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# 敬业集团汽车结构钢

JINGYE GROUP STEEL USED FOR  
THE STRUCTURE OF AUTOMOBIL

敬业集团  
JINGYE GROUP

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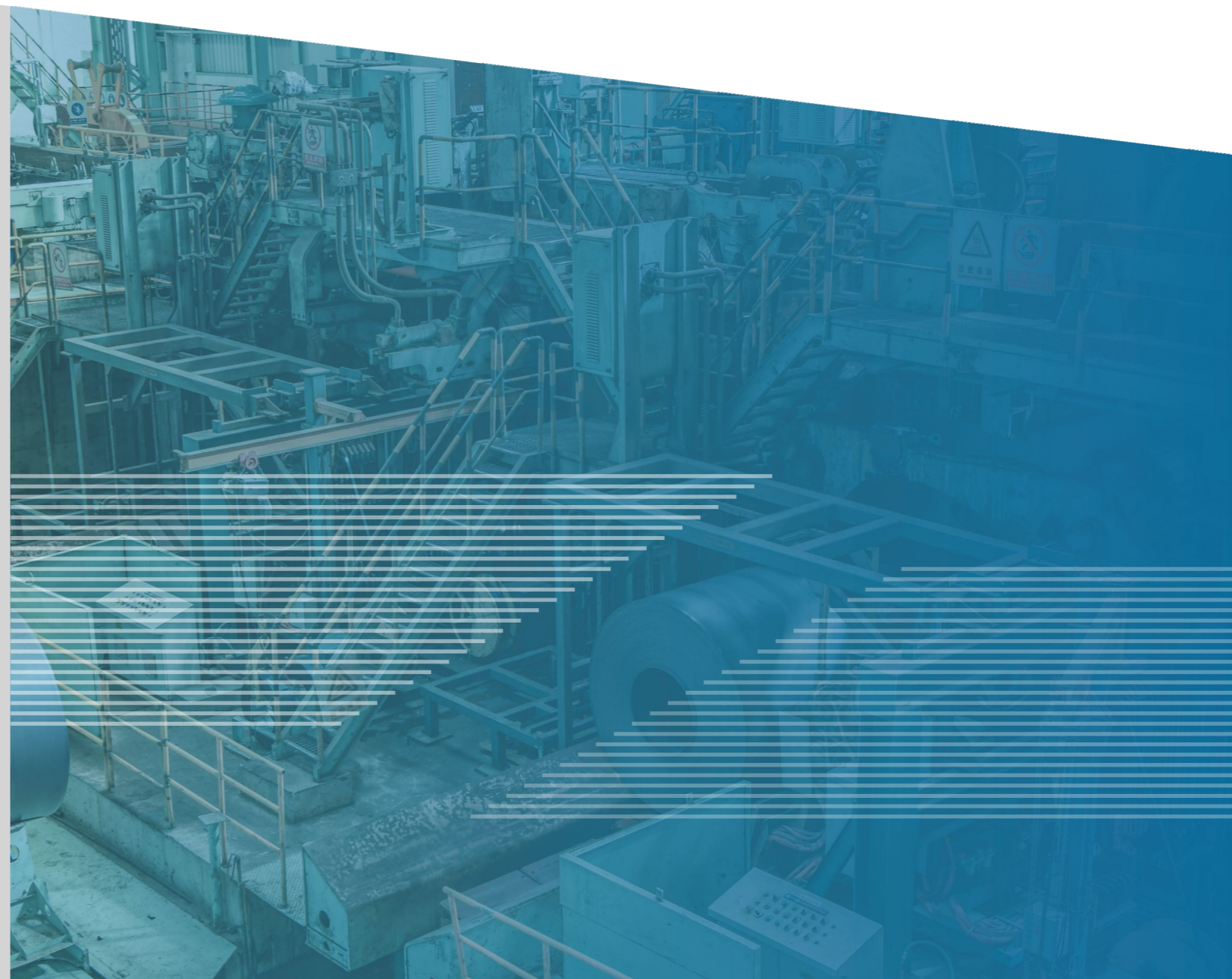
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汽车大梁钢系列  
Automobile beam  
steel series

02

汽车车轮钢系列  
Automobile wheel  
steel series

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汽车机械搅拌罐钢系列  
Automobile stirring tank  
steel series

04

汽车箱体钢系列  
Automobile carriage  
steel series



敬业钢铁有限公司隶属于中国500强企业—敬业集团，主要产品螺纹钢、中厚板、热轧卷板、圆钢、钢轨、异型钢、型钢、品种线材、半成品，是国家高新技术企业，省级技术研究中心，设置研究院专职品种开发机构。

2018年敬业钢铁实施开发汽车钢发展战略，引进宝武集团、安钢集团汽车钢研发团队，利用3-5年做精、做强汽车结构用钢。2019年配套建设高强钢板平整线、开平纵剪生产线。目前已初步形成**汽车大梁钢系列、汽车机械搅拌罐钢系列、汽车车轮钢系列、汽车箱体钢系列**四大产品系列。敬业钢铁致力于打造一流的品种钢拳头产品，助力中国制造强国！

Jingye Iron And Steel Co., Ltd is affiliated to Jingye Group, one of TOP 500 enterprises of China, producing deformed

steel bars, medium/thick plates, hot rolled plates, and round steel, rail, special profiles, section steel, wire rod, semis, has won the titles of National High-tech Enterprise and Provincial Technology Research Center. It establishes its own research institute specialized in developing new products.

In 2018, Jingye Steel inaugurated the development strategy for the automobile steel, recruiting the automobile steel R&D teams from Baowu Group and Angang Group to strive for the goal of, within 3-5 years, establishing a strong and specialized business in steel used for automobile structure. In 2019, the Group set up a high-strength steel plate leveling line and a cut-to-length line. At present, four major series of product-line comes into preliminary shape, that is, automobile beam steel series, automobile stirring tank steel series, automobile wheel steel series and automobile carriage steel series. Jingye Steel is committed to creating first-rate steel products and assisting China to be powerful in manufacturing.

# 01

## Automobile beam steel series 汽车大梁钢系列

大梁钢为汽车主要承载部件，对钢板的强韧性能及疲劳性能要求高。主要用于汽车车架纵梁、横梁、边梁、贯穿梁等车梁结构件制造。

**敬业集团汽车大梁钢优点：低氮、低氧、低温高冲击、高强度，具有良好的耐低温冲击性和耐颠簸疲劳性。适宜于东北、新疆等低温周期长的寒冷地区服役。**

The beam steel, as the main weight-carrying part in automobiles, needs to meet the high toughness and fatigue performance standard. It is mainly used in the manufacture of automobile beam structural parts such as sills, crossmembers, side sills and through beams.

The strength of automobile beam steel is as follow: low nitrogen content, low oxygen content, low temperature and high impact resistance, high strength, good low temperature impact resistance and bump fatigue resistance. The automobile beam steel is suitable for use in chilling areas with long low-temperature period such as Northeast China and Xinjiang.

### 1 产品规格 Product specifications

典型牌号 Typical grade	厚度 Thickness, mm	宽度 Width, mm
510L	2.5~12	1200~1260
600L		1400~1430
700L		1500~1570

### 2 产品实物性能指标 Product physical performance indicators

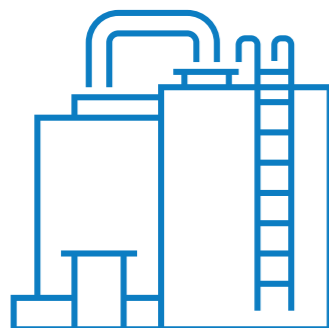
执行标准：GB/T3273-2015《汽车大梁用热轧钢板及钢带》或技术协议。

在国家标准基础上，敬业大梁钢采用折叠冷弯检测，增加了-20℃、-40℃纵向、横向冲击检测（一些大梁钢生产企业只检测-20℃纵向冲击）。

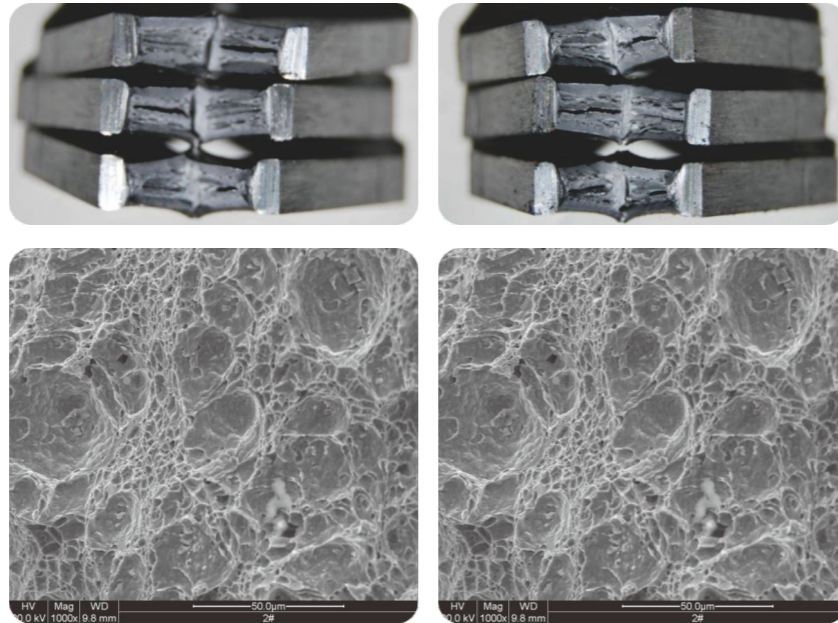
Standards applied: GB/T3273-2015 "Hot-rolled Steel Plates/strips Used for Automobile Beams" or technical agreements.

On the basis of the national standard, Jingye beam steel is subject to the cold folding test and longitudinal/transverse impact tests at -20℃ and -40℃(while some beam steel manufacturers only use the longitudinal impact test at -20℃).

典型牌号 Typical grade	厚度 Thickness mm	屈服强度 Yield strength ReH,MPa	抗拉强度 Tensile strength Rm,MPa	伸长率 Elongation at break A,%	180°宽冷弯 D=0 双向折叠弯 Cold folding test at 180° D=0 Double-sided folding test	冲击方向 Impact direction	冲击功 Impact energy K <sub>v2</sub> ,J	
							-20℃	-40℃
700L	2.5~2.75	710~735	730~780	23~25	合格 qualified			
	3.0~4.0	700~720	730~760	22~25	合格 qualified	横向 Transverse	120~140	100~130
						纵向 Longitudinal	130~160	120~150
	5.0~6.0	700~740	730~770	21.5~24	合格 qualified	横向 Transverse	135~175	125~160
						纵向 Longitudinal	180~210	160~200
	8	700~740	720~770	18~22	合格 qualified	横向 Transverse	165~195	140~175
						纵向 Longitudinal	200~230	190~220
	10	670~720	710~770	18~22	合格 qualified	横向 Transverse	150~180	130~160
纵向 Longitudinal						220~250	190~220	
600L	2.5~2.75	630~660	670~700	22~25	合格 qualified			
	3.0~4.0	620~640	670~700	23~26	合格 qualified	横向 Transverse	130~165	120~150
						纵向 Longitudinal	190~220	160~200
	5.0~6.0	640~670	680~710	21~25	合格 qualified	横向 Transverse	150~180	140~160
纵向 Longitudinal						200~230	190~220	

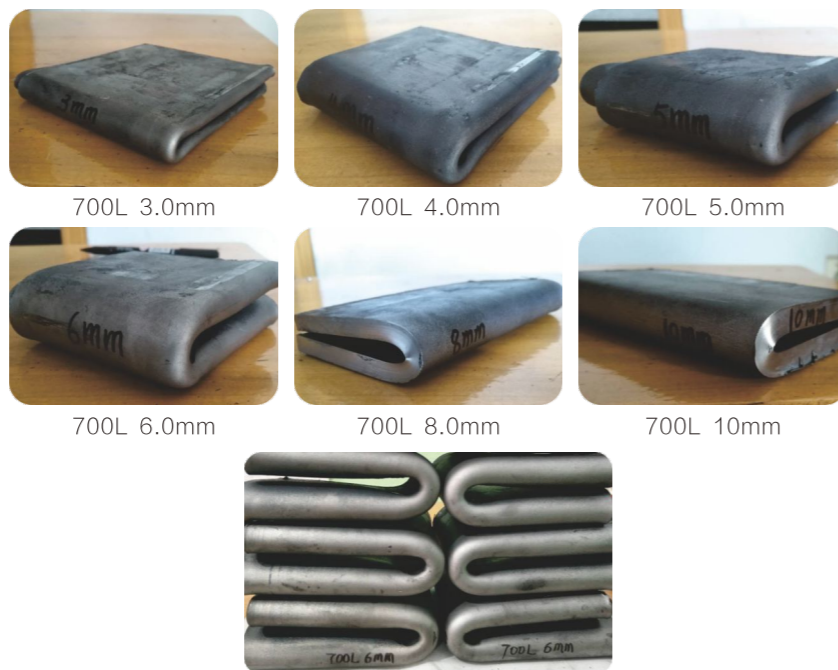


低温冲击断口形貌：Shapes of Low-temperature impact fractures:



敬业700L从左至右依次-20℃、-40℃冲击试样及韧窝状断口  
From left to right: Impact specimens and dimple-shaped fractures at -20℃ and -40℃(Jingye 700L)

尖角折叠冷弯特性：Cold folding characteristics of sharp corners:

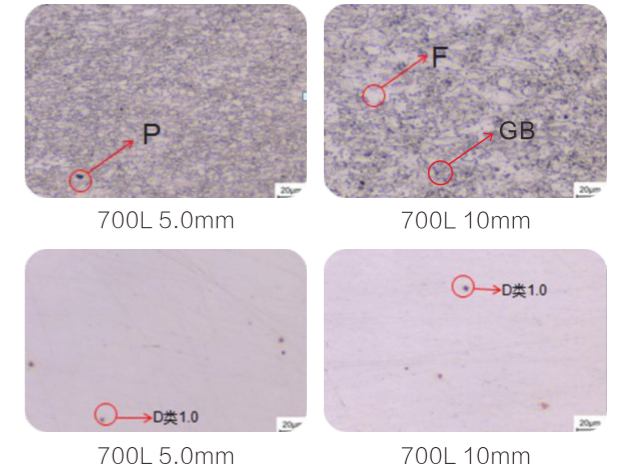


敬业700L纵、横向双面折叠冷弯  
Longitudinal and transverse double-sided cold folding (Jingye 700L)

3 组织结构与夹杂物 Structures and inclusions

大梁钢700L卷板金相组织特点：均匀、细小铁素体F和粒状贝氏体GB，晶粒度达到12级以上（优于国标GB/T3273），总夹杂物级别1.0级以下。具有良好的强度、塑性、韧性综合工艺力学指标。

The metallographic structure of Jingye 700L beam steel is characterized by uniform and fine ferrite F and granular bainite GB, with over Grade 12 grain size (which is better than that specified in GB/T3273), total inclusions content grade below Grade 1.0. It possesses sound comprehensive mechanical attributes such as strength, plasticity and toughness.

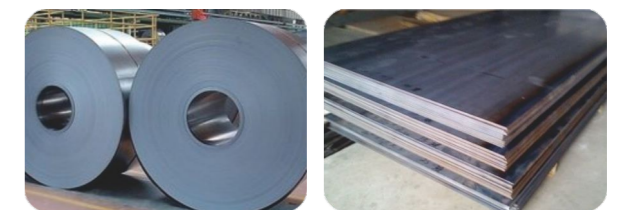


敬业高强大梁钢卷板组织结构与夹杂物形态  
Structures and inclusions of Jingye high-strength beam steel plate

4 产品使用展示 Displays about product utilization

敬业大梁钢卷板开平后板面平整、光洁、板形优良，易焊接、变形加工，获得客户广泛的好评和赞誉。

After the beam steel roll is flattened, the plate surface is flat, smooth, and easy to weld and process, which has won praises from users.



敬业700L热卷、开平板表面及板形良好  
Jingye 700L hot rolls and flattened plates have good surface and plate shapes



敬业700L厚度2.75mm  
半挂车贯穿梁  
Jingye 700L semi-trailer through-beam thickness: 2.75mm



敬业700L半挂车主梁结构  
Jingye 700L semi-trailer main beam structure



敬业700L半挂车大梁组装  
Jingye 700L semi-trailer truck stringer assembly

# 02

## Automobile wheel steel series 汽车车轮钢系列

汽车车轮钢为汽车主要旋转受力支撑部件，主要采用滚压、冲压、旋压方法制作不同车型的轮辋和轮辐。要求钢板表面氧化铁皮薄、光洁度高，具有较高的强韧性、冷成型性、凸缘延伸性、抗疲劳性，闪光焊接性和喷涂附着性。

**敬业集团汽车车轮钢优点：表面氧化铁皮薄、表面光亮、色泽均匀一致；低屈强比、易扩径加工。**

Automobile wheel steel is mainly used in supporting the rotation of automobiles, Rims and spokes of various vehicle types are processed using rolling, stamping and spinning methods. It requires less oxide scales and excellent smoothness, toughness, cold formability, flange extension, fatigue resistance, flash weldability and spray adhesion.

The advantages of Jingye automobile wheel steel: thin iron oxides, bright surface, uniform color, low yield ratio and easy for expansion processing.

### 1 产品规格 Product specifications

典型牌号 Typical grade	厚度 Thickness, mm	宽度 Width, mm
330CL	2.5~16	1200~1260
380CL		1400~1430
440CL		1500~1570
490CL	2.5~10	1200~1260
540CL		1400~1430 1500~1570

### 2 产品实物性能指标 Product physical performance indicators

执行标准：YB/T4151-2015《汽车车轮用热轧钢板及钢带》或技术协议。

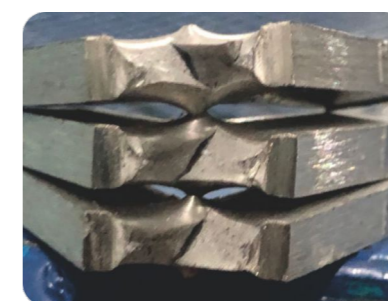
在行业标准基础上，敬业车轮钢采用双面折叠冷弯检测，增加了-20℃低温冲击检测（一些车轮钢生产企业不检测冲击韧性）。

Standard applied: YB/T4151-2015 "Hot-rolled Steel Plates and Strips for Automobile Wheels" or technical agreement.

On the basis of the industry standard, Jingye wheel steel is subject to the cold folding test and the low-temperature impact test at -20℃ (while the impact test is not required by some wheel steel manufacturers).

典型牌号 Typical grade	厚度 Thickness mm	屈服强度 Yield strength ReH, MPa	抗拉强度 Tensile strength Rm, MPa	伸长率 Elongation at break A, %	180°宽冷弯 D=0 双向折叠弯 Cold folding test at 180° D=0 Double-sided folding test	冲击方向 Impact direction	冲击功 Impact energy K <sub>v23</sub> , J	
							-20℃	-40℃
330CL	4.0	350~390	380~450	35~42	合格 qualified	纵向 Longitudinal	160~190	150~180
380CL	6.5	380~410	420~470	34~39	合格 qualified	纵向 Longitudinal	160~220	150~180
440CL	5.5	410~460	450~500	31~37	合格 qualified	纵向 Longitudinal	210~260	180~240
	5.95	400~450	450~500	31~37	合格 qualified	纵向 Longitudinal	210~260	180~240

低温冲击断口形貌：  
Shapes of Low-temperature impact fractures:

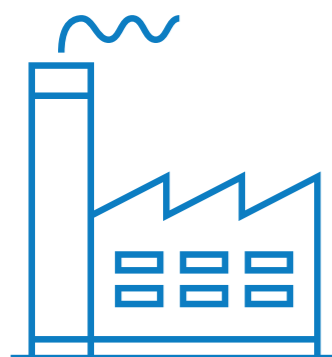


敬业440CL从左至右依次-20℃、-40℃冲击试样断口  
From left to right: Impact fractures at -20℃ and -40℃ (Jingye 440CL)

尖角折叠冷弯特性：  
Cold folding characteristics of sharp corners:



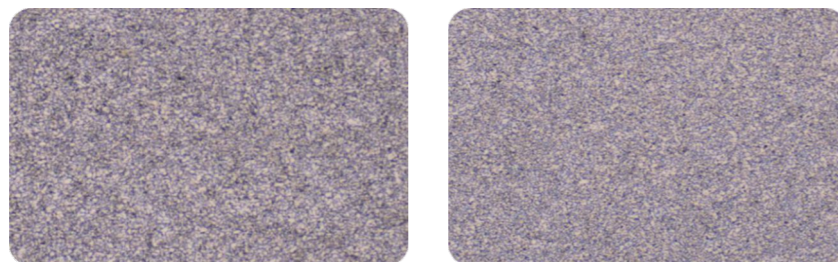
敬业440CL厚度5.95mm  
纵、横向双面折叠冷弯  
Longitudinal and transverse double-sided cold folding of Jingye 440CL thickness: 5.95mm



### 3 组织结构与夹杂物 Structures and inclusions

车轮钢卷板金相组织特点：均匀细小铁素体F和珠光体P为主，少量的准多边形铁素体，具有良好的强韧性、凸缘延展性。晶粒度达到12级以上（优于冶金行业标准YB/T4151），总夹杂物级别控制在1.0级以下。

The metallographic structure of the wheel steel is characterized by uniform and fine ferrite F, pearlite P, and a small amount of quasi-polygonal ferrite, with good strength toughness, flange ductility, above Grade 12 grain size (which is better than that specified in YB/T4151) and below Grade 1.0 total inclusions content.



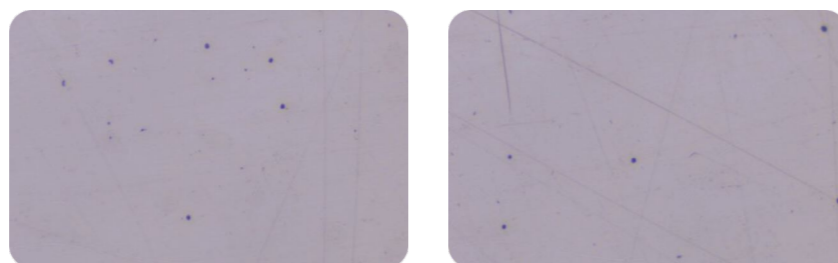
380CL 4.5mm

380CL 6.5mm



440CL 5.5mm

440CL 5.95mm



380CL 6.5mm

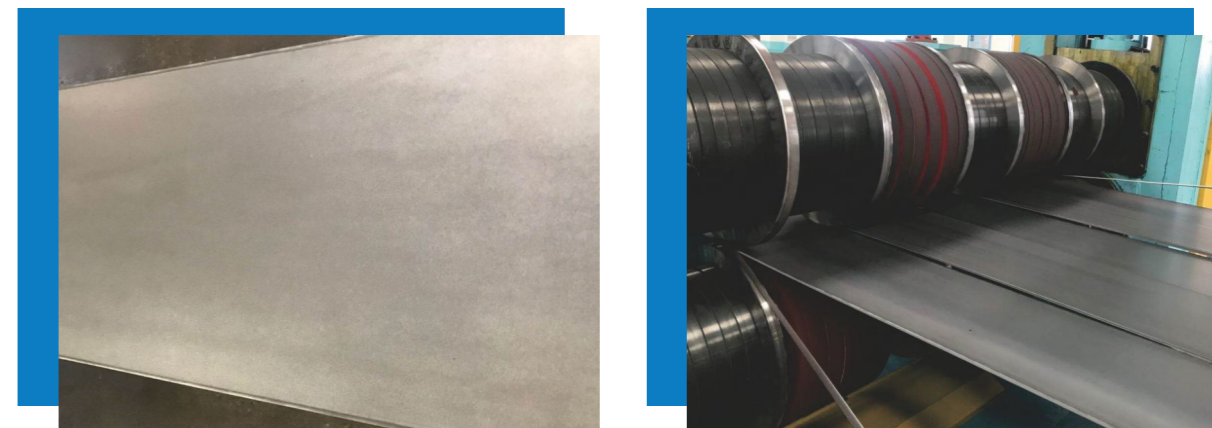
440CL 5.5mm

敬业汽车车轮钢卷板组织结构与夹杂物形态  
Structures and inclusions of Jingye automobile wheel steel roll

### 4 产品使用展示 Displays about product utilization

敬业车轮钢卷板表面氧化铁皮薄而致密，板面平整、光洁，板形质量优异。冷加工成型性优良、焊接性能稳定。

Jingye wheel steel has a thin and dense oxide scale, the plate surface is flat and smooth with good shape, with excellent cold workability and stable welding performance.



敬业440CL厚度5.95mm开平板表面及分条板形  
Flat steel plate and strip of Jingye 440CL with a thickness of 5.95mm



敬业产品表面光亮、色泽均匀一致  
Bright surface and uniform color of the Jingye products



某钢企产品颜色不均  
Poor quality of a product from another manufacturer

敬业440CL厚度5.5mm轮辋扩径表面、焊缝质量  
Expansion surface and weld quality of rim made of Jingye 440CL with a thickness of 5.5mm



敬业440CL厚度5.5-5.95mm轮辋滚圆、冲压成型优良  
Excellent rolling and stamping surface of rim made of Jingye 440CL with a thickness of 5.5-5.95mm

# 03

## Automobile stirring tank steel series 汽车机械搅拌罐用钢系列

汽车机械搅拌罐用钢是为散装水泥车、矿粉车、煤粉车及水泥搅拌车等设计开发的专用钢。

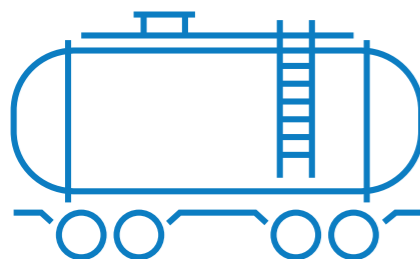
**敬业集团汽车机械搅拌罐用钢优点：采用加铌微合金化工艺，性能均匀，成型性能好。**

The automobile stirring tank steel is a kind of special steel designed and developed for bulk cement trucks, ore trucks, coal trucks and cement mixer trucks.

The advantages of Jingye automobile mechanical stirring tank steel: uniform performance and good forming performance achieved from niobium-added micro-alloying process.

### 1 产品规格 Product specifications

典型牌号 Typical grade	厚度 Thickness, mm	宽度 Width, mm
520JJ	2.5~10	1200~1260
620JJ		1400~1430
		1500~1570



### 2 产品实物性能指标 Product physical performance indicators

执行标准：供货技术协议。

敬业机械搅拌罐采用双面折叠冷弯检测，2.75mm及以上规格增加-20℃低温冲击检测。

Standard applied: Technical agreement concerning supply.

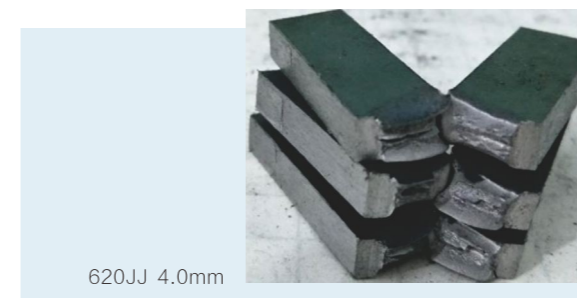
Jingye steel for the mechanical stirring tank is subject to the cold folding test, and the steel with a thickness of 2.75mm and above is subject to the low temperature impact test at -20℃.

典型牌号 Typical grade	厚度 Thickness mm	屈服强度 Yield strength ReH, MPa	抗拉强度 Tensile strength Rm, MPa	伸长率 Elongation at break A, %	180° 宽冷弯 D=0 双向折叠弯 Cold folding test at 180° D=0 Double-sided folding test
520JJ	2.5~2.75	500~560	580~660	22~27	合格 qualified
	3.0~4.0	480~560	560~650	22~27	合格 qualified
	5.0~6.0	480~560	560~650	22~27	合格 qualified
620JJ	2.5~2.75	600~660	680~710	21~25	合格 qualified
	3.0~4.0	580~660	660~720	21~25	合格 qualified
	5.0~6.0	580~660	660~720	21~25	合格 qualified

低温冲击断口形貌：  
Shapes of Low-temperature impact fractures:



尖角折叠冷弯特性：  
Cold folding characteristics of sharp corners:



敬业620JJ卷板-40℃纵向冲击试样断口  
Longitudinal impact sample fractures of Jingye 620JJ rolled plate (-40℃)

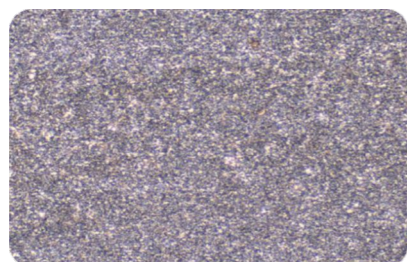


敬业520JJ、620JJ卷板纵、横向双面折叠冷弯  
Longitudinal and transverse double-sided cold folding of Jingye 520JJ and 620JJ rolled plates

### 3 组织结构与夹杂物 Structures and inclusions

机械搅拌罐卷板金相组织特点：均匀细小铁素体F+珠光体P为主，少量弥散粒状贝氏体GB组织，具有高强度、高韧性，良好的延伸塑性。晶粒度达到12级以上，总夹杂物级别控制在1.0级以下。

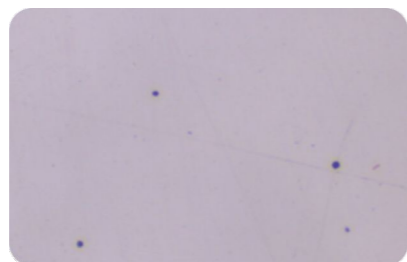
The metallurgical structure of mechanical stirring tank steel is characterized by uniform and fine ferrite F and pearlite P mainly and a small amount of dispersed granular bainite GB structures, with high strength, high toughness and good extension plasticity, over Grade 12 particle size and below 1.0% total inclusions content.



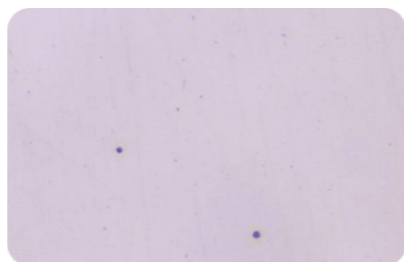
620JJ 2.75mm



620JJ 4.0mm



620JJ 2.75mm



620JJ 4.0mm

敬业机械搅拌罐卷板组织结构与夹杂物形态  
Structures and inclusions of the Jingye rolled plates for mechanical stirring tank



### 4 产品使用展示 Displays about product utilization

敬业汽车机械搅拌罐卷板表面平整、光洁，板形良好，纵、横向弯曲变形优良、焊接性能稳定。

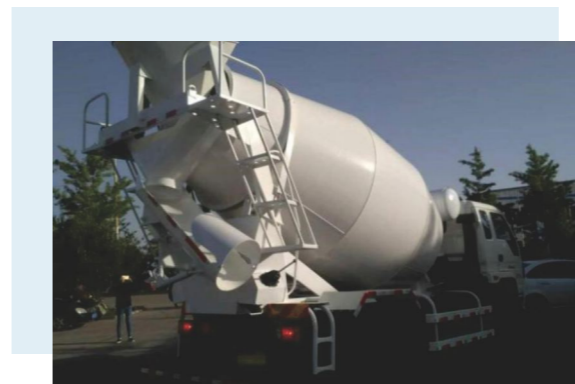
Jingye hot-rolled plate for automobile stirring tank has flat and smooth surface, and good shape, excellent longitudinal and lateral folding deformation, and stable welding performance.



敬业620JJ水泥散装罐车体拼焊  
Bulk Cement tank body welded with Jingye 620JJ



敬业620JJ水泥散装罐车体主梁(700L)结构  
Bulk Cement tank body main beam (700L) structure welded with Jingye 620JJ



河北敬业专用汽车有限公司  
机械搅拌罐专用车制造 (620JJ)  
Mechanical stirring tank (620JJ)  
truck manufactured by  
Hebei Jingye Special Vehicle Co., Ltd.



# 04

## Automobile carriage steel series 汽车箱体用钢系列

汽车箱体主要用作公路运输自卸车、矿用、矿坑自卸车、半挂货车的载货车箱制造。承受严苛的装载冲击、卸车磨损、满载应变等服役条件，要求轻量化、易加工、长寿耐用。

**敬业集团汽车箱体用钢优点：表面平整度高、颜色光亮一致；抗变形、耐磨、耐腐蚀，成型性优良。**

The automobile carriage steel is mainly used in the manufacture of carriages on road transport dump trucks, mining and pit dump trucks, and semi-trailer trucks and it can withstand severe service conditions such as loading impacts, unloading abrasions, and full load strains. It needs to be light-weighted, easy to process, long service life and other requirements.

The advantages of automobile carriage steel from Jingye Group: high surface flatness, uniform color, resistance to deformation, wear and corrosion resistance, and excellent formability.



### 1 产品规格 Product specifications

典型牌号 Typical grade	厚度 Thickness, mm	宽度 Width, mm
500XT	2.5~10	1200~1260
550XT		
600XT		
650XT		
700XT		

### 2 产品标准与性能指标 Product standards and performance indicators

执行标准：供货技术协议。

Standard applied: Technical agreement for supply.

敬业汽车箱体钢采用折叠冷弯检测。纵、横向双面折弯合格率达100%。

Jingye automobile carriage steel is subject to the cold folding test. The qualification rate for longitudinal/transverse folding tests reaches 100%.

典型牌号 Typical grade	厚度 Thickness mm	屈服强度 Yield strength ReH,MPa	抗拉强度 Tensile strength Rm,MPa	伸长率 Elongation at break A,%	180° 宽冷弯 D=0 双向折弯 Cold folding test at 180° D = 0 Double-sided folding test
600XT	2.5	510~590	610~680	21~25	合格 qualified
	2.75	520~580	620~680	21~25	合格 qualified
	3.0	520~580	620~680	21~25	合格 qualified

尖角折叠冷弯特性：

Cold folding characteristics of sharp corners:



敬业600XT厚度2.5mm  
Jingye 600XT with a thickness of 2.5mm



### 3 组织结构与夹杂物 Structures and inclusions

箱体钢卷板金相组织特点：以均匀细小铁素体F+珠光体P为主，少量弥散粒状贝氏体GB组织，具有高强度、高韧性，耐冲压、抗变形特点。晶粒度达到12级以上，总夹杂物级别控制在1.0级以下。

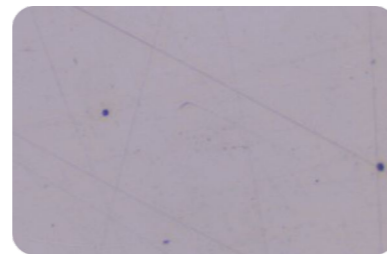
The metallurgical structure of the automobile carriage is characterized by uniform and fine ferrite F and pearlite P and a small amount of dispersed granular bainite GB structure, with high strength, high toughness, impact resistance and deformation resistance, over Grade 12 particle size and below 1.0% total inclusions content.



600XT 2.5mm



600XT 3.0mm



600XT 2.5mm

敬业箱体钢卷板组织结构与夹杂物形态  
Structures and inclusions of steel plate for Jingye automobile carriage

### 4 产品使用展示 Displays about product utilization

敬业箱体钢卷板 $\leq 3.0\text{mm}$ 以下规格全部平整后交货，表面光亮、色泽均匀一致，板形平直度良好；纵、横向弯曲变形优良、焊接性能稳定。

Jingye hot rolled plates for the automobile carriage with thickness  $\leq 3.0\text{mm}$  are all delivered after flattening, with bright surface, uniform color, good shape, excellent longitudinal and transverse folding deformation and stable welding performance.



敬业600XT厚度2.5~2.75mm板面光亮平直  
Bright and smooth surface of Jingye 600XT with thickness of 2.5~2.75mm



**JINGYE GROUP**  
STEEL USED FOR  
THE STRUCTURE OF AUTOMOBIL