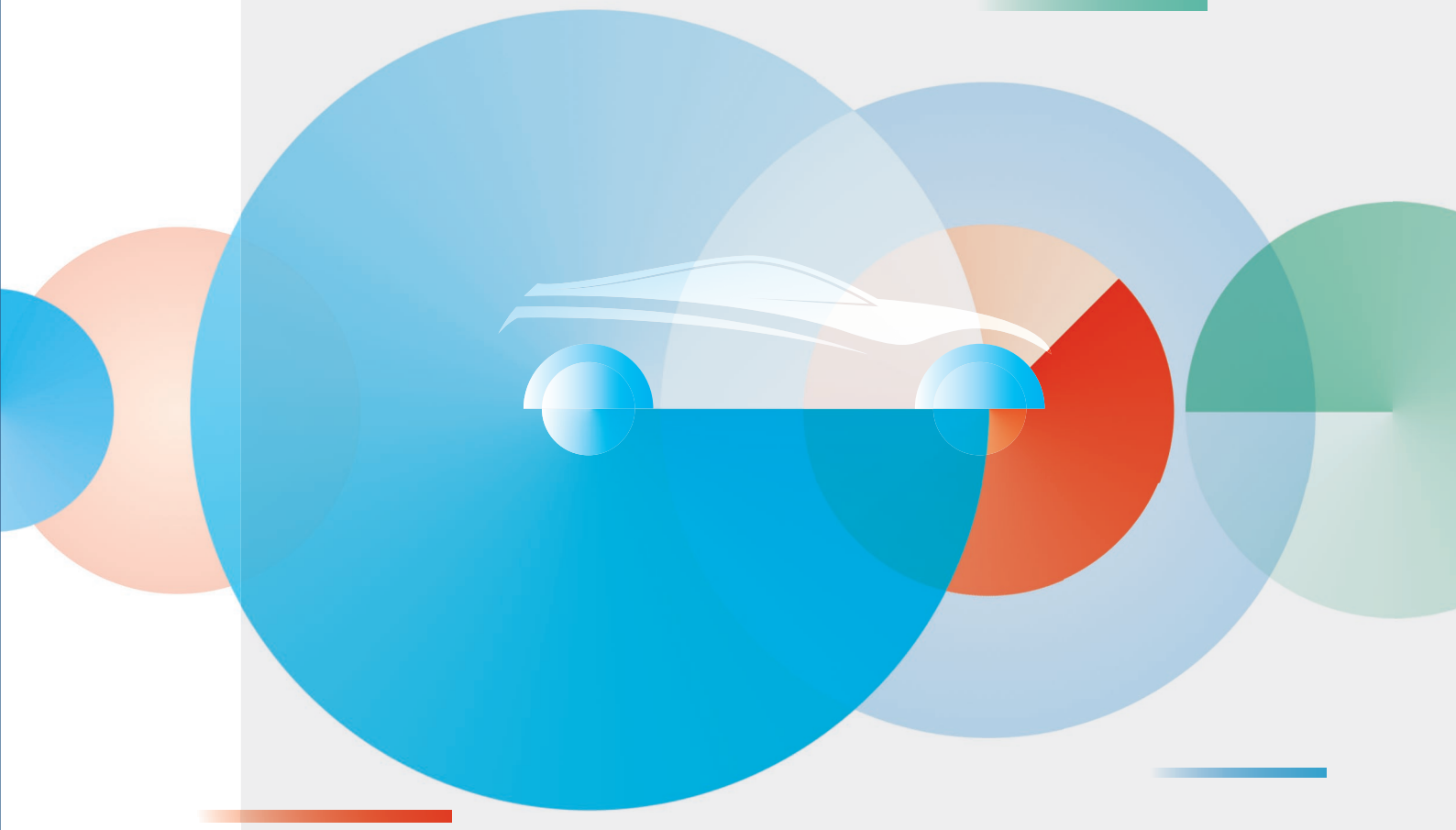
BAOSTEEL

BNA BAOSTEEL-NIPPON STEEL

吉帕钢 X-GPa

宝钢汽车板超高强钢家族

Ultra-High Strength Steel Family of Baosteel Automotive Sheet



宝钢汽车板
Baosteel Automotive Sheet

SMARTEX
宝钢新能源车整体解决方案

吉帕钢 X-GPa

定义：宝钢股份将抗拉强度在1000MPa(兆帕)以上的汽车轻量化用超高强钢命名为吉帕钢®（X-GPa®）。

宝钢一直致力于高端汽车板的研发和生产，近年来结合车身轻量化和绿色环保要求，大力发展吉帕钢®（X-GPa®）产品。吉帕钢®主要用于汽车车身骨架，可明显提高汽车主动安全性，同时实现轻量化减重效果。是宝钢股份践行可持续发展之路的绿色产品典范。

Definition: Baosteel names automotive steels with tensile strength of more than 1000 MPa as X-GPa® Steels for lightweight application.

Baosteel has committed to development and production of advanced automotive steel sheets, and vigorously developed X-GPa® Steels to meet the requirements of BIW lightweight and environmental protection in recent years. X-GPa® steels which are capable to significantly improve active safety performance and meanwhile achieve weight reduction are mainly used as key structural parts in BIW. It is an typical example of Baosteel green products to fulfill the road of sustainable development.

- BaoQP®淬火延性钢/Quenching and Partitioning Steel
- QE高延伸高扩孔钢/QP Steel with High Hole Expansion
- DP双相钢/Dual Phase Steel
- DH高塑性双相钢/Dual Phase High Ductility Steel
- CP复相钢/Complex Phase Steel
- CH高塑性复相钢/Complex Phase High Ductility Steel
- MS马氏体钢/Martensite Steel
- TWIP孪晶诱导塑性钢/Twinning Induced Plasticity Steel
- PHS热成形用钢/Press Hardening Steel

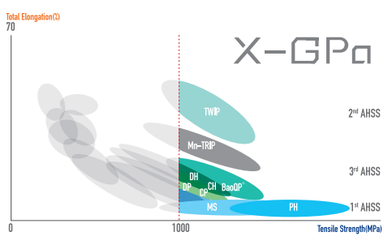


图1 吉帕钢®家族

Fig 1 X-GPa® Steel Family

吉帕钢®主要应用于汽车白车身的结构件、安全件（图2）。采用吉帕钢®，可以减轻车身重量、提高车身被动安全性、提高车型性价比，**助力汽车实现全生命周期低碳**。

X-GPa® Steels are intensively applied for structural parts and safety parts in automobile body as shown in Fig. 2. The application of X-GPa® Steels can effectively carry out weight reduction and improve passive safety, and ultimately enhance cost performance, **Contributing to lower carbon emission in whole life cycle**.

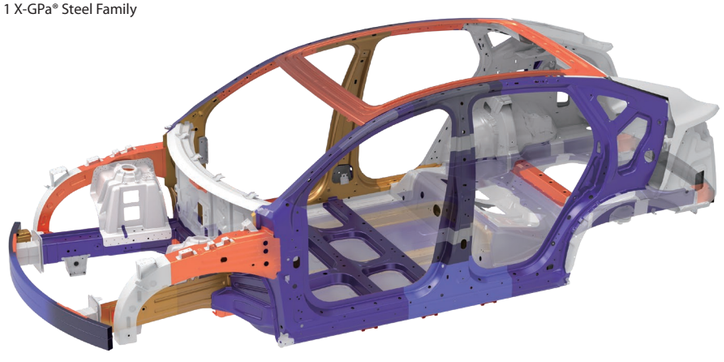


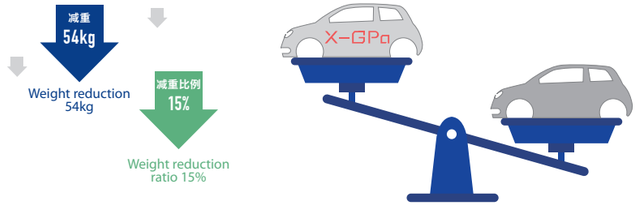
图2 吉帕钢®应用的主要零件示意图（宝钢升级版纯电动白车身BCB EV® Pro）

Fig 2 Typical Applications of X-GPa® Steels in Baosteel Car Body Electric Vehicle [Baosteel Car Body EV(BCB EV® Pro)]

绿色低碳典范 An exemplar of "Green" and "Low Carbon"

吉帕钢®（X-GPa®）在车身上的应用，可减少传统钢材的使用量，按照BCB EV® Pro 61%的吉帕钢®（X-GPa®）应用比例计算，可实现车身减重54kg，减重比例达15%。

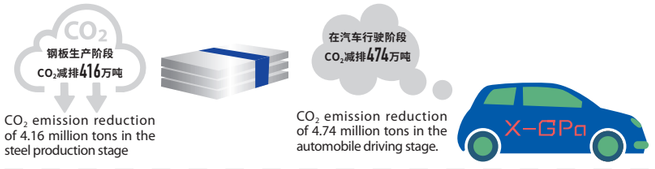
The application of X-GPa® steel on the car body can reduce the use of traditional steel. According to the 61% application of X-GPa® steel on BCB EV® Pro, the car body weight can be reduced by 54kg with a weight reduction ratio of 15%.



在钢板生产阶段，累计实现CO_2减排416万吨

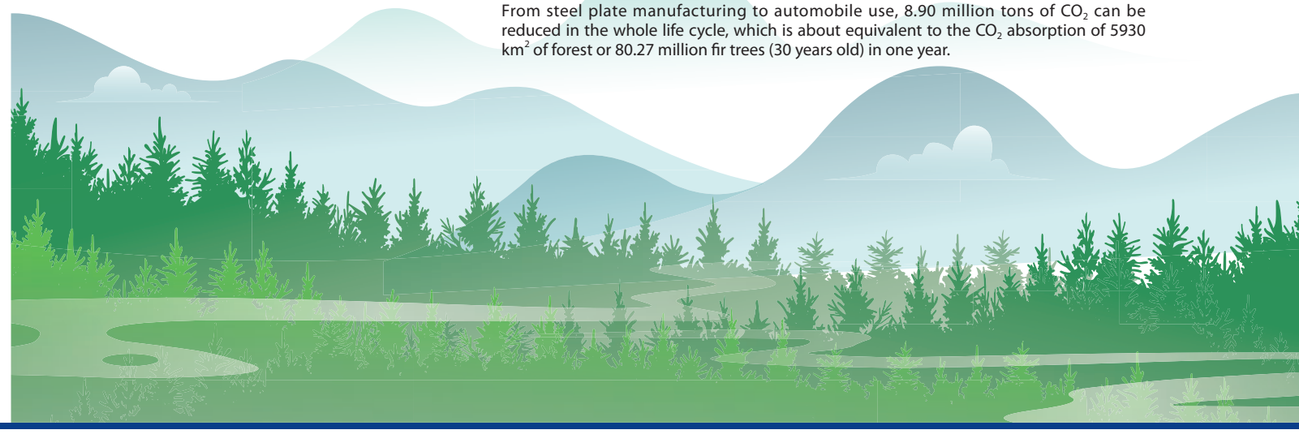
在汽车行驶阶段，以10年20万公里计算，可累计实现CO_2减排474万吨。

By the end of 2022, Baosteel has produced 3.17 million tons of X-GPa® steel in total, which has achieved a cumulative CO_2 emission reduction of 4.16 million tons in the steel plate production stage and can achieve a cumulative CO_2 emission reduction of 4.74 million tons based on 200000 km in 10 years in the automobile driving stage.



从钢板制造到汽车使用，全生命周期总计可实现CO_2减排890万吨，约相当于5930平方公里森林（1.8个神农架风景区面积）或8027万棵冷杉（三十年树龄）一年的CO_2吸收量。

From steel plate manufacturing to automobile use, 8.90 million tons of CO_2 can be reduced in the whole life cycle, which is about equivalent to the CO_2 absorption of 5930 km^2 of forest or 80.27 million fir trees (30 years old) in one year.



吉帕钢®可供货品种情况 Available grades of X-GPa® steel

表1显示了宝钢吉帕钢®的可供货品种情况，其中：普冷最高强度达1700MPa，热镀锌最高强度达1500MPa，电镀锌最高强度达1310MPa，热成形用钢最高强度达2000MPa。

Table 1 shows the available varieties of X-GPa® Steels in Baosteel. Among these products, the maximum tensile strength of cold rolled steel sheets reaches 1700 MPa. In addition, the maximum tensile strength of hot galvanized steel sheets and electro galvanized steel sheets reaches 1500 MPa and 1310 MPa, respectively, the maximum tensile strength of PHS reaches 2000MPa.

表1 吉帕钢®的可供货品种情况
Table 1 Available grades of X-GPa® steel

钢种 Steel grade	钢级 Strength grade	冷轧 Cold rolled	电镀锌 Electro galvanizing	热镀纯锌 Hot galvanizing	热镀锌铁合金 Hot galvanealing	热镀铝硅 Hot dip aluminum silicon
QP	980	●	●	●	●	-
	1180	●	●	●	●	-
	1500	○	-	-	-	-
QE	980	●	-	●	●	-
DP	980(低屈服)	●	●	●	●	-
	980(高屈服)	●	●	●	●	-
	1180	●	●	●	●	-
	1310	●	●	○	-	-
	1500	○	-	○	○	-
DH	980(低屈服)	●	●	●	-	-
	980(高屈服)	●	●	●	-	-
	1180	○	○	○	-	-
CP	980	●	-	●	-	-
	1180	●	-	●	-	-
	1300	○	-	○	-	-
CH	980	●	-	●	-	-
	1180	●	-	●	-	-
	1370	○	-	○	-	-
Mart	980	●	-	-	-	-
	1180	●	-	-	-	-
	1300	●	○	-	-	-
	1400	●	-	-	-	-
	1500	●	-	-	-	-
	1700	●	-	-	-	-
TWIP	950	●	-	-	-	-
PHS	1000	●	-	-	-	●
	1500	●	-	-	-	●
	1800	●	-	-	-	●
	2000	●	-	-	-	●

●：已经量产供货钢种
○：正在研发钢种，如需订货请咨询销售人员
-：N/A

注：表中宝钢钢级和部分其他标准中相近钢级（抗拉强度相差不超过30MPa）虽命名不同但属于同一钢级，可供情况参照表中宝钢钢级，如：DP980和DP1000是同一钢级，参照DP980，CP980和CP1000是同一钢级，参考CP980，QP1500和QP1470是同一钢级，参考QP1500。

●: Mass production
○: steel is under developing, please consult our sales agents if have ordering demand
-: N/A

Note: Baosteel steel grades in the table are similar to steel grades in some other standards (tensile strength difference is within 30 MPa). Although the desigations may be different, it is feasible to refer to each other. For example, DP980 and DP1000 are regarded as same steel grade. The data of DP980 is recommended as reference. CP980 and CP1000 are regarded as same steel grade, and it recommend to use the data of CP980 as reference. Similarly, QP1500 and QP1470 are regarded as same steel grade, QP1500 usually will be set as reference.

产品特点 Technical characteristics

组织特点：铁素体+马氏体+残余奥氏体（图3），其中残余奥氏体的含量在8-15%之间。

Microstructure: The microstructure is composed of ferrite, martensite and retained austenite with a volume fraction of 8-15%. (Fig.3)

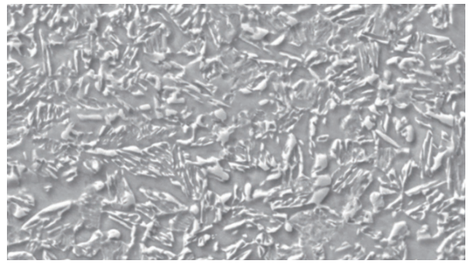


图3 典型QP钢金相组织图片
Fig 3 Typical microstructure of QP

性能特点：QP钢以马氏体为基体相，利用残余奥氏体在变形过程中的TRIP效应，能实现较高的加工硬化能力，因此比同级别超高强钢拥有更高的塑性和成形性能。采用宝钢创新的低点焊LME产品设计准则与制造工艺，使QP钢镀锌产品具备了低LME敏感性，有效改善了材料点焊性能。

主要用途：适用于形状较为复杂的汽车安全件和结构件。

Properties: Benefiting from the TRIP effect of retained austenite, BaoQP® steels exhibit quite high strain hardening capacity, and higher ductility and formability than other UHSS with same strength level. Coated BaoQP® possess good spot welding LME-resistance based on Baosteel innovative design criterion and manufacturing technique of low LME sensibility products.

Applications: BaoQP® steels are suited for the automotive structural and safety parts with complex shapes.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

表2 普冷QP钢性能范围
Table 2 Property standards of CR QP

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL[c] A_{50mm}, % ≥
HC600/980QP(E+Z)	600~850	980	15
HC600/980QP-EL(E+Z)	600~850	980	20
HC820/1180QP(E+Z)	820~1100	1180	8
HC820/1180QP-EL(E+Z)	820~1100	1180	14
HC1100/1470QP	1100~1400	1470	13

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241 规定的No.5 试样，试样方向为横向。
c 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of Rp0.2 apply. Otherwise, the values of Rel apply.
b Guaranteed for No.5 tensile specimens according to standard JIS 22241 with the tensile axis vertical to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

表3 热镀锌QP钢性能范围
Table 3 Property standards of HDG QP

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率[c] EL[c] A_{50mm}, % ≥
HC600/980QPD+Z/ZF	600~850	980	15
HC600/980QP-ELD+Z/ZF	600~850	980	20
HC820/1180QPD+Z/ZF	820~1100	1180	8
HC820/1180QP-ELD+Z/ZF	820~1100	1180	14

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241 规定的No.5 试样，试样方向为横向。
c 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of Rp0.2 apply. Otherwise, the values of Rel apply.
b Guaranteed for No.5 tensile specimens according to standard JIS 22241 with the tensile axis vertical to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

应用案例 Application cases

980MPa级别QP钢，是宝钢第一个全球首发产品。目前BaoQP®已经在全国实现了大批量的商业化应用，主要可用于A柱加强板、B柱加强板、车门铰链加强板等零件。

QP980 was the first "world first" product of BaoSteel. and now BaoQP® already has been commercially supplied to vehicles in domestic market. Moreover, BaoQP® steels are suited for manufacturing structural and safety parts, such as A-pillar reinforcement., B-pillar reinforcement. and hinge-pillar reinforcement.

图4 B柱加强板，
HC600/980QP，2.0mm
Fig 4 B-pillar reinforcment,
HC600/980QP, 2.0mm

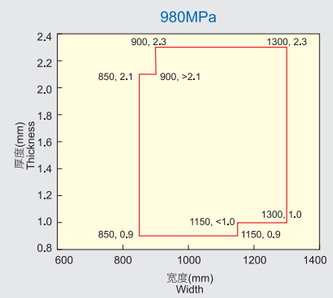
图5 辊冲成形主副座椅安装后横梁
HC1100/1470QP，1.4mm
Fig 5 Roll-stamping seat cross beam,
HC1100/1470QP, 1.4mm

图6 B柱内板，
HC820/1180QP-EL，1.2mm
Fig 6 B-pillar inner
HC820/1180QP-EL,1.2mm

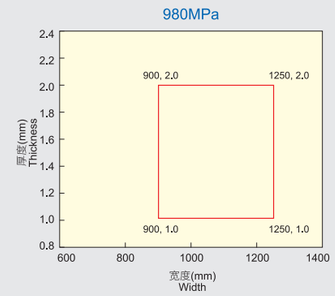
图7 门槛内板，
HC820/1180QP-ELD+ZF，1.0mm
Fig 7 Sill Inner
HC820/1180QP-ELD+ZF, 1.0mm

供货规格 Product dimensions

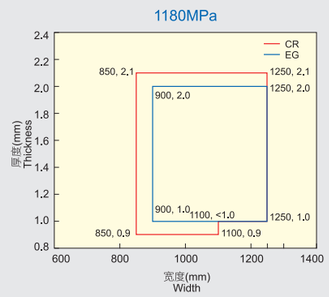
QP980普冷产品可供规格范围
Available range of QP980 CR sepcifications



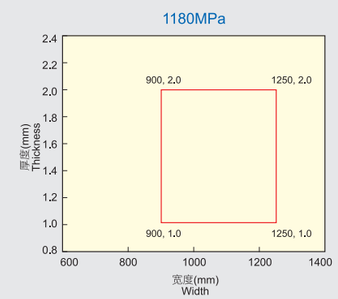
QP980EG/GI/GA可供规格范围
Available range of QP980EG/GI/GA sepcifications



QP1180EG/QP1180普冷产品的可供规格范围
Available range of QP1180EG/QP1180 CR sepcifications



QP1180 GI/GA可供规格范围
Available range of QP1180 GI/GA sepcifications



QE（高扩孔型淬火延性钢）系列产品
QE (QP steel with high hole expansion ratio) series steel

产品特点 Technical characteristics

组织特点：通过获得贝氏体（贝氏体/铁素体+残余奥氏体）来替代原有双相钢中的马氏体和铁素体组织，并且有别于较高含量残余奥氏体的QP钢，因此具有更好的组织均匀性和局部塑型变形能力，从而提高扩孔性能和翻边成型性。（图8）。

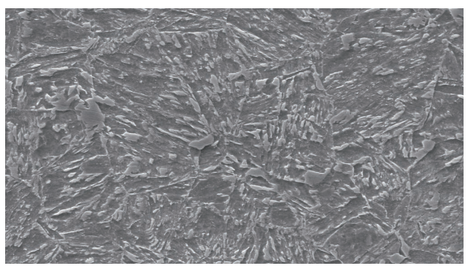


图8 典型QE钢金相组织图片
Fig 8 Typical microstructure of QE

Microstructure: By replacing the martensite and ferrite phases in the DP steels or the higher content of retained austenite in QP steels, the bainite (bainite/ferrite + retained austenite) obtained in this steel is beneficial to have better organization uniformity and local plastic deformation ability. This attributes to improved hole expansion performance and flanging formability. (Fig8)

性能特点：在常规QP钢的基础上，通过微观组织的调控，实现了高扩孔率和较高的延伸率的综合平衡性能。

主要用途：适用于高翻边扩孔、高弯曲、且有较高拉延成形性能要求的安全件、结构件以及座椅用途的零部件。

Properties: Based on the commercial QP steels, the re-designed microstructure shows a balance of high stretch-flangeability and good elongation.

Application: It can be utilized in the safety and structural parts or seat slide parts that requiring a relatively higher stretch-flangeability, higher bending performance and better elongation.

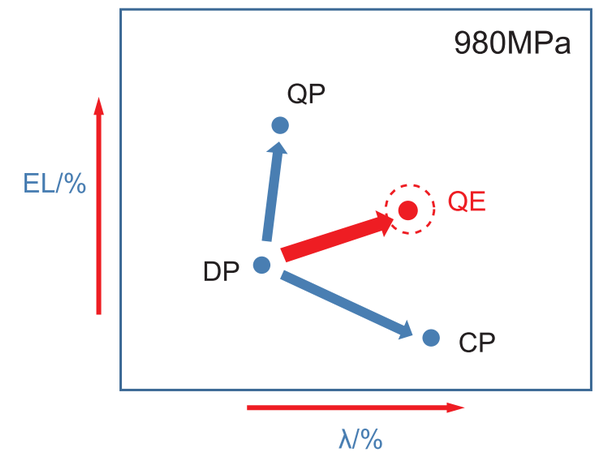


图9 QE钢性能特点示意图
Fig 8 Typical microstructure of QE

表4 典型力学性能
Table 4 Mechanical properties

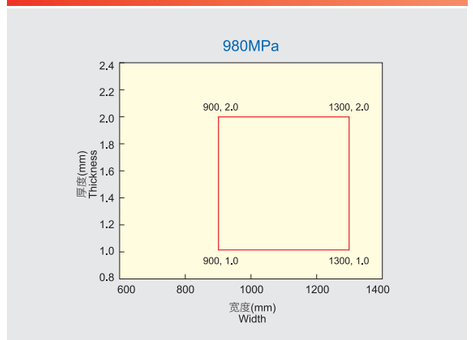
牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率[c] EL[c] A_{50mm}, % ≥	扩孔率 HER λ/% ≥
HC650/980QE	650-950	980	14	50
HC650/980QED+Z/ZF	650-950	980	14	50

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241规定的No.5试样，试样方向为横向。
C 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS 22241 with the tensile axis vertical to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

供货规格 Product dimensions

QE980普冷/GI/GA可供规格范围
Available range of QE980 CR/GI/GA sepcifications



应用案例 Application cases

图10 滑轨加强件，HC650/980QE，2.0mm
Fig 10 Slide Rail Reinforcement, HC650/980QE, 2.0mm

DP（双相钢）系列产品
DP (Dual Phase) series steel

产品特点 Technical characteristics

微观组织：以铁素体和马氏体组织为主（图11），马氏体以岛状弥散分布在铁素体基体上，铁素体较软，使材料具备较好的成形性，马氏体较硬，使材料具备高强度，通过双相实现强度与塑性的协调，从而改善双相钢的综合性能。

性能特点：具备无屈服延伸、无室温时效、低屈强比、高加工硬化指数和高烘烤硬化值的特点。

良耐蚀系列产品：采用宝钢自主研发的高耐蚀组合工艺，可以有效祛除表面合金元素富集，优化表面质量，提高普冷产品耐腐蚀能力，提升电泳涂装性能，从而得到高表面质量的普冷DP产品系列家族。高耐蚀、良涂装、高级表面DP普冷产品可以拓展应用至车身当中对耐蚀性能要求较高的零部件，如：门槛、座椅横梁、门防撞梁、A柱、B柱等安全件和结构件，特别是在免涂装座椅骨架等零件上的应用前景极大。

主要用途：DP钢系列是目前结构类零件的首选钢种，其中低屈强比的产品主要应用于A柱加强板、B柱加强板等零件，高屈强比的产品主要用于车底横梁、门槛、门防撞梁、座椅骨架、电池包框架等零件。

Microstructure: The microstructure is mainly composed of ferrite and martensite (Fig. 11). Martensite islands disperses in the ferrite matrix. The soft ferrite makes the material have better formability, and the hard martensite makes the material have high strength. The coordination of strength and plasticity is realized through dual phase, so as to improve the comprehensive properties of dual phase steel.

Properties: No yield extension, no room-temperature aging, low yield/tensile strength ratio, high strain hardening exponent and high bake hardening value.

Adopting the high corrosion resistance combined process independently developed by Baosteel, it can effectively remove the enrichment of surface alloy elements, optimize the surface quality, improve the corrosion resistance of cold rolling products, and improve the electrophoretic coating performance. Thus, a series of DP product family with high surface quality can be obtained, which have high corrosion resistance, good coating performance and advanced surface quality. These products can be extended to parts and components with high corrosion resistance requirements in the car body, such as threshold, seat beam, door crash beam, A-pillar and B-pillar, especially in parts like non-coating seat frame.

Application: DP steels are preferred to manufacture structural parts. The products with low yield ratio are widely applied to A-pillar reinforcement, B-pillar reinforcement. and other parts, while the products with high yield ratio are mainly used for underbody cross member, threshold, door anti-collision beam, seat frame, battery pack frame structure and other parts.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

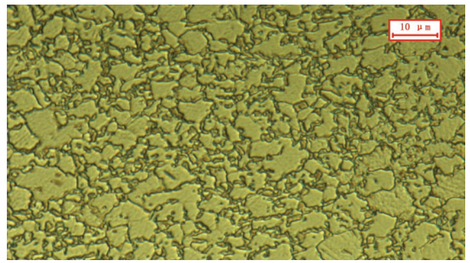


图11 典型DP钢金相组织图片
Fig 11 Typical microstructure of DP

表5 普冷DP钢性能范围
Table 5 Property standards of DP-CR

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率[c] EL[c] A_{50mm}, % ≥
HC550/980DP(E+Z)	550~720	980	9
HC650/980DP(E+Z)	650~900	980	8
HC700/980DP(E+Z)	700~920	980	8
HC750/1180DP(E+Z)	750~1050	1180	7
HC820/1180DP(E+Z)	820~1150	1180	6
HC900/1180DP(E+Z)	900~1200	1180	5
HC950/1310DP(E+Z)	950~1250	1310	5
HC1000/1470DP	1000-1250	1470	5

表6 热镀锌DP钢性能范围
Table 6 Property standards of DP-HDG

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率[c] EL[c] A_{50mm}, % ≥
HC550/980DPD+Z/ZF	550~730	980	8
HC650/980DPD+Z/ZF	650~900	980	6
HC700/980DPD+Z/ZF	700~900	980	6
HC740/1180DPD+Z/ZF	740~980	1180	5
HC820/1180DPD+Z/ZF	820~1150	1180	5
HC950/1310DPD+Z/ZF	950-1250	1310	5
HC1000/1470DPD+Z/ZF	1000~1300	1470	5

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241 规定的No.5 试样，普冷试样方向为横向，热镀锌试样方向为纵向。
c 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2%；当产品公称厚度不大于0.50mm时，断后伸长率允许下降4%。
d n值是在10%~20%应变范围内计算得到的。当均匀延伸率小于20%时但不小于12%时，计算的应变范围为10%至均匀延伸结束；当均匀延伸率小于12%时，应变硬化指数应按照均匀延伸率结束点计算的真应变值报告（$n_{均匀延伸}=\varepsilon_{均匀延伸}$）。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241. For the tensile axis of specimens, Coated is parallel to the rolling direction, Uncoated is vertical to the rolling direction.
c When the specified nominal thickness is in the range of 0.5~0.7 mm, the minimum value of EL should be reduced by 2%. For thickness less than 0.5 mm, the minimum value of EL should be reduced by 4%.
d n-value should be determined by the strain range of 10-20%. If maximum uniform elongation is less than 20% but more than 12%, n-value should be determined by the strain range from 10% to end uniform elongation. If uniform elongation is less than 12%, n-value shall be reported as uniform elongation equals true strain at uniform elongation.($n_{UE} = \varepsilon_{UE}$)
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

应用案例 Application cases

图12 前防撞梁，HC1000/1470DPD+ZF，1.2mm
Fig 12 Front Bumper, HC1000/1470DPD+ZF, 1.2mm

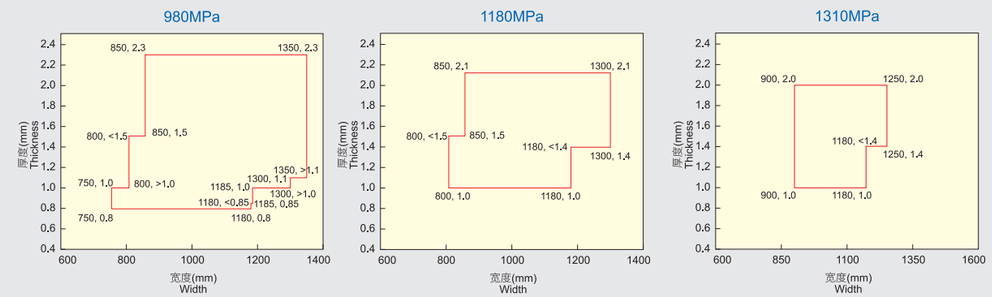
图13 门槛加强板，HC820/1180DPD+Z，1.35mm
Fig 13 Threshold reinforcement, HC820/1180DPD+Z, 1.35mm

图14 车门防撞梁，HC950/1310DP，厚度1.4mm
Fig 14 Door beam, HC950/1310DP, 1.4mm

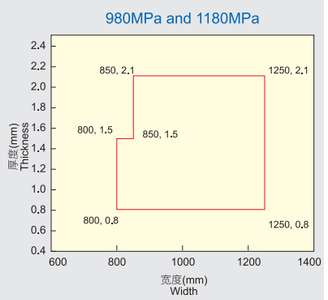
DP（双相钢）系列产品
DP (Dual Phase) series steel

供货规格 Product dimensions

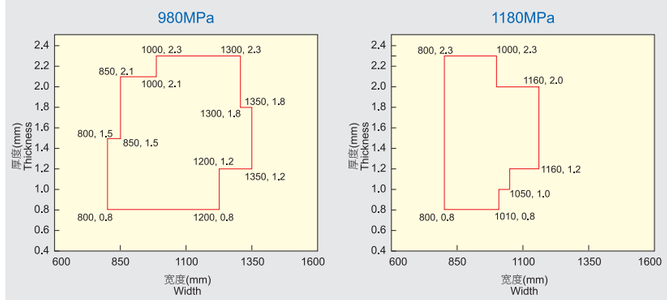
普冷DP钢可供规格范围
Available range of CR DP



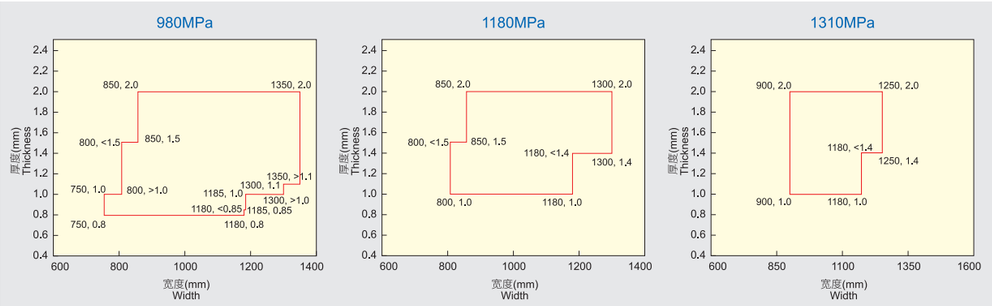
热镀纯锌DP钢可供规格范围
Available range of HDG (GI) DP



热镀锌铁合金DP钢可供规格范围
Available range of HDG (GA) DP



电镀锌DP钢可供规格范围
Available range of EG DP



DH（高塑性双相钢）系列产品
DH (Dual Phase High Ductility) series steel

产品特点 Technical characteristics

组织特点：DH钢组织由铁素体、马氏体和残余奥氏体组成（也可含少量贝氏体），其中残余奥氏体含量在5~10%之间（图15）。

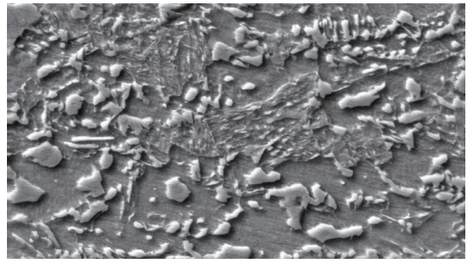


图15 典型DH钢金相组织图片
Fig 15 Typical microstructure of DH

Microstructure: The microstructure is composed of ferrite, martenstite and retained austenite with a volume fraction of 5~10%.

性能特点：通过组织中残余奥氏体在变形过程中的TRIP作用，DH钢拥有比DP钢更好的拉延成形性能和冲击吸能性；同时DH钢也具有较低的LME敏感性。

主要用途：用于成形性要求更高的安全件、结构件，如前纵梁内、外板、B柱内板、A柱内板等。

Properties: Benefiting from the TRIP effect of retained austenite, DH steels exhibit higher cold formability and better crash behavior as compared to conventional DP steels at same strength level. DH steels also have low susceptibility to LME.

Applications: DH steels are suitable for the automotive structural and safety parts with complex shapes, such as Front sill, A/B pillar inner panel.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

表7 普冷及电镀锌DH钢性能范围
Table 7 Property standards of DH-CR and EG

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL[c] A_{50mm}, % ≥
HC420/780DH(E+Z)	420~550	780	19
HC550/980DH(E+Z)	550~700	980	15
HC700/980DH(E+Z)	700~850	980	14
HC850/1180DH	850~1050	1180	13

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241规定的No.5试样，试样方向为纵向。
C 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

DH（高塑性双相钢）系列产品
DH (Dual Phase High Ductility) series steel

表8 镀锌DH钢性能范围
Table 8 Property standards of DH-HDG

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL[c] A_{50mm}, % ≥
HC420/780DHD+Z	420~550	780	19
HC550/980DHD+Z	550~700	980	15
HC700/980DHD+Z	700~850	980	14
HC850/1180DHD+Z	850~1050	1180	8

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241规定的No.5试样，试样方向为纵向。
C 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

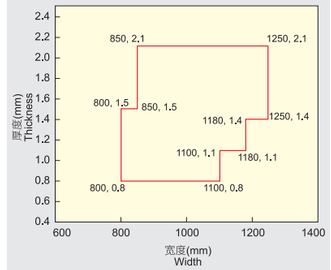
应用案例 Application cases

图16 前纵梁内板，
HC550/980DHD+Z，1.4mm
Fig 16 Front sill inner panel,
HC550/980DHD+Z, 1.4mm

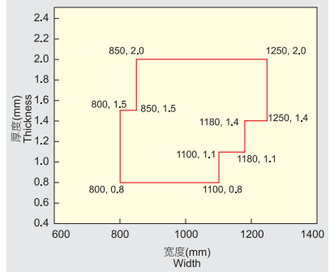
图17 后门防撞梁，
HC700/980DHE+Z，1.4mm
Fig 17 Door beam,
HC700/980DHE+Z, 1.4mm

供货规格 Product dimensions

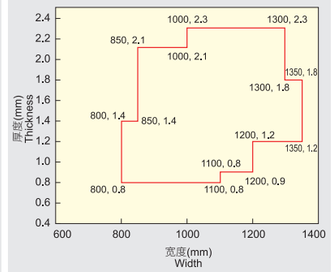
DH980普冷可供规格范围
Available range of DH980-CR sepcifications



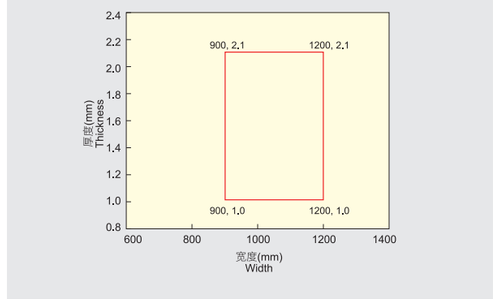
DH980电镀锌可供规格范围
Available range of DH980-EG sepcifications



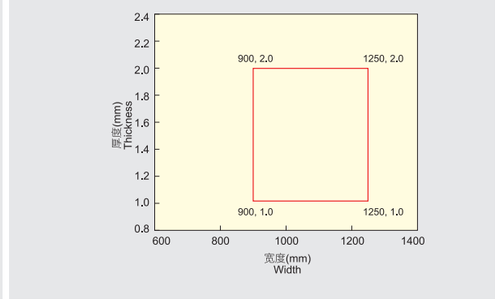
DH980热镀纯锌可供规格范围
Available range of DH980-GI sepcifications



DH1180普冷可供规格范围
Available range of DH1180-CR sepcifications



DH1180热镀纯锌可供规格范围
Available range of DH1180-GI sepcifications



CP（复相钢）系列产品
CP (Complex Phase) series steel

产品特点 Technical characteristics

组织特点：主要为以贝氏体和（或）铁素体组织为基体，并且通常分布少量的马氏体、残余奥氏体和珠光体组织（图18）。

Microstructure: The microstructure mainly contains bainite and (or) ferrite, and usually has a few martensite, pearlite and/or retained austenite, as shown in Fig. 18.

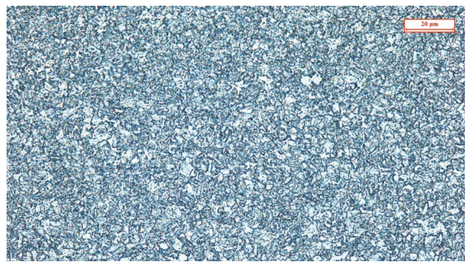


图18 典型冷轧复相钢金相组织图片
Fig 18 Typical microstructure of CP

性能特点：晶粒细小，抗拉强度较高。与同等抗拉强度的双相钢相比，其屈服强度明显要高很多，同时具有弯曲性能和扩孔性能高等特点。这种钢具有较高的能量吸收能力和优良的翻边成形性能。

主要用途：底盘悬挂件，保险杠，座椅滑轨等。

Properties: Fine grain sizes, quite high YS/TS ratio (compared with DP steel of the same strength grade), and better bending and flangeability with high energy absorption.

Application: Chassis suspension, bumper, seat rail etc.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

表9 普冷CP钢性能范围
Table 9 Property standards of CP-CR

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL[c] A_{50mm}, % ≥	扩孔率 λ % ≥
HC780/980CP	780~950	980	7	50
HC900/1180CP	900~1100	1180	6	30
HC900/1300CP	900~1100	1300	5	30

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241 规定的No.5 试样，试样方向为纵向。
C 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

表10 热镀锌CP钢性能范围
Table 10 Property standards of CP-HDG

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL A_{50mm}, % ≥	扩孔率 λ % ≥
HC780/980CPD+Z	780~950	980~1140	7	40
HC900/1180CPD+Z	900~1100	≥1180	6	30
HC900/1300CPD+Z	900~1100	≥1300	5	30

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 通常情况下，试样方向为纵向，试样为JIS Z 2241 规定的No.5试样，如用户有特殊要求，可协商确定。
c 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%。
d 为热轧基板热镀锌，通常情况下厚度t≥2.0mm，订货时需要协商具体的厚度和宽度范围。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
d For the hot-rolled base plate hot-dip galvanizing,usually, the thickness t≥2.0mm,please confirm the thickness and width range of product before official order.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

应用案例 Application cases

图19 座椅滑轨，HC780/980CP，1.4mm
Fig 19 Seat rail, HC780/980CP, 1.4mm

图20 辊压成形主副座椅安装前横梁，HC900/1180CP，1.4mm
Fig 20 Seat front crossmember, roll-forming, HC900/1180CP, 1.4mm

供货规格 Product dimensions

普冷和热镀纯锌CP钢可供规格范
Available range of CR and HDG (GI) CP

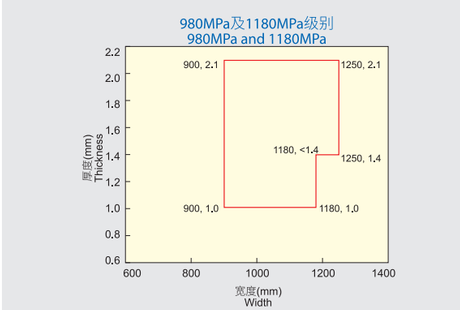


图21 前门门槛，HC780/980CPD+Z, 1.3mm
Fig 21 Front Door Threshold,HC780/980CPD+Z, 1.3mm

CH（高塑性复相钢）系列产品
CH (Complex Phase High Ductility) series steel

产品特点 Technical characteristics

组织特点：以下贝氏体基体为主，通过调节亚微米级碳化物弥散析出，得到细小均匀的微观组织结构（图22）。

Microstructure: The microstructure contains pure lower bainite with sub-micro carbides, leading to fine grains and uniformly distributed precipitations.

图22 典型CH钢金相组织图片
Fig 22 Typical microstructure of CH

性能特点：相比传统复相钢，拥有更高的塑性(即断裂延伸率)，同时还保有较好的弯曲、翻边和扩孔性能。其中1180CH(普冷和热镀纯锌)还具有良好的抗延迟开裂性能，而热镀纯锌1180CH还具有良好的抗LME性能。

主要用途：座椅滑轨和对弯曲（或）扩孔、及拉延成形均有高要求的车身安全件，如地板横梁，门槛等。

Properties: CH steel has higher ductility (i.e. total elongation) than conventional CP steel, while remaining good bendability, flangeability and high hole expansion ratio in which CH1180(CR & GI) has good anti-delayed-crack property and hot-dip galvanized CH1180-GI has good anti-LME property as well.

Application: Seat rail and car body safety component with high requirements on bending, (or) flangeability as well as drawing forming, such as crossmember front floor, door beam, etc.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

表11 普冷CH钢性能范围
Table 11 property standards of CH-CR

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL[c] A_{50mm}, % ≥	扩孔率 λ % ≥
HC780/980CH	780~950	980	11	30
HC900/1180CH	900~1150	1180	8	30
HC1000/1370CH	1000~1250	1370	6	30

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241规定的No.5试样，试样方向为纵向。
C 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

CH钢的显微组织为铁素体和贝氏体的基体加上少量的马氏体，珠光体和奥氏体。和相同强度级别的CP钢相比，CH钢具有更好的成形性能。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

表12 热镀锌CH钢性能范围
Table 12 Property standards of CH-HDG

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率[c] EL[c] A_{50mm}, % ≥	扩孔率 λ % ≥
HC780/980CHD+Z	780~950	980	11	30
HC900/1180CHD+Z	900~1150	1180	8	30
HC1000/1370CHD+Z	1000~1250	1370	6	30

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 通常情况下，试样方向为纵向，试样为JIS Z 2241规定的No.5试样，如用户有特殊要求，可协商确定。
c 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS Z 2241 with the tensile axis parallel to the rolling direction.
c When the specified nominal thickness is in the range 0f 0.5-0.7mm, the minimum value of EL should be reduced by 2%.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

应用案例 Application cases

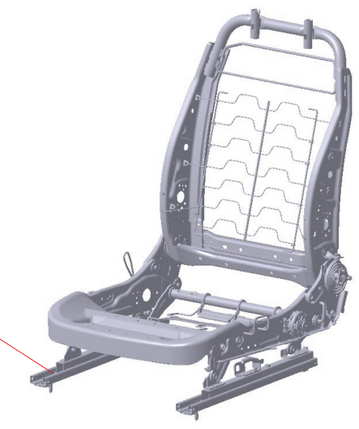
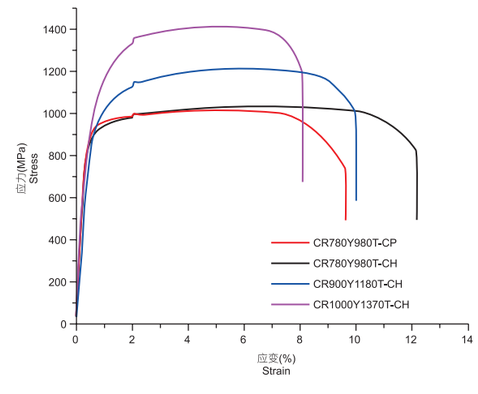


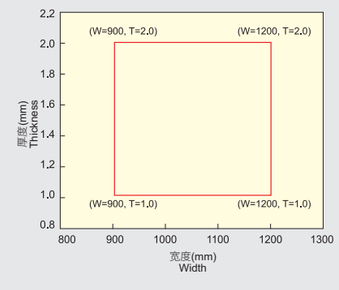
图23 座椅滑轨，HC900/1180CH，1.4mm
Fig 23 Seat rail, HC900/1180CH, 1.4mm

应力应变曲线 Stress-Strain Curve



供货规格 Product dimensions

普冷及热镀纯锌CH钢可供规格范围
Available range of CR and GI CH Steel



MS（马氏体钢）系列产品
MS (Martensite) series steel

产品特点 Technical characteristics

微观组织：以马氏体组织为主（图24）。

Microstructure: Almost all martensite

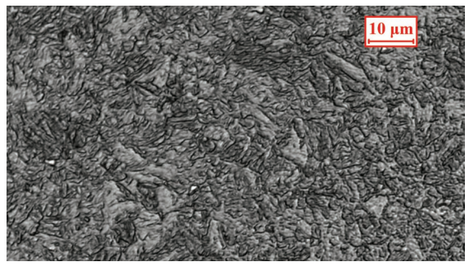


图24 典型1500MPa马氏体钢金相组织图片
Fig 24 Typical microstructure of 1500MS

性能特点：屈强比高，抗拉强度高，延伸率相对较低，需要注意延迟开裂的倾向。

主要用途：适合于简单零件的冷冲压和截面相对单一的辊压成形零件，如保险杠、门槛加强板和侧门内的防撞杆等。

Properties: high Yield Ratio, High tensile strength, Relatively low Elongation, Delayed cracking should be noted.

Application: MS high strength steel is preferred steel for simple cold stamping parts and Roll forming parts with a relatively single interface, such as Bumper, threshold reinforcing plate and the side door anti-collision rod etc.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products can be supplied in accordance with the requirements of international standard such as EN, ASTM, JIS, also can be supplied in accordance with customer's standard or requirement, or Baosteel standards.

表13 普冷MS钢性能范围
Table 13 property standards of MS-CR

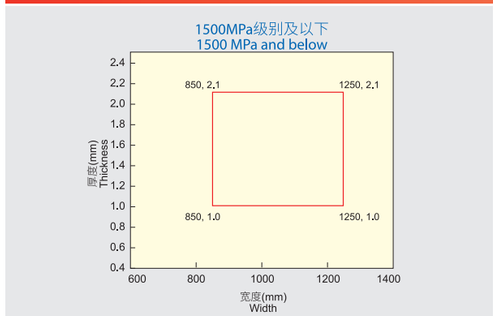
牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL A_{50mm}, % ≥	180°弯曲试验 不小于 (a=试样厚度) Recommended inner bending radius
HC700/980MS	700~960	980	4	6a
HC950/1180MS	950~1200	1180	4	8a
HC1030/1300MS	1030~1300	1300	4	8a
HC1150/1400MS	1150~1400	1400	3	8a
HC1200/1500MS	1200~1500	1500	3	8a
HC1350/1700MS	1350~1700	1700	3	8a

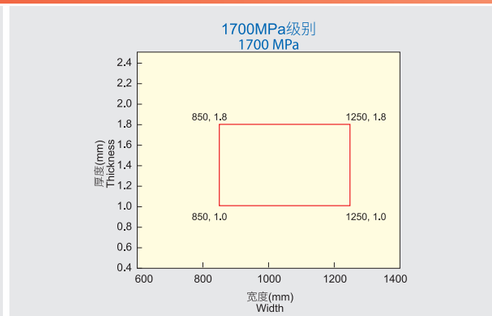
a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为JIS Z 2241 规定的No.5 试样，试样方向为横向。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for No.5 tensile specimens according to standard JIS 22241 with the tensile axis vertical to the rolling direction.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

供货规格 Product dimensions

普冷MS钢可供规格范围
Available range of MS-CR



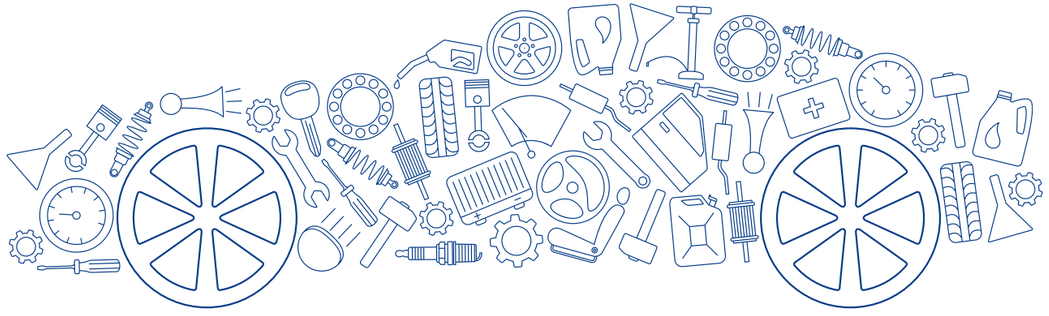


超出上图规格范围但厚度在2.3mm以下的可以协商试制
when demand exceed the scope of the above specifications and thickness is less than 2.3mm , it can be negotiated.

应用案例 Application cases

图25 辊压成形后保险杠，HC1350/1700MS，1.4mm
Fig 25 Roll forming rear bumper, HC1350/1700 MS, 1.4mm

图26 车门防撞梁，HC1030/1300MS, 1.6mm
Fig 26 Door beam, HC1030/1300MS, 1.6mm



TWIP（孪晶诱导塑性钢）系列产品
TWIP (Twinning Induced Plasticity) series steel

产品特点 Technical characteristics

组织特点：为单相奥氏体组织（图27）。

Microstructure: Full austenite

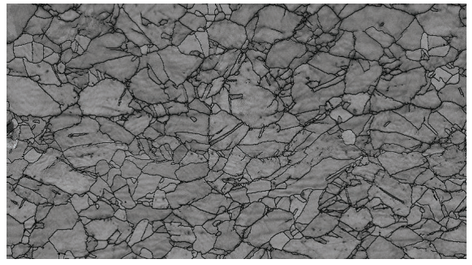


图27 典型TWIP钢金相组织图片
Fig 27 Typical microstructure of TWIP

产品特点：TWIP钢利用孪晶诱发塑性机制，能在1000MPa的抗拉强度级别上实现50%以上的超高延伸率。TWIP钢集超高强钢的强度与超深冲钢的成形性能于一身，具有以往任何一种汽车用钢都无法达到的优越性能。未来TWIP钢若能实现大规模商业化应用，不仅会带来汽车零部件轻量化和安全性能的显著提升,而且会带动零部件设计的变革。宝钢于2012年6月实现普冷TWIP钢的生产,成为具备TWIP钢生产能力的厂家，并进一步于2014年5月完成了热镀锌TWIP钢试制。

性能特点：TWIP钢具有很高的加工硬化性能,因此拥有良好的冲压成形应变分布,可以避免局部变形过度,因此拥有与超深冲钢相当的成形极限。

主要用途：TWIP钢更易冲压成各种复杂部件,适用于各种结构及车体安全部件,在减重的同时大幅度提高碰撞安全性。

Properties: With good stamping strain distribution, the excessive local deformation of TWIP steel can be avoided.

Application: It is much easier for TWIP steel to form complex parts, such as structural and car safety components, which will lighter the weight and improve the crash safety.

Product Characteristics: Due to twinning induced plasticity (TWIP) effect, TWIP steel, exhibits sufficient elongation of over 50% at the tensile strength level of 1000MPa. With the strength level of UHSS and the formability of SEDDQ steels, TWIP steel shows excellent performance which any other automotive steels can not achieve. When commercially applied in the future, this kind of steel will remarkably contribute to the weight reduction of auto-parts and the improvement of automotive safety, as well as the revolution of components design. With cold-rolling TWIP steel successfully produced in June of 2012,Baosteel has become the manufacturer of this product and Baosteel has successfully produced GI TWIP steel in May 2014.

供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products listed in the tables below can be supplied in accordance with EN, ASTM, JIS, and BaoSteel standards. Ordering according to customer's standard or requirement is also available.

表14 普冷TWIP钢性能范围
Table 14 property standards of TWIP-CR

牌号 Steel Grade	屈服强度[a, b] YS[a, b] $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL A_{50mm}, % ≥	n ≥
HC450/950TW	450~600	950	47	0.35

a 无明显屈服时采用$Rp_{0.2}$，否则采用R_{eL}。
b 试样为GB/T 228中的P17试样，试样方向为纵向。
注：正式订货时请确认订货标准和技术参数，具体数据可以协商。

a If the yield point is not pronounced, the values of $Rp_{0.2}$ apply. Otherwise, the values of R_{eL} apply.
b Guaranteed for P17 tensile specimens according to standard GB/T 228 with the tensile axis parallel to the rolling direction.
Note: Please confirm the specifications of product before official order. The specifications are negotiable.

用途及案例 Purpose and case

TWIP钢实现了超高强度和超高塑性的统一，将会带来汽车零部件设计上的大幅度改变。根据其性能特点，TWIP钢将适合用于具有复杂形状的超高强度结构件和安全件，如保险杠、B柱等。

TWIP steels exhibit the combination of ultra-high strength and ultra-high formability, which allows remarkable design modification and number reduction of auto-parts. According to their properties, TWIP steels are supposed to be suited for manufacturing structural and safety parts requiring both ultra-high strength and very complex shape, such as bumper and B-pillar.

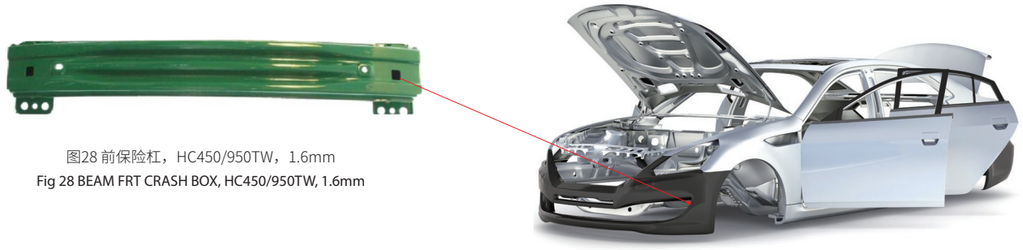
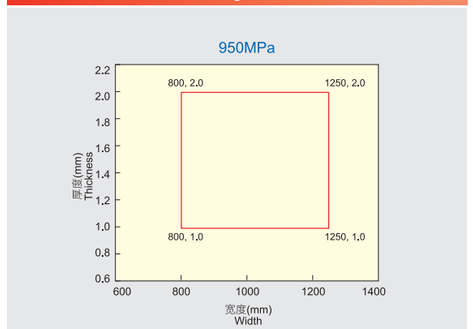


图28 前保险杠，HC450/950TW，1.6mm
Fig 28 BEAM FRT CRASH BOX, HC450/950TW, 1.6mm

供货规格 Product dimensions

普冷TWIP钢可供规格范围
Available range of TWIP-CR



PHS（热成形用钢）系列产品
PHS (Press Hardening) series steel

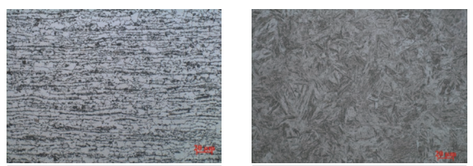
产品特点 Technical characteristics

1500MPa级别热成形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。

宝钢热成形用钢包括无镀层和铝硅镀层，家族通过成分设计优化可实现不同强度级别的产品。相对于无镀层的热成形用钢，铝硅镀层具有减少喷丸工序、避免钢板表面脱碳、提高零件耐蚀性等优点。

组织特点：热成形前，基板主要是铁素体+珠光体组织，热成形后，主要为马氏体组织（图29）。

Microstructure: Before press hardening, the substrate is mainly ferrite + pearlite, after press hardening, mainly martensite (Fig.29).



热成形前
Before press hardening

热成形后
After press hardening

图29 典型热成形用钢金相组织图片
Fig 29 Typical microstructure of PHS

The microstructure of 1500MPa grades press hardening steel in as-delivered condition is ferrite/pearlite matrix with small amounts of carbide or bainite. After press hardening, the metallographic structure is mainly martensite, and a small amount of ferrite, bainite or residual austenite is allowed under the premise that the strength meets the requirements.

Baosteel PHS includes coating free and aluminum silicon coating. The family products can achieve different strength levels through composition design optimization. Compared with PHS without coating, Al - Si coating has the advantages of reducing shot peening process, avoiding decarbonization of steel surface and improving corrosion resistance of parts.

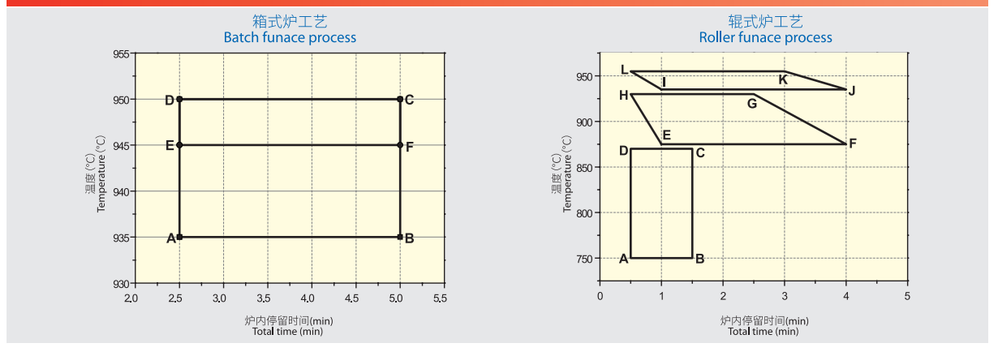
性能特点：热成形用钢是将坯料加热到奥氏体化温度以上，并保温一定时间，然后模压淬火形成马氏体钢，实现零件的高强、高韧性，有效提高零件的抗碰撞性能。热成形用钢主要应用于车身结构件特别是防止侵入的安全结构件上。

Properties: Press hardening process is to heat blank above austenitizing temperature, and hold for a certain time, and then die quenching to form martensitic. Press hardening can achieve high strength, high toughness of parts, and effectively improve the anti-collision performance of parts. Press hardened steel is mainly used in the body structure, especially in the safety structure to prevent intrusion.

热成形工艺窗口：由于铝硅镀层自身特点，镀层在热冲压过程中会发生合金化扩散，加热时间或者温度不合适，将直接影响零件涂装和焊接等性能，宝钢推荐的典型热冲压工艺窗口如下图所示。

Press hardening process window: Due to the characteristics of the aluminum silicon coating itself, the coating will occur alloying diffusion in the press hardening process. If the heating time or temperature is not appropriate, the coating structure will change, thus affecting the coating and welding performance of parts. The typical hardening process window recommended by Baosteel is shown in Fig.

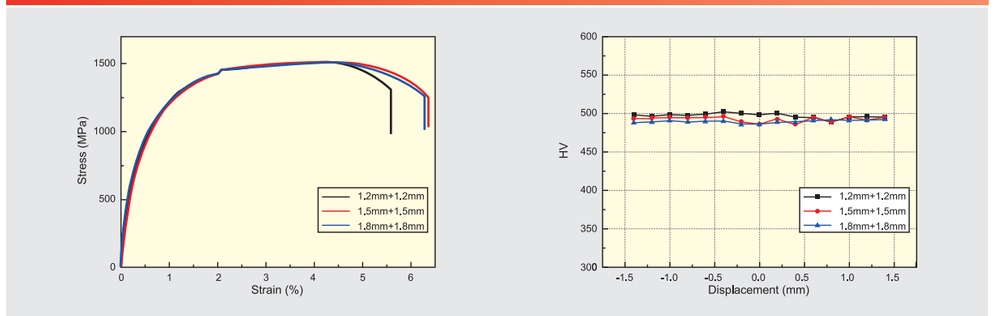
典型的热冲压工艺窗口
Typical press hardening process window



激光拼焊工艺：宝钢采用自主开发的激光填丝拼焊技术生产的铝硅镀层热成形钢拼焊板，产品质量稳定、受控。因该拼焊技术摒弃了镀层消融环节，使拼焊板的生产成本下降及生产效率提高，产品更具市场竞争力。宝钢可根据用户需求，提供铝硅镀层拼焊板或拼焊热冲压件。

Laser Welding Process: Baosteel adopts laser wire filling technology which is developed by Baosteel to produce hot-formed tailor welded blanks with Al Si coating. The product quality is stable and controlled. With such technology, coating ablation is abandoned, the production cost of tailor welded blanks is reduced, the production efficiency is improved, and the products are more competitive in the market. Baosteel can provide tailor welded blanks or tailor welded hot stamping parts with Al Si coating according to customers' requirements.

HC950/1300HS+AS（等强）拼焊板的性能
Properties of HC950/1300HS+AS tailor welded blanks



供货标准 Supply standard

宝钢可以按照欧标、美标或JIS等国际通用标准的要求进行供货，也可以按照用户的标准或要求进行供货，或者采用如下的宝钢标准进行供货。

The products can be supplied in accordance with the requirements of international standard such as EN, ASTM, JIS, also can be supplied in accordance with customer's standard or requirement, or Baosteel standards.

表15 热成形用钢交货状态力学性能范围
Table 15 Typical mechanical properties of PHS under delivery condition

牌号 Steel Grade	屈服强度 YS $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL A_{50mm}, % ≥
HC340/460HS (B500HS)	320	400	15
HC340/460HS+AS (B500HS+AS)	320	400	15
HC370/550HS (B600HS)	340	450	15
HC370/550HS+AS (B600HS+AS)	340	450	15
HC800/1000HS (B1000HS)	300	600	10
HC800/1000HS+AS (B1000HS+AS)	300	600	10
HC950/1300HS (B1500HS)	280	450	20
HC950/1300HS+AS (B1500HS+AS)	300	500	17
HC1100/1700HS (B1800HS)	300	500	16
HC1100/1700HS+AS (B1800HS+AS)	300	500	15
HC1200/1800HS (B2000HS)	300	500	15
HC1200/1800HS+AS (B2000HS+AS)	300	500	14

PHS（热成形用钢）系列产品
PHS (Press Hardening) series steel

表16 热成形后典型力学性能
Table 16 Typical mechanical properties of PHS after quenching

牌号 Steel Grade	屈服强度 YS $Rp_{0.2}$, MPa	抗拉强度 TS R_m, MPa ≥	断后伸长率 EL A_{50mm}, % ≥
HC340/460HS (B500HS)	392	519	20
HC340/460HS+AS (B500HS+AS)			
HC370/550HS (B600HS)	451	641	18
HC370/550HS+AS (B600HS+AS)			
HC800/1000HS (B1000HS)	877	1085	9.5
HC800/1000HS+AS (B1000HS+AS)			
HC950/1300HS (B1500HS)	1067	1565	7
HC950/1300HS+AS (B1500HS+AS)			
HC1100/1700HS (B1800HS)	1213	1830	5.5
HC1100/1700HS+AS (B1800HS+AS)			
HC1200/1800HS (B2000HS)	1345	2020	5.5
HC1200/1800HS+AS (B2000HS+AS)			

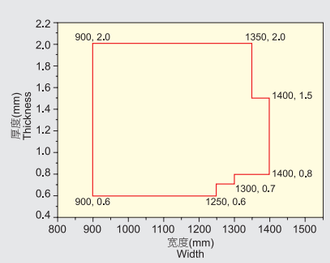
应用案例 Application cases

图30 热成形 B柱，HC950/1300HS，1.8mm
Fig 30 Press hardened B pillar, HC950/1300HS, 1.8mm

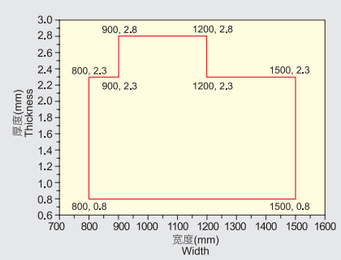
图31 热镀铝硅热成形 B柱，HC950/1300HS+AS，1.5mm
Fig 31 AS coated press hardened B pillar, HC950/1300HS+AS, 1.5mm

供货规格 Product dimensions

普冷热成形用钢可供规格范围
Available range of bare PHS



热镀铝硅热成形用钢可供规格范围
Available range of Al-Si coated PHS



吉帕钢® 加工能力
X-GPa® steel processing capacity

为满足用户对吉帕钢®剪切落料需求，确保高质量加工和配送交付，营销中心（宝钢国际）加工配送体系配置了相应加工能力，已投产的980MPa及以上的纵横切、落料产线30条，设计年加工产能165万吨，其中1180MPa以上的加工能力的纵横切、落料线16条，设计产能92万吨。宝钢在各区域配置1180MPa纵切分条能力，1180MPa以上需求由上海辐射全国，提供加工配送服务。

上海地区已形成吉帕钢®剪切、落料加工能力 45万吨，上海宝钢高强钢配置1800MPa纵切机组和1500MPa横切机组各一条，宝钢阿赛洛具备1200MPa落料加工能力。上海以外地区，长春宝钢、柳州宝钢、烟台宝井、南京宝住具备 1180-1470MPa落料加工能力，可以满足吉帕钢®落料加工需求。

针对1700MPa马氏体钢板形要求的矫直机组建设中，计划于2024年初在上海形成加工能力。

In order to meet the shear processing requirements of X-GPa® steel and ensure the processing quality and delivery requirements of X-GPa® steel materials, the processing and distribution system of the Baosteel Marketing & Sales Center (Shanghai Baosteel International Economic&Trading Co., Ltd.) is equipped with corresponding processing capacity. It has 30 production lines with a processing capacity of 980MPa and above, with a total designed capacity of 1.65 million tons. Among them, there are 16 slitting line, cut-to-length line or blanking lines with a processing processing capacity of 920,000 tons of over 980MPa. Baosteel is equipped with 1180MPa slitting capacity in each region, and the demand above 1180MPa is extended from Shanghai to the whole country to provide processing and distribution services.

The steel service centers of Baosteel in Shanghai have been formed X-GPa® steel shear and blanking processing capacity of 450,000 tons. In order to meet the steel shear and blanking processing needs of over GPa ultra-high strength steel. Shanghai high strength steel company equipped with 1800MPa longitudinal cutting unit and 1500MPa transverse cutting unit, Baosteel Arcelor has 1200MPa blanking processing capacity. Outside Shanghai, Changchun Baosteel, Liuzhou Baosteel Autoparts, YantaiBao-Mit, Nanjing baosummit, has 1180-1470MPa blanking capacity, which can meet requirements of X-GPa® steel blanking processing.

The 1700MPa Martensitic steel straightening line is under construction, and will form a processing capacity in Shanghai by 2024.

	纵切机组13条 Parameters of 13 slitting lines	横切（含摆剪）机组3条 Parameters of 3 Cut-to-Length (including Pendulum shear) lines	落料机组14条 Parameters of 14 Blanking lines
最大抗拉强度 Cutting Strenght Max	980-1800MPa	980-1500MPa	980-1470MPa
最大屈服强度 Yield Strenght Max	780-1500MPa	760-1200MPa	700-1150MPa
最大入/出口卷重 Coil Weight Max	25-30t	30t	20-25t
入口卷材宽度 Entrance Width	300-1650mm	300-1650mm	300-1850mm
出口卷材宽度 Exit Width	30-1650mm	—	—
剪切长度 Cutting Length	—	300-6000mm	—
最大入/出口卷材外径 OD Max	2100mm	2100mm	—
最小入/出口卷材内径 OD Min	900mm	900mm	
卷材入/出口内径 ID	Ø508 mm或Ø610mm Φ508 or 610mm	Ø508 mm或Ø610mm Φ508 or 610mm	Ø508 mm或Ø610mm Φ508 or 610mm
带钢厚度 Thickness Range	0.5-6.0mm	0.5-4.0mm	0.5-3.2mm
工作台面尺寸 Table size	—	—	4500×2500mm
落料步距 Blanking step distance	—	—	220-4000mm
合模高度 Clamping height	—	—	1100mm
SPM值 SPM values	—	—	10-80
最大堆垛重量 Stacking Weight Max	—	5t	4-5t
最大堆垛高度 Stacking Height Max	—	750mm	700mm（含料架） 700mm(including material shelf)
年加工能力 Annual Capacity	82万吨 820,000T	15万吨 150,000T	68万吨 680,000T

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