



北京首钢股份有限公司  
BEIJING SHOUGANG CO., LTD.

# 中铝中镁锌铝镁 产品手册

CONTINUOUSLY HOT-DIP ZN-AL-MG ALLOY STEEL SHEET  
AND STRIP PRODUCTS MANUAL (SOZAME®)

北京首钢股份有限公司  
Beijing Shougang Co., Ltd.

# Products Introduction

## 产品介绍

### 1.1 牌号和用途 Steel Grades and Application

钢种分类	牌号 Steel Grades	用途 Application	执行标准 Standard
低碳钢 Low Carbon Steel	DD51D+ZMA	一般冷成形用 Commercial purpose	Q/SGJS 0014
	DD52D+ZMA		
	SGHCD+ZMA		
碳素结构钢 Carbon Structural Steel / 低合金高强度钢 High-strength Low-alloy Steel	S220GD+ZMA	结构用 Structural purpose	
	S250GD+ZMA		
	S280GD+ZMA		
	S300GD+ZMA		
	S320GD+ZMA		
	S350GD+ZMA		
	S390GD+ZMA		
	S400GD+ZMA		
	S420GD+ZMA		
	S450GD+ZMA		
	S500GD+ZMA		
	S550GD+ZMA		
	SGH340D+ZMA		
	SGH400D+ZMA		
	SGH440D+ZMA		
SGH490D+ZMA			
SGH540D+ZMA			
低合金高强度钢 High-strength Low-alloy Steel	HD300LAD+ZMA	结构用 Structural purpose	
	HD340LAD+ZMA		
	HD380LAD+ZMA		
	HD420LAD+ZMA		
	HD460LAD+ZMA		
	HD500LAD+ZMA		
	HD550LAD+ZMA		
HD700LAD+ZMA			
双相钢 Dual Phase Steel	HD330/580DPD	结构用 Structural purpose	
铁素体 - 贝氏体钢 Ferrite-Bainite Steel	HD300/450FBD		
	HD440/580FBD		
复相钢 Complex Phase Steel	HD600/780FBD		
	HD660/760CPD		
碳素结构钢 Carbon Structural Steel / 低合金高强度钢 High-strength Low-alloy Steel	SHR320WD+ZMA	结构用 Structural purpose	Q/SGJS 0028
	SHR350WD+ZMA		
	SHR390WD+ZMA		
	SHR420WD+ZMA		
	SHR450WD+ZMA		
	SHR500WD+ZMA		
	SHR550WD+ZMA		
	SHR600WD+ZMA		
	SHR650WD+ZMA		
SHR700WD+ZMA			

钢种分类	牌号 Steel Grades	用途 Application	执行标准 Standard
低碳钢 Low Carbon Steel	DC51D+ZMA	一般冷成形用 Commercial purpose	Q/SGJS 0026
	DC52D+ZMA		
	SGCC+ZMA		
碳素结构钢 Carbon Structural Steel / 低合金高强度钢 High-strength Low-alloy Steel	S220GD-CR+ZMA	结构用 Structural purpose	
	S250GD-CR+ZMA		
	S280GD-CR+ZMA		
	S320GD-CR+ZMA		
	S350GD-CR+ZMA		
	S390GD-CR+ZMA		
	S420GD-CR+ZMA		
	S450GD-CR+ZMA		
	S500GD-CR+ZMA		
	S550GD-CR+ZMA		
	SGC340+ZMA		
	SGC400+ZMA		
SGC440+ZMA			
SGC490+ZMA			
SGC570D+ZMA			
低合金高强度钢 High-strength Low-alloy Steel	HC260LAD+ZMA	结构用 Structural purpose	
	HC300LAD+ZMA		
	HC340LAD+ZMA		
	HC380LAD+ZMA		
	HC420LAD+ZMA		
	HC460LAD+ZMA		
	HC500LAD+ZMA		
HC550LAD+ZMA			

### 1.2 化学成分 Chemical Compositions (单位 Unit:%)

牌号 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Ti <sup>a</sup> ≤
DD51D、DC51D	0.18	0.50	1.20	0.12	0.045	0.30
DD52D、DC52D	0.12	0.50	0.60	0.10	0.045	0.30

<sup>a</sup> 可用 Nb 代替部分 Ti, 此时 Nb 和 Ti 的总含量应不大于 0.30%。  
Part of Ti can be replaced by Nb, and the total content of Nb and Ti should not be greater than 0.30%.

牌号 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤
S220GD、S250GD、S280GD、S300GD、S320GD、S350GD、S390GD、S400GD、S420GD、S450GD、S500GD、S550GD S220GD-CR、S250GD-CR、S280GD-CR、S320GD-CR、S350GD-CR、S390GD-CR、S420GD-CR、S450GD-CR、S500GD-CR、S550GD-CR	0.20	0.60	1.70	0.10	0.045

牌号 Steel Grades	C ≤	Mn ≤	P ≤	S ≤
SGHCD、SGCC	0.15	0.80	0.05	0.05
SGH340D、SGC340	0.25	1.70	0.20	0.05
SGH400D、SGC400	0.25	1.70	0.20	0.05
SGH440D、SGC440	0.25	2.00	0.20	0.05
SGH490D、SGC490	0.30	2.00	0.20	0.05
SGH540D	0.30	2.50	0.20	0.05

注：必要时可添加本表中不含的合金元素。

牌号 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Al ≥	Ti ≤	Nb ≤
HC260LAD	0.11	0.50	0.60	0.025	0.025	≥ 0.015	0.12	0.09
HC300LAD	0.11	0.50	1.00	0.030	0.025	≥ 0.015	0.15	0.09
HC340LAD	0.11	0.50	1.00	0.030	0.025	≥ 0.015	0.15	0.09
HC380LAD	0.11	0.50	1.40	0.030	0.025	≥ 0.015	0.15	0.09
HC420LAD	0.11	0.50	1.40	0.030	0.025	≥ 0.015	0.15	0.09
HC460LAD	0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.15	0.09
HC500LAD	0.15	0.50	1.70	0.030	0.025	≥ 0.015	0.15	0.09
HC550LAD	0.20	0.50	2.00	0.030	0.025	≥ 0.015	0.15	0.09

牌号 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Al ≥	Ti ≤	Nb ≤
HD300LAD	0.12	0.50	1.30	0.030	0.025	0.015	0.15	0.10
HD340LAD	0.12	0.50	1.50	0.030	0.025	0.015	0.15	0.10
HD380LAD	0.12	0.50	1.50	0.030	0.025	0.015	0.15	0.10
HD420LAD	0.12	0.50	1.60	0.030	0.025	0.015	0.15	0.10
HD460LAD	0.12	0.50	1.65	0.030	0.025	0.015	0.15	0.10
HD500LAD	0.12	0.50	1.70	0.030	0.025	0.015	0.15	0.10
HD550LAD	0.12	0.60	1.80	0.030	0.025	0.015	0.15	0.10
HD700LAD	0.12	0.60	2.10	0.030	0.025	0.015	0.20	0.10

牌号 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Al	Ti+Nb ≤	Cr+Mo ≤	B ≤	Cu ≤
HD330/580DPD	0.14	1.0	2.20	0.060	0.010	0.015 ~ 0.1	0.15	1.40	0.005	0.20
HD300/450FBD	0.18	0.50	2.00	0.050	0.010	0.015 ~ 2.0	0.15	1.00	0.005	0.20
HD440/580FBD	0.18	0.50	2.00	0.050	0.010	0.015 ~ 2.0	0.15	1.00	0.010	0.20
HD600/780FBD	0.18	0.50	2.00	0.050	0.010	0.015 ~ 2.0	0.15	1.00	0.010	0.20
HD660/760CPD	0.18	1.00	2.20	0.050	0.010	0.015 ~ 1.2	0.25	1.00	0.005	0.20

钢种 Steel Grades	C ≤	Si ≤	Mn ≤	P ≤	S ≤	Al ≥	Ti ≤	Nb ≤	碳当量 (CEV) ≤
SHR320WD+ZMA	0.08	0.50	1.30	0.030	0.025	0.015	0.15	0.10	0.3
SHR350WD+ZMA	0.08	0.50	1.50	0.030	0.025	0.015	0.15	0.10	0.33
SHR390WD+ZMA	0.10	0.50	1.50	0.030	0.025	0.015	0.15	0.10	0.35
SHR420WD+ZMA	0.10	0.50	1.60	0.030	0.025	0.015	0.15	0.10	0.37
SHR450WD+ZMA	0.12	0.50	1.65	0.030	0.025	0.015	0.15	0.10	0.4
SHR500WD+ZMA	0.12	0.50	1.70	0.030	0.025	0.015	0.15	0.10	0.42
SHR550WD+ZMA	0.13	0.60	1.80	0.040	0.025	0.015	0.15	0.10	0.43
SHR600WD+ZMA	0.13	0.60	2.10	0.040	0.025	0.015	0.20	0.10	0.48
SHR650WD+ZMA	0.13	0.60	2.10	0.040	0.025	0.015	0.20	0.10	0.48
SHR700WD+ZMA	0.13	0.60	2.10	0.040	0.025	0.015	0.20	0.10	0.48

### 1.3 力学性能 Mechanical Properties

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> ,MPa	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>80mm</sub> %, ≥			
DD51D+ZMA <sup>c</sup>	—	270 ~ 500	22			
DD52D+ZMA <sup>c</sup>	140 ~ 300	270 ~ 420	26			

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为横向。No. P6 test piece(L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the transverse direction apply.  
<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用下屈服强度 R<sub>el</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2% proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the lower yield strength(R<sub>el</sub>).  
<sup>c</sup> 力学性能有效期为制造完成后 1 个月内。 Mechanical properties just for products within 1 month from manufactured.

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> ,MPa	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>80mm</sub> %, ≥				r90 <sup>a</sup> ≥	n90 <sup>a</sup> ≥
			≤ 0.35	> 0.35 ~ 0.50	> 0.50 ~ 0.70	> 0.70		
DC51D+ZMA <sup>c</sup>	—	270 ~ 500	15	18	20	22	—	—
DC52D+ZMA <sup>c</sup>	140 ~ 300	270 ~ 420	19	22	24	26	—	—

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为横向。No. P6 test piece(L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the transverse direction apply.  
<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用下屈服强度 R<sub>el</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2% proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the lower yield strength(R<sub>el</sub>).  
<sup>c</sup> 力学性能有效期为制造完成后 1 个月内。 Mechanical properties just for products within 1 month from manufactured.

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa, ≥	抗拉强度 Tensile strength <sup>a,c</sup> R <sub>m</sub> , MPa, ≥	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>80mm</sub> %, ≥
S220GD+ZMA	220	300	20
S250GD+ZMA	250	330	19
S280GD+ZMA	280	360	18
S300GD+ZMA	300	370	18
S320GD+ZMA	320	390	17
S350GD+ZMA	350	420	16
S390GD+ZMA	390	460	16
S400GD+ZMA	400	470	15
S420GD+ZMA	420	480	15
S450GD+ZMA	450	510	14
S500GD+ZMA	500	530	—
S550GD+ZMA	550	560	—

力学性能有效期为制造完成后 1 个月内。 Mechanical properties just for products within 1 month from manufactured.  
<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。 No. P6 test piece(L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.  
<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用上屈服强度 R<sub>eh</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2% proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the upper yield strength(R<sub>eh</sub>).  
<sup>c</sup> 除 S550GD+ZMA 外, 其他牌号的抗拉强度可要求 140MPa 的范围值。 For all grades except S550GD+ZMA, a range of 140MPa can be expected for tensile strength.

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa, ≥	抗拉强度 Tensile strength <sup>a,c</sup> R <sub>m</sub> , MPa, ≥	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>80mm</sub> %, ≥			
			≤ 0.35	> 0.35 ~ 0.50	> 0.50 ~ 0.70	> 0.70
S220GD-CR+ZMA	220	300	13	16	18	20
S250GD-CR+ZMA	250	330	12	15	17	19
S280GD-CR+ZMA	280	360	11	14	16	18
S320GD-CR+ZMA	320	390	10	13	15	17
S350GD-CR+ZMA	350	420	9	12	14	16
S390GD-CR+ZMA	390	460	9	12	14	16
S420GD-CR+ZMA	420	480	8	11	13	15
S450GD-CR+ZMA	450	510	7	10	12	14
S500GD-CR+ZMA	500	530	—			
S550GD-CR+ZMA	550	560	—			

表中力学性能有效期为制造完成后 1 个月内。 Mechanical properties just for products within 1 month from manufactured.  
<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。 No. P6 test piece(L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.  
<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用上屈服强度 R<sub>eh</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2% proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the upper yield strength(R<sub>eh</sub>).  
<sup>c</sup> 除 S550GD-CR+ZMA 外, 其它牌号的抗拉强度可要求 140MPa 的范围值。 For all grades except S550GD-CR+ZMA, a range of 140MPa can be expected for tensile strength.



牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>50mm</sub> , % <sub>≥</sub>	n 值 <sup>a</sup>	
				n <sub>10-20/Ag</sub> ≥	
HD300LAD+ZMA	300 ~ 380	380 ~ 500	24	0.14	
HD340LAD+ZMA	340 ~ 440	420 ~ 540	22	0.13	
HD380LAD+ZMA	380 ~ 480	450 ~ 570	20	-	
HD420LAD+ZMA	420 ~ 520	480 ~ 600	18	-	
HD460LAD+ZMA	460 ~ 560	520 ~ 640	16	-	
HD500LAD+ZMA	500 ~ 620	560 ~ 700	14	-	
HD550LAD+ZMA	550 ~ 670	610 ~ 750	12	-	
HD700LAD+ZMA	700 ~ 850	750 ~ 950	10	-	

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。No. P6 test piece (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用下屈服强度 R<sub>el0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2 %-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the lower yield strength (R<sub>el</sub>).

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa, ≥	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa, ≥	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>50mm</sub> , % <sub>≥</sub>
SGH340D+ZMA	245	340	20
SGH400D+ZMA	295	400	18
SGH440D+ZMA	335	440	18
SGH490D+ZMA	365	490	16
SGH540D+ZMA	400	540	16

<sup>a</sup> 试样为 JIS Z 2241 规定的 No.5 试样, 试样方向为纵向。No.5 test piece specified in JIS Z2241 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用上屈服强度 R<sub>eh0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2%-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the upper yield strength (R<sub>eh</sub>).

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa, ≥	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa, ≥	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>50mm</sub> , % <sub>≥</sub>	
				SGCCD
SGC340D	+ZMA	245	340	20
SGC400D	+ZMA	295	400	18
SGC440D	+ZMA	335	440	18
SGC490D	+ZMA	365	490	16
SGC570D	+ZMA	560	570	—

<sup>a</sup> 试样为 JIS Z 2241 规定的 No.5 试样, 试样方向为纵向。No.5 test piece specified in JIS Z2241 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用上屈服强度 R<sub>eh0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2%-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the upper yield strength (R<sub>eh</sub>).

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa	断后伸长率 Elongation after fracture <sup>a,c</sup> , A <sub>50mm</sub> , % <sub>≥</sub>	n 值 <sup>a</sup>		BH <sub>2</sub> <sup>a</sup> MPa, ≥
				n <sub>4-6</sub> ≥	n <sub>10-20/Ag</sub> ≥	
HD330/580DPD+ZMA	330 ~ 450	580 ~ 680	19	0.16	0.13	30

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。No. P6 test piece (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用下屈服强度 R<sub>el0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2 %-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the lower yield strength (R<sub>el</sub>).

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa	断后伸长率 Elongation after fracture <sup>a,c</sup> , A <sub>50mm</sub> , % <sub>≥</sub>	BH <sub>2</sub> <sup>a</sup> MPa, ≥
HD440/580FBD+ZMA	440 ~ 600	580 ~ 700	15	30
HD600/780FBD+ZMA	600 ~ 760	780 ~ 920	12	30
HD660/760CPD+ZMA	660 ~ 820	760 ~ 960	10	30

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。No. P6 test piece (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用下屈服强度 R<sub>el0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2 %-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the lower yield strength (R<sub>el</sub>).

牌号 Steel Grades	屈服强度 Yield strength <sup>a,b</sup> MPa, ≥	抗拉强度 Tensile strength <sup>a</sup> R <sub>m</sub> , MPa, ≥	断后伸长率 Elongation after fracture <sup>a</sup> , A <sub>50mm</sub> , % <sub>≥</sub>
SHR350WD+ZMA	250	330	19
SHR390WD+ZMA	280	360	18
SHR420WD+ZMA	300	370	18
SHR450WD+ZMA	320	390	17
SHR500WD+ZMA	350	420	16
SHR550WD+ZMA	390	460	16
SHR600WD+ZMA	400	470	15
SHR650WD+ZMA	420	480	15
SHR700WD+ZMA	450	510	14

力学性能有效期为制造完成后 1 个月内。Mechanical properties just for products within 1 month from manufactured.

<sup>a</sup> 试样为 GB/T 228.1-2010 中的 P6 试样 (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm), 试样方向为纵向。No. P6 test piece (L<sub>0</sub>=80mm, b<sub>0</sub>=20mm) specified in GB/T 228.1-2010 and taken in the longitudinal direction apply.

<sup>b</sup> 无明显屈服现象时采用 R<sub>p0.2</sub>, 否则采用上屈服强度 R<sub>eh0</sub>。 If definite yield phenomenon is not present, the yield strength values apply to the 0.2%-proof strength (R<sub>p0.2</sub>), otherwise the yield strength values apply to the upper yield strength (R<sub>eh</sub>).

### 1.4 拉伸应变痕 stretcher Strain Mark

钢种 Steel Grades	拉伸应变痕 Tensile Strain Marks
低碳钢、碳素结构钢、高强度低合金钢 Low Carbon Steel、Carbon Structural Steel、High-strength Low-alloy Steel	不做保证。 No guarantee period.
双相钢、铁素体-贝氏体钢、复相钢 Dual Phase Steel、Ferrite-Bainite Steel、Complex Phase Steel	使用时不应出现拉伸应变痕。 The products shall be free from stretcher strain marks when forming.

### 1.5 可订货规格 Sizes (单位 Unit:mm)

#### 热基可订货规格 SIZE(mm)

钢种 Steel Grades	屈服强度 Yield strength	公称厚度 Nominal thickness	公称宽度 Nominal width
低碳钢 Low Carbon Steel	≤ 250MPa	1.8 ≤ d ≤ 2.0	900-1500
		2.0 < d ≤ 3.5	900-1500
		3.5 < d < 4.0	900-1500
		4.0 ≤ d ≤ 5.5	900-1500
		5.5 < d ≤ 6.0	900-1300
碳素结构钢 Carbon Structural Steel	< 500MPa	1.8 ≤ d ≤ 2.0	900-1500
		2.0 < d ≤ 3.5	900-1500
		3.5 < d < 4.0	900-1500
		4.0 ≤ d ≤ 5.5	900-1500
		5.5 < d ≤ 6.0	900-1250
	≥ 500MPa	1.8 ≤ d < 2.0	900-1300
		2.0 ≤ d ≤ 3.5	900-1500
		3.5 < d < 4.0	900-1500
		4.0 ≤ d ≤ 4.5	900-1500
		4.5 < d ≤ 6.0	900-1250
低合金高强度钢 High-strength Low-alloy Steel	≤ 500MPa	1.8 ≤ d ≤ 2.0	900-1500
		2.0 < d ≤ 3.5	900-1500
		3.5 < d < 4.0	900-1500
		4.0 ≤ d ≤ 5.5	900-1500
		5.5 < d ≤ 6.0	900-1250
	> 500MPa	1.8 ≤ d < 2.0	900-1300
		2.0 ≤ d ≤ 3.5	900-1500
		3.5 < d < 4.0	900-1500
		4.0 ≤ d ≤ 4.5	900-1500
		4.5 < d ≤ 6.0	900-1250
双相钢 / 复相钢 Dual Phase Steel、Complex Phase Steel	≤ 500MPa	1.8 ≤ d ≤ 4.0	900-1500
	> 500MPa	4.0 ≤ d ≤ 6.0	900-1300
		1.8 ≤ d ≤ 4.5	900-1300

#### 冷基可订货规格 Sizes(mm)

钢种 Steel Grades	屈服强度 Yield strength	公称厚度 Nominal thickness	公称宽度 Nominal width
碳素结构钢 Carbon Structural Steel	< 500MPa	0.8 ≤ d ≤ 1.5	900-1500
		1.5 < d ≤ 1.8	1000-1350
		1.8 < d ≤ 2.0	1000-1300
		2.0 < d ≤ 2.3	1000-1250
	≥ 500MPa	0.8 ≤ d ≤ 1.3	900-1500
		1.3 < d ≤ 1.5	900-1350
		1.5 < d ≤ 1.8	1000-1250

### 1.6 厚度允许偏差 Thickness tolerance

规定的最小屈服强度 Specified minimum yield strength Re MPa	公称厚度 Nominal thickness	下列公称宽度下的厚度允许偏差 Tolerances on thickness for a nominal width <sup>a,b</sup>					
		普通精度 PT.A Normal tolerances			高级精度 PT.B Advanced tolerances		
		≤ 1200	> 1200~1500	> 1500	≤ 1200	> 1200~1500	> 1500
Re < 260	0.8~1.00	±0.06	±0.07	±0.08	±0.045	±0.050	±0.060
	> 1.00~1.20	±0.07	±0.08	±0.09	±0.050	±0.060	±0.070
	> 1.20~1.60	±0.10	±0.11	±0.12	±0.060	±0.070	±0.080
	> 1.60~2.00	±0.12	±0.13	±0.14	±0.070	±0.080	±0.090
	> 2.00~2.50	±0.14	±0.15	±0.16	±0.090	±0.100	±0.110
	> 2.50~3.00	±0.17	±0.17	±0.18	±0.110	±0.120	±0.130
	> 3.00~5.00	±0.20	±0.20	±0.21	±0.15	±0.16	±0.17
260 ≤ Re < 360 <sup>c</sup>	0.8~1.00	±0.07	±0.08	±0.09	±0.050	±0.060	±0.070
	> 1.00~1.20	±0.08	±0.09	±0.11	±0.060	±0.070	±0.080
	> 1.20~1.60	±0.11	±0.13	±0.14	±0.070	±0.080	±0.090
	> 1.60~2.00	±0.14	±0.15	±0.16	±0.080	±0.090	±0.110
	> 2.00~2.50	±0.16	±0.17	±0.18	±0.110	±0.120	±0.130
	> 2.50~3.00	±0.19	±0.20	±0.20	±0.130	±0.140	±0.150
	> 3.00~5.00	±0.22	±0.24	±0.25	±0.17	±0.18	±0.19
360 ≤ Re ≤ 420	0.8~1.00	±0.08	±0.09	±0.11	±0.060	±0.070	±0.080
	> 1.00~1.20	±0.10	±0.11	±0.12	±0.070	±0.080	±0.090
	> 1.20~1.60	±0.13	±0.14	±0.16	±0.080	±0.090	±0.110
	> 1.60~2.00	±0.16	±0.17	±0.19	±0.090	±0.110	±0.120
	> 2.00~2.50	±0.18	±0.20	±0.21	±0.120	±0.130	±0.140
	> 2.50~3.00	±0.22	±0.22	±0.23	±0.140	±0.150	±0.160
	> 3.00~5.00	±0.22	±0.24	±0.25	±0.17	±0.18	±0.19
420 < Re ≤ 900	0.8~1.00	±0.09	±0.11	±0.12	±0.070	±0.080	±0.090
	> 1.00~1.20	±0.11	±0.13	±0.14	±0.080	±0.090	±0.110
	> 1.20~1.60	±0.15	±0.16	±0.18	±0.090	±0.110	±0.120
	> 1.60~2.00	±0.18	±0.19	±0.21	±0.110	±0.120	±0.140
	> 2.00~2.50	±0.21	±0.22	±0.24	±0.140	±0.150	±0.170
	> 2.50~3.00	±0.24	±0.25	±0.26	±0.170	±0.180	±0.190
	> 3.00~5.00	±0.26	±0.27	±0.28	±0.23	±0.24	±0.26
> 5.00~6.00	±0.28	±0.29	±0.30	±0.25	±0.26	±0.28	

<sup>a</sup> 钢带两端各 10m 内的厚度允许偏差可比规定值超出 50%。

The thickness tolerances within 10m at each end of the steel strip may be increased by a maximum of 50%.

<sup>b</sup> 对双面镀层重量之和不小于 450g/m<sup>2</sup> 的产品，其厚度允许偏差可增加 ±0.01mm。

The thickness tolerance of hot-dip coating products with the sum of double-sided coating weight not less than 450g/m<sup>2</sup> can exceed ± 0.01mm.

<sup>c</sup> 牌号 DD51D+ZMA 厚度允许偏差应符合此档规定。DD51D+ZMA should comply with this requirement.





1.7 推荐的公称镀层重量、镀层代号及镀层重量检测值

Recommended nominal coating weight, coating No. and measured coating weight

镀层形式 Coating form	镀层种类 Coating variety	推荐公称镀层重量 Coating weight g/m <sup>2</sup>	镀层代号 Coating No. *	JIS G 3302 镀层代号 Coating No.	双面三点平均值 Average Coating weight in both sides and three spots g/m <sup>2</sup> , ≥	双面单点值 Coating weight in both sides and single spot g/m <sup>2</sup> , ≥	单面单点值 Coating weight in each side and single spot g/ m <sup>2</sup> , ≥
等厚镀层 Same mass coating on both sides	ZMA	80	80	Z08	80	70	32
		90	90	-	90	77	36
		100	100	Z10	100	85	40
		120	120	Z12	120	102	48
		140	140	Z14	140	120	56
		150	150	-	150	130	60
		160	160	-	160	136	64
		180	180	Z18	180	153	72
		190	190	-	190	162	76
		200	200	Z20	200	170	80
		220	220	Z22	220	187	88
		225	225	-	225	195	90
		250	250	Z25	250	215	100
		270	270	-	270	234	108
		275	275	Z27	275	235	110
		300	300	-	300	255	120
		305	305	-	305	275	122
		310	310	-	310	264	124
		325	325	-	325	277	130
		350	350	Z35	350	300	140
375	375	Z37	375	319	150		
400	400	-	400	340	160		
425	425	-	425	362	170		
430	430	-	430	366	172		
450	450	Z45	450	385	180		
500	500	-	500	425	200		
550	550	-	550	468	220		
600	600	Z60	600	510	240		

1.8 表面处理 Surface treatment

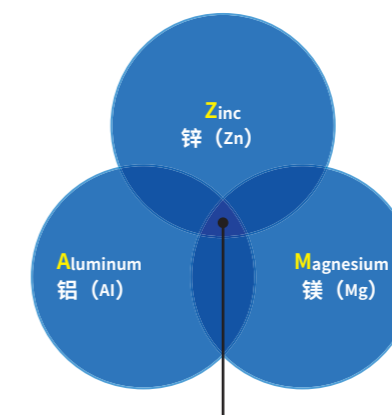
序号 Serial number	类别 category	代码 Code No.	特征 Features
1	三价铬钝化 Cr3+ treatment	C3	该表面处理可减少产品在运输和储存期间表面产生白锈或黑锈。三价铬钝化处理时，应限制钝化膜中对人体有害的六价铬成分。The treatment can prevent white or black rusts formed on product surfaces during transportation and storage. During Cr3+ passivation treatment, the Cr6+ components in the passivation film that harmful to human body shall be limited
2	涂油 Oiling	O	该表面处理可减少产品在运输和储存期间表面产生白锈，所涂的防锈油一般不作为后续加工用的轧制油和冲压润滑油。The treatment can prevent white rusts formed on product surfaces during transportation and storage. The anti-rust oil is generally not as subsequent processing stamping in the rolling and lubricating.
3	三价铬钝化 + 涂油 Cr3+ treatment+Oiling	CO3	该表面处理可减少产品在运输和储存期间表面产生白锈或黑锈。三价铬钝化处理时，应限制钝化膜中对人体有害的六价铬成分。The treatment can prevent white or black rusts formed on product surfaces during transportation and storage. During Cr3+ passivation treatment, the Cr6+ components in the passivation film that harmful to human body shall be limited
4	无铬耐指纹 Chromium-free anti-fingerprint treatment	AFN	该表面处理可减少产品在运输和储存期间表面产生白锈，可提高电子和电气产品表面的耐汗渍沾污性。无铬耐指纹应限制耐指纹膜中对人体有害的六价铬成分。The treatment can prevent white rusts formed on product surfaces during transportation and storage, and can improve the perspiration of electronic and electrical product surface. Chromium-During chromium free and anti-fingerprint treatment, the Cr6+ components in the passivation film that harmful to human body shall be limited
5	不处理 No treatment	U	该表面处理仅适用于需方订货时明确提出表面不处理的情况，应在合同中注明。表面不处理的产品在运输和储存期间表面较易产生白锈和黑点，需方应慎重选择。This surface treatment is only applied to the buyers when ordering specify surface without treatment, which should be indicated in the contract. No treatment with the surface of the products more easily produce white rust and black spots. Customers should choose carefully.

### 1.9 相近牌号对照 Reference list of corresponding steel grades

Q/SGJS 0014	GB/T 2518	EN 10346	VDA 239
DD51D+ZMA	-	DX51D+ZM	HR0
DD52D+ZMA	-	DX52D+ZM	HR2
S220GD+ZMA	S220GD	S220GD+ZM	
S250GD+ZMA	S250GD	S250GD+ZM	
S280GD+ZMA	S280GD	S280GD+ZM	
S300GD+ZMA	S300GD	-	
S320GD+ZMA	S320GD	S320GD+ZM	
S350GD+ZMA	S350GD	S350GD+ZM	
S390GD+ZMA	S390GD	S390GD+ZM	
S400GD+ZMA	-	-	
S420GD+ZMA	S420GD	S420GD+ZM	
S450GD+ZMA	S450GD	S450GD+ZM	
S500GD+ZMA	-	-	
S550GD+ZMA	S550GD	S550GD+ZM	
HD300LAD+ZMA	-	HX300LAD+ZM	HR300LA
HD340LAD+ZMA	-	HX340LAD+ZM	HR340LA
HD380LAD+ZMA	-	HX380LAD+ZM	HR380LA
HD420LAD+ZMA	-	HX420LAD+ZM	HR420LA
HD460LAD+ZMA	-	HX460LAD+ZM	HR460LA
HD500LAD+ZMA	-	HX500LAD+ZM	HR500LA
HD550LAD+ZMA	-	-	HR550LA
HD700LAD+ZMA	-	-	HR700LA

Q/SGJS 0014	JIS G 3302
SGHCD	SGHC
SGH340D	SGH340
SGH400D	SGH400
SGH440D	SGH440
SGH490D	SGH490
SGH540D	SGH540

### 1.10 产品特性 Product features



首钢 SOZAMC® 锌-铝 (6wt.%) - 镁 (3wt.%) 镀层钢板  
SHOUGANG SOZAMC® Zn-Al (6%) -Mg (3%) Alloy Hot-Rolled Steel Sheets

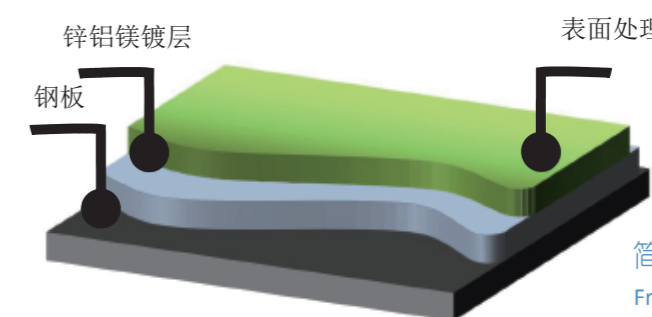
首钢 SOZAMC® 锌铝镁合金镀层钢板耐蚀性是同等镀层重量热镀锌 (GI) 产品的 3 倍以上, 具有良好的切口耐蚀性, 可以部分取代成形后加工再热浸镀锌的钢板。

In terms of corrosion resistance, SHOUGANG SOZAMC® Zn-Al-Mg alloy hot-rolled steel sheets is 3 times better than hot-dip zinc-coated steel sheets with the same coating weight, and the excellent corrosion resistance is achieved on cut edge. It can be used as a substitute for post hot-dip galvanizing in some ways.

使用寿命长 Long product life

可部分取代批量热浸镀锌  
substitute for post hot-dip galvanizing

镀层重量少  
Light coating weight



节约维修费用  
Reduce repair cost

实现降低全生命周期成本  
Reduce manufacturing cost

简化工艺  
Friendliness  
through process  
saving



### 1.10.1 平面耐蚀性 corrosion resistance of flat sections

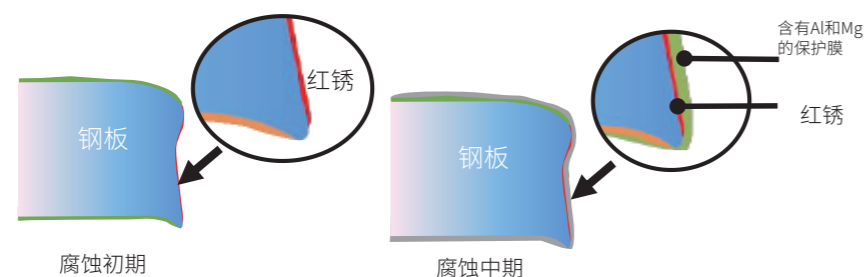
与纯锌 (GI) 镀层相比, 由于锌铝镁镀层中所含的铝 (Al) 和镁 (Mg) 作用, 随着时间推移, 在镀层表面形成附着性强的保护膜, 抑制镀层的腐蚀, 从而发挥优异的耐蚀性。热浸镀锌虽然也在镀层表面形成保护膜, 但是该保护膜表面粗糙且附着性低, 故腐蚀因子容易穿透, 造成镀层腐蚀扩大。

Compared with pure zinc (GI) coating, a protective film with strong adhesion is formed on the coating surface over time due to the action of Al and Mg contained in Zn-Al-Mg coating. The protective film with strong corrosion resistance can inhibit the corrosion of the coating, so as to give play to excellent corrosion resistance. Although hot-dip zinc coating also forms a protective film on the surface, the surface of the protective film is rough and possesses low adhesion. As a consequence, the corrosion factor is easy to penetrate, resulting in the expansion of coating corrosion.

### 1.10.2 切口耐蚀性 corrosion resistance of cut edge

钢板的切口端面暴露的基体在空气中由于雨水等原因容易发生氧化生红锈。在切口断面部位, 从镀层析出的 Al、Mg 元素会在端口部位生成致密的锌系保护膜, 并覆盖端口部位, 从而发挥优异的耐蚀性。

The exposed cut edge of substrate is oxidized due to rain, condensation, etc. Excellent corrosion resistance is achieved on cut edge parts by covering the ends with a fine zinc-based protective film that contains Al and Mg leaching from the coating layer.



### 1.11 典型应用 Typical applications



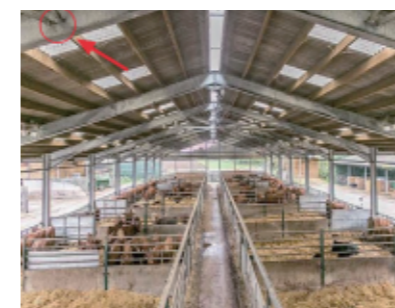
光伏支架 Solar Stent



钢板仓 Steel Silo



公路护栏 Guard Rail



养殖设备 Animal Production Equipment



电器柜 Electric Box



仓储货架 Storage Rack

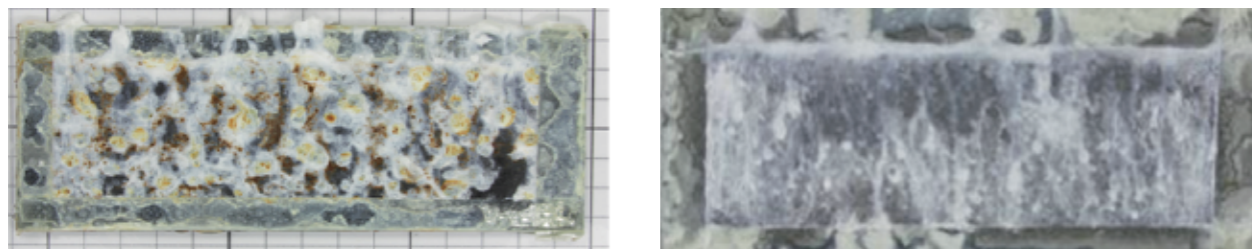




## 2.1 中性盐雾平面耐蚀性 Planar corrosion resistance (SST)

中性盐雾试验条件下，SOZAMC® 的平面耐蚀性达到热浸镀锌镀层的 6 倍以上。

In neutral salt spray test, SOZAMC® is a corrosion resistant products that is 6 times stronger resistance than that of a normal hot-dip galvanized steel sheet.



Z1200, 800 小时

ZMA275, 5040 小时

## 2.2 中性盐雾切口耐蚀性 Corrosion resistance on cut section (SST)

中性盐雾试验条件下，SOZAMC® 的切口耐蚀性达到热浸锌的 20 倍以上。

In neutral salt spray test, the corrosion resistant of SOZAMC® on cut section is 20 times stronger resistance than that of a normal hot-dip galvanized steel sheet.

镀层种类	镀层重量 (g/m <sup>2</sup> )	板厚 (mm)	出红锈时间 (h)	腐蚀形貌 Corrosion morphology
热浸锌	600/600	4.0	133	
SOZAMC®	140/140	3.0	3300	
SOZAMC®	140/140	5.0	3552	
SOZAMC®	140/140	5.5	2520	
SOZAMC®	140/140	6.0	1152	

## 2.3 中性盐雾冲孔耐蚀性 Corrosion resistance on punch cut section(SST)

不同厚度的 SOZAMC® 镀层板在冲孔位置均表现出优异的耐蚀性。

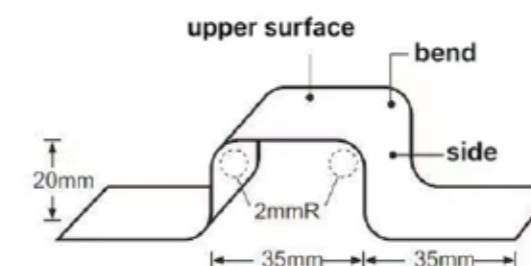
SOZAMC® shows excellent corrosion resistance on punch cut section of different thickness steel plate.

镀层种类	镀层重量 (g/m <sup>2</sup> )	板厚 (mm)	出红锈时间 (h)	腐蚀形貌 Corrosion morphology
SOZAMC®	140/140	2.0	> 2568	
SOZAMC®	140/140	5.5	> 2568	
SOZAMC®	140/140	6.0	> 2731	

## 2.4 中性盐雾折弯耐蚀性 Corrosion resistance on bending part(SST)

中性盐雾试验条件下，SOZAMC® 的折弯耐蚀性良好，90°折弯对耐蚀性影响很小。完成 5000 小时中性盐雾试验后，样品表面没有出现红锈腐蚀。

SOZAMC® shows excellent corrosion resistance on the bending parts. 90 ° bending affects little on the corrosion resistance. SOZAMC® gets no red rust after 5000h SST.



镀层种类	镀层重量 (g/m <sup>2</sup> )	板厚 (mm)	实验时间 (h)	腐蚀形貌 Corrosion morphology
SOZAMC®	140/140	1.2	5000	
SOZAMC®	140/140	1.5	5000	
SOZAMC®	140/140	3.0	5000	
SOZAMC®	140/140	5.0	5000	

## 联系方式

CONTACT

北京首钢股份有限公司  
Beijing Shougang Co.,Ltd.  
http://www.sggf.com.cn

上海首钢钢铁贸易有限公司  
Shanghai Shougang Steel Trading Co. Ltd.  
电话: 021-50930789  
传真: 021-50931008

广州首钢钢铁贸易有限公司  
Guangzhou Shougang Steel Trade Co., Ltd.  
电话: 020-22123069  
传真: 020-22123691

山东首钢钢铁贸易有限公司  
Shandong Shougang Steel Trade Co., Ltd.  
电话: 0532-80667080  
传真: 0532-80667087

首钢鹏龙钢材有限公司  
电话: 010-81470116

苏州首钢钢材加工配送有限公司  
电话: 0512-53995377

宁波首钢浙金钢材有限公司  
电话: 0574-86283086

宁波首钢汽车部件有限公司  
电话: 0574-23455501

哈尔滨首钢武中钢材加工配送有限公司  
电话: 0451-51640025

沈阳首钢钢材加工配送有限公司  
电话: 024-83960710

中国首钢印度有限公司  
China Shougang India Private Limited  
Tel: 0091 124 4100380/1  
Tax: 0091 124 4100381

首钢国际(新加坡)有限公司  
Shougang International(Singapore) PTE. Limited  
Tel: 0065 62251706  
Tax: 0065 62252617

首钢国际(奥地利)有限公司  
Shougang International(Austria)GmbH  
Tel: 0043 1 802 1995 10  
Tax: 0043 1 802 1995 50

首钢国际(加拿大)投资有限公司  
Shougang International(Canada)Investment LTD.  
Tel: 001 6046970128  
Tax: 001 6046970113

首钢智慧营销平台  
Shougang Intelligent Marketing Platform  
https://imp.sggf.com.cn

天津首钢钢铁贸易有限公司  
Tianjin Shougang Steel Trade Co., Ltd.  
电话: 022-84914552  
传真: 022-84918191

武汉首钢钢铁贸易有限公司  
Wuhan Shougang Steel Trade Co., Ltd.  
电话: 027-59710209  
传真: 027-59710258

佛山首钢中金钢材加工配送有限公司  
电话: 0757-81861600

首钢(青岛)钢业有限公司  
电话: 0532-86682569

株洲首钢汇隆钢材加工配送有限公司  
电话: 0731-22330180

天津物产首钢钢材加工配送有限公司  
电话: 022-59060812

重庆首钢武中汽车部件有限公司  
电话: 023-63173616

首钢国际(马来西亚)有限公司  
Shougang International(Malaysia)SDN.BHD.  
Tel: 0060 03 33778968/8972  
Tax: 0060 03 33920293

首钢国际(韩国)有限公司  
Shougang International(Korea)CO.,LTD  
Tel: 0082 220519118  
Tax: 0082 517459117

首钢国际(香港)投资有限公司  
Shougang International(Hong Kong) Investment Limited  
Tel: 00852- 28910011  
Tax: 00852- 28910011

卓航海运(新加坡)有限公司  
Superior Ocean Shipping(Singapore)PTE.LTD.  
Tel: 0065-62251706  
Tax: 0065-62252617

## 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
SOZAMC <sup>®</sup>	首钢中铝锌铝镁 镀层钢板 ZnAlMg(Medium Al) coated steel sheet	镀层中含有较高的铝含量和镁含量, 镀层的耐蚀性达到纯锌镀层的 3 倍以上, 切口位置也有良好的耐蚀性, 能够大幅度减少热浸锌的用量, 可以广泛用于户外钢结构的制造, 具备对热浸锌工艺的良好替代性。 The coating contains high aluminum (5~7%) and magnesium (2~4%) . The corrosion resistance of the coating is more than 3 times that of the zinc coating. The cutting edge also has good corrosion resistance. It can greatly reduce the amount of hot-dip zinc, thus has good substitutability for hot dip galvanizing process. It can be widely used to manufacture outdoor steel structures.	镀层为 ZMA 的所有锌铝镁镀层 产品牌号



首钢智慧营销平台  
Shougang for WeChat



扫描下载本册内容  
Scan QR code to download this file

北京首钢股份有限公司  
Beijing Shougang Co., Ltd



本手册以环保纸印刷  
Using the recyclable paper

SGGF 2023-06-01-009



6 787604 1117412