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WUHAN IRON & STEEL CO., LTD.
RAIL & SECTION STEEL PRODUCTS
武钢有限
钢轨及型材产品

www.baosteel.com

衷心感谢您对宝钢股份武钢有限条材厂的关注和支持。

武钢有限条材厂是公司战略产品之一精品长材的生产基地，包含型材、线材、棒材三条生产线，近年来，条材厂不断采用钢铁生产新技术、新工艺、新设备，不断满足市场和用户对钢材产品的新要求，建立了完善的全流程质量管理体系，产品质量和品种规格均大幅提升。

武钢有限条材厂生产的钢轨、钢板桩、磁浮用钢、高导电电极钢、履带钢、弹簧钢、帘线钢、电缆钢、冷墩钢、热轧螺纹钢等，广泛用于铁路、建筑、能源、汽车、造船、航天、矿产等行业。

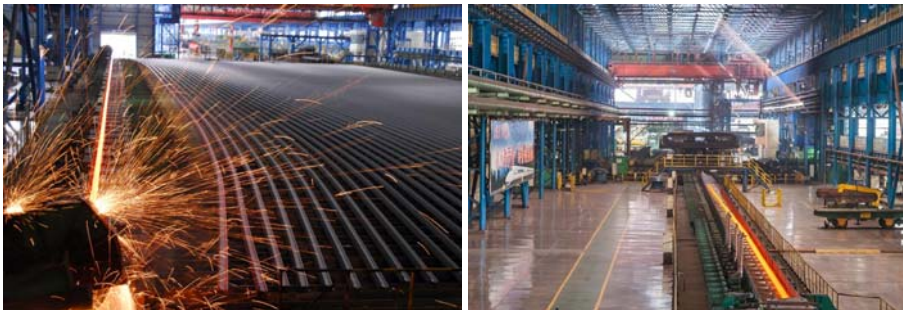
本手册综合介绍了武钢有限长材产品的规格、特性和应用等，热忱欢迎您选用武钢有限长材产品。

Thanks for your attention and support to bar factory of Baosteel Wuhan Iron and Steel Co.,Ltd. sincerely.

Bar factory of Wuhan Iron and Steel Co., Ltd. adopts new technology, new technique and new equipments to continuously meet new steel product demands of market and users. There was overall upgrade of production equipment and technology and the whole process of quality management system was built, so that the quality and specifications of product improve a lot.

Rail, steel sheet pile, section steel for medium and low speed maglev railway, High conductivity electrode steel, Crawler steel, Spring steel, Tire cord steel, Cable steel, Cold pier steel, Hot rolling thread steel produced in Wuhan Iron and Steel Co.,Ltd. are widely used in railways, architecture, machinery, shipbuilding, minerals and other industries.

This manual comprehensively introduces the specifications, characteristics and applications of the long products of Wuhan Iron and Steel Co.,Ltd. to make it convenient for you to select and order. Warmly welcome you to choose long products of Wuhan Iron and Steel Co.,Ltd.



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China's Major R&D and Production Base for Iron and Steel
中国重要的钢铁生产研发基地

精品长材
Premium Long Product Steel

冷轧电工钢
Cold Rolled Electrical Steel

汽车板
Automotive Sheet Steel

高性能工程结构用钢
High-performance Engineering Structural Steel

宝钢股份武汉钢铁有限公司

Wuhan Iron & Steel Co., Ltd., subsidiary of Baoshan Iron & Steel Co., Ltd.

宝钢股份武汉钢铁有限公司于2017年3月2日成立，是宝钢集团、武钢集团联合重组后，两家央企的核心资产宝钢股份、武钢股份启动换股吸收合并成立的子公司，与上海宝山、南京梅山、湛江东山一起，成为宝钢股份的四大钢铁基地。

公司厂区坐落在武汉市东部、长江南岸，用地面积21.17平方公里，厂区道路总长67公里，厂界31公里。

公司拥有炼焦、炼铁、炼钢、轧钢及配套公辅设施等一整套先进的全流程钢铁生产工艺设备，始终专注于冶金产品及副产品、钢铁延伸产品制造及冶金产品的技术开发。

钢铁产品主要有钢轨、型材、棒材、线材、热轧卷板、热轧中厚板、冷轧卷板、镀锌板（含电镀锌）、镀锡板、冷轧取向和无取向电工钢、彩涂钢板等各类钢铁品种。

产品通过遍布全球的营销网络，广泛应用于汽车、家电、石油化工、机械制造、能源交通、金属制品、航空航天、核电、电子仪表等行业。

公司主体装备达到了国际一流水平，形成了以精品长材、冷轧电工钢、汽车用钢、高性能工程结构用钢四大战略产品为重点的一批名牌产品。

Following up with the reliance and restructuring of Shanghai Baosteel Group Corporation and Wuhan Iron & Steel Group Corporation, Wuhan Iron & Steel Co., Ltd., subsidiary of Baoshan Iron & Steel Co., Ltd. was established on March 2, 2017 after Baoshan Iron & Steel Co., Ltd. merged with Wuhan Iron & Steel Co., Ltd. through share absorption, and become one of the four major production bases together with Shanghai Baoshan Steel Plant, Nanjing Meishan Steel Plant and Zhanjiang Dongshan Steel Plant.

Located in the east of Wuhan city and to the south of Yangtze river, Wuhan Qishan steel plant has an area of 21.17 square kilometers. The plant road has a total length of 67 kilometers and the boundary of the plant is 31 kilometers.

Owning the complete iron and steel production process and facilities including coking, iron-making, steel-making, steel-rolling and supporting utility facilities, the company is dedicated to the production of metallurgical products and by products, further processing of steel products and R & D of metallurgical products.

Steel products mainly include Rail, Section steel, Bar steel, Wire rod, Hot-rolled coil, Hot rolled plate, Cold rolled coils and Sheets, Galvanized sheet (including electro- galvanized sheet), Tin plate, Cold rolled grain oriented electrical steel, Cold rolled non-oriented electrical steel, Prepainted sheet, etc.

Through the marketing and sales network across the world, the products are widely used in automotive, home appliance, petrochemical industry, machinery manufacturing, energy, transportation, metal products, aerospace, nuclear power, electronic instrumentation and other industries.

As the main equipment and facilities have reached the international first-class level, a number of products under the four strategic categories including long product, cold rolled electrical steel, automotive steel, high-performance engineering structural steel have gained the award of China Brand product.

世界先进水平的轨梁生产线

Internationally Advanced Rail & Beam Production Line

产线介绍 Production Line Introduce

2008年7月，武钢有限升级改造的万能轧制生产线建成投产，主要生产设备与工艺技术达世界先进水平，轧制能力强，轧制范围广，并配备有世界先进的检测设备和检测技术。2017年，新增一条钢轨全在线热处理生产线，实现批量生产。

武钢有限轨梁生产线年设计能力105万吨，主要产品为各种型号钢轨、钢板桩、磁浮用钢、电极钢、履带钢、H型钢、支护用钢、工字钢、槽钢、角钢等，产品规格齐全，质量稳定可靠，广泛用于铁路、建筑、机械、造船、矿产等行业。

In July 2008, Wuhan Iron and Steel Co., Ltd. put the upgraded and reconstructed universal rolling production line into use. The main production equipment and technology reached world-class level, with strong rolling capacity and wide rolling range. There are also advanced testing equipment and testing technology of the world here. In 2017, rail of full length on-line heat treatment production line was newly added, which made volume production possible.

Rail beam production line of Wuhan Iron and Steel Co., Ltd. has an annual design capacity of 1.05 million tons. Main products are all kinds of rail, steel sheet pile, Section steel for medium and low speed maglev railway, High conductivity electrode steel, Crawler steel, H-shaped steel, support steel, -shaped steel, channel steel, angle steel etc.. The products, with complete specification and stable and reliable quality, are widely used in railways, architecture, machinery, shipbuilding, minerals and other industries.

炼钢工艺 Steelmaking process

为钢轨及型材产品提供成分稳定、钢质纯净、表面质量优良的各种规格钢坯

Provide all kinds of billet with stable composition, high steel purity, and excellent surface quality for rail and section steel products

顶底复吹转炉炼钢，配合以LF、RH炉外精炼，钢水质量完全满足各类轨道用钢的要求。

Basic oxygen steelmaking, combined with LF and RH external refining, making the quality of molten steel fully meet the demand of all kinds of rail steels.

H含量稳定控制在2ppm以下，O含量稳定控制在20ppm以下。

The content of H is stably controlled below 2ppm, and the content of O is stably controlled below 20ppm

钢铁行业中自动化程度和技术含量先进大方坯连铸机。

There is a bloom caster with the highest automation and technology in the international steel industry.

加热工艺 Heating process

钢坯受热均匀，大幅度提高钢轨及型材产品轧制质量和精度

Rolling quality and precision of rail and section steel products is greatly improved due to heat homogeneity of steel billet

步进式加热，保证钢坯受热均匀。

Step heating ensures that the steel billet is the same.

表面脱碳层深度稳定控制在0.3mm以下。

The depth of surface decarburization layer is stably controlled below 0.3mm.

开坯工艺 Blank opening process

为万能轧机提供高尺寸精度的中间坯

Provide high precision intermediate billet for universal rolling mill

高压水除鳞装置，有效去除初生氧化铁皮。

The high pressure water descaling device removes primary iron scale effectively.

高刚度、带液压平衡和轴向调整功能的新一代开坯轧机。

The new generation of billet rolling mill with high stiffness, hydraulic balance and axial adjustment functions.

辊缝调节精度±0.25mm。

Roll gap adjustment accuracy±0.25mm.

万能精轧工艺 Universal finish rolling process

保证高尺寸精度和表面质量的钢轨及型材产品

Produce rail and section steel with high quality

高压水除鳞装置在轨型坯进入万能轧机之前，去除次生氧化铁皮。

The high pressure water descaling device removes the secondary iron scale before the rail enters the universal rolling mill.

采用世界上先进的钢轨和型钢生产设备——万能轧机。

Advanced universal mill in the world is used.

采用紧凑封闭式牌坊技术，装备有自动辊缝控制系统，可实现对轧辊辊缝的精确设定，确保钢轨尺寸精度，百米钢轨全长轨高波动控制在0.2mm以内。

Compact and closed rolling arch technology, equipped with automatic roll gap control system, can achieve accurate setting of roll gap, to guarantee the dimensional accuracy of rail section. The height fluctuation of 100 meter rail shall be controlled within 0.2mm.

钢轨全在线热处理工艺 Rail of full length on-line heat treatment process

提升钢轨综合性能

Improving the comprehensive performance of rail

在线热处理装备和工艺，满足不同廓形和钢种的热处理要求。热处理钢轨具有稳定、均匀的综合性能，百米热处理钢轨全长硬度波动控制在5HB以内。

Heat treatment equipment and technology can meet heat treatment demand of different profiles and grades, and the heat treated rail has stable and well-distributed comprehensive performance. The hardness fluctuation of 100 meter heat treated rail shall be controlled within 5HB.

热辊印和热打印 Branding and hot stamping

为每一根优质的钢轨背书

Endorse for every high quality rail

在钢轨轨腰两侧分别打印出一组符号和数字组成的字符串，标识钢轨的规格、牌号、炉号和年月等信息。

Print a set of strings of symbols and numbers on both sides of the waist of every rail, displaying information such as specification, brand, furnace number and date.

检测手段 Testing means

确保钢轨的内外质量满足标准要求

Ensure that internal and external quality of rail meets the standard requirements

表面涡流探伤、超声波探伤、激光检测平直度等检测手段，可对钢轨的表面质量、内部质量、弯曲情况进行全面的自动检测。

Testing means such as surface eddy current testing, ultrasonic testing, and laser flatness detection are used to carry out comprehensive automatic detection on surface quality, internal quality and bending condition of rail.

检验试验 Inspection and test

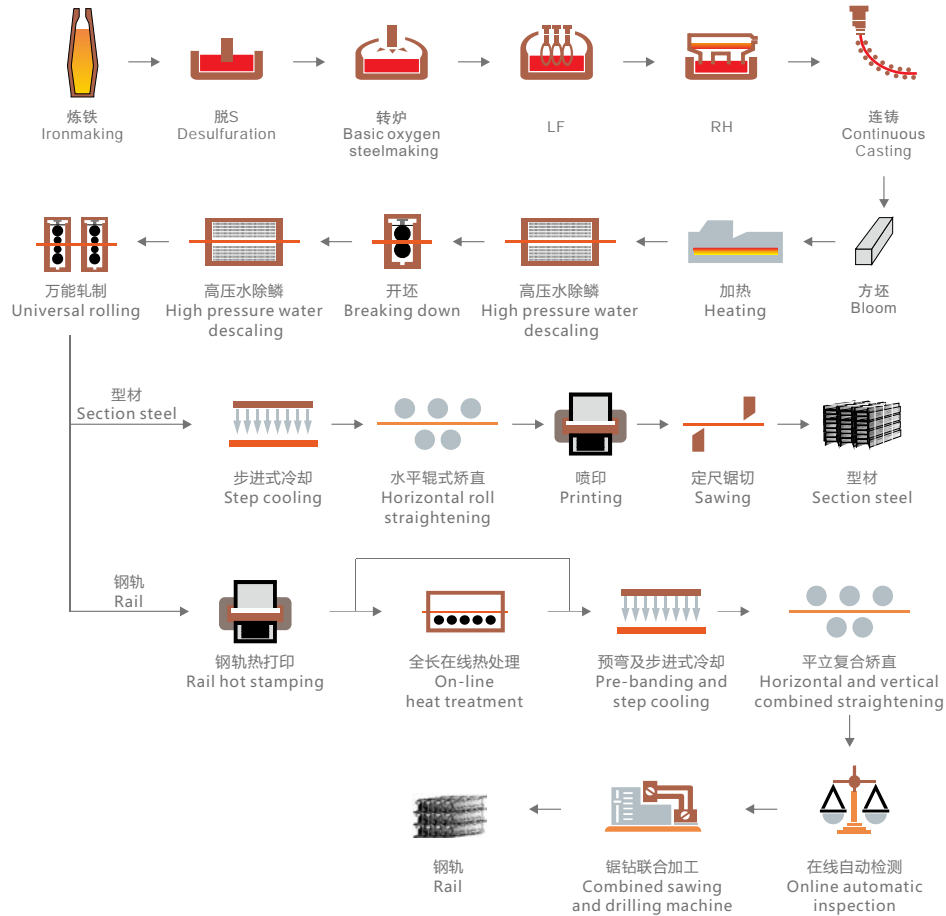
为钢轨及型材产品发放出厂证明

Issue factory certificate for rail and section steel products

高度信息化、集成化的试样加工机床、机器人、拉伸试验机、全自动硬度试验机、金相显微镜等相应设备达到国际领先水平，及时、准确完成钢轨所有检验项目。

The highly informationized and integrated sample processing machine tool, robot, tensile test machine, automatic hardness tester, metallographic microscope and other corresponding equipment have reached the world's leading level, which ensures that all project inspection of rail is completed in time.

工艺流程 Production Process



产品

Product

产品一览表 Product List

品种 Varieties	可供牌号 Available grade	可供型号及规格 Available type and specifications	用途 Application
钢轨 Rail	U71MnG、U75VG、 U71Mn、U75V、U71MnH、 U75VH、U68CuCr、 R320Cr、R350HT、 R350LHT、R370CrHT、 R260、R400HT、HH370、 SS310、900A、900B、WR-A	33kg/m、43kg/m、50kg/m、60kg/ m、60N、75kg/m、75N、59R2、 60R2、UIC54、54E1、UIC60、 60E1、60E2、115RE、R65、 QU80、QU100、QU120、75A、75R、 90A、100A、60AT1	高速铁路、普通铁路、重载铁路、沿 海铁路及隧道、城市轨道交通、起 重机钢轨、铁路道岔 Rails of high speed railways, ordinary rail- ways, heavy haul railways, coastal rail- ways and tunnels, and urban rail transit and crane, railroad switch
钢板桩 Steel sheet pile	WBZ450、 WBZ500、 WBZ550、 WBZ600、 Q390P、SY390	W-III、W-IV PU400×170×15.5	堤防、围堰等防渗止水工程以及挡 土墙、挡水墙、建筑基坑支护等。 Seepage prevention and stop works such as dikes and cofferdams and retaining wall, retaining wall, building foundation pit support etc.
H型钢 H-beam	Q235、Q275、Q355、 Q460NH	HW200×200、HW250×250、 HW300×300、HM250×175、 HM300×200、HM350×250、 HN300×150、HN350×175、 HN400×150、HN400×200	建筑、结构、车辆等 Architecture, structure, vehicle etc.
中低速磁浮铁 路用型钢 Section steel for medium and low speed maglev railway	Q235D、CF235D	轨枕、F型钢	中低速磁浮铁路轨排 Medium and low speed maglev railway track
高导电电极钢 High conductivity electrode steel	DJ008、SAE1006	扁钢 Flat steel	电解铝槽电极 Electrolytic aluminum cell electrode
支护U型钢 U-shaped Steel for support	Q275、Q355、20MnK	25U、29U、36U、40U	巷道支护 Roadway supporting
角钢 Angle steel	Q235、Q355、Q420、Q460	∠18、∠20、∠22、∠25	建筑、车辆结构、输变电铁塔等 Architecture, vehicle structure, trans- mission and transformation tower etc.
工字钢 I-shaped steel	Q235、Q355	25、28、32、36、40、45、50	建筑、结构 Architecture, structure
槽钢 Channel steel	Q235、Q355	25、28、30、32、36、40	建筑、车辆结构 Architecture, vehicle structure
球扁钢 Bulb steel	A、B	20、22、24、27	船用骨架 Skeleton of ships

注：根据用户需求可开发其他规格和牌号的产品。

Note: Products of other standard and grades can be developed according to user demand.

钢轨 Rail

武钢有限拥有近60年钢轨生产历史，是我国重要的钢轨生产基地和全系列轨道用钢解决方案的优质供应商。

可按铁标TB/T2344、TB/T3276以及国标GB2585组织生产各种型号用途的普通铁路和高速铁路用钢轨，单支最长可达100米。同时还可按EN、UIC、BS等国外标准组织生产，满足国际市场需求。

Wuhan Iron and Steel Co.,Ltd., which has a history of 60 years, is one of China's four largest rail production plants.

All kinds of rails of ordinary railways and high speed railways can be produced according to the iron standard TB/T2344, TB/T3276, and the national standard GB2585, each of which can reach the maximum length of 100 meters. Meanwhile, rails can also be produced by foreign standards such as EN, UIC, BS and so on to meet the demand on the international market.

供货技术条件（一） Technical Conditions for Supply I

供货标准 Supply standard	型号 Specification	牌号 Grade	主要化学成分 Main chemistry (%)							
			C	Si	Mn	P	S	V	Cr	Cu
GB2585	43~75kg/m	U71Mn	0.65-0.76	0.15-0.35	1.10-1.40	≤0.030	≤0.030	≤0.030	≤0.15	≤0.15
		U75V	0.71-0.80	0.50-0.80	0.70-1.05	≤0.030	≤0.030	0.04-0.12	≤0.15	≤0.15
TB/T2344.1 TB/T2344.2	43~75kg/m 60N 75N 60AT1	U71Mn	0.65-0.80	0.15-0.58	0.70-1.20	≤0.025	≤0.025	—	≤0.15	≤0.15
		U71MnH	0.65-0.80	0.15-0.58	0.70-1.20	≤0.025	≤0.025	—	≤0.15	≤0.15
		U75V U75VH	0.71-0.80	0.50-0.80	0.75-1.05	≤0.025	≤0.025	0.04-0.12	≤0.15	≤0.15
TB/T2344	43-75kg/m 60N 75N	U71Mn	0.65-0.76	0.15-0.58	0.70-1.20	≤0.030	≤0.025	—	≤0.15	≤0.15
		U75V	0.71-0.80	0.50-0.80	0.75-1.05	≤0.030	≤0.025	0.04-0.12	≤0.15	≤0.15
TB/T3276	60kg/m 60N	U71MnG	0.65-0.75	0.15-0.58	0.70-1.20	≤0.025	≤0.025	≤0.030	≤0.15	≤0.15
		U75VG	0.71-0.80	0.50-0.70	0.75-1.05	≤0.025	≤0.025	0.04-0.08	≤0.15	≤0.15
行业标准 或技术协议 Standard or technical protocol	59R2 60R2 33kg/m	U71Mn	0.65-0.76	0.15-0.58	1.10-1.40	≤0.030	≤0.030	≤0.030	≤0.15	≤0.15
		U75V	0.71-0.80	0.50-0.80	0.70-1.05	≤0.030	≤0.030	0.04-0.12	≤0.15	≤0.15
TJ/WG171	43~75kg/m 60N、75N	U68CuCr	0.60-0.76	0.50-0.80	0.80-1.30	≤0.030	≤0.025	—	0.20-0.60	0.20-0.60
EN13674-1 或技术协议 Or technical protocol	54E1 60E1 60E2 R65	R260	0.62-0.80	0.15-0.58	0.70-1.20	≤0.025	≤0.025	≤0.030	≤0.15	≤0.15
		R320Cr	0.60-0.80	0.50-1.10	0.80-1.20	≤0.020	≤0.025	≤0.18	0.80-1.20	≤0.15
		R350HT	0.72-0.80	0.15-0.58	0.70-1.20	≤0.020	≤0.025	≤0.030	≤0.15	≤0.15
		R350LHT	0.72-0.80	0.15-0.58	0.70-1.20	≤0.020	≤0.025	≤0.030	≤0.030	≤0.15
		R370CrHT	0.70-0.82	0.40-1.00	0.70-1.20	≤0.020	≤0.020	≤0.030	0.40-0.60	≤0.15
		R400HT	0.90-1.05	0.20-0.60	1.00-1.30	≤0.020	≤0.020	≤0.030	≤0.030	≤0.15
UIC860 或技术协议 Or technical protocol	UIC54 UIC60	900A	0.60-0.80	0.10-0.50	0.80-1.30	≤0.040	≤0.040	—	—	—
		900B	0.55-0.75	0.10-0.50	1.30-1.70	≤0.040	≤0.040	—	—	—
BS11 或技术协议 Or technical protocol	75A、75R 90A、100A	WR-A	0.65-0.80	0.10-0.50	0.80-1.30	≤0.040	≤0.040	—	—	—
AREMA或 技术协议	115RE	SS310	0.74-0.86	0.10-0.60	0.75-1.25	≤0.020	≤0.020	≤0.010	≤0.030	—
		HH370	0.74-0.86	0.10-0.60	0.75-1.25	≤0.020	≤0.020	≤0.010	≤0.030	—
YB/T 5055	QU80、QU100 QU120	U71Mn	0.65-0.77	0.15-0.35	1.10-1.50	≤0.035	≤0.035	—	≤0.15	≤0.15

注：交货状态：热处理和热轧。可以根据用户需求，进行成分及性能设计，提供满足用户要求的其它牌号钢轨。

Note: Delivery state: heat treatment and hot rolling. We can design component and performance according to user demand and provide rails of other grades to meet the user demand.

供货技术条件（二） Technical Conditions for Supply II

型号 Specification	尺寸 Dimension (mm)			
	轨高 Height of rail h	轨头宽 Width of rail head b	轨底宽 Width of rail flange b2	轨腰厚 Thickness of rail web s
33kg/m	115	50	130	15
43kg/m	140	70	114	14.5
50kg/m	152	70	132	15.5
60kg/m、60N	176	70.8	150	16.5
75kg/m、75N	192	72	150	20
60AT1	152	70.85	152	44
59R2、60R2	180	113	180	12
UIC54、54E1	159	70	140	16
UIC 60、60E1 60E2	172	72	150	16.5
75A	128.59	61.91	114.3	12.7
75R	128.59	61.91	122.24	13.1
90A	142.88	66.67	127	13.89
100A	152.40	69.85	133.35	15.08
115RE	168.3	69	139.7	15.87
R65	180	75	150	18
QU80	130	80	130	32
QU100	150	100	150	38
QU120	170	120	170	44

截面尺寸允许偏差 Allowable Deviation of Sectional Dimension

普通钢轨尺寸允许偏差 Allowable deviation of ordinary rail dimension

型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	h	b	b2	s	
33kg/m	±0.5	±0.5	±1.5	+0.75 -0.5	
43kg/m, 50kg/m 60kg/m, 60N 75kg/m, 75N	±0.6	±0.5	+1.0 -1.5	+1.0 -0.5	
UIC54、54E1	±0.5	±0.5	+1.5 -1.0	+1.0 -0.5	
UIC 60、60E1 60E2	±0.6				
75A、75R 90A、100A	±0.5	±0.5	±1.0	+1.0 -0.5	
QU80、QU100 QU120	±1.0	+1.0 -2.0	+1.0 -2.0	±1.0	
115RE	±0.8 -0.4	±0.6	±1.0	±1.0 -0.5	
R65	±0.8	±0.5	±1.0 -1.5	±0.8 -0.5	

高速铁路用钢轨尺寸允许偏差 Allowable deviation of rail dimension used for high speed railways

型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	h	b	b2	s	
60kg/m, 60N	±0.6	±0.5	±1.0	+1.0 -0.5	
UIC60、60E1、 60E2	±0.5	±0.5	±1.0	±1.0 -0.5	

道岔用钢轨尺寸允许偏差 Allowable deviation of rail dimension used for railroad switch

型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	h	b	b2	s	
60AT1	±0.6	±0.5	±2.0	+1.0 -0.5	

重载铁路用钢轨尺寸允许偏差 Allowable deviation of rail dimension used for heavy haul railways

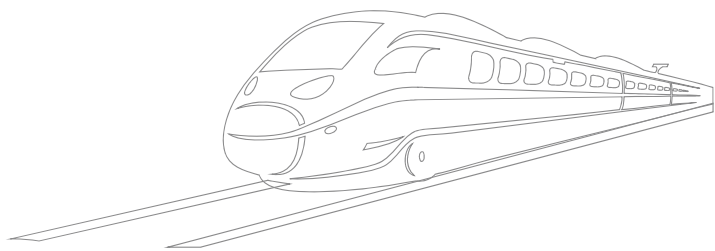
型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	h	b	b2	s	
60kg/m、60N 75kg/m、75N	±0.6	±0.5	+1.0 -1.5	+1.0 -0.5	
UIC60、60E1、 60E2	±0.5 -1.0	±0.6 -0.5	±1.5 -1.0	±1.0 -0.5	

城市轨道交通用槽型钢轨尺寸允许偏差 Allowable deviation of channel rail dimension used for urban rail transit

型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	h	b	b2	s	
59R2、60R2	±1.5	±1	+1 -3	+1 -0.5	

产品主要性能 Product Performance

牌号 Grade	主要性能 Main performance		
	抗拉强度 R _m Tensile strength N/mm ²	伸长率 A Elongation %	轨顶面硬度 Rail top surface hardness HBW10/3000
U71Mn	≥880	≥10	260 ~ 300
U71MnH	≥1080	≥10	320 ~ 380
U75V	≥980	≥10	280 ~ 320
U75VH	≥1180	≥10	340 ~ 400
U68CuCr	≥980	≥10	280 ~ 320
R320Cr	≥1080	≥9	320 ~ 360
R350HT、R350LHT	≥1175	≥9	350 ~ 390
R370CrHT	≥1280	≥9	370 ~ 410
R260	≥880	≥10	260 ~ 300
R400HT	≥1280	≥9	400-440
SS310	≥980	≥10	≥310
HH370	≥1180	≥10	≥370
900A	880 ~ 1030	≥10	260 ~ 300
900B	880 ~ 1030	≥10	260 ~ 300
WR-A	≥880	≥10	260 ~ 300



应用 Applications

武钢有限致力钢轨生产近60年，曾在上世纪七十年代参与了中国最大海外援建项目——坦赞铁路。2008年，武钢有限全面升级轨梁生产设备及工艺，具备了生产高纯净度、高尺寸精度、高表面质量、高平直度钢轨的能力，钢轨最大长度可达100米，满足时速350公里高速铁路的需要。2008年底武钢钢轨通过了铁道部门的上道使用许可，并于2013年9月通过了中铁检验认证中心（CRCC）的认证。

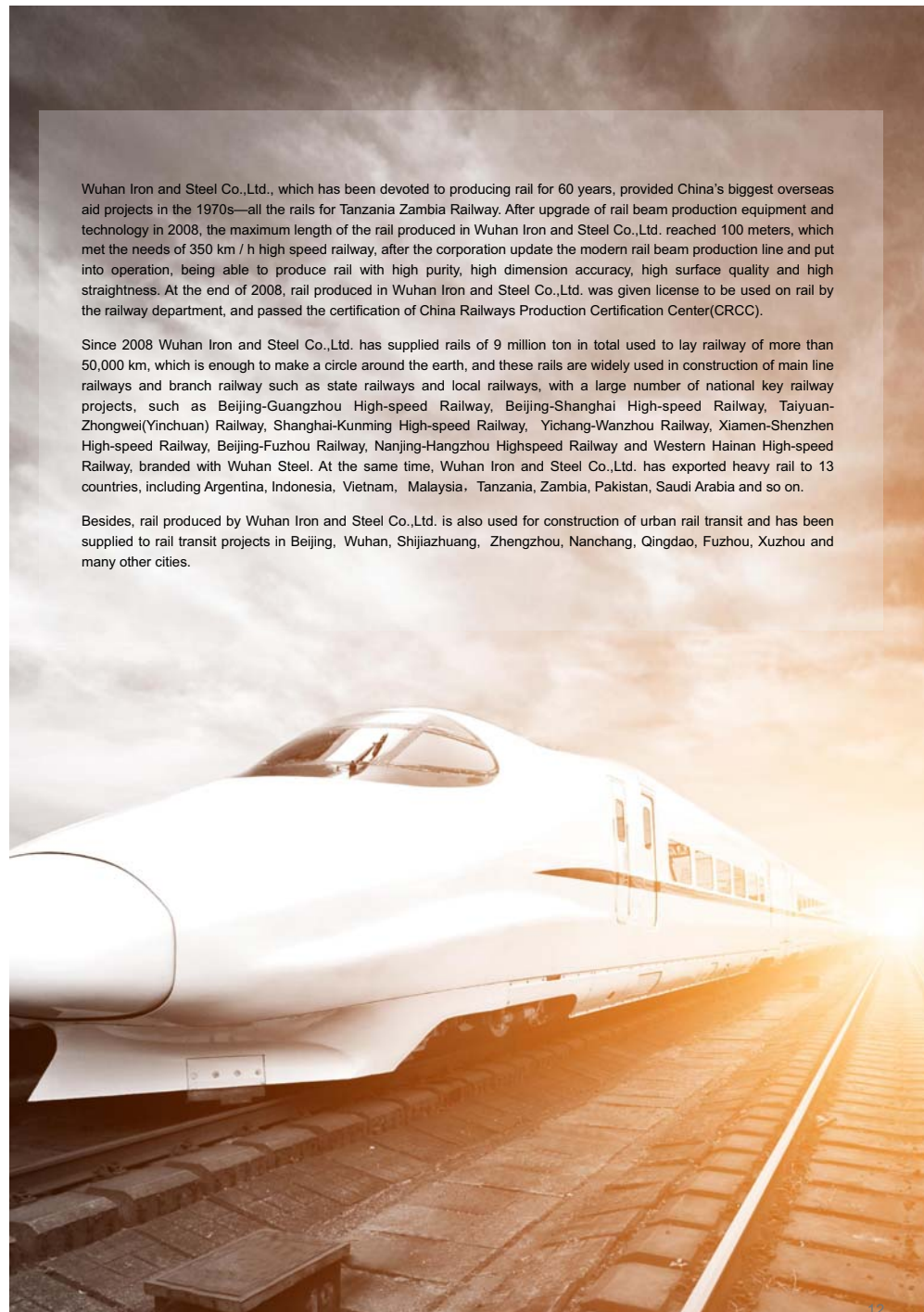
2008年至今武钢有限钢轨供货总量近900万吨，铺设铁路里程5万余公里，足可绕地球一圈。广泛应用于国有铁路、地方铁路等干线铁路和支线铁路建设，一大批国家重点铁路工程如京广高铁、京沪高铁、太中银铁路、沪昆高铁、宜万铁路、厦深高铁、京福铁路、宁杭客专、海南西环等烙上武钢印。同时，武钢钢轨已出口至13个国家，如阿根廷、印度尼西亚、越南、马来西亚、坦桑尼亚、赞比亚、巴基斯坦、沙特阿拉伯等。

此外，武钢有限钢轨还用于城市轨道交通建设，已向北京、武汉、石家庄、长沙、郑州、南昌、青岛、福州、徐州等多个城市的轨道交通项目供货。

Wuhan Iron and Steel Co.,Ltd., which has been devoted to producing rail for 60 years, provided China's biggest overseas aid projects in the 1970s—all the rails for Tanzania Zambia Railway. After upgrade of rail beam production equipment and technology in 2008, the maximum length of the rail produced in Wuhan Iron and Steel Co.,Ltd. reached 100 meters, which met the needs of 350 km / h high speed railway, after the corporation update the modern rail beam production line and put into operation, being able to produce rail with high purity, high dimension accuracy, high surface quality and high straightness. At the end of 2008, rail produced in Wuhan Iron and Steel Co.,Ltd. was given license to be used on rail by the railway department, and passed the certification of China Railways Production Certification Center(CRCC).

Since 2008 Wuhan Iron and Steel Co.,Ltd. has supplied rails of 9 million ton in total used to lay railway of more than 50,000 km, which is enough to make a circle around the earth, and these rails are widely used in construction of main line railways and branch railway such as state railways and local railways, with a large number of national key railway projects, such as Beijing-Guangzhou High-speed Railway, Beijing-Shanghai High-speed Railway, Taiyuan-Zhongwei(Yinchuan) Railway, Shanghai-Kunming High-speed Railway, Yichang-Wanzhou Railway, Xiamen-Shenzhen High-speed Railway, Beijing-Fuzhou Railway, Nanjing-Hangzhou Highspeed Railway and Western Hainan High-speed Railway, branded with Wuhan Steel. At the same time, Wuhan Iron and Steel Co.,Ltd. has exported heavy rail to 13 countries, including Argentina, Indonesia, Vietnam, Malaysia, Tanzania, Zambia, Pakistan, Saudi Arabia and so on.

Besides, rail produced by Wuhan Iron and Steel Co.,Ltd. is also used for construction of urban rail transit and has been supplied to rail transit projects in Beijing, Wuhan, Shijiazhuang, Zhengzhou, Nanchang, Qingdao, Fuzhou, Xuzhou and many other cities.



▼ 京沪高铁 Beijing-Shanghai High-speed Railway

京沪高速铁路，是新中国成立以来一次建设里程长、投资大、标准高的高速铁路，设计时速380公里，是我国铁路重要的“生命线”。

武钢有限以优异的实物质量和良好的服务，为京沪高铁这一中国铁路的标志性工程助力添彩。

Beijing-Shanghai High-speed Railway is an important "lifeline" of China's railway with the longest mileage-building, the largest investment and highest standards of high-speed railway since the founding of China, whose designed speed is 380 km / h.

Wuhan Iron and Steel Co.,Ltd., with its excellent product quality and good service, has the honor to lay rails for the landmark project of the Chinese railway in Beijing-Shanghai High-speed Railway.



▼ 沪昆高铁 Shanghai-Kunming High-speed Railway

沪昆高铁是我国八纵八横快速客运通道重要的“一横”，也是东西向线路里程最长、经过省份最多的高速铁路，设计时速350公里。武钢有限供应钢轨25万吨，占总量的一半。

Shanghai-Kunming High-speed Railway, a cross of China's eight vertical and eight horizontal rapid passenger transport channels, with a designed speed of 350 km / h, is a high-speed railway with the longest mileage and crossing the most provinces among China's East-West routes. Wuhan Iron and Steel Co.,Ltd.supplied rail of 250 thousand tons, covering half of overall length.



▼ 广深港高铁 Guangzhou Shenzhen Hong Kong high-speed railway

广深港高铁是中国“八纵八横”高速铁路网京哈-京港澳通道的重要部分，设计时速为350公里，武钢耐腐蚀钢轨U68CuCr应用于广深港高铁的狮子洋隧道（海洋大气腐蚀环境）中。

Guangzhou Shenzhen Hong Kong high-speed railway is an important part of the Beijing Harbin Beijing Hong Kong Macao channel of China's "eight vertical and eight horizontal" high-speed railway network, with a design speed of 350 kilometers per hour. Corrosion-resistant rail U68CuCr of Wuhan Iron and Steel Co.,Ltd. is applied to the Shiziyang Tunnel (marine atmospheric corrosion environment) of Guangzhou Shenzhen Hong Kong high-speed railway.



▲ 京广高铁 Beijing-Guangzhou High-speed Railway

京广高铁全长2298公里，设计时速350公里，武钢有限供应钢轨14万吨。

Beijing-Guangzhou High-speed Railway is 2298km in length, whose designed speed is 350 km / h. Wuhan Iron and Steel Co.,Ltd. supplied rail of 140 thousand tons.



▲ 宜万铁路 Yichang-Wanzhou Railway

宜万铁路全线桥梁、隧道的总长度约278公里，有34座高风险的岩溶隧道，是我国铁路史上修建难度最大、公里造价最高、历时最长的山区铁路。武钢有限为宜万铁路提供了全部钢轨，完全满足复杂地质条件下的使用要求。

Yichang-Wanzhou Railway, whose total length of the bridge and tunnel is about 278 kilometers, including 34 high risk karst tunnels, is a mountain railway with the most difficult construction, the highest cost per kilometer and the longest elapsed time in the history of our country's construction of railway. Wuhan Iron and Steel Co.,Ltd. supplied the whole rails, which were all qualified for the use under complex geological conditions.

重点铁路工程供货一览(2009-2022) Key railway supply list(2009-2022)

项目名称 Project	铺设公里数 Kilometres of laying	项目名称 Project	铺设公里数 Kilometres of laying
大西客专 Datong-Xi'an Passenger Dedicated Line	533	连盐铁路 Lianyungang-Yancheng Railway	206
赣龙扩能 Ganzhou-Longyan Railway Expansion	508	龙厦铁路 Longyan-Xiamen Railway	160
广珠城际 Guangzhou-Zhuhai Intercity Rail Transit	150	娄邵铁路 Loudi Shaoyang Railway	237
贵广铁路 Guiyang-Guangzhou Railway	838	南广铁路 Nanning-Guangzhou High-speed Railway	688
海南西环 Western Hainan High-speed Railway	638	南龙铁路 Nansanlong Passenger Railway Line	268
汉孝城际 Wuhan- Xiaogan Intercity Railway	116	宁杭客专 Nanjing-Hangzhou High-speed Railway	362
汉宜铁路 Wuhan-Yichang High-speed Railway	569	宁启复线 Nanjing-Qidong Railway	326
杭甬客专 Hangzhou-Ningbo Passenger Dedicated Line	212	厦深铁路 Xiamen-Shenzhen Railway	748
杭长客专 Beijing-Fuzhou High-speed Railway	482	深茂铁路 Shenzhen-Maoming railway	165
京福高铁 Beijing-Fuzhou High-speed Railway	1449	武黄城际 Wuhan-Huangshi High-speed Railway	479
沪昆客专 Shanghai-Kunming High-speed Railway	2054	湘桂扩能 Xiang-Gui railway Expansion	205
怀邵衡铁路 Huaihua-Hengyang Railway	200	向莆铁路 Xiangtang-Putian Railway	1276
京沪高铁 Beijing-Shanghai High-speed Railway	143	新建大冶北至阳新铁路 Newly built Daye North Station-Yangxin railway	128
京广高铁 Beijing-Guangzhou High-speed Railway	1109	渝利铁路 Chongqing-Lichuan Railway	300
九景衢铁路 Jiujiang-Quzhou Express Railway	521	云桂铁路 Nanning-Kunming High-Speed Railway	700
兰渝铁路 Lanzhou-Chongqing Railway	155	宜万铁路 Yichang-Wanzhou Railway	283
蒙华铁路 Inner Mongolia-Jiangxi Railway	1295	昌赣铁路 Nanchang-Ganzhou Railway	820
汉十高铁 Wuhan-Shiyan High-speed Railway	800	郑万、郑阜高铁 Zhengzhou-Wanzhou High-speed Railway Zhengzhou-Fuyang High-speed Railway	940



轨道交通供货一览 Rail transit supply list

项目名称 Project	供货量(吨) Supply (ton)	项目名称 Project	供货量(吨) Supply(ton)
北京地铁 Beijing Metro	1100	福州地铁 Fuzhou Metro	2000
武汉地铁 Wuhan Metro	80000	徐州地铁 Xuzhou Metro	8500
武汉有轨电车 Wuhan Tram	10000	南京地铁 Nanjing Metro	10230
石家庄地铁 Shijiazhuang Metro	9835	清远磁浮 Qingyuan Maglev Express	8000
长沙磁浮 Changsha Maglev Express	5000	黄石有轨电车 Huangshi Tram	7500
郑州地铁 Zhengzhou Metro	10000	合肥地铁 Hefei Metro	4300
南昌地铁 Nanchang Metro	9000	武夷山有轨电车 Wuyi Mount Tram	7500
青岛地铁 Qingdao Metro	3000	凤凰磁浮 Fenghuang Maglev Express	4000

钢板桩 Steel Sheet Pile

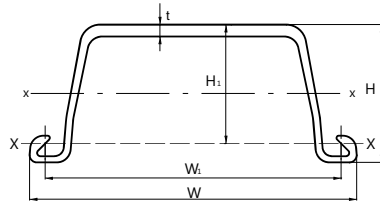
钢板桩是一种边部带有锁口的复杂断面型钢，可通过锁口自由组合形成一种连续紧密的钢结构墙体，用来挡土、挡水和防护，广泛应用于房屋建筑、码头建设、桥梁建造、堤防工程、闸门以及抗洪抢险等临时或永久性结构。

Steel sheet pile, a complex section steel with an edge with a lock, is a steel structure wall of a continuous tight can be formed by the free combination of the lock. It is widely used in permanent or temporary structure, such as house building, wharf construction, bridge construction, embankment engineering, sluice gate and fighting a flood and rescuing, etc.

可供型号、供货标准及用途 Available Model, Supply Standard and Application

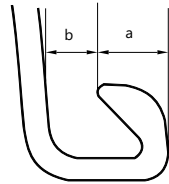
型号 Specification	供货标准 Supply standard	用途 Application
3#桩 (W-III) 3#pile (W-III)	GB/T 20933 Q/WG (DX) 20 JIS A 5528	适用于堤防加固、截流围堰等防渗止水工程以及挡土墙、挡水墙、建筑基坑支持等结构基础工程。 It is used in structural engineer such as building structure, retaining wall, protective wall, building foundation pit support, et.
4#桩 (W-IV) 4#pile (W-IV)		

截面形状 Profile



钢板桩截面示意图

U-shaped steel sheet pile cross-section diagram



钢板桩锁口示意图

Steel sheet pile lock diagram

截面面积及特性 Section Area and Characteristic

型号 Specification	规格尺寸 Specifications mm	理论重量 Theoretical weight kg/m	单根材 Single		
			截面积 Sectional area cm ²	惯性矩(I _x) Moment of inertia cm ⁴	截面模量(W _x) Section modulus cm ³
W-IIIa	400×125×13.0	60.0	76.42	2220	223
W-IIIb	400×150×13.1	58.4	74.40	2790	250
W-IV	400×170×15.5	76.1	96.99	4670	362

化学成分 (Wt%) Chemical Composition

牌号 Grade	C	Si	Mn	S	P	N
WBZ450	≤0.22	≤0.55	≤1.50	≤0.035	≤0.035	≤0.011
WBZ500	≤0.24	≤0.55	≤1.60	≤0.035	≤0.035	≤0.011
WBZ550	≤0.26	≤0.60	≤1.70	≤0.035	≤0.035	≤0.011
WBZ600	≤0.27	≤0.60	≤1.70	≤0.035	≤0.035	≤0.011
Q390P	≤0.20	≤0.50	≤1.70	≤0.035	≤0.035	≤0.011
SY390	-	-	-	≤0.040	≤0.040	-

尺寸及外形允许偏差 Allowable Deviation of Size and Shape

项目 Item	允许偏差 Tolerance
有效宽度 (W _i) Effective width (W _i)	W _i ≤ 500mm +2.0%W _i -1.5%W _i
有效高度 Effective height (H _i)	±4%H _i
腹板厚度 (t) Web thickness (t)	< 10mm 10 ~ < 16mm ±1.0 mm ±1.2 mm
长度 Length	+200 mm 0
侧弯 Lateral bending	≤ 10000mm > 10000mm 局部 Part ≤ 0.12%L ≤ 0.10%L+2mm ≤ 5/1000
翘曲 Warping	≤ 10000mm > 10000mm 局部 Part ≤ 0.25%L ≤ 0.20%L+5mm ≤ 5/1000
扭曲 Twisting	≤ 2%L, 但不超过 50mm ≤ 2%L, but no more than 50mm
端面斜度 End slope	≤ 4%W _i
锁口 Lock	4 ≤ a-b ≤ 10

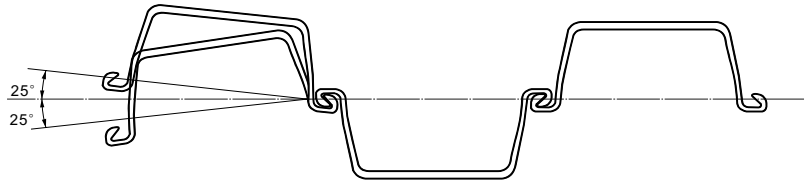
力学性能 Mechanical Property

牌号 Grade	R _{el} MPa	R _m MPa	A %
WBZ450	≥ 240	≥ 450	≥ 23
WBZ500	≥ 295	≥ 500	≥ 17
WBZ550	≥ 390	≥ 550	≥ 16
WBZ600	≥ 420	≥ 600	≥ 15
Q390P	≥ 390	≥ 490	≥ 20
SY390	≥ 390	≥ 490	≥ 20

最大转动角度 Maximum Rotation Angle

咬合时的最大转动角度如下:

The maximum rotation angle of steel sheet piles is as follows:



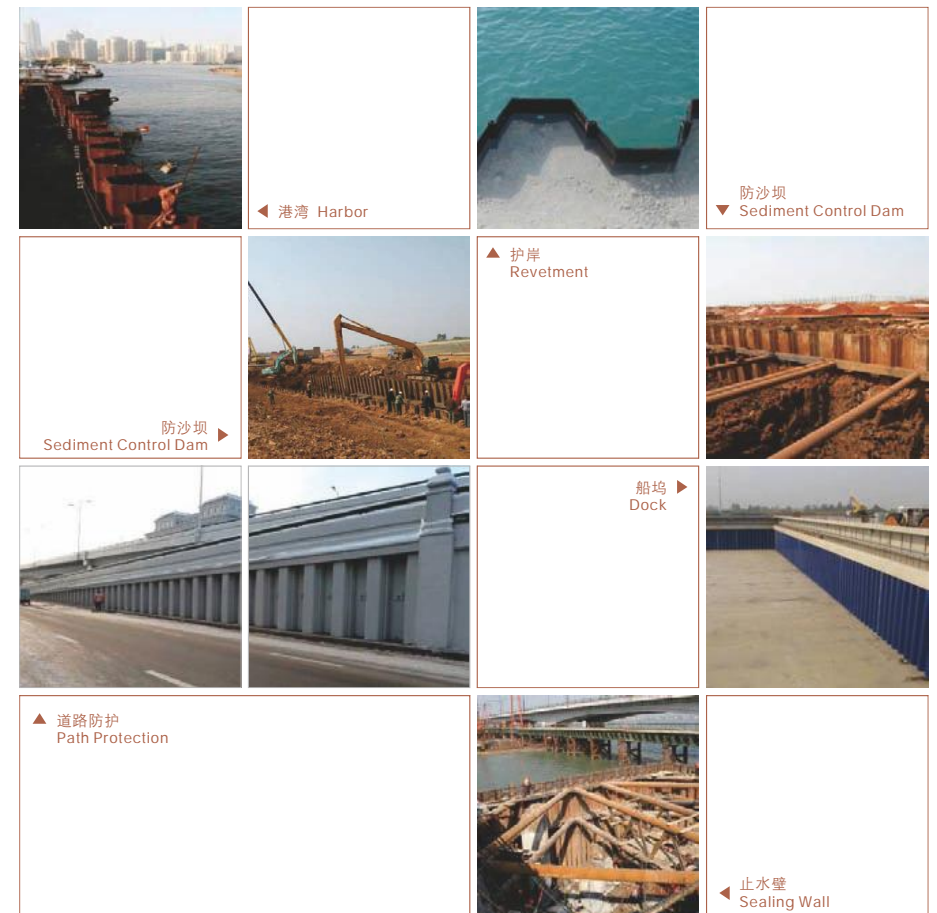
产品特点及用途 Features and Uses

<p>主要特点 Main features</p>	<p>强度高、重量轻、止水性能好；经久耐用，并可重复使用，减少钢材用量；施工简便、易于操作，可大大提高作业效率，尤其适宜洪水、塌方、塌陷等抢险救灾；作业空间要求小，适应性强，不受天气条件制约，因而施工安全系数高。</p> <p>It has high strength, light weight, good water stop performance. With its strong durability and long service life, it can be used for many times, so the steel usage would be decreased. The construction is simple and easy to operate, which can greatly improve the efficiency of operation, especially in the work after flood, collapse, subsidence and flow sand. When using it, the workspace requirement is small, and the adaptability is strong, the use of it is free from weather conditions, so it has high safety factor of construction.</p>
<p>主要用途 Uses</p>	<p>广泛应用于房屋建筑、码头建设、桥梁建造、堤防工程、闸门以及抗洪抢险等临时或永久性结构。</p> <p>It is widely used in permanent or temporary structure, such as house building, wharf construction, bridge construction, embankment engineering, sluice gate and fighting a flood and rescuing, and so on.</p>

应用 Applications

武钢有限自主研发生产的热轧钢板桩已成功应用于武汉东湖隧道工程、武汉二七长江大桥、沈阳汽博大桥、武汉严西湖大桥等大型建设项目的围堰工程。

Hot rolled U-shaped steel sheet pile, developed and produced by Wuhan Iron and Steel Co.,Ltd. independently, has been used in cofferdam project of large construction project such as East Lake Tunnel Project, Wuhan Two-Seven Yangtze River Bridge, Shenyang Qibo Bridge and Wuhan Yanxihu Bridge.



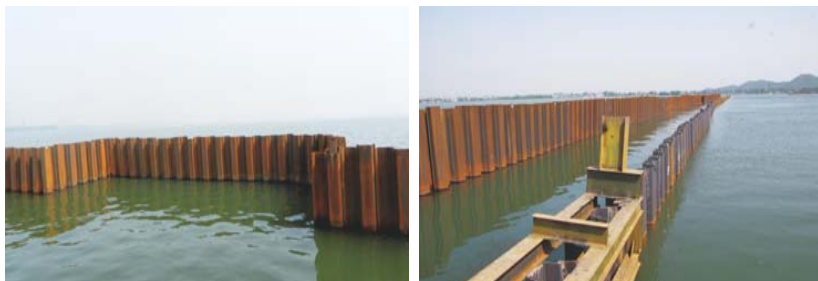
▼ 长江二七大桥工程 Wuhan Two-Seven Yangtze River Bridge

该工程通过打桩围成面积约为150m²的基坑。

The project made a foundation pit with an area of 150m² by piling.



▼ 东湖隧道工程 East Lake Tunnel Project



东湖隧道工程是武汉市政的一项重点工程，全长10.6公里，全线采用“桥-隧-隧-路”组合形式建设，工程设计采用钢板桩进行围堰支护，“围堰明挖”方式，大量采用15、18米长钢板桩。

East Lake Tunnel Project is a key project of Wuhan Municipal Administration, whose overall length is 10.6km, and the combination of bridge - tunnel - tunnel - road is used in the construction of the whole line. In engineering design, steel sheet piles are used for cofferdam support and "cofferdam open cut" mode used a large number of steel sheet piles of 15m and 18m in length.



▲ 沈阳汽博大桥桥墩围堰工程 Pier Cofferdam Project of Shenyang Qibo Bridge

沈阳汽博大桥为沈阳四环线标志性工程，施工需在水中进行，对钢板桩的止水性能要求较高。桥墩建设过程中，通过打桩将定长为12m的钢板桩围成数个长宽约60×15m的基坑。

Shenyang Qibo Bridge is the landmark project of Shenyang Fourth Ring Road. Because the construction needed to be carried out in water, waterproof capability of steel sheet pile was highly demanded. During the pier construction, The project used steel sheet piles with a fixed length of 12m to make many foundation pits of 60 x 15m in length and width by piling.

▼ 武汉四环线汉江大桥桥墩围堰工程 Pier Cofferdam Project of Wuhan Fourth Ring Road Hanjiang River Bridge

武汉四环线汉江大桥工程是武汉四环线交通的主要通道，桥墩围堰支护均采用18米长钢板桩。

The project of Wuhan Fourth Ring Road Hanjiang River Bridge is the main channel of Wuhan Fourth Ring Road traffic, and pier cofferdam support adopted 18-meter-long steel sheet pile.



中低速磁浮铁路用型钢 Section Steel for Medium and Low Speed Maglev Railway

与普通城市轨道交通相比，磁浮铁路具有速度快、爬坡能力强、运行噪音小、安全舒适等显著优点，且运行能耗低、污染小；同时其建设成本低、投资少。

为助力我国磁浮铁路发展，武钢有限自主开发了中低速磁浮铁路用H型轨枕和F型轨道，成为国内首家可提供全套中低速磁浮铁路轨排用钢的供应商。产品尺寸精度高、强韧性匹配及低温冲击性能良好，完全满足工程对钢材质量要求。

Compared with ordinary urban rail transit, maglev railway has many advantages, such as fast speed, strong climbing ability, low running noise, safety and comfort, no fuel and less pollution. It also has the superiority of low investment and low construction cost.

H-shape sleeper steel and F-shape rail for Section steel for medium and low speed maglev railway was developed independently by Wuhan Iron and Steel Co.,Ltd. for the purpose of assisting the development of maglev railway. Wuhan Iron and Steel Co.,Ltd. is the only supplier that can provide a full range of medium and low speed maglev railway materials in China. The product, with high dimension accuracy, strong toughness matching and good performance at low temperature impact, fully meets the technical requirements of engineering design.

供货技术条件 Technical Conditions for Supply

牌号 Grade	型号 Specification	供货标准 Supply standard	截面示意图 Schematic diagram of section
Q235D	H型轨枕 H-shaped sleeper	技术协议 Technical agreement	
CF235D	F型钢 F-shaped steel	技术协议 Technical agreement	

化学成分 (Wt%) Chemical Composition

牌号 Grade	C	Si	Mn	S	P	Als
Q235D	≤0.17	≤0.35	≤1.40	≤0.035	≤0.035	≤0.015
CF235D						

力学性能 Mechanical Property

牌号 Grade	R _{eL} MPa	R _m MPa	A %
Q235D	≥235	370-500	≥26
CF235D			

应用 Applications

长沙火车站——黄花机场磁浮铁路是我国首条拥有完全自主知识产权的中低速磁浮项目，全长18.5公里，设计列车最高时速120公里，为普通城市轨道交通的1.5倍。其轨枕均由武钢有限提供。

Changsha Maglev Express from Changshanan Railway Station to Huanghua International Airport is the first medium and low speed maglev project with full proprietary intellectual property rights in china. The whose overall length is 18.5km, and designed maximum speed is 120km/h, half higher than the speed of ordinary urban rail transit. All of its tracks are supplied by Wuhan Iron and Steel Co.,Ltd.



广东清远磁浮铁路是我国首条磁浮旅游专线，开创了磁浮交通和主题旅游的新模式，项目全长38公里，列车设计时速120公里，轨道结构采用的F型钢全部由武钢有限提供。

Guangdong Qingyuan maglev railway is the first maglev tourism special line in China, which has created a new mode of maglev transportation and theme tourism. The project is 38 kilometers long, the design speed of the train is 120km / h, and the F-shaped steel used in the track structure is all provided by Wuhan Iron and Steel Co.,Ltd.



湖南凤凰磁浮铁路无缝衔接张吉怀高铁，线路全长11.2公里，列车设计时速100公里，具有快启快停、大长坡道的运行特点，轨道结构采用的F型钢由武钢有限提供。

Hunan Fenghuang maglev railway seamlessly connects zhangjihuai high-speed railway, with a total length of 11.2 kilometers and a design speed of 100km / h. It has the characteristics of fast start and stop and large and long ramp operation. The F-shaped steel used in the track structure is provided by Wuhan Iron and Steel Co., Ltd.



H型钢 H-shaped Steel

H型钢是由工字钢优化发展而成的一种经济断面型材，其截面面积分配更加合理，具有重量轻、承载能力大、抗弯性能好等优点；构造简洁，可直接拼装组合形成构件，易于施工。广泛用于厂房、高层建筑、桥梁、船舶以及大型起重运输机械等大型建造领域。

H-shaped steel is a kind of economic section beam derived from I-shaped steel. The distribution of section area of H-shaped steel is more optimized. It has the advantages of light weight, good compression and bending resistance, large bearing capacity, etc. It is convenient to construct and can be directly assembled and combined into components. H-shaped steel is widely used in the field such as factory buildings, high rise building, bridge, ship, lifting transport machinery and so on.

代表型号供货技术条件 Technical Conditions for Supply of Representative Model

型号 Specification	主要尺寸 Main dimension (mm)				供货标准 Supply standard
	高度 Height H	翼缘宽 Flange width B	腰厚 Waist thickness t1	翼缘厚 Flange thickness t2	
HW200×200	200	200	8	12	GB/T11263
	200	204	12	12	
HW250×250	244	252	11	11	
	250	250	9	14	
HW300×300	250	255	14	14	
	294	302	12	12	
HM250×175	300	300	10	15	
	300	305	15	15	
HM300×200	244	175	7	11	
HM600×300	294	200	8	12	
HN300×150	582	300	12	17	
	298	149	5.5	8	
HN350×175	300	150	6.5	9	
	346	174	6	9	
HN400×150	350	175	7	11	
	400	150	8	13	
HN400×200	396	199	7	11	
	400	200	8	13	

产品特点及用途 Features and Uses

主要特点 Main features	H型钢的翼缘宽，侧向刚度大，抗弯能力强，比相同高度工字钢增加 5 ~ 10%；所成构件结构稳定，抗自然灾害能力强；自重轻，钢材用量小，可有效降低工程成本；易于施工和拆除再利用；构造简洁，可灵活设计，外形美观。
	H-shaped steel has wide flange, large lateral stiffness, and strong bending resistance that is 5 ~ 10% stronger than I-shaped steel of the same height. It's stable structure and strong ability can resist natural disasters. Light weight and low steel consumption can effectively reduce costs. Simple construction can save manpower and material resources, and easy to dismantle and reuse. It has a succinct construction, flexible in design and beautiful in appearance.

截面尺寸允许偏差 Allowable Deviation of Sectional Dimension

项目 Item	允许偏差 Allowable deviation mm	截面示意图 Schematic diagram of section
高度 Height H	< 400	±2.0
	≥400 ~ < 600	±3.0
宽度 Width B	< 100	±2.0
	≥100 ~ < 200	±2.5
	≥200	±3.0
厚度 Thickness t1, t2	< 5	±0.7
	≥5 ~ < 16	±1.0
	≥16 ~ < 25	±1.5
翼缘斜度 Flange slope T	(型号) 高度 ≤ 300 (Model) Height ≤ 300	T ≤ 1.0%B
	(型号) 高度 > 300 (Model) Height > 300	T ≤ 1.2%B
弯曲度 Curvature	(型号) 高度 ≤ 300 (Model) Height ≤ 300	≤ 长度的 0.15% Less than the length of the 0.15%
	(型号) 高度 > 300 (Model) Height > 300	≤ 长度的 0.10% Less than the length of the 0.10%
中心偏差 Center deviation S	(型号) 高度 ≤ 300 或宽度 ≤ 200 (Model) Height ≤ 300 or width ≤ 200	±2.5
	(型号) 高度 > 300 或宽度 > 200 (Model) Height > 300 or width ≤ 200	±2.5
端面斜度 End slope e	e ≤ 1.6% × (H 或 B) e ≤ 1.6% × (H or B)	适用于上下、左右大弯曲 Suitable for large upper and lower bending and left and right bending

产品特点及用途 Features and Uses

主要用途 Application	H型钢广泛应用于工业厂房、高层建筑、桥梁、船舶、石油平台、起重运输机械、铁路车辆、设备基础、支架以及市政工程、基础桩等领域。由于塑性好，结构稳定性高，抗自然灾害力强，所以特别适用于地震多发地带的建筑结构。
	H-shaped steel is widely used in industrial buildings, high-rise buildings, bridges, ships, oil platforms, hoisting and transporting machinery, railway vehicles, equipment base, support, municipal engineering, foundation pile and other fields. Because of its good plasticity, high structural stability and strong ability to resist natural disasters, it is especially qualified for construction structure in earthquake-prone areas.

支护用U型钢 U-shaped Steel for Support

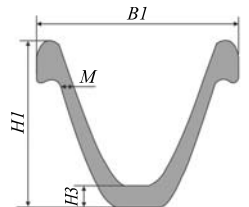
支护用U型钢具有承受压力大，支撑时间长，易安装不易变形等特点，主要用于矿井巷道、矿井巷道二次支护以及穿山隧道的支撑支护等。支护用U型钢的使用，可以显著提高巷道安全系数，降低维修率，从而显著降低支护成本。武钢支护用U型钢工艺成熟，产品质量稳定。

U-shaped steel for support, characterized by bearing high pressure, long supporting time, easy installation, and non-deforming, is mainly used in mine laneways, secondary support in mine laneways and bracing and support of tunnels through the hill. The use of U-shaped steel for support can greatly improve the safety factor of laneway and reduce the maintenance rate to greatly reduce the cost of support. Wuhan Iron and Steel Co., Ltd. has mature process of U-shaped steel for support, and the products have stable quality.

供货技术条件 Supply Technical Conditions

型号 Specification	主要尺寸 Main dimension mm				供货标准 Supply standard
	高度 Height h	外开口 External opening B1	底厚 Bottom thickness H3	立腿厚 Leg thickness M	
25U	110	135	15	6.3	GB/T4697
29U	124	150.5	16	7.2	
36U	138	171	17	7.8	
40U	141.9	171	20.2	8.5	

截面尺寸允许偏差 Allowable Deviation of Sectional Dimension

型号 Specification	允许偏差 Allowable deviation (mm)				截面示意图 Schematic diagram of section
	H1	B1	H3	M	
25U	+1.0 -1.5	+1.0 -3.0	+0.5 -1.0	+0.8 -0.5	
29U	+1.0 -1.5	+1.0 -3.0	+0.5 -1.2	+0.8 -0.5	
36U	± 1.5	+2.0 -3.0	± 1.0	+0.8 -0.5	
40U	± 2.5	+2.0 -3.0	± 1.0	+0.8 -0.5	

产品特点、用途及使用注意事项 Features, Uses and Precautions for Use

主要特点 Main features	<p>支护用 U 型钢具有承受压力大，支撑时间长，易安装不易变形等特点，武钢有限 25 号支护用 U 型钢是国内独家产品。</p> <p>U-shaped steel for support has the characteristics of bearing high pressure, long supporting time, easy installation, and non-deforming. 25# U-shaped Steel for support produced by Wuhan Iron and Steel Co., Ltd. is domestic exclusive products.</p>
主要用途 Uses	<p>支护用 U 型钢主要用于矿山巷道支撑，新型的 25 号支护 U 型钢按照德国 DIN 标准开发，产品具有锁紧装置，用于制作深井煤矿拱形支架，安全可靠。</p> <p>U-shaped Steel for support is mainly used for mine roadway support. The new 25# U-shaped Steel for support was developed according to the German DIN standard, and has a locking device, so it is safe and reliable to be used for making arch support of deep well coal mine.</p>
使用注意事项 Precautions for use	<p>支护用 U 型钢不能用冲床加工为拱形支架。</p> <p>U-shaped Steel for support cannot be made into arch support with puncher.</p>

热轧等边角钢 Hot Rolled Equilateral Angle Steel

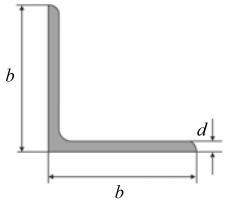
角钢属建造用碳素结构钢，是简单断面的型钢钢材，在使用中要求有较好的可焊性、塑性变形性能及一定的机械强度。按结构的不同需要组成各种受力构件，也可作构件之间的连接件。广泛地用于各种建筑结构和工程结构，如房梁、桥梁、输电塔、起重运输机械、船舶、工业炉、反应塔、容器架、电缆沟支架、动力配管、母线支架安装、以及仓库货架等。

Angle steel, carbon structural steel for construction, is simple section steel. When used, it is required to have better weldability, plastic deformation performance and certain mechanical strength. According to the different needs of structure, a variety of stress components can be made, and it can also be used as a connecting member between components. It is widely used in all kinds of structure of architecture and engineering, such as housing beams, bridges, transmission towers, hoisting and transporting machinery, ships, industrial furnaces, reaction towers, container shelves, cable trench supports, power piping, installation of bus structure, and warehouse shelves.

供货技术条件 Supply Technical Conditions

型号 Specification	主要尺寸 Main dimension (mm)		供货标准 Supply standard	
	边长 Length of a side b	边厚 Thickness of a side d		
18	180	12	GB/T706	
		14		
		16		
		18		
20	200	14		
		16		
		18		
		20		
22	220	24		
		16		YB/T 4163 GB/T706 武钢技术协议
		18		
		20		
25	250	22		
		24		
		26		
		28		
		30		
		32		
		35		

截面尺寸允许偏差 Allowable Deviation of Sectional Dimension

项目 Item	允许偏差 (mm) Allowable deviation	截面示意图 Schematic diagram of section
边宽度 (b) Length of a side	≤56	
	> 56-90	
	> 90-140	
	> 140-200	
	> 200	
边厚度 (d) Thickness of a side	≤56	
	> 56-90	
	> 90-140	
	> 140-200	
	> 200	

产品特点、用途及使用注意事项 Features, Uses and Precautions for Use

主要特点 Main features	武钢有限等边角钢工艺成熟，质量稳定，实测精度高于相关标准规定，表面光洁、化学成分稳定、机械性能可靠、焊接性能良好。 Equilateral angle steel process of Wuhan Iron and Steel Co., Ltd. is mature, and the produced angle steel has stable quality and chemical composition, reliable mechanical properties, good welding performance and smooth surface, whose measurement accuracy is higher than the relevant standards.
主要用途 Uses	角钢主要用于制作输电线路铁塔、微波中转站铁塔、建筑施工吊车塔身、电梯支架等。武钢有限角钢制造的铁塔已打入国际市场。 Angle steel is mainly used to make transmission line tower, microwave transfer station tower, tower crane body and elevator bracket etc. Angle steel of Wuhan Iron and Steel Co., Ltd. have successfully entered the international market.
使用注意事项 Precautions for use	铁塔在极端条件气候条件如低温、高温、高盐碱使用时，建议选用耐候钢。 Please choose weathering resistant steel if the tower is used under extreme climate conditions such as low temperature, high humidity, high salt and alkali.

工槽钢 I-shaped & Channel Steel

工字钢和槽钢产品具有较高的抗拉强度和韧性，在高层建筑、桥梁等钢结构中具有良好的冷弯性能和焊接性能，断面尺寸、表面质量控制良好，广泛用于车辆制造、大型桥梁的建造、机械制造、工业厂房构件等众多行业。

I-shaped steel and channel steel have high tensile strength and toughness. When used in steel structures such as high rise buildings and bridges, they have good cold bending and welding performance, and good control of section size and surface quality, so they are widely used in many industries such as vehicle manufacturing, construction of large bridges, machinery manufacturing and industrial building components.

工字钢供货技术条件 Technical Conditions for Supply of I-shaped Steel

型号 Specification	主要尺寸 Main dimension mm			供货标准 Supply standard
	高度 Height h	腿宽 Leg thickness b	腰厚 Waist thickness d	
25a	250	116	8.0	GB/T706
25b	250	118	10.0	
28a	280	122	8.5	
28b	280	124	10.5	
32a	320	130	9.5	
32b	320	132	11.5	
32c	320	134	13.5	
36a	360	136	10.0	
36b	360	138	12.0	
36c	360	140	14.0	
40a	400	142	10.5	
40b	400	144	12.5	
40c	400	146	14.5	
45a	450	150	11.5	
45b	450	152	13.5	
45c	450	154	15.5	
50a	500	158	12.0	
50b	500	160	14.0	
50c	500	162	16.0	

工字钢截面尺寸允许偏差 Allowable Deviation of Sectional Dimension of I-shaped Steel

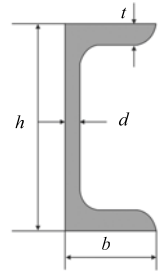
项目 Item	允许偏差 Allowable deviation (mm)	截面示意图 Schematic diagram of section
高度 Height h (mm)	< 100	
	100 ~ < 200	
	200 ~ < 400	
	≥ 400	
腿宽度 Leg thickness b (mm)	< 100	
	100 ~ < 150	
	150 ~ < 200	
	200 ~ < 300	
	300 ~ < 400	
腰厚度 Waist thickness d (mm)	≥ 400	
	< 100	
	100 ~ < 200	
	200 ~ < 300	
	300 ~ < 400	
≥ 400		

槽钢供货技术条件 Technical Conditions for Supply of Channel Steel

型号 Specification	尺寸 Dimension (mm)			供货标准 Supply standard
	高度 Height h mm	腿宽度 Leg thickness b mm	腰厚度 Waist thickness d mm	
25a	250	78	7.0	GB/T706
25b	250	80	9.0	
25c	250	82	11.0	
28a	280	82	7.5	
28b	280	84	9.5	
28c	280	86	11.5	
32a	320	88	8.0	
32b	320	90	10.0	
32c	320	92	12.0	
36a	360	96	9.0	
36b	360	98	11.0	
36c	360	100	13.0	
40a	400	100	10.5	
40b	400	102	12.5	
40c	400	104	14.5	

槽钢截面尺寸允许偏差 Allowable Deviation of Sectional Dimension of Channel Steel

项目 Item	允许偏差 Allowable deviation (mm)	截面示意图 Schematic diagram of section
高度 Height h (mm)	< 100	± 1.5
	100 ~ < 200	± 2.0
	200 ~ < 400	± 3.0
	≥ 400	± 4.0
腿宽度 Leg thickness b (mm)	< 100	± 1.5
	100 ~ < 150	± 2.0
	150 ~ < 200	± 2.5
	200 ~ < 300	± 3.0
	300 ~ < 400	± 3.5
	≥ 400	± 4.0
腰厚度 Waist thickness d (mm)	< 100	± 0.4
	100 ~ < 200	± 0.5
	200 ~ < 300	± 0.7
	300 ~ < 400	± 0.8
≥ 400	± 0.9	



造船用球扁钢 Bulb Steel For Ship Building

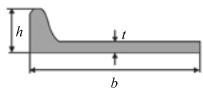
造船用球扁钢是造船业的专用产品，主要用于远洋、沿海、内河各种船舶船体肋骨和边水仓等主要部位。

Bulb steel for ships, selected products of ship building industry, is special steel used in the main parts of ocean, coastal and inland ship hull ribs and dibholes on the edges.

供货技术条件 Technical Conditions for Supply

型号 Specification	主要尺寸 Main dimension mm			供货标准 Supply standard
	宽度 Width b	高度 Height h	厚度 Thickness t	
20a	200	44	10	LR、GL、ABS、DNV、 BV、CCS 等船规 GB/T9945
20b	200	46	12	
22a	220	48	11	
22b	220	50	13	
24a	240	52	12	
24b	240	54	14	
27a	270	55	12	
27b	270	57	14	

截面尺寸允许偏差 Allowable Deviation of Sectional Dimension

型号 Specification	允许偏差 Allowable deviation (mm)			截面示意图 Schematic diagram of section
	b	h	t	
20	± 2.0	± 0.8	+0.4 -0.6	
22	± 2.5	± 0.95		
24	± 2.5	± 0.95		
27	± 2.5	± 0.95		

产品特点及用途 Features and Uses

主要特点 Main features	<p>武钢有限生产的造船用球扁钢从 1981 年起已经通过中国、德国、英国、挪威、美国、法国船级社认可。该产品成分稳定，实物质量可靠，尤其是执行国际先进水平的标准后，用户减少了由于高度差和表面缺陷的修磨量。同时对包装进行了改进，减少了运输造成的损伤，提高了使用寿命，深受各船厂的欢迎。</p> <p>Bulb steel for ship building produced by Wuhan Iron and Steel Co., Ltd. has been approved by China, Germany, the United Kingdom, Norway, the United States and the French ship classification society since 1981. The product has stable composition and reliable physical quality. Especially after the implementation of the standards of the advanced international level, users have reduced the grinding allowance due to height difference and surface defect. Meanwhile, packing was improved and then it has been warmly welcomed by shipyards because the damage caused by transportation was reduced and the service life was improved.</p>
主要用途 Uses	<p>该产品是各种船舶船体肋骨和边水仓等主要部位的专用钢材。大量用于上海江南造船厂、上海沪东造船厂、武汉造船厂等造船企业。</p> <p>The product, special steel used in the main parts of hull ribs of all kinds of ships and dibholes on the edges, is largely used in Shanghai Jiangnan Shipyard, Shanghai Hudong Shipyard, Wuhan shipyard and other shipbuilding enterprises.</p>

高导电电极钢 High conductivity electrode steel

电极用钢主要用于建设电解铝用槽，电极钢作为电解槽的电极通过电流对氧化铝进行电解成纯铝，具有低电阻率、低能耗的特点，武钢有限电极用钢工艺成熟、产品质量稳定。

Electrode steel is mainly used to build electrolytic cells for electrolytic aluminum. As the electrode of the electrolytic cell, electrode steel electrolyzes alumina into pure aluminum through current, which has the characteristics of low resistivity and low energy consumption.

供货技术条件 Technical Conditions for Supply

牌号 Grade	型号 Specification	供货标准 Supply standard	截面示意图 Schematic diagram of section
DJ008 SAE1006	扁钢 Flat steel	技术协议 Technical agreement	

化学成分 (Wt%) Chemical Composition

牌号 Grade	C	Si	Mn	S	P
DJ008	≤0.008	≤0.006	≤0.03	≤0.03	≤0.012
SAE1006	≤0.06	≤0.05	≤0.4	≤0.02	≤0.025

产品特点及用途 Features and Uses

主要特点 Main features	<p>电极用钢主要用于建设电解铝用槽，电极钢作为电解槽的电极通过电流对氧化铝进行电解成纯铝，具有低电阻率、低能耗的特点，武钢有限电极用钢工艺成熟、产品质量稳定。</p> <p>Electrode steel is mainly used to build electrolytic cells for electrolytic aluminum. As the electrode of the electrolytic cell, electrode steel electrolyzes alumina into pure aluminum through current, which has the characteristics of low resistivity and low energy consumption. Wuhan Iron and Steel Co., Ltd. has mature technology and stable product quality.</p>
主要用途 Uses	<p>主要用于建设电解铝用槽。</p> <p>It is mainly used for the construction of electrolytic cells for electrolytic aluminum.</p>

履带钢 Crawler steel

履带钢用于制造工程机械底盘履带系统，主要应用于挖掘机、推土机、矿山设备等工程机械的行走底盘，履带钢与石块、泥沙等直接接触，具有强韧性高、耐磨性好等特点，武钢有限履带钢产品工艺成熟，产品质量稳定。

Crawler steel is used to manufacture the chassis and crawler system of construction machinery. It is mainly used in the walking chassis of excavators, bulldozers, mining equipment and other construction machinery. The crawler steel is in direct contact with stones, sand and other materials, and has the characteristics of high strength, toughness and good wear resistance. The crawler steel products of Wuhan Iron and Steel Co., Ltd are mature in technology and stable in quality.

供货技术条件 Technical Conditions for Supply

牌号 Grade	型号 Specification	供货标准 Supply standard	截面示意图 Schematic diagram of section
27CrMnB	型钢 Section steel	技术协议 Technical agreement	

化学成分 (Wt%) Chemical Composition

牌号 Grade	C	Si	Mn	S	P
27CrMnB	0.20~0.35	0.10~0.50	0.8~2.0	≤0.030	≤0.020

产品特点及用途 Features and Uses

主要特点 Main features	<p>履带钢用于制造工程机械底盘履带系统，与石块、泥沙等直接接触，具有强韧性高、耐磨性好等特点，武钢有限履带钢产品工艺成熟，产品质量稳定。</p> <p>Crawler steel is used to manufacture the chassis crawler system of construction machinery. It is in direct contact with stones, sand and other materials. It has the characteristics of high strength, high toughness and good wear resistance. The technology of Wuhan Iron and Steel Co., Ltd crawler steel products is mature and the product quality is stable.</p>
主要用途 Uses	<p>履带钢主要应用于挖掘机、推土机、矿山设备等工程机械的行走底盘。</p> <p>Crawler steel is mainly used for the walking chassis of construction machinery such as excavators, bulldozers and mining equipment.</p>

保障能力 Support Capability



研发能力 R&D Capability

- 中国钢铁行业领先的钢铁研发机构——宝钢股份中央研究院。
- 完善的研发体系和完整的研发制度。
- 高素质的科技人才和一流的研发团队。
- 世界先进的研发设备和一流的中试工厂。
- 高效协调的产销研项目组能快速对市场 and 用户需求作出响应。
- 通过国家实验室认可委员会认证的实验室。

The leading iron and steel R & D institution in China's steel industry-- Baosteel Central Research Institute.

A perfect R & D system and a complete R & D institution.

High quality scientific and technological talents and first-class R & D team.

The world's advanced R & D equipment and the first class pilot plant.

Efficient and coordinated production, marketing and research team can respond quickly to market and user needs.

The laboratory is accredited by the National Laboratory Accreditation Committee.

过程能力 Process Capability

针对钢轨、型材生产流程长、工艺复杂、技术要求高的特点，通过整合公司内生产、技术、质检等资源，对生产的全流程实施了精益化管理。稳定的钢轨质量，确保铁路运输安全。

- 科研人员于试制期间进行全程现场跟踪和技术指导，优化生产工艺。
- 炼钢工序成立了RH、铸坯质量控制、设备维护、炼钢生产组织等精益化管理小组。
- 轧钢工序成立了脱碳层控制、热打码运行、轧钢质量控制、精整质量控制、物流管理、设备保障、百米钢轨检查等精益化管理小组。
- 全自动在线检测，及时发现钢轨内在缺陷并处理。
- 钢轨表面质量采取逐支四面检查方式，严格按照标准判定。

In view of the long process of rail and section bar production, complex process and high technical requirements, the lean management of the whole process of production is carried out by integrating the resources of production, technology and quality inspection within the company. Stable rail quality ensures that railway transportation is safe.

During the trial production, the researchers conduct full field tracking and technical guidance to optimize the production process.

The steelmaking process has set up a lean management team such as RH, billet quality control, equipment maintenance, steelmaking production organization and so on.

The rolling process has set up a lean management group, such as decarburization control, thermal code operation, steel rolling quality control, finishing quality control, logistics management, equipment support, 100-meter rail inspection and so on.

Automatic online detection can timely detect and deal with rail internal defects.

The quality of rail surface is checked one by one with a four-side inspection strictly according to the standard.



认证证书 Certification



服务能力 Service Capability

- 提供远程网上订货，通过PC和移动端随时查询所订产品的生产进度及物流运输的动态。
- 提供门对门配送服务，合同经过评审后，根据客户需求，可直接配送至客户指定仓库或者制造基地。
- 售后服务承诺：客户诉求24小时内响应。

We provide remote online ordering, and inquiries at any time by PC and mobile terminals about the manufacturing schedule and the logistics and transportation dynamics of the products ordered.

We provide door-to-door delivery service -- after the contract is reviewed, according to user needs, products can be directly distributed to the user designated warehouse or manufacturing base.

Customer demand within 24 hours response.

物流仓储能力 Logistics Storage Capability

规范的吊装和搬运 Standard hoisting and transporting

- 型钢主要采用电磁吸盘吊装。 Steel section is mainly hoisted with electromagnetic sucker.
- 不具备电磁吸盘时，使用其他安全吊装方式。 When electromagnetic sucker is not available, other hoisting means will be used.
超长型钢和钢轨使用平衡梁，或多台起重机械同步吊装。 Super long section steel and rail are hoisted with balanced beam or multiple lifting machinery synchro hoisting is applied.



规范的铁路运输和装载加固方案 Standardized railway transportation and loading reinforcement scheme

- 车底板上安装专用转向架，转向架使用前进行专门检测，确保符合有关技术标准。 Special bogie is installed on the floor of a train, which is specially tested before its use to ensure that it complies with relevant technical standards.



100米钢轨专用转向架
Special bogie for 100-meter rail

25米钢轨专用转向架
Special bogie for 25-meter rail

- 型材铁路装载加固方案 Reinforcement scheme for section bar railway loading



25米钢轨铁路装载加固方案 Reinforcement scheme for 25-meter rail loading



100米钢轨铁路装载加固方案 Reinforcement scheme for 100-meter rail loading



规范的水路运输船舶和装载加固方案 Standard waterway shipping ships and loading reinforcement scheme

- 长度不超过25米的钢轨、型钢可通过水路运输。 Rail and section bar, not longer than 25m, can be transported by water, and the ships chosen conform to the relevant regulations of the state water transport management.
- 根据货物长度和船舱内部结构合理布载。 Products are loaded reasonably according to the length of the cargo and the inner structure of the cabin.
- 舱底摆放垫木，避免货物与舱底直接接触。 Timber is placed at the bottom of the bilge to avoid direct contact between cargo and bilge.

规范的公路运输车辆和装载加固方案 Standardized road transport vehicles and loading reinforcement schemes

- 选用车辆符合国家道路运输相关管理规定。 The vehicles chosen conform to the relevant regulations of the state road transport management.



规范的仓储 Standardized warehousing

- 存储场地平整、干燥、无杂物。 The storage site is flat, dry and free from sundries.
- 保持产品捆带完好，标识标牌清晰准确。 The product is tied well, and the logo and sign are clear and accurate.



产品标识 Product Identification

钢轨标识 Rail Marking

钢轨标识采用热辊印、热打印和标签的方式

- 热辊印位于钢轨腰部，通过一组符号和数字分别表示商标、规格、材质、生产日期等内容。
- 热打印位于钢轨腰部、热辊印对侧，通过一组符号和数字分别表示商标、生产日期和炉批号等内容。
- 标签贴于钢轨端部，主要内容包括批号、轧制代号、材质、型号、长度、捆号等。

Rail marking adopts branding, hot stamping and label.

Branding is carried out on the rail waist, with a set of symbols and numbers indicating trademark, specification, material, production date and other content respectively.

Hot stamping is carried out on the rail waist, opposite to branding, with a set of symbols and numbers indicating trademark, production date and batch number of furnace respectively.

The label is attached to the end of the rail, whose main contents include batch number, rolling code, material, type, length, bundle No. and so on.



热辊印
Branding

热打印
Hot stamping

标签
Label

型材标识 Section Steel Identification

型材标识采用喷漆和标签的方式

- 喷漆位于型材腿部，内容包括炉批号、班别和材质。
- 标签贴于型材腿部，内容包括炉批号、轧制代号、材质、型号、长度、捆号等。

Section steel identification adopts lacquering and labeling

Lacquering is on the leg of the section bar, whose main contents include batch number of furnace, production shift and material.

The label is attached to the leg of section steel, whose main contents include batch number of furnace, rolling code, material, type, length, bundle No. and so on.



WISCO 武汉钢铁有限公司 WUHAN IRON & STEEL COMPANY LIMITED			
牌号 GRADE	WB2500		
轧制号 BATCH NO.	S700541	炉号 HEAT NO.	A7128473
品种 SORT	板桩 PILE	规格 SIZE	W-IV
重量 WEIGHT	5707 kg	数量 NUMBER	5*15000 mm
捆包号 BUNDLE NO.	S7005410002		总长 TOTALEN
生产日期 DATE	20170831		0 mm
检查班别 INSPECT SHIFT	4		

产品质量证明书 Inspection Certificate

WISCO 武汉钢铁有限公司 Wuhan Iron & Steel Co., Ltd.		产品质量证明书 INSPECTION CERTIFICATE		WUHAN IRON & STEEL CO., LTD. CHANGSHI STEEL QUALITY SERVICE CHANGSHI QUALITY CENTER TEL: 027-8668888 FAX: 027-8668888																																																																																											
客户名称 CUSTOMER	合同号 CONTRACT NO.	产品名称 PRODUCT NAME	规格 SPECIFICATION	数量 QUANTITY	重量 WEIGHT																																																																																										
生产厂家 MANUFACTURER	炉号 HEAT NO.	轧制号 BATCH NO.	生产日期 DATE	检查日期 CHECK DATE	检查班次 CHECK SHIFT																																																																																										
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