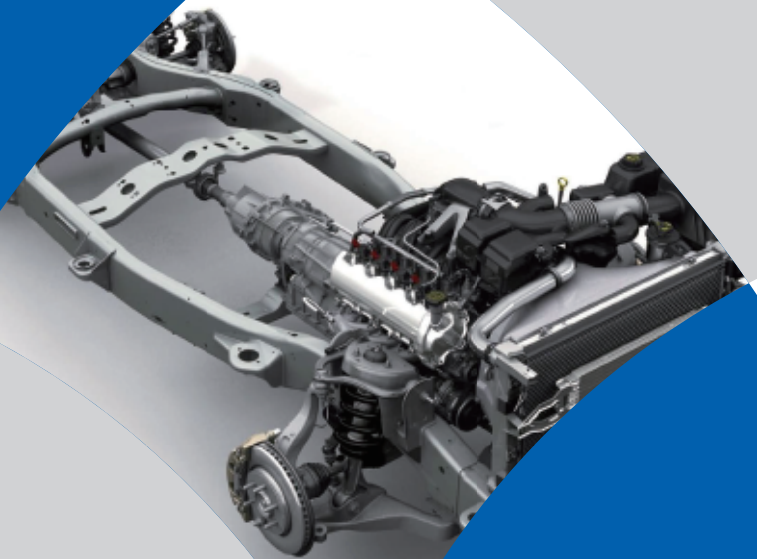




北京首钢股份有限公司
BEIJING SHOUGANG CO., LTD.

酸洗 产品手册

PICKLED PLATE PRODUCT MANUAL



北京首钢股份有限公司
Beijing Shougang Co., Ltd.

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Chapter 1 Pickled Products of Shougang Steel

第一章 首钢酸洗产品

1.1 产品类别 Product Category

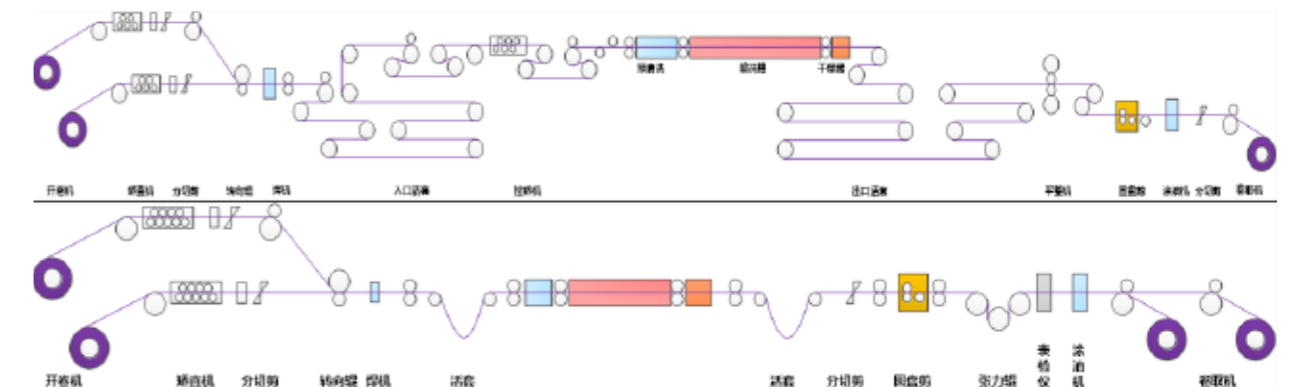
首钢酸洗产品自 2009 年启动研发以来，现已形成汽车、家电、特殊用钢、五金四大类产品体系，高领产品占比达到 63%。以迁钢、京唐两个生产基地为依托，在首钢技术研究院及技术中心支撑下，积累了丰富的生产、技术及品质管理经验。首钢酸洗产品具有性能稳定可靠、产品尺寸精度高、板形控制良好等诸多特点，产品质量广受用户认可，具有良好的市场美誉度。

首钢酸洗产品主要供应冷成型用钢、结构用钢、汽车结构用低合金高强度钢、汽车车轮用钢、优质碳素钢等众多行业领域。

Since the start of research and development of Shougang pickled products in 2010, four major product systems have been formed, including automobiles, home appliances, special steel, and hardware, of which leading and high-end products account for 63%. Relying on Qiangang base and Jingtang base, with the support of Shougang Technology Research Institute and Technology Center, Shougang pickled products have accumulated rich experience in production, technology and quality management. Shougang pickled products are stable and reliable, high dimensional accuracy, good shape control and many other characteristics, product quality is widely recognized by users, with a good market reputation.

Shougang pickled products include cold forming steel, structural steel, low alloy high strength steel for automobile structure, automobile wheel steel, high quality carbon steel and many other industries.

1.2 工艺流程 Process flow



Chapter 2 Product Introduction

第二章 产品介绍



1.3 热轧酸洗机组简介 Introduction to pickling unit

首钢目前共计 4 条热轧酸洗板生产机组，具备 377 万吨酸洗板生产能力，其中迁钢基地连续式酸洗机组、京唐基地连续式酸洗机组均于 2020 年相继投产，引入激光焊接、在线拉矫破鳞、紊流酸洗、在线平整、在线拉矫、切边、涂油等工序。

Shougang currently has 4 pickling production lines with a production capacity of 3.77 million tons of pickled plate. Among them, the continuous pickling line at Qiangang Base and the continuous pickling line at Jingtang Base were put into operation one after another in 2020, introducing laser welding and online Stretching and correcting scales, turbulent flow pickling, online leveling, online tensioning, trimming, oiling and other processes.

首钢在线汽车板使用性能数据库覆盖 1200MPa 级别及以下汽车板牌号，内容包含化学成分、金相组织、力学性能、成形性能、碰撞性能、疲劳性能等，可满足汽车厂认证和选材的需求，为汽车企业提供准确的材料成形仿真数据。

Shougang online automotive steel performance database covers grades up to 1200MPa, including chemical composition, metallurgical structure, mechanical properties, forming properties, crash performance, fatigue performance, etc. It can meet the requirements of auto factory certification and material selection, and provide accurate material forming simulation data for auto enterprises.

2.1 冷成型用钢 Cold forming steel

冷成型就是在不加热的情况下对材料进行冲剪、弯曲、拉伸等加工方式。冷成型工艺有锻压、辊压、冲压等。冷成型用钢具有良好的冲压性能、焊接性能和较高的尺寸精度，按照其用途可以分为一般用、冲压用、深冲用和超深冲用，如家电外壳、汽车刹车片、离合器等零部件。

Cold forming is the process of punching, shearing, bending and stretching materials without heating. The cold forming process includes forging, rolling, stamping and so on. Cold forming steel has good stamping performance, welding performance and high dimension precision. According to its use, it can be divided into commercial purpose, drawing, deep drawing and extra-deep drawing, such as home appliance shell, automobile brake pad, clutch and other parts.

2.1.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard		相当国家 / 国际标准 National/International standard						
标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	
Q/SGZGS 0314	SPHC	JIS G 3131	SPHC	-	-	-	-	
	SPHD		SPHD					
	SPHE		SPHE					
	SPHF		SPHF					
	DD11	EN 10111	DD11	DIN1614-2	-	ISO 3573	HR1	
	DD12		DD12				StW22	HR2
	DD13		DD13				StW23	HR3
	DD14		DD14				StW24	-

2.1.2 化学成分 Chemical composition

牌号 Grade	化学成分 (熔炼分析) / % Chemical composition (Ladle analysis)					
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Alt ≥
SPHC、DD11	0.12	0.05	0.60	0.035	0.030	0.010
SPHD、DD12	0.08	0.05	0.45	0.030	0.025	
SPHE、DD13	0.06	0.05	0.40	0.025	0.020	
SPHF、DD14	0.06	0.05	0.35	0.020	0.020	

2.1.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test							180°弯曲试验 180° Bending test	
	抗拉强度 Tensile strength R _m /MPa	下列厚度 (mm) 的断后伸长率 Elongation as follow normal thickness, A _{50mm} /%						下列厚度 (mm) 的弯曲直径 Inner diameters as follow normal thickness	
		< 1.6	1.6 ~ < 2.0	2.0 ~ < 2.5	2.5 ~ < 3.2	3.2 ~ < 4.0	≥ 4.0	< 3.2	≥ 3.2
SPHC	≥ 270	≥ 27	≥ 29	≥ 29	≥ 29	≥ 31	≥ 31	D=0	D=1a
SPHD	≥ 270	≥ 30	≥ 32	≥ 33	≥ 35	≥ 37	≥ 39	—	—
SPHE	≥ 270	≥ 32	≥ 34	≥ 35	≥ 37	≥ 39	≥ 41	—	—
SPHF	≥ 270	≥ 37	≥ 38	≥ 39	≥ 39	≥ 40	≥ 42	—	—

牌号 Grade	拉伸试验 Tensile test							性能保证期 Guarantee period
	抗拉强度 Tensile strength R _m / MPa	下列厚度 (mm) 的下屈服强度 Lower yield strength as follow normal thickness R _{el} / MPa		下列厚度 (mm) 的断后伸长率 Elongation as follow normal thickness				
		< 2.0	2.0 ~ 7.0	A _{80mm} / %		A / %		
DD11	≤ 440	170 ~ 360	170 ~ 340	≥ 22	≥ 23	≥ 24	≥ 28	—
DD12	≤ 420	170 ~ 340	170 ~ 320	≥ 24	≥ 25	≥ 26	≥ 30	6个月 6 months
DD13	≤ 400	170 ~ 330	170 ~ 310	≥ 27	≥ 28	≥ 29	≥ 33	6个月 6 months
DD14	≤ 380	170 ~ 310	170 ~ 290	≥ 30	≥ 31	≥ 32	≥ 36	6个月 6 months

2.1.4 可订货规格 Available size

生产基地 Base	名称 Name			公称厚度 Nominal thickness/mm	公称宽度 Nominal width/mm
	首钢企业标准 Shougang standard	相当国家 / 国际标准 National/International standard	牌号 Grade		
迁钢基地 Qiangang base	Q/SGZGS 0314	JIS G 3131	SPHC、SPHD、SPHE、SPHF	1.5-8.0	750-1600
		EN 10111	DD11、DD12、DD13、DD14	1.5-8.0	750-1600
		DIN1614-2	StW22、StW23、StW24	1.5-8.0	750-1600
		ISO 3573	HR1、HR2、HR3	1.5-8.0	750-1600
京唐基地 Jingtang base	Q/SGZGS 0314	JIS G 3131	SPHC、SPHD、SPHE、SPHF	0.8-7.0	750-1630
		EN 10111	DD11、DD12、DD13、DD14	0.8-7.0	750-1630
		DIN1614-2	StW22、StW23、StW24	0.8-7.0	750-1630
		ISO 3573	HR1、HR2、HR3	0.8-7.0	750-1630

2.2 结构用钢 Structural steel

适用于一般结构、机械结构、焊接结构、焊管等用途。

Structural steel is suitable for general structure, mechanical structure, welding structure, welded pipe and other purposes.

2.2.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard		相当国家 / 国际标准 National/International standard			
标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade
Q/SGZGS 0316	SS330	JIS G 3101	SS330	GB/T 3274	Q195
	SS400、SS400B		SS400		Q235A、Q235B
	SS490、SS490B		SS490		—
	SM400A	SM400A	Q235A、Q235B、20		
	SM400B	SM400B	Q235C		
	SM400C	SM400C	Q235D		
	SM490A、SS490AB	SM490A	Q355A、Q355B		
	SM490B、SS490BB	SM490B	Q355C		
	SM490C、SS490CB	SM490C	Q355D		
	SM490YA	SM490YA	Q355A、Q355B		
	SM490YB	SM490YB	Q355C		
	SM520B	SM520B	Q420A、Q420B		
	SM520C	SM520C	Q420C		
	SM570	SM570	—		
	SPHT1	SPHT1	08Al		
	SPHT2	SPHT2	15		
	SPHT3	SPHT3	Q235A、20		
	SPHT4	SPHT4	—		
	St37-2	EN 10025: 2	S235JR	DIN 17100	St37-2
	St37-3		S235J0		St37-3
St44-2	S275JR		St44-2		
St50-2	E295		St50-2		
St52-3	S355J0		St52-3		

2.2.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数), % Chemical composition (Mass fraction)					碳当量及其它 Carbon equivalent and others	
	C	Si	Mn	P	S		
SS330	--	--	--	≤ 0.050	≤ 0.050	根据需要可添加其它合金元素。 Other alloying elements can be added as needed.	
SS400 SS400B	≤ 0.20	≤ 0.35	≤ 1.40	≤ 0.035	≤ 0.035	根据需要可添加其它合金元素。 Other alloying elements can be added as needed.	
SS490 SS490B	≤ 0.20	≤ 0.35	≤ 1.60	≤ 0.035	≤ 0.035	SS400B 和 SS490B 还应满足 B: 0.0008-0.0020。 SS400B and SS490B should meet B: 0.0008-0.0020.	
SS540	≤ 0.30	--	≤ 1.60	≤ 0.040	≤ 0.040	根据需要可添加其它合金元素。 Other alloying elements can be added as needed.	
SM400A	≤ 0.23	--	≥ 2.5C	≤ 0.035	≤ 0.035		
SM400B	≤ 0.20	≤ 0.35	0.60-1.40	≤ 0.030	≤ 0.030		
SM400C	≤ 0.18	≤ 0.35	0.60-1.40	≤ 0.025	≤ 0.025		
SM490A SM490AB	≤ 0.20	≤ 0.55	≤ 1.60	≤ 0.035	≤ 0.035	1、根据需要可添加其它合金元素。 Other alloying elements can be added as needed 2、经供需双方协商, SM490 系列 (8 个牌号) 碳当量 ≤ 0.38, SM520 系列 (2 个牌号) 碳当量 ≤ 0.40, SM570 碳当量 ≤ 0.44, 碳当量公式为: $Ceq=C+1/6Mn+1/24Si+1/40Ni+1/5Cr+1/4Mo+1/14V$ After negotiation, SM490 series (8 brands) carbon equivalent ≤ 0.38, SM520 series (2 brands) carbon equivalent ≤ 0.40, SM570 carbon equivalent ≤ 0.44. The carbon equivalent formula is: $Ceq=C+1/6Mn+1/24Si+1/40Ni+1/5Cr+1/4Mo+1/14V$ 3、经供需双方协商, 也可用焊接裂纹敏感系数代替碳当量, SM490 系列 (8 个牌号) 焊接裂纹敏感系数 ≤ 0.24, SM520 系列 (2 个牌号) 焊接裂纹敏感系数 ≤ 0.26, 焊接裂纹敏感系数公式为: $Pcm=C+1/30Si+1/20Mn+1/60Ni+1/20Cr+1/15Mo+1/10V+5B$ After negotiation, the welding crack sensitivity coefficient can also be used instead of carbon equivalent. The crack sensitivity coefficient of SM490 series (8 brands) ≤ 0.24, and that of SM520 series (2 brands) ≤ 0.26. 4、SM490AB、SM490BB、SM490CB 还应满足 B: 0.0008-0.0020 SM490AB, SM490BB, SM490CB should meet B: 0.0008-0.0020	
SM490B SM490BB	≤ 0.18	≤ 0.55	≤ 1.60	≤ 0.035	≤ 0.035		
SM490C SM490CB				≤ 0.025	≤ 0.025		
SM490YA	≤ 0.20	≤ 0.55	≤ 1.60	≤ 0.035	≤ 0.035		
SM490YB							
SM520B	≤ 0.20	≤ 0.55	≤ 1.60	≤ 0.035	≤ 0.035		
SM520C	≤ 0.20	≤ 0.55	≤ 1.60	≤ 0.030	≤ 0.030		
SM570	≤ 0.18	≤ 0.55	≤ 1.70	≤ 0.035	≤ 0.035		
St37-2	≤ 0.17	≤ 0.35	≤ 1.40	≤ 0.035	≤ 0.035		N ≤ 0.012, 碳当量 ≤ 0.35。 N ≤ 0.012, carbon equivalent ≤ 0.35. 镇静钢, 可添加合金元素 Killed steel, alloying elements can be added
St37-3	≤ 0.17	≤ 0.35	≤ 1.40	≤ 0.030	≤ 0.030		N ≤ 0.012, 碳当量 ≤ 0.35 N ≤ 0.012, carbon equivalent ≤ 0.35 St37-3 为特殊镇静钢, 可添加合金元素 ST37-3 is a specially killed steel, alloying elements can be added
St44-2	≤ 0.21	≤ 0.35	≤ 1.50	≤ 0.035	≤ 0.035	N ≤ 0.012, 碳当量 ≤ 0.40 N ≤ 0.012, carbon equivalent ≤ 0.40 可添加合金元素 Alloy elements can be added	
St50-2	≤ 0.30			≤ 0.050	≤ 0.050	镇静钢 Killed steel	

St52-3	0.20	0.55	≤ 1.60	0.030	0.030	N ≤ 0.012, 碳当量 ≤ 0.45 N ≤ 0.012, carbon equivalent ≤ 0.45 可添加合金元素 Alloy elements can be added
SPHT1	0.10	0.35	≤ 0.50	0.030	0.030	经供需双方协议, 对于最终用途为热镀锌钢管, 可要求牌号 SPHT1 牌号的 Si 含量 ≤ 0.04%, 并在合同中注明。 After negotiation, for hot-dip galvanized steel pipe whose final use is SPHT1, the Si content of grade SPHT1 is required to be no more than 0.04%, and it shall be indicated in the contract.
SPHT2	0.18	0.35	≤ 0.60	0.030	0.030	
SPHT3	0.25	0.35	0.30-0.90	0.030	0.030	
SPHT4	0.30	0.35	0.30-1.00	0.030	0.030	

2.2.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test										180°弯曲试验 弯头直径 D	夏比 V 型缺口冲击试验 冲击试样尺寸 Charpy V test, Sample size 10mm×10mm×55mm				
	抗拉强度 Tensile strength R _m /MPa	上屈服强度 Upper yield strength R _{eh} /MPa	以下厚度的断后伸长率, Elongation as follow normal thickness						A _{80mm} /%	A ₅ /%						
			公称厚度 (mm) Nominal thickness													
			< 3	≥ 3	≤ 7	≤ 1	> 1.5	> 1.5 ~ 2					> 2 ~ 2.5	> 2.5 ~ < 3	≥ 3	< 3
St37-2	360-510		≥ 235	≥ 15	≥ 16	≥ 17	≥ 18	≥ 19	≥ 24	1.5a	2a	+20	≥ 27			
St37-3										1a	1.5a	0	≥ 27			
St44-2	430-580	410-560	≥ 275	≥ 12	≥ 14	≥ 15	≥ 16	≥ 17	≥ 21	2.5a	3a	+20	≥ 27			
St50-2	490-660	470-610	≥ 295	≥ 10	≥ 11	≥ 12	≥ 13	≥ 14	≥ 18	--	--	--	--			
St52-3	510-680	470-630	≥ 355	≥ 12	≥ 13	≥ 14	≥ 15	≥ 16	≥ 20	2.5a	3a	0	≥ 27			



2.2.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test				180°弯曲试验 弯头直径 D 180° bend test Inner diameters	夏比 V 型缺口冲击试验 冲击试样尺寸 10mm×10mm×55mm Charpy V test, Sample size 10mm×10mm×55mm	
	抗拉强度 Tensile strength R _m , MPa	以下厚度的上屈服强度 Upper yield strength as follow normal R _{eH} /MPa	以下厚度的断后伸长率 Elongation as follow normal thickness			试验温度 /°C Test temperature	冲击吸收能量 KV ₂ /J Impact absorbed energy
			A _{50mm} /%	A _{200mm} /%			
		公称厚度 mm					
≤ 7	≤ 5	5-7					
SS330	330-430	≥ 205	≥ 26	≥ 21	3.0a	-	-
SS400 SS400B	400-510	≥ 245	≥ 21	≥ 17	3.0a	-	-
SS490 SS490B	490-610	≥ 285	≥ 19	≥ 15	4.0a	-	-
SS540	≥ 540	≥ 400	≥ 16	≥ 13	4.0a	-	-
SM400A	400-510	≥ 245	≥ 23	≥ 18	—	-	-
SM400B						0	≥ 27
SM400C						0	≥ 47
SM490A SM490AB	490-610	≥ 325	≥ 22	≥ 17	—	-	-
SM490B SM490BB						0	≥ 27
SM490C SM490CB						0	≥ 47
SM490YA	490-610	≥ 365	≥ 19	≥ 15	—	-	-
SM490YB						0	≥ 27
SM520B	520-640	≥ 365	≥ 19	≥ 15	—	0	≥ 27
SM520C						0	≥ 47
SM570	570-720	≥ 460	≥ 19		—	-5	≥ 47

牌号 Grade	拉伸试验 Tensile test				180°弯曲试验 弯头直径 D 180° bend test Inner diameters		
	抗拉强度 Tensile strength R _m , MPa	以下厚度的断后伸长率 A _{50mm} , % Elongation as follow normal thickness				公称厚度 /mm thickness/mm	
		公称厚度 /mm thickness/mm				公称厚度 /mm thickness/mm	
		< 1.6	1.6 ~ < 3.0	3.0 ~ < 6.0	6.0 ~ 7.0	< 3.0	3.0 ~ 7.0
SPHT1	≥ 270	≥ 30	≥ 32	≥ 35	≥ 37	0a	a
SPHT2	≥ 340	≥ 25	≥ 27	≥ 30	≥ 32	2a	3a
SPHT3	≥ 410	≥ 20 ^c	≥ 22	≥ 25	≥ 27	3a	4a
SPHT4	≥ 490	≥ 15 ^c	≥ 18	≥ 20	≥ 22	3a	4a

2.2.4 可订货规格 Available size

生产基地 Base	名称 Name			公称厚度 Nominal thickness/mm	公称宽度 Nominal width/mm
	首钢企业标准 Shougang standard	相当国家 / 国际标准 National/International standard	牌号 Grade		
迁钢基地 Qiangang base	Q/SGZGS 0316	JIS G 3101	SS400	1.5-7.0	750-1600
		JIS G 3132	SPHT1、SPHT2、SPHT3、SPHT4	1.5-7.0	750-1600
		EN 10025-2	S235JR、S275JR	1.5-7.0	750-1600
		DIN 17100	St37-2、St52-3	1.5-7.0	750-1600
京唐基地 Jingtang base		JIS G 3101	SS400	1.0-7.0	750-1600
		JIS G 3132	SPHT1、SPHT2、SPHT3、SPHT4	1.0-7.0	750-1600
		EN 10025-2	S235JR、S275JR	1.0-7.0	750-1600
		DIN 17100	St37-2、St52-3	1.0-7.0	750-1600



2.3 汽车结构用低合金高强度钢 HSLA steel for automobile structure

具有良好成型性能，主要用于制造汽车大梁、构架、滚型车轮等汽车结构件。

HSLA steel has good forming properties and is mainly used to manufacture automobile structural parts such as automobile beams, frames, and roller wheels.

2.3.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard		相当国家 / 国际标准 National/International standard	
标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade
Q/SGZGS 0315	S315MC	EN 10149-2	S315MC
	S355MC		S355MC
	S420MC		S420MC
	S460MC		S460MC
	S500MC		S500MC
	S550MC		S550MC
	S600MC		S600MC
	S650MC		S650MC
	S700MC		S700MC
	QStE340TM		SEW 092
	QStE380TM	QStE380TM	
	QStE420TM	QStE420TM	
	QStE460TM	QStE460TM	
	QStE500TM	QStE500TM	
	QStE550TM	QStE550TM	
	SAPH310	JIS G 3113	
	SAPH370		SAPH370
	SAPH400		SAPH400
	SAPH440		SAPH440
	SPFH490	JIS G 3134	SPFH490
	SPFH540		SPFH540
SPFH590	SPFH590		
SPFH540Y	SPFH540Y		
SPFH590Y	SPFH590Y		

2.3.2 化学成分 Chemical composition

牌号 Grade	化学成分 (熔炼分析) Chemical composition (Ladle analysis) / %					
	C	Si	Mn	P	S	Alt
SAPH310	≤ 0.12	≤ 0.30	≤ 0.50	≤ 0.025	≤ 0.020	≥ 0.010
SAPH370	≤ 0.12	≤ 0.30	≤ 1.20	≤ 0.025	≤ 0.020	≥ 0.010
SAPH400	≤ 0.12	≤ 0.30	≤ 1.40	≤ 0.025	≤ 0.020	≥ 0.010
SAPH440	≤ 0.12	≤ 0.30	≤ 1.60	≤ 0.025	≤ 0.020	≥ 0.010

牌号 Grade	化学成分 (熔炼分析) Chemical composition (Ladle analysis) / %					
	C	Si	Mn	P	S	Alt
SPFH490	≤ 0.15	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.020	≥ 0.015
SPFH540	≤ 0.15	≤ 0.50	≤ 1.80	≤ 0.025	≤ 0.020	≥ 0.015
SPFH590	≤ 0.18	≤ 0.60	≤ 2.00	≤ 0.025	≤ 0.020	≥ 0.015
SPFH540Y	≤ 0.15	≤ 0.60	≤ 1.80	≤ 0.025	≤ 0.020	≥ 0.015
SPFH590Y	≤ 0.15	≤ 0.60	≤ 1.80	≤ 0.025	≤ 0.020	≥ 0.015

牌号 Grade	化学成分 (熔炼分析) Chemical composition (Ladle analysis) / %										
	C	Si	Mn	P	S	Alt	Nb a	V a	Ti a	Mo	B
S315MC	≤ 0.12	≤ 0.50	≤ 1.30	≤ 0.025	≤ 0.020	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S355MC	≤ 0.12	≤ 0.50	≤ 1.50	≤ 0.025	≤ 0.020	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S420MC	≤ 0.12	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S460MC	≤ 0.12	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S500MC	≤ 0.12	≤ 0.50	≤ 1.70	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S550MC	≤ 0.12	≤ 0.50	≤ 1.80	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.15	--	--
S600MC	≤ 0.12	≤ 0.50	≤ 1.90	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22	≤ 0.5	≤ 0.005
S650MC	≤ 0.12	≤ 0.60	≤ 2.00	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22		≤ 0.005
S700MC	≤ 0.12	≤ 0.60	≤ 2.10	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22		≤ 0.005

牌号 Grade	化学成分 (熔炼分析) Chemical composition (Ladle analysis) / %							
	C	Si	Mn	P	S	Alt	Nb	Ti
QStE340TM	≤ 0.12	≤ 0.50	≤ 1.30	≤ 0.025	≤ 0.020	≥ 0.015	≤ 0.09	≤ 0.22
QStE380TM	≤ 0.12	≤ 0.50	≤ 1.40	≤ 0.025	≤ 0.020	≥ 0.015	≤ 0.09	≤ 0.22
QStE420TM	≤ 0.12	≤ 0.50	≤ 1.50	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.22
QStE460TM	≤ 0.12	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.22
QStE500TM	≤ 0.12	≤ 0.50	≤ 1.70	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.22
QStE550TM	≤ 0.12	≤ 0.50	≤ 1.80	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.22

牌号 Grade	化学成分 (熔炼分析) Chemical composition (Ladle analysis) / %										
	C	Si	Mn	P	S	Alt	Nb a	V a	Ti a	Mo	B
QStE600TM	≤ 0.12	≤ 0.50	≤ 1.90	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22	≤ 0.5	≤ 0.005
QStE650TM	≤ 0.12	≤ 0.60	≤ 2.00								
QStE700TM	≤ 0.12	≤ 0.60	≤ 2.10								

2.3.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test										弯曲试验 180° 180° bend test	
	抗拉强度 Tensile strength R _m /MPa	下列厚度的下屈服强度 Lower yield strength as follow thickness R _{eH} /MPa			下列厚度的断后伸长率 A _{50mm} / % Elongation as follow normal thickness							
		公称厚度 mm Nominal thickness			公称厚度 mm Nominal thickness					公称厚度 mm Nominal thickness		
		< 6.0	6.0 ~ < 8.0	8.0 ~ < 14.0	< 2.0	2.0 ~ < 2.5	2.5 ~ < 3.15	3.15 ~ < 4.0	4.0 ~ < 6.3	≥ 6.3	< 2.0	≥ 2.0
SAPH310	≥ 310	≥ 185 ^d	≥ 185 ^d	≥ 175 ^d	≥ 33	≥ 34	≥ 36	≥ 38	≥ 40	≥ 41	D=0a	D=2a
SAPH370	≥ 370	≥ 225	≥ 225	≥ 215	≥ 32	≥ 33	≥ 35	≥ 36	≥ 37	≥ 38	D=a	D=2a
SAPH400	≥ 400	≥ 255	≥ 235	≥ 235	≥ 31	≥ 32	≥ 34	≥ 35	≥ 36	≥ 37	D=2a	D=2a
SAPH440	≥ 440	≥ 305 ^e	≥ 295 ^f	≥ 275 ^g	≥ 29	≥ 30	≥ 32	≥ 33	≥ 34	≥ 35	D=2a	D=2a

牌号 Grade	拉伸试验 Tensile test						弯曲试验 180° 180° bend test	
	上屈服强度 R _{eH} / MPa Upper yield strength R _{eH} /MPa	抗拉强度 R _m / MPa Tensile strength R _m /MPa	断后伸长率 A _{50mm} / % Elongation					
			公称厚度 mm Nominal thickness				公称厚度 mm Nominal thickness	
< 2.0	2.0 ~ < 2.5	2.5 ~ < 3.25	3.25 ~ 8.0	< 3.25	≥ 3.25			
SPFH490	≥ 325	≥ 490	≥ 22	≥ 23	≥ 24	≥ 25	D=a	D=2a
SPFH540	≥ 355	≥ 540	≥ 21	≥ 22	≥ 23	≥ 24	D=2a	D=3a
SPFH590	≥ 420	≥ 590	≥ 19	≥ 20	≥ 21	≥ 22	D=3a	D=3a
SPFH540Y	≥ 295	≥ 540	—	≥ 24	≥ 25	≥ 26	D=2a	D=3a
SPFH590Y	≥ 325	≥ 590	—	≥ 22	≥ 23	≥ 24	D=3a	D=3a

牌号 Grade	拉伸试验 Tensile test				弯曲试验 180° 180° bend test
	上屈服强度 R _{eH} /MPa Upper yield strength R _{eH} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 Elongation		
			A _{80mm} / %	A / %	
公称厚度 < 3mm Nominal thickness < 3mm	公称厚度 ≥ 3mm Nominal thickness ≥ 3mm				
S315MC	≥ 315	390 ~ 510	≥ 20	≥ 24	D=0a
S355MC	≥ 355	430 ~ 550	≥ 19	≥ 23	D=0.5a
S420MC	≥ 420	480 ~ 620	≥ 16	≥ 19	D=0.5a
S460MC	≥ 460	520 ~ 670	≥ 14	≥ 17	D=1a
S500MC	≥ 500	550 ~ 700	≥ 12	≥ 14	D=1a
S550MC	≥ 550	600 ~ 760	≥ 12	≥ 14	D=1.5a
S600MC	≥ 600	650 ~ 820	≥ 11	≥ 13	D=1.5a
S650MC	≥ 650	700 ~ 880	≥ 10	≥ 12	D=2a
S700MC	≥ 700	750 ~ 950	≥ 10	≥ 12	D=2a

牌号 Grade	拉伸试验 ^a Tensile test				弯曲试验 180° 180° bend test
	上屈服强度 R _{eH} /MPa Upper yield strength R _{eH} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 Elongation		
			公称厚度 < 3mm Nominal thickness < 3mm	公称厚度 ≥ 3mm Nominal thickness ≥ 3mm	
A _{80mm} / %	A / %				
QStE340TM	≥ 340	420 ~ 540	≥ 19	≥ 25	D=0.5a
QStE380TM	≥ 380	450 ~ 590	≥ 18	≥ 23	D=0.5a
QStE420TM	≥ 420	480 ~ 620	≥ 16	≥ 21	D=0.5a
QStE460TM	≥ 460	520 ~ 670	≥ 14	≥ 19	D=1a
QStE500TM	≥ 500 ^d	550 ~ 700	≥ 12	≥ 17	D=1a
QStE550TM	≥ 550 ^d	600 ~ 760	≥ 12	≥ 15	D=1.5a
QStE600TM	≥ 600 ^d	650 ~ 820	≥ 11	≥ 13	D=1.5a
QStE650TM	≥ 650 ^d	700 ~ 880	≥ 10	≥ 12	D=2a
QStE700TM	≥ 700 ^d	750 ~ 950	≥ 10	≥ 12	D=2a

2.3.4 可订货规格 Available size

名称 Name		厚度订货范围 /mm Nominal thickness/ mm	宽度订货范围 /mm Nominal width/mm
首钢企业标准 Shougang standard	相当国家 / 国际标准 National/International standard	牌号 Grade	
Q/SGZGS 0315	EN 10149-2	S315MC	1.2-7.0
		S355MC	1.2-7.0
		S420MC、S460MC、S500MC	1.4-6.5
		S550MC	1.5-6.5
		S600MC	1.5-6.5
		S650MC、S700MC	1.5-6.5
	SEW 092	QStE340TM	1.2-7.0
		QStE380TM、QStE420TM、QStE460TM	1.4-6.5
		QStE500TM	1.4-6.5
		QStE550TM	1.5-6.5
	JIS G3113	SAPH310	1.2-7.0
		SAPH370	1.2-7.0
		SAPH400	1.2-7.0
		SAPH440	1.2-7.0
	JIS G3134	SPFH540、SPFH590	1.5-6.5

2.4 汽车车轮用钢 Wheel steel

具有良好冷成型性能、耐疲劳性能和焊接性能，用于制造钢制汽车轮辐、轮辋。

Wheel steel has good cold forming property, fatigue resistance and welding property. It is used to make spokes and rims of steel automobiles.

2.4.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard	
标准号 Standard	牌号 Grade
Q/SGZGS 0351	S330LW/ S330LF、S380LW/ S380LF、S400LW/ S400LF、S420LW/ S420LF、S440LW/ S440LF、S490LW/ S490LF、S540LW/ S540LF、S590LW/ S590LF、S650LW/ S650LF、S700LW/S700LF

2.4.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)					
	C	Si	Mn	P	S	Als ≥
S330LW	≤ 0.12	≤ 0.05	≤ 0.50	≤ 0.025	≤ 0.015	≥ 0.010
S380LW	≤ 0.12	≤ 0.15	≤ 1.20	≤ 0.025	≤ 0.015	≥ 0.010
S400LW	≤ 0.14	≤ 0.15	≤ 1.40	≤ 0.025	≤ 0.015	≥ 0.010
S420LW	≤ 0.14	≤ 0.30	≤ 1.40	≤ 0.025	≤ 0.015	≥ 0.010
S440LW	≤ 0.14	≤ 0.30	≤ 1.50	≤ 0.025	≤ 0.015	≥ 0.010
S490LW	≤ 0.15	≤ 0.30	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.010
S540LW	≤ 0.12	≤ 0.35	≤ 1.70	≤ 0.020	≤ 0.010	≥ 0.010
S590LW	≤ 0.12	≤ 0.50	≤ 1.80	≤ 0.020	≤ 0.010	≥ 0.010
S650LW	≤ 0.12	≤ 0.55	≤ 2.00	≤ 0.020	≤ 0.010	≥ 0.010
S700LW	≤ 0.12	≤ 0.55	≤ 2.10	≤ 0.020	≤ 0.010	≥ 0.010

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)					
	C	Si	Mn	P	S	Als
S330LF	≤ 0.12	≤ 0.05	≤ 0.50	≤ 0.025	≤ 0.015	≥ 0.010
S380LF	≤ 0.14	≤ 0.15	≤ 1.20	≤ 0.025	≤ 0.015	≥ 0.010
S400LF	≤ 0.16	≤ 0.15	≤ 1.40	≤ 0.025	≤ 0.015	≥ 0.010
S420LF	≤ 0.16	≤ 0.30	≤ 1.40	≤ 0.025	≤ 0.015	≥ 0.010
S440LF	≤ 0.18	≤ 0.30	≤ 1.50	≤ 0.025	≤ 0.015	≥ 0.010
S490LF	≤ 0.18	≤ 0.30	≤ 1.70	≤ 0.025	≤ 0.015	≥ 0.010
S540LF	≤ 0.20	≤ 0.35	≤ 1.70	≤ 0.020	≤ 0.010	≥ 0.010
S590LF	≤ 0.20	≤ 0.50	≤ 1.70	≤ 0.020	≤ 0.010	≥ 0.010
S650LF	≤ 0.20	≤ 0.55	≤ 1.80	≤ 0.020	≤ 0.010	≥ 0.010
S700LF	≤ 0.20	≤ 0.55	≤ 1.90	≤ 0.020	≤ 0.010	≥ 0.010

2.4.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test			180°弯曲试验 180° bend test
	下屈服强度 R _{eL} /MPa Lower yield strength R _{eL} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 A/% Elongation A/%	
S330LW/ S330LF	≥ 225	330 ~ 430	≥ 33.0	D=0.5a
S380LW/ S380LF	≥ 235	380 ~ 480	≥ 28.0	D=1.0a
S400LW/ S400LF	≥ 235	400 ~ 520	≥ 26.0	D=1.0a
S420LW/ S420LF	≥ 290	420 ~ 520	≥ 26.0	D=1.0a
S440LW/ S440LF	≥ 295	440 ~ 550	≥ 26.0	D=1.0a
S490LW/ S490LF	≥ 325	490 ~ 600	≥ 24.0	D=2.0a
S540LW/ S540LF	≥ 355	540 ~ 660	≥ 22.0	D=2.0a
S590LW/ S590LF	≥ 420	590 ~ 710	≥ 20.0	D=2.0a
S650LW/ S650LF	≥ 500	650 ~ 770	≥ 17.0	D=2.0a
S700LW/S700LF	≥ 550	700 ~ 850	≥ 15.0	D=2.0a

2.4.4 可订货规格 Available size

名称 Name		厚度订货范围 /mm Nominal thickness/mm	宽度订货范围 /mm Nominal width/mm
首钢企业标准 Shougang standard	牌号 Grade		
Q/SGZGS 0351	S330LW/ S330LF、S380LW/ S380LF、S400LW/ S400LF、S420LW/ S420LF、S440LW/ S440LF、S490LW/ S490LF、S540LW/ S540LF、S590LW/ S590LF、S650LW/ S650LF、S700LW/S700LF	1.8-6.0	750-1300

2.5 汽车大梁用钢

汽车大梁用钢具有良好的成型性能，用于制造汽车大梁（纵梁、横梁）。

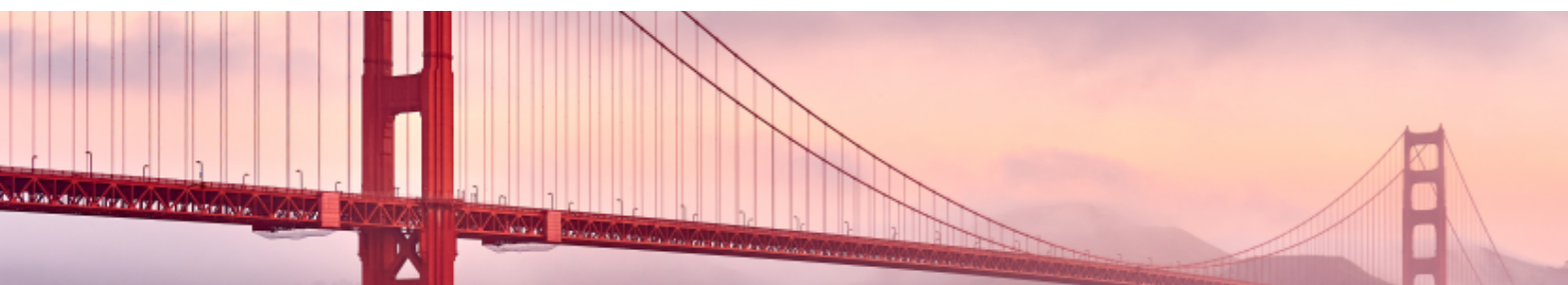
The steel for automobile frames has good forming properties and is mainly used to manufacture automobile longitudinal frames and cross frames.

2.5.1 牌号标准 Grade and standard

国家标准	
标准号 Standard	牌号 Grade
GB/T 3273	370L、420L、440L、510L、550L、600L、650L、700L、750L、800L

2.5.2 化学成分 Chemical composition

牌号 Grade	化学成分（质量分数 /%） Chemical composition(wt%)					
	C	Si	Mn	P	S	Als
370L	≤ 0.12	≤ 0.50	≤ 0.60	≤ 0.025	≤ 0.015	≥ 0.015
420L	≤ 0.12	≤ 0.50	≤ 1.50	≤ 0.025	≤ 0.015	≥ 0.015
440L	≤ 0.18	≤ 0.50	≤ 1.50	≤ 0.025	≤ 0.015	≥ 0.015
510L	≤ 0.20	≤ 0.50	≤ 1.60	≤ 0.025	≤ 0.015	≥ 0.015
550L	≤ 0.20	≤ 0.50	≤ 1.70	≤ 0.025	≤ 0.015	≥ 0.015
600L	≤ 0.12	≤ 0.50	≤ 1.80	≤ 0.025	≤ 0.015	≥ 0.015
650L	≤ 0.12	≤ 0.50	≤ 1.90	≤ 0.025	≤ 0.015	≥ 0.015
700L	≤ 0.12	≤ 0.60	≤ 2.00	≤ 0.025	≤ 0.015	≥ 0.015
750L	≤ 0.12	≤ 0.60	≤ 2.10	≤ 0.025	≤ 0.015	≥ 0.015
800L	≤ 0.12	≤ 0.60	≤ 2.20	≤ 0.025	≤ 0.015	≥ 0.015



2.5.3 力学性能 Mechanical Properties

牌号 Grade	下屈服强度 R _{eL} /MPa	抗拉强度 R _m /MPa	断后伸长率 Elongation		180°弯曲试验 b=35mm 180° Bending Test Width b=35mm	
			A _{80mm} /%	A/%	厚度 Thickness ≤ 12mm	厚度 Thickness > 12mm
			厚度 Thickness < 3mm	厚度 Thickness ≥ 3mm		
370L	≥ 245	370 ~ 480	≥ 23	≥ 28	D=0.5a	D=1a
420L	≥ 305	420 ~ 540	≥ 21	≥ 26	D=0.5a	D=1a
440L	≥ 330	440 ~ 570	≥ 21	≥ 26	D=0.5a	D=1a
510L	≥ 355	510 ~ 650	≥ 20	≥ 24	D=1a	D=2a
550L	≥ 400	550 ~ 700	≥ 19	≥ 23	D=1a	D=2a
600L	≥ 500	600 ~ 760	≥ 15	≥ 18	D=1.5a	D=2a
650L	≥ 550	650 ~ 820	≥ 13	≥ 16	D=1.5a	D=2a
700L	≥ 600	700 ~ 880	≥ 12	≥ 14	D=2a	D=2.5a
750L	≥ 650	750 ~ 950	≥ 11	≥ 13	D=2a	D=2.5a
800L	≥ 700	800 ~ 1000	≥ 10	≥ 12	D=2a	D=2.5a

2.5.4 可订货规格 Available size

名称 Name		厚度订货范围 /mm Nominal thickness/ mm	宽度订货范围 /mm Nominal width/mm
标准 standard	牌号 Grade		
GB/T 3273	370L、420L、440L、510L、550L	1.2-6.0	750-1300
	600L、650L、700L、750L、800L	1.5-6.0	

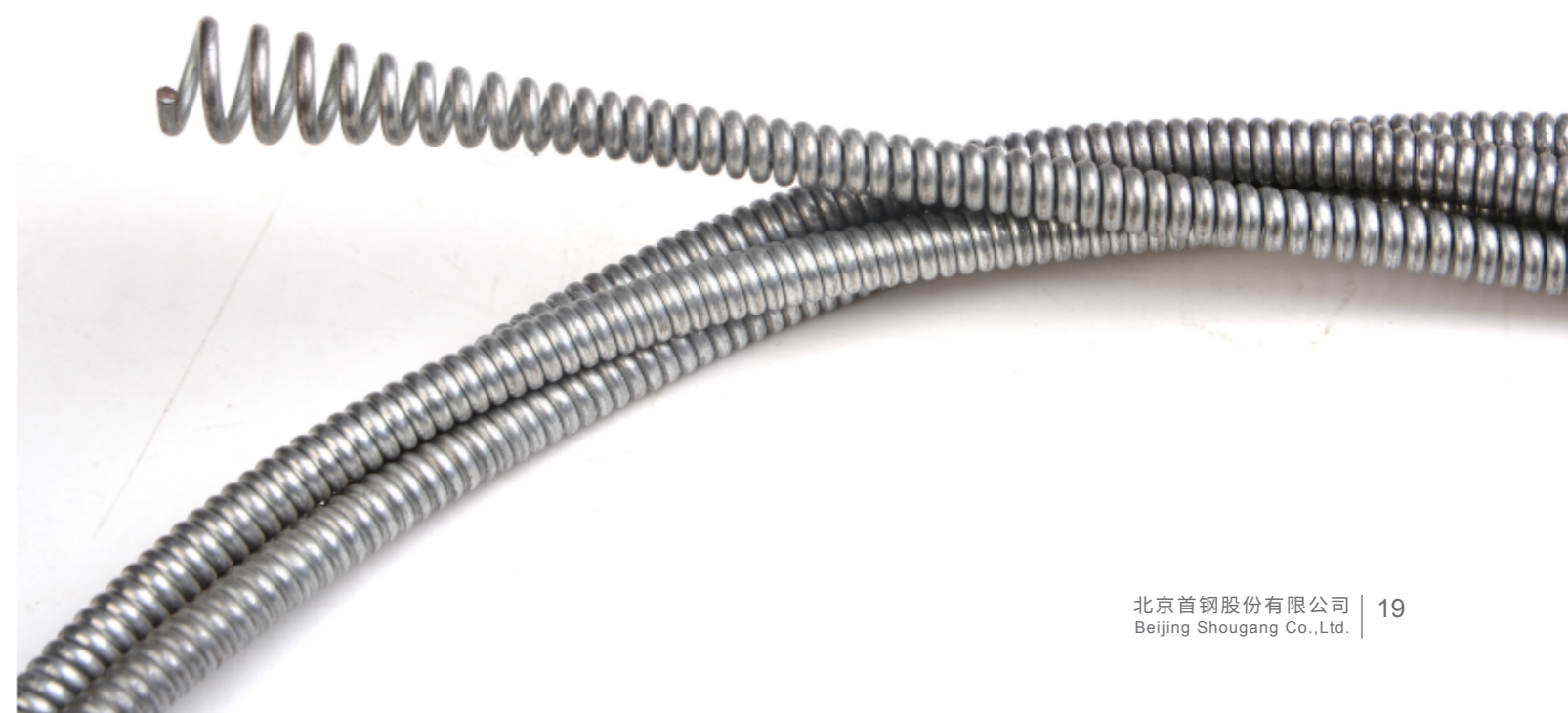
2.6 优质碳素钢 High-quality carbon steel

优质碳素钢依靠调整含碳（C）量来改善钢的力学性能，所含的硫、磷及非金属夹杂物比碳素结构钢少，机械性能较为优良。主要用于制造一般结构及机械结构零、部件以及建筑结构件和输送流体用管道。根据使用要求，有时需热处理（正火或调质）后使用。

25 以下的低碳钢系列塑性好，易于拉拔、冲压、挤压、锻造和焊接。常用来制造螺钉、螺母、垫圈、小轴以及冲压件、焊接件，有时也用于制造渗碳件。30-55 中碳系列因钢中珠光体含量增多，其强度和硬度较前提高，淬火后的硬度可显著增加。以 45 钢最为典型，它不仅强度、硬度较高，且兼有较好的塑性和韧性，即综合性能优良，在机械结构中用途最广，常用来制造轴、丝杠、齿轮、连杆、套筒、键、重要螺钉和螺母等。60 以上的高碳系列经过淬火、回火后不仅强度、硬度提高，且弹性优良，常用来制造小弹簧、发条、钢丝绳、轧辊等。

The mechanical properties of high-quality carbon steel can be improved by adjusting the content of carbon (C). The content of sulfur, phosphorus and non-metallic inclusions is less than that of carbon structural steel, and the mechanical properties of high quality carbon steel are better. It is mainly used to manufacture parts and components of general structure and mechanical structure, as well as building structural parts and pipe for conveying fluid. According to the use requirements, sometimes need heat treatment (normalizing or quenching) after use.

Low carbon steel with carbon content below 0.25% has good plasticity and is easy to be drawn, pressed, extruded, forged and welded. Commonly used to manufacture screws, nuts, washers, small shafts and stamping parts, welding parts, sometimes also used in the manufacture of carburized parts. Due to the increase of pearlite content in 30-55 medium carbon series steel, its strength and hardness are improved compared with those before, and the hardness can be significantly increased after quenching. To 45 steel is the most typical, it is not only high strength, hardness, and has good plasticity and toughness, that is, excellent comprehensive performance, the most widely used in the mechanical structure, commonly used in the manufacture of shaft, screw, gear, connecting rod, sleeve, key, important screws and nuts. More than 60 high carbon series after quenching, tempering not only strength, hardness, and excellent elasticity, commonly used to manufacture small springs, spring, steel wire rope, roll, etc..



2.6.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard		相当国家 / 国际标准 National/International standard														
标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade							
Q/SZGS 0356	SAE1005、SAE1005B、	GB/T 699	-	-	-	-	-	SAE J 403	SAE1005							
	SAE1006、SAE1006B		-						SAE1006							
	SAE1007		-						SAE1007							
	SAE1008、SAE1008 B		8						SAE1008							
	SAE1009		-						SAE1009							
	SAE1010		10						SAE1010							
	SAE1012		-						SAE1012							
	SAE1013		-						SAE1013							
	SAE1015		15						SAE1015							
	SAE1016		-						SAE1016							
	SAE1017		-						SAE1017							
	SAE1018		-						SAE1018							
	SAE1019		-						SAE1019							
	SAE1021		-						SAE1021							
	SAE1022		-						SAE1022							
	20、C22E、S20C、SAE1020		20						ISO 683-1 EN 10083-2	-	JIS G 4051	S20C	SAE1020			
	25、C25、S25C、SAE1025		25							C25/C25E		S25C	SAE1025			
	30、C30、S30C、SAE1030		30							C30/C30E		S30C	SAE1030			
	35、C35、S35C、SAE1035		35							C35/C35E		S35C	SAE1035			
	40、C40、S40C、SAE1040		40							C40/C40E		S40C	SAE1040			
	45、C45、S45C、SAE1045		45							C45/C45E		S45C	SAE1045			
	50、C50、S50C、SAE1050		50							C50/C50E		S50C	SAE1050			
	55、C55、S55C、SAE1055		55							C55/C55E		S55C	SAE1055			
	60、C60、SAE1060		60							C60/C60E		-	SAE1060			
	65、SAE1065		65							-		-	SAE1065			
	70、SAE1070		70						-	-	SAE1070					
	75、SAE1074		75						-	-	SAE1074					
	SAE1075		-						-	-	SAE1075					
	80、SAE1080		80						-	-	SAE1080					
	85、SAE1085		85						-	-	SAE1085					
	SAE1090		-						-	-	SAE1090					
	SAE1095		-						-	-	SAE1095					
	20Mn		20Mn						-	-	-	-	-	-	-	-
	25Mn		25Mn						-	-	-	-	-	-	-	-
	30Mn		30Mn						-	-	-	-	-	-	-	-
	35Mn		35Mn						-	-	-	-	-	-	-	-
	40Mn		40Mn						-	-	-	-	-	-	-	-
	45Mn		45Mn						-	-	-	-	-	-	-	-
	50Mn		50Mn						-	-	-	-	-	-	-	-
	60Mn		60Mn						-	-	-	-	-	-	-	-
	65Mn		65Mn						-	-	-	-	-	-	-	-
	70Mn		70Mn						-	-	-	-	-	-	-	-

2.6.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)									
	C	Si	Mn	P	S	Cr	Ni	Cu	Mo	B
SAE1005	≤ 0.06	≤ 0.03	≤ 0.35	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1005B	≤ 0.06	≤ 0.03	≤ 0.35	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	0.0008-0.002
SAE1006	≤ 0.08	≤ 0.03	0.25-0.40	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1006B	≤ 0.08	≤ 0.03	0.25-0.40	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	0.0008-0.002
SAE1007	0.02-0.10	≤ 0.03	≤ 0.50	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1008B	≤ 0.10	≤ 0.03	0.30-0.50	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	0.0008-0.002
SAE1008	≤ 0.10	≤ 0.03	0.30-0.50	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1009	≤ 0.15	≤ 0.03	≤ 0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1010	0.08-0.13	≤ 0.03	0.30-0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1012	0.10-0.15	≤ 0.03	0.30-0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1013	0.11-0.16	≤ 0.03	0.30-0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1015	0.13-0.18	≤ 0.03	0.30-0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1016	0.13-0.18	≤ 0.03	0.60-0.90	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1017	0.15-0.20	≤ 0.03	0.30-0.60	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1018	0.15-0.20	≤ 0.03	0.60-0.90	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1019	0.15-0.20	≤ 0.03	0.70-1.00	≤ 0.025	≤ 0.020	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1020	0.18-0.23	≤ 0.03	0.35-0.60	≤ 0.030	≤ 0.030	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1021	0.18-0.23	≤ 0.03	0.60-0.90	≤ 0.030	≤ 0.030	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1022	0.18-0.23	≤ 0.03	0.70-1.00	≤ 0.030	≤ 0.030	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1025	0.22-0.28	≤ 0.37	0.30-0.60	≤ 0.030	≤ 0.030	≤ 0.15	≤ 0.20	≤ 0.20	≤ 0.10	-
SAE1030	0.28-0.34	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1035	0.32-0.38	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1040	0.37-0.44	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1045	0.43-0.50	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1050	0.48-0.55	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1055	0.50-0.60	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1060	0.55-0.65	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1065	0.62-0.70	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1070	0.67-0.75	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1074	0.72-0.80	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1075	0.70-0.80	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1080	0.77-0.85	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1085	0.82-0.90	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37
SAE1095	0.90-1.03	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37	≤ 0.37

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)								
	C	Si	Mn	P	S	Cr	Ni	Cu	Mo
20	0.18-0.23	0.17-0.35	0.35-0.60	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
25	0.22-0.28	0.17-0.35	0.50-0.70	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
30	0.28-0.33	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
35	0.32-0.38	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
40	0.37-0.43	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
45	0.43-0.48	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
50	0.48-0.53	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
55	0.52-0.60	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
60	0.57-0.65	0.17-0.37	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
65	0.62-0.70	0.17-0.37	0.60-0.80	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
70	0.67-0.75	0.17-0.37	0.60-0.80	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
75	0.72-0.80	0.17-0.37	0.50-0.80	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
80	0.77-0.85	0.17-0.37	0.60-0.80	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
85	0.82-0.90	0.17-0.37	0.50-0.70	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
20Mn	0.17-0.23	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
25Mn	0.22-0.29	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
30Mn	0.27-0.34	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
35Mn	0.32-0.39	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
40Mn	0.37-0.44	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
45Mn	0.42-0.50	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
50Mn	0.48-0.56	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
60Mn	0.57-0.65	0.17-0.37	0.70-1.00	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
65Mn	0.62-0.70	0.17-0.37	0.90-1.20	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10
70Mn	0.67-0.75	0.17-0.37	0.90-1.20	≤ 0.03	≤ 0.03	≤ 0.20	≤ 0.20	≤ 0.20	≤ 0.10

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)								
	C	Si	Mn	P	S	Cr	Ni	Cu	Mo
S20C	0.18-0.23	0.17-0.35	0.35-0.60	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	-
S25C	0.22-0.28	0.17-0.35	0.30-0.60	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	-
S30C	0.28-0.33	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	-
S35C	0.32-0.38	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	-
S40C	0.37-0.43	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.20	-
S45C	0.43-0.48	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.30	-
S50C	0.48-0.53	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.30	-
S55C	0.52-0.58	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.20	≤ 0.20	≤ 0.30	-

2.6.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test	
	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 A /% Elongation/%
20	≥ 410	≥ 28
25	≥ 450	≥ 24
30	≥ 490	≥ 22
20Mn	≥ 450	≥ 24
25Mn	≥ 490	≥ 22
30Mn	≥ 540	≥ 20

2.6.4 可订货规格 Available size

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)								
	C	Si	Mn	P	S	Cr	Ni	Cu	Mo
C22E	0.18-0.23	0.17-0.35	0.35-0.60	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C25、C25E	0.22-0.28	0.17-0.35	0.50-0.70	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C30、C30E	0.28-0.33	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C35、C35E	0.32-0.38	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C40、C40E	0.37-0.43	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C45、C45E	0.43-0.48	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C50、C50E	0.48-0.53	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C55、C55E	0.52-0.60	0.17-0.35	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10
C60、C60E	0.57-0.65	0.17-0.37	0.60-0.80	≤ 0.030	≤ 0.030	≤ 0.40	≤ 0.20	≤ 0.20	≤ 0.10

首钢企业标准 Shougang standard	名称		厚度订货范围 /mm Nominal thickness/mm	宽度订货范围 /mm Nominal width/mm
	相当国家 / 国际标准 National/International standard	牌号 Grade		
Q/SGZGS 0356	SAE J 403	SAE1006、SAE1010	1.0-7.0	750-1635
		SAE1008、SAE1012	1.0-7.0	750-1635
		SAE1022	1.5-6.5	750-1500
		SAE1020	1.5-6.5	750-1500
		SAE1045	1.5-6.5	750-1500
	JIS G 4051	S45C	1.5-6.5	800-1515
GB/T 699	20	1.5-6.5	750-1500	
	45	1.5-6.5	800-1515	
	65Mn	1.5-6.5	750-1500	

2.7 搪瓷用钢 Enamel steel

用于制造日常生活搪瓷制品、家电类、水处理工业等具有良好搪瓷性能的搪瓷制品。

Enamelled steel is used in the manufacture of daily enamel products, household appliances, water treatment industry and other enamel products with good enamel performance.

2.7.1 牌号标准 Grade and standard

牌号 Grade	适用厚度范围, mm thickness range, mm	牌号表示方法 Indicates of grade	牌号示例 Examples of grades	用途 Application
STC210R	≤ 7.0	由代表首钢“首”汉语拼音首字母“S”、搪瓷汉语首字母“TC”、规定的屈服强度下限值、热轧板汉语拼音首字母“R”组成。It is composed of the initials “S” representing the “first” Chinese pinyin of Shougang, the initials “TC” of enamel Chinese, the prescribed lower limit of yield strength, and the initials “R” of Chinese pinyin for hot-rolled plates.	例如: STC330R S—代表首钢; TC—代表搪瓷; 330—规定的屈服强度下限值, 单位为MPa; R—代表热轧板。 For example: STC330R S-stands for Shougang; TC-stands for enamel; 330—The lower limit of the specified yield strength, the unit is MPa; R-stands for hot rolled plate.	日用搪瓷钢(日搪): 热水器内胆等。 Daily-use enamel steel: inner tank of water heater, etc.
STC245R				
STC300R				
STC330R				
STC360R				

2.7.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)					
	C	Si	Mn	P	S	Als
STC210R	≤ 0.12	≤ 0.05	≤ 0.70	≤ 0.020	≤ 0.025	≥ 0.015
STC245R	≤ 0.12	≤ 0.05	≤ 1.20	≤ 0.020	≤ 0.025	≥ 0.015
STC300R	≤ 0.12	≤ 0.05	≤ 1.40	≤ 0.020	≤ 0.025	≥ 0.015
STC330R	≤ 0.16	≤ 0.05	≤ 1.50	≤ 0.020	≤ 0.025	≥ 0.015
STC360R	≤ 0.16	≤ 0.05	≤ 1.60	≤ 0.020	≤ 0.025	≥ 0.015

2.7.3 力学性能 Mechanical Properties

牌号 Grade	拉伸试验 Tensile test			
	下列公称厚度 (mm) 的下屈服强度 R_{eL} /MPa, Lower yield strength as follow normal R_{eL} /MPa,		抗拉强度 R_m /MPa, Tensile strength R_m /MPa,	断后伸长率 A_{50mm} /%, Elongation/%,
	< 1.60	≥ 1.60		
STC210R	≥ 210		≥ 300	≥ 28
STC245R	≥ 245		≥ 340	≥ 26
STC300R	≥ 300		≥ 370	≥ 24
STC330R	≥ 290	≥ 330	≥ 400	≥ 22
STC360R	≥ 360		≥ 440	≥ 22

2.7.4 可订货规格 Available size

牌号 Grade	厚度订货范围 /mm Nominal thickness/mm	宽度订货范围 /mm Nominal width/mm
STC210R、STC330R STC245R、STC300R	1.6-6.0	750-1520

2.8 先进高强钢 Advanced high-strength steel

先进高强钢区别于传统高强钢, 具有良好吸能性, 在汽车轻量化和提高安全性方面起着非常重要的作用。主要包括双相钢、复相钢、高扩孔钢, 以及热成形钢。

首钢先进高强钢广泛应用于汽车工业, 主要应用于汽车结构件、安全件和加强件如 A/B/C 柱、车门槛、前后保险杠、车门防撞梁、横梁、纵梁、座椅滑轨等零部件。

Advanced high-strength steel is different from traditional high-strength steel, has good energy absorption, and plays a very important role in reducing the weight of automobiles and improving safety. Mainly include dual-phase steel, complex-phase steel, high hole expansion steel, and hot-formed steel.

Shougang's advanced high-strength steel is widely used in the automotive industry, mainly in automotive structural parts, safety parts and reinforcements such as A/B/C pillars, door sills, front and rear bumpers, door anti-collision beams, cross beams, longitudinal beams, seat slides Parts such as rails.



2.8.1 牌号标准 Grade and standard

标准号 Standard	先进高强钢类别 Types of advanced high-strength steel	牌号 Grade
GB T 20887.3	Dual-phase steel 双相钢	HR300/540DP、HR330/580DP、HR380/680DP、HR450/780DP
GB T 20887.6	Complex-phase steel 复相钢	HR660/760CP、HR720/950CP
Q/SGJS 0018.1		HR800CP、HR1000CP
GB T 20887.2	High hole expansion steel 高扩孔钢	HR300/450HE、HR380/540HE、HR440/580HE、HR520/680HE、HR600/780HE、HR780/980HE
Q/SGJS 0018.2		FB590、FB780、FB45、FB60
协议	Nano Precipitation Steel 纳米析出钢	HR780NA、HR980NA

2.8.2 化学成分 Chemical composition

1、双相钢 Dual-phase steel

牌号 Grade	化学成分 (熔炼分析) /% Chemical composition (Ladle analysis)											
	C	Si	Mn	P	S	Alt	Cr+Mo	Nb+Ti	V	Cu	B	Cr+Ni+Mo
HR300/540DP	≤ 0.23	≤ 2.00	≤ 3.30	≤ 0.090	≤ 0.015	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.40	≤ 0.006	≤ 1.50
HR330/580DP												
HR380/680DP												
HR450/780DP												

2、复相钢 Complex-phase steel

牌号 Grade	化学成分 (熔炼分析) /% Chemical composition (Ladle analysis) /%									
	C	Si	Mn	P	S	Alt ^b	Cr+Mo	Nb+Ti	V	B
HR660/760CP	≤ 0.15	≤ 0.80	≤ 2.20	≤ 0.040	≤ 0.015	≤ 2.00	≤ 1.00	≤ 0.20	≤ 0.20	≤ 0.005
HR720/950CP	≤ 0.20	≤ 1.50	≤ 2.50	≤ 0.040	≤ 0.015	≤ 2.00	≤ 1.20	≤ 0.20	≤ 0.20	≤ 0.005

牌号	C	Si	Mn	P	S	Alt	Cr+Mo	Nb+Ti	V	B	CU
HR800CP	≤ 0.18	≤ 0.8	≤ 2.2	≤ 0.08	≤ 0.015	≤ 2.0	≤ 1.0	≤ 0.25	≤ 0.20	≤ 0.005	≤ 0.20
HR1000CP	≤ 0.23	≤ 0.8	≤ 2.2	≤ 0.08	≤ 0.015	≤ 2.0	≤ 1.0	≤ 0.25	≤ 0.20	≤ 0.005	≤ 0.20

3、高扩孔钢 High hole expansion steel

牌号 Grade	化学成分 (熔炼分析) /% Chemical composition (Ladle analysis) /%										
	C	Si	Mn	P	S	Alt	Cr+Mo	Nb+Ti	V	B	Cr+Ni+Mo
HR300/450HE	≤ 0.18	≤ 1.00	≤ 2.00	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.005	≤ 1.50
HR380/540HE	≤ 0.18	≤ 1.20	≤ 2.00	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.010	≤ 1.50
HR440/580HE	≤ 0.18	≤ 1.20	≤ 2.00	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.010	≤ 1.50
HR520/680HE	≤ 0.18	≤ 1.20	≤ 2.00	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.010	≤ 1.50
HR600/780HE	≤ 0.18	≤ 1.20	≤ 2.00	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.010	≤ 1.50
HR780/980HE	≤ 0.18	≤ 1.60	≤ 2.20	≤ 0.050	≤ 0.010	≥ 0.015	≤ 1.00	≤ 0.15	≤ 0.15	≤ 0.010	≤ 1.50

牌号 Grade	化学成分 (熔炼分析) /% Chemical composition (Ladle analysis) /%									
	C	Si	Mn	P	S	Alt	Nb	Ti	V	Cr
FB590	≤ 0.15	≤ 1.20	≤ 2.00	≤ 0.025	≤ 0.010	≥ 0.015	≤ 0.09	≤ 0.09	≤ 0.15	≤ 0.80
FB780	≤ 0.10	≤ 1.20	≤ 2.00	≤ 0.020	≤ 0.010	≥ 0.015	≤ 0.10	≤ 0.10	≤ 0.15	≤ 1.00
FB45	≤ 0.18	≤ 0.20	≤ 1.20	≤ 0.025	≤ 0.010	0.015-0.07	≤ 0.03	≤ 0.03	≤ 0.06	≤ 0.10
FB60	≤ 0.18	≤ 0.45	≤ 1.60	≤ 0.025	≤ 0.010	0.015-0.07	≤ 0.09	≤ 0.09	≤ 0.06	≤ 0.10

^a 经供需双方协商, 也可以添加 Mo。

4. 纳米析出钢 Nano Precipitation Steel

牌号 Grade	化学成分 (熔炼分析) /% Chemical composition (Ladle analysis) /%							
	C	Si	Mn	P	S	Alt	Ti	Mo
HR780NA	≤ 0.10	≤ 0.2	≤ 2.0	≤ 0.03	≤ 0.015	≥ 0.015	≤ 0.15	≤ 0.4
HR980NA	≤ 0.10	≤ 0.3	≤ 2.5	≤ 0.03	≤ 0.015	≥ 0.015	≤ 0.25	≤ 0.6

2.8.3 力学性能

1. 双相钢 Dual-phase steel

牌号 Grade	拉伸试验 Tensile test			
	下屈服强度 R _{eL} /MPa Lower yield strength R _{eL} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 % Elongation/%	
			A _{50mm} (L ₀ =50mm, b ₀ =25mm)	A _{80mm} (L ₀ =80mm, b ₀ =20mm)
HR300/540DP	330~450	540-660	≥ 24	≥ 21
HR330/580DP	330~450	580-700	≥ 22	≥ 19
HR380/680DP	380~500	680-800	≥ 19	≥ 17
HR450/780DP	450-610	780-900	≥ 16	≥ 14

2. 复相钢 Complex-phase steel

牌号 Grade	拉伸试验 Tensile test			
	下屈服强度 R _{eL} /MPa Lower yield strength R _{eL} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 A _{80mm} /% Elongation/%	
			板厚 /mm Thickness/mm	
HR660/760CP	660~820	≥ 760	< 9	≥ 10
HR720/950CP	720~920	≥ 950	< 8	≥ 9

牌号	规定延伸强度 R _{p0.2} /MPa	抗拉强度 R _m /MPa	断后伸长率 A _{80mm} /%
HR800CP	680-830	780-980	≥ 10
HR1000CP	720-920	950-1150	≥ 9

3. 高扩孔钢 High hole expansion steel

牌号 Grade	拉伸试验				平均极限扩孔率 average limiting hole expansion ratio $\bar{\lambda}$ / %
	下屈服强度 R _{eL} /MPa Upper yield strength R _{eL} /MPa	T 抗拉强度 R _m /MPa ensile strength R _m /MPa	断后伸长率 A _{50mm} /% Elongation/% (L ₀ =50mm, b=25mm)	断后伸长率 A _{80mm} /% Elongation/% (L ₀ =80mm, b=20mm)	
HR300/450HE	300~400	450-550	≥ 27	≥ 24	≥ 80
HR380/540HE	380-540	540-660	≥ 19	≥ 17	≥ 80
HR440/580HE	440~600	580-700	≥ 17	≥ 15	≥ 75
HR520/680HE	520~700	680-800	≥ 16	≥ 13	≥ 60
HR600/780HE	600~800	780-900	≥ 15	≥ 12	≥ 55
HR780/980HE	780~1000	980-1120	≥ 10	≥ 7	≥ 30

牌号 Grade	拉伸试验 ^a Tensile test				平均极限扩孔率 average limiting hole expansion ratio $\bar{\lambda}$ / %
	下屈服强度 R _{eL} /MPa Lower yield strength R _{eL} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	断后伸长率 /% Elongation /%		
			厚度 Thickness <3mm A _{50mm}	厚度 Thickness ≥ 3mm A	
FB590	480-620	590-670	≥ 16	21	≥ 70
FB780	680-840	780-900	≥ 12	15	≥ 50
FB45	320-410	450-560	≥ 24	31	≥ 80
FB60	460-570	580-700	≥ 16	21	≥ 75

4. 纳米析出钢 Nano Precipitation Steel

牌号 Grade	拉伸试验 ^a Tensile Test			平均极限扩孔率 average limiting hole expansion ratio $\bar{\lambda}$ / %
	下屈服强度 R _{eL} /MPa	抗拉强度 R _m /MPa	断后伸长率 A _{50mm} /% Elongation/% (L ₀ =50mm, b=25mm)	
HR780NA	680~830	≥ 780	≥ 17	≥ 65
HR980NA	780~1000	≥ 980	≥ 12	≥ 35

2.8.4 可订货规格 Available size

先进高强度 Advanced high-strength steel	牌号 Grade	厚度订货范围 /mm Nominal thickness/mm	宽度订货范围 /mm Nominal width/mm
双相钢 Dual-phase steel	HR300/540DP、HR330/580DP、HR380/680DP、HR450/780DP	1.2-6.0	750-1260
复相钢 Complex-phase steel	HR660/780CP、HR720/950CP、HR800CP、HR1000CP	2.0-6.0	800-1500
高扩孔钢 High hole expansion steel	HR300/450HE、HR380/540HE、HR440/580HE、HR520/680HE、HR600/780HE、HR780/980HE、FB590、FB780、FB45、FB60	1.8-5.0	800-1260
纳米析出钢 Nano Precipitation Steel	HR780NA、HR980NA	2.0-6.0	800-1500

2.9 焊接气瓶用钢 Steel for welding gas cylinders

用于制造焊接气瓶，主要盛装低压液化气体和溶解气体，属于气瓶系移动式压力容器。

It is used to manufacture welded gas cylinders, mainly containing low-pressure liquefied gas and dissolved gas, and belongs to the gas cylinder series of mobile pressure vessels.

2.9.1 牌号标准 Grade and standard

首钢企业标准 Shougang standard		相当国家 / 国际标准 National/International standard				厚度 /mm Nominal thickness/mm	宽度 /mm Nominal width/mm
标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade	标准号 Standard	牌号 Grade		
Q/SGZGS 0332	HP235	GB/T 6653	HP235	-	-	-	-
	HP265		HP265			2.0-6.5	750-1600
	HP295		HP295			2.0-6.5	750-1600
	HP325		HP325			-	-
	HP345		HP345			-	-
	SG255	-	-	JIS G 3116	SG255	2.0-6.5	750-1600
	SG295				SG295	2.0-6.5	750-1600
	SG325				SG325	-	-
	SG365				SG365	-	-

2.9.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)										
	C	Si	Mn	P	S	Cu	Nb	V	Ti	Nb+V	Alt
HP235	0.08-0.15	≤ 0.10	≤ 0.10-0.80	≤ 0.018	≤ 0.010	≤ 0.20	≤ 0.05	≤ 0.10	≤ 0.06	≤ 0.12	≥ 0.020
HP265 SG255	0.08-0.018	≤ 0.10	≤ 0.30-0.80	≤ 0.018	≤ 0.010	≤ 0.20	≤ 0.05	≤ 0.10	≤ 0.06	≤ 0.12	≥ 0.020
HP295 SG295	0.08-0.018	≤ 0.10	≤ 0.50-1.00	≤ 0.018	≤ 0.010	≤ 0.20	≤ 0.05	≤ 0.10	≤ 0.06	≤ 0.12	≥ 0.020
HP325 SG325	0.08-0.018	≤ 0.30	≤ 0.70-1.45	≤ 0.018	≤ 0.010	≤ 0.20	≤ 0.05	≤ 0.10	≤ 0.06	≤ 0.12	≥ 0.020
HP345 SG365	0.08-0.018	≤ 0.30	≤ 0.70-1.45	≤ 0.018	≤ 0.010	≤ 0.20	≤ 0.05	≤ 0.10	≤ 0.06	≤ 0.12	≥ 0.020

2.9.3 力学性能 Mechanical Properties

牌号 Grade	拉伸实验 Tensile test				
	下屈服强度 R _{eL} /Mpa Lower yield strength R _{eL} /MPa	抗拉强度 R _m /MPa Tensile strength R _m /MPa	屈强比 % yield ratio%	断后伸长率 Elongation/%	
				厚度 < 3mm thickness < 3mm	厚度 ≥ 3mm width ≥ 3mm
				A _{80mm} %	A%
HP235	≥ 235	380-500	≤ 0.8	≥ 23	≥ 30
HP265	≥ 265	410-520	≤ 0.8	≥ 21	≥ 28
HP295	≥ 295	440-560	≤ 0.8	≥ 20	≥ 27
HP325	≥ 325	490-600	≤ 0.8	≥ 18	≥ 23
HP345	≥ 345	510-620	≤ 0.8	≥ 17	≥ 22
SG255	≥ 265	410-520	≤ 0.8	A _{50mm} ≥ 28	
SG295	≥ 295	440-560	≤ 0.8	A _{50mm} ≥ 26	
SG325	≥ 325	490-600	≤ 0.8	A _{50mm} ≥ 22	
SG365	≥ 365	540-650	≤ 0.8	A _{50mm} ≥ 20	

2.9.4 可订货规格 Available size

名称 Name			厚度订货范围 /mm Nominal thickness/mm	宽度订货范围 /mm Nominal width/mm
首钢企业标准 Shougang standard	相当国家 / 国际标准 National/International standard	牌号 Grade		
Q/SGZGS 0332	GB/T 6653	HP265、HP295	1.5-6.5	750-1600
	JIS G 3116	SG255、SG295	1.5-6.5	750-1600



2.10 连续油管用钢 Steel for coiled tubing

低碳合金钢用于制造连续油管 (Coiled tubing)，有很好的挠性，又称挠性油管，一卷连续油管长几千米。可以代替常规油管进行很多作业，连续油管作业设备具有带压作业、连续起下的特点，设备体积小，作业周期快，成本低。

Low-carbon alloy steel is used in the manufacture of Coiled tubing. It is very flexible, also known as flexible tubing. Each coil of Coiled tubing is several thousand meters long. With the ability to perform many operations in place of conventional tubing, the coiled tubing equipment features a pressurized, continuous trip, small size, fast cycle time, and low cost.

2.10.1 力学性能 Mechanical Properties

牌号 Grade	拉伸实验 Tensile test		
	屈服强度 $R_{p0.2}$ /MPa Yield strength $R_{p0.2}$ /MPa	抗拉强度 R_m /MPa Tensile strength R_m /MPa	断后伸长率 Elongation/%
CT70	410~530	530~650	≥ 16
CT80	483~585	552~685	≥ 16
CT90	552~689	≥ 669	≥ 13
CT100	610~758	758~848	≥ 13
CT110	670~793	793~965	≥ 11

2.10.2 可订货规格 Available size

牌号 Grade	厚度 /mm thickness/mm	宽度 /mm width/mm
CT70、CT80、CT90、CT100、CT110	1.5-6.0	800-1250

2.11 特殊钢 Special steel

特殊钢具有特殊的化学成分 (合金化)、采用特殊的工艺生产、具备特殊的组织和性能、能够满足特殊需要的钢类。常见的特殊钢有精冲钢、热成形钢等。

Special steel has a special chemical composition (alloying), the use of special process production, with special structure and properties, can meet the special needs of the steel class. The common special steel is fine blanking steel, hot-forming steel, etc.

2.11.1 牌号标准 Grade and standard

标准号 Standard	类别 Category	牌号 Grade
协议	精冲钢 Fine blanking steel	55MnB、50CrV4
协议	热成形钢 Hot formed steel	22MnB5、26MnB5、34MnB5、HR950、1300HS、HR1000/1500HS、HR1200/1800HS、HR1200/2000HS

2.11.2 化学成分 Chemical composition

1、精冲钢 Fine blanking steel

牌号 Grade	化学成分 (质量分数) Chemical composition(wt%)/%								
	C	Si	Mn	P	S	Cr	V	Als	B
50CrV4	0.48-0.54	0.25-0.35	0.80-1.05	≤ 0.020	≤ 0.010	0.90-1.10	0.10-0.20	0.010-0.050	-
55MnB	0.52-0.58	0.15-0.35	0.60-0.90	≤ 0.025	≤ 0.020	0.08-0.15	-	0.010-0.050	0.0012-0.0030

2、热成形钢 Hot formed steel

牌号	C	Si	Mn	P	S	Alt	B	Cr	Ti	Mo	N
22MnB5	0.20-0.25	≤ 0.50	1.1-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.35	0.02-0.05	≤ 0.35	≤ 0.008
26MnB5	0.24-0.29	≤ 0.50	1.1-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.35	0.02-0.05	≤ 0.35	≤ 0.008
34MnB5	0.32-0.37	≤ 0.50	1.1-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.35	0.02-0.06	≤ 0.35	≤ 0.008
40MnB5	0.38-0.43	≤ 0.50	1.1-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.60	0.02-0.06	≤ 0.35	≤ 0.008
HR950/1300HS	0.17-0.25	≤ 0.50	1.0-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.35	0.02-0.06	≤ 0.35	≤ 0.008
HR1000/1500HS	0.20-0.26	≤ 0.50	1.0-1.6	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.35	0.02-0.06	≤ 0.35	≤ 0.008
HR1200/1800HS	0.27-0.35	≤ 0.50	1.1-2.0	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 0.50	0.02-0.06	≤ 0.35	≤ 0.008
HR1200/2000HS	0.32-0.40	≤ 0.50	1.1-2.0	≤ 0.025	≤ 0.010	0.010-0.060	0.0008-0.0050	≤ 1.00	0.02-0.06	≤ 0.35	≤ 0.008

2.11.3 力学性能 Mechanical Properties

1、精冲钢 Fine blanking steel

牌号 Grade	洛氏硬度 Rockwell hardness	拉伸试验 Tensile test	
		屈服强度 $R_{p0.2}$ /MPa Yield strength $R_{p0.2}$ /MPa	抗拉强度 R_m /MPa Tensile strength R_m /MPa
50CrV4 55MnB	≤ 91 HRB	-	-

公称厚度 mm Nominal width/ mm	完全脱碳层 (铁素体) 深度不大于公称厚度的百分比, % The depth of the completely decarbonized layer A (ferrite) is not greater than a percentage of the nominal thickness %	
	单面 Single sided	两面 Double sided
≤ 3	1.5	3.0
> 3	1.0	2.0

非金属夹杂物级别, 级 Non-metallic inclusion level ,level								
A类 (硫化物类) Class A (Sulphide)		B类 (氧化铝类) Class B (Alumina)		C类 (硅酸盐类) Class C (Silicate)		D类 (球状氧化物类) Class D (spherical oxides)		DS类 (单颗粒球状类) DS class (single particle spherical class)
粗系	细系	粗系	细系	粗系	细系	粗系	细系	-
≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	实测

2、热成形钢 Hot formed steel

牌号	拉伸试验		
	下屈服强度 R_{eL} /MPa	抗拉强度 R_m /MPa	断后伸长率 A_{50mm} /%
22MnB5	320-630	480-800	≥ 15
26MnB5	320-650	500-800	≥ 14
34MnB5	320-680	550-850	≥ 12
40MnB5	350-780	600-950	≥ 10

牌号	拉伸试验		
	下屈服强度 R_{eL} /MPa	抗拉强度 R_m /MPa	断后伸长率 A_{50mm} /%
HR950/1300HS	320-630	480-800	≥ 15
HR1000/1500HS	320~650	500~800	≥ 14
HR1200/1800HS	320~680	500~900	≥ 12
HR1200/2000HS	350~800	600~1000	≥ 10

2.11.4 可订货规格 Available size

特殊钢 Special steel	牌号 Grade	厚度 /mm thickness/mm	宽度 /mm width/mm
精冲钢 Fine blanking steel	55MnB、50CrV4 等	1.2-6.5	750-1500
热成形钢 Hot formed steel	22MnB5、26MnB5、34MnB5、40MnB5、HR950/1300HS、HR1000/1500HS、HR1200/1800HS、HR1200/2000HS	1.2-6.5	800-1520



Chapter 3 Dimensional accuracy

第三章 尺寸精度

表 1 规定最小屈服强度小于 360MPa 钢板和钢带的厚度允许偏差

单位为毫米

Table 1 the allowable deviation for the thickness of steel plates and strips with a minimum yield strength of less than 360MPa (unit: mm)

公称厚度 Nominal thickness/mm	厚度允许偏差 Allowable deviation of thickness											
	普通精度 PT.A General tolerance				较高精度 PT.B High tolerance				高级精度 PT.C Highest tolerance			
	公称宽度 Nominal width/mm				公称宽度 Nominal width/mm				公称宽度 Nominal width/mm			
	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800
≤ 1.50	± 0.15	± 0.17	-	-	± 0.10	± 0.12	-	-	± 0.08	± 0.10	-	-
$> 1.50 \sim 2.00$	± 0.17	± 0.19	± 0.21	-	± 0.13	± 0.14	± 0.14	-	± 0.10	± 0.11	± 0.11	-
$> 2.00 \sim 2.50$	± 0.18	± 0.20	± 0.21	± 0.25	± 0.14	± 0.15	± 0.17	± 0.20	± 0.11	± 0.12	± 0.14	± 0.17
$> 2.50 \sim 3.00$	± 0.19	± 0.21	± 0.22	± 0.25	± 0.15	± 0.17	± 0.19	± 0.21	± 0.12	± 0.14	± 0.16	± 0.18
$> 3.00 \sim 4.00$	± 0.21	± 0.23	± 0.26	± 0.27	± 0.17	± 0.18	± 0.21	± 0.22	± 0.13	± 0.15	± 0.17	± 0.18
$> 4.00 \sim 5.00$	± 0.24	± 0.26	± 0.28	± 0.29	± 0.19	± 0.21	± 0.22	± 0.23	± 0.14	± 0.16	± 0.17	± 0.19
$> 5.00 \sim 6.00$	± 0.26	± 0.28	± 0.29	± 0.31	± 0.21	± 0.22	± 0.23	± 0.25	± 0.16	± 0.17	± 0.18	± 0.20
$> 6.00 \sim 8.00$	± 0.29	± 0.30	± 0.31	± 0.35	± 0.23	± 0.24	± 0.25	± 0.28	± 0.18	± 0.19	± 0.20	± 0.23
$> 8.00 \sim 10.00$	± 0.32	± 0.33	± 0.34	± 0.40	± 0.26	± 0.26	± 0.27	± 0.32	± 0.20	± 0.21	± 0.22	± 0.26
$> 10.00 \sim 12.50$	± 0.35	± 0.36	± 0.37	± 0.43	± 0.28	± 0.29	± 0.30	± 0.36	± 0.22	± 0.23	± 0.24	± 0.30
$> 12.50 \sim 15.00$	± 0.37	± 0.38	± 0.40	± 0.46	± 0.30	± 0.31	± 0.33	± 0.39	± 0.23	± 0.24	± 0.26	± 0.33
$> 15.00 \sim 25.40$	± 0.40	± 0.42	± 0.45	± 0.50	± 0.32	± 0.34	± 0.37	± 0.42	± 0.25	± 0.27	± 0.30	± 0.35

表 2 规定最小屈服强度不小于 360MPa 钢板和钢带的厚度允许偏差 单位为毫米

Table 2 the allowable deviation for the thickness of steel plates and strips with a minimum yield strength of no less than 360MPa (unit: mm)

公称厚度 Nominal thickness/mm	厚度允许偏差 Allowable deviation of thickness											
	普通精度 PT.A General tolerance				较高精度 PT.B High tolerance				高级精度 PT.C Highest tolerance			
	公称宽度 Nominal width/mm				公称宽度 Nominal width/mm				公称宽度 Nominal width/mm			
	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800	700 ~ 1200	> 1200 ~ 1500	> 1500 ~ 1800	> 1800
≤ 1.50	±0.17	±0.19	-	-	±0.11	±0.13	-	-	±0.09	±0.11	-	-
> 1.50 ~ 2.00	±0.19	±0.21	±0.23	-	±0.14	±0.15	±0.15	-	±0.11	±0.12	±0.12	-
> 2.00 ~ 2.50	±0.20	±0.23	±0.25	±0.28	±0.15	±0.17	±0.19	±0.22	±0.12	±0.14	±0.16	±0.19
> 2.50 ~ 3.00	±0.22	±0.24	±0.26	±0.29	±0.17	±0.19	±0.21	±0.23	±0.14	±0.15	±0.18	±0.20
> 3.00 ~ 4.00	±0.24	±0.26	±0.29	±0.30	±0.19	±0.20	±0.23	±0.24	±0.15	±0.16	±0.19	±0.20
> 4.00 ~ 5.00	±0.26	±0.29	±0.31	±0.32	±0.21	±0.23	±0.24	±0.25	±0.16	±0.18	±0.19	±0.21
> 5.00 ~ 6.00	±0.29	±0.31	±0.32	±0.34	±0.23	±0.24	±0.25	±0.28	±0.18	±0.19	±0.20	±0.23
> 6.00 ~ 8.00	±0.32	±0.33	±0.34	±0.39	±0.25	±0.26	±0.28	±0.31	±0.20	±0.21	±0.23	±0.26
> 8.00 ~ 10.00	±0.35	±0.36	±0.37	±0.44	±0.29	±0.29	±0.30	±0.35	±0.23	±0.24	±0.25	±0.29
> 10.00 ~ 12.50	±0.39	±0.40	±0.41	±0.47	±0.31	±0.32	±0.33	±0.40	±0.25	±0.26	±0.27	±0.34
> 12.50 ~ 15.00	±0.41	±0.42	±0.44	±0.51	±0.33	±0.34	±0.36	±0.43	±0.26	±0.27	±0.29	±0.36
> 15.00 ~ 25.40	±0.44	±0.46	±0.50	±0.55	±0.35	±0.37	±0.41	±0.46	±0.28	±0.30	±0.34	±0.39

表 3 钢板和钢带的宽度允许偏差 单位为毫米

Table 3 the allowable deviation for the width of steel plates and strips (unit: mm)

公称宽度 Nominal thickness/mm	允许偏差 Allowable deviation	
公称宽度 Nominal width/mm	切边 Scrap edge	不切边 Mill-edge
≤ 1200	+ 3 0	+ 20 0
> 1200 ~ 1500	+ 5 0	
> 1500	+ 6 0	

Chapter 4 Quality assurance

第四章 质量保障

- 通过 ISO9001 质量体系认证。
- 通过了 ISO/IEC17025:2005 实验室认证。
- 通过了 GBT19002-2003/ISO10012:2003 测量体系的认证。
- 通过了 ISO/TS16949: 2009, GB/T24001-2004 /ISO14001:2004, GB/T28001-2011 体系认证审核。
- Shougang obtained ISO 9001 certification.
- Shougang obtained ISO/IEC17025:2005 laboratory certification.
- Shougang obtained GBT19002-2003/ISO10012:2003 measurement system certification .
- Shougang obtained ISO/TS16949:2009, GB/T24001-2004/ISO14001:2004, GB/T28001-2011 system certification .



Chapter 5 Packaging and Labeling

第五章 包装与标识

表 4 包装方式分类

Table 1 Classification of packing methods

类别 Category	包装方式代码 Packing Code	包装方式名称 Name of packing method	适用范围 Range of application	
			一般要求 General requirements	其他要求 Other requirements
热连轧酸洗钢带 Hot rolled pickled steel strip	HP01	Simple package	筒包适用于储运条件较好、短途运输、直接用户、气候条件较好或产品表面质量要求不高等情况；	适用于国内，主要用于冷轧原材料的包装。此包装为裸装，为避免争议，需向客户说明可能带来的影响。 Applicable to domestic, mainly used for packaging of cold-rolled raw materials. This packaging is naked, in order to avoid disputes, it is necessary to explain the possible impact to the customer.
	HP03	Simple package	Simple package is suitable for conditions such as good storage and transportation conditions, short-distance transportation, direct users, good weather conditions or low product surface quality requirements;	适用于国内。 Applicable to domestic.
	HP04	General package	普包适用于储运条件复杂、中长途运输、周转运输、气候条件一般或产品表面质量要求较高等情况；	适用于国内。 Applicable to domestic.
	HP04a	General package		适用于国内。 Applicable to domestic.
	HP05	Fine package	The general package is suitable for complicated storage and transportation conditions, long-distance transportation, turnover transportation, general climatic conditions or high product surface quality requirements, etc;	适用于国内和出口。 Suitable for domestic and export.
	HP05a	Fine package		适用于国内和出口。 Suitable for domestic and export.
	HP06	Fine package	精包适用于储运条件复杂、长途运输、出口、气候条件较差或产品表面质量要求很高等情况。	适用于国内和出口。 Suitable for domestic and export.
	热连轧酸洗钢板 Hot rolled pickled steel plate	HPS01	General package	Fine package is suitable for complex storage and transportation conditions, long-distance transportation, export, poor weather conditions, or high product surface quality requirements.
HPS02		Fine package		适用于国内和出口。 Suitable for domestic and export.
HPS03		Fine package		适用于国内和出口。 Suitable for domestic and export.

1、热连轧酸洗钢带包装方式 Packing method of hot-rolled pickled steel strip

表 5 热连轧酸洗钢带包装方式 Table 2 Classification of packing methods

序号 Number	包装方式名称 Name of packing method	包装方式代码 Packing Code	气相防锈纸 volatile rust preventive paper	内芯纸板 Inner core cardboard	工业膜 Industrial film	内周护板 ^a Inner peripheral guard plate		外周护板 ^a Outer peripheral guard plate			端护板 ^a End guard plate		护角 Guard corner		钢捆带 ^b Steel strap	推荐方式图示 Recommended way diagram
						瓦楞纸 corrugated paper	钢 Steel	瓦楞纸 corrugated paper	纤维 fiber	钢 Steel	钢 Steel	塑料 plastic	纸 paper	钢 Steel		
1	筒包 Simple package	HP01	-	-	-	-	-	-	-	-	-	-	-	-	√	图 1 Figure 1
2	筒包 Simple package	HP03	√	√	-	-	-	-	-	-	-	√	√	√	√	图 2 Figure 2
3	普包 General package	HP04	√	√	-	-	√	-	√	-	√	√	√	√	√	图 3 Figure 3
3	普包 General package	HP04a	√	√	-	-	√	-	-	√	-	√	√	√	√	图 3 Figure 3
4	精包 Fine package	HP05	√	√	√	-	√	-	√	-	-	√	√	√	√	图 4 Figure 4
4	精包 Fine package	HP05a	√	√	√	-	√	-	-	√	-	√	√	√	√	图 4 Figure 4
5	精包 Fine package	HP06	√	√	√	√	√	√	-	√	-	√	√	√	√	图 5 Figure 5

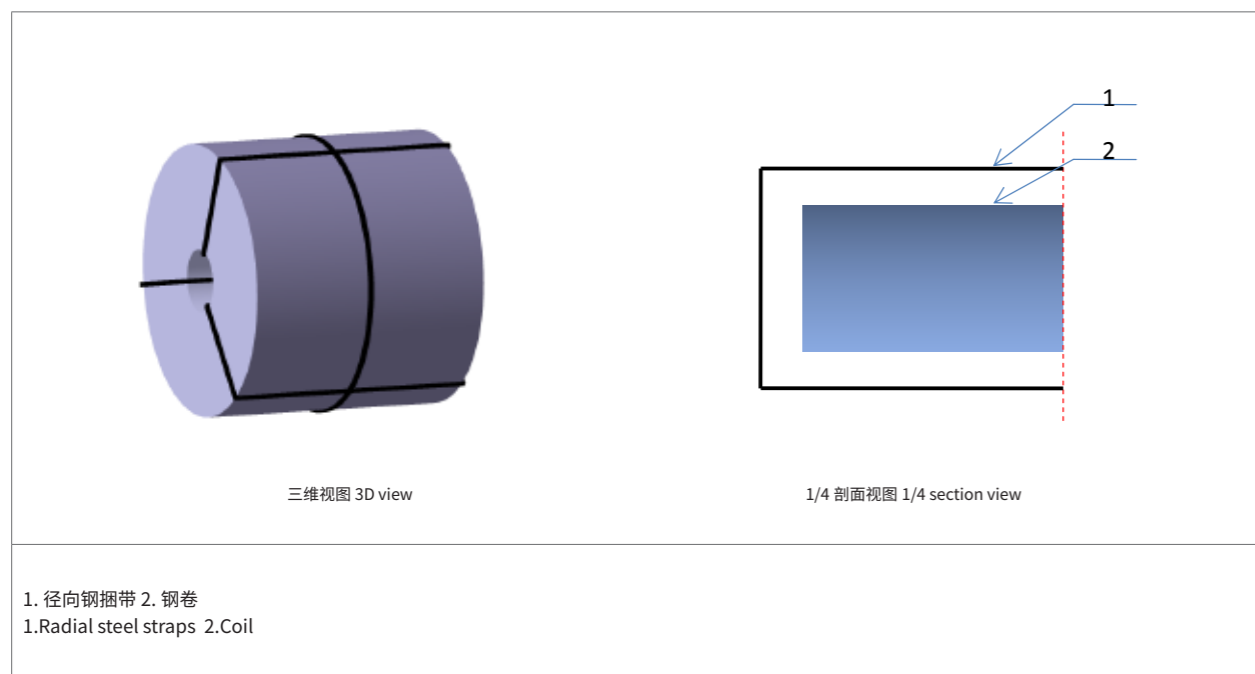


图 1 HP01 包装图示
Fig.1 HP01 Packing diagram

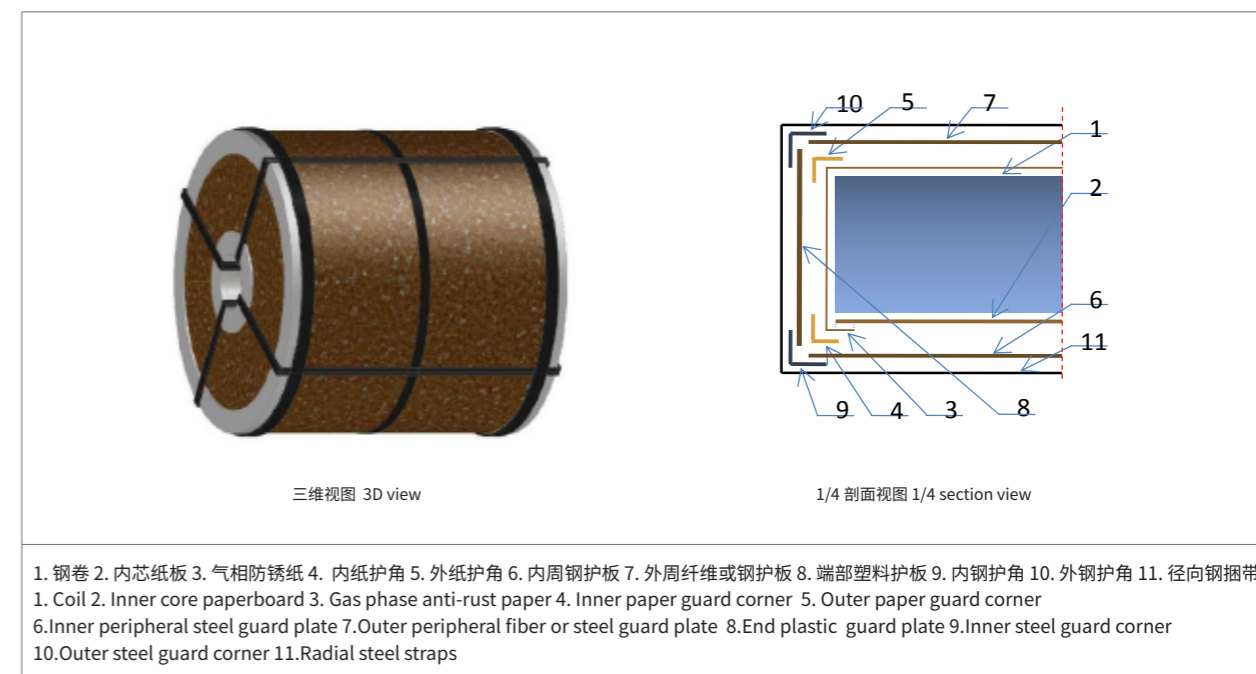


图 3 HP04,HP04a 包装图示
Fig.3 HP04,HP04a Packing diagram

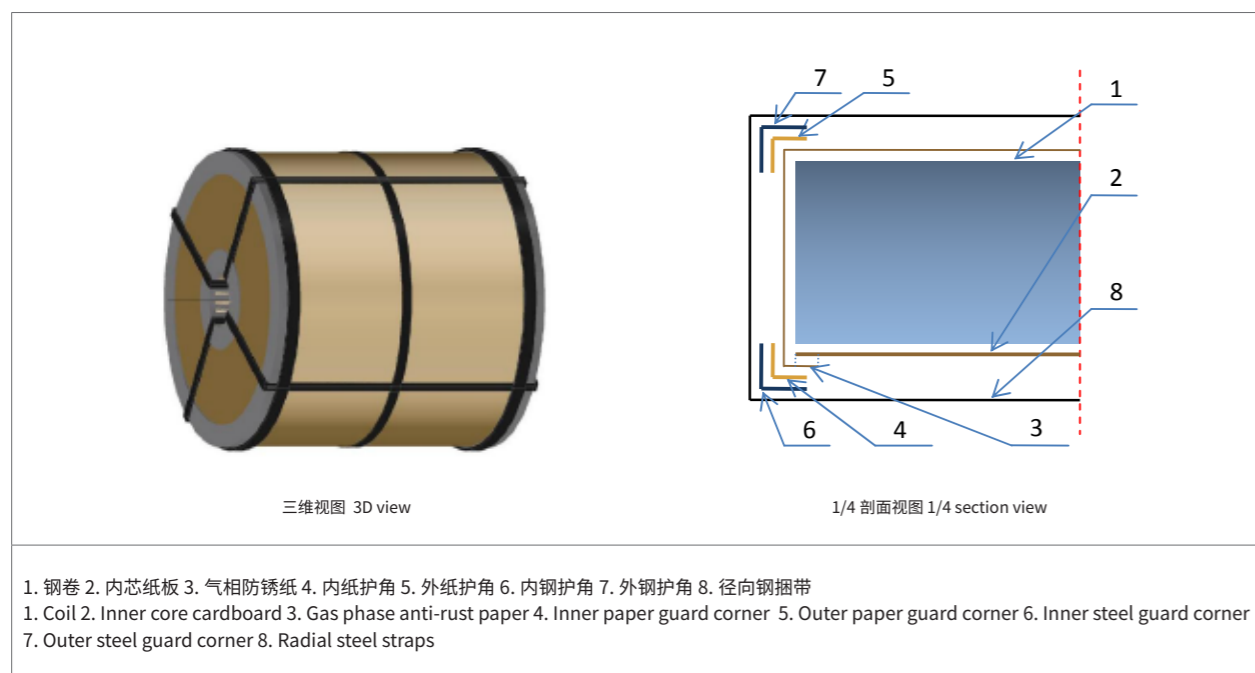


图 2 HP03 包装图示
Fig.2 HP03 Packing diagram

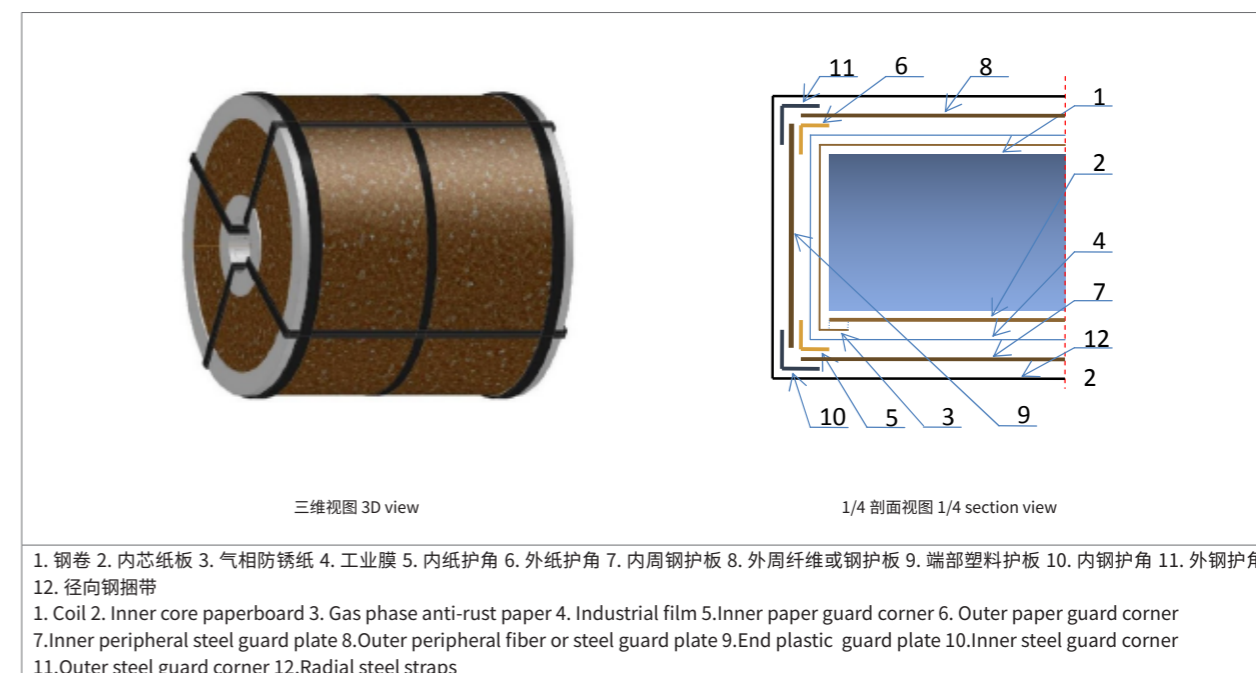


图 4 HP05,HP05a 包装图示
Fig.4 HP05,HP05a Packing diagram

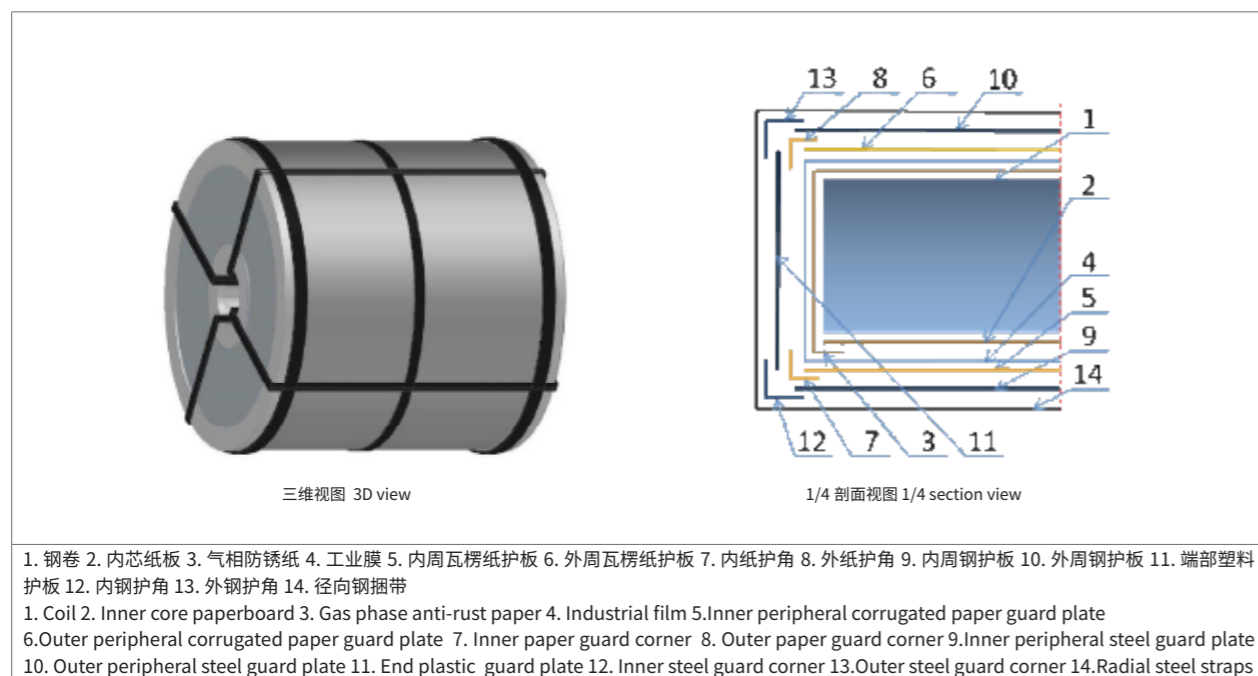


图 5 HP06 包装图示
Fig.5 HP06 Packing diagram

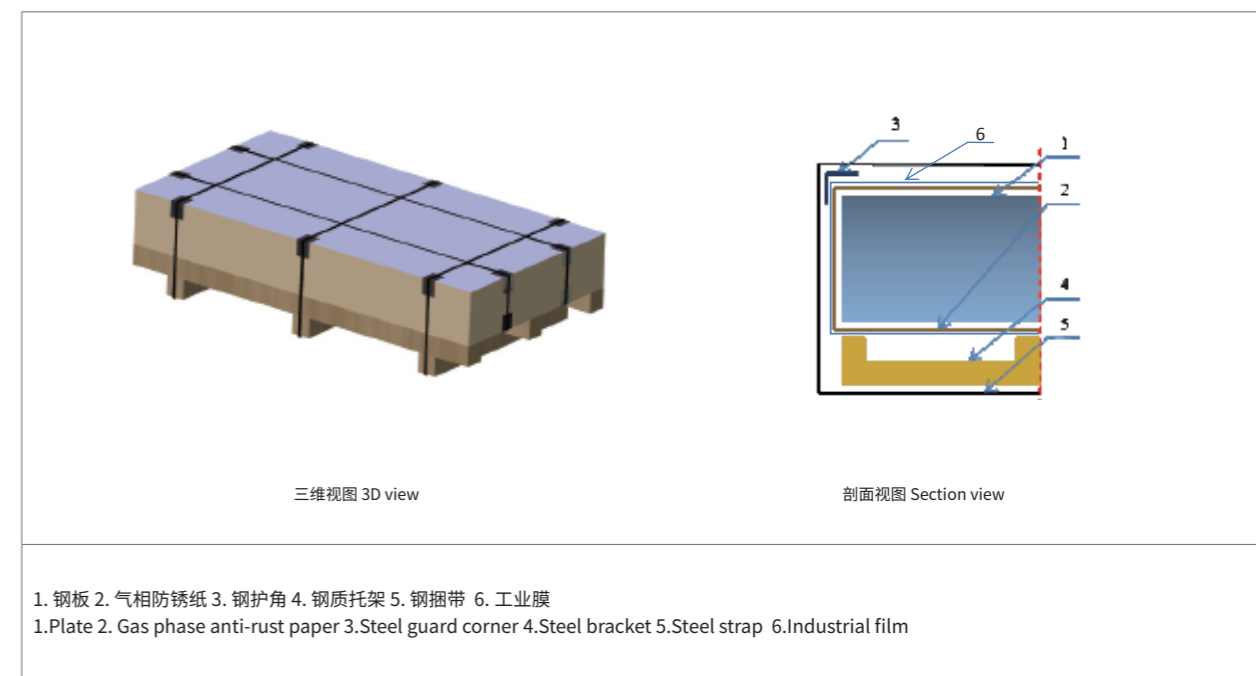


图 6 HPS01 包装图示
Fig.6 HPS01 Packing diagram

2、热连轧酸洗钢板的包装方式 Packing method of hot-rolled pickled steel plate

表 6 热连轧酸洗钢板的包装方式 Table 3 Classification of packing methods

序号 Number	包装方式名称 Name of packing method	包装方式代码 Packing Code	气相防锈纸 volatile rust preventive paper	工业膜 Industrial film	下垫板 Underlay backing plate	上盖板 Upper cover plate	侧护板 Side guard plate	钢质托架 Steel bracket	钢护角 Steel guard corner	盒盖 Box cover	围板 Coaming	钢捆带 Steel strap	推荐方式图示 Recommended way diagram
1	普包 General package	HPS01	✓	✓	-	-	-	✓	✓	-	-	纵向不小于 2 道，横向不小于 3 道 Not less than 2 lines longitudinal, not less than 3 lines transverse	图 6 Figure 6
2	精包 Fine package	HPS02	✓	✓	✓	✓	✓	✓	✓	-	-	纵向不小于 2 道，横向不小于 3 道 Not less than 2 lines longitudinal, not less than 3 lines transverse	图 7 Figure 7
3	精包 Fine package	HPS03	✓	✓	-	-	-	✓	-	✓	✓	纵向不小于 2 道，横向不小于 3 道 Not less than 2 lines longitudinal, not less than 3 lines transverse	图 8 Figure 8

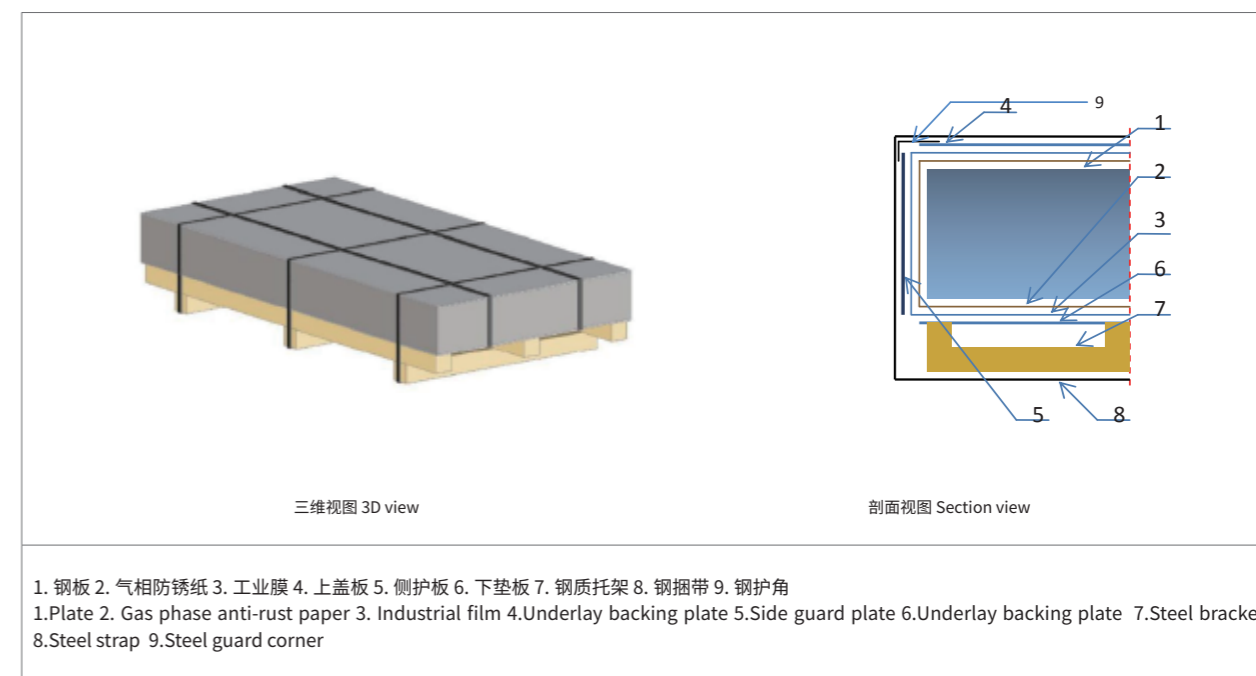


图 7 HPS02 包装图示
Fig.7 HPS02 Packing diagram

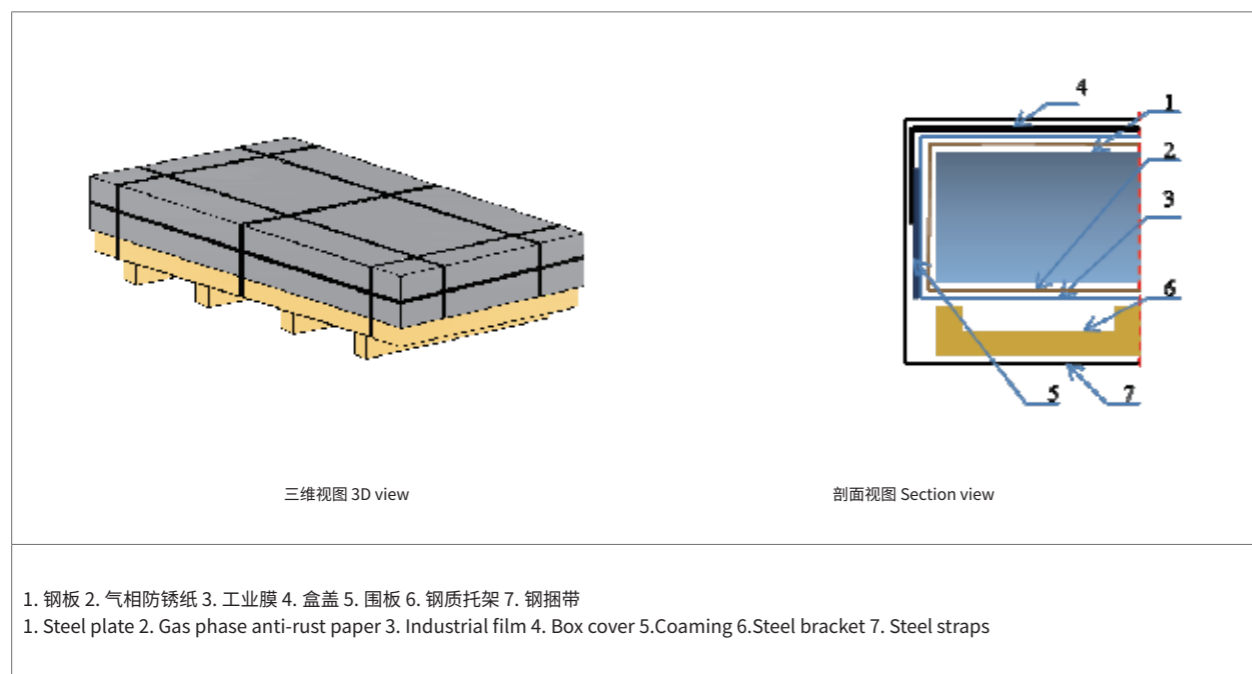


图 8 HPS03 包装图示
Fig.8 HPS03 Packing diagram



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产品商标介绍

PRODUCT TRADEMARK INTRODUCTION

注册商标	商标名称	商标简述	主要牌号
SOVETEN®	首钢超高强汽车板 Ultra High Strength Steel	<p>抗拉强度超过 780MPa 级别的超高强钢，产品覆盖酸洗及冷轧双相钢 (DP)，热基、酸洗及冷轧复相钢 (CP)、冷轧马氏体钢 (MS) 等，广泛应用于车身及底盘安全结构件，可实现汽车轻量化的同时提升碰撞安全性能。</p> <p>Ultra high strength steel with a tensile strength exceeding 780MPa, including dual phase steel (DP)(pickled or cold rolled), complex phase steel (CP)(hot rolled, pickled or cold rolled), martensitic steel (MS) (cold rolled), etc., are widely used in body and chassis safety structural parts, can reduce the weight of the car and improve the crash safety performance.</p>	HRMP800、HR800CP、HR1000CP、HR660Y760T-CP、HR450/780DP、SP251-780FPQ、SP251-780PQ、WSS-M1A368-A71 等
SOVEWH®	首钢车轮钢 Wheel Steel	<p>首钢车轮钢热轧板卷，采用不同强化方式设计形成普通碳锰、高强低合金、低温相变强化三大系列产品，具有良好的焊接性能、成形性能和疲劳性能，尺寸精度高、表面质量优异，广泛应用于国内外不同轻量化水平的商用车、乘用车车轮轮辋和轮辐制造。</p> <p>The continuously hot rolled steel sheet and strip for automobile wheel were designed with different strengthening processes to form three series of products: C-Mn, HSLA and low-temperature transformation hardening steels. With good weldability, formability and fatigue performance, high precision of dimension and outstanding surface quality, the products are widely used in the manufacturing of domestic and overseas commercial and passenger automobile wheel rims and discs with different lightweight levels.</p>	S380LW、S420LW、S490LW、SHR590DP、SHR590FB、SHR590HE、SHR650DP、SHR650FB、SHR690DP、SHR690FB、SHR700FB、SHR780FB、SHR800DP、SPFH540、SRS590、SRS650 等
SOHILAM®	首钢高扩孔高强汽车板 High Strength Steel with High Hole Expansion Ratio	<p>高扩孔高强钢是具有优异扩孔性能的钢种，产品覆盖冷轧高扩孔钢、酸洗及热基高扩孔钢，冷轧高扩孔钢应用于车身安全结构件，有利于提高车身结构抗侵入性能，提升承载吸能效果；热轧高扩孔钢具有优异的边缘延展性及疲劳耐久性，广泛应用于底盘复杂结构件。</p> <p>High hole expansion high strength steel is a steel with excellent hole expansion performance including cold rolled, pickled and hot rolled. Cold rolled high hole expansion steel is used to manufacture body safety structural parts. It is conducive to improve the anti-intrusion performance of the body structure and the load-bearing and energy-absorbing effect. Hot rolled high hole expansion steel has excellent edge ductility and fatigue durability, which is widely used in complex structural parts of the chassis.</p>	HR480Y580T-HED、HR660Y760T-HED、HR600/780HE、HR300/450HE、HR380/540HE、HR440/580HE、HR440/590HE、HR450T/300Y-FB、HR580T/440Y-FB、HR440Y580T-FB、HR300Y450T-FB、HRFB600、FB780、FB45、FB60、HR45、HR60 等



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