



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.

Chapter 1 Pickled Products of Shougang Steel

第一章 首钢酸洗产品

1.1 产品类别 Product Category

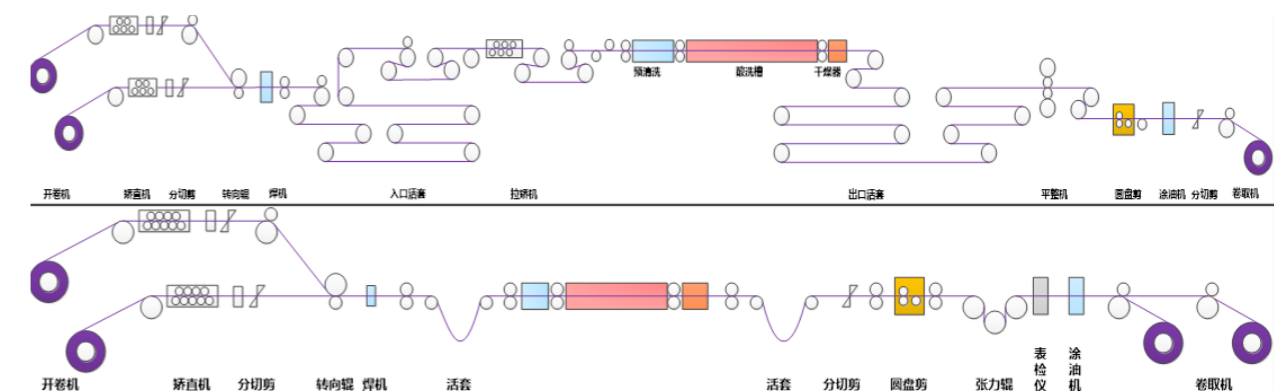
首钢酸洗产品自 2010 年启动研发以来，现已形成汽车、家电、特殊用钢、五金四大类产品体系，高领产品占比达到 63%。以迁钢、京唐两个生产基地为依托，在首钢技术研究院及技术中心支撑下，积累了丰富的生产、技术及品质管理经验。首钢酸洗产品具有性能稳定可靠、产品尺寸精度高、板形控制良好等诸多特点，产品质量广受用户认可，具有良好的市场美誉度。

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

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、滚轧、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					StW22	ISO 3573	HR1
	DD12		DD12					StW23		HR2
	DD13		DD13					StW24		HR3
	DD14		DD14					-		-

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		JIS G 3131	SPHC、SPHD、SPHE、SPHF	1.5-7.0	750-1600
		EN 10111	DD11、DD12、DD13、DD14	1.5-7.0	750-1600
		DIN1614: 2	StW22、StW23、StW24	1.5-7.0	750-1600
		ISO 3573	HR1、HR2、HR3	1.5-7.0	750-1600
京唐基地 Jingtang base		JIS G 3131	SPHC、SPHD、SPHE、SPHF	0.8-6.0	750-1630
		EN 10111	DD11、DD12、DD13、DD14	0.8-6.0	750-1630
		DIN1614: 2	StW22、StW23、StW24	0.8-6.0	750-1630
	ISO 3573	HR1、HR2、HR3	0.8-6.0	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 912 GB/T 3274 GB/T 710 GB/T 711	Q195	
	SS400、SS400B		SS400		Q235A、Q235B	
	SS490、SS490B		SS490		—	
	SM400A	JIS G 3106	SM400A		Q235A、Q235B、20	
	SM400B		SM400B		Q235C	
	SM400C		SM400C		Q235D	
	SM490A、SS490AB		SM490A		Q345A、Q345B	
	SM490B、SS490BB		SM490B		Q345C	
	SM490C、SS490CB		SM490C		Q345D	
	SM490YA		SM490YA		Q345A、Q345B	
	SM490YB		SM490YB		Q345C	
	SM520B		SM520B		Q420A、Q420B	
	SM520C		SM520C		Q420C	
	SM570	SM570	-			
	SPHT1	JIS G 3132	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 ^a	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. Pcm=C+1/30Si+1/20Mn+1/60Ni+1/20Cr+1/15Mo+1/10V+5B 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				0.035	0.035		
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										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 Rm,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/%			
			公称厚度 (mm) Nominal thickness										
	< 3	≥ 3	≤ 7	≤ 1	> 1~1.5	> 1.5~2	> 2~2.5	> 2.5~< 3	≥ 3	< 3		≥ 3	试验温度, °C Test temperature
St37-2	360-510		235	15	16	17	18	19	24	1.5a	2a	+20	≥ 27
St37-3	360-510		235	15	16	17	18	19	24	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	抗拉强度 Tensile strength Rm,MPa	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	
		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 ≥				
			A _{50mm} /%	A _{200mm} /%			
		公称厚度 mm					试验温度 /°C Test temperature
≤ 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 ^f		—	-5	≥ 47



牌号 Grade	抗拉强度 Tensile strength Rm,MPa	拉伸试验 Tensile test				180°弯曲试验 弯头直径 D 180° bend test Inner diameters	
		以下厚度的断后伸长率 A _{50mm} , % Elongation as follow normal thickness ≥				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
		GB/T	Q235B	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	0.8-6.0	750-1600
		JIS G 3132	SPHT1	0.8-6.0	750-1600
		GB/T	Q235B	0.8-6.0	750-1600
	EN 10025: 2	S235JR	0.8-6.0	750-1600	
	DIN 17100	St37-2	0.8-6.0	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 3113	SAPH310
	SAPH370		SAPH370
	SAPH400		SAPH400
	SAPH440		SAPH440
	SPFH490	JIS G3134	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		≤ 0.005
S650MC	≤ 0.12	≤ 0.60	≤ 2.00	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22	≤ 0.5	≤ 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								
QStE650TM	≤ 0.12	≤ 0.60	≤ 2.00	≤ 0.025	≤ 0.015	≥ 0.015	≤ 0.09	≤ 0.20	≤ 0.22	≤ 0.5	≤ 0.005
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 Elongation as follow normal thickness A _{50mm} / %					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					
			< 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 / %	
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 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	
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	1.5-6.0	750-1550	
		S355MC	1.5-6.0	750-1550	
		S420MC、S460MC、S500MC	1.5-6.0	750-1550	
		S550MC	1.8-5.0	750-1400	
		S600MC	1.8-5.0	750-1400	
		S650MC、S700MC	1.8-5.0	750-1400	
	SEW 092	QStE340TM	1.5-6.0	750-1550	
		QStE380TM、QStE420TM、QStE460TM	1.5-6.0	750-1550	
		QStE500TM	1.5-6.0	750-1550	
		QStE550TM	1.8-5.0	750-1400	
	JIS 3113	SAPH310	1.5-6.0	750-1550	
		SAPH370	1.5-6.0	750-1550	
		SAPH400	1.5-6.0	750-1550	
		SAPH440	1.5-6.0	750-1550	
	JIS G3134		SPFH540、SPFH590	1.6-6.0	750-1500

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

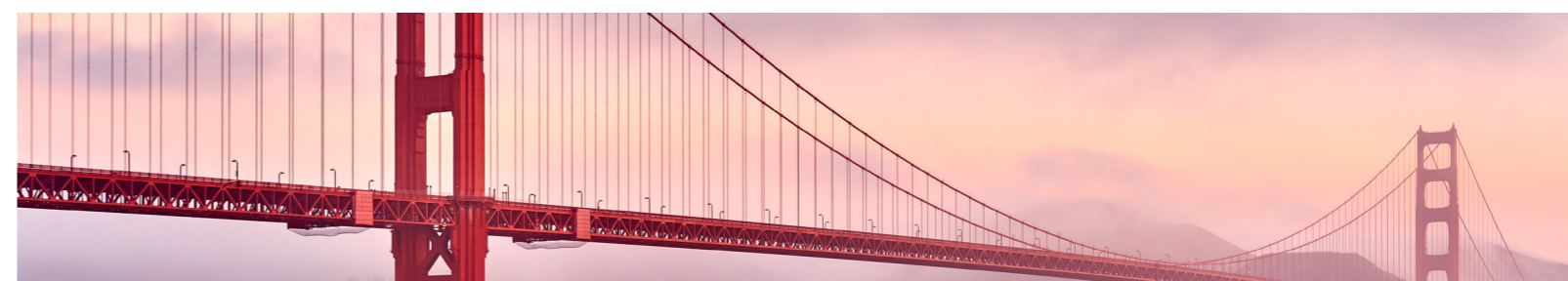
牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)					
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Als ^a ≥
S330LF	0.12	0.05	0.50	0.025	0.015	0.010
S380LF	0.14	0.15	1.20	0.025	0.015	0.010
S400LF	0.16	0.15	1.40	0.025	0.015	0.010
S420LF	0.16	0.30	1.40	0.025	0.015	0.010
S440LF	0.18	0.30	1.50	0.025	0.015	0.010
S490LF	0.18	0.30	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



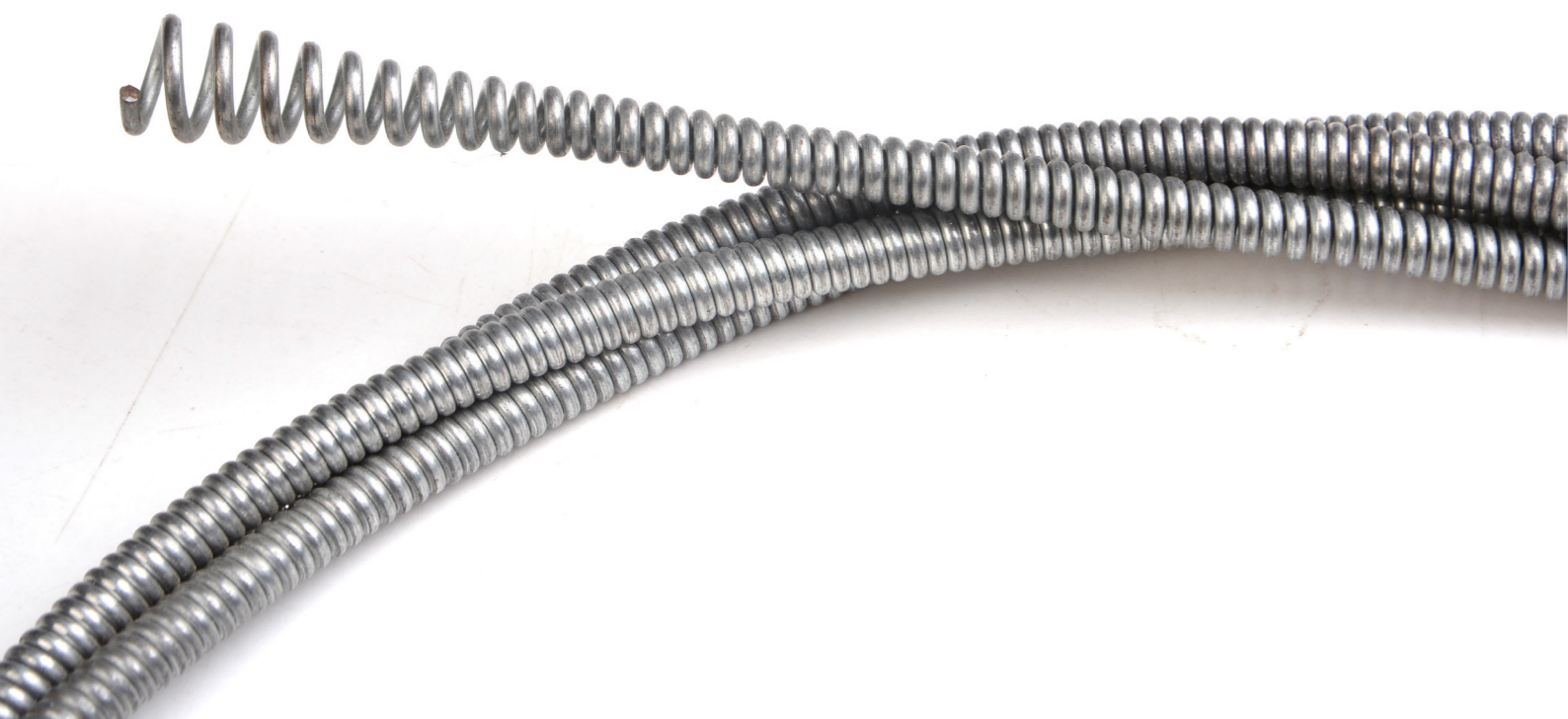
2.5 优质碳素钢 High-quality carbon steel

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..



2.5.1 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/SGZGS 0356	SAE1005、SAE1005B、		-						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					S20C	SAE J 403	SAE1020
	25、C25、S25C、SAE1025		25				C25/C25E	S25C		SAE1025
	30、C30、S30C、SAE1030		30				C30/C30E	S30C		SAE1030
	35、C35、S35C、SAE1035		35		ISO 683-1		C35/C35E	S35C		SAE1035
	40、C40、S40C、SAE1040		40		EN 10083-2		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								

2.5.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition(wt%)									
	C	Si ^a	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 ≤	others
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 ≤	others
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	a
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	a
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	a
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	a
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	a
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	a
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	a
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	a
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	a

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	-

2.5.3 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

2.5.4 可订货规格 Available size

名称			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 0356	SAE J 403	SAE1006、SAE1010	0.8-7.0	750-1635
		SAE1008、SAE1012	1.5-7.0	750-1635
		SAE1022	2.0-6.5	750-1500
		SAE1020	2.0-6.5	750-1500
		SAE1045	2.0-6.5	750-1500
	JIS G 4051	S45C	2.2-4.7	800-1515
	GB/T 699	20	2.0-6.5	750-1500
		45	2.2-4.7	800-1515
		65Mn	2.0-5.0	750-1500

2.6 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。

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

2.6.1 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				
STC330R				
STC360R				

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	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

2.6.3 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, ≥		断后伸长率 A _{50mm} /%, ≥ Elongation /%, ≥
	< 1.60	≥ 1.60	
STC210R	210		28
STC245R	245		26
STC300R	300		24
STC330R	290	330	22
STC360R	360		22

2.6.4 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	1.9-6.0	750-1520

2.7 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.



2.7.1 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	HR330/580DP、HR450/780DP
GB T 20887.6	Complex-phase steel	HR660/760CP、HR720/950CP
GB T 20887.2	High hole expansion steel	HR300/450HE、HR440/580HE、HR600/780HE

2.7.2 化学成分 Chemical composition

1、双相钢 Dual-phase steel

牌号 Grade	化学成分 (质量分数) (熔炼分析) Chemical composition(wt%) (Ladle analysis) /%							
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Alt ^b ≥	Cu ≤	B ≤
HR330/580DP	0.23	2.00	3.30	0.090	0.015	0.015	0.40	0.006
HR450/780DP								

2、复相钢 Complex-phase steel

牌号 Grade	化学成分 (质量分数) (熔炼分析) Chemical composition(wt%) (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 (质量分数) (熔炼分析) Chemical composition(wt%) (Ladle analysis) /%					
	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Alt ^b ≥
HR300/450HE	0.18	1.2	2.0	0.050	0.010	0.015
HR440/580HE						
HR600/780HE						

2.7.3 力学性能

1. 双相钢 Dual-phase steel

牌号 Grade	拉伸试验 Tensile test			n 值
	下屈服强度 R _{eL} /MPa Upper 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/ % ≥ (L0=80mm, b=20mm)	
HR330/580DP	330~470	≥ 580	≥ 19	≥ 0.14
HR450/780DP	450~610	≥ 780	≥ 14	≥ 0.11

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/% \geq	
			板厚 /mm Thickness/mm	
			< 3.0 ^b	$\geq 3.0^c$
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 ^a			扩孔率 /%
	下屈服强度 ^{b, c} R_{eL} /MPa Lower yield strength ^{b, c} R_{eL} /MPa	抗拉强度 R_m /MPa	断后伸长率 A_{80mm} /% (L0=80mm, b=20mm)	
HR300/450HE	300~400	≥ 450	≥ 24	≥ 80
HR440/580HE	440~620	≥ 580	≥ 14	≥ 75
HR600/780HE	600~800	≥ 780	≥ 12	≥ 55

2.7.4 可订货规格 Available size

先进高强度钢 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	HR330/580DP、HR450/780DP	2.2-5.0	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、HR440/580HE、HR600/780H	1.8-5.0	800-1260

2.8 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.

2.8.1 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	-	-

2.8.2 化学成分 Chemical composition

牌号 Grade	化学成分 (质量分数 /%) Chemical composition (wt%)										
	Ca	Si \leq^b	Mn \leq	P \leq^c	S \leq	Cu \leq	Nb \leq	V \leq	Ti \leq	Nb+V \leq	Alt \geq^d
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

2.8.3 力学性能 Mechanical Properties

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

2.8.4 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	2.0-6.5	750-1600
	JIS G 3116	SG255、SG295	2.0-6.5	750-1600



2.9 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.

2.9.1 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	最小延伸率 /% Minimum 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

2.9.2 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	0.8-6.0	800-1250

2.10 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.

3.10.1 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

2.10.2 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

2.10.3 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) a
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 ReL/MPa	抗拉强度 R _m /MPa	断后伸长率 A ₅₀ mm/%
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 ReL/MPa	抗拉强度 R _m /MPa	断后伸长率 A ₅₀ mm/%
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

2.10.4 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	1.2-6.0	750-1500
热成形钢 Hot formed steel	22MnB5、26MnB5、34MnB5、40MnB5、HR950/1300HS、HR1000/1500HS、HR1200/1800HS、HR1200/2000HS	1.2-6.0	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 ~ 2.00	±0.17	±0.19	±0.21	-	±0.13	±0.14	±0.14	-	±0.10	±0.11	±0.11	-
> 2.00 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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 ~ 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	简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	1. 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	2. 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。 Applicable to domestic.
	HP05	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.
	HP05a	Fine package	2. Fine package is suitable for complex storage and transportation conditions, long-distance transportation, export, poor weather conditions, or high product surface quality requirements.	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	HP06	Fine package	2. Fine package is suitable for complex storage and transportation conditions, long-distance transportation, export, poor weather conditions, or high product surface quality requirements.	适用于国内和出口。 Suitable for domestic and export.
	HPS01	General package	2. Fine package is suitable for complex storage and transportation conditions, long-distance transportation, export, poor weather conditions, or high product surface quality requirements.	适用于国内。 Applicable to domestic.
	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

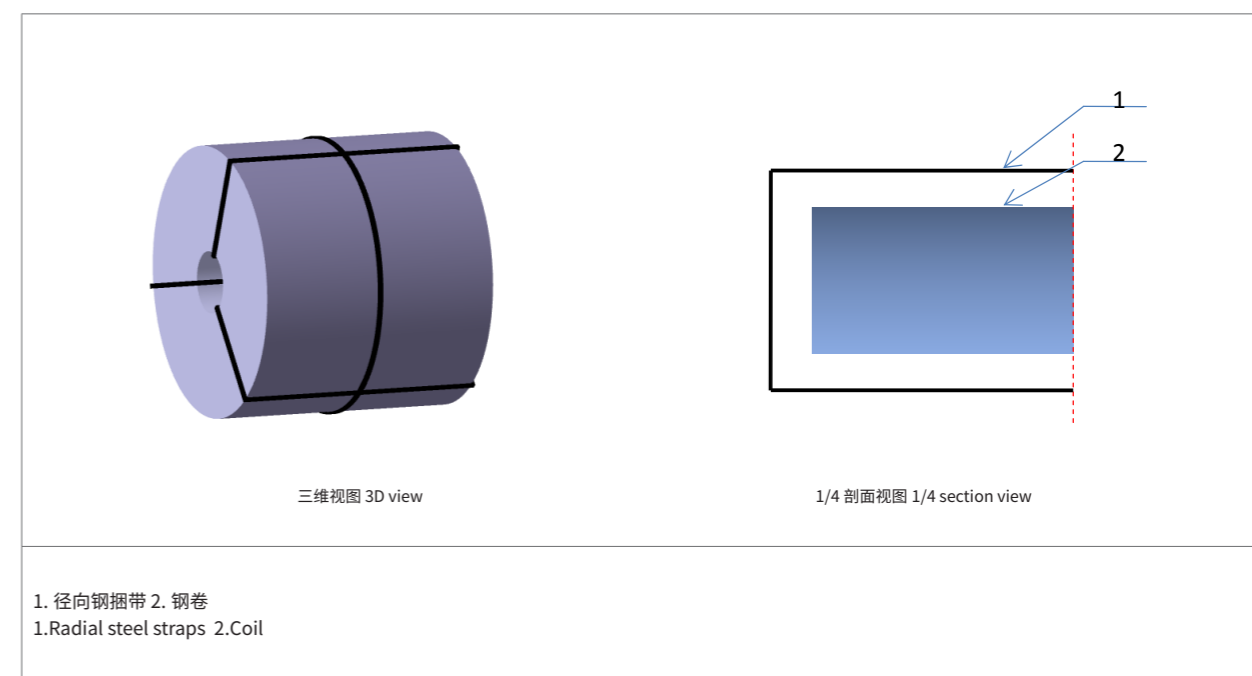


图 1 HP01 包装图示
Fig.1 HP01 Packing diagram

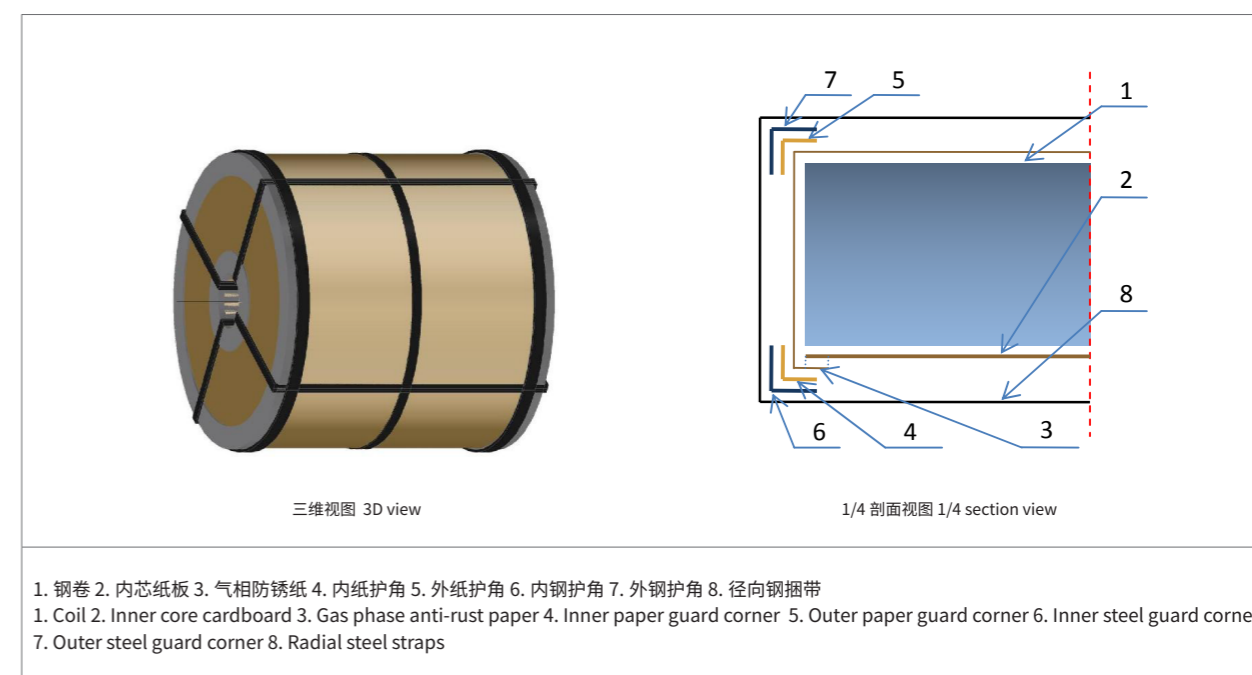


图 2 HP03 包装图示
Fig.2 HP03 Packing diagram

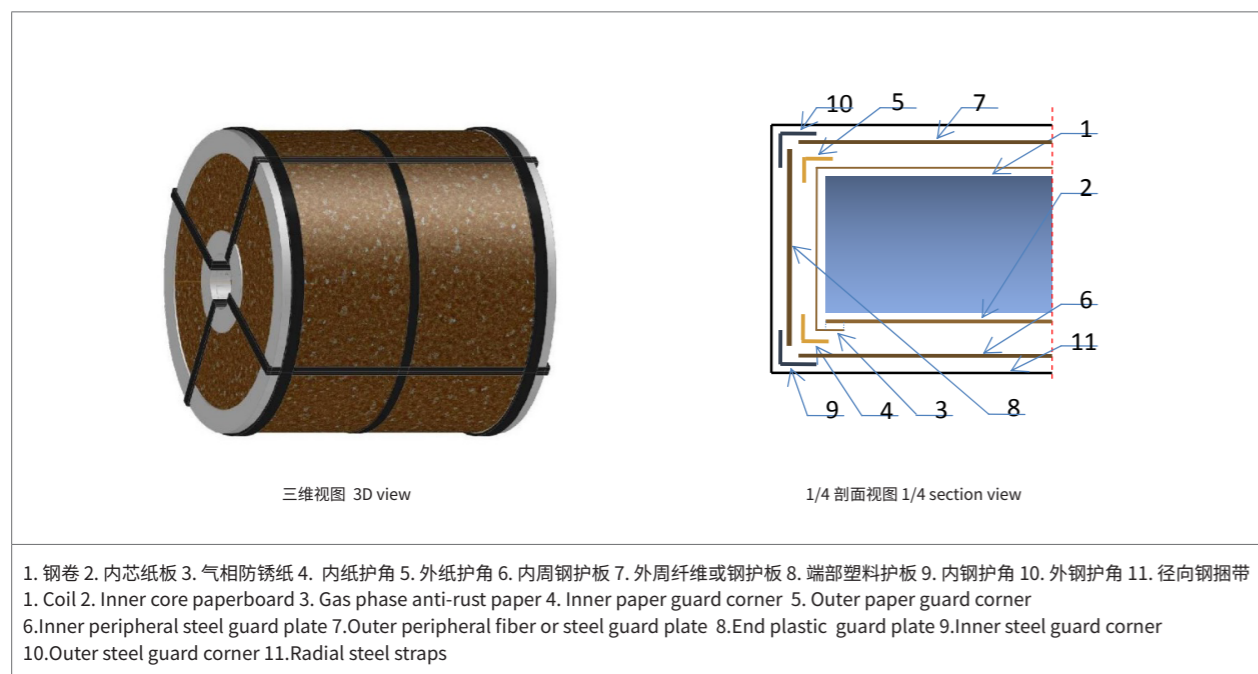


图 3 HP04,HP04a 包装图示
Fig.3 HP04,HP04a Packing diagram

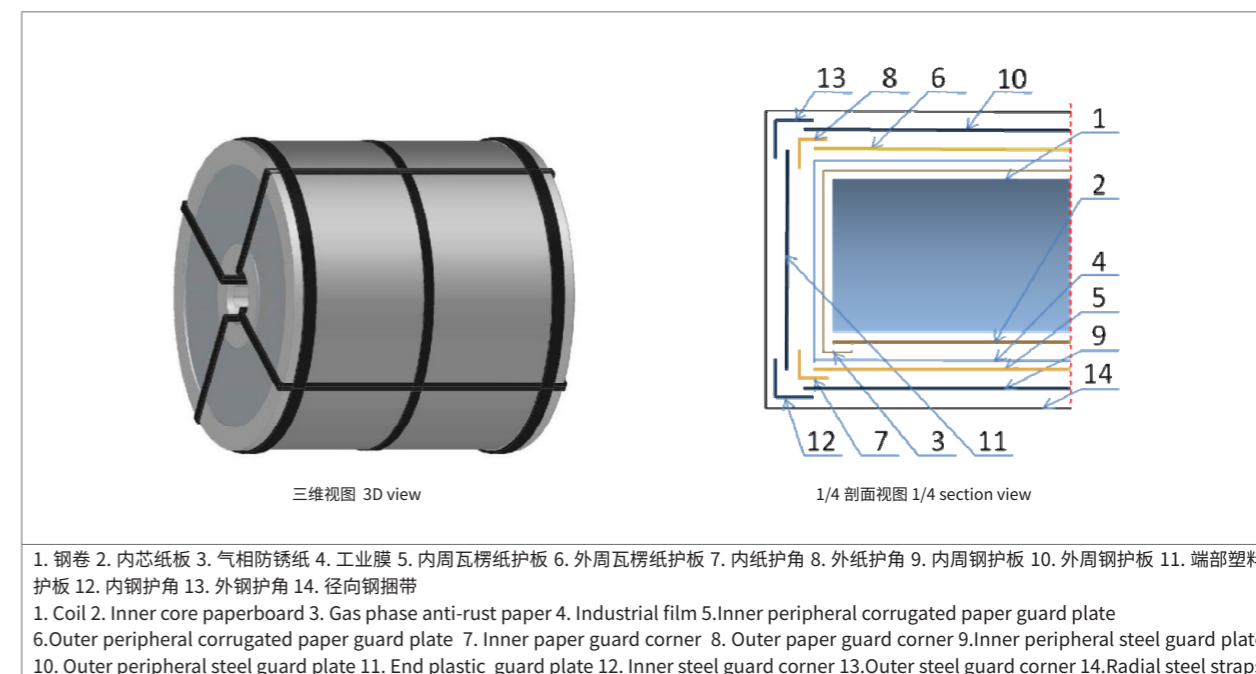


图 5 HP06 包装图示
Fig.5 HP06 Packing diagram

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

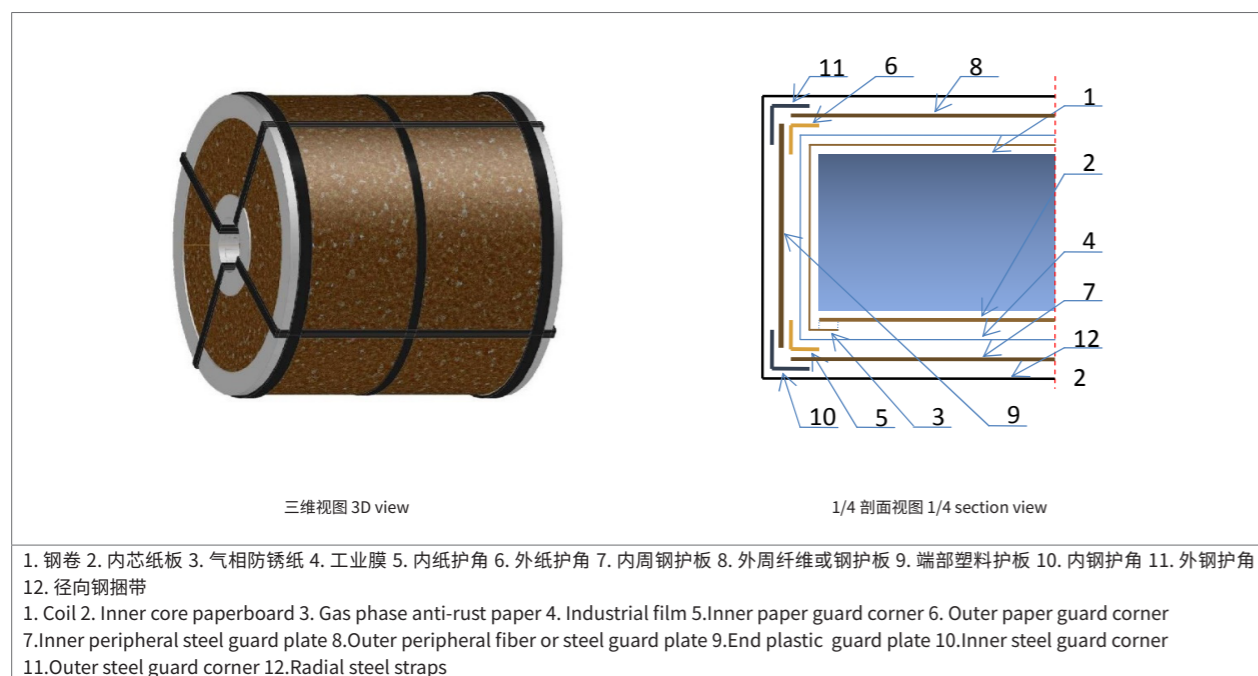


图 4 HP05,HP05a 包装图示
Fig.4 HP05,HP05a Packing diagram

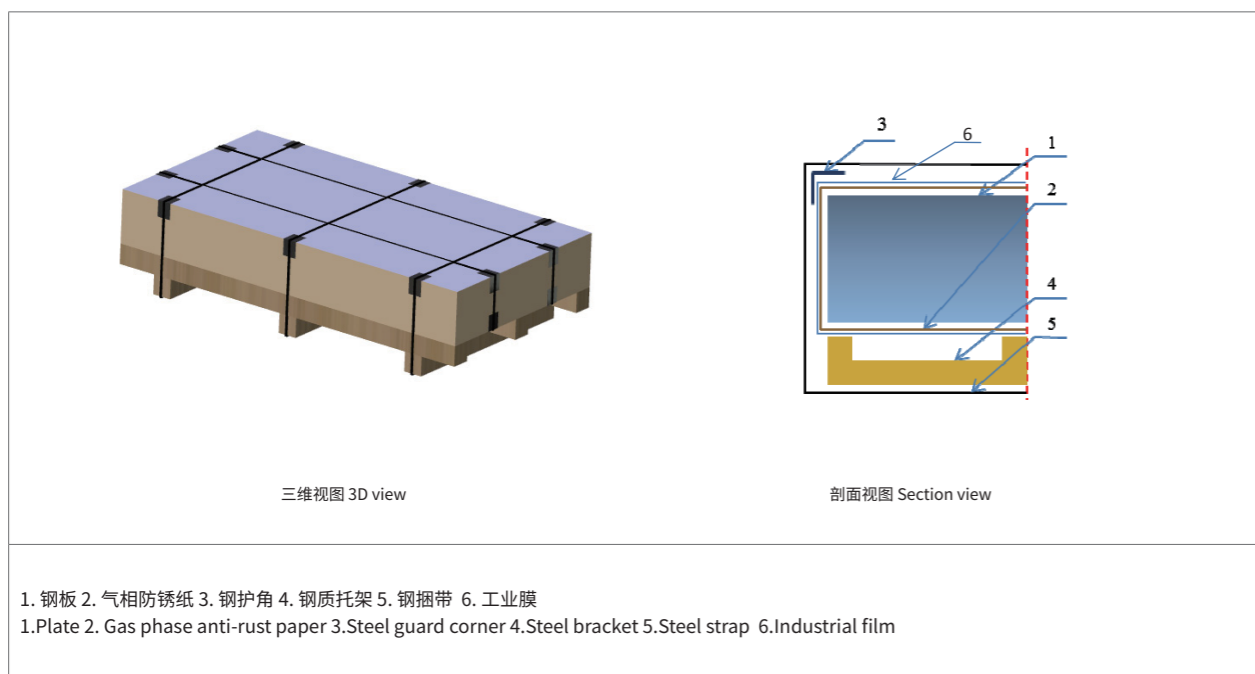


图 6 HPS01 包装图示
Fig.6 HPS01 Packing diagram

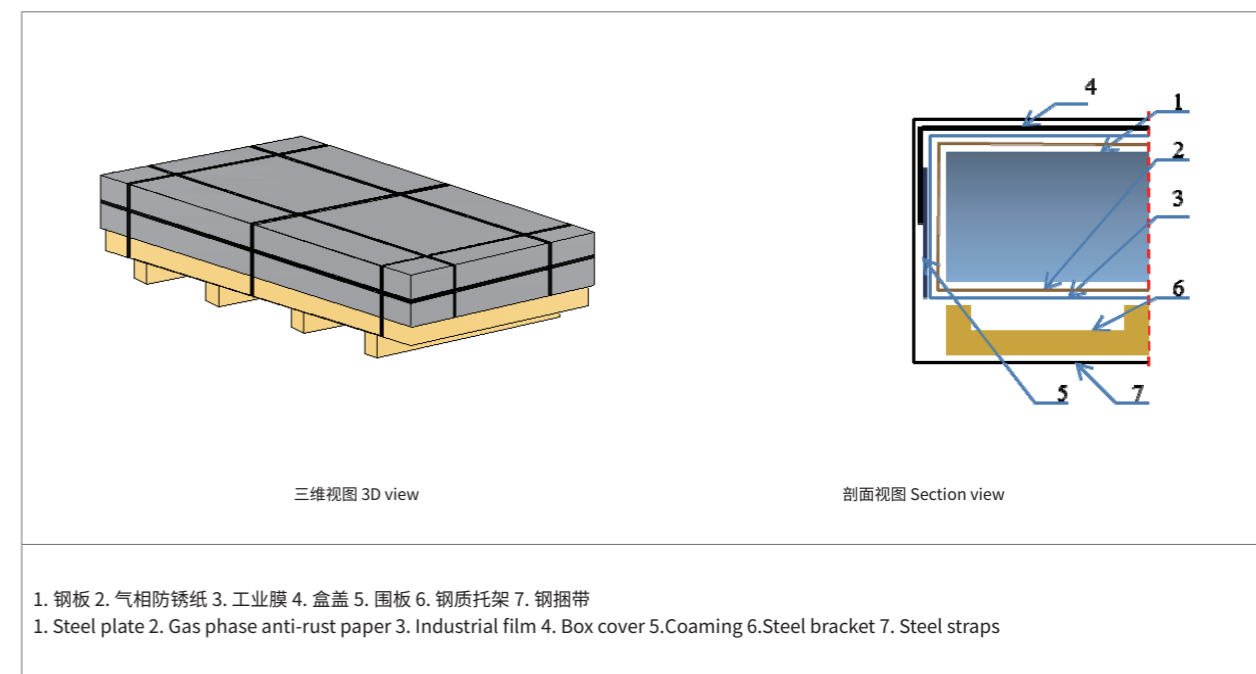


图 8 HPS03 包装图示
Fig.8 HPS03 Packing diagram

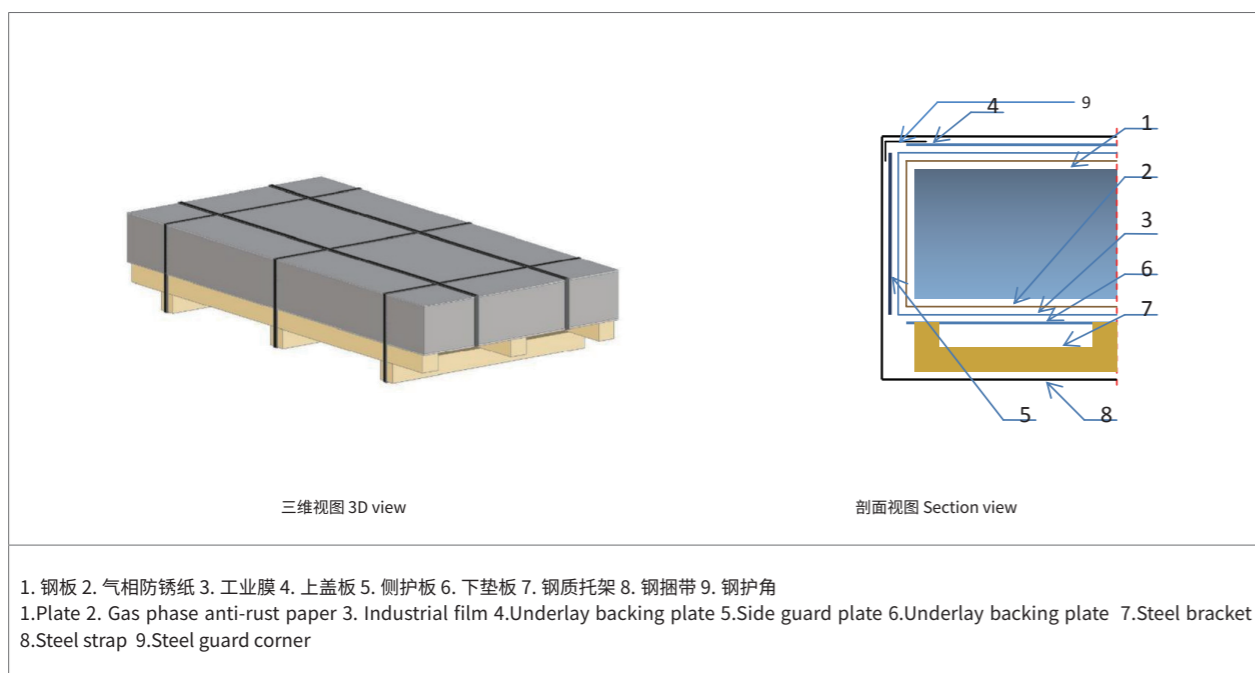


图 7 HPS02 包装图示
Fig.7 HPS02 Packing diagram





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