N- 正火 (正火轧制), TM- 热机械轧制, V- 调质

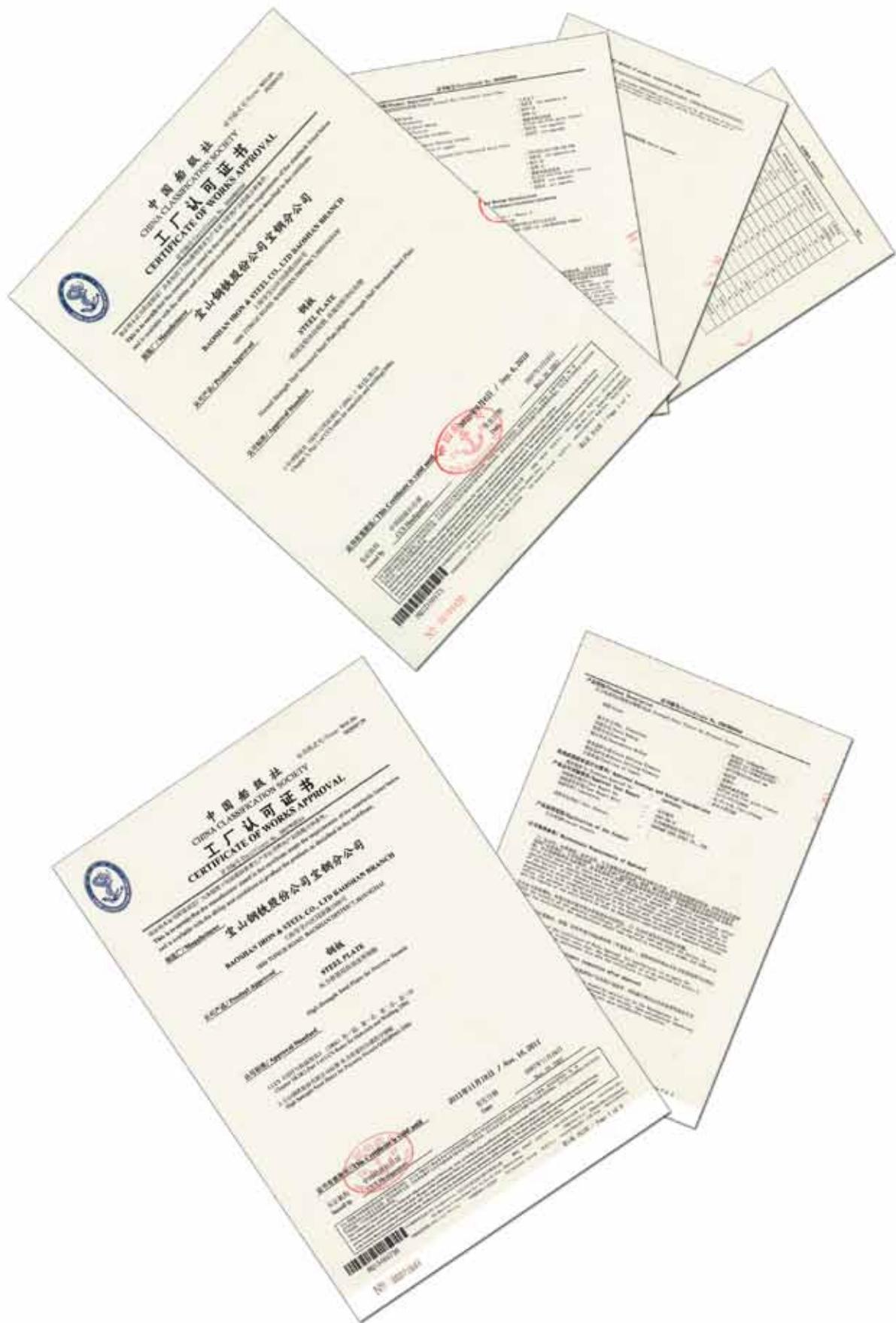
Remarks: U-as rolled, CR-temperature controlled rolled, N-normalized or normalized rolled, TM-thermo-mechanically treated, V-quenched and tempered

**产品证书** | Product Certificates  
**船级社证书** Certificate of Classification of Society





## 产品证书 | Product Certificates 船级社证书 Certificate of Classification of Society





# 产品证书 | Product Certificates

## 船级社证书 Certificate of Classification of Society

Approval of Material Manufacturers Zulassung von Werkstoffherstellern	
	
<p>This is to certify that the works of Herrn wird bescheinigt, dass die Firma</p> <p><b>BAOSHAN IRON &amp; STEEL CO., LTD.</b> <b>BAosteel Branch GUOYUAN</b> <b>BAOSHAN DISTRICT</b> <b>200900 SHANGHAI</b> <b>CHINA</b></p>	
<p>has been subjected to an approval test in accordance with the Society's Rules with satisfactory results and is approved for the manufacture of the following products: einer Zulassungsprüfung nach den Vorschriften des Germanischen Lloyd unterzogen wurde und für die Herstellung folgender Erzeugnisse zugelassen ist:</p> <p><b>Plates made from normal and higher strength hull structural steel</b> - GL-A, GL-B, GL-D, GL-E (including grades Z25 and Z35) - GL-A32, GL-A36, GL-D32, GL-D36, GL-E32, GL-E36 (including Z25 and Z35) in accordance with the GL Rules for Metallic Materials, Chap. 2, Sect. 1, B and I, I; <b>Strips made from normal and higher strength hull structural steel</b> - GL-A, GL-B - GL-A32, GL-A36 in accordance with the GL Rules for Metallic Materials, Chap. 2, Sect. 1, B.</p>	
<p>This approval is granted provided that all products intended to be used for the construction of ships or installations classed with Germanischer Lloyd comply in every respect with the Society's Rules and Requirements. Die Zulassung erfolgt unter der Voraussetzung, dass alle Erzeugnisse, die zum Bau von Schiffen und Anlagen mit Klasse bei Germanischer Lloyd bestehen sind, die Vorschriften des Germanischen Lloyd in jeder Hinsicht erfüllen.</p>	
<p>Certificate of approval No. WZ 476 HH 7 Zulassungsbescheinigung Nr.</p>	
<p>This Certificate is valid until: 2011-02-11 Diese Bescheinigung ist gültig bis: Part of the approval is our letter of approval ref. no. 005809-08 of 2008-02-11. Bestandteil der Zulassung ist das Zulassungsabschreiben, Typ. Nr. 005809-08 vom 2008-02-11. Hamburg, 2008-02-11</p>	
<p>Germanischer Lloyd  Uwe Pohle</p> <p> Dr. Eva Jungjans</p>	

Approval of Material Manufacturers Zulassung von Werkstoffherstellern																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Grade	Thickness	Marking Element	Delivery Period	Delivery Condition	Plate	GL-A, GL-B	Med	A/H/S	25	AR	35	Plate	GL-A, GL-B	Med	A	25	N	35	Plate	GL-A, GL-B, GL-C	Med	A/H/S	25	N	35	Plate	D, D1	Med					Plate	GL-A, GL-B, GL-C	Med	A/H/S-T	25	N	35	Plate	D, GL-E	Med					Plate	GL-D	Med	A/H/S				Plate	GL-A32, GL-C32	Med	A/H/S	25	AR	35	Plate	GL-A32, GL-C32	Med	A/H/S	25	N	35	Plate	GL-A32, GL-C32	Med	A/H/S-T	25	CR	40	Plate	GL-A32, GL-C32	Med	A/H/S-T	25	N	35	Plate	GL-A32, GL-C32	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	CR	40	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	TM	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	N	35	Plate	GL-A36, GL-C36	Med	A/H/S-T	25	AR	35	Plate	GL-A36, 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**Appendix 1**

**Product Description and/or Approval Condition**

Certificate No : SHII18909-SP001      Date of Approval : 4th January, 2006.

= Condition of Supply

Grade (1)	Grade refining elements	Max. Thickness (mm)	Condition of Supply (2)
A32, B32	A3(+T)	30	AR
B32	A3	30	R
B32	A3(+T)	25	AR
A32, B32, C32	A3(+T)	30	R
AH 32(2), BH 32(2)	A3(+B)	30	R
AH 36(2), BH 36(2)	A3(+B+T)	30	TGP
AH 32(2)	A3(+T)	30	AR
AH 36(2)	A3(+T)	30	R
AH 36(2)	A3(+B+T)	30	TGP
AH 32(2)	A3(+T)	30	AR
AH 36(2)	A3(+B+T)	30	R
AH 36(2)	A3(+B+T)	30	TGP
AH 36(2)	A3(+B+T)	30	R
AH 36(2)	A3(+B+T)	30	TGP
AH 36(2)	A3(+B+T)	30	R

= Remarks

(1) A3(+B) : with specified through thickness properties of 215, 225 and 235.  
(2) AR : As Received  
R : Untreated Rolling Condition  
B : Normalized Condition  
TGP : Thermal-Mechanical Controlled Process (Thermo-Mechanical Rolling)  
< The end >

AC-1B(2008.05)



**Appendix 1**

**QA System Approval Condition**

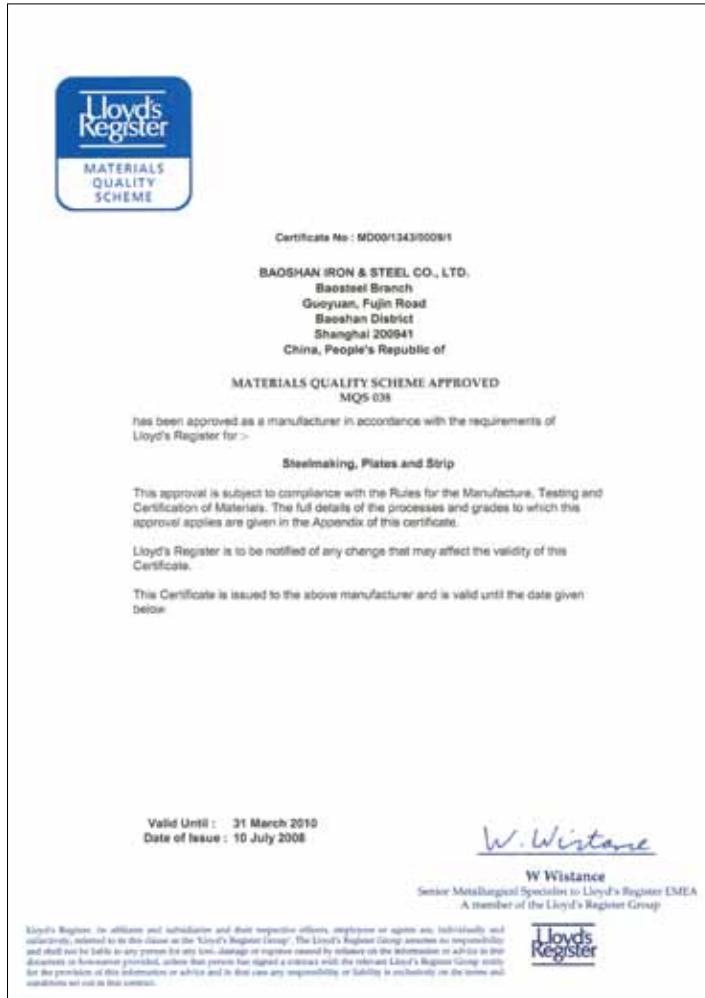
Certificate No : SHII18909-QA001      Date of Approval : 16th May, 2007.

= General Approval Condition

- Approval of Manufacturing process for the following rolled steels is to be maintained separately from this approval.  
- Rolled steel plates for Hull (SHII18909-SP001)
- This Certificate is valid on condition that verification of the manufacturer's Quality Assurance System is carried out on an annual audit and found to be satisfactory by this Society.
- Tests and surveys are to be carried out by the manufacturer in accordance with the requirements of this Society's Rules for Classification of Steel Ships and equivalent approved manufacturer's Quality Assurance Procedure (No. : 02-04-00-000).
- The following form of declaration is to be stamped or printed on each mill certificate with the name of the steel works in English and is to be signed by the person in charge of manufacturer's survey.  
"This certificate is issued by the manufacturer in accordance with the arrangement made by the Korean Register of Shipping and the Society of German Surveyors No. SHII18909-QA001. It is to verify that the materials described above have been manufactured and tested with satisfactory results in accordance with the Rules of Korean Register of Shipping and the suitable requirements."
- Mill certificates issued by the manufacturer are to be forwarded to KR Shanghai Office together with the manufacturer's test records for endorsement thereon by the surveyor.
- The confirmation survey is to be carried out by a KR surveyor once every one(1) year.
- In case where other organizations especially request witnessing of the test by the Surveyor or there is any problem with the quality of certified products, the Society may directly issue, with prior notice, the product certificate upon witnessing of the tests regardless of associated survey delegation.
- The following documents are to be prepared by the manufacturer and made available at the request of the surveyor :  
- Material test and inspection records  
- Documents and data for quality control activity. < The end >

AC-1B(2008.05)

**产品证书** | Product Certificates  
**船级社证书** | Certificate of Classification of Society



NIPPON KAIJI KYOKAI



Certificate No. NKR 19380L

### APPROVAL OF MANUFACTURING PROCESS

This is to certify that  
Baoshan Iron & Steel Co., Ltd., Baosteel Branch  
Baoshan District, Shanghai  
China

has been approved for the manufacturing process of undersigned materials by the NIPPON KAIJI KYOKAI in accordance with the requirements of I.L. Part K of the Society's "Rules for the Survey and Construction of Steel Ships" and Chapter I, Part I of the Society's "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use".

**MATERIALS** : Rolled Steels for Hull

The details of approval conditions to which this approval applies are given in the PARTICULARS OF APPROVAL, listed in the reverse of this certificate.

On this behalf, the products for the ships classed with the Society will be manufactured, tested and inspected complying with the Rules.

This certificate is valid until the 12th day of December, 2010.  
Issued at Tokyo on the 6th day of March, 2008.

Initial Approval Date : 13th December 2006

  
T. Takahashi  
General Manager  
Material and Equipment Department

**ClassNK**

SNK NIPPON KAIJI KYOKAI  
4-7, KIOCHI-CHO, CHIYODA-KU,  
TOKYO 100-8901, JAPAN

No. : 19380L19380L  
Date : 6 March 2008

### PARTICULARS OF APPROVAL

Approval Conditions for Manufacturing Process of  
Rolled Steels for Hull

**Manufacturer**: Baoshan Iron & Steel Co., Ltd., Baosteel Branch

**list of Product**: Steel Plates

**rule**: I.A, I.C, I.D, II.E, EASL, ESSL, ESS2, EAM, ED3 and EISB

**Grade**: All Grades with "T35" through thickness properties

**apply Conditions**:

- Decarburization Practice**: See Table.
- System of Controlants**: See Table.
- Other Thickness**: See Table.
- Heat Treatment**: See Table.

rule	Decarburization Practice	System of Controlants	Max. Thickness (mm)	Heat Treatment
A	None	None	50	As Rolled
B	Fine grained Killed	Si-Mn-Al-Ti Si-Mn-Al Si-Mn-Al-Nb-Ti	50	Normalizing
C	None	None	50	Normalizing
D	None	None	50	Normalizing
E	None	None	50	Normalizing
F	None	None	50	Normalizing
G	None	None	50	Normalizing
H	None	None	50	Normalizing
I	None	None	50	Normalizing
J	None	None	50	Normalizing
K	None	None	50	Normalizing
L	None	None	50	Normalizing
M	None	None	50	Normalizing
N	None	None	50	Normalizing
O	None	None	50	Normalizing
P	None	None	50	Normalizing
Q	None	None	50	Normalizing
R	None	None	50	Normalizing
S	None	None	50	Normalizing
T	None	None	50	Normalizing
U	None	None	50	Normalizing
V	None	None	50	Normalizing
W	None	None	50	Normalizing
X	None	None	50	Normalizing
Y	None	None	50	Normalizing
Z	None	None	50	Normalizing

Additional Conditions:

- Steel Plates
- Continuous Casting

Note: "TMCP/AC" as a heat treatment condition is to be confirmed in the next revision.

  
C. Goto  
T. Takahashi  
General Manager  
Material and Equipment Department

NIPPON KAIJI KYOKAI



Certificate Number : 07T1524

Date : 22 August 2007

### CERTIFICATE FOR APPROVAL OF MANUFACTURERS

THIS IS TO CERTIFY THAT the works of

**BAOSHAN IRON & STEEL CO., LTD.**  
**BAOSTEEL BRANCH**  
**SHANGHAI, CHINA**

have been surveyed by NIPPON KAIJI KYOKAI for approval of the Quality Assurance System as well as Production procedures/facilities, Workmanship and inspection/testing methods under the Rules for Approval of Manufacturers and found to be competent to produce

**Rolled Steel for Hull**

to be used for ships classed or intended for classification with the society.

This certificate is valid until 21 August 2012 subject to periodical surveillance.

Approval Number : 07 CLQA 153

NIPPON KAIJI KYOKAI

  
(T. Kapil  
Managing Director)

Note : This certificate is subject to the conditions as per attached sheet.

**ClassNK**

NIPPON KAIJI KYOKAI



Attachment to  
Certificate Number 07 T1 524

**Name of Manufacturer :**  
Baoshan Iron & Steel Co., Ltd. Baosteel Branch

**Address of Manufacturer :**  
855 Fujin Road, Baoshan District, Shanghai, 200941 China

**Articles and Approval Conditions of Products :**

- Hull Structural plate for marine use

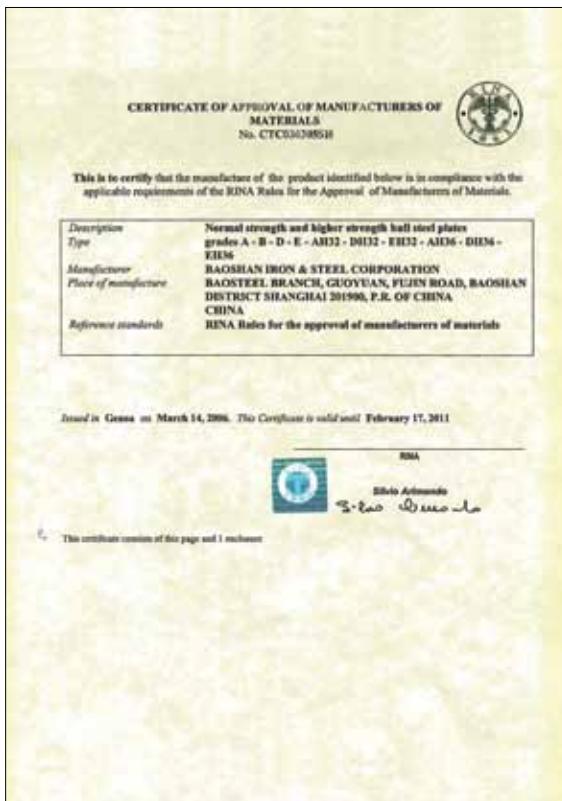
**Related Documents :**

- Quality Manual ( BGGLSC-2007, July 2007 )
- NK Assessment Record ( 70306 )

-- The End --

# 产品证书 | Product Certificates

## 船级社证书 Certificate of Classification of Society



**中华人民共和国  
特种设备制造许可证  
Manufacture License of Special Equipment  
People's Republic of China**

(材 料)

编号: TSC210004-2014

单位名称: 宝山钢铁股份有限公司  
 单位名称: 上海市宝山区牡丹江路 1813 号南楼  
 制造地址: 1. 上海市宝山区富锦路 885 号  
               2. 上海市宝山区北蕴川路 777 号  
 经审查, 获准从事下列材料的制造:

名称	牌号	规格	标准	备注
锅炉和压力容 器用钢板	Q245R, Q345R, Q370R, 18MnMoNbR, 13MnNiMoR, 15CrMoR, 14Cr1MoR, 12Cr2Mo1R, 12Cr1MoVR	(6.0~150) × (900~4800) × L mm	GB713-2008	热轧、控轧、 正火、 正火加回火
低温压力容器 用低合金钢板	16MnDR, 15MnNiDR, 09MnNiDR	(6.0~100) × (900~4800) × L mm	GB3531-2008	正火或正火 加回火
压力容器用调 质高强度钢板	07MnCrMoVR, 07MnNiMoVDR, 12MnNiVR	(12~60) × (900~ 4800) × L mm	GB19189-2003	淬火加回火
焊接气瓶用钢 板和钢带	HP235, HP265, HP295, HP325, HP345	(2.5~12) × (120~ 1900) × L (C) mm	GB6653-2008	热轧、控轧
	HP235, HP265, HP295, HP325, HP345, B440HP, B490HP	(2.0~12) × (120~ 1900) × L (C) mm	Q/BQB 329-2009	热轧、控轧

审批机关: 国家质量监督检验检疫总局

发证机关:

有效期至: 2014 年 11 月 8 日

发证日期: 2010 年 11 月 9 日



国家质量监督检验检疫总局制

产品证书  
特种设备许可证书

Product Certificates  
Certificate of Special equipment by National Related Administrative or Institutes

**全国锅炉压力容器标准化技术委员会**

地 址：北京市朝阳区安外小关东里 14 号  
邮编编码：100012  
<http://www.caclp.org.cn>

电 话：(010) 64445727, 64445749  
传 真：(010) 64445709  
E-mail：[64445709@sohu.com](mailto:64445709@sohu.com)

**12Cr2Mo1R、14Cr1MoR 钢板材料专家评审意见**

应宝山钢铁股份有限公司的申请，全国锅炉压力容器标准化技术委员会于 2007 年 9 月 5 日在大连组织召开了 12Cr2Mo1R、14Cr1MoR 钢板材料评审会议。参加会议的专家名单见附件 1。会上宝山钢铁股份有限公司的代表介绍了宝钢分公司炼钢厂及厚板厂的主要装备。12Cr2Mo1R、14Cr1MoR 钢板的研制结果。兰石机械设备有限责任公司的代表介绍了 12Cr2Mo1R 钢板及焊接接头的力学性能、焊接性能等试验结果。

与会专家审阅了技术资料，听取了介绍，就有关技术问题进行了询问和讨论。评审意见如下：

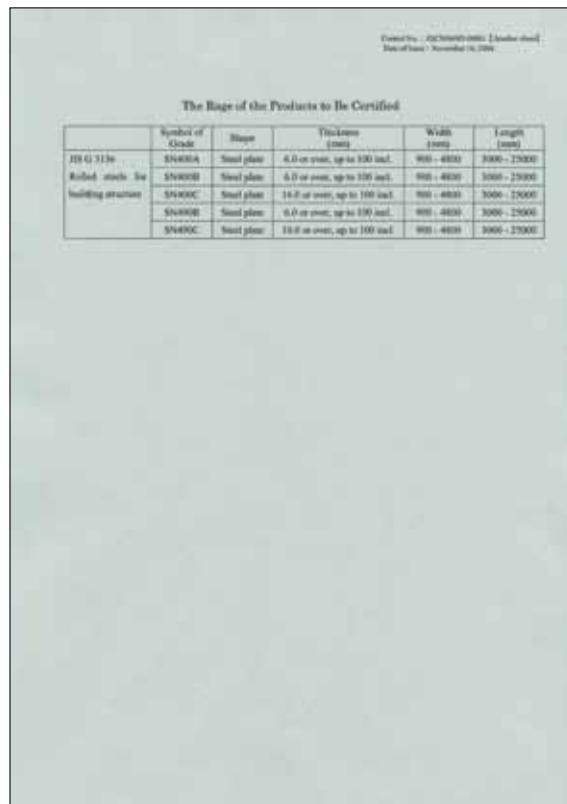
1. 宝钢生产的 12Cr2Mo1R 钢板，钢的冶金质量和钢板的力学性能优良，符合 GB150 和 GB713（报批稿）的要求。可用于制造厚度 10mm 以下的承压设备。
2. 宝钢工业试制的临氢设备用 95mm 厚 12Cr2Mo1R (II) 钢板，钢的化学成分、钢板的力学性能和钛耐大脱化性能符合临氢设备用钢的基本要求，可用于制造相应设计参数的临氢设备。
3. 宝钢生产的 14Cr1MoR 钢板，钢的冶金质量和钢板的力学性能优良，符合 GB150 和 GB713（报批稿）的要求，可用于制造厚度 10mm 以下的承压设备。
4. 建议宝钢进一步开展钢板的允吸性检测温度、断裂韧性 (CTOD, J<sub>IC</sub>)、高温持久强度等试验工作。待生产条件具备后，开展厚度大于 10mm 钢板的研制工作。

评审委员会主任：朱国平  
评审委员会副主任：李国强

2007 年 9 月 5 日



Product Certificates | 产品证书  
JIS certificate | JIS 证书



# 产品证书 | Product Certificates

## CE 证书 CE certificate

### Certificate

#### Quality-Assurance System for Manufacturer of Materials

acc. to Directive 97/23/EC

Certificate No.: 01 262 CHNQ-06 8200

Name and address of the manufacturer:

Baoshan Iron & Steel Co., Ltd.  
Core Base  
No.885 Fujin Road, Baoshan District, Shanghai,  
P.R.China 201900

Herewith we certify that the material manufacturer has established and applies a Quality Management System. The system was audited according to the European Directive 97/23/EC, Annex I, Part 4.2, with regard to the materials as listed in the scope of approval.

Tested acc. to Directive  
97/23/EC:

GM System acc. to EN 754-6, article 4.2 and  
AD 2000-Merkblatt 190

Audit report no.:

CHNQ-06 8200

Range of materials:

Manufacturing of Steel Plates, see annex to certificate

Manufacturing plant:

Baoshan Iron & Steel Co., Ltd.  
Core Base  
No.885 Fujin Road, Baoshan District, Shanghai,  
P.R.China 201900

Valid until:

September 26, 2015

College, January 21, 2013

Dipl.-Ing. Svenja Kredt

TÜV Rheinland-Certification Body Nr.  
Pressure Equipment  
CE Conformity Assessment  
Product Code: CH-NQ-06  
Approval Sheet: D-01123 8200

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Annex to Certificate No.: 01 262 CHNQ-06 8200

Details of the Validity of the Approval as Manufacturer of Materials in accordance to PED 97/23/EC and AD 2000-Merkblatt 190

described in

ID	Material group Description	Designation Number	Type of construction Code	Type of product	Dimensions Thickness mm	Weight kg	Date		Page No.	VDA-Checklist Status
							Start	End		
<i>The use of the materials according to PED 97/23/EC is limited to the publication of harmonized European Standards or to the specification by a European standard approved or to the particular material specified. With this the manufacturing authority for equivalent material grades according to other standards (e.g. DIN, EN, NFPA, ASME) is given. The requirements and limits of the specific code respectively the PED must be observed for the use of material grades listed in columns 5 &amp; 6.)</i>										
1	FERROUS-FERROUS Ferrous base metals	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
2	FERROUS-FERROUS Ferrous base metals	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
3	FERROUS-FERROUS Ferrous base metals	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
4	ALUMINUM, ALUMINUM Aluminum & aluminum alloys & composites	EN 10025-100	U, M	Unalloyed structural steels	0 - 100	-	-	-	-	The use of aluminum and its alloys should be limited to the specific material codes given in the specifications and the standards.
5	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2-2004	U, M	Unalloyed structural steels	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
6	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2-2004	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard

PED 97/23/EC-Accord 06 8200 Rev. 01 Received core item

**TÜVRheinland®**

Rev. 01  
PED 97/23/EC-Accord 06 8200 Rev. 01 Received core item

### Certificate

#### Conformity of the factory production control according Regulation 305/2011/EU: System 2+

Certificate number

9836-CPR-A201

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation - CPR), this certificate applies to the construction product:

Scope:

Hot Rolled Products of Structural Steels  
for metal structures or as composite metal and concrete  
structures (see Annex)

Name and address of the manufacturer:

Baoshan Iron & Steel Co., Ltd. Core Base  
No.885 Fujin Road, Baoshan  
201900 Shanghai, P.R.China

Manufacturing plant:

Baoshan Iron & Steel Co., Ltd. Core Base  
No.885 Fujin Road, Baoshan  
201900 Shanghai, P.R.China

Specification:

This certificate attests that all provisions concerning the assessment and verification of consistency of performance described in Annex 2A of the standard(s)

EN 10025-1:2004

under system 2+ are applied and that the factory production control fulfills all the prescribed requirements set out above.

Validity period:

This certificate was first issued on 07.11.2013 and will remain valid as long as the test methods and/or factory production control requirements included in the harmonized standard used to assess the performance of the declared construction product do not change, and the product, and the manufacturing conditions in the plant, are not modified significantly, but not longer than 31.10.2016.



Dipl.-Ing. I. Krüger-Fuhl  
Certification body for construction products

Rev. 0

Berlin, November 07, 2013

TÜV Rheinland-Certification Body  
Certified body for construction products and steel  
Arl-Gütersloh  
Am Güterbahnhof 1  
D-4375 Arnsberg

[www.tuv.com](http://www.tuv.com)



**TÜVRheinland®**  
Genaue Richtung.

TÜV Rheinland Industrial Services

Certification Body for Construction Products

Annex to Certificate No.: 0025-CPR-A201

Details of the Validity of the Approval as Manufacturer of hot rolled Products of Structural Steels

in accordance to Regulation 305/2011/EU: System 2+

ID	Material group Description	Designation Number	Type of construction Code	Type of product	Dimensions Thickness mm	Weight kg	Date		Page No.	VDA-Checklist Status
							Start	End		
<i>The use of the materials according to PED 97/23/EC is limited to the publication of harmonized European Standards or to the specification by a European standard approved or to the particular material specified. With this the manufacturing authority for equivalent material grades according to other standards (e.g. DIN, EN, NFPA, ASME) is given. The requirements and limits of the specific code respectively the PED must be observed for the use of material grades listed in columns 5 &amp; 6.)</i>										
1	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
2	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
3	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
4	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard

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TÜV Rheinland Industrial Services

Certification Body for Construction Products

Annex to Certificate No.: 0025-CPR-A201

Details of the Validity of the Approval as Manufacturer of hot rolled Products of Structural Steels

in accordance to Regulation 305/2011/EU: System 2+

ID	Material group Description	Designation Number	Type of construction Code	Type of product	Dimensions Thickness mm	Weight kg	Date		Page No.	VDA-Checklist Status
							Start	End		
<i>The use of the materials according to PED 97/23/EC is limited to the publication of harmonized European Standards or to the specification by a European standard approved or to the particular material specified. With this the manufacturing authority for equivalent material grades according to other standards (e.g. DIN, EN, NFPA, ASME) is given. The requirements and limits of the specific code respectively the PED must be observed for the use of material grades listed in columns 5 &amp; 6.)</i>										
1	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
2	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
3	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard
4	STEEL, STEEL, STEEL Steel, stainless steel and aluminum	EN 10025-2	U, M	Steel plates for structural purposes	0 - 100	-	01/2000-01	01/2015-01	1-11	Test certificate according to harmonized European Standard

**TÜVRheinland®**  
Precision Right.



Annex to Certificate No.: 01 202 CHIQ-06 0200 Details of the Validity of the Approval as Manufacturer of Materials in accordance to PED 97/23/EC and AD2000-W0/TRD 100 respectively										TUV Rheinland Group			
No. Code	Material-grade Material-No.	Material Specification	Delivery Cond. +	Article Type of product	Dimensions			Weight max Value	Test specification/ Requirements Technical Regulation	Remarks	Date 2006-8-31 Rev.0	Page No. 1 of 1	TÜV-name/Stamp TUV Rheinland Group
					Thickness mm	Up to mm	From mm	To mm					
1	P235GH, P265GH P295GH/P355GH	EN10028-2	U, N	Steel plates for pressure purpose	10	150			AD 2000-W1	The pre-manufactured of continuous casting billets and slabs used for hot rolling steel plates should produced by PED & AD2000-W0 approved manufacturer within the approved scope.			
2	P355N, P355NH P355NL1 & P355NL2	EN10028-3	U, N	Steel plates for pressure purpose	10	150			AD 2000-W1	The type of test certificate to EN10204 should be in compliance with AD2000-W1.			
3	S235JR, S235J0, S235J2 S235JC, S235JR, S235JC S355JC, S355J2, S355J2C	EN 10025-1993	U, N	Unalloyed structural steels	10	150			AD 2000-W1				
4	S235JR, S235J0, S235J2 S235JR, S235J0, S235J2 & S355JR, S355J2, S355J2C	EN 10025-2: 2004	U, N	Unalloyed structural steels	10	150			AD 2000-W1				
<b>Remarks</b>													
A = solution treatment and quenched L = solution treatment N = normalised S = stress relieved annealed TM = thermo mechanical treatment U = not treated													
V = quenched and tempered CR = temperature controlled rolled G = soft annealed													
* = Description in column 16/Code: a = Material b = Delivery condition c = Article or object d = Dimensions, see Techn. Regulation e = Weight, see Techn. Regulation f = Name/No. of Techn. Regulation													

## 供货业绩

Application Achievement

### ■ 海工/Ocean engineering

行业 Industry	重点用途 Application	代表牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
EQ系列 EQ series	海洋石油钻井平台 Ocean oil drilling platform	EQ43	10-178	20000
		EQ47		
		EQ51		
		EQ56		
		EQ63		
		EQ70		
齿条钢、半圆板 Rack and chord steel		A517Q	80-178	
API系列 API series	浮体锚座 Floating anchor stock	API 2H-50	8-50	
		API 2W-50		
		API 2W-60		

■ 管线 / Pipeline steel

业主单位 Customer	重点工程名称 Project	代表牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
中国石油 CNPC	中俄管线 Sino-Russian pipeline	K60、X70、 X70-W、X80、 X80-W	14-33	830000
	西气东输二线 Second phrase, pipeline for transmitting gas from west to east			
	中卫 – 贵阳一期 First phrase, pipeline from Zhongwei-Guiyang			
	中卫 – 贵阳二期 Second phrase, pipeline from Zhongwei-Guiyang			
	中卫 – 贵阳三期 Third phrase, pipeline from Zhongwei-Guiyang			
	西气东输三线 Third phrase, pipeline for transmitting gas from west to east			
中国石化 SINOPEC	川气出川管线 Pipeline of transmitting Sichuan natural gas			
中海油 CNOOC	广东管网 Guangdong pipeline net			
印度石油 India Oil	印度海底管线 Submarine pipeline, India	X52	20-24	

## 供货业绩

### Application Achievent

#### ■ 原油储罐 / Crude oil storage tank

业主单位 Customer	工程名称 Project	代表牌号 Grade	厚度范围 Thickness mm	罐型(万立方) Tank type ( $\times 10^4 \text{ m}^3$ )	供货业绩 Weight/tanks
中石化 SINOPEC	白沙湾石油储备基地 Baishawan crude oil reserve base	B610E (08MnNiVR) /12MnNiVR	12-41	15	240000吨 350台
	茂名储罐 Maoming storage tank			12.5	
	仪征商储 Yizheng commercial storage tank			12.5	
	黄岛国家石油储备基地 Huangdao national oil reserve base			10	
	惠州石油储备基地 Huizhou oil reserve base			10	
中海油 CNOOC	钦州二期储罐 Second phrase, Qingzhou storage tank		12-41	15	240000吨 350台
	钦州储罐 Firstphrase, Qingzhou storage tank			10	
	兰州储罐 Lanzhou storage tank			10	
其它 Others	大连新港 Dalian port project		12-41	15	240000吨 350台
	海南洋浦港 Hainan Yangpu harbor project			10	

■ 低温球罐 / Low temperature spherical tank

业主单位 Customer	工程名称 Project	代表牌号 Grade	厚度范围 Thickness mm	罐形 Tank type	供货业绩 Weight/tanks
中海油 CNOOC	中海油惠州项目 Huizhou project	B610CF-L1/L2 07MnNiVDR 07MnNiMoDR	12-50	2000m <sup>3</sup>	30000吨 71台
中石化 SINOPEC	中石化天津项目 Tianjin project			2000m <sup>3</sup>	
中石化 SINOPEC	中石化镇海项目 Zhenhai project			2000m <sup>3</sup>	
中石化 SINOPEC	中石化北海项目 Beihai project			2000m <sup>3</sup>	
神华宁煤 Shenhua ningxia coal Industry group co., ltd	神华宁煤煤制烯烃项目 Coal to olefin project			2500m <sup>3</sup>	
山东兗矿 YanKuang group	山东兗矿二期项目 YanKuang second phase project			2500m <sup>3</sup>	
东联化工 Donglian chemical corporation	泰州滨江项目 Taizhou binjiang project			3000m <sup>3</sup>	
中石化 SINOPEC	中化弘润项目 Runhong project			3000m <sup>3</sup>	
烟台万华 Yantai wanhua	烟台万华一期改造项目 First phrase reconstruction project			3000m <sup>3</sup>	
中金石化 Zhongjin petroleum & chemical corporation	宁波中金石化芳烃项目 Ningbo zhongjin petroleum & chemical arene project			3000m <sup>3</sup>	
中景石化 Zhongjing petroleum & chemical corporation	福建中景石化园区化工项目一期 Fujian zhongjing zone petroleum & chemical project first phase			2000m <sup>3</sup>	
中石油 CNPC	中石油云南炼油项目 Petroleum Refining project in Yunnan			3000m <sup>3</sup>	
神华集团 Shenhua group	神华榆神工业区清水煤化学项目 Shenhua yushen industry zone qingshui coal chemistry project			2000m <sup>3</sup>	

## 供货业绩

### Application Achievent

#### ■ Cr-Mo钢、汽包钢、核电钢 / Cr-Mo steel, boil barrel steel, nuclear engineering steel

行业 Industry	重点用途 Application	牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
Cr-Mo钢 Cr-Mo steel	煤化工、炼化设备、电站耐热结构件 Coal chemical industry, refinery equipment, components for resisting heat in power station	12Cr1MoVR 12Cr2Mo1R 14Cr1MoR 15CrMoR	6-150	40000
		SA387系列 SA387 series		
汽包钢 Boil barrel steel	汽包锅炉 Boiler	13MnNiMoR/ 13MnNiMo5-4		
核电 Nuclear engineering steel	AP-1000安全壳、CAP-1400安全壳 AP-1000 containment vessel CAP-1400 containment vessel	SA738B		

#### ■ 结构高强 / High strength structural steel

行业 Industry	重点用途 Application	牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
工程机械 Engineering plant	混凝土泵车、起重机、挖掘机 Concrete mixer, crane, excavator	BWELDY700/900/960/1100系列 BWELDY700/900/960/1100 series	8-100	90000
煤矿机械 Coal mine machinery	矿用电动轮自卸车、挖掘机、 煤矿刮板运输机 Mine used electric wheel dump truck, excavator, scraper conveyor	B-HARD360/400/450/500系列 B-HARD360/400/450/500 series	8-80	50000
煤矿机械 Coal mine machinery	煤矿液压支架 Coal mine hydraulic support	Q500/550/690/890CF系列 Q500/550/690/890CFseries	15-80	190000
海工机械 Ocean engineering machinery	集装箱正面吊、船舶起重机 Container front carrier, shipment crane	S690系列 S690 series	10-150	5000

■ 水电用钢/Steel for hydropower station

用户名称 Customer	工程名称 Project	牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
三峡开发总公司 Three gorge company	三峡向家坝水电站 Xiangjiaba hydropower station	B610CF系列 B610CF series	12-150	120000
中国水利水电第七工程局 7th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.				
中国水利水电第八工程局 8th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.	溧阳抽水蓄能电站 Liyang hydropower station			
江苏国信 Jiangsu guoxin	三峡溪洛渡水电站 Xiluodu hydropower station			
中国水利水电第十四工程局 14th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.				
中国水利水电第五工程局 5th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.	公格尔水电站 Kongur hydropower station			
中国水利水电第八工程局 8th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.	呼和浩特抽水蓄能 Hohhot hydropower station			
东芝水电设备 Toshiba hydropower	清远抽水蓄能电站 Qingyuan hydropower station	B780CF系列 B780CF series	15-140	6000
哈尔滨电机厂 Haerbin electric machinery co,ltd,	三峡溪洛渡水电站等 Xiluodu hydropower station			
哈尔滨电机厂、中国水利水电 第十四工程局 Haerbin electric machinery co,ltd, 14th engineering bureau of China National Water Conservancy & Hydroelectric Engineering Co.	国网仙居抽水蓄能电站 Xianju hydropower station			
上海福伊特水电 Voith hydropower	国网洪屏抽水蓄能电站 Hongping hydropower station			

## 供货业绩

Application Achievent

### ■ 建筑桥梁 / Building and bridge steel plate

行业 Industry	工程名称 Project	牌号 Grade	厚度范围 Thickness mm	供货业绩 Weight t
桥梁工程 Bridge project	上海崇明越江通道长江大桥工程 Shanghai yangtse river tunnel project	Q345B/C/D、 Q345qD、 Q370qE	8-135	200000
	上海闵浦大桥 Shanghai minpu bridge			
	西堠门大桥 Xihoumen bridge			
	金塘大桥 Jintang bridge			
建筑 Architecture	上海环球金融中心 Shanghai world financial center	A572GR50、 SN490B/C、 Q345GJ、 Q390GJ、 Q420D、 Q460E	6-110	150000
	中央电视台新址 New site of CCTV			
	国家体育馆 National stadium			
	世博场馆 EXPO site			



船舶及海洋工程钢板 Shipbuilding and offshore steel plates	51
管线用钢板 Steel plate for pipeline	53
能源用钢板 Steel plate for energy engineering	54
结构用钢板 Structural steel plate	57
宝钢标准钢板 Baosteel specification steel plate	59



## 一、船舶及海洋工程钢板 / Ship and ocean engineering steel plates

可供产品牌号、规格范围及交货状态

Available product grade, specification and delivery condition

### ■ 船舶工程钢板/Ship steel plates

船级社 Classification of Society	品种 Steel type	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition	厚度方向性能 Through-thickness characteristics
ABS BV CCS DNV GL KR LR NK RINA	普通船板 Ordinary-strength ship steel plates	A/B	≤50	AR	Z25/Z35
			≤130	N	
		D	≤35	AR	
			≤130	N	
		E	≤130	N	
	高强船板 High-strength ship steel plates	AH32/ DH32	≤20	AR	
			≤40	CR/NR	
			≤100	N	
		AH36/DH36	≤20	AR	
			≤40	CR/NR	
			≤100	N	
		EH32/EH36	≤100	N	
		AH/DH/EH32/36	≤80	TM	
		AH40/DH40/EH40	≤68	TM	
	高韧性船板 High-toughness ship steel plates	FH32/FH36/FH40	≤68	TM	





■ 特殊船板及海洋用钢板/Special ship plate and ocean engineering plate

船级社/标准 Classification of Society	分类 Steel type	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition	厚度方向性能 Through-thickness characteristics
ABS CCS DNV LR	超高强度船板 Ultra high-strength ship steel plates	A47/D47/E47	≤80	TM	Z25/Z35
		A/D/EQ43/47/51/56 A/D/E420/460/500/550	≤80	TM	
			≤88	QT	
		AQ/DQ/EQ63/70 A/D/E620/690	≤178	QT	
ASTM A514/517		A514/517Q	≤178	QT	
API	海洋工程钢板 Ocean engineering steel plates	API 2H GR 42/GR50	≤100	N	Z25/Z35
		API 2Y GR50/GR60	≤80	QT	
		API 2W GR50/GR60	≤80	TM	
		S355G2	≤20	N	
		S355G3	≤40	N	
		S355G5	≤20	TM	
		S355G6	≤40	TM	
		S355G7/8/9/10+N	≤100	N	
		S355G7/8/9/10+M	≤80	TM	
		S420G1/G2+M	≤80	TM	
EN 10225	船用锅炉压力容器钢板 Boiler and pressure vessel steel plates for shipbuilding	S460G1/G2+M	≤80	TM	
		NV360-0F,1F,2F NV410-0F,1F	≤50	AR	
			≤80	N	
		NV460-0F,1F NV490-0F,1F NV510-0F,1F	≤40	NR	
			≤80	N	
DNV	船用锅炉压力容器钢板 Boiler and pressure vessel steel plates for shipbuilding	360FG/410FG/460FG/ 490FG/510FG	≤20	AR	
		360FG/410FG	≤60	N	
		460FG/490FG/510FG	≤50	N	
		410FG/460FG/490FG	≤35	NR	
		360FG/410FG/460FG/ 490FG/510FG	≤50	TM	
		B610CF(07MnMoVR)	≤50	QT	
LR	压力容器用高强度钢板 High strength heavy steel plates for pressure vessels	B610CF-L1 (07MnNiMoVDR)			
		B610CF-L2 (07MnNiMoVDR)			
CCS	压力容器用高强度钢板 High strength heavy steel plates for pressure vessels				

注：1、AR—普通轧制 CR ( NR )—控轧 ( 正火轧制 ) N—正火 TM(TM)—热机械轧制 Q—调质

2、以上牌号、规格已通过 ABS、BV、CCS、DNV、GL、KR、LR、NK、RINA 等九家船级社认可，用户如有要求，也可按 GB 712 进行供货。

Remarks: 1.AR-as rolled, CR-control rolling, N-normalizing, TM(TM)-thermomechanical controlled process, QT-quenched and tempered,

2.the above steel grades and specification have been recognized by nine classification of societies, including ABS, BV, CCS, DNV, GL, KR, LR and RINA. GB 712 is also available if customers require.



## 二、管线用钢板 / Steel plate for pipeline

可供产品标准、牌号、规格范围及交货状态

Available product standard, grade, specification and delivery condition

产品标准 Product specification	牌号 Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
API Spec5L/ISO3183	L245 or Gr.B	≤40	CR
	L290 or X42	≤40	CR
	L320 or X46	≤40	CR
	L360 or X52	≤40	CR/TM
	L390 or X56	≤40	CR/TM
	L415 or X60	≤40	CR/TM
	L450 or X65	≤40	TM
	L485 or X70	≤40	TM
	L555 or X80	≤35	TM
	L625 or X90	≤30	TM
	L690 or X100	≤30	TM
	L830 or X120	≤25	TM
	L360M or X52MS	≤30	TM
	L390M or X56MS	≤30	TM
	L415Mor X60MS	≤30	TM
	L450Mor X65MS	≤30	TM
	L485M/L555M	≤30	TM
GB/T 9711	L245	≤40	CR
	L290	≤40	CR
	L360	≤40	CR/TM
	L415	≤40	CR/TM
	L450	≤40	TM
	L485	≤40	TM
	L555	≤35	TM
DNV-OS-F101	245	≤40	CR
	290	≤40	CR
	360	≤40	CR/TM
	415	≤40	CR/TM
	450	≤40	TM
	485	≤40	TM
	555	≤35	TM



### 三、能源用钢板 / Steel plate for energy engineering

可供产品标准、牌号、规格范围及交货状态

Available product standard, grade, specification and delivery condition

产品标准 Product specification	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
GB 713	Q245R(20g、20R)	6~150	AR/CR/N
	Q345R(16Mng、19Mng、16MnR)		AR/CR/N+SR
	Q370R(15MnNbR)		N/N+SR
	18MnMoNbR		N+T/N+T+SR
	13MnNiMoR(13MnNiMoNb g 13MnNiMoNbR)		N+T/N+T+SR
	15CrMoR(15CrMog)、15CrMoR(H)		N+T/N+T+SR/N+ACC+T+SR
	12Cr1MoVR(12Cr1MoVg)		AR/CR/N/N+T/N+T+SR
	14Cr1MoR、14Cr1MoR(H)		N+T/N+T+SR/N+ACC+T+SR
	12Cr2Mo1R、12Cr2Mo1R(H)		N+T/N+T+SR/N+ACC+T+SR
GB 3531	16MnDR	6-120	N/N+SR
	15MnNiDR		
	09MnNiDR		
GB 19189	07MnCrMoVR 07MnMoVR	12-60	QT/QT+SR
	07MnNiMoVDR 07MnNiVR		
	07MnNiMoDR		
	12MnNiVR		
	SA387 Gr.12/A387 Gr.12 SA387 Gr.12(H)/A387 Gr.12(H)		
ASME SA387/SA387M ASTM A387/A387M	SA387 Gr.11/A387 Gr.11 SA387 Gr.11(H)/A387 Gr.11(H)	6-150	A/CR/CR+T/N/N+T+SR /N+ACC+T+SR
	SA387 Gr.22/A387 Gr.22		
	SA387 Gr.22(H)/A387 Gr.22(H)		
	SA204 GrB SA204 GrC		
ASME SA204/SA204M ASTM A204/A204M	6-100		N/N+SR
ASME SA203/SA203M ASTM A203/A203M	SA203 Gr.D SA203 Gr.E	6-80	N+T



产品标准 Product specification	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
ASME SA285/SA285M ASTM A285/A285M	SA285 Gr.A/A285 Gr.A SA285 Gr.B/A285 Gr.B SA285 Gr.C/A285 Gr.C	6-50	AR/CR/AR+SR /CR+SR/N/N+SR
ASME SA299/SA299M ASTM A299/A299M	SA299/A299	8-130	N/N+SR
ASME SA516/SA516M ASTM A516/A516M	SA516Gr.55/A516Gr.55 SA516Gr.60/A516Gr.60 SA516Gr.65/A516Gr.65 SA516Gr.70/A516Gr.70	6-130	AR/CR/N/N+T /N+SR/AR+SR /N+T+SR
ASME SA533/SA533M ASTM A533/A533M	SA533 Type A/A533 Type A SA533 Type B/A533 Type B SA533 Type C/A533 Type C SA533 Type D/A533 Type D	10-130	Q/Q+SR
ASME SA515/SA515M ASTM A515/A515M	SA515Gr.60/A515Gr.60 SA515Gr.65/A515Gr.65 SA515Gr.70/A515Gr.70	6-130	AR/CR/N/N+SR
ASME SA737/SA737M ASTM A737/A737M	SA737 Gr.B/A737 Gr.B SA737 Gr.C/A737 Gr.C	8-50	N/N+SR/N+ACC+T
ASME SA738/SA738M ASTM A738/A738M	SA738 Gr.A/A738 Gr.A	8-150	N/N+SR/Q/Q+SR
	SA738 Gr.B/A738 Gr.B	10-100	Q/Q+SR
	SA738 Gr.C/A738 Gr.C	10-150	Q/Q+SR
ASME SA612/SA612M ASTM A612/A612M	SA612/A612	6-25	AR/CR/N/N+SR
ASME SA662/SA662M ASTM A662/A662M	SA662 Gr.A/A662 Gr.A SA662 Gr.B/A662 Gr.B SA662 Gr.C/A662 Gr.C	6-50	CR/N/N+SR
ASME SA455/SA455M ASTM A455/A455M	SA455/A455	8-130	AR/CR/N/N+SR
ASME SA841/SA841M ASTM A841/A841M	SA841 Gr.A/A841 Gr.A SA841 Gr.B/A841 Gr.B SA841 Gr.C/A841 Gr.C	8-65	TM/TM+T



产品标准 Product specification	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
EN 10028-2	P235GH	8-130	AR/CR/NR/N/N+SR
	P265GH	8-130	
	P295GH	8-130	
	P355GH (19Mn6)	8-130	
	16Mo3	8-130	
	20MnMoNi4-5	10-130	
EN 10028-3	P275NH/NL1/NL2	6-130	N/NR
	P355N/NH/NL1/NL2	6-130	N/NR
	P460NH/NL1/NL2	8-130	N/N+T
EN 10028-5	P355M/ML1/ML2	8-80	TM/TM+T
	P420M/ML1/ML2	8-60	TM/TM+T
	P460M/ML1/ML2	8-60	TM/TM+T
EN 10028-6	P355Q/QH/QL1/QL2	10-130	Q/Q+SR
	P460Q/QH/QL1/QL2		
	P500Q/QH/QL1/QL2		
	P690Q/QH/QL1/QL2		

注：A—退火 AR—普通轧制 ACC—加速冷却 CR—控轧 N—正火 NR—正火轧制 Q—调质 SR—消除应力退火 T—回火 TM(TM)—热机械轧制

Remarks: A-annealing, AR-as rolled, ACC-accelerated cooling, CR-controlled rolling, N-normalizing, NR-normalizing rolling, Q-quenching and tempering, SR-Stress Relieving, T-tempering, TM-thermo-mechanical controlled process



#### 四、结构用钢板 / Structural steel plate

可供产品标准、牌号、规格范围及主要用途

Available product standard, grade, specification and delivery condition

产品标准 Product specification	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
JIS G3101	SS400 /SS490	6-130	AR
JIS G3106	SM400A/SM490A	6-130	AR
	SM400B /SM400C	6-130	AR/CR/N
	SM490B/SM490C		
	SM490YA	6-100	AR/CR
	SM490YB		
	SM520B/SM520C	6-100	AR/CR/N
JIS G3136	SM570	10-100	QT
	SN400B/C SN490B/C	6-100	AR/CR/N
EN 10025-2	S235JR /S275JR/S355JR		
	S235J0/S275J0/S355J0	6-130	AR/CR/N
	S235J2/S275J2/S355J2/S355K2		
EN 10025-3	S275N/S275NL	6-130	N
	S355N/S355NL		
EN 10025-4	S275M/S275ML		
	S355M/S355ML	10-80	TM
	S420M/S420ML		
EN 10025-6	S460Q/S460QL/S460QL1		
	S500Q/S500QL/S500QL1		
	S550Q/S550QL/S550QL1	10-150	QT
	S620Q/S620QL/S620QL1		
	S690Q/S690QL/S690QL1		
GB/T 700	Q235A	6-150	AR
	Q235B/Q235C/Q235D	6-150	AR/CR/N
GB/T 1591	Q345A/Q345B/Q345C /Q345D/Q345E	6-150	AR/CR/N
	Q390A/Q390B/Q390C /Q390D/Q390E	6-150	AR/CR/N
	Q420A/Q420B/Q420C /Q420D/Q420E	8-150	CR/N
	Q460C/Q460D/Q460E	8-120	CR/N/TM
	Q690D	10-150	QT



产品标准 Product specification	牌号 Steel Grade	厚度范围 Thickness mm	交货状态 Delivery Condition
GB/T 714	Q235qC/Q345qC/Q370qC		
	Q235qD/Q345qD/Q370qD	8-150	AR/CR/N
	Q345qE		
	Q370qE	10-80	AR/CR/N
	Q420qC/Q420qD/Q420qE	10-70	TM
GB/T 19879	Q345GJB/Q345GJC/Q345GJD		
	Q390GJC/Q390GJD/Q390GJE	10-150	AR/CR/N/TM
	Q420GJC/Q420GJD/Q420GJEW		
ASTM A36	A36	6-150	AR/CR/N
ASTM A283	A283 Gr.C	6-150	AR
ASTM A572/709	A572Gr50/A709Gr50		
	A572Gr60/A709Gr60	8-150	CR/N
ASTM A514	A514Gr.F	10-150	QT
ASTM A633	A633Gr.D/A633Gr.E	20-155	CR/N
ASTM A588	A588 Gr.A/Gr.B	8-90	N
		90.1-160	N+T
YB/T 4137-2005	Q460CFC/D/E		
	Q500CFC/D/E	12-80	TM
	Q550CFC/D/E		
	Q620CFC/D/E		
	Q690CFC/D/E	12-50	TM
Q890CFC/D/E			

- 备注：1、Q420GJC/D/EW 为具有耐候性能的高强建筑用钢；  
 2、可以按照产品标准或产品标准 + 用户附加的技术协议供货；  
 3、增加 Z 向性能时，按照 GB/T5313 或按照用户技术协议执行。

Remarks: 1. Q420GJC/D/EW is high strength construction structural steels with weathering properties.  
 2. Delivery comply with production standards or plus additional requirements by technical agreement.  
 3. The requirements of through thickness characteristics comply with GB/T 5315 or technical agreement.



## 五、宝钢标准钢板 / Baosteel specification plate steel

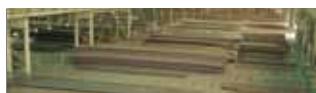
可供产品标准、牌号、规格范围及主要用途

Available product standard, grade, specification and delivery condition

品种 Steel type	产品标准 Product specification	牌号 Steel Grade	厚度 Thickness mm	用 途 Utility
水电用低裂纹敏感性高强度厚钢板 High strength steel with low sensitive welding cracking hydropower station	Q/BQB 620-2013	B610CFHQL2 B780CFHQL2	10~150	低焊接裂纹敏感性钢，用于最低服役温度为-20℃等水电站压力钢管、蜗壳、岔管等金属构件。 Mainly processed as pressure steel tube, volute, bifurcated pipe which can be served at -20℃.
		B610CFHML2 B780CFHML2	10~60	
		B610CFHQL4 B780CFHQL4	10~150	低焊接裂纹敏感性钢，用于最低服役温度为-40℃等水电站压力钢管、蜗壳、岔管等金属构件。 Mainly processed as pressure steel tube, volute, bifurcated pipe which can be served at -40℃.
		B610CFHML4 B780CFHML4	10~60	
		B780CFHQL5	10~150	低焊接裂纹敏感性钢，用于最低服役温度为-50℃等水电站压力钢管、蜗壳、岔管等金属构件。 Mainly processed as pressure steel tube, volute, bifurcated pipe which can be served at -50℃.
		B780CFHML5	10~60	
压力容器用高强度厚钢板 High strength plate steel for pressure vessels	Q/BQB 660-2013	B610E (08MnNiVR)	10~45	大热输入焊接用钢，用于压力容器和石油储罐等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels and crude oil tank
		B610E (12MnNiVR)		
		B610CF (07MnMoVR)	10~75	低焊接裂纹敏感性钢，用于-20~100℃等压力容器、水电压力钢管等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels and pressure steel tube at -20~100℃
		B610CF-L1 (07MnNiVDR)	10~75	低焊接裂纹敏感性钢，用于-40~100℃等压力容器、水电压力钢管等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels and pressure steel tube at -40~100℃
		B610CF-L2 (07MnNiMoDR)	10~75	低焊接裂纹敏感性钢，用于-50~100℃等压力容器、水电压力钢管等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels and pressure steel tube at -50~100℃



品种 Steel type	产品标准 Product specification	牌号 Steel Grade	厚度 Thickness mm	用 途 Utility
压力容器Ni高强度钢板 High strength plate steel for pressure vessels with Ni elements	Q/BQB 665-2013	08Ni3DR	5~80	用于温度为-100°C ~ 100°C 的压力容器等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels at -100 ~ 100°C
		06Ni9DR	5~40	用于温度为-196°C ~ 100°C 的压力容器等装备及结构件。 Mainly processed as structural component and equipment of pressure vessels at -196 ~ 100°C
建筑抗震用低屈服强度厚钢板 Low yield strength plate steel for construction	BZJ 610-2013	BLY160 BLY225	12~100	建筑抗震用结构件，如耗能阻尼构件等。 Mainly processed as structural component of shock resistant construction, such as energy consumption damper.
高强度焊接结构用厚钢板 High strength plate steel for welded structure	BZJ 611-2013	BWELDY700QL2 BWELDY700QL4	10~80	用于要求有良好焊接性能和综合力学性能的挖掘机、铲车、混凝土泵车、汽车起重机等工程机械，以及采煤机液压支架、大型吊机等矿山、港口机械结构等。 Mainly used for the excavator, forklift, concrete mixer, motocrane, hydraulic support and huge hoist.
		BWELDY900QL2 BWELDY900QL4 BWELDY960QL2 BWELDY960QL4 BWELDY1100QL2 BWELDY1100QL4	10~50	
工程机械用耐磨厚钢板 Abrasion resistant plate steel for engineering machine	BZJ 613-2013	BHARDY360 BHARDY400 BHARDY450 BHARDY500	≤100	用于要求有高强度、高耐磨性能的矿山、建筑及农业等工程机械，如推土机、装载机、挖掘机、自卸车及各种矿山机械等。 Mainly used for the engineering machine of mine, construction and agriculture such as bulldozer, excavator, dumper.



## 宝钢标准牌号钢板介绍

Chemical composition and mechanical property of Baosteel specification steel plate

### 水电用低焊接裂纹敏感性高强度厚钢板

High strength steel with low sensitive welding cracking hydropower station

牌号 Grade	厚度 Thickness mm	化学成分 <sup>a</sup> (熔炼分析) % Chemical composition (heat analysis) %											
		C	Si	Mn	P	S	Cu	Ni	Cr	Mo	V	B	Ceq <sup>b</sup>
B610CFHQL2	10~80	≤0.09						≤0.60					≤0.42(10≤t≤60) ≤0.44(60<t≤80)
B610CFHML2			≤0.40	0.60	~	≤0.015	≤0.007	≤0.25		≤0.30	≤0.40	0.02 ~ 0.06	≤0.20(10≤t≤60) ≤0.22(60<t≤80)
B610CFHQL4				1.60									
B610CFHML4	>80~150	≤0.11						≤1.00					≤0.48 ≤0.24
B780CFHQL2	10~80	≤0.09			0.60								≤0.53(10≤t≤60) ≤0.54(60<t≤80)
B780CFHML2			≤0.40	0.60	~	≤0.015	≤0.007	≤0.40	≤1.50	≤0.60	≤0.60	0.02 ~ 0.06	≤0.24(10≤t≤60) ≤0.25(60<t≤80)
B780CFHQL4				1.60									
B780CFHML4	>80~150	≤0.12											≤0.56 ≤0.28
B780CFHQL5	10~80	≤0.09		0.60								0.02 ~ 0.06	
B780CFHML5	>80~150	≤0.12	≤0.40	~ 1.60	≤0.015	≤0.007	≤0.40	≤1.50	≤0.60	≤0.60		≤0.002	

<sup>a</sup> 为改善钢的性能，可添加其它微合金元素。

$$\text{Ceq} = C + \frac{Mn}{6} + \frac{Si}{24} + \frac{Ni}{40} + \frac{Cr}{5} + \frac{Mo}{4} + \frac{V}{14}$$

$$\text{Pcm} = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

<sup>a</sup> To improve the property of steel, the other micro alloying elements can be added.

$$\text{Ceq} = C + \frac{Mn}{6} + \frac{Si}{24} + \frac{Ni}{40} + \frac{Cr}{5} + \frac{Mo}{4} + \frac{V}{14}$$

$$\text{Pcm} = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B$$



牌号 Grade	厚度 Thickness mm	拉伸试验 Tensile test			冲击试验 Impact test		180°弯曲试验 b=2a (a=试样厚度, b=试样宽度, d=弯心直径) 180°Bend test b=2a (a=thickness for test piece, b=width for test piece, d=inside diametre)
		下屈服强度 <sup>a</sup> Lower yield strength $R_{eL}$ MPa	抗拉强度 Tensile strength $R_m$ MPa	断后伸长率A, % Elongation after fracture ( $L_0 = 5.65 \sqrt{S_0}$ )	温度 Temperature °C	冲击功 <sup>b</sup> Impact energy $KV_2$ J	
B610CFHQL2	10~75	≥490	610~740	≥17	-20	≥47	d=3a
B610CFHML2	>75~150	≥470	590~720				
B610CFHQL4	10~75	≥490	610~740	≥17	-40	≥47	d=3a
B610CFHML4	>75~150	≥470	590~720				
B780CFHQL2	10~50	≥690	780~920	≥15	-20	≥47	d=3a
B780CFHQL2	>50~150	≥670	760~900				
B780CFHQL4	10~50	≥690	780~920	≥15	-40	≥47	d=3a
B780CFHQL4	>50~150	≥670	760~900				
B780CFHQL5	10~50	≥690	780~920	≥15	-50	≥47	d=3a
B780CFHQL5	>50~150	≥670	760~900				

<sup>a</sup> 屈服现象不明显时采用 $R_{p0.2}$ 。

<sup>b</sup> 根据需方要求, 经供需双方协商并在合同中注明, 冲击功可规定≥80J或≥100J。

<sup>a</sup> The yield strength value applies to the  $R_{p0.2}$  if the yield strength is not pronounced.

<sup>b</sup> The minimum impact energy value may be 80J or 100J if agreed at the time of enquiry and order.



## 压力容器用高强度厚钢板

### High strength plate steel for pressure vessels

牌号 Grade	厚度 Thickness mm	化学成分 <sup>a</sup> (熔炼分析) % Chemical composition (heat analysis) %											
		C	Si	Mn	P <sup>b</sup>	S	Cu	Ni	Cr	Mo <sup>c</sup>	V	B	Pcm <sup>d</sup>
B610E (08MnNiVR)	10~45	≤0.11	0.15 ~ 0.40	1.20 ~ 1.60	≤0.015	≤0.005	≤0.25	0.15~0.40	≤0.20	≤0.30	0.02~0.06	≤0.002	≤0.22
B610E (12MnNiVR)	10~45	≤0.15											
B610CF (07MnMoVR)	10~60	≤0.09	0.15 ~ 0.40	1.20 ~ 1.60	≤0.015	≤0.007	≤0.25	≤0.40	≤0.30	0.10~0.30	0.02~0.06	≤0.002	≤0.20
	> 60~75	≤0.10											≤0.22
B610CF-L1 (07MnNiVDR)	10~60	≤0.09	0.15 ~ 0.40	1.20 ~ 1.60	≤0.015	≤0.005	≤0.25	0.20~0.50	≤0.30	≤0.30	0.02~0.06	≤0.002	≤0.20
	> 60~75	≤0.10											≤0.22
B610CF-L2 (07MnNiMoDR)	10~50	≤0.09	0.15 ~ 0.40	1.20 ~ 1.60	≤0.015	≤0.005	≤0.25	0.30~0.60	≤0.30	0.10~0.30	0.02~0.06	≤0.002	≤0.21
	> 50~60	≤0.09											≤0.22
	> 60~75	≤0.10											

<sup>a</sup> 为改善钢的性能，可添加其他微合金元素；

<sup>b</sup> 对于球罐用途B610CF-L2(07MnNiMoDR)，P含量应不大于0.012%；

<sup>c</sup> 厚度不大于36mm的B610CF(07MnMoVR)钢板、厚度不大于30mm的B610CF-L2(07MnNiMoDR)钢板Mo含量下限可不作要求。

<sup>d</sup> Pcm为焊接裂纹敏感性组成，按以下公式计算：

$$Pcm = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B \quad (\%)$$

<sup>a</sup> To improve the performance of the steel, the other micro alloying elements can be added.

<sup>b</sup> For B610CF-L2(07MnNiMoDR) applied to spherical tank, the P content shall be more than 0.012%.

<sup>c</sup> For B610CF(07MnMoVR) of nominal thickness≤36mm and B610CF-L2(07MnNiMoDR) of nominal thickness≤30mm, the lower limit of the Mo content is not necessary.

<sup>d</sup> Pcm, which means welding cracking sensitivity, should be calculated by the formula below.

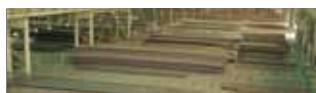
$$Pcm = C + \frac{Si}{30} + \frac{Mn}{20} + \frac{Cu}{20} + \frac{Ni}{60} + \frac{Cr}{20} + \frac{Mo}{15} + \frac{V}{10} + 5B \quad (\%)$$



牌号 Grade	厚度 Thickness mm	拉伸试验 Tensile test			冲击试验 Impact test		180°弯曲试验 b=2a (a=试样厚度, b=试样宽度, d=弯心直径) 180°Bend test b=2a (a=thickness for test piece, b=width for test piece, d=inside diametre)
		下屈服强度 <sup>a</sup> Lower yield strength $R_{eL}$ MPa	抗拉强度 Tensile strength $R_m$ MPa	断后伸长率A, % Elongation after fracture ( $L_0 = 5.65 \sqrt{S_0}$ )	温度 Temperature °C	冲击功 <sup>b</sup> Impact energy $KV_2$ J	
B610E (08MnNiVR)	<20	≥490	610~730	≥17	-20	≥100	d=3a
	≥20~45			≥18			
B610E (12MnNiVR)	<20	≥490	610~730	≥17	-20	≥100	d=3a
	≥20~45			≥18			
B610CF (07MnMoVR)	10~60	≥490	610~730	≥17	-20	≥100	d=3a
	>60~75	≥470	590~710				
B610CF-L1 (07MnNiVDR)	10~60	≥490	610~730	≥17	-40	≥100	d=3a
	>60~75	≥470	590~710				
B610CF-L2 (07MnNiMoDR)	10~60	≥490	610~730	≥17	-50	≥100	d=3a
	>60~75	≥470	590~710				

<sup>a</sup> 屈服现象不明显时采用 $R_{p0.2}$ 。

<sup>b</sup> The yield strength value applies to the  $R_{p0.2}$ , if the yield strength is not pronounced.



### 低温压力容器用镍合金厚钢板

High strength plate steel for pressure vessels with Ni elements

牌号 Grade	化学成分 <sup>a,b</sup> (熔炼分析) % Chemical composition (heat analysis) %							
	C	Si	Mn	P	S	Ni	Mo	V
08Ni3DR	≤0.08	0.15~0.35	0.30~0.80	≤0.010	≤0.005	3.25~3.70	≤0.12	≤0.05
06Ni9DR	≤0.08	≤0.35	0.30~0.80	≤0.008	≤0.004	8.50~10.0	≤0.10	≤0.01

牌号 Grade	厚度 Thickness mm	拉伸试验 Tensile test			冲击试验 Impact test		180°弯曲试验 b=2a (a=试样厚度, b=试样宽度, d=弯心直径) 180°Bend test b=2a (a=thickness for test piece, b=width for test piece, d=inside diametre)
		下屈服强度 <sup>d</sup> Lower yield strength $R_{eL}$ MPa	抗拉强度 Tensile strength $R_m$ MPa	断后伸长率 A, % Elongation after fracture	温度 Temperature °C	冲击功 Impact energy $KV_2$ J	
08Ni3DR	5~60	≥320	490~620	≥21	-100	≥60	d=3a
	>60~80	≥300	480~610				
06Ni9DR	5~30	≥560	680~820	≥18	≥-196	≥100	d=3a
	>30~40	≥550					

<sup>a</sup> 为改善钢板的性能，钢中可添加其他合金元素，但含量应在质量证明书中报告。

<sup>b</sup> 作为残余元素时，Cu≤0.25%，Cr≤0.25%。供方若能保证合格可不做分析。

<sup>c</sup> Cr+Cu+Mo≤0.50%。

<sup>d</sup> 屈服现象不明显时采用 $R_{p0.2}$ 。

<sup>a</sup> To improve the performance of the steel, the other micro alloying elements can be added, the content of the added elements shall be reported in the inspection document.

<sup>b</sup> As residual element, Cu should be ≤0.25%, Cr should be ≤0.25%, which can not be analyzed if supplier guarantees the quality.

<sup>c</sup> Cr+Cu+Mo≤0.50%.

<sup>d</sup> The yield strength value applies to the  $R_{p0.2}$ , if the yield strength is not pronounced.



## 建筑抗震用低屈服强度厚钢板

Low yield strength plate steel for construction

牌号 Grade	化学成分 <sup>a</sup> (熔炼分析) % Chemical composition (heat analysis) %					
	C	Si	Mn	P	S	N
BLY160	≤0.05	≤0.10	≤0.50	≤0.025	≤0.015	≤0.006
BLY225	≤0.10	≤0.10	≤0.60	≤0.025	≤0.015	≤0.006

牌号 Grade	拉伸试验 <sup>b, c</sup> Tensile test				冲击试验 <sup>e</sup> Impact test	
	下屈服强度 <sup>d</sup> Lower yield strength $R_{el}$ MPa	抗拉强度 Tensile strength $R_m$ MPa	断后伸长率 Elongation after fracture %	屈强比 Yield ratio %	试验温度 Temperature °C	冲击功 Impact energy $KV_2$ J
BLY160	140~180	220~320	≥45	≤80	0	≥27
BLY225	205~245	300~400	≥40	≤80	0	≥27

<sup>a</sup> 由供方选择，根据需要可添加Nb、V、Ti、B等其它合金元素；

<sup>b</sup> 拉伸试验规定值适用于横向试样；

<sup>c</sup> 拉伸试样尺寸为：厚度≤50mm,  $L_0=50$ mm,  $b=25$ mm; 厚度>50mm,  $L_0=50$ mm,  $d=14$ mm。

对于厚度>25mm~50mm, 也可采用 $L_0=50$ mm,  $d=14$ mm, 但仲裁时为 $L_0=50$ mm,  $b=25$ mm;

<sup>d</sup> 屈服现象不明显时，屈服强度采用 $R_{p0.2}$ ；

<sup>e</sup> 冲击试验规定值适用于纵向试样。

<sup>a</sup> Nb、V、Ti、B and other alloying elements can be added when needed.

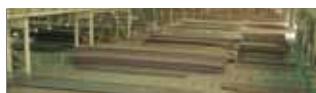
<sup>b</sup> The orientation of the test pieces for tensile test is transverse.

<sup>c</sup> The dimension of test pieces for tensile test: for thickness≤50mm,  $L_0=50$ mm,  $b=25$ mm; for thickness>50mm,  $L_0=50$ mm,  $d=14$ mm; for thickness>25mm~50mm,  $L_0=50$ mm,  $d=14$ mm. The arbitration dimension should be  $L_0=50$ mm and  $b=25$ mm.

<sup>d</sup> The yield strength value applies to the  $R_{p0.2}$ , if the yield strength is not pronounced.

<sup>e</sup> The orientation of the test pieces for impact test is longitudinal.

厚度方向性能级别 Quality class	牌号表示 Grade	化学成分S element S	厚度方向的断面收缩率 (%) Reduction of area in %	
		%	三个试样平均值 Average value of three tests	单个试样值 Individual value
Z15	BLY160-Z15	≤0.010	≥15	≥10
	BLY225-Z15			
Z25	BLY160-Z25	≤0.007	≥25	≥15
	BLY225-Z25			
Z35	BLY160-Z35	≤0.005	≥35	≥25
	BLY225-Z35			



### 高强度焊接结构用厚钢板

High strength plate steel for welded structure

牌号 Grade	化学成分 <sup>a</sup> (熔炼分析) % Chemical composition (heat analysis) %										其它 others	CEV <sup>a</sup>	
	C	Si	Mn	P	S	Nb	Ti	V	Al	厚度 mm Thickness		≤50	>50
	≤0.18	≤0.50	≤1.60	≤0.025	≤0.015	≤0.05	≤0.05	≤0.06	≥0.018	Cr≤0.80	≤0.60	≤0.65	
				≤0.020	≤0.010					Mo≤0.70			
BWELDY700QL2	≤0.20	≤0.50	≤1.70	≤0.025	≤0.015	≤0.05	≤0.05	≤0.06	≥0.018	Ni≤2.00	≤0.65	-	
BWELDY700QL4				≤0.020	≤0.010					Cu≤0.30			
BWELDY900QL2	≤0.20	≤0.50	≤1.70	≤0.025	≤0.015	≤0.05	≤0.05	≤0.06	≥0.018	B≤0.005	≤0.70	-	
BWELDY900QL4				≤0.020	≤0.010					N≤0.015			

牌号 Grade	拉伸试验 Tensile test						冲击试验 <sup>c</sup> Impact test		180°弯曲试验 b=2a (a=试样厚度, b=试样宽度, d=弯心直径) 180°Bend test b=2a (a=thickness for test piece, b=width for test piece, d=inside diametre)						
	上屈服强度 <sup>b</sup> Upper yield strength $R_{eH}$ MPa		抗拉强度 Tensile strength $R_m$ MPa		断后伸长率A, % Elongation after fracture ( $L_0 = 5.65 \sqrt{S_0}$ )	温度 Temperature °C	冲击功 Impact energy $KV_2$ J								
	厚度 mm Thickness		厚度 mm Thickness												
	≤50	>50	≤50	>50											
BWELDY700QL2	≥700	≥670	770~940	760~930	≥14	-20	≥30	d=3a							
BWELDY700QL4						-40	≥30								
BWELDY900QL2	≥900	-	940~1150	-	≥12	-20	≥30	d=3a							
BWELDY900QL4						-40	≥30								
BWELDY960QL2	≥960	-	980~1150	-	≥12	-20	≥30	d=3a							
BWELDY960QL4						-40	≥30								

<sup>a</sup> 根据需要可添加其它合金元素, CEV= C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15;

<sup>b</sup> 拉伸试验取横向试样; 屈服现象不明显时, 采用 $R_{p0.2}$ 。

<sup>c</sup> 冲击试验取纵向试样, 冲击试样为标准试样。

<sup>d</sup> 弯曲试验取横向试样。

<sup>a</sup> To improve the property of steel, the other alloying elements can be added, CEV= C+Mn/6+(Cr+Mo+V)/5+(Ni+Cu)/15.

<sup>b</sup> The orientation of the test pieces for tensile test is transverse; The yield strength value applies to the Rp0.2, if the yield strength is not pronounced.

<sup>c</sup> The orientation of the test pieces for impact test is longitudinal,

<sup>d</sup> The orientation of the test pieces for bend test is transverse.



### 工程机械用耐磨厚钢板

Abrasion resistant plate steel for engineering machine

牌号 Grade	化学成分 <sup>a</sup> (熔炼分析) % Chemical composition (heat analysis) %												质量 等级 Quality class	冲击试验 <sup>b</sup> Impact test		表面 布氏 硬度 <sup>c</sup> Brinell hardness HBW
	C	Si	Mn	P	S	Cr	Ni	Ti	Mo	Alt	B	温度 Temperature °C		冲击功 Impact energy KV <sub>2</sub> J		
BHARDY360	$\leq 0.20$	$\leq 0.60$	$\leq 1.60$	$\leq 0.025$	$\leq 0.015$	$\leq 0.80$	$\leq 0.50$	$\leq 0.05$	$\leq 0.50$	$\geq 0.015$	$\leq 0.005$	A B C D E	-	-	330~390	
													+20	$\geq 20$		
													0			
													-20			
													-40			
BHARDY400	$\leq 0.22$	$\leq 0.70$	$\leq 1.60$	$\leq 0.025$	$\leq 0.010$	$\leq 1.00$	$\leq 0.70$	$\leq 0.05$	$\leq 0.50$	$\geq 0.015$	$\leq 0.005$	A B C D E	-	-	370~430	
													+20	$\geq 20$		
													0			
													-20			
													-40			
BHARDY450	$\leq 0.26$	$\leq 0.70$	$\leq 1.60$	$\leq 0.020$	$\leq 0.010$	$\leq 1.10$	$\leq 0.80$	$\leq 0.05$	$\leq 0.55$	$\geq 0.015$	$\leq 0.005$	A B C D E	-	-	420~480	
													+20	$\geq 20$		
													0			
													-20			
													-40			
BHARDY500	$\leq 0.30$	$\leq 0.70$	$\leq 1.60$	$\leq 0.020$	$\leq 0.010$	$\leq 1.20$	$\leq 1.00$	$\leq 0.05$	$\leq 0.60$	$\geq 0.015$	$\leq 0.005$	A B C D E	-	-	470~550	
													+20	$\geq 20$		
													0			
													-20			
													-40			

<sup>a</sup> 根据需要可添加其它合金元素。当Cu, As作为残余元素时，则Cu≤0.30%，As≤0.08%，如供方能保证可不做分析。

<sup>b</sup> 冲击取纵向试样。

<sup>c</sup> 硬度值为一组三个试验结果的平均值。

<sup>a</sup> To improve the property of steel, the other alloying elements can be added. As residual element, Cu should be ≤0.30%, As should be ≤0.08%, which can not be analyzed if supplier guarantees the quality.

<sup>b</sup> The orientation of the test pieces for impact test is longitudinal.

<sup>c</sup> The value of Brinell hardness is the average of three tests.

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- 2、标准
- 3、尺寸
- 4、单件重量、订货总重量
- 5、交货状态
- 6、产品特性

化学成分、力学性能、超声波探伤、热处理、标记方法等

## 7、用途及加工方法

冷加工、热加工、热处理、焊接方法

## 8、钢板的检验方法

工厂证明、第三方检验机关的证明、有无会同验收及其内容

## 9、其它有关制造方面需要特别关注的事项

特别是对订货产品的要求和注意事项



1. Grade designations and other symbols
2. Standard specification
3. Size
4. Unit weight and total weight
5. Delivery conditions
6. Properties of products  

Chemical composition,mechanical properties,ultrasonic inspection,heat treatment,marking.
7. Intended application and fabrication method  

Cold forming,hot forming,heat treatment,welding methods
8. Testing method  

Certification of factory,certification of the third inspection agency,inspection content
9. Other special concerned contents about the fabrication  

Especially the requirement and attention for the ordered products





## 宝山钢铁股份有限公司

<http://www.baosteel.com>

## BAOSHAN IRON & STEEL CO., LTD.

<http://www.baosteel.com>

### 厚板与工程材料销售部 Heavy Plate & Engineering Materials Sales Department

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邮编：200940  
电话：021-26641204  
传真：021-26645421

### 厚板技术服务室 Technology & Service Division, Heavy Plate Department

地址：上海宝山宝钢纬度三路  
邮编：201941  
电话：021-26642550  
传真：021-26645077

### 宝钢服务热线 Baosteel Service Hot-line

400-820-8590

### 宝钢在线 <http://www.baosteel.net.cn>

## 国内贸易公司 Domestic Sales Channels

### 上海宝钢钢材贸易有限公司

电话：021-50509696  
传真：021-68404618

### 广州宝钢南方贸易有限公司

电话：020-32219999  
传真：020-32219555

### 北京宝钢北方贸易有限公司

电话：010-56512000  
传真：010-56512199

### 成都宝钢西部贸易有限公司

电话：028-85335388  
传真：028-85335680

### 武汉宝钢华中贸易有限公司

电话：027-84298800  
传真：027-84298224

### 沈阳宝钢东北贸易有限公司

电话：024-31391158  
传真：024-31391160

### 上海宝钢商贸有限公司

电话：021-60869800  
传真：021-60869804

### 上海宝钢浦东国际贸易有限公司

电话：021-36014655  
传真：021-51266522 51266533

### 上海宝钢宝山钢材贸易有限公司

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## 东北亚及澳洲大区 Northeast Asia and Oceania Region

### 宝和通商株式会社 HOWA TRADING CO., LTD. TEL: 0081-3-3237-9121 FAX: 0081-3-3237-9123

### 宝和通商首尔事务所 HOWA TRADING CO., LTD., SEOUL OFFICE TEL: 0082-2-5080893 FAX: 0082-2-5080891

### 宝钢澳大利亚贸易有限公司 BAO AUSTRALIA PTY LTD. TEL: 0061-8-94810535 FAX: 0061-8-94810536

## 东南亚及南亚大区 Southeast Asia and South Asia Region

### 宝钢新加坡贸易有限公司 BAosteel SINGAPORE PTE LTD. TEL: 0065-63336818 FAX: 0065-63336819

### 宝钢印度公司 BAosteel INDIA COMPANY PRIVATE LTD. TEL: 91-22-30071700 FAX: 91-22-30071777

### 越南代表处 VIETNAM OFFICE TEL: 0084-8-39100126 FAX: 0084-8-39100124

### 泰国代表处 THAILAND OFFICE TEL: 0066-2-6543008 FAX: 0066-2-6543010

## 欧非中东大区 Europe, Africa & Middle East Region

### 宝钢欧洲有限公司 BAosteel EUROPE GMBH TEL: 0049-40-41994101 FAX: 0049-40-41994120

### 宝钢中东代表处 BAosteel MIDDLE EAST REPRESENTATIVE OFFICE TEL: 00971-4-8840458 FAX: 00971-4-8840485

### 宝钢西班牙有限公司 BAosteel ESPAÑA, S.L. TEL: 0034-93-4119325 FAX: 0034-93-4119330

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## 美洲大区 America Region

### 宝钢美洲贸易有限公司 BAosteel AMERICA INC. TEL: 001-201-3073355 FAX: 001-201-3073358

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### 休斯顿代表处 HOUSTON OFFICE TEL: 001-281-4847333 FAX: 001-281-4842655

### 洛杉矶代表处 LOS ANGELES OFFICE TEL: 001-949-7526789 FAX: 001-949-7521234

### 宝钢巴西贸易有限公司（宝美巴西代表处） BAosteel DO BRAZIL PTE LTDA. TEL: 0055-21-25311363 FAX: 0055-21-25310298

