



宝钢热冲压钢

**Baosteel
Hot Stamping Steel**



创享改变生活
CREATION BEYOND VISION

宝钢汽车板
Baosteel Automotive Sheet

产品特点 Product features

宝钢热冲压钢通过成分设计、添加硼、铬等微合金提高淬透性，经过热冲压成形过程，可将交货状态强度为500~600MPa的材料提高至强度1500MPa以上，有效提高零件的抗碰撞性能，实现车身轻量化，热冲压钢主要应用于车身结构件特别是防止侵入的安全结构件上。

Baosteel hot stamping steels are alloyed with a small percentage of boron, Cr to improve the hardenability, after hot stamping process, the tensile strengths of 500~600MPa displayed by the material in the as-delivered condition can be increased to a maximum of 1500MPa, improve crash performance, and high light-weighting potential. Hot stamping steels are used for structural and safety parts, especially for anti-intrusion components.

种类和牌号 Variety & steel grade

种类 Variety

宝钢可根据用户的不同需求提供各强度级别的热轧、热轧酸洗、冷轧、热镀锌硅的钢卷或钢板产品。

- 热轧卷/板
- 热轧酸洗卷/板
- 冷轧卷/板
- 热镀锌硅卷/板

Baosteel can provide different steel grades of HR, HR & Pickled, CR, AS strip or sheet product according to the different needs of customers.

- HR strip/sheet
- HR & Pickled strip/sheet
- CR strip/sheet
- AS strip/sheet

种类 Variety		强度级别 Grade				
		500MPa	600MPa	1200MPa	1500MPa	1800MPa
无镀层产品 Uncoated product	热轧/HR	●	●	●	●	※
	热轧酸洗/HRP	●	●	●	●	※
	冷轧/CR	●	●	●	●	●
镀层产品 Coating product	镀锌/GI	○	○	○	○	○
	镀锌/GA	○	○	○	○	○
	镀铝硅/AS	※	※	○	●	※

● 商业化 Commercialized ○ 研发中 Under development ※ 已研发 Developed

供货牌号 Steel grade

级别 Grade	牌号 Steel grade	供货能力 Ability
500MPa	B500HS/BR500HS/B500HS+AS	可供货/Commercialized
600MPa	B600HS/BR600HS/B600HS+AS	可供货/Commercialized
1200MPa	B1200HS/BR1200HS	可供货/Commercialized
1500MPa	HC950/1300HS(B1500HS)/HD950/1300HS(BR1500HS)	可供货/Commercialized
1500MPa	HC950/1300HS+AS	可供货/Commercialized
1800MPa	B1800HS/BR1800HS	可供货/Commercialized

工艺流程 Manufacture process



技术特点 Technical characteristics

化学成分 (熔炼分析, %质量分数) Chemical composition (heat analysis, % by mass)

牌号 Steel grade	C	Si	Mn	P	S	Al _t	Ti	B	Cr+Mo+Nb
B500HS BR500HS B500HS+AS	≤0.15	≤0.5	≤1.5	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.50
B600HS BR600HS B600HS+AS	≤0.15	≤0.5	≤1.5	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.50
B1200HS BR1200HS	0.16~0.22	≤0.5	1.0~1.5	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.50
HC950/1300HS(B1500HS) HD950/1300HS(BR1500HS)	0.20~0.25	≤0.5	1.0~1.5	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.50
HC950/1300HS+AS	0.20~0.25	≤0.5	1.0~1.5	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.50
B1800HS BR1800HS	0.28~0.35	≤0.5	1.0~1.8	≤0.025	≤0.010	0.01~0.06	≤0.05	≤0.0050	≤0.80

力学性能 Mechanical properties

热冲压钢交货状态力学性能

Mechanical properties in as-delivered condition

牌号 Steel grade	屈服强度 YS, R _{p0.2} (MPa)	抗拉强度 TS, R _m (MPa)	伸长率 El, A ₅₀ (%)
BR500HS	280~450	≥430	≥20
B500HS	260~420	≥410	≥25
BR600HS	300~450	≥450	≥20
B600HS	280~420	≥440	≥25
BR1200HS	≥280	≤700	≥18
B1200HS	≥220	380~700	≥22
HD950/1300HS (BR1500HS)	320~630	480~800	≥16
HC950/1300HS (B1500HS)	280~450	≥450	≥20
HC950/1300HS+AS	≥300	≥500	≥17
BR1800HS	≥350	≥500	≥14
B1800HS	≥300	≥450	≥18

热冲压钢热成形后典型力学性能

Typical mechanical properties after hot stamping

牌号 Steel grade	屈服强度 YS, R _{p0.2} (MPa)	抗拉强度 TS, R _m (MPa)	伸长率 El, A ₅₀ (%)	硬度 Hardness HV10
B500HS BR500HS	392	519	20	--
B600HS BR600HS	411	641	18	--
B1200HS BR1200HS	995	1356	8	430
HC950/1300HS(B1500HS) HD950/1300HS(BR1500HS)	1067	1565	7	480
HC950/1300HS+AS	1043	1525	7	476
B1800HS BR1800HS	1213	1830	5.5	530

*900~950°C加热3~5分钟, 然后以>40°C/s的冷速模具内快速冷却。

*900°C to 950°C heat treatment for 3 to 5 minutes followed by quenching in cooled stamping tools (cooling speed > 40°C/s).

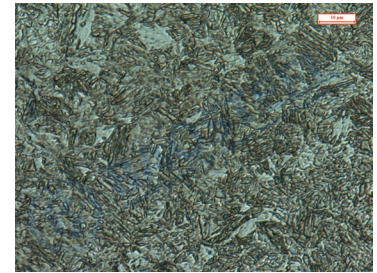
微观组织 Microstructure

热冲压用钢供货状态的金相组织通常为铁素体加珠光体组织，微少的碳化物颗粒。少数情况下有贝氏体组织。热成形后，金相组织主要为马氏体组织。在强度满足要求的前提下，允许有少量铁素体、贝氏体或残余奥氏体组织存在。

Microstructure in as-delivered condition is ferrite and pearlite matrix with small amounts of carbide or bainite. After hot stamping process, microstructure is martensite, and a small amount of ferrite, bainite and retained austenite is allowed under the condition that the strength meets the requirements.



热处理前，铁素体+珠光体
Before quenching, Ferrite and Pearlite



热冲压后，马氏体
After quenching, Martensite

镀层 Coating

热镀铝硅合金镀层 Hot-dip aluminum-silicon alloy coating(AS coating)

- 镀层中硅的质量百分数约为5~11%，铝的含量在85%以上
- 良好的耐蚀性
- 减少工序及降低成本(无需喷丸处理, 加热无需气体保护)
- 无氧化铁皮和脱碳层
- 零件高尺寸精度(无喷丸处理, 无变形)

- AS coating contains 5-11% wt Si and the more than 85%wt Al
- Excellent corrosion resistance
- Simplified process and cost savings (no shot-blasting, no inert atmosphere in ovens)
- No scale, no decarburization
- Good final part geometric tolerance(no shot-blasting, no deformation)

镀层重量 Coating mass

可供的等厚镀层的公称镀层重量范围为30/30g/m²~100/100g/m²。可供的差厚镀层每面公称镀层重量范围为30~50g/m²，差厚比最大为1:2。

The available range of same coating mass is from 30 to 100g/m² for each side. The available range of differential coating mass is 30 to 50g/m² for each side, and max differential ratio is 1:2.

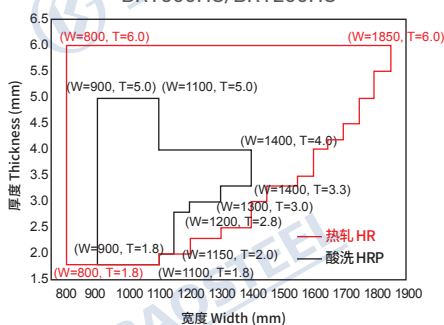
镀层种类 Coating type	镀层形式 Coating mass designation	推荐镀层重量 ^a g/m ² Recommend coating mass ^a g/m ²
铝硅合金镀层/AS	等厚/Same coating mass for each side	40/40, 50/50, 60/60, 75/75, 90/90, 100/100
	等差/Differential coating mass for each side	30/40, 30/50, 40/50

^a 50g/m²热镀铝硅合金镀层的镀层厚度约为16.7μm。Coating mass 50g/m² equals to a coating thickness of 16.7μm approximately.

供货规格 Product dimensions

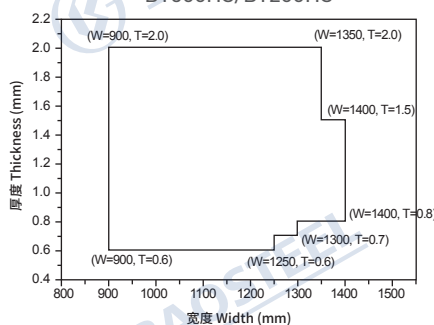
热轧及酸洗产品可供规格范围 Hot-rolled & Hot-rolled pickled product

BR1500HS/BR1200HS



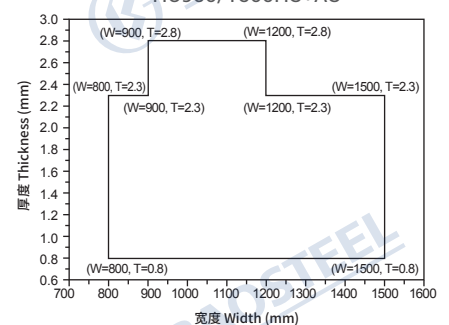
冷轧产品可供规格范围 Cold-rolled product

B1500HS/B1200HS



热镀铝硅镀层产品可供规格范围 AS coating product

HC950/1300HS+AS



*超出上述规格范围可协商试制。Out of the range: to be discussed before trial produce.

500MPa, 600MPa和1800MPa级别可协商生产。500MPa, 600MPa and 1800MPa grade should be discussed before produce.

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