BAOSTEEL

Appliance Steel

家 电 用 钢

www.baosteel.com

宝山钢铁股份有限公司
BAOSHAN IRON & STEEL CO., LTD.

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前言

关注用户的需求、生产和提供安全、环保、优质的产品和服务是宝钢的使命和应尽的社会责任。

本手册介绍了OA产品、影视产品、空调、冰箱、洗衣机、电池壳、搪瓷钢等家电用冷轧、热镀、电镀、彩涂、电工钢等系列产品。

本手册介绍的产品符合下列法律法规要求：
欧盟RoHS指令《关于在电子电气设备中限制使用某些有害物质指令》(2002/95/EC)

欧盟WEEE指令《关于报废电气电子设备指令》(2002/96/EC)
注：RoHS和WEEE两指令于2003年1月27日同时发布，其中RoHS指令于2006年7月1日起实施，WEEE指令于2005年8月13日起实施。

欧盟PFOS指令《关于限制全氟辛烷磺酸销售及使用指令》(2006/122/EC)
注：2006年12月27日发布和生效，该指令要求各成员国于2008年6月27日开始实施限制措施。

REACH指令《关于化学品注册、评估、许可和限制的法规》(第1907/2006(EC)法规)
注：欧盟于2006年12月立法通过，并于2007年6月1日起生效。
日本的《资源有效利用促进法实施令》(2006年7月1日实施)
中国的《电子信息产品污染防治管理办法》(信息产业部第39号令)
注：于2006年2月28日颁布，2007年3月1日起实施。
用户满意是一切活动的出发点和归宿。我们将始终致力于为您提供优质的产品、高效的服务、完善的解决方案，并期待与您携手，打造绿色钢铁价值链，共创美好、绿色的未来！

Foreword

It is Baosteel's mission and social responsibility to focus on customer demands, provide safe, environmental, high quality products and services.

This manual describes cold rolled, hot-dip galvanized, electro-galvanized, prepainted steel, electrical steel and other products, which are used for appliances such as OA, video, air-conditioners, refrigerators, washing machines, battery shell, enamel and so on.

Products described in this manual meet the following legal requirements:

EU RoHs Directive "the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment"(2002/95/EC)implementation.

EU WEEE Directive on Waste Electrical and Electronic Equipment (2002/96/EC)
Note: RoHs and WEEE directives were released on January 27, 2003 simultaneously, but RoHS was put in force on July 1, 2006 and WEEE on August 13, 2005.

EU PFOS Directive "the restriction of the sales and use of PFOS"(2006/122/EC)
Note: This directive was released on December 27, 2006, which required member states to implement restrictive measures on June 27, 2008.

REACH Directive "Registration, Evaluation, Authorization and Restriction of Chemicals" (No.1907/2006(EC))
Note: The EU released the directive by legislation, which went into effect on June 1, 2007.
Japan's "The law of promoting the effective use of resources" (Implemented on July 1, 2006.)
China's "Electronic Information Products Pollution Control Regulations"(Ministry of Information Industry Order No.39)
Note: This regulation was released on February 28, 2006 and implemented on March 1, 2007.
User satisfaction is the foundation and destination of all our actions. We will always be committed on providing high quality products, efficient services and perfect solution. We look forward to working with you to create a environmental value chain, creating a better, greener future!

宝钢绿色宣言

宝钢是中国钢铁业先进制造技术的领头羊、环境友好型产品及服务的提供者，同时，宝钢也是绿色钢铁产业链的倡导者和实践者。在促进人类现代舒适生活的同时，保护环境、降低环境负荷是我们责无旁贷的使命。我们承诺：

一、开发高能源效率和高资源效率的制造工艺，开发和推广高能源效率和高资源效率的产品和系统，与用户分享先进的环境设计理念和技术，向社会提供环境绩效优良的产品和服务。

二、符合环保法规要求是我们的最低标准。保证制造过程中不故意添加法律法规禁止的对环境和健康有害的物质，同时降低产品在使用寿命中对环境产生的有害影响。

三、优先与环保绩效良好的供应商、分包方合作，提升供应商在可持续发展方面的意识和绩效，同时积极为客户提供绿色解决方案，致力于共同打造绿色产业链。

四、发布基于生命周期评价的产品环境声明，公示我们核心产品的环境绩效，方便顾客和其他相关方比较不同产品全生命周期的影响。

五、积极开展与政府、企业及国际间合作，推广应用国际间的研究成果、与各国先进节能及环境改善技术同步发展。

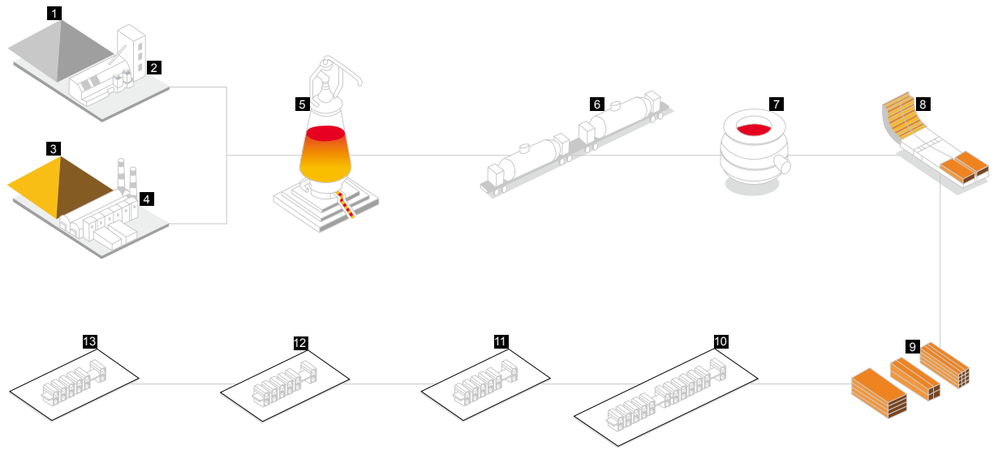
提高产品性能的同时降低对环境的不良影响、实现企业和环境的和谐发展是宝钢矢志不渝的追求，环境经营将始终贯穿于宝钢的发展战略、业务流程、日常运营之中。我们会一如既往地探索钢铁工业可持续发展的途径，塑造崭新的社会角色，共创美好的未来。

生产流程简介

Introduction of process

- 生产流程 *Production process*
- 主要产线 *Main production lines*

生产流程 Production process



1 煤 Coal	2 烧结 Sintering
3 铁矿石 Iron ore	4 焦炉 Coke oven
5 高炉 Blast furnace	6 鱼雷型铁水罐车 Torpedo
7 转炉 Converter	8 连铸机 Con-caster
9 连铸板坯 Continuous casting billet	10 热轧 Hot-rolled
11 冷轧 Cold-rolled	12 连退 Continuous annealing
13 镀(铝)锌 Galvanizing	

主要产线 Main Production Lines

NO.2030

2030单元于1988年9月投产，主要产品为热轧酸洗板卷、冷轧板卷、热镀锌板卷、电镀锌板卷、彩色涂层板卷和捆带钢。

主要生产机组包括：酸洗、轧机、脱脂、罩式炉、连续退火机组、连续热镀锌机组、连续电镀锌机组、连续彩色涂层机组、重卷机组、纵切机组、横切机组和翻板清洗机组。

设计最终成品规模394万吨/年，其中热轧酸洗板产品145万吨/年，冷轧产品产量150万吨/年，镀锌产品产量77万吨/年，包括29万吨/年热镀锌产品和48万吨/年电镀锌产品，彩涂产品产量22万吨/年。

2030 line started the manufacture in September 1988, the main products of this line include pickling hot-rolled coil & sheet, cold-rolled coil & sheet, hot-dip galvanized coil & sheet, Electro-galvanized coil & sheet, prepainted coil & sheet and strip steel. The main production unit includes: pickling, rolling, degreasing, bell-type furnaces, continuous annealing, hot-dip galvanizing line, color coating line, rewinding machine, slitting machine, cross shearing unit and reverse turning bed cleaning unit. The design capacity of the final product is 3.94 million tons/year, with pickling hot-rolled 1.45 million tons/year, cold-rolled product 1.5 million tons/year, galvanized products >770 thousand tons/year including 290 thousand tons hot-dip galvanized products and 480 thousand tons Electro-galvanized products, prepainted product 220 thousand tons/year.

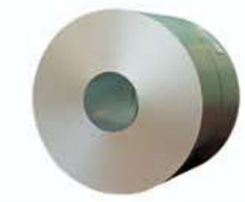
NO.1730

1730单元是宝钢股份“十一五”规划项目中的主体项目，是继2030、1420、1550、1800冷轧之后的又一个大型冷轧项目，其主要目的是拓展宝钢高表面、高精度产品要求的生产品种和规格。1730单元于2008年5月投产，主要生产机组包括：酸洗轧机联合机组、连续退火机组、连续热镀锌机组、中试机组、精整机组。

生产规模为168万吨，其中高表面质量的冷轧板70万吨/年，高表面质量的热镀锌板70万吨/年。

每年还分别为中试机组和1550冷轧提供15.464万吨和13.322万吨轧后冷硬卷。

1730 line is the main project in Baosteel”s “Eleventh Five-Year Plan”. It is another large-scale cold rolling project following the cold-rolling projects of 2030, 1420, 1550, 1800, with the purpose of expending Baosteel production varieties and specifications with high surface quality and high accuracy. 1730 line started the manufacture in May, 2008, whose main production unit includes: CDCM, continuous annealing unit, hot-dip galvanizing line, pilot-plant testing unit and finishing unit. The production capacity is designed to be 1.68 tons/year, with the high surface quality cold-rolled sheets 700 thousand tons/year and the high surface quality hot-dip galvanized sheets 700 thousand tons/year. It also includes 155 thousand tons of cold rolled full hard coils provided for the pilot-plant testing unit and 133 thousand tons for 1550 cold-rolled unit respectively.



MAIN PRODUCTION LINES

NO.1550

1550单元于2000年3月投产，主要产品以汽车板、家电板和中低牌号冷轧电工钢为主，是高技术、高难度、高附加值的产品。

主要机组包括：酸洗轧机联合机组、连续退火平整机组、连续热镀锌机组、重卷检查机组、电工钢连续退火涂层机组、电工钢精整机组。

设计最终成品规模146万吨/年，其中冷轧产品产量45万吨/年，镀锌产品产量60万吨/年，包括35万吨/年热镀锌产品和31吨/年电镀锌产品，电工钢产品产量90万吨/年。

1550 line started the manufacture in March, 2000, and the main products include: automotive steel, appliance steel and low & medium grade cold-rolled electrical steel, which are all products with high-tech, superior difficulty and high added value. The main unit includes: CDCM, continuous annealing temper mill, hot-dip galvanizing line, recoiling inspection unit, electrical steel continuous annealing coating unit, and electrical steel finishing unit. The design capacity of the final product is 1.46 million tons/year, with cold-rolled product output 450 thousand tons/year, galvanized products 600 thousand tons/year including 350 thousand tons/year of hot-dip galvanized products and 310 thousand tons/year of Electro-galvanized products, electrical steel product output 900 thousand tons/year.

NO.1800

1800单元于2004年12月投产，主要产品为冷轧板和热镀锌板。主要生产机组包括：酸洗机组、连续退火机组、连续热镀锌机组、精整机组。

生产规模为170万吨/年，其中冷轧板90万吨/年，热镀锌板80万吨/年。

1800 line started the manufacture in December, 2004, whose main products are cold-rolled steel and hot-dip galvanized steel. The main manufacturing unit includes: pickling line, continuous annealing line, hot-dip galvanizing line, and finishing unit. The production capacity is designed to be 1.7 million tons/year, with cold-rolled sheet output 900 thousand tons/year and hot-dip galvanized sheet 800 thousand tons/year.

NO.1420

1420单元于1998年3月投产，主要产品为镀锡板及轧硬卷、主要生产机组包括：酸洗轧机联合机组、连续退火平整机组、电镀锡机组、精整机组。

设计最终成品规模76万吨/年，其中电镀锡板44万吨/年、32万吨冷轧薄板。厚度0.17~0.80mm，宽度700~1230mm。

产品主要用于制罐工业、汽车工业、电气行业和家电行业。

1420 line started the manufacture in March 1988, and the main products of the line are tin plate and hard rolled coil. The main production unit includes: pickling rolling mill joint unit, continuous annealing temper mill, tin plating unit, and finishing unit. The design capacity of the final product is 760 thousand tons/year, with 440 thousand tons/year of tin plate, 320 thousand tons/year of cold-rolled sheet. Products with thickness 0.17~0.80mm and width 700~1230mm are mainly used in canning, automobile, electrical industries and household appliances.

NO.1220

1220单元于1990年12月投产，主要产品为冷轧板、镀锡板、镀铬板，主要生产机组包括：酸洗机组、5机架冷连轧机组、电解清洗机组、全氢罩式退火、平整机组、连续退火机组、二次冷轧机组、电镀锡机组、电镀铬机组、精整机组。

设计最终成品规模100万吨/年，其中冷轧产品总量45万吨/年，电镀锡板35万吨/年，电镀铬板20万吨/年。

1220 line started the manufacture in December, 1990, whose main productions are cold rolled sheet, tin plate, chrome plate. The main production unit includes: pickling unit, 5-stand tandem cold rolling unit, electrolytic cleaning unit, full hydrogen bell-type annealing, temper mill, continuous annealing line, the second cold-rolling mill, electrolytic tin plating unit, electrolytic chrome plating unit and finishing unit. The design capacity of the final product is one million tons/year, with cold-rolled product output 450 thousand tons/year, tin platts 350 thousand tons/year, and chrome plates 200 thousand tons/year.

NO.1420

梅钢1420单元于2009年10月投产，产品主要面向食品、化工、建筑、轻工、家电、结构等行业。主要生产机组包括：酸洗轧机联合机组 、连续退火机组、连续热镀锌机组、热镀铝锌机组、精整机组，设计生产规模为85万吨。

1420 line of Meishan Steel started the manufacture in October, 2009, whose products are mainly used in food, chemical, construction, light industry, household appliances, structural and other industries. The main production line includes: pickling rolling mill joint unit, continuous annealing unit, continuous hot-dip galvanizing line, hot-dip galvanized and aluminized units, and finishing unit. Its production capacity is designed to be 850 thousand tons.

NO.1780

不锈钢冷轧新产线2010年6月起投产，其冷连轧机组设计的工艺、设备与1800单元相近，产品大纲除60公斤级以上产品外，与1800单元、1730单元类似。

New stainless steel cold-rolling production line started the manufacture in June, 2010, whose process design and equipment of continuous cold rolling unit is similar to 1800 unit. Except products with more than 60kg, its product outline is similar to 1800 and 1730 units.

主要家电用钢选材

Selection of steel for appliances

● OA	*OA*
● 影视	*Video*
● 空调	*Air conditioner*
● 冰箱	*Refrigerator*
● 洗衣机	*Washing machine*
● 通讯机柜	*Communication machine cabinets*
● 电池壳	*Battery shell*
● 搪瓷钢	*Vitreous enamelling*

底板
Foundation

结构件
Bracket

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
底板 Foundation				✓		
结构件 Bracket				✓		

复印机、打印机内置框架件均采用电镀锌钢板

The inner frame pieces of copiers & printers are mainly made of electro-galvanized steel.

结构件
Bracket

底板
Foundation

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
底板 Foundation				✓		
结构件 Bracket				✓		

复印机、打印机内置框架件均采用电镀锌钢板

The inner frame pieces of copiers & printers are mainly made of electro-galvanized steel.

模组后背板
Module

模组（框）
Module

各类结构件
Various types of brackets

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
模组 Module		✓		✓	✓	
后盖 Rear cover		✓		✓	✓	✓
各类结构件 Various types of brackets	✓	✓		✓	✓	

模组用钢（背板和边框）主要为电镀锌钢板和镀铝锌钢板

The inner frame pieces of copiers & printers are mainly made of electro-galvanized steel and 55% Al-Zn alloy galvanized.

面板
Front panel

底板
Bottom plate

后盖板
Back cover

阀座板
Mounting plate

上盖板
Top cover

蒸发器支撑板
Vaporizer bracket plate

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
面板 Front panel		✓	✓			✓
底板 Bottom plate		✓	✓		✓	
上盖板 Top cover		✓	✓			✓
阀座板 Mounting plate		✓				
挂钩 Hanger		✓				
下挡板 Bottom plate		✓				
蒸发器支撑板 Vaporizer bracket plate		✓			✓	
加热器支架 Heater bracket		✓				

内部件基本采用热镀锌锌产品冲压后直接使用；外部件采用新铁合金或者热镀锌产品成型后喷涂使用；部分用户直接采用彩涂板制作外部件；镀铝锌用于使用时需耐高温的零部件生产。

Inner parts basically use hot-dip galvanized products for direct use after drawing; outer parts use galvannealed or hot-dip galvanized products for spraying after forming; some users directly use prepainted steel to produce outer parts; 55% Al-Zn alloy galvanized products are used for the production of the parts which need to be high temperature resistant when used.

冰箱 Refrigerator

门板
Door panel

桥板
Bridge plate

侧板
Side plate

后盖板
Back cover

压缩机底板
Baseplate for compressor

L 型加强条
L-shape reinforcing bar

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
门板 Door panel	✓	✓		✓		✓
侧板 Side plate	✓					✓
压缩机底板 Baseplate for compressor		✓			✓	
桥板 Bridge plate		✓				
后盖板 Back cover		✓			✓	
L型加强条 L-shape reinforcing bar	✓	✓			✓	

冰箱零件材料以热镀锌产品为主，部分用户会选择镀铝锌和普冷板，彩涂板主要用于冰箱门板和侧板。

Parts of the refrigerator mainly use hot-dip galvanized products; some users will choose 55% Al-Zn alloy galvanized and cold-rolled plate. Prepainted steel is mainly used for the refrigerator door and side panels.

洗衣机 Washing machine

门板
Casing

底板
Foundation plate

封门板
Sealing plate

箱角
Case corner

箱体连接板
Case junction panel

固定板
Fixed plate

离合器
Clutch

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
门板 Casing	✓	✓	✓	✓		✓
封门板 Sealing plate	✓	✓	✓	✓		
箱体连接板 Case junction panel		✓				
底板 Foundation plate		✓				
箱角 Case corner		✓				
固定板 Fixed plate		✓				
离合器 Clutch		✓				

洗衣机零件材料以热镀锌产品为主，部分用户会选择锌铁合金和普冷板，彩涂板主要用于洗衣机外壳。

Parts of the washing machine mainly use hot-dip galvanized products; some users will choose galvannealed and cold-rolled plate. Prepainted steel is mainly used for the washing machine shell.

通讯机柜 Communication cabinets

面板
Front panel

机盒
Box

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
机盒上下盖 Upper and lower covers of machine case		✓		✓		✓
机箱面板 Case panel		✓				✓
机箱骨架 Case framework	✓	✓				
机柜面板 Cabinet panel	✓	✓				✓
机柜骨架 Cabinet framework	✓	✓				

以热镀锌材料裸用或喷涂使用为主，部分产品会使用普冷板、彩涂板和电镀锌。

The parts mainly use hot-dip galvanized materials for direct use or for use after spraying; some users will choose Cold-rolled plate, Prepainted steel and electro-galvanized products.

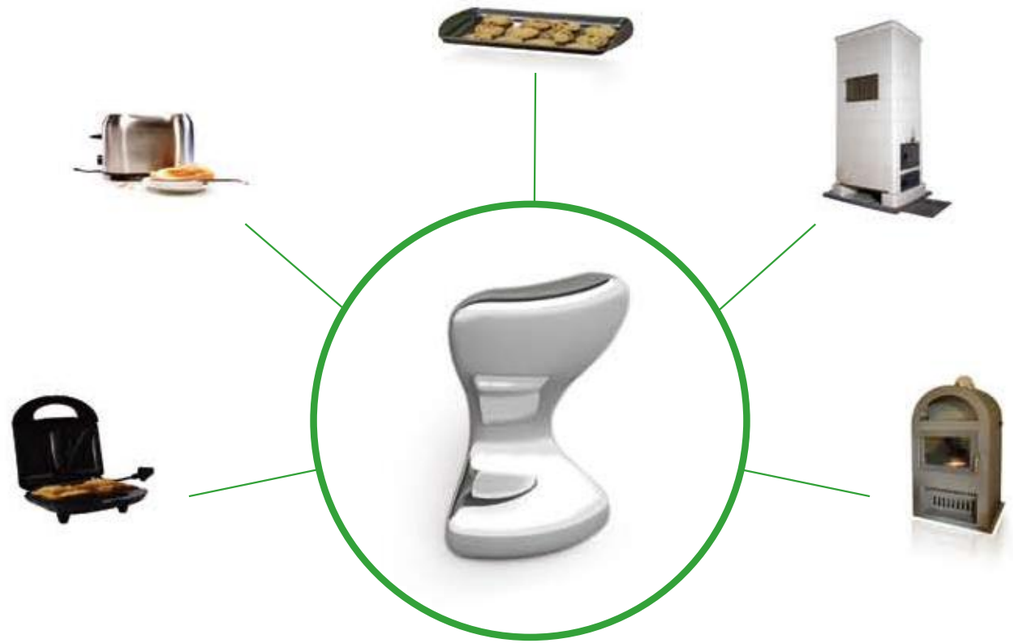
电池壳　Battery shell

零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
电池钢壳 Battery shell	✓					

电池钢壳均为电池钢冲制而成

Battery shell are punched by battery steel.

搪瓷钢　Vitreous enamelling



零部件 Parts	普冷 Cold-rolled steel	热镀锌 Hot-dip galvanized	锌铁合金 Galvannealed	电镀锌 Electro-galvanized	镀铝锌 55% Al-Zn alloy galvanized	彩涂 Prepainted steel
脱硫/脱销设备 Desulfurization/ denitrificationequipment	✓					

烤炉内胆、托盘和边框全部为搪瓷钢；灶台的台面为搪瓷钢生产。

Oven liner, tray and border all use vitreous enamelling steel; the table board of the hearth is made from vitreous enamelling steel. The picture of the finished product is as follows (please select the appropriate one):

家电用钢产品特性

Product features of steel for appliances

- 冷轧产品 *Cold-rolled steel sheet*
- 热镀锌产品 *Hot-dip galvanized steel sheet*
- 电镀锌产品 *Electro-galvanized steel sheet*
- 镀铝锌产品 *55% Al-Zn alloy galvanized steel sheet*

冷轧产品 Cold-rolled steel sheet

冲压系列用钢牌号及用途简介
Introduction of grades and uses of steel for drawing series

标准及牌号 Standard and grades / 材料类别 Material category	宝钢企业标准 Baosteel enterprise standards		相当国际标准 Equivalent foreign standard		说明 Description	
	标准号 Standard number	牌号 Grade	标准号 Standard number	牌号 Grade		
一般用 General use	Q/BQB402-2009 Q/BQB403-2009 Q/BQB408-2009	SPCC DC01 BLC	EN10327 JISG3141	SPCC DC01 JSC270C	冰箱等家电外壳、油桶、钢家俱等一般成形加工用 Steel for general shaping and processingof refrigerator and other household applianceshell, oil drums, steel furniture	
冲压级 Used for drawing	Q/BQB402-2009 Q/BQB403-2009 Q/BQB408-2009	SPCD DC03 BLD	EN10327 JISG3141	SPCD DC03 JSC270D	家电冲压成形加工用钢 Steel for the drawing and shaping of household appliances	
深冲用 Used for deep drawing	Q/BQB402-2009 Q/BQB403-2009 Q/BQB408-2009	SPCE DC04 BUSD	EN10327 JISG3141	SPCE DC04 JSC270E	深冲压成形加工用钢 Steel for deep drawing and shaping process	
特深冲用 Used for special deep drawing	Q/BQB402-2009 Q/BQB403-2009 Q/BQB408-2009	SPCF(SPCEN) DC05 BUFD	EN10327 JISG3141	SPCF DC05 JSC270F	特深冲压成形加工用钢 Steel for special deep drawing and shaping process	
超深冲用 Extra deep drawing	Q/BQB402-2009 Q/BQB403-2009 Q/BQB408-2009	SPCG DC06 BSUFD	EN10327 JISG3141	SPCG DC06 JSC260G	超深冲压成形加工用钢。 Steel for special deep drawing and shaping process	
特超深冲用 Used for special extra-deep drawing	Q/BQB403-2009	DC07	EN10327 JISG3141	DC07	深冲性能特别优良加工用钢 Steel with particularly good deep drawing propertie	
家电面板用 Used for the panel of household appliances	BZJ471-2009	BLC－JD1			喷涂用（烘烤硬化性）For spraying (Bake hardening)	洗衣机外板 Outer plate of washing machine
		BLC－JD2				冰柜外板 Outer plate of freezer
		BLC－JD3				冰箱侧板及喷涂用小冰箱面板 Refrigerator side panel and the small refrigerator panel for spraying
		BLD－JD1			覆膜用（抗时效性）For tectorial use (aging resistance)	深冲用冰箱覆膜面板 Refrigerator tectorial panelfor deep drawing
		BLD－JD2				冲压用冰箱覆膜面板 Refrigerator tectorial panel for drawing
		BLD－JD3				一般用冰箱覆膜面板 Refrigerator tectorial panelfor general use

冲压系列用钢力学性能
Mechanical properties of steel drawing series

牌号 Grade	屈服强度[a] MPa Yield strength	抗拉强度 MPa Tensile strength 不小于 Not less than	断后伸长率[b] Elongation % A80mm 不小于 Not less than						r90[c]	n90[c]
			公称厚度 mm Nominal thickness						不小于 Not less than	
			<0.30	0.30～＜0.50	0.50～＜0.70	0.70～＜1.0	1.0～＜1.6	≥1.6		
DC01[d]	140～280	270	24	26	28	30	32	34	–	–
DC03	140～240	270	–	30	32	34	35	36	1.3	–
DC04	130～210	270	–	34	36	38	39	40	1.6	0.18
DC05	120～180	270	–	35	38	40	40	41	1.9	0.2
DC06	110～170	260	–	37	39	41	42	43	2.1	0.22
DC07	100～150	250	–	40	42	44			2.5	0.23

a 无明显屈服时采用$RP_{0.2}$，否则采用ReL。当厚度大于0.50mm且不大于0.70mm时，屈服强度规定值允许增加20MPa；当厚度不大于0.50mm时，屈服强度规定值允许增加40MPa。

b 试样为GB/T 228中的P6试样，试样方向为横向。

c r90值和n90值的要求仅适用于厚度不小于0.50mm的产品。当厚度大于2.0mm时，r90值允许降低0.2。

d DC01的屈服强度上限值仅适用于产品制造完成之日起的8天内。

a. When there is no significant yield, $RP_{0.2}$ should be used; otherwise ReL should be used. When the thickness is more than 0.50mm and not more than 0.70mm, the specified value of the yield strength is allowed to increase 20MPa; when the thickness is not more than 0.50mm, the specified value of the yield strength is allowed to increase 40MPa.

b. The sample is the P6 sample in GB/T 228 and the sample direction is transverse.

c. The requirements of r90 and n90 values apply only to products with the thickness not less than 0.50mm. When the thickness is more than 2.0mm, the value of r90 is allowed to lower 0.2.

d. The upper limit value of DC01 yield strength applies only to products within 8 days since the manufacturing date.

牌 号 Grade	屈服强度[a,b,c] MPa Yield strength	抗拉强度 MPa Tensile strength 不小于 Not less than	断后伸长率[c] Elongation %（L0=50mm,b=25mm）不小于 Not less than							rm [d, e]不小于	
			公称厚度 mm Nominal thickness							公称厚度 mm Nominal thickness	
			<0.25	0.25~<0.30	0.30~<0.40	0.40~<0.60	0.60~<1.0	1.0~<1.6	≥1.6	0.5~<1.0	1.0~<1.6
SPCC	—	270	25	28	31	34	36	37	38	—	—
SPCD	240	270	27	30	33	36	38	39	40	—	—
SPCE	220	270	29	32	35	38	40	41	42	—	—
SPCF (SPCEN)	210	270	—	—	37	40	42	43	44	—	—
SPCG	190	270	—	—	—	42	44	45	46	1.4	1.3

a 当屈服现象不明显时采用$RP_{0.2}$，否则采用ReL。
b 当厚度大于0.40mm且不大于0.60mm时，屈服强度的规定值允许增加20MPa；当厚度不大于0.40mm时，屈服强度的规定值允许增加40MPa。
c 试样为GB/T 228中的P14试样，试样方向为纵向。
d 厚度＜0.5mm和厚度＞1.6mm时，r值不做要求。
e rm＝(r90+2r45+r0)/4。
rm＝(r90+2r45+r0)/4

a. When there is no significant yield, $RP_{0.2}$ should be used; otherwise ReL should be used.
b. When the thickness is more than 0.40mm and not more than 0.60mm, the specified value of the yield strength is allowed to increase 20MPa; when the thickness is not more than 0.40mm, the specified value of the yield strength is allowed to increase 40MPa.
c. The sample is the P14 sample in GB/T 228 and the sample direction is longitudinal.
d. When the thickness is less than 0.5mm and more than 1.6mm, r values are not required.
e. rm = (r90+2r45+r0)/4
rm = (r90+2r45+r0)/4

牌 号 Grade	屈服强度[a] MPa Yield strength	抗拉强度 MPa Tensile strength 不小于 Not less than	断后伸长率[b] Elongation %（L0=50mm,b=25mm）不小于 Not less than				r90[c]	n90[c]
			公称厚度 mm Nominal thickness				不小于 Not less than	
			<0.60	0.60~<1.0	1.0~<1.6	≥1.6		
BLC	140～270	270	36	38	40	42	—	—
BLD	120～240	270	38	40	42	44	1.5	0.18
BUSD	120～210	260	40	42	44	46	1.7	0.2
BUFD	120～190	250	42	44	46	48	2	0.21
BSUFD	110～180	250	44	46	48	50	2.2	0.22

a 当屈服现象不明显时采用$RP_{0.2}$，否则采用ReL。
b 试样为GB/T 228中的P14试样，试样方向为横向。
c r90和n90仅适用于厚度不小于0.50mm的产品。当厚度大于2.0mm时，r90值允许降低0.2。

a. When there is no significant yield, $RP_{0.2}$ should be used; otherwise ReL should be used.
b. The sample is the P14 sample in GB/T 228 and the sample direction is transverse.
c. The requirements of r90 and n90 values apply only to products with the thickness not less than 0.50mm. When the thickness is more than 2.0mm, the value of r90 is allowed to lower 0.2.

冲压系列用钢可供范围
Available range of steel for drawing series

项目 Item		公称尺寸 mm Nominal size
厚度 Thickness		0.25-3.5
宽度 Width		800-1830
长度 Length	钢板 Steel plate	1000-6000
	钢带 Steel strip	卷内径(Coil inside diameter) 508、610

电池壳用钢牌号及用途简介
Introduction of grades and uses of steel for battery shell

牌 号 Grade	用 途 Use
BDCK	电池壳用 Battery shell

电池壳用钢力学性能
Mechanical properties of steel for battery shell

牌 号 Grade	抗拉强度[a] 不小于 Tensile strength Not less than MPa	断后伸长率A_{50}mm 不小于 Elongation Not less than %	硬度 Hardness HRB
BDCK	275	34	40~56

a. 试样为GB/T228中的P14试样

a. The sample is the P14 sample in GB/T228

电池壳用钢可供范围
Available range of steel for battery shell

公称厚度 mm Nominal thickness	厚度允许偏差 mm Thickness tolerance	公称宽度 mm Nominal width	宽度允许偏差 mm Width tolerance	钢带内径 mm Inside diameter of steel strip	可供表面结构 Available surface structure
0.25~0.30	−0.007~+0.003	切边(With cut edge)：800~1005	切边(With cut edge)：0~+3	508	光面 Smooth surface（B）
0.25~0.50	±0.01	不切边(Without cut edge)：800~1020	不切边(Without cut edge)：0~+5		麻面 Pitted surface（D）

搪瓷用冷连轧钢板牌号及用途简介
Introduction of grades and uses of cold-rolled steel for enamel

牌 号 Grade	用 途 Use
DC03ED	一次搪瓷用冷轧钢板 Cold-rolled steel plate for direct enamel
DC04ED（BTC4D）	
DC06ED	两次搪瓷用冷轧钢板 Cold-rolled steel plate for twice enamel
DC01EK	深冲用搪瓷冷连轧钢板 Enamel cold-rolled steel plate for deep drawing
DC04EK	
DC06EK	
BTC1	

搪瓷用冷连轧钢板力学性能
Mechanical properties of cold-rolled steel for enamel

	ReL或$Rp_{0.2}$MPa	RmMPa	A80%	r90
DC03ED	≤240	270-350	≥34	
DC04ED	≤210	270-350	≥38	
DC06ED	≤190	270-350	≥38	≥1.6
DC01EK	≤270	270-390	30	
DC04EK	≤220	270-350	36	
DC06EK	≤190	270-350	38	≥1.6
BTC1	≤190	270-320	≥39	

搪瓷用冷连轧钢板可供范围
Available range of cold-rolled steel for enamel

项目 Item		公称尺寸 mm Nominal
厚度 Thickness		0.3-3.0
宽度 Width		720-1650
长度 Length	钢板 Steel plate	1000-6000
	钢带 Steel strip	卷内径 (Coil inside diameter) 508、610

以上为冷轧产品部分，其中单面搪瓷用热轧薄钢板力学性能去除。以下依次为电镀锌、热镀锌和镀铝锌部分。

The above is about the cold-rolled products, in which the mechanical properties of hot-rolled steel for single-side enamel have been removed. The following is about electro-galvanized, hot-dip galvanized and 55% Al-Zn alloy galvanized products one by one.

热镀锌产品 Hot-dip galvanized steel sheet

热镀锌牌号介绍
Introduction of hot-dip galvanized grades

牌 号 Grade	特 点 Feature
DC51D+Z, DC51D+ZF, DD51D+Z	低碳钢 Low carbon steel
DC52D+Z, DC52D+ZF	低碳钢或无间隙原子钢 Low carbon steel or interstitial free steel
DC53D+Z, DC53D+ZF	
DC54D+Z, DC54D+ZF, DD54D+Z	无间隙原子钢 Interstitial free steel
DC56D+Z, DC56D+ZF	
DC57D+Z, DC57D+ZF	
S220GD+Z, S220GD+ZF	碳素结构钢或低合金钢 Carbon structural steel or low alloy steel
S250GD+Z, S250GD+ZF	
S280GD+Z, S280GD+ZF	
S320GD+Z, S320GD+ZF	
S350GD+Z, S350GD+ZF	
S550GD+Z	
HC180YD+Z, HC180YD+ZF (H180YD+Z, H180YD+ZF)	无间隙原子高强度钢 High strength interstitial free steel
HC220YD+Z, HC220YD+ZF (H220YD+Z, H220YD+ZF)	
B240P1D+ZF B260LYD+ZF	
HC260YD+Z, HC260YD+ZF (H260YD+Z, H260YD+ZF)	
HC180BD+Z, HC180BD+ZF (H180BD+Z, H180BD+ZF)	烘烤硬化钢 Bake-hardening steel
HC220BD+Z, HC220BD+ZF (H220BD+Z, H220BD+ZF)	
HC260BD+Z, HC260BD+ZF (H260BD+Z, H260BD+ZF)	
HC300BD+Z,HC300BD+ZF	

牌 号 Grade	特 点 Feature
HC260LAD+Z, HC260LAD+ZF (H260LAD+Z, H260LAD+ZF)	低合金高强度钢 High strength low alloy steel
HC300LAD+Z, HC300LAD+ZF (H300LAD+Z, H300LAD+ZF)	
HC340LAD+Z(H340LAD+Z) HC340LAD+ZF(H340LAD+ZF) HD340LAD+Z(HR340LAD+Z)	
HC380LAD+Z(H380LAD+Z), HC380LAD+ZF	
HC420LAD+Z(H420LAD+Z), HC420LAD+ZF HD410LAD+Z(HR410LAD+Z)	
HC250/450DPD+Z,HC250/450DPD+ZF	双相钢 Dual-phase steel
HC300/500DPD+Z,HC300/500DPD+ZF	
HC280/590DPD+Z, HC280/590DPD+ZF	
HC340/590DPD+Z, HC340/590DPD+ZF	
B340/590DPD+Z, B340/590DPD+ZF	
HC420/780DPD+Z, HC420/780DPD+ZF	
HC550/980DPD+Z	
HC380/590TRD+Z, HC380/590TRD+ZF	相变诱导塑性钢 Transformation induced plasticity steel
HC400/690TRD+Z, HC400/690TRD+ZF	
HC420/780TRD+Z, HC420/780TRD+ZF	
HC350/600CPD+Z, HC350/600CPD+ZF	复相钢 Complex phase steel
HC500/780CPD+Z, HC500/780CPD+ZF	
HC700/980CPD+Z, HC700/980CPD+ZF	
HD620/750CPD+Z, HD620/750CPD+ZF	
HD680/780CPD+Z, HD680/780CPD+ZF	
HD720/950CPD+Z, HD720/950CPD+ZF	

注：新版标准中原H系列牌号整体调整为HC系列牌号和HD系列牌号，其中，C代表冷轧基板，D代表热轧基板；括号中的牌号可使用到2012年年底。

Note: In the new edition of standards, the original H series of grades are totally adjusted to HC series and HD series. Among them, C refers to basal plate for cold rolling, and D refers to basal plate for hot rolling; the grades in parentheses can be used to the end of 2012.

热镀锌镀层种类及后处理方式
Categories and treatment of hot-dip galvanized coating

分类项目 Classification	类别 Category		代号 Code	
镀层种类 Coating type	纯锌镀层	Pure zinc coating	Z	
	锌铁合金镀层	Zinc-iron alloy coating	ZF	
镀层重量表示方法[a、b] Expressive methods of coating weight	等厚镀层 A (g/m^2)/B (g/m^2) (A=B)	Uniform thickness	A/B	
	差厚镀层 A (g/m^2)/B (g/m^2) (A≠B)	Different thickness coating		
表面结构 Surface structure	纯锌镀层(Z)	Pure zinc coating	小锌花	X
			零锌花	M
表面处理 Surface treatment	锌铁合金镀层(ZF)	Zinc-iron alloy coating	锌铁合金	R
	铬酸钝化	Chromic acid passivation		C
	铬酸钝化+涂油	Chromic acid passivation + oiling		CO
	无铬钝化	Chrome-free passivation		C5
	无铬钝化+涂油	Chrome-free passivation + oiling		CO5
	无铬耐指纹	Chrome-free fingerprint resistant		N5
	自润滑	Self-lubricating		SL
	涂油	Oiling		O
	不处理	Without treatment		U

a. A为钢带的外表面镀层重量或钢板的上表面镀层重量，单位为g/m^2；
B为钢带的内表面镀层重量或钢板的下表面镀层重量，单位为g/m^2。
b. 经供需双方协商，等厚镀层代号可以双面重量之和表示。例如Z250，ZF90等。

a. A is the coating weight on the outer surface of steel strip or the coating weight on the upper surface of steel plate, with the unit in g/m^2;
B is the coating weight on the inner surface of steel strip or the coating weight on the lower surface of steel plate, with the unit in g/m^2.
b. By the agreement of both sides of supply and demand, the code of the coating with uniform thickness can be expressed with the sum of the weight in both sides, such as Z250，ZF90, etc.

热镀锌镀层范围及推荐公称镀层重量
Hot-dip galvanized coating range and recommended nominal coating weight

镀层形式 Coating form	适用的表面结构 Applicable surface structure	下列镀层种类的镀层重量范围 a g/m^2 （A/B） Range of coating weight of the following coating types（A/B）	
		纯锌镀层(Z) Pure zinc coating	锌铁合金镀层(ZF) Zinc-iron alloy coating
等 厚 Uniform thickness	X、M、R	30/30~225/225	30/30~90/90
差 厚[b] Different thickness	X、M	30~150(每面) (Each side)	–

a. 50 g/m^2 镀层（纯锌和锌铁合金）重量约等于7.1μm。
b. 对于差厚镀层，差厚比最大1：3。

a. The weight of 50 g/m2 of coating (pure zinc and zinc-iron alloy) is equal to about 7.1μm.
b. For the coating with different thickness, the maximum ratio of different thickness is 1: 3.

镀层种类 Coating type	镀层形式 Coating form	推荐的镀层重量 g/m^2 Recommended coating weight	镀层代号 Coating code
Z	等厚 Uniform thickness	40/40	40/40
		50/50	50/50
		70/70	70/70
		100/100	100/100
		125/125	125/125
		140/140	140/140
		175/175	175/175
		225/225	225/225
ZF	等厚 Uniform thickness	30/30	30/30
		45/45	45/45
		50/50	50/50
		60/60	60/60
Z	差厚 Different thickness	50/100	50/100
		70/140	70/140

热镀锌镀层重量
Hot-dip galvanized coating range

镀层种类 Coating type	镀层形式 Coating form	镀层代号 Coating code	镀层重量 g/m² 不小于 Coating weight Not less than	
			单面三点平均值 Average value of three points in the single side	单面单点值 single spot per side
Z、ZF	等厚镀层 Coating with uniform thickness	A/B [a]	A/B [a]	(0.85×A)/(0.85×B)
Z	差厚镀层 Coating with different thickness			

a. A、B为钢板及钢带的公称镀层重量(g/m²)。

a. A and B are the nominal coating weight of steel plate and steel strip (g/m²).

热镀锌可供范围
Available range of hot-dip galvanized products

项目 Item		公称尺寸 mm Nominal
厚度 Thickness		0.30~3.0
宽度 Width	钢带 Steel strip	700~1830
	纵切钢带 Slitting steel strip	450~900
长度 Length	钢板 Steel plate	1000~6000
钢带（卷）内径 Inside diameter of steel strip (coil)		610/508

电镀锌产品 Electro-galvanized steel sheet

电镀锌牌号介绍
Introduction of electro-galvanized grades

电镀锌材料类别 Categories of electro-galvanized material	标准及牌号 Standards and grades	
	牌号 Grade	标准 Standard
一般用 General use	SECC BLCE+Z DC01E+Z	Q/BQB430-2009
冲压用 Used for drawing	SECD BLDE+Z DC03E+Z	
深冲用 Used for deep drawing	SECE BUSDE+Z DC04E+Z	
特深冲用 Used for special deep drawing	SECF DC05E+Z BUFDE+Z	
超深冲用 Used for extra deep drawing	BSUFDE+Z DC06E+Z	
特超深冲用 Used for special extra deep drawing	DC07E+Z	

电镀锌镀层种类及后处理方式
Categories and treatment of electro-galvanized coating

分类项目 Classification	类别 Category	代号 Code
镀层种类 Types of coating	纯锌镀层 Pure zinc coating	Z
	锌镍合金镀层 Zinc-nickel alloy coating	ZN
镀层重量表示方法 Expressive methods of coating weight	等厚镀层 Uniform thickness coating A (g/m2)/B (g/m2) (A=B) 差厚镀层 Different thickness coating A (g/m2)/B (g/m2) (A≠B) 单面镀层 Single-side coating A (g/m2)/B (g/m2) (A=0或B=0)	A/B
镀层表面处理 Coating surface treatment	无铬钝化 Chrome-free passivation	C5
	无铬钝化+涂油 Chrome-free passivation + oiling	CO5
	磷化 Phosphatization	P
	磷化+涂油 Phosphatization + oiling	PO
	磷化(含无铬封闭) Phosphatization (including chrome-free closed)	PC5
	磷化(含无铬封闭)+涂油 Phosphatization (including chrome-free closed) + oiling	PCO5
	涂油 Oiling	O
	不处理 Without treatment	U
	无铬耐指纹 Chrome-free fingerprint resistant	N5
	自润滑 Self-lubricating	SL

A为钢带的外表面镀层重量或钢板的上表面镀层重量，单位为g/m^2；
B为钢带的内表面镀层重量或钢板的下表面镀层重量，单位为g/m^2。

A is the coating weight on the outer surface of steel strip or the coating weight on the upper surface of steel plate, with the unit in g/m^2 ;
B is the coating weight on the inner surface of steel strip or the coating weight on the lower surface of steel plate, with the unit in g/m^2.

电镀锌镀层范围及推荐公称镀层重量
Electro-galvanized coating range and recommended nominal coating weight

镀层形式 Coating form	镀层种类 Coating type	
	纯锌镀层（单面）g/m^2 Pure zinc coating(single-side)	锌镍合金镀层（单面）g/m^2 Zinc-nickel alloy coating(single-side)
等厚 Uniform thickness	3~90	10~40
差厚 Different thickness	3~90，两面差值最大值为40 The maximum difference value between both sides is 40.	10~40，两面差值最大值为20 The maximum difference value between both sides is 20.
单面 Single side	10~110	10~40

注：50g/m²纯锌镀层重量约等于7.1μm，50g/m²锌镍合金镀层重量约等于6.8μm。

Note: The weight of 50g/m² of pure zinc coating is equal to about 7.1μm, and the weight of 50g/m² of zinc-nickel alloy coating is equal to about 6.8μm.

镀层形式 Coating form	镀层种类 Coating type	
	纯锌镀层（单面）g/m^2 Pure zinc coating (single-side)	锌镍合金镀层（单面）g/m^2 Zinc-nickel alloy coating (single-side)
等厚 Uniform thickness	10/10，20/20，30/30，40/40，50/50，70/70，90/90	10/10，20/20，30/30，40/40
差厚 Different thickness	10/30，20/40，30/50，40/60，50/70，60/90	10/20，15/25，25/30，30/40
单面 Single side	10/0，20/0，30/0，40/0，50/0，60/0，70/0，80/0，90/0，100/0，110/0	10，15，20，25，30，40

电镀锌可供范围
Available range of electro-galvanized products

项目 Item		公称尺寸 mm Nominal
厚度 Thickness		0.3-3.5
宽度 Width		800-1830
长度 Length	钢板 Steel plate	1000-6000
	钢带 Steel strip	卷内径 Coil inside diameter 508、610

镀铝锌产品 55% Al-Zn alloy galvanized steel sheet

镀铝锌牌号介绍
Introduction of 55% Al-Zn alloy galvanized grades

牌 号 Grade	用 途 Use
DC51D+AZ	冷成形用 For cold forming
DC52D+AZ	
DC53D+AZ	
DC54D+AZ	
S250GD+AZ	结构用 For structure
S300GD+AZ	
S350GD+AZ	
S550GD+AZ	

镀铝锌镀层范围及推荐公称镀层重量
55% Al-Zn alloy galvanized coating range and recommended nominal coating weight

镀层种类 Coating type	推荐的公称镀层重量a g/m² Recommended nominal coating weight
铝锌合金镀层 55% Al-Zn alloy galvanized coating	30/30，40/40，50/50，60/60，75/75，90/90

a 50 g/m²热镀铝锌合金镀层的厚度约为13.3μm。
The thickness of 50 g/m² of hot-dip galvanized and aluminized alloy coating is about 13.3μm.

镀铝锌镀层种类及后处理方式
Categories and treatment of 55% Al-Zn alloy galvanized coating

项目 Item	分类 Classification	代号 Code
镀层种类 Coating type	铝锌合金镀层 Aluminum-zinc alloy coating	AZ
镀层表面结构 Coating surface structure	正常锌花 Normal spangle	-
表面处理 Surface treatment	铬酸钝化 Chromic acid passivation	C
	无铬钝化 Chrome-free passivation	C5
	铬酸钝化+涂油 Chromic acid passivation + oiling	CO
	无铬钝化+涂油 Chrome-free passivation + oiling	CO5
	普通耐指纹 Common fingerprint resistant	N
	无铬耐指纹 Chrome-free fingerprint resistant	N5
	涂油 Oiling	O
	不处理 Without treatment	U

镀铝锌可供范围
Available range of 55% Al-Zn alloy galvanized products

公称厚度 mm Nominal thickness	宽度 mm Width	钢板长度 mm Length of steel plate	钢带内径 mm Inside diameter of steel strip
0.22~2.0	700~1300	1000~6000	508

主要表面处理产品介绍

Introduction of the surface treatment products

- 热镀锌表面处理钢板 *Hot-dip galvanized steel sheet*
- 电镀锌表面处理钢板 *Electro-galvanized steel sheet*
- 镀铝锌表面处理钢板 *55% Al-Zn alloy galvanized steel sheet*
- 彩涂钢板 *Features of prepainted steel*

热镀锌表面处理钢板 Hot-dip galvanized steel sheet

● 热镀锌无铬钝化板

热镀锌无铬钝化钢板是将特殊造膜性有机物和添加剂组成的无铬处理剂和锌层表面反应形成钝化态薄膜，以取代传统的铬酸盐钝化膜，延缓钢板表面产生白锈的时间，赋予产品优秀的裸露耐蚀性。

Cr-free passivation hot-dip galvanized steel sheet

Cr-free passivation hot-dip galvanized steel sheet is designed to retard corrosion by an organic composite film with an advanced barrier property and an inorganic rust-preventive additive with a self-healing property in the organic film, replacing traditional chromate conversion coating. It is widely used as a low-cost rust-preventive process for suppressing white rust of Zn.

● 热镀锌无铬耐指纹钢板

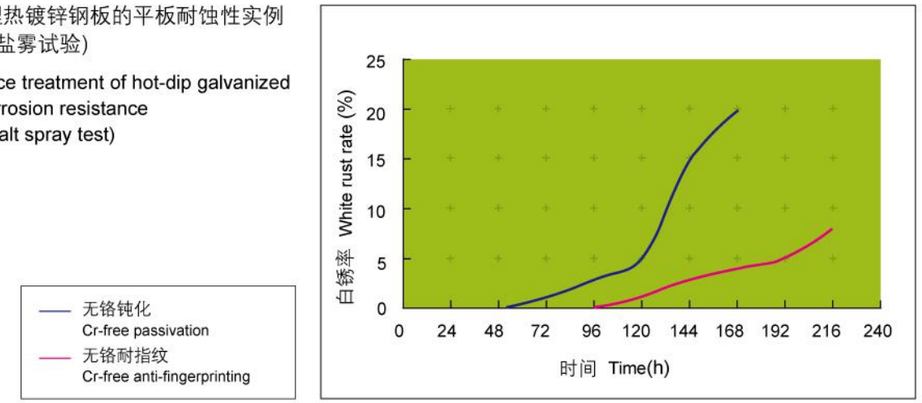
热镀锌无铬耐指纹钢板是一种表面涂覆有机薄膜(完全不含Cr)的高附加值产品，具有优良的耐蚀性、耐指纹性、导电性（接地性）和涂装性等。
上述产品适用于高档电脑机箱、OA和AV器材的壳体及底板、家用电器及同类产品的内板。

Cr-free anti-fingerprinting hot-dip galvanized steel sheet

Cr-free anti-fingerprinting hot-dip galvanized steel sheet is a high added-value product with organic resin coating film (no-chromate absolutely) on the substrate, has good multipe functions including corrosion resistance, anti-fingerprinting property, electrical conductivity (grounding property) and paintability.
Above-mention product is applied to high grade computer cabinet casing, the chassis and bottom plates of OA and AV equipment, internal plates of home appliances and similar products.

● 不同表面处理热镀锌钢板的平板耐蚀性实例 (ASTM B117盐雾试验)

Different surface treatment of hot-dip galvanized sheet plate corrosion resistance (ASTM B117 salt spray test)



● 不同表面处理热镀锌钢板成型后耐蚀性实例(ASTM B117盐雾试验)

Affter forming, different treatment of hot-dip galvanized steel plate corrosion resistance (ASTM B117 salt spray test)

	T弯（3T） T-bending	杯突（6mm） Cup-testing
无铬钝化 Cr-free passivation		
无铬耐指纹 Cr-free anti-fingerprinting		

热镀锌表面处理钢板 Hot-dip galvanized steel sheet

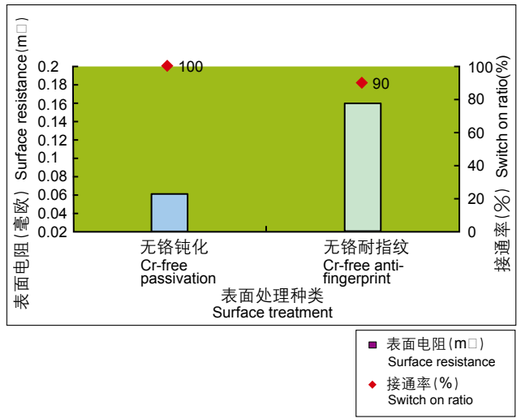
接地性
Grounding property

LORESTA-EP MCP-T360低阻抗分析仪／ Low conductivity analyze instrument

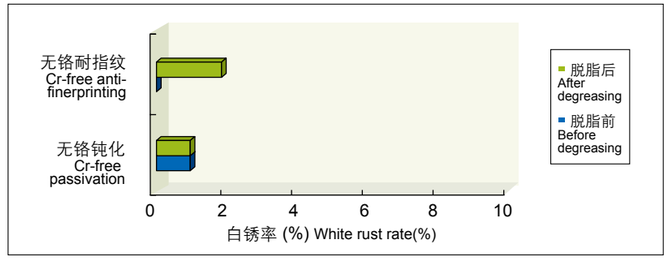
评价／ Evaluate ：

接通率/Switch on ratio(%) ＝ $\frac{\text{接通次数/switch on time}}{\text{20(次)}}$ x100%

接通/Switch on ＝表面电阻/ Surface resistance ＜1mΩ



耐碱性–碱洗后耐蚀性
Corrosion resistance after alkaline degreasing



碱性脱脂/Alkali degreasing：
PARKERIZING FC-364S脱脂剂
Spray 50°C× 2min
耐蚀性/Corrosion Resistance：SST 72h

其他性能
Properties

注：◎ 优良 ○ 一般 ×差

	耐湿热性 (49℃×98%RH) Humidity resistance	耐热性* (180℃×20min) Heat-resistance	耐指纹性 Anti-fingerprint	耐溶剂性 (乙醇、丙酮) Solvent-resistance (Ethanol,Acetone)	涂装性 Coatability
无铬钝化 Cr-free passivation	◎	◎	◎	◎	○
无铬耐指纹 Cr-free anti-fingerprint	◎	◎	◎	◎	◎

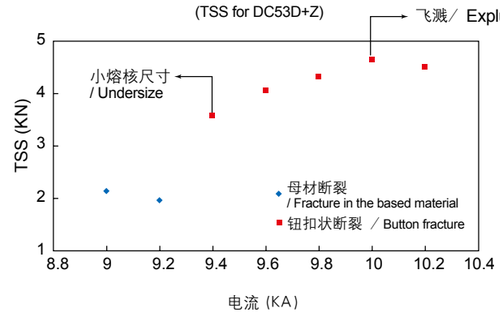
注*：鉴于热镀锌无铬钝化和无铬耐指纹处理膜的特性，此类产品在经受高温（＞250℃）的场合会变黄，故不推荐用于高温烘烤等用途的电器。
Attention*：Due to the characteristic of hot-dip galvanized Cr-free passivation and anti-fingerprinting steel sheet, the surface of this product will turn yellow in high temperature(＞250℃), so not recommended for work in a state of high temperature appliances such as ovens, microwave ovens and so on.

热镀锌无铬钝化板的点焊性实例
The weldability of hot-dip galvanized Cr-free passivation (spot welding)

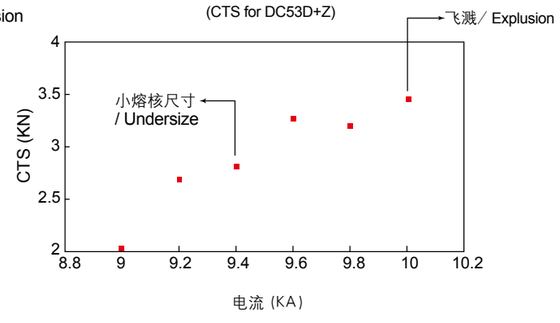
试样 Sample		点焊试验条件 Spot welding condition	
规格 Specification	DC53D＋Z 0.8mm 厚	焊接电源型号 Power	D10-10 容量/Capacity 110KVA
		点焊控制器 Controller	Medweld 200s
		三段式电流电阻点焊工艺 Multi-current	预热时间3周波 Preheating 3 cycle
锌层重量（g/m²） Coating weight	110/110		焊接时间11周波 Welding 11 cycle
			热处理时间4周波 Heat treating 4 cycle
			保载时间1周波 Holding 1 cycle
表面处理 Surface treatment	无铬钝化 Cr-free passivation	电极 Electrode	圆屋顶形 Φ6mm Dome-shaped
		电极压力 Force	1.65 KN

点焊性能：最小焊接电流–9.4 KA；最大焊接电流(飞溅门槛值)–10.0 KA；可焊电流范围–0.6 KA
Weldability: Minimum current-9.4KA; maximun current (sputter threshold)-10.0KA; welding current scope-0.6KA.

可焊电流范围区间及附近的焊点静态力学性能
Welding current scope and static mechanical properties



焊点剪切拉伸强度（TSS）
Welding spot shear strength



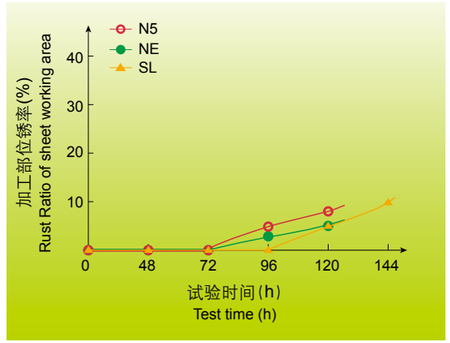
焊点十字拉伸强度（CTS）
Welding spot cross tensile strength

电镀锌表面处理钢板 Electro-galvanized steel sheet

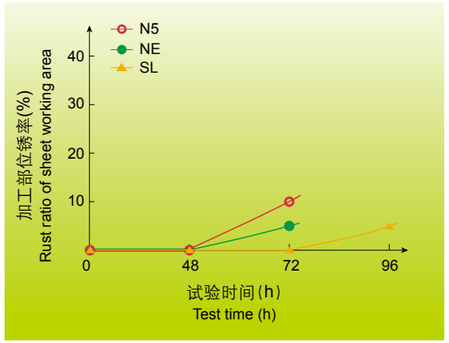
耐蚀性
Corrosion resistance

采用盐雾试验（JIS Z 2371），以表面白锈率（WR%）表征，分别评价平板和加工部位的耐腐蚀性。
Salt spray test (JIS Z 2371):
The corrosion resistance of flat surface section and formed section is evaluated by surface white rust ratio (WR%)

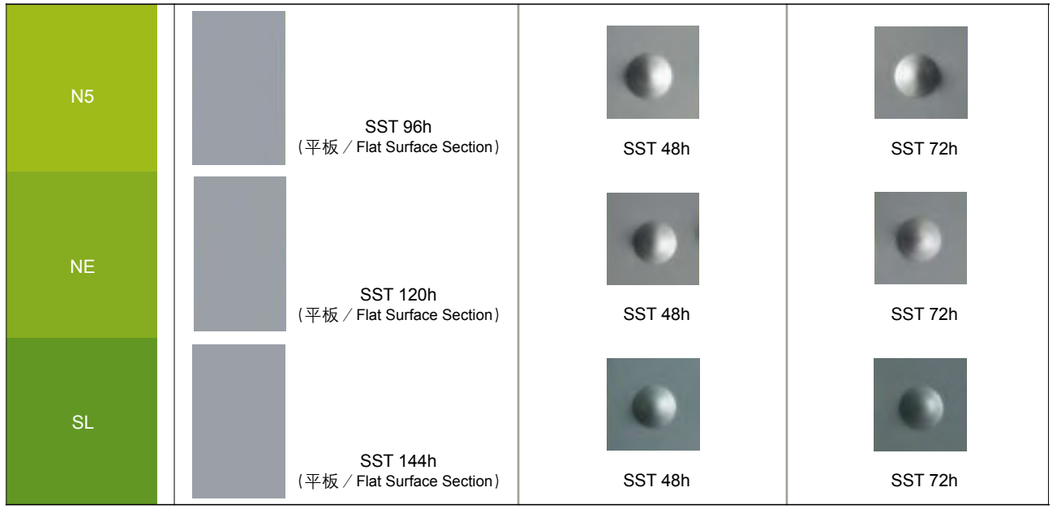
平板耐腐蚀性试验实例
Example of corrosion resistance of flat surface section



杯突7mm耐腐蚀性试验实例
Example of corrosion resistance of formed section (Erichsen 7mm extruded section)



平板及杯突7mm盐雾照片
Photograph of corrosion resistance of flat surface section and erichsen 7mm extruded section



耐指纹性
Fingerprinting resistant

表面涂层类型 Surface coating types	评价方法 Evaluation method	色差(△E*) Chromatism (△E*)
N5	擦拭前后钢板表面的色差值（凡士林擦拭法） Chromatism Values of the Steel Sheet Surface before and after wiping with Vaseline	＜2.0
NE	浸泡前后钢板表面的色差值（人工指纹液(JIS K2246)浸泡5秒钟） Chromatism Values of the Steel Sheet Surface before and after dipping-in with Artificial Fingerprinting Solution (JIS K2246) for 5 seconds.	＜1.0
SL	擦拭前后钢板表面的色差值（凡士林擦拭法） Chromatism Values of the Steel Sheet Surface before and after wiping with Vaseline	＜2.0

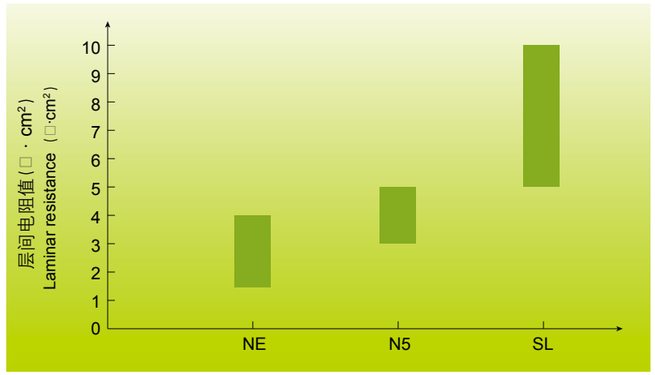
导电性

按JIS C2550进行层间电阻试验
试验电压：0.5V
电流范围：0～1A
触头表面积：1cm2×10触点
试验压力：2N/mm2±5%

Laminar resistance test (JIS C2550)

Test voltage: 0.5V
Current range: 0～1A
Contact surface area: 1cm2×10 contact points
Test pressure: 2N/mm2±5%

层间电阻
Laminar resistance



表面电阻(4探针式)
LORESTA-EP低阻抗表面接触电阻测定仪，ESP探针评价

$$导通率（\%）= \frac{导通次数*}{20次} \times 100$$

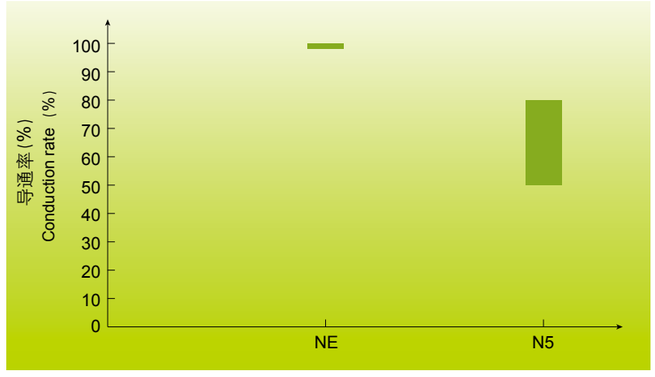
*导通：小于1mΩ

Loresta (4 prove type)
Lorsta type
Assessment

$$Conducting\ rate\ (\%) = \frac{conducting\ cycle*}{20\ cycles} \times 100$$

*Conducting: Less than 1mΩ

表面电阻
Surface resistance



电镀锌表面处理钢板 Electro-galvanized steel sheet

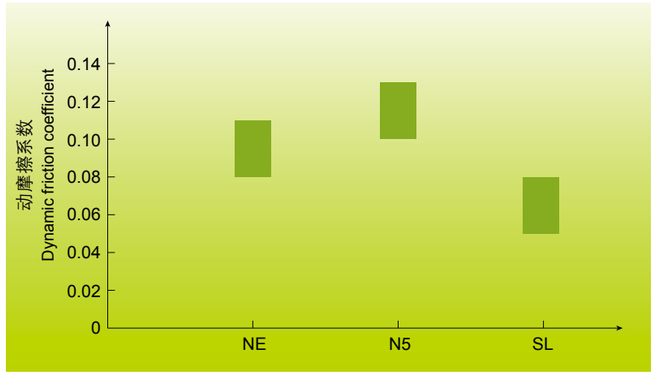
润滑性

动摩擦系数
试验状态：不涂油
触头：10mm不锈钢球滑动
滑动速度：150mm/min
负荷：100g-f

Lubricity

Dynamic friction coefficient
Test status: No oil condition
Contact part: ø10mm sus ball
Moving speed: 150mm/min
Load: 100g-f

动摩擦系数
Dynamic friction coefficient

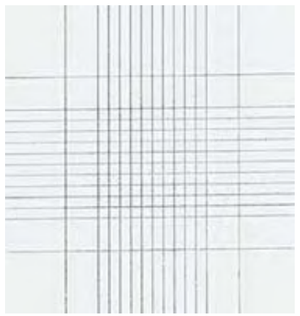


涂装性

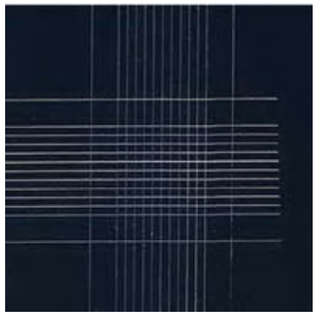
Painting adhesiveness

涂装条件

涂料种类 Paint types	膜厚 Coating film thickness	烘烤条件 Baking condition	试验结果 Test result		
			N5	NE	SL
三聚氰胺醇酸树脂涂料 (A04－9白色氨基烘漆，上海振华造漆厂制造) Melamine alkyd resin paint (A04-9 white amino baking paint, made by Shanghai Chenhua Paint MFG Company)	20微米 20 micrometer	140℃×40min	无剥离 No peeling	无剥离 No peeling	无剥离 No peeling
丝网印刷油墨(精工#1300EX油墨) Screen printing ink (Seiko #1300EX ink)	10微米 10 micrometer	120℃×20min	无剥离 No peeling	无剥离 No peeling	无剥离 No peeling



三聚氰胺醇酸树脂（划格试验）
Melamine alkyd resin (Cross cut test)

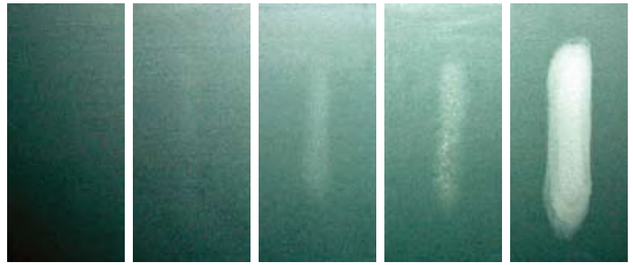


油墨（划格试验）
Ink (Cross cut test)

耐溶剂性

Solvent resistance

涂层类型 Coating type	试验条件 Test conditions	试验结果 Test result
N5	M.E.K(丁酮)或者80%酒精擦拭20次 Wiping by M.E.K (butanone) or 80% alcohol for 20 times	≥3级 ≥level 3
SL		
NE	常用有机溶剂浸泡168h Soaking of common organic solvent for 168h	5级 level 5



5级 level 5　4级 level 4　3级 level 3　2级 level 2　1级 level 1

等级说明：
5级：表面无任何损伤；
4级：正面观察表面无损伤，侧光下皮膜轻微损伤；
3级：正面可见皮膜轻度损伤；
2级：皮膜损伤严重，但未暴露基板；
1级：皮膜完全脱落。

Level description
Level 5: no surface damage;
Level 4: no visible damage under front side observation, but minor film damage could be found from side light;
Level 3: visible light damage of the film on the front side;
Level 2: serious damage of the film but without exposing the base plate;
Level 1: Complete peeling of the film;

镀铝锌表面处理钢板　55% Al-Zn alloy galvanized steel sheet

热镀铝锌生产线生产铝锌合金(55%Al—43.4%Zn—1.6%Si)钢板具备出色的耐大气腐蚀性能和外观,除应用于高档建筑外板以外,钝化或耐指纹膜处理的镀铝锌钢板在家电行业的使用量正在逐步上升。

热镀铝锌无铬耐指纹钢板或无铬钝化钢板,适合用作冰箱、空调后背板或内部其他结构件等,该产品锌花均匀美观,耐蚀性优良,使用时与发泡性粘结剂的附着力良好。

专用于各种显示器防爆带钢的热镀铝锌无铬钝化钢板除了具有良好耐蚀性以外,焊接(凸/点焊)性能、耐高热等使用特性优良,与当前热套式防爆带钢生产工艺相适应。

55% Al-Zn alloy coated steel sheet has excellent weather-proof property and appearance. In addition to the plate for top grade building outside, the volume of 55% Al-Zn alloy coated sheet with Cr-free passivation and anti-fingerprinting treatment used in home appliaance is getting bigger and bigger.

Cr-free passivation and anti-fingerprinting 55% Al-Zn alloy coated sheet are applicable to rear back panel for refrigerator and air conditioner or ther internal structural parts. This kind of product has even beautiful spangle, with excellent corrosion resistance property and good adhesion with foaming adhesive.

Specially used in explosion-proof band for CRT, the Cr-free passivation 55% Al-Zn alloy coated sheet has excellent corrosion resistance property, weldability, heat resistance property. It is suitable for current process of CRT.

● 热镀铝锌无铬耐指纹板性能

The properties of Cr-free anti-fingerprinting 55% Al-Zn alloy coated sheet

耐盐雾性能（ASTM B117） Salty-spray resistance property	耐黑变性 （湿热促进试验法 70℃ ×90%RH × 120h后测定色差ΔE Blacken-resistance After humidity test (70℃×90%RH)120h, measure the color difference(ΔE)
SST 120h （黑锈／Black rust<10%）	ΔE < 2.0 肉眼观察无明显变色 No significant change visually

耐指纹性 Anti-fingerprinting	发泡性 Adhesion	耐高温性 （220℃ × 1h） Heat-resistance	耐溶剂性 Solvent-resistance		抗擦伤性 Anti-scratching
			乙醇 Ethanol	MEK	
◎	◎	◎	○	○	○

注：◎ 优秀 Excellent　○ 一般 Common　× 差 Bad

● 热镀铝锌无铬钝化板性能

The properties of Cr-free passivation 55% Al-Zn alloy coated sheet

耐蚀性（SST） ASTM B117试验标准 Corrosion-resistance	耐湿热性／Humidity-resistance （49℃、RH>95%） ASTM D-1748试验标准	耐热性／Heat resistance （200℃ × 5min） （肉眼观察／Visually）	发泡性 Adhesion	涂装性 Coatability
⩾ 72h （黑锈／Black rust < 10%）	240h （黑锈／Black rust < 10%）	外观不变色 No significant change	良好 Good	良好 Good

彩涂钢板　Features of prepainted steel

彩涂板的腐蚀过程

涂层钢板表面的有机涂层起覆盖隔离作用可防止涂膜下的基板较快的腐蚀。涂层钢板所选用镀层板也具有相应的耐蚀性。
因此涂层钢板的耐腐蚀性，主要包括基板腐蚀和涂膜劣化两个方面。
在一般环境中，劣化过程首先表现为光泽降低，然后从表面引起粉化、脱落。由于树脂的分解，使涂层表面成为粉末而脱落。

劣化过程：

失光→褪色→粉化→表面开裂→涂层起泡脱落→白/红锈
劣化现象：如下表所示

Process of corrosion of the prepainted steel sheet

The organic coating on surface of the prepainted steel sheet can prevent the base metal coated with the coating from being quickly corroded. And the coated base metal selected for the prepainted steel sheet also possess corresponding resistance to corrosion.
So, the resistance to corrosion of the prepainted steel sheet mainly includes two parts, namely the resistance of the base metal and the resistance to deterioration of the coating film.
Under normal circumstances, the process of deterioration often starts from a loss of gloss, and then the chalking and shedding of the membrane. Owing to the decomposition of the resin content, the surface of the coating membrane starts chalking and then shedding.

Process of Deterioration

Lost of gloss→fading → chalking→ surface rupture→ foaming and shedding of the coating membrane→ white/red rust
Apperance of Deterioration: shown in the following table:



试验方法

1、耐酸碱试验

原理
将试样在一定浓度的酸碱溶液中浸渍一定的时间，取出后评定色差、光泽的变化及是否有涂层起泡、脱落等现象。

结果
按照GB/T 1766对试样进行失光等级、变色等级、起泡等级、脱落等级等评定，平行试样测定结果取最差值为试验结果。

Method of test

1. Acid/alkaline-resistance test

Principle
Soak the sample in the acid/alkaline solution with a specified concentration for a certain period, and then take it out of the solution to assess the change of color and gloss, and whether it foams, sheds, etc.

Result
According to the standard GB/T 1766, assess the grade of the sample in loss of gloss, color change, foaming and shedding, etc.
In normal conditions, the iron is apt to rust, however, once the iron is galvanized, it will have a quite good resistance to corrosion and won't rust. For details, please refer to the test below.

2、中性盐雾试验

原理
试样暴露在中性氯化钠盐雾气氛中至规定的时间后，评定其表面起泡、锈蚀等级和腐蚀蔓延距离等。

结果
1、对于平板试样，按照GB/T 1766评定起泡等级、生锈等级等，取平行试样的最差值为试验结果。
2、对于划叉和切口试样，在划线上选择一个代表性的区域，在至少6个等距离的位置上，测量划线处至起泡和锈蚀的最大腐蚀蔓延距离，取其算术平均值，即为平均腐蚀蔓延距离，并记录划线最大和最小腐蚀蔓延距离。

2. Salt fog test

Principle
After expose the sample in the neutral Nacl mist for a specified time, assess the surface foaming and rusting, the outreach of surface corrosion, etc.

Result
1.For the flat-sheet sample, assess the grade of foaming and rusting by the GB/T 1766 standard, and take the worst result as the final.
2.For the scratched or notched sample, choose a typical area within the lineation scope, measure the intervals between the maximum outreach of corrosion of the foamed and rusted part and the lineation at six equidistant points at least, and then take the arithmetic mean value, namely the outreach of corrosion on average, and record the maximum and minimum distances at the same time.<0}(Histogram of the test of resistance to neutral salt mist).

性能指标 Performance index	膜厚 Thickness of film		光泽度 Glossiness		铅笔硬度 Pencil hardness		冲击功 Absorbed-in-fracture energy		T弯 T bend		色差ΔE Color difference
	正面 Front side	反面 Back side	正面 Front side	反面 Back side	正面 Front side	反面 Back side	正面 Front side	反面 Back side	正面 Front side	反面 Back side	
实物水平 Actual level	24μm	15μm	25	32	⩾F	⩾H	9J	9J	⩽2T	⩽2T	0.61

家电用钢的涂装技术

Painting technology of steel for appliances

- 特点简介 *Introduction of the feature*
- 涂油板涂装的工艺流程 *Painting process of oiled plate*
- 各工艺段的作用和原理 *The role and principle of each process section*
- 典型家电用钢涂装性实例 *Typical painting examples of steel for appliances*

特点简介 Introduction of the feature

提高家电产品中钢铁件的使用寿命

所有的钢铁件在空气中均会通过与腐蚀介质(空气中的O_2、H_2O、CI等)的接触渗透而发生锈蚀、腐烂,直至失去原有的机械强度。为延缓锈蚀的发生,最常用的手段是在钢铁件表面涂上一层有机涂层,使钢铁件与腐蚀介质隔绝,起到物理保护的作用。

Prolonging the service life of the steel pieces used in the appliance products

All the iron and steel pieces will never escape the possibility of corrosion, decaying, even loss of original mechanical strength on the account of contact with and penetration of corrosive media in the air (O_2, H_2O, Cl etc. contained in the air). To inhibit the corrosion from occurring as long as possible, the approach that is frequently resorted to is applying organic coating on the surface to serve as a physical protection, by isolating it from the corrosive media.

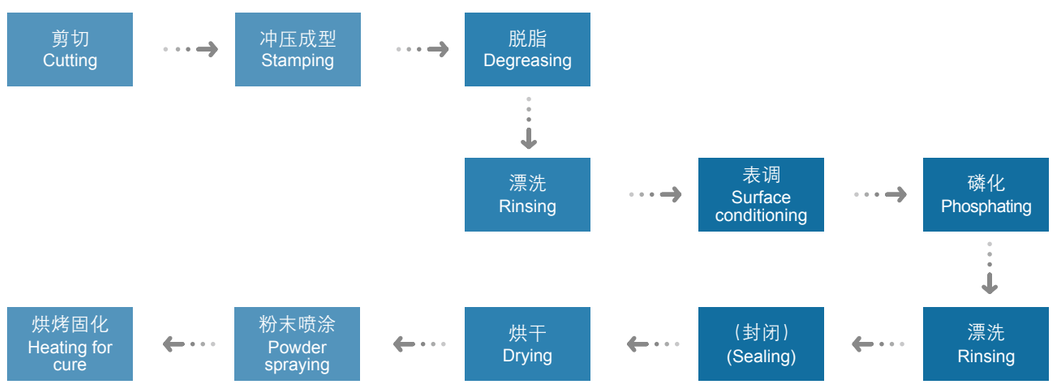
装饰性

通过有机涂层的涂装,可彻底改变钢板冷冰冰的单调外观。有机涂层能赋予钢板以各种颜色、质感,满足美学的要求。

Decoration function

Coating treatment with organic coating is such that the cold-as-steel and monotonous appearance of the steel sheet can be re-made thoroughly. The organic coating beautifies the steel sheet with different color and amplifies its sense of quality, meeting the aesthetical requirement.

涂油板涂装工艺流程 Painting process of oiled plate



工艺段名称 Process	作 用 Function	基本原理 Principle	工作方式 Mode
脱 脂 Degreasing	产生洁净的金属表面 Make suface clean	碱性水剂脱脂 Water-borne detergent	喷 淋、浸渍 Spray, dip
表 调 Surface conditioning	金属表面改性，使之易于附着磷化膜 Modify the surface of substrate	化学法表面调整，形成磷化晶核 To form nuclei of phosphate crystal	喷 淋、浸渍 Spray, dip
磷 化 Phosphating	形成利于有机涂层附着和抗膜下腐蚀的化学转化膜 Form conversion coating with corrosion resistance and coating adhesion function	伪转化型单元或多元锌系磷化 Zinc or tri-cation phosphate crystal	喷 淋、浸渍 Spray, dip
喷 涂 Spray coating	形成装饰和高耐蚀表面 decorative and good corrosion-resistance surfance	有机粉末涂料 Organic powder coating	静电喷涂 Electrostatic painting
固 化 Curing	有机涂料固化成膜 Make the coating cross-linking	热交联固化 Cross linking	加热固化 Heat

各工艺段的作用和原理 The role and principle of each process section

常用的脱脂工艺有两种：碱性水基脱脂和有机溶剂脱脂

碱性水剂脱脂

将碱性化学脱脂剂以喷、刷、浸、电解等方式与钢板表面的防锈油膜接触并发生物理及化学反应，将防锈油及钢板生产过程中吸附的残碳、铁粉等异物除去。
常用的碱性脱脂剂由NaOH、Na_2CO_3、Na_3PO_4等碱金属盐及复配的表面活性剂按比例溶解于水而成；当被处理材是镀锌板或耐指纹板时，考虑到镀锌层和有机膜的耐碱性，应适度降低脱脂剂的碱度。
工作时通过对油膜的渗透、侵润、乳化和分散作用，使油被乳化成牛奶状的混合物—乳化液，并包裹着碳粉、铁粉等杂质，离开钢板进入脱脂液中，达到除油清洁的目的。

有机溶剂脱脂

将带油的金属工件置于三氯乙烷、三氯乙烯等的蒸汽中将油膜从金属表面除去。
通过有机溶剂对防锈油的溶解和稀释，将粘度大的油降低到十分低的粘度，使油与金属表面松弛，再通过包围它的溶剂而冲掉。
为强化溶解效果，常辅以超声波清洗。
当电镀锌／热镀锌耐指纹钢板表面轻微沾污时，可用蘸有乙醇或丙醇的干净软布擦拭，达到去污清洁的效果。

There are two types of degreasing process in popular use-water-borne alkaline degreasing and organic solvent degreasing

Water-borne detergent degreasing

The detergent will react with the rust preventive oil on the steel sheet surface, physically and chemically, by way of spraying, brushing, dipping or in electrolytic manner etc. to remove the preventive oil and such impurities as residual carbon, iron powder and so on absorbed in the process of production.
The common detergent is made of NaOH, Na_2CO_3, Na_3PO_4 and other alkali metal salts in a proportion to the compound surface active agent, then solved in water. Where the galvanized sheet or anti-fingerprint sheet is treated, consideration shall be taken into the alkali resistance of the galvanizing coating and of the organic film, and the alkalinity of detergent ought to be properly reduced.
The detergent reacts with oil film by means of penetration, soaking, emulsion and separation, to emulsify the oil into milk-like compound - emulsion, which carries with it the impurities such as powdery carbon, iron etc. departing off the sheet and is discharged into degreasing solution. Thus doing the end is served of oil removal and cleaning.

Organic solvent degreasing

It is to place the oil-contained metal pieces in the vapor composed of trichloro-ethane and trichlorethylene etc. to take the oil film off the metal surface.
As a result of dissolution and dilution to rust preventive oil by organic solvent, the oil viscosity ever high will be reduced to a very low degree whereby oil slackens off the metal surface, then is washed away with the solution carrying it.
Ultrasonic cleaning is frequently adopted to enhance the dissolution effect.
When the electro-galvanized / hot-dip galvanized anti-fingerprinting steel surface slightly soiled, it can take a dip ethanol or acetone soft cloth to wipe the plate, so as to achieve decontamination cleansing effect.

常用磷化工艺及基本原理

Regular phosphating process and its basic principle

磷化处理是将被处理金属置于磷化液中，通过磷化液中磷酸二氢盐与金属的反应在表面生成一层致密的化学转化膜，作为喷涂有机涂层的化学前处理。处理方式通常为喷淋或浸渍。
家电磷化以伪转化型磷化为主，极少量采用转化型磷化(仅适用于冷轧板)。前者附着力与耐蚀性好，后者的加工性更好，处理时间更短，适合于快速流水线。
磷化能把金属表面的活性转化到最小的程度，把以后的腐蚀反应降到最低限度。
磷化膜能给金属提供一个“粗糙面”，给油漆或其他有机膜提供一个很好的咬合，增强其附着力。
磷化膜的等电位和绝缘性抑制了有机涂层的膜下腐蚀蔓延。
镀锌钢板涂装后由于锌层的牺牲阳极保护作用而有良好的防穿孔腐蚀性能，冷轧板由于磷化膜中含Fe，能形成抗碱性优异的$Me_2Fe(PO_4)_2 \cdot 4H_2O$晶体，从而在防止膜下腐蚀蔓延方面有优势。

Phosphating treatment is to place the metal to be treated into the phosphating solution where a layer of compact chemical conversion film is formed on the surface of metal reacting with dihydrogen phosphate in the phosphating solution, which serves as pre-chemical treatment of organic coating. The treatment is usually spraying or dipping. Phosphating of steel for appliance is adopting much more frequently the pseudo-conversion phosphating than the conversion phosphating (the latter applicable only to the cold rolled sheet). The former is featured as one with good adhesion and corrosion-resistance while the latter is of better workability and shorter handling time, suitable for fast streamline production.
Phosphating can inhibit the activity of metal surface to a minimum possible degree and minimize the subsequent corrosion action to a lowest possible level.
Phosphating film creates a “rough face” to the metal, providing a good bonding interface for paint or other organic coating and resultantly reinforcing the adhesion.
Equipotential and insulation with respect to phosphating film deter the corrosive creepage under the film of organic coating.
After coating the galvanized steel sheet has excellent resistance-to-punching corrosion by the reason of sacrificial protective action. The cold rolled sheet, due to the fact that Fe is contained in the phosphating film of it therefore capable of forming Me2Fe (PO4)2·4H2O crystal excellent in alkali-resistance, is outperforming in preventing the corrosive propagation under film.

常用喷涂工艺及基本原理

Regular coating technology and its basic principle

家电制造业中最常用的喷涂工艺是静电粉末涂装法。静电粉末涂装法是运用高压电场感应效应，使粉末涂料和被涂物件受感应而分别带上彼此相反的电荷，把粉末涂料吸附到被涂物件上去，然后把被涂物件放在烘烤炉烘烤流平成膜。热塑性粉末涂料只需要熔融流平即可，而热固性粉末涂料流平后还要交联固化成膜。

The most popular coating technology in the household appliance manufacturing industry is electrostatic powder coating process. It is to apply induction, by means of induction effect of high-voltage electric field, on powder coating and the target part, so loaded with the opposite electric charge that the powder coating is absorbed onto the target part. The target parts will then be put in the baking oven for baking to flow flat into film. The powder coating is classified into two: thermoplastic type and thermosetting type. The former is made simply by its fusion to flow flat; the latter, after flow flat, still need cross-linking hardening to form film.

静电粉末喷涂有如下优点：

被涂物表面处理后可直接进行喷涂；
适用于50—150μm厚度的涂膜，涂膜厚度均匀，不容易流挂；
对被涂物的适应性强，可以喷不同大小和形状的被涂物，包括管道的内外壁；
对各种粉末涂料的适应性强，喷溢的粉末涂料可以回收利用，涂料的利用率高。

Electrostatic powder coating process has the following merits:

It can be applied directly onto the target parts after its surface treatment;
It is applicable where the coating thickness is between 50-50μm, and is of uniform thickness, no flowing mark.
It is widely applicable to the different target parts, can be used on target part in different size and different shape, including inner and outer wall of the pipe.
It is flexibly adaptable to various kinds of powder coating; the spilt powder coating can be reclaimed for use. Its utilization efficiency therefore is high.

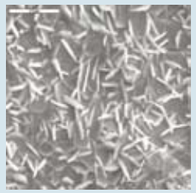
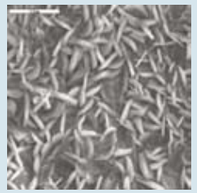
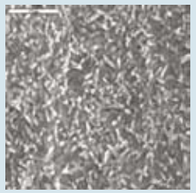
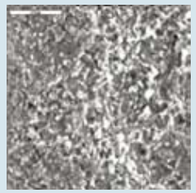
典型家电用钢涂装性实例 Typical painting examples of steel for household appliances

可磷化性

在一般伪转化型的多元锌系磷化体系和正常工艺条件下，冷轧板、镀锌板和热镀锌铁合金板都具有优良的可磷化性，磷化膜结晶细密，膜重一般可达2−4g/m^2。

Phosphatibility

In a trication Zinc based phosphating system for general pseudo-conversion phosphating and under normal process conditions, the cold rolled sheet, galvanized sheet and galvannealed sheet are exclusively of excellent phosphatibility, the phosphating film is compactly crystallined and weighed as to be ranging in 2-4g/m^2.

冰箱侧板用 冷轧板 Cold rolled sheet for side cover of refrigerator	洗衣机外围用 电镀锌板 Electro-galvanized sheet for casing of the washing machine	空调室外机用 热镀锌板 Hot-dip galvanized sheet for outdoor mounted set for air conditioner	空调室外机用 热镀锌铁合金板 Galvannealed sheet for outdoor mounted set for air conditioner
			

各种钢板在家电涂装线上处理的磷化膜微观形貌(SEM照片)

The morphology of phosphating film treated on the electrical appliance coating line of various steel sheets (SEM)

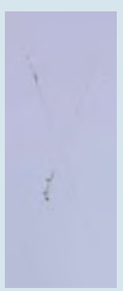
涂油无处理的涂层附着力

Adhesion

试验项目 Test item		冰箱侧板用 冷轧板 Cold rolled sheet for side cover of refrigerator	洗衣机外围用 电镀锌板 Electro-galvanized sheet for casing of the washing machine	空调室外机用 热镀锌板 Hot-dip galvanized sheet for outdoor mounted set for air conditioner	空调室外机用 热镀锌铁合金板 Galvannealed sheet for outdoor mounted set for air conditioner
一次附着力 Adhesion	划格 Cross hatch tape test	★	★	★	★
	冲击 Impact test	★	★	★	★
二次附着力 * Wet adhesion	划格 Cross hatch tape test	★	★	★	★
	冲击 Impact test	★	★	★	★
试验方法 Test method	划格 Cross hatch tape test	1mm间隔地划100格，Scotch 600#胶带剥离试验 Make the cross hatch cut with the sharp cutting tool. The number of lines in each direction are II and the spacing between lines is 1mm, scotch 600# tape peel off.			
	冲击 Impact test	50kgcm球冲击，观察涂层开裂状况 After rapidly deforming by 50kgcm impact. Examine the impacted area for cracking			
评判标准 Jadgement		★ 良好 No tape off　　X 大量脱落 tape off heavily			
二次附着力 * Wet adhesion		试样置于沸水中煮沸2小时后按一次附着力方法进行性能检测 Panel is dipped into boiling water for 2 hours, then tested its adhesion with the way metioned above			

试验数据待确认

And the test data should be confirmed

耐蚀性试验 Corrosion-resistance test	冰箱侧板用 冷轧板 Cold rolled sheet used for side cover of the refrigerator	洗衣机外围用 电镀锌板 Electro-galvanized sheet for casing of the washing machine	空调室外机用 热镀锌板 Hot-dip galvanized sheet for outdoor-mounted set for air conditioner	空调室外机用 热镀锌铁合金板 Galvannealed sheet for outdoor mounted set for air conditioner
SST 500h (cross-cut)				

500小时盐雾试验后的抗膜下腐蚀性能（ASTM B117）

The cosmetic corrosion-resistance of various steel sheets (ASTM B117, SST 500h)

产品环境声明

Environmental
product declaration

● 产品环境声明 *Environmental Product Declaration*

产品环境声明 Environmental product declaration

表 1 1kg 冷轧产品生命周期影响评价结果

环境负荷指标	单位	数量
资源消耗（ADP）	kgSbeq./kg	0.0044
能源消耗(EDP)	MJ/kg	12.2780
全球变暖潜力（GWP 100）	kg CO_2 eq./kg	1.0656
酸化潜力(AP)	kg SO_2 eq./kg	0.0047
富营养化潜力(EP)	kg PO_4^{3-} eq./kg	0.0005

指标说明：
1）资源消耗（ADP）：制造1kg 冷轧产品消耗的锑当量
2）能源消耗(EDP)：制造1kg 冷轧产品消耗的能源
3）全球变暖潜力（GWP 100）：制造1kg冷轧产品排放的二氧化碳当量
4）酸化潜力(AP)：制造1kg 冷轧产品排放的二氧化硫当量
5）富营养化潜力(EP)：制造1kg冷轧产品排放的磷酸根当量

注：本产品生命周期影响评价结果由国际钢协和宝钢合作完成，环境绩效数据代表宝钢生产实绩。

图 1 显示了冷轧产品生命周期各阶段的相应贡献，根据环境影响类别将冷轧产品生命周期过程划分为钢铁制程、运输、上游三个阶段。

- “钢铁制程”主要指在钢铁企业内部的生产过程；
- “运输”主要指铁矿石、煤炭、石灰石等大宗原材料、能源、辅助材料从产地运输到钢铁企业的过程；
- “上游”主要指钢铁企业生产用外购原材料、能源、辅助材料等在钢铁企业外部的开采、生产过程，并包含钢铁副产品在企业外部产生的环境收益，如高炉渣用作水泥原材料等。

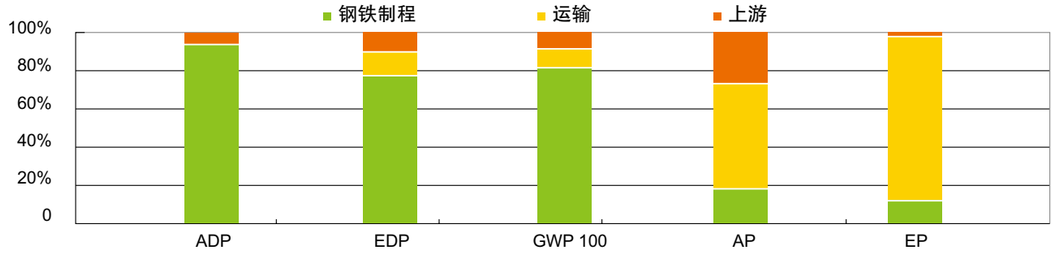


图 1 1kg 冷轧产品生命周期各阶段对环境影响的相应贡献

纵观冷轧产品生命周期各阶段，94% 的资源消耗、77% 的能源消耗在钢铁制程产生。主要是钢铁制程中对铁矿石资源、煤炭的消耗。

81% 的温室气体在钢铁生产阶段产生，10% 在运输阶段产生，8% 则来自上游的原辅料及能源。钢铁生产中煤炭作为主要能源和还原剂是温室气体产生的最重要来源。

对 AP 和 EP 的影响主要产生在运输阶段，铁矿石、煤炭等原材料、能源来自澳洲、南美洲，运输量大，运输距离遥远，采用海轮运输，主要燃料为柴油，因此运输过程中产生的硫氧化物、氮氧化物导致对 AP、EP 的影响较大。而钢铁制程内部则专设有硫氧化物、氮氧化物的脱除装置，最大限度的减小其环境影响。

6.1 循环

所有的钢铁产品都是有价值的可回收材料，可以 100% 进行回收利用，宝钢通过回收利用的废钢作为炼钢的原材料；所有的包装物均可回收利用，钢捆带、钢护角、盖板、内外周包板均可回收作为炼钢的原料，木托架、防锈纸等均可循环利用。宝钢提供的钢铁产品环境影响已经包含了钢材在使用完成后进行回收带来的环境利益。

6.2 最终处置

钢铁产品可以 100% 回收，不需要进行任何废弃物处置（如焚烧、填埋等），钢铁产品加工过程产生的废边和切屑也可以 100% 回收利用。

Table1 Life cycle assessment result of 1kg cold rolled steel

Environmental load index	Unit	Quantity
Abiotic Depletion Potential (ADP)	kgSbeq./kg	0.0044
Energy Depletion potential (EDP)	MJ/kg	12.2780
Global Warming Potential(GWP 100)	kg CO_2 eq./kg	1.0656
Acidification Potential (AP)	kg SO_2 eq./kg	0.0047
Eutrophication potential(EP)	kg PO_4^{3-} eq./kg	0.0005

Note on indexes:
1)Abiotic Depletion (ADP): stibium equivalent depleted for manufacture of 1kg cold-rolled product
2)Energy Depletion (EDP): energy depleted for manufacture of 1kg cold-rolled product
3)Global Warming Potential (GWP 100): carbon dioxide equivalent emitted for manufacture of 1kg cold-rolled product
4)Acidification potential (AP): sulfur dioxide equivalent emitted for manufacture of 1kg cold-rolled product
5)Eutrophication potential (EP): phosphate radical equivalent emitted for manufacture of 1kg cold-rolled product

Note: This product life cycle assessment result is completed by World Steel Association and Baosteel through operation, environmental performance data represents practical production performance of Baosteel.

Drawing 1 shows contributions relevant to all phases of cold-rolled product life cycle, cold-rolled product life cycle process is divided into three phases of steel manufacture process, transportation, upstream according to environmental influence kind.

- Steel manufacture process" mainly refers to production process in steel enterprise;
- Transportation" mainly refers to the transportation process from producing area to steel enterprise of bulk original materials, energies, auxiliary materials such as iron ore, coal, limestone;
- Upstream" mainly refers to mining, production process of raw materials, energy, auxiliary materials procured externally for steel enterprise production outside steel enterprise , including environmental gains generated by auxiliary steel product outside the enterprise, such as cement raw materials used for blast furnace slag.

Drawing 1 Contributions to environmental influence relevant to all phases of 1kg cold-rolled product life cycle

In all phases of cold-rolled product life cycle, 94% of ADP, 77% of EDP occur in steel manufacture process. They are mainly depletion of iron ore resource, coal in steel manufacture process.

81% of GHG is generated in steel production process, in which 10% generated in transportation phase, 8% coming from raw material and energy of upstream. In steel production, the coal as main energy source and reducing agent is the most important source of GHG generated.

Influence to AP and EP is mainly generated in transportation phase, for raw materials, energy sources of iron ore, coal etc. coming from Australia, South America, due to large transport amount, far transport distance, seagoing vessel is adopted for transportation with main fuel of diesel oil, therefore sulfur dioxide, nitrogen dioxide generated during transportation cause more serious influence to AP, EP. Removal device of sulfur dioxide, nitrogen dioxide is set in iron and steel manufacture process to reduce environmental influence at maximum.

6.1 Cycle

All iron and steel products are valuable recyclable materials 100% of which can be reclaimed and utilized, Baosteel uses recycled steel scrap as raw material of steelmaking; all wrappage can be recycled and utilized, such as steel binding band, steel angle armor, covering plate, wrapper sheet of internal and external wrapper sheet, wooden bracket, antirust paper etc. can be recycled and utilized. Environmental influence of iron and steel products supplied by Baosteel has contained environmental benefit brought by reclamation of steel material after use.

6.2 Final disposal

100% of iron and steel product can be recycled without any waste treatment (such as burning, burying etc.), 100% of slitter edge and cuttings generated during iron and steel product processing can be recycled and utilized.

产品环境声明 Environmental product declaration

表 1 1kg 热镀锌产品生命周期影响评价结果

环境负荷指标	单位	数量
资源消耗（ADP）	kgSbeq./kg	0.0066
能源消耗(EDP)	MJ/kg	16.6220
全球变暖潜力（GWP 100）	kg CO_2 eq./kg	1.4473
酸化潜力(AP)	kg SO_2 eq./kg	0.0089
富营养化潜力(EP)	kg PO_4^{3-} eq./kg	0.0007

指标说明：
1）资源消耗（ADP）：制造1kg 热镀锌产品消耗的锑当量
2）能源消耗(EDP)：制造1kg 热镀锌产品消耗的能源
3）全球变暖潜力（GWP 100）：制造1kg热镀锌产品排放的二氧化碳当量
4）酸化潜力(AP)：制造1kg 热镀锌产品排放的二氧化硫当量
5）富营养化潜力(EP)：制造1kg热镀锌产品排放的磷酸根当量

注：本产品生命周期影响评价结果由国际钢协和宝钢合作完成，环境绩效数据代表宝钢生产实绩。

图 1 显示了热镀锌产品生命周期各阶段的相应贡献，根据环境影响类别将热镀锌产品生命周期过程划分为钢铁制程、运输、上游三个阶段。

- “钢铁制程”主要指在钢铁企业内部的生产过程；
- “运输”主要指铁矿石、煤炭、石灰石等大宗原材料、能源、辅助材料从产地运输到钢铁企业的过程；
- “上游”主要指钢铁企业生产用外购原材料、能源、辅助材料等在钢铁企业外部的开采、生产过程，并包含钢铁副产品在企业外部产生的环境收益，如高炉渣用作水泥原材料等。

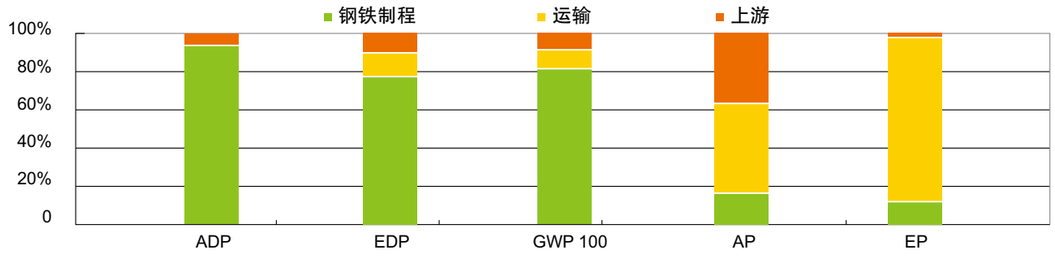


图 1 1kg 热镀锌产品生命周期各阶段对环境影响的相应贡献

纵观热镀锌产品生命周期各阶段，91% 的资源消耗、73% 的能源消耗在钢铁制程产生。主要是钢铁制程中对铁矿石资源、煤炭的消耗。

78% 的温室气体在钢铁生产阶段产生，10% 在运输阶段产生，12% 则来自上游的原辅料及能源。钢铁生产中煤炭作为主要能源和还原剂是温室气体产生的最重要来源。

对 AP 和 EP 的影响主要产生在运输阶段，铁矿石、煤炭等原材料、能源来自澳洲、南美洲，运输量大，运输距离遥远，采用海轮运输，主要燃料为柴油，因此运输过程中产生的硫氧化物、氮氧化物导致对 AP、EP 的影响较大。而钢铁制程内部则专设有硫氧化物、氮氧化物的脱除装置，最大限度的减小其环境影响。

6.1 循环

所有的钢铁产品都是有价值的可回收材料，可以 100% 进行回收利用，宝钢通过回收利用的废钢作为炼钢的原材料；所有的包装物均可回收利用，钢捆带、钢护角、盖板、内外周包板均可回收作为炼钢的原料，木托架、防锈纸等均可循环利用。宝钢提供的钢铁产品环境影响已经包含了钢材在使用完成后进行回收带来的环境利益。

6.2 最终处置

钢铁产品可以 100% 回收，不需要进行任何废弃物处置（如焚烧、填埋等），钢铁产品加工过程产生的废边和切屑也可以 100% 回收利用。

Table1 Life cycle assessment result of 1kg hot-galvanized steel

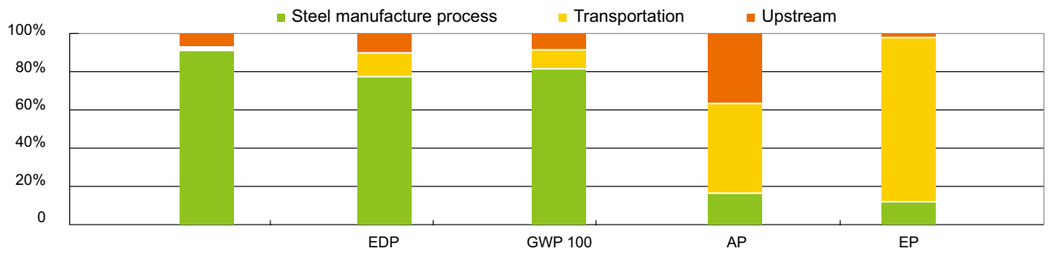
Environmental load index	Unit	Quantity
Abiotic Depletion Potential (ADP)	kgSbeq./kg	0.0066
Energy Depletion potential (EDP)	MJ/kg	16.6220
Global Warming Potential(GWP 100)	kg CO_2 eq./kg	1.4473
Acidification Potential (AP)	kg SO_2 eq./kg	0.0089
Eutrophication potential(EP)	kg PO_4^{3-} eq./kg	0.0007

Note on indexes:
1)Abiotic Depletion (ADP): stibium equivalent depleted for manufacture of 1kg hot-dip galvanized product
2)Energy Depletion (EDP): energy depleted for manufacture of 1kg hot-dip galvanized product
3)Global Warming Potential (GWP 100): carbon dioxide equivalent emitted for manufacture of 1kg hot-dip galvanized product
4)Acidification potential (AP): sulfur dioxide equivalent emitted for manufacture of 1kg hot-dip galvanized product
5)Eutrophication potential (EP): phosphate radical equivalent emitted for manufacture of 1kg hot-dip galvanized product

Note: This product life cycle influence evaluation result is completed by World Steel Association and Baosteel through operation, environmental performance data represents practical production performance of Baosteel.

Drawing 1 shows contributions relevant to all phases of hot-dip galvanized product life cycle, hot-dip galvanized product life cycle process is divided into three phases of steel manufacture process, transportation, upstream according to environmental influence kind.

- "Steel manufacture process" mainly refers to production process in steel enterprise;
- "Transportation" mainly refers to the transportation process from producing area to steel enterprise of bulk original materials, energies, auxiliary materials such as iron ore, coal, limestone;
- "Upstream" mainly refers to mining, production process of raw materials, energy, auxiliary materials procured externally for steel enterprise production outside steel enterprise , including environmental gains generated by auxiliary steel product outside the enterprise, such as cement raw materials used for blast furnace slag.



Drawing 1 Contributions to environmental influence relevant to all phases of 1kg hot-dip galvanized product life cycle

Throughout all phases of hot-dip galvanized product life cycle, 91% of ADP, 73% of EDP occur in steel manufacture process. They are mainly depletion of iron ore resource, coal in steel manufacture process.

78% of GHG is generated in steel production process, in which 10% generated in transportation phase, 12% coming from raw material and energy of upstream. In steel production, the coal as main energy source and reducing agent is the most important source of GHG generated.

Influence to AP and EP is mainly generated in transportation phase, for raw materials, energy sources of iron ore, coal etc. coming from Australia, South America, due to large transport amount, far transport distance, seagoing vessel is adopted for transportation with main fuel of diesel oil, therefore sulfur dioxide, nitrogen dioxide generated during transportation cause more serious influence to AP, EP. Removal device of sulfur dioxide, nitrogen dioxide is set in iron and steel manufacture process to reduce environmental influence at the maximum.

6.1 Cycle

All iron and steel products are valuable recyclable materials 100% of which can be reclaimed and utilized, Baosteel uses recycled steel scrap as raw material of steelmaking; all wrappage can be recycled and utilized, such as steel binding band, steel angle armor, covering plate, wrapper sheet of internal and external wrapper sheet, wooden bracket, antirust paper etc. can be recycled and utilized. Environmental influence of iron and steel products supplied by Baosteel has contained environmental benefit brought by reclamation of steel material after use.

6.2 Final disposal

100% of iron and steel product can be recycled without any waste treatment (such as burning, burying etc.), 100% of slitter edge and cuttings generated during iron and steel product processing can be recycled and utilized.

产品环境声明 Environmental product declaration

表 1 1kg 电镀锌产品生命周期影响评价结果

环境负荷指标	单位	数量
资源消耗（ADP）	kgSbeq./kg	0.0072
能源消耗(EDP)	MJ/kg	17.9720
全球变暖潜力（GWP 100）	kg CO2 eq./kg	1.6366
酸化潜力(AP)	kg SO2 eq./kg	0.0099
富营养化潜力(EP)	kg PO_4^{3-} eq./kg	0.0007
指标说明： 1）资源消耗（ADP）：制造1kg 电镀锌产品消耗的锑当量 2）能源消耗(EDP)：制造1kg 电镀锌产品消耗的能源 3）全球变暖潜力（GWP 100）：制造1kg电镀锌产品排放的二氧化碳当量 4）酸化潜力(AP)：制造1kg 电镀锌产品排放的二氧化硫当量 5）富营养化潜力(EP)：制造1kg电镀锌产品排放的磷酸根当量		
注：本产品生命周期影响评价结果由国际钢协和宝钢合作完成，环境绩效数据代表宝钢生产实绩。		

图 1 显示了电镀锌产品生命周期各阶段的相应贡献，根据环境影响类别将电镀锌产品生命周期过程划分为钢铁制程、运输、上游三个阶段。

- “钢铁制程”主要指在钢铁企业内部的生产过程；
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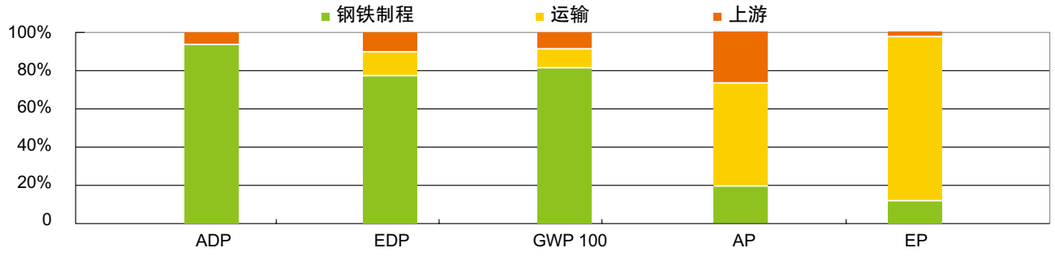

图 1 1kg 电镀锌产品生命周期各阶段对环境影响的相应贡献

纵观电镀锌产品生命周期各阶段，93% 的资源消耗、78% 的能源消耗在钢铁制程产生。主要是钢铁制程中对铁矿石资源、煤炭的消耗。

83% 的温室气体在钢铁生产阶段产生，9% 在运输阶段产生，8% 则来自上游的原辅料及能源。钢铁生产中煤炭作为主要能源和还原剂是温室气体产生的最重要来源。

对 AP 和 EP 的影响主要产生在运输阶段，铁矿石、煤炭等原材料、能源来自澳洲、南美洲，运输量大，运输距离遥远，采用海轮运输，主要燃料为柴油，因此运输过程中产生的硫氧化物、氮氧化物导致对 AP、EP 的影响较大。而钢铁制程内部则专设有硫氧化物、氮氧化物的脱除装置，最大限度的减小其环境影响。

6.1 循环

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Table1 Life cycle assessment result of 1kg electro-galvanized

Environmental load index	Unit	Quantity
Abiotic Depletion Potential (ADP)	kgSbeq./kg	0.0072
Energy Depletion potential (EDP)	MJ/kg	17.9720
Global Warming Potential(GWP 100)	kg CO_2 eq./kg	1.6366
Acidification Potential (AP)	kg SO_2 eq./kg	0.0099
Eutrophication potential(EP)	kg PO_4^{3-} eq./kg	0.0007
Note on indexes: 1)Abiotic Depletion (ADP): stibium equivalent depleted for manufacture of 1kg hot galvanized product 2)Energy Depletion (EDP): energy depleted for manufacture of 1kg hot galvanized product 3)Global Warming Potential (GWP 100): carbon dioxide equivalent emitted for manufacture of 1kg hot galvanized product 4)Acidification potential (AP): sulfur dioxide equivalent emitted for manufacture of 1kg hot galvanized product 5)Eutrophication potential (EP): phosphate radical equivalent emitted for manufacture of 1kg hot galvanized product		
Note: This product life cycle influence evaluation result is completed by World Steel Association and Baosteel through operation, environmental performance data represents practical production performance of Baosteel.		

Drawing 1 shows contributions relevant to all phases of electro-galvanized product life cycle, electro-galvanized product life cycle process is divided into three phases of steel manufacture process, transportation, upstream according to environmental influence kind.

- "Steel manufacture process" mainly refers to production process in steel enterprise;
- "Transportation" mainly refers to the transportation process from producing area to steel enterprise of bulk original materials, energies, auxiliary materials such as iron ore, coal, limestone;
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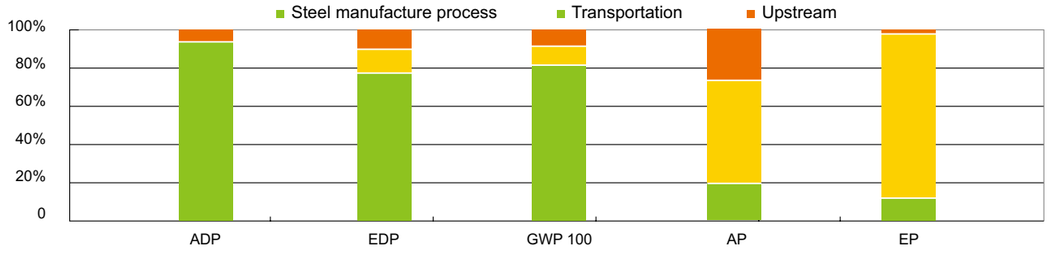

Drawing 1 Contributions to environmental influence relevant to all phases of 1kg electro-galvanized product life cycle

Throughout all phases of electro-galvanized product life cycle, 93% of ADP, 78% of EDP occur in steel manufacture process. They are mainly depletion of iron ore resource, coal in steel manufacture process.

83% of GHG is generated in steel production process, in which 9% generated in transportation phase, 8% coming from raw material and energy of upstream. In steel production, the coal as main energy source and reducing agent is the most important source of GHG generated.

Influence to AP and EP is mainly generated in transportation phase, for raw materials, energy sources of iron ore, coal etc. coming from Australia, South America, due to large transport amount, far transport distance, seagoing vessel is adopted for transportation with main fuel of diesel oil, therefore sulfur dioxide, nitrogen dioxide generated during transportation cause more serious influence to AP, EP. Removal device of sulfur dioxide, nitrogen dioxide is set in iron and steel manufacture process to reduce environmental influence at the maximum.

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6.2 Final disposal

100% of iron and steel product can be recycled without any waste treatment (such as burning, burying etc.), 100% of slitter edge and cuttings generated during iron and steel product processing can be recycled and utilized.

合规性声明

Compliance declaration

合规性声明 Compliance declaration

关于宝钢钢铁产品符合 RoHS 指令相关规定的声明

尊敬的客户：

宝山钢铁股份有限公司(以下简称"宝钢")，与宝钢原材料供应商一起，根据宝钢在钢铁产品制造领域的丰富经验，以及原料供应商提供的原材料信息，借助现有科学及技术条件下的最新技术评估手段，对宝钢钢铁产品的法律法规符合性进行了审慎评估，在此，我们认为以下声明信息是正确可靠的，评估的方法是科学的。

宝山钢铁股份有限公司在此声明：附件中所列由宝钢直接供货的产品，符合欧盟2002/95/EC (RoHS)指令《关于在电子电气设备中限制使用某些有害物质指令》及其后续修订的指令。RoHS 指令对限用物质在均一材质中最大允许浓度规定如下：

物质名称	最大允许浓度（质量分数）
铅（Pb）	1000ppm
镉（Cd）	100ppm
汞（Hg）	1000ppm
六价铬（Cr^{6+}）	1000ppm
多溴联苯（PBBs）	1000ppm
多溴联苯醚（PBDEs）	1000ppm

由于 RoHS 指令仍在不断更新中，对于其后续的重大修订，如增补限用物质，豁免应用条款的取缔等，宝山钢铁股份有限公司将及时进行进一步的评估，并适时更新本符合性声明。

宝山钢铁股份有限公司

2011 年 2 月 28 日

Compliance of RoHS Declaration

Dear Customers:

After careful evaluation of EU Directives 2002/95/EC(commonly called "RoHS") , Baoshan Iron & Steel Co., Ltd. (hereinafter referred as BAOSTEEL) hereby certifies the steel products manufactured by BAOSTEEL, which have been listed in the ANNEX, are fully comply with Directive 2002/95/EC of the European Parliament and of the Council of January 2003, on the restriction of the use of certain Hazardous Substances in electrical and electronic equipment. None of our products nor packaging materials contain any unconditionally banned substances, including Cadmium (Cd) and its compounds, Lead (Pb) and it's compounds, Hexavalent chromium (Cr) compounds, Mercury (Hg) and it's compounds, and prohibited flame retardants, namely Polybrominates biphenyls (PBB's), nor Polybrominated diphenyl ethers (PBDE's).

As Regulations from different authorities are updated frequently, normally, these changes are within scope, and typically involve adding substances with specific constraints and eliminating exemptions on certain substances with specific constraints. BAOSTEEL continually tracks changes to regulations, evaluates the further revise in time and update this declaration to reflect these changes.

Baoshan Iron & Steel Co., Ltd.

February 28, 2011

合规性声明 Compliance declaration

关于宝钢钢铁产品符合 REACH 法规相关规定的声明

尊敬的客户：

宝山钢铁股份有限公司（以下简称“宝钢”），与宝钢原材料供应商一起，根据宝钢在钢铁产品制造领域的丰富经验，以及原料供应商提供的原材料信息，借助现有科学及技术条件下的最新技术评估手段，对宝钢钢铁产品的法律法规符合性进行了审慎评估，在此，我们认为以下声明信息是正确可靠的，评估的方法是科学的。

宝山钢铁股份有限公司在此声明：本声明书附录 1 所列产品，符合 REACH 法规以下条款的规定：

1. 符合(EC) No 1907/2006（REACH）法规第 33 条款的规定，即对物品中高度关注物质（SVHC）通报的义务；（按照欧洲化学品管理署（ECHA）2011 年 12 月 19 日正式公布的高度关注物质（SVHC）候选清单（参见附录 2），以上 SVHC 在宝钢钢铁产品中的重量百分比小于 0.1%）；
2. 符合(EC) No 1907/2006（REACH）法规第 67 条款的规定，即除非该(化学)物质、混合物或物品满足附件 XVII 中列明的限制条件，否则不得制造、投放市场或使用。宝钢制造的钢铁产品作为物品，符合附件 XVII 中列明的限制物质在物品中的重量百分比小于 0.1%。）

鉴于 REACH 法规的内容仍在不断的更新中，对于其后续的重大修订，如对附录 XIV 对 SVHC 候选物质的增加，附录 XVII 对限制物质的增加，宝钢将及时对这些变化进行评估，并保留更新和撤销本声明的权力。

宝山钢铁股份有限公司

2012 年 01 月 10 日

REACH Compliance Declaration

Dear Customers:

After careful evaluation of the European Union Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) , Baoshan Iron & Steel Co., Ltd. (hereinafter referred as BAOSTEEL) hereby certifies the steel products manufactured by BAOSTEEL, which have been listed in the ANNEX 1, are fully comply with the related requirements of REACH:

1. Under the structure of the REACH Regulation, BAOSTEEL is a manufacturer of “articles” to our EU customers(according to ECHA’s guidance for articles, the steel coils, plates, sheets, bars, wire rods shall be considered as articles). We do not manufacture “substances” or “preparations” and our articles do not involve the “intentional release of substances”. Accordingly, we foresee no registration or pre-registration requirement for the products we supply to you.

2. With regard to the requirements of Article 33 of REACH:Duty to communicate information on substances in articles. We declare that none of the SVHCs (the Candidate List of Substances of Very High Concern for authorisation currently released by ECHA till the date of Dec.19, 2011, please refer to annex 2) is present in BAOSTEEL’s steel products (and also package) in quantities totaling in a concentration equal or above 0.1%.

3. With regard to the requirement of Article 67 of REACH: A substance on its own, in a preparation or in an article, for which Annex XVII contains a restriction shall not be manufactured, placed on the market or used unless it complies with the conditions of that restriction. We declare that none of the restricted substances is present in BAOSTEEL’s steel products (and also package) in quantities totaling in a concentration equal or above 0.1%.

As REACH Regulation is updated frequently, for the major changes afterwards, such as the addition of SVHC substances into Annex XIV, the addition of restricted substances in Annex XVII, BAOSTEEL will evaluates the further revise in time and update this declaration to reflect these changes.

Baoshan Iron & Steel Co., Ltd

Jan.10,2012

宝山钢铁股份有限公司
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