BAOSTEEL

Prepainted Steel Sheets

彩 涂 钢 板

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

Technical Manual of
Prepainted Steel Sheets

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Technical Manual

Technical Manual of Prepainted Steel Sheets

彩涂钢板技术手册

Corporate Profile

简 介

宝山钢铁股份有限公司(以下简称“宝钢股份”)成立于 2000 年 2 月 3 日，同年 12 月 12 日在上海证券交易所上市。宝钢股份是中国最大、最现代化的钢铁联合企业，也是全球最具竞争力的钢铁企业之一。在国内，宝钢股份在冷轧板卷、热轧板卷、无缝钢管等产品的制造和销售中始终处于业内领导地位，是汽车、家电、石油天然气开采等行业最大的钢铁供应商。2004 年，宝钢以多年奋斗所形成的竞争实力，登上了国际经济的大舞台，在中国钢铁制造业中率先进入世界 500 强。宝钢致力建成全国最大、最现代化的建筑用钢精品生产基地，彩涂生产线设备一流，工艺技术先进，基板品种规格齐全，涂料种类功能广泛，年产达到 55 万吨。能适应建筑、家电等多种用途，目前已经广泛应用于机场，体育馆、民用、工业厂房建筑等。

Baoshan Iron & Steel Co., Ltd. (hereinafter referred to as Baosteel) was established on Feb. 3, 2000 and listed on Shanghai Stock Exchange on Dec. 12 in the same year. Baosteel is the largest and most modernized iron & steel complex and also one of the most competitive steel enterprises in the world. At home, Baosteel has always taken the leading position in manufacturing and selling cold rolled steel products, hot rolled steel products, seamless steel tubes, etc. and has grown up into the most influential iron & steel provider to the industries covering auto, electrical household appliances, petroleum, etc. In 2004, Baosteel entered the international market and took the first to rank among the world top 500 enterprises in China’s iron & steel industry. Baosteel is striving for building the largest and most modernized production base of first-grade constructional steel, having topping production lines of prepainted steel sheets with advanced technologies, a complete set of base metal products in specifications, a great diversity of coatings and a yearly output of 0.55 million tons. Its products are widely used in architecture, electrical household appliance, airport, sports hall, civilian building, factory, etc.

**Build Baosteel Ltd.
into the most competitive
iron & steel enterprise
in the world**

Overview of Prepainted Steel Sheets

彩涂概述

Prepainted Steel Sheets

彩涂板简介

- 在钢板上涂上有机涂料，涂料可以有各种不同的颜色，彩色涂层钢板由此而得名，简称彩板，也称有机涂层钢板。由于彩色涂层钢板是在钢板加工成型前先涂上涂料，在国外也称为预涂层钢板。彩涂板有机涂层起了覆盖隔离作用，可防止钢板生锈，使用寿命更长。
- 彩涂板的基板有冷轧基板、热镀锌基板、电镀锌基板、热镀铝锌基板。彩涂板的面漆涂层种类可以分成：聚酯、硅改性聚酯、偏聚氟乙烯、高耐久性聚酯等。
- 生产工艺从一涂一烘发展到了二涂二烘，也出现三涂三烘的工艺。
- 彩涂板的颜色可以有很多种，如桔黄、奶黄、深天蓝、海蓝、绯红、砖红、象牙、瓷蓝等。
- 彩涂板的表面状态可以分成正常涂层板、压花板、印花板。
- 彩涂板市场用途主要分为建筑、家电和交通运输等。

彩涂板发展

- 彩色涂层钢板二十世纪三十年代中期产生于美国，开始是窄带钢涂漆，美国在1955年建造了第一批宽带材涂层机组。二十世纪六十年代，涂层钢板在美国、欧洲和日本得到了迅速的发展。
- 我国在八十年代之前彩色涂层钢板产品的生产基本上属于空白。直到八十年代武钢、宝钢才相继建了二涂二烘型式的彩色涂层钢板生产线，填补了国内空白。随着宝钢彩色涂层钢板产品在国内的推广以及应用领域的扩大，人们对彩板的认识也越来越提高，因此到二十世纪末，二十一世纪初，国内彩色涂层钢板生产线如雨后春笋般地建了起来，用量也大大增加。据不完全统计，2004年国内彩涂板用量已达到320万吨左右。

Brief introduction

- Prepainted steel sheet is coated with organic layer, which provides higher anti-corrosion property and a longer lifespan than that of galvanized steel sheets.
- The base metals for prepainted steel sheet consist of cold-rolled, HDG electro-galvanized and hot-dip alu-zinc coated. The finish coats of prepainted steel sheets can be classified into groups as follows: polyester, silicon modified polyesters, polyvinylidene fluoride, high-durability polyester, etc.
- The production process has evolved from one-coating-and-one-baking to double-coating-and-double-baking, and even three-coating-and-three-baking.
- The color of the prepainted steel sheet has a very wide selection, like orange, cream-colored, dark sky blue, sea blue, bright red, brick red, ivory white, porcelain blue, etc.
- The prepainted steel sheets can also be classified into groups by their surface textures, namely regular prepainted sheets, embossed sheets and printed sheets.
- The prepainted steel sheets are mainly provided for various commercial purposes covering architectural construction, electrical household appliances, transportation, etc.

History of prepainted steel sheet

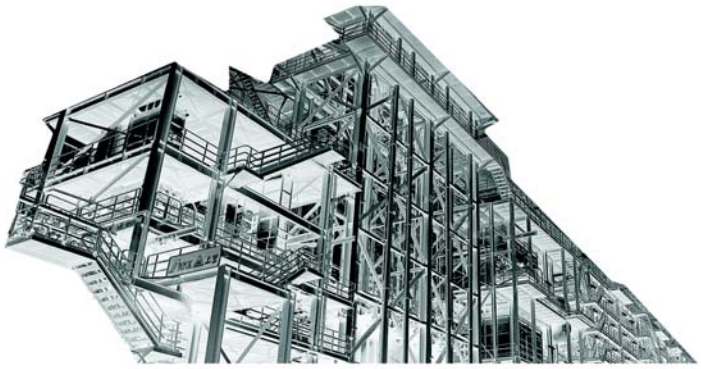
- The production of prepainted steel sheet originated in the United States in the mid 1930s. At the beginning, the technology was only adopted in producing prepainted steel strip. Till 1995, the first batch of coating equipment for broad strip steel was invented and produced in the United States in 1955. In the 1960s, the production of prepainted steel sheet made a rapid development in the United States, Europe and Japan. Besides, the prepainted steel products were also developed greatly all over the world.
- By the end of the 1980s, the production of prepainted steel sheet in China had been almost blank. Until the 1980s, Wusteel and Baosteel established the double-coating-double-baking production lines of prepainted steel sheets in succession. With increasingly promotion and application of Baosteel's prepainted steel sheets at home, more and more people make themselves acquainted with the production of steel sheets. Thus, at the turning point of the 20th century the 21st century, a lot of production lines of prepainted steel sheets emerged like bamboo shoots after a spring rain and there was also a great demand for such products. With partial regional results tallied, the consumption of prepainted steel sheets at home had already amounted to 3.2 million tons or so in 2004.

彩涂板剖面结构示意图

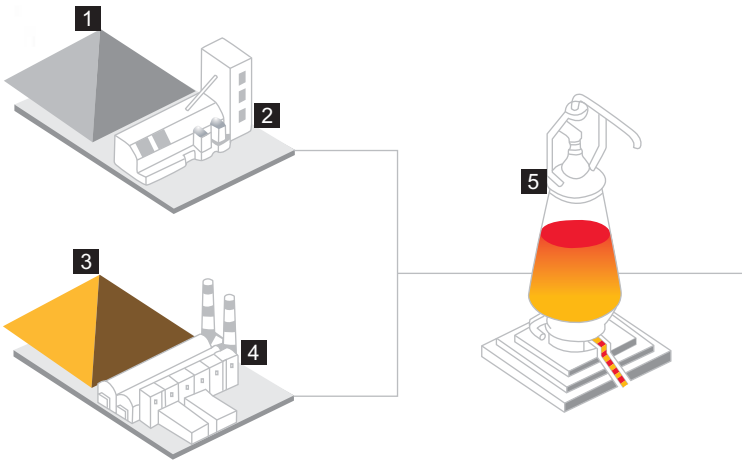
Sketch Map of Sectional Structure of Prepainted Steel Sheet

Diagram of Main Production Process

主要生产流程



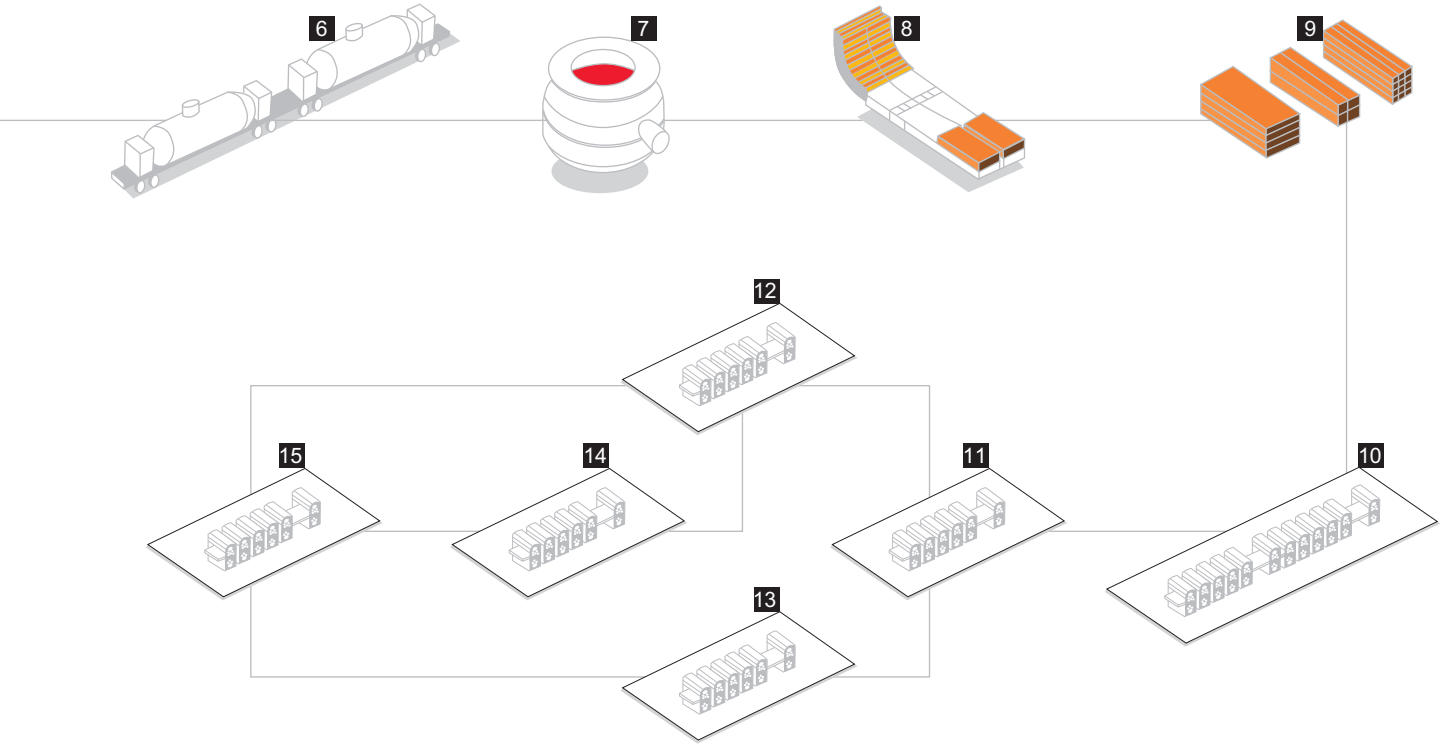
Prepainted ***Steel Sheets***



Prepainted Steel Sheets

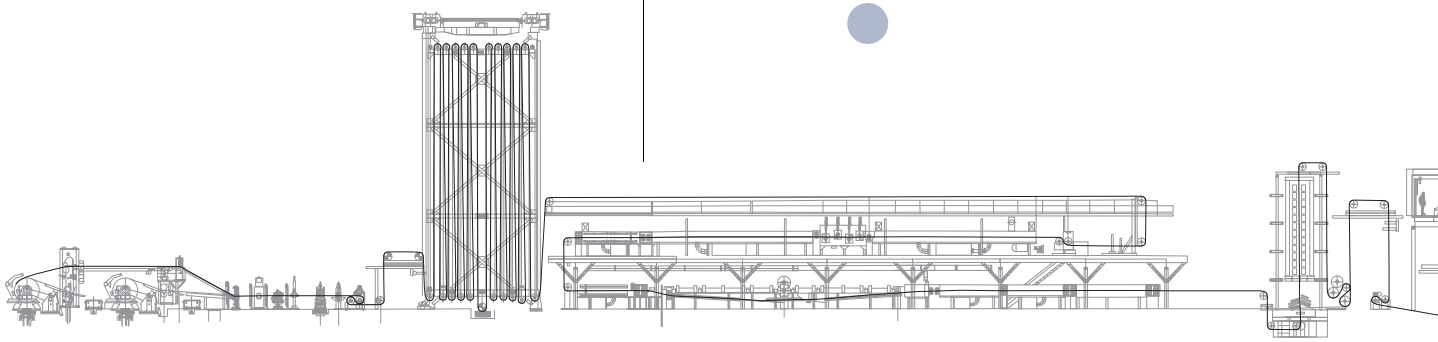
Diagram of Main Production Process

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 热镀(铝)锌 Hot-dip alu-zinc coated	14 电镀锌 Electrogalvanizing	15 彩涂 Coil coating



Process of Prepainted Steel Sheets

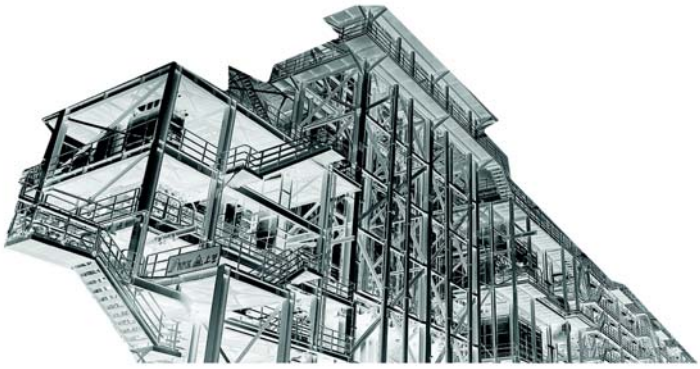
彩涂工艺



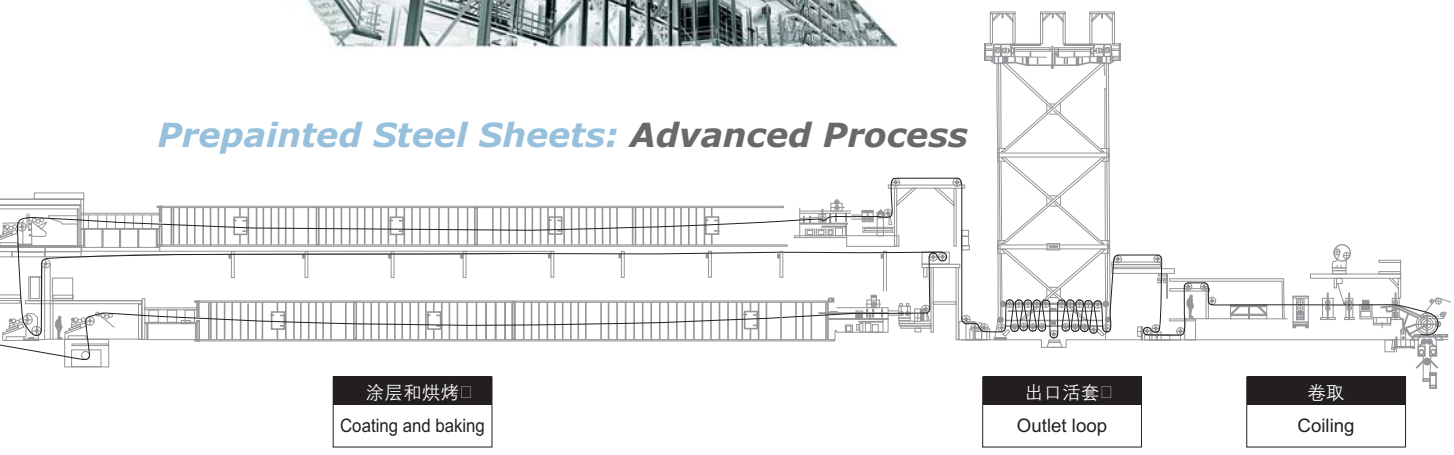
▸ 简单的工艺流程：
Brief Production Flow of Prepainted Steel

开卷 → 缝合 → 入口活套 → 清洗 → 化学处理 → 初涂 → 初涂烘烤 → 初涂冷却 ↓
精涂 → 精涂烘烤 → 精涂冷却 → 出口活套 → 检查 → 打印 → 分剪 → 卷取

Uncoiling → Welding → Inlet looper → Cleaning → Chemical treatment → Primary coating → Baking of primary coating → Cooling of primary coating ↓
Finish coating → Baking of finish coating → Cooling of finish coating → Outlet looper → Checking → Stamping → Cutting → Coiling

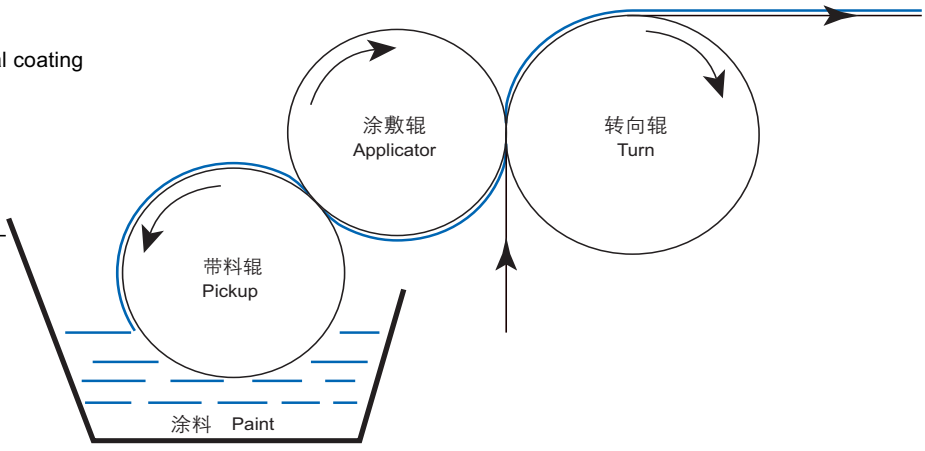


Prepainted Steel Sheets: ***Advanced Process***



二辊逆涂示意图

Sketch map of double-roller sequential coating



Prepainted ***Steel Sheets***

Production Line of Prepainted Steel Sheets

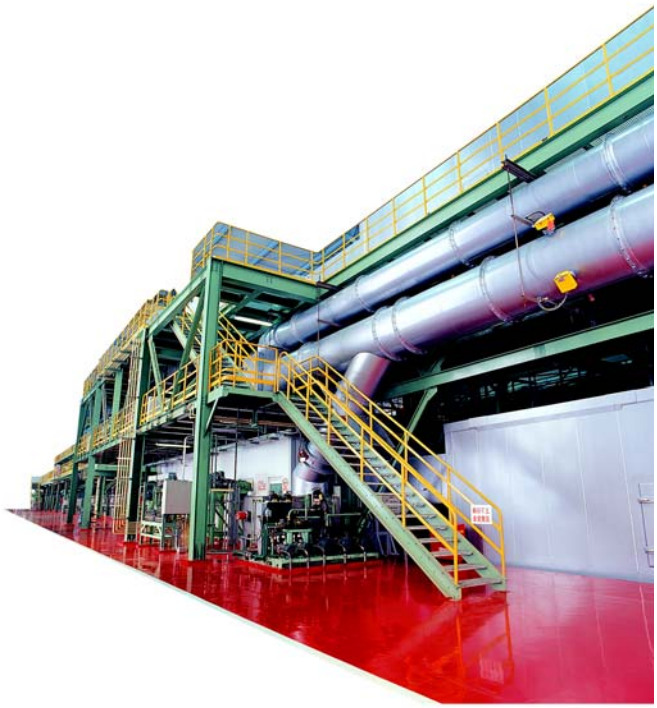
彩涂机组

- 目前宝钢已建成3条大型的二涂二烘型式的彩色涂层钢板生产线，设计年产量总共可达55万吨。产品可广泛用于建筑，家电、交通运输和家具等行业。

At present, Baosteel has already built three large-scale double-coating-double-baking production lines of prepainted steel sheet with a yearly output of 0.55 million tons. The products of these lines are widely used in architecture, electrical household appliance, transportation, furniture, etc.

Prepainted Steel Sheets

Production Line of Prepainted Steel Sheets



宝钢 3 条彩色涂层钢板生产线的有关情况：

Information about baosteel's three production lines of prepainted steel sheet:

项 目 Projects	1号彩色涂层机组 Production line 1	2号彩色涂层机组 Production line 2	3号彩色涂层机组 Production line 3
设备 Equipment	二涂二烘，美国WEAN UNITED设备 Double-coating-double-baking designed by U.S. WEAN UNITED	二涂二烘，美国FATA HUNTER设备 Double-coating-double-baking designed by U.S. FATA HUNTER	二涂二烘，自行设计研制 Double-coating-double-baking designed by baosteel itself
最高工艺速度 Max speed	146米／分 146 meters per minute	150米／分 150 meters per minute	150米／分 150 meters per minute
年产量 Capacity	设计22万吨 0.22 million tons (planned)	设计17万吨 0.17 million tons (planned)	设计15万吨 0.15 million tons (planned)
投产年份 Year of operation	1988年	2002年	2004年
产品尺寸 Size range	厚度／Thickness 0.3～2.0mm	厚度／Thickness 0.3～1.0mm	厚度／Thickness 0.22～1.0mm
	宽度／Width 900～1550mm	宽度／Width 700～1250mm	宽度／Width 700～1250mm
	钢卷重量／Weight of steel coil 3～15 MT		
	钢卷内径／Inner Diameter of Steel Coil Φ610mm	钢卷内径／Inner Diameter of Steel Coil Φ610mm、Φ508mm	
基板类型 Base Metal	冷轧板、热镀锌板(光整小锌花、无锌花) 热镀铝锌板、电镀锌板 Cold-rolled, hot-dip zinc coated (with small skin pass spangle or not), hot-dip alu-zn coated, electro-galvanized		
面漆种类 Paint type	聚酯、硅改性聚酯、高耐久性聚酯、聚偏氟乙烯 Polyester, silicon modified polyesters, high-durability polyester, and polyvinylidene fluoride		
涂层表面状态 Surfaces type	各种颜色、印花 Different colors and printed patterns	各种颜色、压花 Different colors and embossed patterns	各种颜色 Different colors

Coating Structure
涂层结构

Prepainted Steel Sheets

- **1、涂层结构类型：**

  2/1： 上表面涂二次，下表面涂一次，烘烤二次。

  2/1M：上下表面各涂二次，烘烤二次。

  2/2： 上下表面各涂二次，烘烤二次。

- **2、不同涂层结构的用途**

  2/1： 单层背面漆的耐蚀性、抗划伤性较差，但具有良好的粘结性，主要应用于夹芯板；

  2/1M：背面漆的耐蚀性、抗划伤性和加工成型性较好，具有良好的粘接性，适用与单层压型板和夹芯板。

  2/2： 双层背面漆的耐蚀性、抗划伤性和加工成型性较好，多数用于单层压型板，但其粘结性不良，不宜用于夹芯板。

- **1、Type of coating structure**

  2/1: Coat the top surface of the steel sheet twice, coat the lower surface once, and bake the sheet twice.

  2/1M: Coat and bake twice for both top surface and undersurface.

  2/2: Coat the top/lower surface twice and bake twice.

- **2、Usage of different coating structures**

  2/1: The anti-corrosion property and scratch resistance of the single-layer backside coating is poor, however, its adhesive property is good. The prepainted steel sheet of this kind is mainly used for sandwich panel;

  2/1M: Back coating has good corrosion resistance, scratch resistance and molding performance. Besides it has good adhesion and is applicable for single layer panel and sandwich sheet.

  2/2: The anti-corrosion property, scratch resistance and processing property of the backside coating of prepainted steel sheet is better, so it is widely used for roll forming. But its adhesive property is poor, so it is not used for sandwich panel.

彩涂分类及代号

Category & Coding of Prepainted Steel Sheet:

分类/Classification	项目/Item	代号/Code
用途/Applications	建筑外用/Construction external use	JW
	建筑内用/Construction internal use	JN
	钢窗/Steel windows	GC
	家电/Household appliance	JD
	家具/Furniture	JJ
	其它/Others	QT
涂层表面状态/Surface finish	涂层板/Normal coated	TC
	压花板/Embossed	YA
	印花板/Printed	YI
面漆种类 Types of top coatings	聚酯/PE	PE
	硅改性聚酯/Silicon modified polyesters	SMP
	高耐久性聚酯/High-durability polyester	HDP
	聚偏氟乙烯/Polyvinylidene fluoride	PVDF
基板类型/Base metal	电镀锌板/Electro-galvanized base metal	ZE
	热镀锌板/Hot-dip zinc coated base metal	Z
	热镀铝锌板/Hot dip Al-Zn steel sheet	AZ
热镀锌基板镀层表面结构 Coating surface structure of hot dip galvanized substrate	小锌花/Small spangle	X
	零锌花/Zero spangle	M
基板表面预处理类型 Pretreatment types for substrate surface	普通化学预处理/Normal chemical pretreatment	C
	无铬化学预处理/Chrome free chemical pretreatment	C5
涂层结构/Coating type	正面二层、反面一层/Top side two coats, bottom side one coat	2/1
	正面二层、反面二层/Top side two coatings, bottom side two coatings	2/2
	正面二层、反面二层(注：反面涂层的厚度低于2/2产品反面涂层的厚度) Top side two coatings, bottom side two coatings (Note: The thickness of bottom side coating is smaller than that of the product type 2/2)	2/1 M

Prepainted ***Steel Sheets***

Introduction of Usage

用途简介

建筑

彩涂板是木材和其他材料的具有吸引力的取代者，因为它们具有防止褪色、耐气候，抗粉化等优点。它们使建筑的维护费用降到最低的水平。同时，各种各样的颜色，表面结构和镀层，使它具有极大的灵活性和可选性。

在我国90%以上的彩板应用于建筑，宝钢彩涂板在建筑行业也得到了广泛的应用。

宝钢彩涂板和镀锌板满足了大型场馆建设中对材料色彩、造型、品质、性能等各方面的苛刻要求。在我国会展中心、体育场馆、航空枢纽、文化设施等许多标志性建筑中得到了认可。经过15年不断探索和改进，不仅在钢铁行业得到成熟的应用，在汽车制造、有色金属、电力、煤矿、轻工、医药、食品等行业也得到了普遍认可。从学校、住宅到商业建筑，从别墅到高层商住楼，时刻为您营造温馨、和谐、舒适的生活环境。

彩色涂层钢板的用途分类
Application of Prepainted Steel Sheets

建筑业 Construction	室外 Outside	厂房、农用仓库、住宅预制构件、瓦楞屋顶、墙壁、雨水管道、阳台、货售亭、卷帘门 workshop, agricultural warehouse, residential precast unit, corrugated roof, wall, rainwater drainage pipe, terrace, retailer booth, roller shutter door
	室内 Inside	门、门框、房屋轻钢结构、屏风、天花板、电梯、楼梯、通风道 door, doorcase, light steel roof structure, folding screen, ceiling, elevator, stairway, vent gutter
电器 Electrial appliance		冰箱、洗衣机、开关柜 、仪表柜、空调、微波炉、面包机 refrigerator, washer, switch cabinet, instrument cabinet, air conditioning, micro-wave oven, bread maker
家具 Furniture		暖气片 、灯罩、衣柜、桌子、床 、更衣箱、书架 central heating slice, lampshade, chifforobe, desk, bed, locker, bookshelf
运输业 Carrying trade		汽车和火车内装饰、隔板、集装箱、隔离栏、轮船隔仓板 exterior decoration of auto and train, clapboard, container, isolation lairage, isolation board
其它 Others		写字用白板、垃圾箱、广告牌、钟表、打字机、仪表盘、体重器、照相器材 writing panel, garbage can, billboard, timekeeper, typewriter, instrument panel, weight sensor, photographic equipment

Construction

The prepainted steel sheet for construction is an attractive substitute for wood and other materials, owing to its advantages, including fast color, good durability performance, chalking resistance, etc.It minimizes the maintenance cost. At the same time, various colors, surface structures and coatings provide such products with great flexibility and option.

In China, more than 90% color coated sheets are applied in construction, and Baosteel´s prepainted steel sheets are also widely used in such field.

Baosteel's prepainted steel sheets satisfy the large-scale halls' rigorous requirements in construction in material color, shape, quality, property, etc. They have been recognized by many landmark buildings in China, covering hall centers, sports halls, aviation knobs, cultural facilities, etc. After 15 years' continuous research and improvement, Baosteel has been not only widely used but also been commonly recognized in auto, non-ferrous metal, power industry, coal mining, light industry, medicine, foodstuff, etc. Baosteel's construction steel has already substituted traditional building materials with its safety, durability,

esthetic quality and environmental-friendly property, for always building up a comfortable, harmonious and cozy living environment, from schools and residences to commercial buildings, and from villas to top-grade commercial apartments.

Prepainted ***Steel Sheets***

Introduction of Usage

用途简介

家电

- 家电彩板一般以电镀锌、热镀锌和冷板为基板，用于生产冰箱和大型空调系统，冰柜、面包机、家具等。
- 家电产品的应用始于良好的外观。
- 保证质量，拒绝污迹，是宝钢彩涂产品的承诺。它可应用于冰箱、冷冻柜、洗衣机、空调和其他家电产品。我们的彩涂产品生产线，装备了一流的生产控制和检化验装置，同时，我们在彩涂板生产中积累的大量经验，使我们的产品质量胜人一筹。精良的包装和便捷的物流系统，保证我们的产品以零缺陷交付给您。一批批高光泽、高质量的彩涂产品已经交到家电产品用户的手上，使他们在产品、质量上具备了良好的竞争优势。

Prepainted Steel Sheets

Household appliances

- The prepainted steel sheet for household appliances often takes electro-galvanized, hot-dip zinc-coated and cold rolled steel sheet as its base metal, which is widely applied in manufacturing refrigerators, large-scale air-conditioning systems, refrigerating cabinet, bread maker, furniture, etc.
- The distribution of electrical household appliances is started from their good appearances.
- Baosteel promises to guarantee the quality of its prepainted steel products. Its products can be applied to refrigerators, refrigerating cabinets, washers, air conditionings and other household appliances.Baosteel's production lines of prepainted steel products are equipped with first-grade equipment of production control, check and inspection, at the same time; its products also take the leading potion among fellow ones with Baosteel's abundant experience in the production of prepainted steel sheets. With excellent packing and convenient logistic system, Baosteel guarantees to deliver its customers the products with zero defect. Batches of prepainted steel products with good luster and high quality that have already delivered to all the providers of electrical household appliances offer them a powerful competitive force in quality.

Introduction of Base Metals

基板介绍

种类 Type

Prepainted Steel Sheets

- 彩涂板的基板可以分成冷轧基板、热镀锌基板、电镀锌基板、热镀铝锌基板。
- **冷轧基板**

  由冷轧基板生产的彩涂板，具有平滑美丽的外观，且具有冷轧板的加工性能；但是表面涂层的任何细小划伤都会把冷轧基板暴露在空气中，从而使露铁处很快生成红锈。因此这类产品只能用于要求不高的临时隔离措施和作室内用材。
- **热镀锌基板**

  热镀锌彩涂板除具有锌的保护作用外，表面上的有机涂层还起了隔绝保护、防止生锈的作用，使用寿命比热镀锌板更长。热镀锌基板的含锌量一般为180g/m²（双面），建筑外用热镀锌基板的镀锌量最高为275g/m²（双面）。
- **热镀铝锌基板**

  采用热镀铝锌钢板(55%Al-Zn)作为彩涂基板。通常含铝锌量为150g/m²（双面）。

  热镀铝锌板的耐蚀性是热镀锌板的2～5倍。

  高至490℃的温度下连续或间歇使用不会严重氧化或产生氧化皮。

  反射热和光的能力是热镀锌钢板的2倍，反射率大于0.75是节省能量的理想建筑材料。
- **电镀锌基板**

  通常含锌量为20/20g/m²，因此该产品不适合使用在室外制作墙、屋顶等。但因具有美丽的外观和优良的加工性能，因此主要可用于家电、音响、钢家具、室内装璜等。

Prepainted Steel Sheets

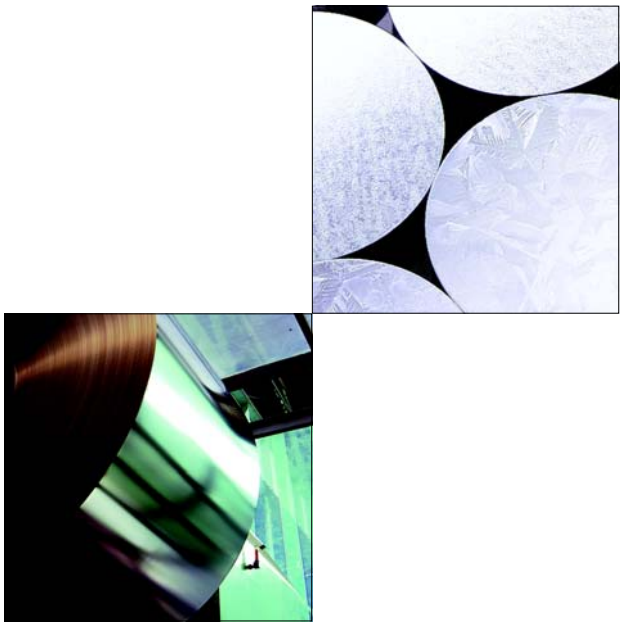
The base metals for prepainted steel sheet consist of cold-rolled, HDG electro-galvanized and hot-dip alu-zinc coated steel sheet.

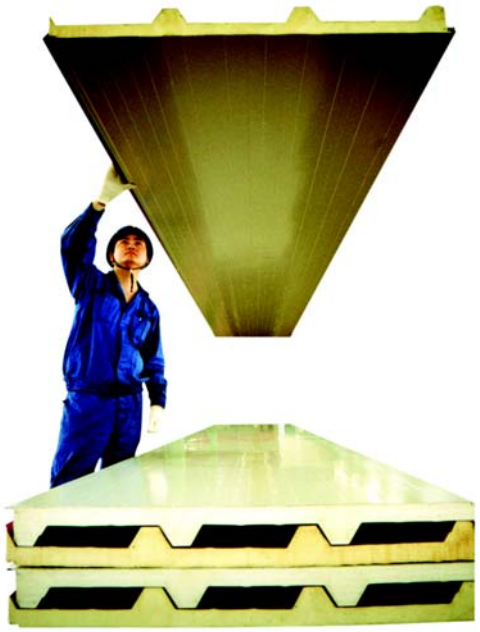
- **Cold-rolled base metal**

  The prepainted steel sheet processed with cold-rolled base metal features in its smooth and beautiful appearance and the machinability of cold rolled steel sheet, however, in case of any tiny scratch on the top coating may expose the cold rolled base metal in the air and the exposed base metal may rust soon. Thus, the products of this kind can only be used as temporary isolation measures and indoor materials with low requirements.

- **Hot-dip zinc coated base metal**

  The prepainted steel sheet with hot-dip zinc-coated base metal as its base metal not only has the protective function of zinc coating but also has an isolation and protection function with its organic layer that prevents it from rusting and prolongs its service span longer, than that of hop-dip zinc steel sheet. The zinc content of hop-dip zinc base metal is generally 180 per 1 square meters(both sides), while that of the hot-dip zinc base metal for construction outdoors is 275 square meters per 1 square meters.





- **Hop-dip alu-zinc base metal**

  The hop-dip alu-zinc base metal adopts the hot-dip zinc-aluminum coated steel sheet (55%Al-Zn) as its prepainted base metal.

  The corrosive resistance of the hot-dip alu-zinc coated steel sheet is twice to 5 times as much as that of the hot-dip zinc-coated base metal.

  It can satisfy the processing requirements of rolling, coiling and others processes alike.

  Its color won't change while continuously or intermittently working with an ambient temperature up to 316℃.

  Neither serious oxygenation nor oxide scale might appear while continuously or intermittently working with an ambient temperature up to 490℃.

  Its heat and the light reflected are respectively twice as much as those of hot-dip zinc steel sheet, and its reflectivity is more than 0.75, exceeding 0.65(required by the EPA Energy Star Standard), which is an ideal construction materials of saving energy.

- **Electro-galvanized base metal**

  The prepainted electro-galvanized steel sheet adopts an electro-galvanized base metal coated and baked with an organic coating. Owing to the thin zinc-coated layer of the electro-galvanized base metal, the zinc content of the prepainted steel sheet of electro-galvanized base metal is usually 20/20g/m^2, and the products of this kind are not suitable for building walls or roofs outdoors. However, it has esthetic appearance and excellent machinability, which makes it suitable for electrical household appliances, acoustic devices, steel household appliances, interior decoration, etc.

Introduction of Base Metals

基 板 介 绍

特 性 Characteristics

Prepainted ***Steel Sheets***

一、环境与镀层对基板寿命的影响

基板的镀层种类、镀层重量以及不同的使用环境对基板的使用寿命起着决定性的作用。如图一、图二所示：

1. Longevity of base metal influenced by environment and coating

The longevity of the base metal influenced by coating type, weight and environment For details, please refer to the diagram 1, 2:

Prepainted Steel Sheets

图表一：涂层重量与寿命关系

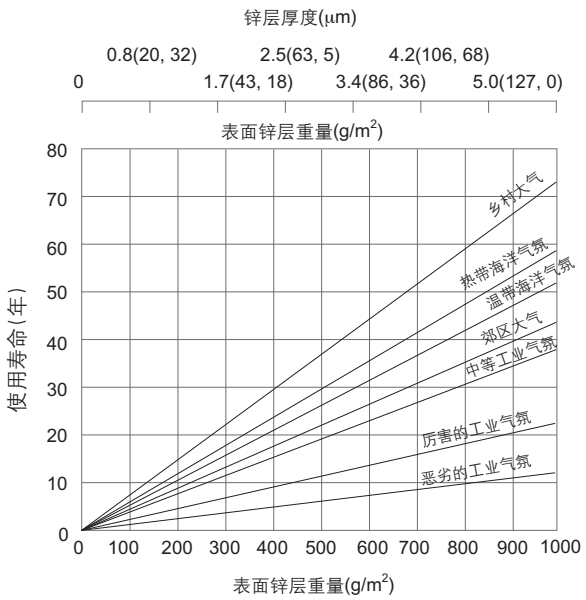
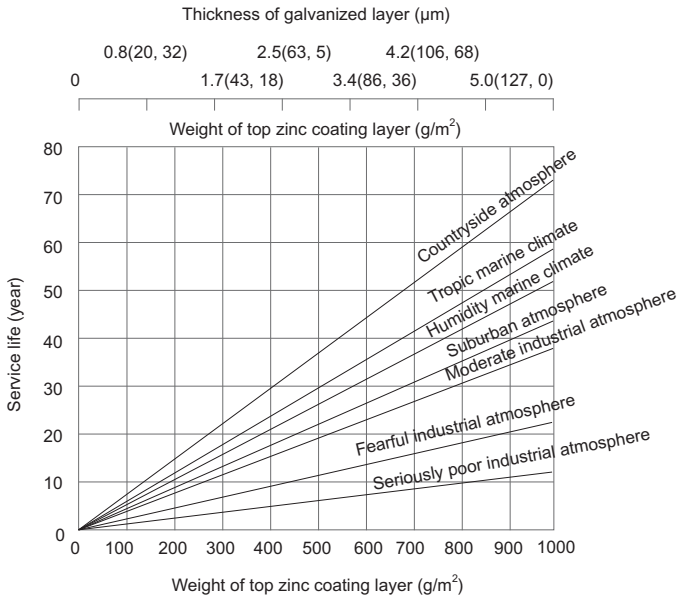
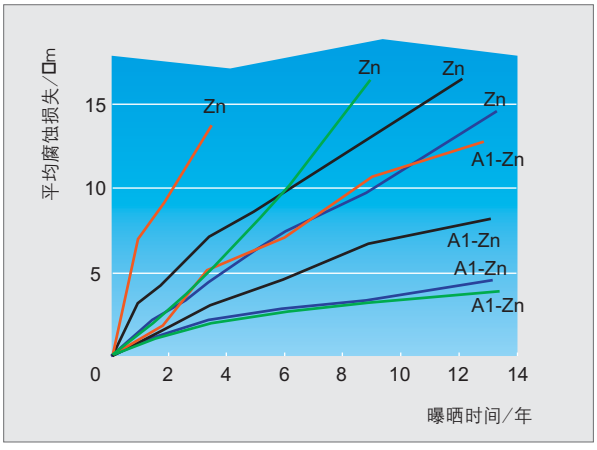


Diagram 1: weight of coating and service life

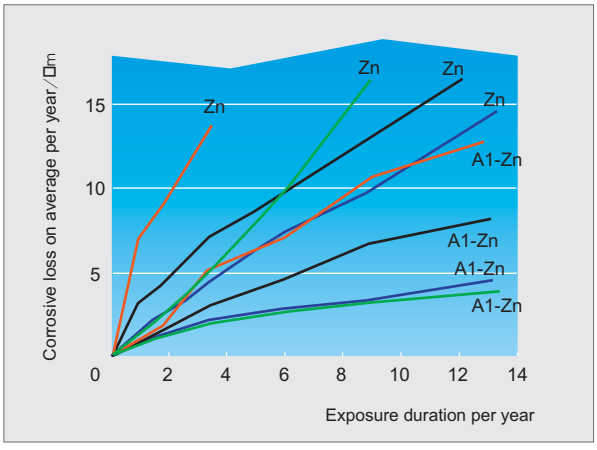


图表二：大气曝晒实验



严重海洋性气候　中等海洋性气候
乡村气候　工业性气候

Diagram 2: Atmospheric Exposure Test



Rough marine climate　Moderate marine climate
Countryside climate　Industrial climate

二、宝钢彩涂产品特性
Characteristics of prepainted steel products

1、彩色涂层钢板的牌号及用途:
Type and usage of prepainted steel sheet:

基板类型 Type of base metal	彩涂板的牌号 Steel grade	基板的牌号 Grade of base metal	用途 Application
热镀锌板 Hot-dip zinc coated	TDC51D+Z	DC51D+Z	一般用/Normal use
	TDC52D+Z	DC52D+Z	冲压用/For drawing
	TDC53D+Z	DC53D+Z	深冲压用/For deep drawing
	TS280GD+Z	S280GD+Z	结构用/Structure
	TS350GD+Z	S350GD+Z	结构用/Structure
	TS550GD+Z	S550GD+Z	高强度结构用/For high-strength structure
热镀铝-锌合金板 Hot-dip alu-zinc alloy coated	TDC51D+AZ	DC51D+AZ	一般用/Normal use
	TDC52D+AZ	DC52D+AZ	冲压用/For drawing
	TS250GD+AZ	S250GD+AZ	结构用/Structure
	TS300GD+AZ	S300GD+AZ	结构用/Structure
	TS350GD+AZ	S350GD+AZ	结构用/Structure
	TS550GD+AZ	S550GD+AZ	高强度结构用/For high-strength structure
电镀锌板 Electro-galvanized	TSECC	SECC	一般用/Normal use
	TSECD	SECD	冲压用/For drawing
	TSECE	SECE	深冲压用/For deep drawing
	TBLCE+Z	BLCE+Z	一般用/Normal use
	TBLDE+Z	BLDE+Z	冲压用/For drawing
	TBUSDE+Z	BUSDE+Z	深冲压用/For deep drawing

2、尺寸、外形、重量、厚度允许偏差

Allowance of size, shape, weight and thickness

2.1、钢板和钢带的尺寸范围如下：

Size ranges of steel sheet and steel strip are shown as follows:

单位：mm

项　目 Items	公称尺寸 Nominal dimensions
公称厚度 Nominal thickness	0.22～2.0
公称宽度 Nominal width	700～1550
钢板的公称长度 Nominal cut length	1000～4000

2.2、钢板的不平度 / Plainness

A.1 冷轧基板、电镀锌基板不平度 / Plainness of cold rolled substrate, electro-galvanized substrate

单位：mm

规定的最小屈服强度 MPa	公称宽度 Nominal width	普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		公称厚度 Nominal thickness			公称厚度 Nominal thickness		
		＜0.70	0.70～＜1.20	⩾1.2	＜0.70	0.70～＜1.2	⩾1.2
＜260	⩽1200	10	8	7	5	4	3
	＞1200～1500	12	10	8	6	5	4
	＞1500	17	15	13	8	7	6
260～＜340	⩽1200	13	10	8	8	6	5
	1200～1500	15	13	11	9	8	6
	＞1500	20	19	17	12	10	9

A.2 热镀锌基板不平度 / Plainness of hot dip galvanized substrate

A.2.1 对规定最小屈服强度小于 260MPa 的钢板，不平度最大允许偏差应符合表 A1 的规定。

For steel sheet with a specified minimum yield strength less than 260MPa, the maximum plainness tolerance should be in conformity with the stipulations of Table A1.

表 A1：

单位：mm

规定的最小屈服强度 MPa	公称宽度 Nominal width	下列公称厚度时的不平度 mm Plainness (mm) for the nominal thickness as shown below					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		＜0.70	0.70～＜1.60	1.6～3.0	＜0.70	0.70～＜1.60	1.6～3.0
＜260	＜1200	10	8	8	5	4	3
	1200～＜1500	12	10	10	6	5	4
	≥1500	17	15	15	8	7	6

A.2.2 对规定最小屈服强度不小于 260MPa，且小于 360MPa 的钢板，及牌号为 DC51D+Z（ZF）、DD51D+Z 和 S550GD+Z（ZF）的钢板及钢带，其不平度最大允许偏差应符合表 A2 的规定

For steel sheet and steel strip with a specified minimum yield strength not less than 260MPa but less than 360MPa, and the grades of DC51+Z(ZF)、DD51D+Z 和 S550GD+Z（ZF), the maximum plainness tolerance should be in conformity with the stipulations of Table A2.

表 A2：

单位：mm

规定的最小屈服强度 MPa	公称宽度 Nominal width	下列公称厚度时的不平度 mm Plainness (mm) for the nominal thickness as shown below					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		＜0.70	0.70～＜1.60	1.6～3.0	＜0.70	0.70～＜1.60	1.6～3.0
260～＜360	＜1200	13	10	10	8	6	5
	1200～＜1500	15	13	13	9	8	6
	≥1500	20	19	19	12	10	9

A.3 镀铝锌基板不平度 / Plainness of hot dip Al-Zn substrate

A.3.1 对规定最小屈服强度小于 260MPa 的钢板，不平度最大允许偏差应符合表 A3 的规定。
For steel sheet with a specified minimum yield strength less than 260MPa, the maximum plainness tolerance should be in conformity with the stipulations of Table A3.

表 A3：　　单位：mm

规定的最小屈服强度 MPa	公称宽度 Nominal width	下列公称厚度时的不平度 mm Plainness (mm) for the nominal thickness as shown below					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		＜0.70	0.70～＜1.60	1.6～2.0	＜0.70	0.70～＜1.60	1.6～2.0
＜260	＜1200	10	8	8	5	4	3
	1200～＜1500	12	10	10	6	5	4

A.3.2 对规定最小屈服强度不小于 260MPa，但小于 360MPa 的钢板，以及牌号为 DX51D+AZ.和 S550GD+AZ 的钢板，其不平度最大允许偏差应符合表 A4 的规定。
For steel sheet with a specified minimum yield strength not less than 260MPa, but less than 360MPa, and the grades of DX51D+AZ.S550GD+AZ, the maximum plainness tolerance should be in conformity with the stipulations of Table A4.

表 A4：　　单位：mm

规定的最小屈服强度 MPa	公称宽度 Nominal width	下列公称厚度时的不平度 mm Plainness (mm) for the nominal thickness as shown below					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		＜0.70	0.70～＜1.60	1.6～2.0	＜0.70	0.70～＜1.60	1.6～2.0
260～＜360	＜1200	13	10	10	8	6	5
	1200～＜1500	15	13	13	9	8	6

2.3、按不同用途推荐采用的基板及基板通常采用的镀层重量如下表：
Suggestion on slection of base metal and zinc coating weight for different application:

序　号 No.	用　途 Applications	基　板 Base metal	镀层重量（g/m^2）□ Weight of galvanized layer (g/m^2)
1	建筑外用□ Construction external use	热镀锌板 Hot-dip zinc coated base metal	90/90
2	建筑内用、钢窗□ Construction internal use、□ Steel windows	热镀锌板 Hot-dip zinc coated base metal	90/90
		电镀锌板 Electro-galvanized base metal	60/60
3	家电、家具□ Household appliance、Furniture	电镀锌板 Electro-galvanized base metal	20/20
4	建筑□ Construction	热镀铝锌 Hot-dip zinc-aluminum coated board	75/75

2.4、基板的尺寸、外形允许偏差 / Allowance of size and shape of the base metal

A.1 尺寸允许偏差 / Allowance of size

A.1.1 冷轧基板、电镀锌基板(包括镀层)的厚度允许偏差 / Thickness tolerance for cold rolled substrate, electro-galvanized substrate

A.1.1.1 当钢板及钢带公称厚度小于 0.30mm 时，厚度允许偏差为公称厚度的 ± 10%，钢板及钢带的其他厚度允许偏差应符合表 5 的规定。对纵切钢带，其厚度允许偏差应符合未纵切前钢带的相关规定。

For the nominal thickness of steel sheet or steel strip is less than 0.30mm, the thickness tolerance is ±10% of the nominal tolerance. The other thickness tolerances of the steel sheet or steel strip should be in conformity with the stipulations of Table 4. For slit steel sheet, the thickness tolerance should be in conformity with the relevant stipulations for steel sheet before slitting.

A.1.1.2 当钢带厚度小于 1.50mm 时，钢带两端总长度 30m 内的厚度允许偏差允许比规定值超出 50%；当钢带厚度不小于 1.50mm 时,两端总长度 30m 内的厚度允许偏差允许比规定值超出 30%。

For the thickness of steel strip is less than 1.50mm, thickness tolerance for the total length of 30m in both ends of steel strip is allowed to be 50 % greater than the specified figure. For the thickness of steel strip is not less than 1.50mm, thickness tolerance for the total length of 30m in both ends is allowed to be 30 % greater than the specified figure.

表 A5：　　单位：mm

规定的最小屈服强度 MPa	公称厚度 Nominal thickness	厚度允许偏差 Thickness tolerance					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		公称宽度 Nominal width			公称宽度 Nominal width		
		≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
<260	0.30～0.40	±0.03	±0.04	±0.05	±0.020	±0.025	±0.030
	>0.40～0.60	±0.03	±0.04	±0.05	±0.025	±0.030	±0.035
	>0.60～0.80	±0.04	±0.05	±0.06	±0.030	±0.035	±0.040
	>0.80～1.00	±0.05	±0.06	±0.07	±0.035	±0.040	±0.050
	>1.00～1.20	±0.06	±0.07	±0.08	±0.040	±0.050	±0.060
	>1.20～1.60	±0.08	±0.09	±0.10	±0.050	±0.060	±0.070
	>1.60～2.00	±0.10	±0.11	±0.12	±0.060	±0.070	±0.080
	>2.00～2.50	±0.12	±0.13	±0.14	±0.080	±0.090	±0.100
	>2.50～3.00	±0.15	±0.15	±0.16	±0.100	±0.110	±0.120
	>3.00～3.50	±0.17	±0.19	±0.19	±0.140	±0.150	±0.150
260～<340	0.30～0.40	±0.04	±0.05	±0.06	±0.025	±0.030	±0.035
	>0.40～0.60	±0.04	±0.05	±0.06	±0.030	±0.035	±0.040
	>0.60～0.80	±0.05	±0.06	±0.07	±0.035	±0.040	±0.050
	>0.80～1.00	±0.06	±0.07	±0.08	±0.040	±0.050	±0.060
	>1.00～1.20	±0.07	±0.08	±0.10	±0.050	±0.060	±0.070
	>1.20～1.60	±0.09	±0.11	±0.12	±0.060	±0.070	±0.080
	>1.60～2.00	±0.12	±0.13	±0.14	±0.070	±0.080	±0.100
	>2.00～2.50	±0.14	±0.15	±0.16	±0.100	±0.110	±0.120
	>2.50～3.00	±0.17	±0.18	±0.18	±0.120	±0.130	±0.140

规定的最小屈服强度 MPa	公称厚度 Nominal thickness	厚度允许偏差 Thickness tolerance					
		普通精度PF.A Common precise PF.A			高级精度PF.B High-level precision PF.B		
		公称宽度 Nominal width			公称宽度 Nominal width		
		≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
340～420	0.30～0.40	±0.04	±0.05	±0.06	±0.030	±0.035	±0.040
	>0.40～0.60	±0.05	±0.06	±0.07	±0.035	±0.040	±0.050
	>0.60～0.80	±0.06	±0.07	±0.08	±0.040	±0.050	±0.060
	>0.80～1.00	±0.07	±0.08	±0.10	±0.050	±0.060	±0.070
	>1.00～1.20	±0.09	±0.10	±0.11	±0.060	±0.070	±0.080
	>1.20～1.60	±0.11	±0.12	±0.14	±0.070	±0.080	±0.100
	>1.60～2.00	±0.14	±0.15	±0.17	±0.080	±0.100	±0.110
	>2.00～2.50	±0.16	±0.18	±0.19	±0.110	±0.120	±0.130
	>2.50～3.00	±0.20	±0.20	±0.21	±0.130	±0.140	±0.150
	>3.00～3.50	±0.24	±0.27	±0.27	±0.200	±0.210	±0.210
>420	0.30～0.40	±0.05	±0.06	±0.07	±0.035	±0.040	±0.050
	>0.40～0.60	±0.05	±0.07	±0.08	±0.040	±0.050	±0.060
	>0.60～0.80	±0.06	±0.08	±0.10	±0.050	±0.060	±0.070
	>0.80～1.00	±0.08	±0.10	±0.11	±0.060	±0.070	±0.080
	>1.00～1.20	±0.10	±0.11	±0.13	±0.070	±0.080	±0.100
	>1.20～1.60	±0.13	±0.14	±0.16	±0.080	±0.100	±0.110
	>1.60～2.00	±0.16	±0.17	±0.19	±0.100	±0.110	±0.130
	>2.00～2.50	±0.19	±0.20	±0.22	±0.130	±0.140	±0.160
	>2.50～3.00	±0.22	±0.23	±0.24	±0.160	±0.170	±0.180
	>3.00～3.50	±0.24	±0.27	±0.27	±0.200	±0.210	±0.210

A.1.2 热镀锌基板的厚度允许偏差 / Thickness tolerance for hot dip galvanized substrate

A.1.2.1 对于规定的最小屈服强度小于 260MPa 的钢板及钢带，其厚度允许偏差应符合表 A6 的规定。

For steel sheet with a specified minimum yield strength less than 260MPa, the maximum thickness tolerance should be in conformity with the stipulations of Table A6.

表 A6：

单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差 [a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.30～0.40	±0.04	±0.05	±0.06	±0.030	±0.035	±0.040
>0.40～0.60	±0.04	±0.05	±0.06	±0.035	±0.040	±0.045
>0.60～0.80	±0.05	±0.06	±0.07	±0.040	±0.045	±0.050
>0.80～1.00	±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

[a] 钢带焊缝附近10m 范围的厚度允许偏差可超过规定值的50%，对双面镀层重量之和不小于450g/m² 的产品，其厚度允许偏差应增加±0.01mm。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.
For the product with a total coating weight of both sides not less than 450g/m², the thickness tolerance should increase by±0.01mm.

A.1.2.2 对于规定的最小屈服强度不小于 260MPa，且小于 360MPa 的钢板及钢带，其厚度允许偏差应符合表 A.2 的规定。牌号为 DC51D+Z(ZF)、DD51D+Z 和 S550GD+Z(ZF)的钢板及钢带应符合表 A7 的规定。

For steel sheet and steel strip with a specified minimum yield strength not less than 260MPa but less than 360MPa, the thickness tolerance should be in conformity with the stipulations of Table A7. The steel sheet and steel strip with the grades of DC51D+Z(ZF)、DD51D+Z 和S550GD+Z(ZF) should be in conformity with the stipulations of Table A7.

表 A7：

单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差 [a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.30～0.40	±0.05	±0.06	±0.07	±0.035	±0.040	±0.045
>0.40～0.60	±0.05	±0.06	±0.07	±0.040	±0.045	±0.050
>0.60～0.80	±0.06	±0.07	±0.08	±0.045	±0.050	±0.060
>0.80～1.00	±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

[a] 钢带焊缝附近10m 范围的厚度允许偏差可超过规定值的50%，对双面镀层重量之和不小于450g/m² 的产品，其厚度允许偏差应增加±0.01mm。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.
For the product with a total coating weight of both sides not less than 450g/m², the thickness tolerance should increase by±0.01mm.

A.1.2.3 对于规定的最小屈服强度不小于 360MPa 且小于等于 420MPa 的钢板及钢带，其厚度允许偏差应符合表 A8 的规定。

For steel sheet and steel strip with a specified minimum yield strength not less than 360MPa, but less than or equal to 420 MPa, the thickness tolerance should be in conformity with the stipulations of Table A8.

表 A8：

单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差[a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.30～0.40	±0.05	±0.06	±0.07	±0.040	±0.045	±0.050
>0.40～0.60	±0.06	±0.07	±0.08	±0.045	±0.050	±0.060
>0.60～0.80	±0.07	±0.08	±0.09	±0.050	±0.060	±0.070
>0.80～1.00	±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

[a] 钢带焊缝附近10m 范围的厚度允许偏差可超过规定值的50%，对双面镀层重量之和不小于450g/m² 的产品，其厚度允许偏差应增加±0.01mm。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.
For the product with a total coating weight of both sides not less than 450g/m², the thickness tolerance should increase by±0.01mm.

A.1.2.4 对于规定的最小屈服强度大于 420MPa 且小于等于 900MPa 的钢板及钢带，其厚度允许偏差应符合 A9 的规定。

For steel sheet and steel strip with a specified minimum yield strength not less than 420MPa, but less than or equal to 900 MPa, the thickness tolerance should be in conformity with the stipulations of Table A9.

表 A9：

单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差[a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.30～0.40	±0.06	±0.07	±0.08	±0.045	±0.050	±0.060
>0.40～0.60	±0.06	±0.08	±0.09	±0.050	±0.060	±0.070
>0.60～0.80	±0.07	±0.09	±0.11	±0.060	±0.070	±0.080
>0.80～1.00	±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

[a] 钢带焊缝附近10m 范围的厚度允许偏差可超过规定值的50%，对双面镀层重量之和不小于450g/m² 的产品，其厚度允许偏差应增加±0.01mm。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.
For the product with a total coating weight of both sides not less than 450g/m², the thickness tolerance should increase by±0.01mm.

A.1.3 镀铝锌基板的厚度允许偏差 / Thickness tolerance for hot dip Al-Zn substrate

A.1.3.1 对于规定的最小屈服强度小于 260MPa 的钢板及钢带，其厚度允许偏差应符合表 A10 的规定。

For steel sheet and steel strip with a specified minimum yield strength less than 260MPa, the thickness tolerance should be in conformity with the stipulations of Table A10.

表 A10：　　单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差 [a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.22～0.40	±0.04	±0.05	±0.06	±0.030	±0.035	±0.040
>0.40～0.60	±0.04	±0.05	±0.06	±0.035	±0.040	±0.045
>0.60～0.80	±0.05	±0.06	±0.07	±0.040	±0.045	±0.050
>0.80～1.00	±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

[a] 钢带焊缝附近10m范围的厚度允许偏差可超过规定值的50%。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.

A.1.3.2 对于规定的最小屈服强度不小于 260MPa，但小于 360MPa 的钢板及钢带，以及牌号为 DC51D+AZ 和 S550GD+AZ 的钢板及钢带，其厚度允许偏差应符合表 A11 的规定。

For steel sheet and steel strip with a specified minimum yield strength not less than 260MPa, but less than 360MPa, and the grades of DX51D+AZ and S550GD+AZ, the thickness tolerance should be in conformity with the stipulations of Table A11.

表 A11：　　单位：mm

公称厚度 Nominal thickness	下列宽度时的厚度允许偏差 [a] Thickness tolerance while the widths are showed as follows					
	普通精度PT.A Common precise PT.A			高级精度PT.B High-level precision PT.B		
	≤1200	>1200～1500	>1500	≤1200	>1200～1500	>1500
0.22～0.40	±0.05	±0.06	±0.07	±0.035	±0.040	±0.045
>0.40～0.60	±0.05	±0.06	±0.07	±0.040	±0.045	±0.050
>0.60～0.80	±0.06	±0.07	±0.08	±0.045	±0.050	±0.060
>0.80～1.00	±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

[a] 钢带焊缝附近10m范围的厚度允许偏差可超过规定值的50%。
Thickness tolerance for the range of 10m adjacent to steel strip welding seam is allowed to be 50% greater than the specified figure.

A.2 宽度允许偏差 / Width tolerance

A.2.1 热镀锌板、热镀铝锌合金板的宽度允许偏差如表 A12 的规定。

Width tolerance of the hot-dip zinc, hot-dip alu-zinc coated alloy steel sheets should conform to relevant parameters designed by A12.

表 A12：

单位：mm

公称宽度 Nominal width	宽度允许偏差 Width tolerance	
	普通精度PW.A Common precise PW.A	高级精度PW.B High-level precision PW.B
≤1200	0～+5	0～+2
＞1200～1500	0～+6	0～+2
＞1500	0～+7	0～+3

A.2.2 电镀板的宽度允许偏差如表 A13 的规定。

Width tolerance of electro-galvanized steel sheets should conform to relevant parameters designed by A13.

表 A13：

单位：mm

公称宽度 Nominal width	宽度允许偏差 Width tolerance	
	普通精度PW.A Common precise PW.A	高级精度PW.B High-level precision PW.B
≤1200	0～+4	0～+2
＞1200～1500	0～+5	0～+2
＞1500	0～+6	0～+3

A.3 长度允许偏差 / Lengths tolerance

钢板长度允许偏差如表 A14 的规定。

The allowable deviations of lengths of steel sheets with allowable length deviations should conform to relevant parameters designed by A14.

表 A14：

单位：mm

公称长度 Nominal Length	长度允许偏差 Length tolerance	
	普通精度PW.A Common precise PW.A	高级精度PW.B High-level precision PW.B
≤1200	0～+6	0～+2
＞2000	0～+0.003×公称长度	0～+0.0015×公称长度

A.4 外形允许偏差 / Shape tolerance

A.4.1 钢板应切成直角，脱方度应不大于基板宽度 1%。

The steel sheet should be cut in a right angle, and the out of squareness of the sheet should be no more than 1% of the width of the base metal.

3、力学性能/ Mechanical Properties

A.3.1 冷轧基板、电镀锌基板 / Mechanical Properties of cold rolled substrate and electro-galvanized substrate

A.3.1.1 退火及平整的钢板及钢带的力学性能应符合表 A15 的规定。

Mechanical Properties of annealed and tempered steel sheet and steel strip should be in conformity with the stipulations of Table A15.

A.3.1.2 由于时效的影响，钢板及钢带的力学性能会随着储存时间的延长而变差，如屈服强度和抗拉强度的上升，断后伸长率的下降，成形性能变差、出现拉伸应变痕等，建议用户尽早使用。

Due to effects of aging, mechanical properties of the steel plates and steel strip shall deteriorate with storage time passing, E.g. yield strength and tensile strength will rise, rupture elongation decreases, formability deteriorates and tensile strain mark appears etc, it is suggested to use the material as soon as possible.

表 A15：

牌号 Grade	拉伸试验[a, b, c] Tensile test [a,b,c]									r_m[d, e] 不小于 ⩾	
	屈服强度 不大于 Yield strength MPa ⩽	抗拉强度 不小于 Tensile strength MPa ⩾	断后伸长率(L_o=50mm，b=25mm) % 不小于 Elongation (Lo=50mm, b=25mm) % ⩾								
			公称厚度 mm Nominal thickness mm							公称厚度 mm Nominal thickness mm	
			<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$R_{P0.2}$，否则采用R_{eL}。
[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] 当厚度＜0.50mm和厚度＞1.6 mm时，对r值不要求。
[e] r_m＝(r90+2r45+r0)／4。

[a] $R_{P0.2}$ is used when no apparent yield happens, otherwise R_{eL} is used.
[b] For the thickness being greater than 0.40 mm, but not greater than 0.60 mm, the yield strength as specified is allowed to increase by 20 MPa. While for the thickness being not greater than 0.40 mm, the yield strength as specified is allowed to increase by 40 MPa.
[c] Test piece is P14 specified in GB/T 228. The direction for sample taking is vertical.
[d] For the thickness is ＜ 0.50mm and the thickness is ＞1.6 mm, there is no requirement on Value r.
[e] r_m＝(r90+2r45+r0)/4。

A.3.1.3 钢板及钢带的力学性能应符合表 16 的规定。

Mechanical Properties of steel sheet and steel strip should be in conformity with the stipulations of Table 16.

A.3.1.4 由于时效的影响，钢板及钢带的力学性能会随着储存时间的延长而变差，如屈服强度和抗拉强度的上升，断后伸长率的下降，成形性能变差、出现拉伸应变痕等，建议用户尽早使用。

Due to effects of aging, mechanical properties of the steel plates and steel strip shall deteriorate with storage time passing, E.g. yield strength and tensile strength will rise, rupture elongation decreases, formability deteriorates and tensile strain mark appears etc, it is suggested to use the material as soon as possible.

表 A16：

牌号 Grade	拉伸试验[a, b] Tensile test [a, b]						r_{90}[c] 不小于 ⩾	n_{90}[c] 不小于 ⩾
	屈服强度 不大于 Yield strength MPa ⩽	抗拉强度 不小于 Tensile strength MPa ⩾	断后伸长率(L_o=50mm，b=25mm) % 不小于 Elongation (Lo=50mm, b=25mm) % ⩾					
			公称厚度 mm Nominal thickness mm					
			<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	0.20
BUFD	120～190	250	42	44	46	48	2.0	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$R_{P0.2}$，否则采用R_{eL}。
[b] 试样为GB/T 228中的P14试样，试样方向为横向。
[c] r_{90}和n_{90}仅适用于厚度不小于0.50mm的产品。当厚度大于2.0mm时，r_{90}值允许降低0.2。

[a] $R_{P0.2}$ is used when no apparent yield happens, otherwise R_{eL} is used.
[b] Test piece is P14 specified in GB/T 228. The direction for sample taking is horizontal.
[c] r_{90} and n_{90} are only applicable to the products with a thickness not lee than 0.50mm.For thickness being greater than 2.0mm, Value r_{90}0 is allowed to decrease by 0.2.

A.3.2 热镀锌基板 / Mechanical Properties of hot dip galvanized substrate

A.3.2.1 钢板及钢带的力学性能应分别符合表 A17～表 A18 的规定。拉伸试样为带镀层的试样。

Mechanical Properties of steel sheet and steel strip should be in conformity with the stipulations of Table A17 - Table A18 respectively. Test piece for tensile test is samples with coating layer.

A.3.2.2 由于时效的影响，钢板及钢带的力学性能会随着储存时间的延长而变差，如屈服强度和抗拉强度的上升，断后伸长率的下降，成形性能变差、出现拉伸应变痕等，建议用户尽早使用。

Due to effects of aging, mechanical properties of the steel plates and steel strip shall deteriorate with storage time passing, E.g. yield strength and tensile strength will rise, elongation after fracture decreases, formability deteriorates and tensile strain mark appears etc, it is suggested to use the material as soon as possible.

A.3.2.3 对于表 A17 中牌号为 DC51D+Z、DC51D+ZF、DD51D+Z、DC52D+ZF 的钢板及钢带，应保证在制造后 1 个月内，钢板及钢带的力学性能符合表 A17 的规定；对于表 A17 中其他牌号的钢板及钢带，应保证在制造后 6 个月内，钢板及钢带的力学性能符合表 A17 的规定。

For steel sheet and steel strip with grades of DC51D+Z、DC51D+ZF、DD51D+Z、DC52D+ZF , the guarantee that their mechanical properties are in conformity with the stipulations of Table A17 within one month after manufacturing should be provided. For steel sheet and steel strip with other grades in Table A17 , the guarantee that their mechanical properties are in conformity with the stipulations of Table A17 within six months after manufacturing should be provided.

表 A17：

牌号 Grade	拉伸试验[a, b] Tensile test [a, b]			r_{90}[c] 不小于 ⩾	n_{90}[c] 不小于 ⩾
	屈服强度 Yield strength MPa	抗拉强度 Tensile strength MPa	断后伸长率 A_{80}mm % 不小于 Elongation A_{80} % ⩾		
DC51D+Z, DC51D+ZF	–	270～500	22	–	–
DD51D+Z	–	270～500	–	–	–
DC52D+Z, DC52D+ZF	140～300	270～420	26	–	–
DC53D+Z, DC53D+ZF	140～260	270～380	30	–	–
DC54D+Z	120～220	260～350	36	1.6	0.18
DC54D+ZF			34	1.4	0.18
DD54D+Z	⩽260	⩽360	36	–	–
DC56D+Z	120～180	260～350	39	1.9[d]	0.21
DC56D+ZF			37	1.7[d, e]	0.20[e]
DC57D+Z	120～170	260～350	41	2.1[d]	0.22
DC57D+ZF			39	1.9[d, e]	0.21[e]

[a] 无明显屈服时采用$R_{P0.2}$，否则采用R_{eL}。
[b] 试样为GB/T 228 中的P6 试样，试样方向为横向。
[c] 当产品公称厚度大于0.50mm，但小于等于0.70mm 时，断后伸长率允许下降2%；
当产品公称厚度不大于0.50mm 时，断后伸长率允许下降4%。
[d] 当产品公称厚度大于1.5mm，r_{90} 允许下降0.2。
[e] 当产品公称厚度小于等于0.70mm 时，r_{90} 允许下降0.2；n_{90} 允许下降0.01。

[a] $R_{P0.2}$ is used when no apparent yield happens, otherwise R_{eL} is used.
[b] Test piece is P6 specified in GB/T 228. The direction for sample taking is horizontal.
[c] For products with nominal thickness greater than 0.50mm,but less than or equal to 0.70mm, the elongation after fracture is allowed to decrease by 2%.
For products with nominal thickness not greater than 0.50mm, the elongation after fracture is allowed to decrease by 4%.
[d] For products with nominal thickness greater than 1.5mm, the value r_{90} is allowed to decrease by 0.2%.
[e] For products with nominal thickness less than or equal to 0.70mm, the value r_{90} is allowed to decrease by 0.2 and the value n_{90} is allowed to decrease by 0.01.

表 A18：

牌号 Grade	拉伸试验[a, b, c, d] Tensile test [a, b, c, d]		
	屈服强度 不大于 Yield strength MPa ⩽	抗拉强度 不小于 Tensile strength MPa ⩾	断后伸长率 A_{80}mm % 不小于 Elongation A_{80} % ⩾
S220GD+Z, S220GD+ZF	220	300	20
S250GD+Z, S250GD+ZF	250	330	19
S280GD+Z, S280GD+ZF	280	360	18
S320GD+Z, S320GD+ZF	320	390	17
S350GD+Z, S350GD+ZF	350	420	16
S550GD+Z [e]	550	550	–

[a] 无明显屈服时采用$R_{P0.2}$，否则采用R_{eH}。
[b] 除S550GD+Z 外，其他牌号的抗拉强度可要求140MPa 的范围值。
[c] 试样为GB/T 228 中的P6 试样，试样方向为纵向。
[d] 当产品公称厚度大于0.50mm，但不大于0.70mm 时，断后伸长率允许下降2%；当产品公称厚度不大于0.50mm 时，断后伸长率允许下降4%。
[e] 对于牌号为S550GD+Z 的产品，当产品的厚度不大于0.70mm 时，由于厚度减薄效应，导致伸长率过低，无法测得到屈服强度。此时，屈服强度用抗拉强度代替。

[a] $R_{P0.2}$ is used when no apparent yield happens, otherwise R_{eH} is used.
[b] Except grade S550GD+Z, the range value 140MPa can be required for tensile strength of other grades.
[c] Test piece is P6 specified in GB/T 228. The direction for sample taking is vertical.
[d] For products with nominal thickness greater than 0.50mm,but not greater than 0.70mm, the elongation after fracture is allowed to decrease by 2%. For products with nominal thickness not greater than 0.50mm, the elongation after fracture is allowed to decrease by 4%.
[e] For the product of Grade S550GD+Z, when the thickness is not greater than 0.70mm, yield strength can not be measured due to low elongation caused by thickness decreasing effect. In this case, tensile strength substitutes for yield strength.

A.3.3 镀铝锌基板 / Mechanical properties of hot dip Al-Zn substrate

A.3.3.1 钢板及钢带的力学性能应符合表 A19 和表 A20 的规定。除非另行规定，拉伸试样为带镀层试样。
Mechanical Properties of steel sheet and steel strip should be in conformity with the stipulations of Table A19 and Table A20. Unless otherwise specified, test piece for tensile test is samples with coating layer.

A.3.3.2 由于时效的影响，钢板及钢带的力学性能会随着储存时间的延长而变差，如屈服强度和抗拉强度的上升，断后伸长率的下降，成形性能变差等，建议用户尽早使用。
Due to effects of aging, mechanical properties of the steel plates and steel strip shall deteriorate with storage time passing, E.g. yield strength and tensile strength will rise, elongation after fracture decreases, formability deteriorates etc, it is suggested to use the material as soon as possible.

A.3.3.3 对于表 A19 中牌号为 DC51D+AZ 和 DC52D+AZ 的钢板及钢带，应保证在制造后 1 个月内，其力学性能符合表 A19 的规定。对于表 A19 中其他牌号的钢板及钢带，应保证在制造后 6 个月内，其力学性能符合表 A19 的规定。
For steel sheet and steel strip in Table A19 with grades of DC51D+AZ and DC52D+AZ , the guarantee that their mechanical properties are in conformity with the stipulations of Table A19 within one month after manufacturing should be provided. For steel sheet and steel strip with other grades in Table A19 , the guarantee that their mechanical properties are in conformity with the stipulations of Table A19 within six months after manufacturing should be provided.

A.3.3.4 对表 A20 中规定牌号的钢板及钢带，其力学性能的时效不作规定。
For the steel sheet and steel strip with grades specified in Table A20, no effective time limit for mechanical properties is specified.

表 A19：

牌号 Grade	拉伸试验[a, b] Tensile test [a, b]		
	屈服强度 Yield strength MPa	抗拉强度 Tensile strength MPa	断后伸长率 A_{80}mm % 不小于 Elongation A_{80} % ≥
DC51D+AZ	–	270～500	22
DC52D+AZ	140～300	270～420	26
DC53D+AZ	140～260	270～380	30
DC54D+AZ	120～220	260～350	36

[a] 当屈服现象不明显时采用$R_{P0.2}$，否则采用R_{eL}。
[b] 拉伸试验试样为GB/T 228中的P6试样，试样方向为横向样。
[c] 当产品公称厚度大于0.50mm，但小于等于0.70mm时，断后伸长率允许下降2个单位；当产品公称厚度不大于0.50mm时，断后伸长率允许下降4个单位。

[a] $R_{P0.2}$ is used when no apparent yield happens, otherwise ReL is used.
[b] Test piece for tensile test is P6 specified in GB/T 228. The direction of sample taking is horizontal.
[c] For products with nominal thickness greater than 0.50mm, but less than or equal to 0.70mm, the elongation after fracture is allowed to decrease by 2 units. For products with nominal thickness not greater than 0.50mm, the elongation after fracture is allowed to decrease by 4 units.

表 A19：

牌号 Grade	拉伸试验[a, b, c] Tensile test [a, b, c]			
	屈服强度 不大于 Yield strength MPa ⩽	抗拉强度 不小于 Tensile strength MPa ⩾	断后伸长率 A_{80}mm % 不小于 Elongation A_{80} % ⩾	
			A_{80}mm	(L_0=50mm, b=25mm)
S250GD+AZ [d]	250	330	19	–
S300GD+AZ [d]	300	380	18	–
S350GD+AZ [d]	350	420	16	–
S550GD+AZ [e, f]	550	550	–	2

[a] 拉伸试验试样为纵向样。
[b] 当屈服现象不明显时采用$R_{P0.2}$，否则采用R_{eH}。
[C] 当产品公称厚度不大于0.70mm时，断后伸长率允许下降2个单位。
[d] 试样为GB/T 228中的P6试样。
[e] 试样为GB/T 228中的P14试样。
[f] 对于牌号为S550GD+AZ的产品，当产品的厚度不大于0.7mm时，由于厚度减薄效应，导致伸长率过低，以致无法测得到屈服强度。此时，屈服强度用抗拉强度代替。

[a] Test piece for tensile test is vertically-taken sample.
[b] $R_{P0.2}$ is used when no apparent yield happens, otherwise R_{eH} is used.
[c] For products with nominal thickness not greater than 0.70mm, the elongation after fracture is allowed to decrease by 2 units.
[d] Test piece is P6 specified in GB/T 228.
[e] Test piece is P14 specified in GB/T 228.
[f] For the product of Grade S550GD+AZ, when the thickness is not greater than 0.70mm, yield strength can not be measured due to low elongation caused by thickness decreasing effect. In this case, tensile strength substitutes for yield strength.

Prepainted Steel Sheets

Introduction of Coatings

涂料介绍

组成 Composition

- **涂料的组成及其作用**

  各种不同的涂料，都有四个部分组成，即(1)树脂 (2)颜料 (3)溶剂 (4)助剂。其中溶剂是挥发部分。

  (1) 树脂

  树脂即成膜物质，是涂料中的最主要成分和基础，也称基料，它是决定涂膜性质的主要因素。

  要求作为成膜物质的树脂在涂料储存期内相当稳定，不发生明显的物理变化和化学变化；在成膜时，在规定的条件下，能迅速固化成膜。

  树脂种类繁多，在卷材涂料中常用的树脂有丙烯酸树脂、环氧树脂、聚酯树脂和聚氨酯等。不同的树脂，其物理性能和化学性能、以及耐候性、耐蚀性是不一样的。

  (2) 颜料

  颜料须与树脂配合使用，在涂料中的主要作用是使涂膜着色，颜料比例不同会影响涂膜硬度、光泽度以及耐蚀性等。

Prepainted Steel Sheets

(3) 溶剂

溶剂是液态涂料的重要组成部分，在涂料烘干过程中是能挥发的成分。一般也用溶剂调节涂料粘度，这种用于调节涂料粘度的溶剂称为稀释剂。溶剂对涂料的制造、贮存、涂敷、漆膜的形成和成膜质量有着很大的影响。

(4) 助剂

助剂是为改善涂料性能而加入的少量添加剂。助剂在涂料中用量极少，作用却显著，如有的能改进涂料和涂膜的性能，有的能改善烘干时间、有的能防止涂膜产生病态等。助剂种类繁多，有催干剂、固化剂、流平剂、消泡剂、消光剂、稳定剂等。

The solvent is an important component of liquid coating, which is volatile while baking the coating. Generally, the solvent is also used to adjust the viscosity of the coating, and the solvent of this kind is also called diluent. The solvent has important influences on the production, storage and application of coating, the formation of the membrane and the quality of the membrane formation.

(4) Additives

The accessory ingredient is a small amount of additive for improving the performance of coating. Although the dosage of the accessory ingredient is little in the coating, its function is remarkable. For instance, some of them can improve the performance of coating and that of the membrane, some can adjust the baking time, and some can prevent the membrane from morbidity. There is a great variety of the accessory ingredients, including siccative, curing agent, leveling agent, defoaming agent, flatting agent, stabilizing agent, etc.

▸ **Composition and function of coatings**

Every kind of coating consist of four kinds of ingredients, namely (1) resin, (2) pigment, (3) solvent, and (4) additives. Among them, the solvent is a kind of volatile organic compound.

(1) Resin

Resin, namely the membrane forming matter, is the principal component and base of coating, also called base material, and the vital factor determining the property of the membrane. It is required that, being a membrane forming matter, resin should be very stable without any obvious physical change or chemical change in the storage period of coating. Under the specified condition, it can should be quickly dried and congealed into a membrane within the period of membrane formation. There is a great variety of resin products, among which the commonly used ones in the coil coating consist of acrylic resin, epoxy, polyester resin, polyurethane, etc. Different resin has different physical & chemical characteristics as well as different properties in weatherproof, and corrosion resistance.

(2) Pigment

Pigment must match resin in coating, which mainly colors the membrane. Different proportion of pigment of the coating membrane has different rigidity, glossiness, and corrosion resistance, etc.

(3) Solvent

Introduction of Coatings

涂料介绍

分类 Classified

Prepainted ***Steel Sheets***

用　途	建筑涂料和家电涂料
结　构	底漆、面漆
树　酯	环氧、聚酯 、硅改性聚酯 、聚氨酯、聚偏氟乙烯等
功　能	自洁，抗静电、隔热等

Usage	coating for electrical household appliances
Structure	primer, finish coating
Resin	Epoxy, polyester, silicon modified polyester, polyurethane, polyvinylidene fluoride, etc.
Function	Easy-cleaning, antistatic, heat insulation, etc.

Prepainted Steel Sheets

▸ 底漆种类和膜厚

底漆有环氧、聚酯、丙烯酸和聚氨酯等。

一般根据产品的用途、使用场合、加工程度，以及与面漆的配套来选择底漆。底漆的膜厚通常为5～7um。

(1) 环氧底漆

与基材的附着力良好、耐水、耐碱、抗化学腐蚀性好，是最早的卷材用底漆，柔韧性能不如其它底漆。

(2) 聚酯底漆

对基材的附着力好、柔韧性优异、对潮湿的环境较敏感、耐化学药品不如环氧底漆。

(3) 水溶性丙烯酸底漆

对基材的附着力良好、很好的柔韧性、有机溶剂含量低、低温固化。

(4) 聚氨酯底漆

具有耐化学药品性、耐久性、柔韧性好。

▸ Category and film thickness of primers

The category of the primer includes epoxy, polyester, acrylic acid, polyurethane, etc.

In general, the primer is chosen in accordance with the usage, environment condition, processing stage and finish coat. The film thickness of the primer is usually 5~7 um.

(1) Epoxy primer

The epoxy primer has a strong adhesion to the base metal and good properties in waterproof, alkali-proof and chemical resistance, which is the original primer for the coiled steel, having a poorer flexibility than that of other primers.

(2) Polyester primer

The primer has strong adhesion to the base metal and excellent flexibility, which is relatively sensitive to damp environment and has a chemical resistance poorer than that of epoxy primer.

(3) Water-soluble acrylic acid primer

The primer of this kind has strong adhesion, excellent flexibility, lower organic solvent and low-temperature curing.

(4) Polyurethane primer

The primer of this kind has excellent chemical resistance, durability and flexibility.

Introduction of Coatings

涂料介绍

面漆种类及特点

Category and characteristics of finish coats

Prepainted ***Steel Sheets***

- **面漆种类**

在卷钢涂料中，起耐久性作用的是树脂和颜料，最常用的面漆有聚酯、硅改性聚酯、高耐久性聚酯和聚偏氟乙烯等。

(1) 聚酯

附着力良好、颜色丰富、在成型性和室外耐久性方面范围较宽、耐化学药品性中等、成本低。

(2) 硅改性聚酯

涂膜的硬度、耐磨性和耐热性良好；以及良好的外部耐久性和抗粉化性、光泽保持性，柔韧性一般、成本中等。

(3) 高耐久性聚酯

优良的颜色保持性和抗紫外线性能、优良的室外耐久性和抗粉化性、漆膜附着力好、颜色丰富、优异的性价比。

(4) 聚偏氟乙烯

优异的颜色保持性和抗紫外线性能、优异的室外耐久性和抗粉化性、优良的抗溶剂性、良好的成型性、抗脏性、颜色有限、成本高。

Prepainted Steel Sheets

- **Category of finish coats**

  Among all the ingredients of coil coatings, resin and pigment have the function of duration, and the primers commonly used consist of polyester, silicon modified polyester, polyvinylidene fluoride, high durability polyurethane, etc.

  (1) Polyester

  The finish coat of this kind has strong adhesive force, a variety of colors, wide scope of properties in formation and durability outdoors, moderate chemical resistance and low cost.

  (2) Silicon modified polyesters

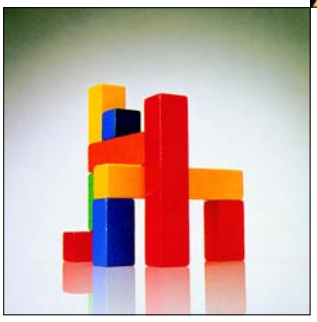
  The membrane of the finish coat of this kind has excellent rigidity, abrasion resistance, thermal resistance, good outside durability, chalking resistance, high retention of color and luster, ordinary flexibility, moderate cost, etc.

  (3) High-durability polyester

  The finish coat of this kind has excellent retention of color, resistance of ultra-violet radiation, strong outdoors durability, chalking resistance, strong adhesion to the base metal, plenty of colors and relatively lower cost compared to the same quality.

  (4) Polyvinylidene fluoride

  The finish coat of this kind features in its excellent retention of color, resistance of ultra-violet radiation, outdoors durability, chalking resistance, resistance to solvent, formability, good dirt resistance, finite colors and high cost.



涂层性能
Performance of Coating Film

1、宝钢彩涂板正面常规性能
Common performance of front coating of baosteel's prepainted steel sheet

涂料种类 Category	涂层厚度 Thickness (μm)	铅笔硬度 Pencil hardness	60°涂层镜面光泽 60° specular glossiness of coating			180°弯曲[a] 180° bend[a]		反向冲击 Impact (J)	耐盐雾 saltfog resistant (h)
			低 Low	中 Moderate	高 High	厚度≤0.75mm（钢窗料厚度≤0.80mm） Thickness ≤0.75mm (thickness of steel materials for door and window ≤0.80mm)			
						A级 A level	B级 B level		
聚酯 PE	≥20	≥F	＜40	40～70	＞70	≤5T	≤3T	≥9	≥500
硅改性聚酯 SMP	≥20	≥F	＜40	40～70	＞70	≤5T	≤3T	≥9	
高耐久性聚酯 HDP	≥20	≥HB	＜40	40～70	–	≤5T	≤2T	≥9	≥1000
聚偏氟乙烯 PVDF	≥20	≥HB	＜40	40～70	–	≤5T	≤2T	≥9	≥1000

a：厚度>0.75mm（钢窗料厚度>0.80mm）的钢板及钢带做90°弯曲。
if the thickness >0.75mm(thickness of steel materials for door and window >0.80mm), the steel sheet or coil should be curved by 90°.

2、宝钢不同背面涂层结构的性能比较(控制值)

Performance Comparison for Different Back Coating Structures of Baosteel (Controlling Value)

涂层结构/Coating structure	2/1	2/1M	2/2
涂层数/Coating layer	1	2	2
颜色/Color	黄绿色/Yellow-green	钢白/Steel white	云白/Cloud white
涂层厚度/Coating thickness	5-7μm	8-10μm	13-18μm
光泽/Glossiness	-	30-50	40-60
铅笔硬度/Pencil hardness	F-2H	≥F	F-2H
反向冲击/Reverse Impact	≥9J	≥9J	≥9J
柔韧性/Flexibility	≤3T	≤3T	≤3T
用途/Application	夹芯板/Sandwich sheet	夹芯板、单层压型板 Sandwich sheet, Single layer panel	单层压型板/Single layer panel

Prepainted ***Steel Sheets***

Introduction of New Products

新产品介绍

高耐久性聚酯 (HDP)
High-durability polyester

▸ **HDP 涂料耐久性好的原理**

(1) 树脂：HDP 采用高分子量的树脂，聚合物支链少，键能稳定，不易光解，因此不易粉化和光泽降低。

(2) 颜料：HDP 采用无机陶瓷颜料，在日光中不易褪色 。

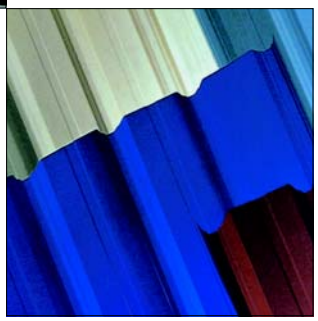
宝钢高耐久性聚酯的供应商为世界上最早的也是最大的涂料公司之一，*提供15年涂层质量保证*，保证15年内涂层不脱落，不粉化。

HDP 与 PE 涂层 QUV 试验对比

QUV testing comparision of HDP coating & PE coating

试验方法 Test method	光泽保持率 Retention rate of glossiness		色差（ΔE） Color difference (ΔE)	
(ASTM G53)	普通聚酯 Common polyester PE	HDP	普通聚酯 Common polyester PE	HDP
QUVA(2000H)	＞70%	100%	＜3	＜1
QUVB(500H)	＞20%	＞80%	＜5	＜3

Prepainted Steel Sheets



- **Reasons why HDP has longer durability**

  (1) Resin: HDP adopts the high molecular weight resin with little branched chain polymer, stable bond energy and resistance to photolysis, so HDP has a relatively good resistance to chalking and excellent retention of luster.

  (2) Pigment: HDP adopts inorganic ceramic pigments, which makes it hard to fade in the sunlight.

  The supplier, one of the earliest and largest coating enterprises in the world, who provides Baosteel with high-durability polyester (HDP), ***offers a quality guarantee of their coating products for 15 years***, and assure that the coating layer by their coating products have excellent resistance to shedding and chalking within such 15 years.

Introduction of New Products

新产品介绍

聚偏氟乙烯 (PVDF)
Polyvinylidene fluoride

Prepainted Steel Sheets

▸ **氟碳彩板的用途**

PVDF 氟碳涂层为现有建筑涂层中的极品，为公认的具有最好保护作用的有机涂层，能保证金属建筑板几十年不受损害，并始终保持美丽的颜色。从1965年进入市场起，氟碳涂层在世界各地的建筑物经历了30多年的日晒风吹雨打，始终保持完美无损。PVDF 为聚偏氟乙烯。氟原子最大的电负性能形成十分稳固的氟碳键，加上其分子独特的对称性，使 PVDF 具有超常的稳定性，独特的抗紫外光光解性能及优异的绝缘性能和机械性能。

▸ **涂料性能**

该产品积累了三十多年的生产技术经验，涂料采用专利配方，Kynar 500 或 Kynar 5000，无机陶瓷颜料，每一种新的原料都必须经过佛罗里达十年曝晒证明才能商业使用，从而使产品质量得到可靠保证。美国Fitzpartrick核电站厂房彩板采用热镀锌基板，涂上含 70% 树脂的氟碳涂料。1971 年建成至今不仅表面及基板完好，而且色彩依旧。

宝钢氟碳涂料的供应商为世界上最早的也是最大的氟碳涂料公司之一，*提供20年涂层质量保证*，保证20年内涂层不脱落，不粉化。

Prepainted Steel Sheets

- **Usage of fluorocarbon prepainted sheet**

  The PVDF fluorocarbon coating is a masterwork among the existing construction coatings, which is generally acknowledged as an organic coating with the best protective performance, guarantees the metal building board not to be damaged for decades and always retains its beautiful color. Since entering the market in 1965, the fluorocarbon coatings world-widely applied to buildings have already successfully traveled through various poor weathers and still remained perfect in the past 30 years. PVDF denotes polyvinylidene fluoride. The fluorine-carbon bond formed by a fluorine atom with the largest electronegativity, together with its unique symmetry of molecule, lets the PVDF has an extra stability, unique resistance to photolysis of ultra-violate radiation, excellent insulation and mechanical properties.

- **Performance of coating**

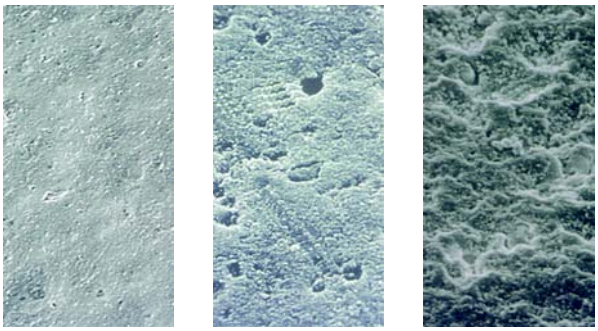
  Baosteel has already accumulated more than 30 years' technical & production experience of the coatings of this kind. The coating adopts some patented recipes, Kynar 500 or Kynar 5000, and inorganic ceramic pigment, and each kind of new materials must be put into commercial uses upon Florida's ten-year insolation certificate, which guarantees the product quality. The prepainted steel sheet for the workshop of Fitzpartick Nuclear Power Plant of the U.S.A. adopts the hot-dip zinc coated base metal that is coated with the fluorocarbon coating with 70% resin content. Since the workshop was built in 1971, while not only the surface and the base metal of the prepainted steel sheet are still perfect, but also its color is retained well.

涂料曝晒后表面比较(放大 1000 倍)

Comparison of coating surface after insolation (enlarge by 1000 times)

佛落里达 45 度角向南

Florida: in the south by an angle of 45 degree



PVDF 氟碳 13 年
PVDF fluorocarbon: 13 years

SMP 硅改性聚酯 9 年
SMP silicon modified polyester: 9 years

PE 聚酯 6 年
PE polyester: 6 years

The supplier, one of the earliest and largest coating enterprises in the world, who provides Baosteel with PVDF, ***offers a quality guarantee of their coating products for 20 years***, and assure that the membrane of the membrane formed by their coating products have excellent resistance to shedding and chalking within such 20 years.

宝钢氟碳彩板实物质量(2001)

Actual quality of Baosteel's fluorocarbon prepainted steel sheet in 2001

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

Introduction of New Products

新产品介绍

自洁 Easy-cleaning

Prepainted Steel Sheets

- **1、什 么让彩板变脏了?**

  天晴时空气中的污染物以及下雨时雨水中的污染物都会残留于墙面或屋顶彩板涂层的表面，形成图 1 的景象。

  根据污染物特性和使用环境污染物分为城市型和郊区型。

  城市型：汽车尾气、工业粉尘颗粒等。

  郊区型：尘土。

- **2、何为自洁彩板?**

  自洁彩板是一种新型的户外建筑用彩涂钢板。它的有机涂层除了具有普通彩板的高装饰性及耐候性外，还具有特殊的自清洁功能。采用这种材料制成的厂房不需要人工清洗维护，只借助于雨水的冲刷就能在空气质量较差的工业和城市地区保持屋顶和墙面彩板的外观鲜艳性，保持彩色涂层的高装饰性。

- **3、不同涂层体系的沾灰及可清洁性**

  氟碳涂料：中低等的沾灰程度，具有很好的可清洁性。

  普通聚酯体系：高的沾灰程度，不易清洁。

  宝钢目前自洁板：中高的沾灰程度，易清洁。

- **4、宝钢自洁彩板**

  具有优异的抗沾污性能，能抵抗污染物渗透靠漆膜内。优异的亲水性能保证了雨水充分展开于涂层表面，起到良好的冲刷效果。

Prepainted Steel Sheets

- **1. Why does the prepainted steel sheet become dirt?**
  The pollutants produced either in a sunny day or in a rainy day may rest on the surfaces of the prepainted steel sheets applied to wall finishes or roofs, which is showed in Figure 1.
  The pollutants can be classified into two groups, namely urban pollutants and suburban ones, according to the characteristics of pollution and environment.
  Urban Pollutants: auto exhaust gas, industrial dust and fog, etc.
  Suburban: dust.
- **2. What's the easy-cleaning prepainted steel sheet?**
  The easy-cleaning prepainted steel sheet is a new prepainted steel sheet for outdoors construction. Its organic coating not only has excellent properties of decoration and weatherproof that common prepainted steel sheets might possess but also has the special self-cleaning function. The factory buildings built by the prepainted steel sheets of this kind needn't any manually-operated cleaning or maintenance, which can retain the cleanness and glossiness of the prepainted steel sheets applied to the walls and roofs only by rainwater, even those in the industries and cities with poorer air quality, and can maintain the high decorative property of the prepainted steel sheets.
- **3. Different coating system might have different contamination and cleaning property**
  Fluorocarbon coating: at the medium and low contamination level, and easy to clean.
  common polyester system: at high contamination level, and hard to clean.
  Easy-cleaning sheet: at medium and high contamination level, easy to clean.
- **4. Baosteel's easy-cleaning prepainted steel sheet**
  Has excellent resistance to staining, which can prevent the pollutants from being penetrated into the coating membrane. Its good water solubility ensures that the rainwater can fully cover the surface of the coating and cleanse the surface well.

图 1：白灰墙面彩板使用 1 年后的表面污染情况

Figure 1: One year after the prepainted steel sheet is applied to the lime wall finish

下图为普通涂层与自洁涂层对比情况

Comparision of common coating & easy-cleaning coating

普通彩板挂片半年后的实物

Actual view of common prepainted steel sheets applied after half a year

自洁彩板挂片半年后的实物

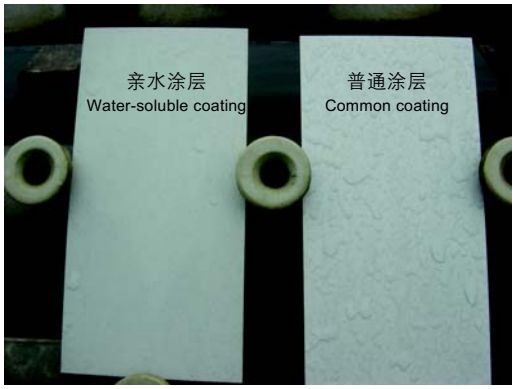
Actual view of Baosteel's easy-cleaning prepainted steel sheets applied after half a year

普通彩板

Common prepainted steel sheets

宝钢自洁彩板

Baosteel's easy-cleaning prepainted steel sheet



亲水涂层与普通涂层对比

Comparision of Water-soluble coating & common coating

Prepainted Steel Sheets

Introduction of New Products

新产品介绍

抗静电 Antistatic

抗静电用彩涂板

- **1、静电的产生**

不同物质的分子、原子以及对电子的相互吸引作用不同瞬间就能产生电荷，这种电荷称之为静电荷。即使很小的静电荷也能产生极高的静电压。一般来说，极性基团较多的聚合物容易携带正电荷，反之则容易携带负电荷。

在日常生活中到处都有产生静电的现象。如人在空调房间走过合成地毯时能产生超过 1000 伏特的电荷积累；在冬天穿脱衣服和汽车开门时会产生手被电击的感觉。

导体和半导体表面也会产生静电现象，但是由于电荷能在表面和材料内部传递，因此不会在表面产生静电荷的积累。而彩涂产品表面的聚酯或氟碳是高分子聚合物，属绝缘材料，一旦带上电荷则很难去除。

- **2、静电的危害**

（1）吸附灰尘和细菌。

（2）降低产品的表面及使用性能。

（3）引起静电放电会造成燃烧或爆炸。

Prepainted Steel Sheets

▸ 3、抗静电彩涂板的工作原理

抗静电彩涂板的抗静电原理是在绝缘的聚酯涂层中加入导电性材料，使原来绝缘的涂层变成半导体，配合建筑工程的接地线的安装，可使彩涂钢板表面因空气对流及衣物摩擦而产生的静电得以导入大地而消失。

▸ 4、抗静电彩涂板的用途

主要用在抗静电、高清洁度无尘、无菌场所。如：电子半导体业、食品加工业、制药业、医院等。

▸ 5、抗静电彩涂板的性能

（1）加工性和耐久性能和普通聚酯相当。

（2）耐化学药品性及耐溶剂性略高于普通聚酯。

（3）表面电阻(Ω/cm^2)为10^6-10^9Ω,(普通聚酯在10^{13}Ω左右)。

Antistatic prepainted steel sheet

▸ **1: Source and danger of static electricity**

The electric charge may be generated instantaneously when different molecules and atoms are absorbing one another and interacting, which is also called static charge. Even very small static charge can generate a high static voltage. Generally speaking, the polymer with many polar groups is apt to carry positive charge; otherwise, it is apt to carry negative charge.

In our daily life, the static there are various static phenomena. For example, a voltage over 1000 volt may produce while a man is walking on the composite carpet in an air conditioning room, and our hand always feel an electric shock while we are taking off in winter, or opening doors of the auto car.

The surface of both conductor and semiconductor may also generate static electricity; however, because the accumulated charge can be conducted by the surface and the internal of materials, there is little static charge accumulated there. While the polyester or fluorocarbon on the surface of the prepainted steel sheet is a kind of high molecule polymer, which is an insulating material. However, as long as the surface generates electric charge, it may be really hard to discharge.

▸ **2: The danger of accumulation of static charge on the surface:**

(1) Adsorbing dust and bacteria.
(2) Damage the performance and usage of the surface of the product.
(3) Cause the static electricity discharged, which may bring about fire disaster or explosion.

▸ **3: Working principle of the antistatic prepainted steel sheet**

The working principle of the antistatic prepainted steel sheet is to add some conducting materials in the insulating polyester coating, which gets the former insulated coating, become a semiconductor. Being assorted with the earthing system of the construction, the accumulated static electricity on the surface of the prepainted steel sheet that is sourced from air convection or fabric friction is conducted into the earthing system and then disappears.

▸ **4: Usage of the antistatic prepainted steel sheet**

Mainly used in antistatic, high cleanness and bacteria-free environments, covering: electronic semi-conductor industry, foodstuff processing industry, pharmaceutical industry, hospitals, etc.

▸ **5: Performance of the antistatic prepainted steel sheet**

(1) Its machining property and durability match that of the prepainted steel sheet with common polyester as its base metal.
(2) Its resistance to chemicals and solvents is slightly higher than that of the common polyester prepainted steel sheet.
(3) Its surface resistance(Ω /cm2) is 106-109 Ω(common polyester prepainted steel sheet: about 10 Ω).

Introduction of New Products

新产品介绍

Prepainted Steel Sheets

彩涂印花钢板

定义：

彩涂印花钢板也称印刷钢板，是在钢板上涂一层油漆烘烤后，用照像凹版技术印刷出图案，再涂上透明漆经烘烤而成之产品。

图纹：

图纹一般是木纹状的，用户若有特殊要求，可另行协商研制。

用途：

主要用作内外墙壁及室内物品装饰。

金属压花彩涂钢板

定义：

金属压花彩涂钢板是在钢板彩涂之后，进行压花处理使彩涂钢板被压出凹凸花纹的产品。

用途：

金属压花彩涂钢板因具有优良立体感，广泛应用于室内装饰面板等用途。

可供规格：

金属压花彩涂钢板不受涂层品种限制，但因使金属变形较为困难故基板厚度一般不超过 0.60mm。

印花钢板

压花钢板

三涂层厚膜彩涂钢板

定义：

厚膜彩涂产品是指涂层膜较厚的彩涂产品，一般彩涂产品膜厚在25μm以下，厚膜产品的膜厚一般在30μm以上。

厚膜产品一般采用多涂层技术，宝钢以三涂层为主，涂层（正面）由三层涂层构成，包括底涂、中涂、面涂，背面也可根据需要涂敷2层或3层涂层。中涂、面涂主要采用氟碳(PVDF)、高耐久性聚酯(HDP)优异的涂料品种。

该产品在提供厚涂层的同时，还可生产特殊效果表面涂层（如珠光效果）。

用途：

三涂层产品是一种高质量、长寿命、高成本的产品，主要应用于体育场馆、机场建筑、大型电厂等国内外重大的工程建设项目及环境恶劣的建筑。

Color-coated Printed Steel Sheet

Definition:

Color-coated printed steel sheet, also called printed sheet, is prepared by being coated with a layer of paint and baked pattern is printed out using the gravure technologies ,then a layer of clear lacquer is coated and after being baked again, color-coated printed steel sheet is obtained.

Patterns:

Patterns are typical wood texture (as shown in the figure). Special requirements from customers may be met via negotiation and research otherwise.

Application:

Mainly applied to decoration for interior and exterior walls and indoor items.

Metal Embossed Color-coated Steel Sheet

Definition:

Metal embossed color-coated steel sheet is the product prepared via being color-coated and applied to produce embossed patterns on color-coated steel sheet.

Application:

Metal embossed color-coated steel sheet is extensively applied as indoor decoration panels because of its good stereoscopic impression.

Provided specification:

Metal embossed color-coated steel sheet is not limited by coating types. But the substrate thickness is normally no more than 0.60mm as it may make the metal hard to deform.

Tri-coating Color-coated Steel Sheet with Thick Film

Definition:

Color-coated products with thick film refers to the color-coated products with thick coating film. The film thickness of common color-coated products is less than 25μm and while that of thick film products is more than 30μm.

Thick film products are normally prepared by the multi-coating technology. Baosteel mainly adopts the tri-coating technology. The coating (facade) is composed of three layers of coatings, including the prime coating, medium coating and top coating. Two or three layers of coatings may be applied to the backside according to the actual demands. PVDF, HDP and other paints with good durability are mainly applied to medium coating and face coating.

When thick coating is provided by such products, surface coating with special effects also can be generated（e.g. pearlescent effect）.

Application:

Tri-coating product is a kind of product with high quality, long service life span and high cost. It is mainly applied to stadium building, airport architecture, large scale power plant, other home and abroad great engineering construction projects and buildings in bad environment.

Introduction of New Products

新产品介绍

Prepainted Steel Sheets

家电冷轧彩涂板

定义：

用冷轧板作为基板直接进行彩涂的彩色涂层钢板。

钢种：

普通、冲压、深冲压

用途：

主要应用于家电产品，如冰箱侧板、冰柜箱体等，该产品不适用于建筑。

家电环保彩涂板

定义：

通过对镀层、预处理和涂料中有害元素（铅、镉、六价铬等）的控制及合适的环保彩涂产品生产工艺，生产符合欧洲 RoHS 指令 (2002/95/EC)的家电用彩涂钢板。

基板种类：

电镀锌基板、热镀锌基板、镀铝锌基板、冷轧基板。

钢种：

普通、冲压、深冲压

涂层结构：

2/1,2/2,2/1M

颜色：

普通素色、金属色、珠光色

用途：

冰箱侧板、空调室内机侧板、空调室外机面板、洗衣机箱体、冰柜箱体、DVD 上盖板、微波炉箱体、热水器外壳、灯罩等

Prepainted Steel Sheets

抗菌彩涂板

定义：

抗菌即先控制微生物的活动和繁殖，创造一个清洁环境，并将其逐步杀灭的一种长期杀菌作用;以生活环境中生息的细菌为对象，抗菌效果可续数年以上,长期保持生活环境的（微生物学）卫生性。

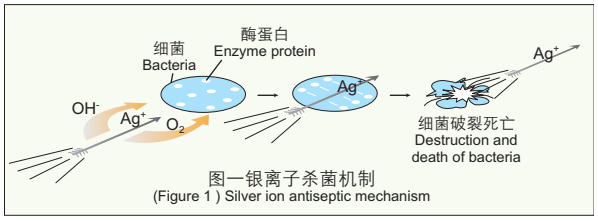
机理：

金属离子溶出型的抗菌机理，在使用过程中抗菌剂缓慢释放出金属离子，溶出的金属离子即能破坏细菌的细胞膜或细胞原生质活性酶的活性，而具有抗菌效果。

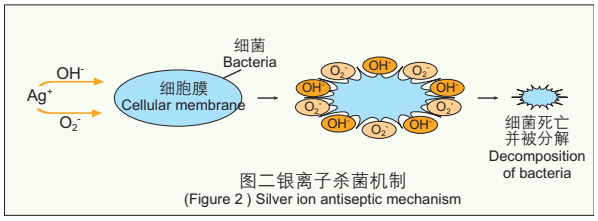
抗菌彩涂板一般采用无机类抗菌剂，使用复合的金属离子溶出型和活性氧的抗菌剂，达到长效和广谱抗菌的要求，低毒性和高效快速。

用途：

用于医院墙面、天花板、食品储藏加工区域、通风系统等。



图一银离子杀菌机制
(Figure 1) Silver ion antiseptic mechanism



图二银离子杀菌机制
(Figure 2) Silver ion antiseptic mechanism

Home Appliance Cold Rolling Color-coated Sheet

Definition:
Color-coated steel sheet with color coating directly carried out on cold rolling sheet as substrate.

Steel type:
Normal, drawing and deep drawing.

Application:
Mainly applied to home appliance products such as refrigerator side sheet, freezer cabinet, etc. But such products are not applicable to buildings.

Environmental Friendly Home Appliance Color-coated Sheet

Definition:
To produce the home appliance color-coated steel sheet in accordance with European RoHS Directive (2002/95/EC) by controlling hard elements (lead, cadmium, hexavalent chrome) in plated layer, pre-treatment and coating and adopting proper environmental friendly production processes for color-coated products.

Substrate type:
Electro-galvanized substrate, hot dip galvanized substrate, aluminum-zinc coated substrate, cold rolling substrate.

Steel type:
Normal, drawing, deep drawing.

Coating structure:
2/1, 2/2, 2/1M.

Color:
Normal solid color, metal color, pearlescent color.

Application:
Refrigerator side sheet, indoor air conditioner side sheet, outdoor air conditioner panel, washing machine cabinet, freezer cabinet, DVD upper cover, microwave oven cabinet, water heater case, lamp cover, etc.

Antiseptic Color-coated Sheet

Definition:
Antisepsis is a long period germicidal action to control the activity and propagation of microorganisms to create a clean environment and then gradually kill all these microorganisms. As for bacteria growing in the living environment, the antiseptic effects may continue for more than several years and maintain long period (microbiology) hygiene for living environment.

Mechanisms:
Stripped metal ion antiseptic mechanism. Antiseptic agent slowly releases metal ions in application. Stripped metal ion can destroy the cell membrane of bacteria or activity of cellular protoplasm active enzyme, so it has antiseptic effects.
Antiseptic color-coated sheet normally adopts the inorganic antiseptic agent. To meet the requirements for long acting and board spectrum antisepsis, low toxicity and high efficiency and quick speed, the antiseptic agent combining stripped metal ions and active oxygen are used.

Application:
Used for hospital wall face, ceiling, food storing and processing area, ventilating system, etc.

Test
试验

腐蚀过程 Process of Corrosion

Prepainted Steel Sheets

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:

劣化过程/Process of deterioration	原因/Reason
失光、变色/Lost of gloss, color change	树脂、颜料变化、分解/Decomposition, chalking of resin and pigments
粉化、开裂/Chalking and shedding	由于树脂分解使表面出现粉末状龟裂/Surface fracture and chalking after the decomposition of the resin
起泡、脱落/Foaming and shedding	起因于锌生锈，在表面渗出/Caused by the rusted zinc content seeped through the surface
白锈、红锈/White/red rust	起因于局部的初期腐蚀和铁的腐蚀/Caused by partially initial corrosion and the corroded base metal

试验方法 Method of test

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。

2、耐中性盐雾试验

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。

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. Test of resistance to neutral salt mist

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).

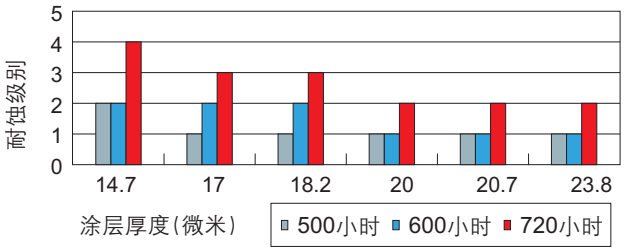
Test

试验

试验方法 Method of test

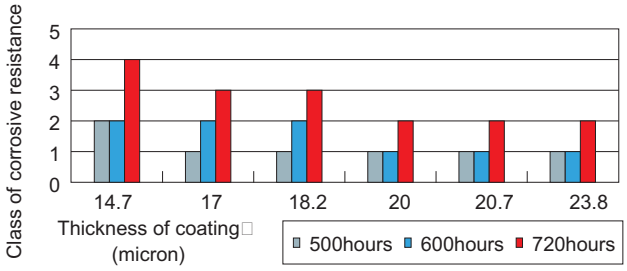
Prepainted Steel Sheets

涂层厚度对彩涂板耐蚀性的影响试验(耐盐雾性能)



注：耐蚀级别数越小性能越好

The corrosive resistance influence by the thickness (Saltfog resistant)



Note: the smaller the class of the corrosive resistance is, the better performance is.

Prepainted Steel Sheets

宝钢彩涂板中性盐雾试验结果

Results of the test of resistance to neutral salt mist of Baosteel's prepainted steel sheet

5%NaCL，35 ± 2℃连续喷淋 1000 小时

5% NaCL, 35 ± 2℃ continuous sprinkling for 1000 hours

彩涂板种类 Category of prepainted steel sheet	颜色 Color	起泡等级 The grade of foaming	生锈等级 The grade of rust	表面情况 Surface conditions
普通聚酯PE Regular polyester PE	海兰 Sea blue	0级 Zero level	不生锈 No rust	无变化 No change
普通聚酯PE Regular polyester PE	白灰 Grey	0级 Zero level	不生锈 No rust	无变化 No change
普通聚酯PE（镀铝锌基板） Regular polyester PE (alu-zinc coated base metal)	白灰 Grey	0级 Zero level	不生锈 No rust	无变化 No change
硅改性SMP Silicon modified the polyester SMP	香山白 White	0级 Zero level	不生锈 No rust	无变化 No change
硅改性SMP Silicon modified the polyester SMP	海兰 Sea blue	0级 Zero level	不生锈 No rust	无变化 No change
高耐久性HDP High duration of HDP	蚝白 Oyster white	0级 Zero level	不生锈 No rust	无变化 No change
高耐久性HDP High duration of HDP	净月灰 Moon grey	0级 Zero level	不生锈 No rust	无变化 No change
氟碳PVDF Fluorocarbon PVDF	宝钢灰 Royal grey	0级 Zero level	不生锈 No rust	无变化 No change
氟碳PVDF Fluorocarbon PVDF	宝钢蓝 Royal blue	0级 Zero level	不生锈 No rust	无变化 No change

试验标准：ASTM B117-2003 盐雾试验标准方法

Standard of test: Standard method of salt mist by the ASTM B117-2003.

评定标准：GB/T 1766-1995 色漆和清漆 涂层老化评级方法（等同于ISO 4628-1980）

GB/T 1766-1995 color paint and varnish Grading method of coat aging(has identical effect as that of the ISO 4628-1980）

宝钢彩涂板耐酸碱试验结果
Results of the test of resistance to acid/alkali of Baosteel's prepainted steel sheet

耐弱酸、耐弱碱
resistance to acid/alkali

0.1%HCl, 0.1%NaOH，室温下浸泡 1000 小时
0.1% Hcl or NaOH, soak for 1000 hours at room temperature

彩涂板种类 Category of prepainted steel sheet	颜色 Color	变色等级 The grade of color change	失光等级 The grade of gloss loss	起泡等级 The grade of foaming	表面情况 Surface conditions
普通聚酯PE Regular polyester PE	海兰 Sea blue	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
普通聚酯PE Regular polyester PE	白灰 Grey	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
普通聚酯PE（镀铝锌基板） Regular polyester PE (alu-zinc coated base metal)	白灰 Grey	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
硅改性SMP Silicon modified the polyester SMP	香山白 White	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
硅改性SMP Silicon modified the polyester SMP	海兰 Sea blue	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
高耐久性HDP High performance of HDP	蚝白 Oyster white	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
高耐久性HDP High duration of HDP	净月灰 Moon grey	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
氟碳PVDF Fluorocarbon PVDF	宝钢灰 Royal grey	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change
氟碳PVDF Fluorocarbon PVDF	宝钢蓝 Royal blue	0级 Zero level	0级 Zero level	0级 Zero level	无变化 No change

试验标准：EN 13523-18：2003卷涂材料－试验方法－第18部分：耐污染
ASTM D1308-87（1998）日用化学品对清漆和着色有机面漆影响试验
Standard of test: EN 13523-18: 2003 Coil Coating-Test Method- Section 18:Resistance to Pollutants
ASTM D1308-87（1998） test of daily chemicals´ influence on varnish and painted organic finish coat

评定标准：GB/T 1766-1995 色漆和清漆 涂层老化评级方法（等同于ISO 4628-1980）
GB/T 1766-1995 color paint and varnish Grading method of coat aging(has identical effect as that of the ISO 4628-1980）

Test
试验

试验方法 Method of test

▸ 3、大气暴露试验

原理

彩涂板经自然大气老化后评定其涂层失光、变色、粉化、起泡、生锈、开裂等涂层老化性能。

结果

1、对于平板试样，按照GB/T 1766评定试样的失光等级、变色等级、粉化等级、起泡等级、生锈等级和开裂等级等，取平行试样的最差值为试验结果。

2、对于破坏试样，按照GB/T 1766评定试样T弯、冲击、划叉、铆接、折弯部位的起泡等级、生锈等级和边部腐蚀蔓延距离等，取平行试样的最差值为试验结果。

3、大气暴露试样的评定也可由各大气暴露试验场完成后提供试验报告。

▸ **3. Air exposure test**

Principle

Assess the loss of gloss, color change, chalking, foaming, rusting, cracking and other aging features of the coating membrane after the prepainted steel sheet aged for being exposed in the air.

Result

1. For the flat-sheet sample, assess the its grade in loss of gloss, color change, chalking, foaming, rusting, cracking, etc. by the GB/T 1766 standard, and take the worst result as the final.
2. For the sample of destroyed steel sheet, assess the grade of all parts bended in T shape, shocked, scratched, riveted or curved in foaming, rusting and outreach of corrosion, etc. by the GB/T 1766 standard, and take the worst result as the final.
3. This test can also be performed by other labs of air exposure, and it is required that the lab should submit the relevant test report to Baosteel.

Quality Assurance
质量保证

Prepainted Steel Sheets

- **质量保证**

  通过了ISO9001、ISO9002、ISO/TS16949质量认证，建立和完善了一整套质量保证体系。

  在一整套质量保证制度下，从订货、订单处理、质量设计、原料采购、生产计划的编制、产品的生产、试验检验，以及产品的包装、入库和发货等，都有完整的规程，并且通过整体产销系统计算机管理，不但提高了工作效率，而且保证了产品的质量。

- **使用承诺**

  PVDF 提供 20 年的使用承诺保证。

  HDP 提供 15 年的使用承诺保证。

- **防伪**

  彩板有专门打印标识区别于其他企业的同类产品。

- **质量检测**

  宝钢的彩涂机组装备了大量先进的在线测试仪器，以保证和提高产品的质量。并且有一整套产品性能测试的设备和方法，对日常生产出的彩涂产品进行各有关性能的测试和控制，保证了产品质量达到国内领先水平和国际同类产品的水平。

- **产销研一体化**

  我们已经形成了产销研一体化的工作制度，在对市场调查，以及对用户状况的反馈，对产品质量和品种的开发和改进方面具有重大意义。

Prepainted Steel Sheets

Quality assurance

Baosteel has already passed the authentification by the ISO9001, ISO9002 and ISO/TS16949 in succession and established a completed set of quality assurance system. Under such a complete set of quality assurance systems, there has a complete set of regulations for ordering, order handling, quality design, purchasing raw materials, working out production plan, production, test and inspection, packaging, storage, delivering, etc. In addition, the PC-based production and marketing system not only improves the working efficiency but also assures the quality of product.

Service promise

PVDF provides with a 20-year service promise.

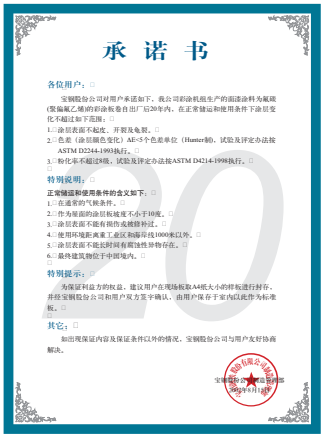
HDP provides with a 15-year service promise.

Anti-counterfeit prepainted steel sheet

The prepainted steel sheet has an unique anti-counterfeit stamp mark by which it can be easily differed from other products alike.

Baosteel's prepainted steel sheet lines are equipped with a large amount of online test instruments so that they can ensure and improve the quality of product. There also has a complete set of equipment and techniques for testing and controlling the performance of their prepainted steel products, which ensures Baosteel's product quality to take a leading position among the fellow products at home and reach the international standard.

We have established a complete set of working systems in production, marketing, research and development, which has significant meanings at all aspects, covering market investigation, response to customer´s feedback, quality control, improvement and innovation in products, etc.



Prepainted Sheets: ***Advanced Process***

Service Guide

使 用 指 南

订货 Order

Prepainted Steel Sheets

- **询价和订货**

询价和订货时请提出以下详细的内容：

产品名称（例如热镀锌彩涂板）；

技术标准（Q/BQB440-2003）；

牌号（如 TDC51D+Z）；

镀层重量（如有特殊要求应写明）；

涂层结构（如上、下表面都涂二层即 2/2；上表面涂二层，下表面涂一层即 2/1）；

规格（厚×宽×长）；

尺寸允许偏差；

正面面漆种类；

颜色（若特殊颜色需附样板并协商）；

正反面（一般面漆卷在外面）；

卷重（3-5 吨）；

卷内径（610mm 或 508mm）；

数量（吨）；

用途；

包装方式（立式或卧式）；

交货期；

Prepainted Steel Sheets

Enquiry and order

Please offer the details as follows when enquiry and ordering:

Name of Product

(e.g. hop-dip zinc-coated prepainted steel sheet)

Technical Standard

(Q/BQB440-2003) Grade (e.g. TDC51D+Z)

Weight of coating

(if any special requirement, please give clear indications.)

Structure of coating (e.g. double coatings on both top and bottom sides, i.e. 2/2; double coatings on top side and one coating on bottom side, i.e. 2/1)

Specs (thickness * width * length)

Allowance of size

Category of front finish coatings

Color (if any special requirements of color please enclose your specimen and timely negotiate with us)

Front and back (Generally finish coat coil faces outside)

Coil Weight (3~5 tons) Coil Inner Diameter (610mm or 508mm)

Quantity (tons)

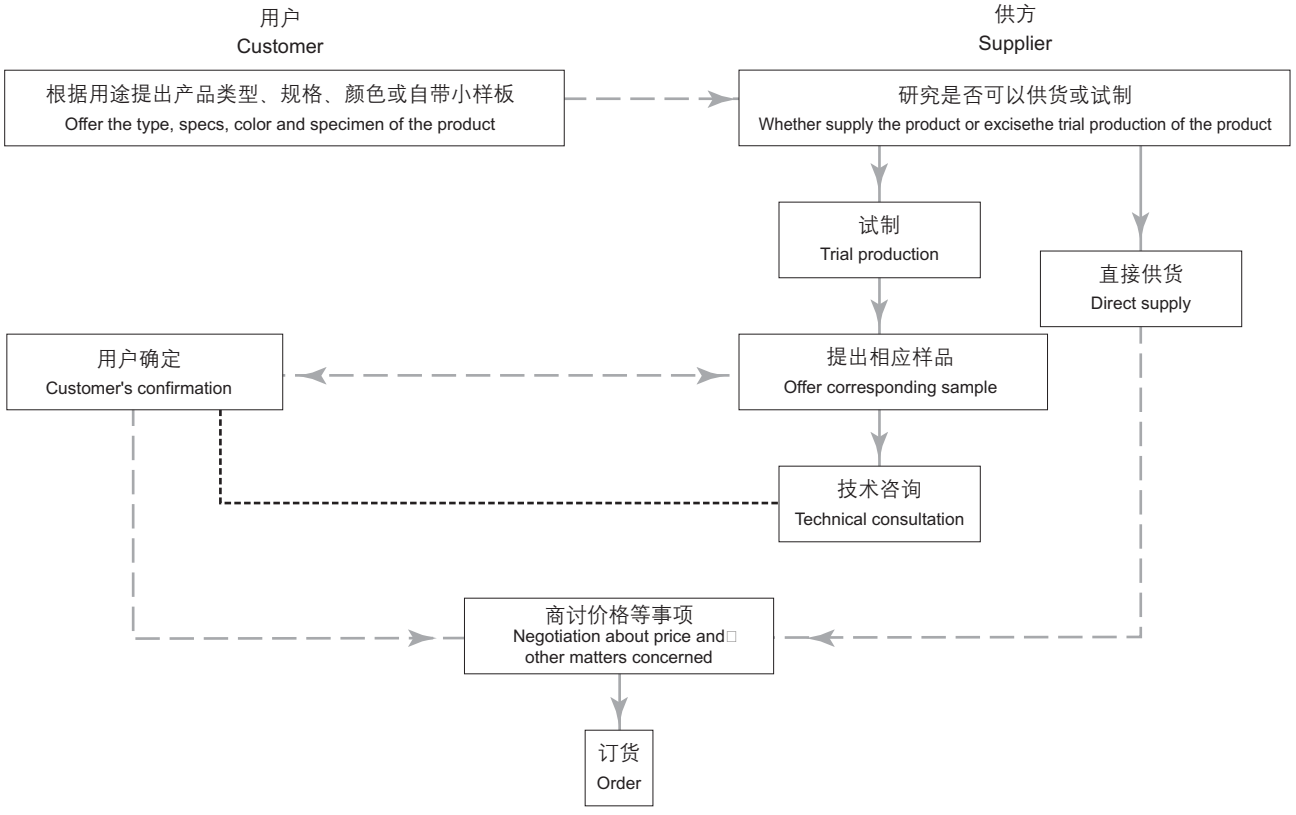
Purpose

Packing Method (vertical or horizontal)

Date of Delivery

▸ **询价订货流程：**

Flow of enquiry and order



Service Guide

使 用 指 南

选材 Material choice

Prepainted Steel Sheets

合理的选材不仅可以满足使用要求，而且可以最大限度地降低成本。如果选材不当，其结果可能是材料性能超过了使用要求，造成不必要的浪费，也可能是达不到使用要求，造成降级或无法使用。因此，用户应高度重视合理选材的重要性，必要时请与我们联系。

彩涂板的选择主要指力学性能、基板类型（镀层种类）和镀层重量、正面涂层性能和反面涂层性能的选择。用途、环境腐蚀性、使用寿命、耐久性、加工方式和变形程度等是选材时应考虑的重要因素。

- **力学性能、基板类型和镀层重量的选择**

力学性能主要依据用途、加工方式和变形程度等因素进行选择。例如，建筑物的屋面板通常不承重，且加工时变形不复杂，通常选用 TDC51D 即可。对于变形程度比较大的零件，应选择 TDC52D、TDC53D 这样成形性好的材料。而对于有承重要求的构件，就应根据设计要求选择合适的结构钢，如 TS280GD、TS350GD 等。彩涂板常用的加工方式有剪切、

Prepainted Steel Sheets

弯曲、辊压等，订货时应根据每种加工方式的特点进行选择。另外，由于实际生产时通常用基板的力学性能代替彩涂板的力学性能，而彩涂工艺可能导致基板的力学性能发生变化，对此应予以注意。

基板类型（镀层种类）和镀层重量主要依据用途、环境腐蚀性、使用寿命和耐久性等因素进行选择。防腐是彩涂板的主要功能之一，镀层种类和镀层重量是影响彩涂板耐腐蚀性的主要因素。由于建筑用彩涂板通常直接暴露在大气环境中，因此通常选择耐腐蚀性好、镀层厚的热镀锌板和热镀铝锌板等基板。另外，不同种类镀层的耐腐蚀性也不同，例如，在相同镀层厚度的情况下，热镀铝锌镀层的耐腐蚀性高于热镀锌镀层。此外，耐腐蚀性通常随镀层重量的增加而提高，因此可以通过使用耐腐蚀性高的基板和/或增加镀层重量的方法提高彩涂板的耐腐蚀性。例如在工业污染严重和沿海潮湿地区，通常使用140/140的热镀锌板或75/75的热镀铝锌板。不同镀层种类钢板的切边耐腐蚀性存在差异，这一点也应引起注意。除此之外，使用寿命、耐久性也是选材时不可忽视的重要因素，如要求使用寿命长、耐久性高时，应选用耐腐蚀性好或镀层重量大的基板。

- **正面涂层性能的选择**

正面涂层性能的选择主要指涂料种类、涂层厚度、涂层色差、涂层光泽、涂层硬度、涂层柔韧性/附着力、涂层耐久性和其他性能的选择。

A rational material choice can not only meet the customer's requirements but also lower the cost at the maximum level. If any improper choice of materials, the performance of materials may surpass the application requirements, as a result, just a waste of materials, otherwise it may not reach the requirements and lead to being degraded or discarded as a useless. However, customers should pay much attention to the proper choice of material. If any, please contact us.

The choice of the prepainted steel sheet is mainly determined by the mechanical property, type of base metal (type of coating), weight of coating, and the choices of the performances of front coating and back coating. Its usage, environmental corrosion, service time, durability, machining method and distortion level are the important factors that should be taken into consideration when choose relevant materials.

- **Choice of mechanical performance, type of base metal and weight of coating**

The choice of mechanical performance should base on the factors, such as usage, machining method, distortion level, etc. For example, the prepainted steel sheet for the roofing of the building usually bears few weight and has few complex distortion while being machined, so it often adopts TDC51D. The prepainted steel sheet for any parts with relatively big distortion should adopt the materials with good machinability, just like TDC52D andTDC53D. While the prepainted steel sheet for any structure with weight bearing requirements should follow the corresponding design to adopt proper structural steel, like TS280GD and TS350GD. The machining methods commonly adopted by the prepainted steel sheet consist of cutting, coiling, rolling, etc., and the descriptions of the properties of each kind of these should be chosen when ordering. In addition, we should notice that we often substitute the mechanical properties of the prepainted steel sheet for those of the base metal in practice while the process of the prepainted steel sheet might change the mechanical properties of the base metal. The choice of the type of the base metal (type of coating) and the weight of coating should be determined in accordance with usage, environmental corrosion, service life, etc. Corrosion resistance is one of the main functions of the prepainted steel sheet. The type and the weight of the coating are the influential factors to the corrosion resistance of the prepainted steel sheet. Owing to being always exposed in the air, the prepainted steel sheet for construction usually selects the base metals with good resistance to corrosion and thick coating , like hot-dip zinc-coated metal and hot-dip alu-zinc coated metal. In addition, different kinds of coating have different resistances to corrosion. For example, the resistance to corrosion of the coating of the hot-dip alu-zinc coated metal is higher than that of the hot-dip zinc coated metal with a of identical thickness. Additionally, the resistance to corrosion usually increases with increase of the coating, so we can improve the resistance to corrosion of the prepainted steel sheet by using the base metal with high resistance to corrosion and/or increasing the weight of the coating. For example, 140/140 hot-dip zinc coated steel sheet or 75/75 hot-dip alu-zinc coated steel sheet is usually applied in the areas with severe industrial pollution and humid costal areas. We should also pay attention that the steel sheet with different coating has different resistance to corrosion of the trimming die. otherwise, the service life and durability are also the important factors for choosing materials. If a longer service life and high durability required, a base metal with high resistance to corrosion or big weight of coating should be chosen.

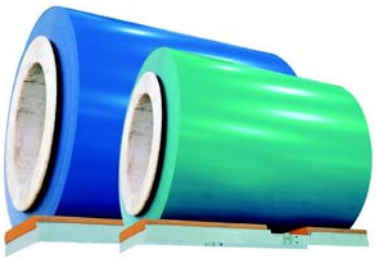
- **Choice of performance of front coating**

The performance choice of front coating is mainly determined by the type of coating material, and the thickness, color difference, coat gloss, rigidity, flexibility/adhesion, durability and other performances of coating.

涂料种类

面漆

常用的面漆有聚酯、硅改性聚酯、高耐久性聚酯和聚偏氟乙烯，不同面漆的硬度、柔韧性/附着力、耐腐蚀性等方面存在一定的差异。聚酯是目前使用量最大的涂料，耐久性一般，涂层的硬度和柔韧性好，价格适中。硅改性聚酯耐久性和光泽、颜色的保持性有所提高，但涂层的柔韧性略有降低。高耐久性聚酯既具有聚酯的优点，又在耐久性方面进行了改进，性价比较高。聚偏氟乙烯的耐久性优异，涂层的柔韧性好，但硬度相对较低，可提供的颜色较少，价格昂贵。各种面漆详细的性能指标可参考有关资料或向专家咨询。面漆主要根据用途、环境腐蚀性、使用寿命、耐久性、加工方式和变形程度等因素来确定。



底漆

常用的底漆有环氧、聚酯和聚氨酯，不同底漆的附着力、柔韧性、耐腐蚀性等方面存在一定的差异。环氧与基板的结合力良好，耐腐蚀性较高，但柔韧性不如其它底漆。聚酯与基板的结合力好，柔韧性优异，但耐腐蚀性不如环氧。聚氨酯是综合性能相对较好的底漆。各种底漆详细的性能指标可参考有关资料或向专家咨询。底漆通常由生产商根据生产工艺、用途、环境腐蚀性以及与面漆的匹配关系来确定。

涂层厚度

彩涂板耐腐蚀性的高低与涂层厚度有密切关系，通常耐腐蚀性随涂层厚度的增加而升高。应根据环境腐蚀性、使用寿命和耐久性来确定合适的涂层厚度。

涂层色差

彩涂板在生产和使用过程中都可能出现色差，由于色差受生产组批、颜色深浅、使用时间、使用环境、用途等多种因素的影响，因此通常由供需双方在订货时协商。

Category of coatings

Finish coat

The finish coats commonly used can be classified into four groups, namely polyester silicon modified polyester, high-weatherproof polyester and polyvinylidene fluoride. The finish coats have different performances in rigidity, flexibility/adhesive force, corrosion resistance, etc. The coating of polyester is the most popular coating for the time being, which has common durability, good rigidity and flexibility of coating and moderate price. The coating of modified silicon polyester has been already greatly improved in durability and retention of gloss and color, but the flexibility of its coating is still lower. The high-weatherproof polyester coating not only possesses the merits of the polyester coating but also makes a great improvement in durability. Its quality is better. The coating of polyvinylidene fluoride has excellent durability and good flexibility of coating, while its rigidity is relatively poor, its color available is less and its price is high. For details of these finish coatings, please consult about relevant materials or contact experts. The finish coatings should be determined by the usage, environmental corrosion, service life, durability, machining method, distortion level, etc.

Primer

The primers commonly used consist of epoxy, polyester and polyurethane. Different primers can be differed by the adhesive force, flexibility, resistance to corrosion, etc. The epoxy primer has strong adhesive force to the base metal and higher resistance to corrosion, while its flexibility is poorer than those of other primers. The polyester primer has strong adhesive force to the base metal and excellent flexibility, while its resistance to corrosion is poorer than that of the epoxy primer. The polyurethane primer is a better primer with comprehensively good performances. For details of these primers, please consult about relevant materials or contact experts. The primer is usually determined by the manufacturer through matching the primer with corresponding process technology, purpose and environmental corrosion.

Thickness of coating

The corrosion resistance of the prepainted steel sheet has closed relationship with the thickness of the coating, and in general, the resistance to corrosion often increases with the increase of the thickness of the. The thickness of the coating should be determined properly by the environmental corrosion, service life and durability.

Color aberration of coating

Being influenced by the production batch, color change, service life, operating environment, purpose, etc., the prepainted steel sheet may have color aberration while being produced or using, so the color aberration of coating should be negotiated by both of the provider and the customer when ordering.

涂层光泽

涂层光泽主要依据用途和使用习惯进行选择。例如，国内建筑用彩涂板通常选择中、低光泽，家电用彩板通常选择高光泽。

涂层硬度

涂层硬度是涂层抵抗擦划伤、摩擦、碰撞、压陷等机械作用的能力，与彩涂板的耐划伤性、耐磨性、耐压痕性等性能有密切联系，主要依据用途、加工方式、储存运输条件等进行选择。

涂层柔韧性 / 附着力

涂层柔韧性 / 附着力与彩涂板的可加工性有密切联系，主要依据加工方式、变形程度等进行选择。在变形速度快、变形程度大时应选择冲击功值高和 T 弯值小的彩涂板。

涂层耐久性

涂层耐久性是彩涂板在使用过程中体现出来的性能，通常用使用寿命的长短进行衡量。涂层耐久性主要受涂料种类、涂层厚度、环境腐蚀性等因素的影响。涂层真实的耐久性可通过大气暴露试验来确定。也可通过人工老化试验对耐久性进行评估。耐中性盐雾试验是最简单、最常用的人工老化试验方法之一，紫外灯加速老化试验也是比较常用的人工老化试验。此外，彩涂板可能会用于酸雨、潮湿等特殊环境，此时还应选择相应的人工老化试验进行评价。需要注意的是人工老化试验通常无法完全模拟实际的使用环境。

其它性能

彩涂板在有些情况下可能需要有比较好的耐有机溶剂性、耐酸碱性、耐污染性等性能，对于这类特殊性能也应引起注意。

- **反面涂层性能的选择**

反面涂层通常由生产商根据用途、使用环境来确定。环境的腐蚀性不高时，反面通常只涂覆一层，主要起装饰作用。如果反面粘贴隔热材料，应在订货时注明，以便生产厂在反面涂覆有良好粘结性能的涂料。环境腐蚀性高时应涂覆二层，以提高耐腐蚀性。

Gloss of coating

The gloss of coating should be determined by the purpose and usage. For instance, the prepainted steel sheet for the construction at home often adopt the steel sheet with a moderate and low gloss of coating, while those for the electrical household appliances often adopt the high-gloss ones.

Rigidity of coating

Coat hardness is the ability to resist any damages from mechanical operation, such as scratch, friction, collision, and pressing, etc., which is close to the properties of the prepainted steel sheet, such as its resistance to scratch, durability, resistance to pressure, etc., and mainly determined by the usage, machining, storage & transportation, etc.

Flexibility/Adhesive force of coating

The flexibility/adhesive force of the coating is close to the machinability of the prepainted steel sheet, which is mainly determined by the machining way, distortion degree, etc. IncIn case of any fast and severer distortion, the prepainted steel sheet with high resistance to collision and small T-shape angle should be selected.

Durability of coating

The durability of the coating is a kind of performance that is indicated during the usage of the prepainted steel sheet, which is usually valued by its service life. The durability of the coating is usually influenced by the type of the coating, thickness of the coating, environmental corrosion, etc. The actual durability of the coatin can be determined via the air exposure test. In addition, it can also be assessed by the test of artificial aging test of the coating. The test of resistance to neutral salty mist is one of the simplest and commonest artificial tests; and the artificial aging test by ultra-violet lamp is also a relatively common method. In addition, the prepainted steel sheet may be used in a special environment with acid rain and humidity, so it should be assessed by corresponding artificial aging test prior to use. We should pay attention that the artificial aging test often fails to completely stimulate the actual operating environment.

Other performances

We should also notice that the prepainted steel sheet may have some requirements of better organic-soluble property, resistance to acid/alkali, resistance to pollution, etc. under peculiar circumstances.

- **Choice of performance of back coating**

The back coating is often determined by the manufacturer in accordance with the purpose and operating environment. In case of poorer environmental corrosion, it just requires a layer of back coating, which mainly functions as a decoration. If lower back insulating materials required, please indicate in the order, so that the manufacturer can timely coat the materials with strong adhesive force to the base metal. In case of higher environmental corrosion, please coat two layer of coating to improve the resistance to corrosion.

Prepainted Steel Sheets

Service Guide

使 用 指 南

加工 Machining

▸ **加工**

彩涂板因其表面有涂层，因此在加工时与普通冷轧板和镀层板存在很多不同的地方，最主要的区别就是必须在保证涂层完好的前提下进行成形加工。加工时的注意事项如下：

力学性能是衡量成形性的重要指标，是确定和调整加工工艺的重要参数，因此加工时应首先予以考虑。

铅笔硬度、T弯、冲击功等指标与加工性能有密切的联系，因此应予以充分考虑。

零件的形状复杂、变形程度较大时，应采用多道次成形。如果一次成形，可能会因变形量过大破坏涂层与基板的结合力。加工时应根据模具形状、变形特点、工艺条件等因素设定合适的间隙，间隙设定时应考虑涂层的厚度。

大多数涂层可作为固体润滑剂，并可满足多数成形工艺的润滑要求，有些涂料可通过调整配方提高涂层的润滑性。如涂层的润滑性不足，可通过涂油、涂蜡、覆可剥离保护膜等方法提高润滑性。但应注意湿润滑剂容易吸污物，应在安装前清除。可剥离保护膜在施工结束后也应尽快去除。

Prepainted Steel Sheets

应根据设备状况、工艺条件、零件形状等因素设定合理的加工速度，变形速度过高容易导致涂层剥落。温度低时涂层的柔韧性降低，因此应避免低温加工。若环境温度较低，应将材料加热到一定温度后再进行加工。

加工时产生的切口断面易发生腐蚀，因此应采取必要的防护措施，如涂防护涂料、嵌封条等。

加工时应尽量减少切断面的毛刺，防止毛刺划伤表面。

应保持所有与涂层接触的表面干净整洁，及时清理加工时产生的切屑和金属颗粒，防止异物损坏涂层表面。

加工时应尽量减少成型辊辊面或模具表面的磨损，保持接触面光洁，防止涂层表面产生压痕、划伤等缺陷。

应尽可能采用工厂预先装配然后再送现场进行安装的施工方式，安装时应采取保护措施防止损坏涂层。

加工时如发现涂层表面破损应及时采用专用修补涂料进行修补，防止破损处发生腐蚀。

- **Machining**

The prepainted steel sheet has a surface coating , by which it can be easily differed from cold-rolled steel sheet and galvanized steel sheet while being machined, and the most extinguished difference is that the whole machining should be implemented on the condition that the coating is kept well. precautions while machining are listed as follows:

The mechanical performance is an important index to assess the machinability of the prepainted steel sheet and a vital parameter to determine and adjust the processing crafts, so it should be taken into consideration first of all while machining. The hardness of pencil, T-shape bending, absorbed-in-fracture energy, etc are close to the machinability, so they should be taken into consideration fully.

For any part with complex structure and large-scale distortion, it is recommended to adopt multi-procedure machining. If adopt one-stop machining, the adhesive force between the coating and the base metal might be damaged by too large distortion. Some intervals during machining should be properly set by the die form, distortion feature, machining conditions, thickness of coating, etc. Most of coating can act as a solid lubricant and meet the lubricant requirements of the common machining, and some coating can improve the lubricant property of the coating through adjusting the prescription. When the lubricity of the coating is not high enough, it can be improved by applying grease, wax or removable protective, etc. But we should pay attention that such moist lubricants are apt to absorb pollutants, so they should be cleaned out prior to the installation. And the removable protective coating should be also wiped off prior to the completion of the installation.

The machining speed should be rationally set in accordance with the equipment conditions, process conditions, shape of part, etc. Any excessively high speed might lead to the shedding of the coating. The flexibility of the coating may be lowered at low temperature, so we must avoid machining under such circumstances. If the ambient temperature is relatively low, the materials should be machined after being heated up to a certain temperature.

The notch and fracture of the prepainted steel sheet while machining may be apt to corrosion, so some protective measures, such as covering protective coat and embedding seal, should be taken. Try to reduce the sentus around the notch and fracture while machining, and prevent the surface coating of the prepainted steel sheet from being scratched by the sentus.

Try to keep all the contact surfaces to the coating clean and timely clear the scraps and metallic granules away while machining, so as to prevent the surface of the coating from any damage.

Try to reduce the abrasion of the molded roll surface and the die surface, keep the contact surface clean, and prevent the surface of the coating from pressure, scratch and any other damages.

Try to adopt the construction policy that the factory takes charge of pre-assembly and sends to implement the onsite installation, and take necessary measures to protect the surface from any damage while installation.

In case of any scratch on the surface while machining, please timely adopt the specified materials to repair and prevent the scratched prepainted steel sheet from corrosion.

Prepainted Steel Sheets

Service Guide

使 用 指 南

储存、运输 Storage and transportation

- **彩涂板的储存、运输**

  储存、运输和装卸是影响彩涂板质量的重要环节，由于操作不当，储存、运输和装卸过程中可能出现划伤、压印、腐蚀等各种缺陷，为尽可能减少和避免各类缺陷的产生，下面给出一些操作中的注意事项。关于储存、运输和装卸方面的具体规定可参考有关资料或向专家咨询。

- **储存**

  产品应存放在干燥通风的室内环境中，避免露天存放以及存放在易发生结露和温差变化大的地方。

  产品应存放在干净整洁的环境中，避免各种腐蚀性介质的侵蚀。

  储存场地的地面应平坦、无硬物并有足够的承重能力。

  卧式钢卷应放在橡皮垫、垫木、托架等装置上，捆带锁扣应朝上，不能直接放在地面上或运输工具上。

  为避免产生压伤，钢卷通常不堆垛存放。钢板堆垛存放时应严格限制堆垛层数，将重量和尺寸大的板包放在下面。

  彩涂板的力学性能和部分涂层性能如铅笔硬度、T 弯值、冲

Prepainted Steel Sheets

击功值等可能随储存时间的延长而发生变化，因此建议用户尽快加工。
储存场地应留有足够的空间供吊运设备使用。
应对钢板和钢卷的存储位置进行合理的安排以便于取用，尽可能减少不必要的移动。

- **运输**

产品应按照出厂时的状态进行运输，不能随意拆卸原有包装。装卸时吊具与产品间应加橡皮垫以防止发生碰伤，有条件的情况下应使用专用吊具。
运输车辆的车厢应打扫干净，车底板上应铺橡皮垫或其它防护装置，车厢四周也应采取必要的防护措施，防止包装产生压痕或碰伤。
立式包装的钢卷在运输和装卸时也应保持立式。
产品应固定牢固，避免在运输时产生相对移动或滚动而造成产品损伤或发生意外事故。
钢板在取出时不能拖拉，以防止切口和切断时产生的毛刺擦伤下面的钢板。钢板应轻拿轻放，不要碰到其它硬物。

- **Storage and transportation of prepainted steel sheet**

Storage, transportation, loading and unloading are the important links that may influence the quality of prepainted steel sheet. Because some improper operation in these procedures may bring various deficiencies, such as scratch, pressure, corrosion, etc., we should pay attention to the following precautions. For the details in storage, transportation, loading/unloading of the prepainted steel sheet, please consult about relevant materials or contact qualified experts.

- **Storage**

Products should be stored in a dry and ventilated room, instead of being stored in the open air or a place with moisture and a great change of temperature.
The products should be stored in a clean and neat environment, preventing from various corrosive substances.
The storage field should be smooth and level, having a good bearing capacity
Horizontal steel coil should be placed on the brackets with rubber cushions or wooden cushions and be locked with the lock catch on the topside. It mustn´t be placed onto the ground or vehicles directly.
To avoid being pressed, the steel coil mustn't be stored in stacking. When the steel sheets are stored in stacking, a limit to every stack should be specified and the sheets with large weight and size should be placed in the lower part of the stack.

The mechanical properties of the prepainted steel sheet and part of performances of the coating, including pencil hardness, T-shape bend, collision, etc. may varies with the time, so we recommend customers to use the products as soon as possible.
The storage field should keep enough room for the hoisting and transporting equipment.
The storage of the steel sheets and coils should be scientifically arranged in advance, so as to avoid unnecessary shifting and conveniently use. Transportation

- **Transportation**

The product must be transported with the state while leaving from the factory and the original packing mustn´t be assembled or changed at will.
While loading/unloading, the rubber cushions should be inserted between the hoisting, loading/unloading equipment, so as to prevent the steel products from any damage. If any, please adopt the special hoisting, loading/unloading equipment for the

products only.
The vehicles in charge of transporting the products should keep clean, rubber cushions and other protective devices should be furnished for the floors of the vehicles, and the necessary actions should be also taken around the carriages, so as to prevent the packing of the products from any damage.
The steel coils packed in vertical should also be transported, loaded/unloaded vertically.
The products should be firmly fixed, so as to prevent them from any damage or unexpected accidents for from the rolling or shifting of the products while being transported.
Do not dragged out the steel sheet, and prevent it from being damaged or scratched by the sentus around the notch or fracture of the other sheet underside. Please fetch and place the steel sheet gently and keep it from any rigid article.

Service Guide

使 用 指 南

包装 Packing

包装方式有卧式和立式两种
The packing can be classified into two kinds, namely packing in vertical or horizontal.

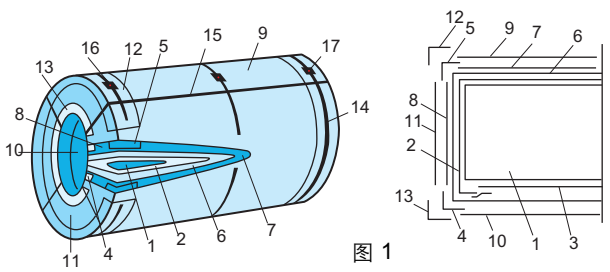


图 1
Figure 1

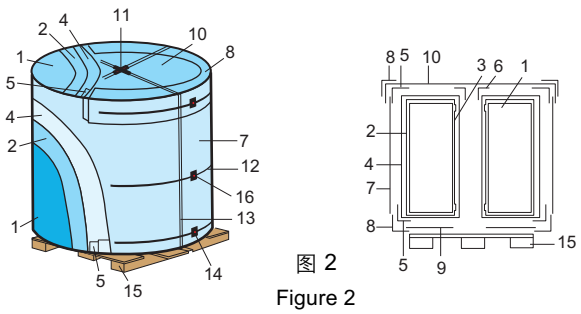
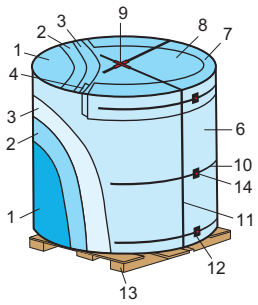


图 2
Figure 2

1	钢卷	2	外周防锈板	3	内芯防锈纸	1	钢卷	2	外周防锈纸	3	内芯防锈纸
4	纸内护角	5	纸外护角	6	塑料套	4	塑料套	5	纸外护角	6	纸内护角
7	外周瓦楞纸	8	圆护瓦楞纸	9	外周包板	7	外周包板	8	铁外护角	9	铁圆护板
10	内周护板	11	铁圆护板	12	铁外护角	10	圆盒盖	11	十字锁扣	12	周向捆带
13	铁内护角	14	周向捆带	15	径向捆带	13	十字捆带	14	锁扣垫片	15	托架
16	锁扣垫片	17	锁扣			16	锁扣				

1	Steel coil	2	Peripheral anti-rust board	3	Inside anti-rust paper	1	Steel coil	2	Peripheral anti-rust board	3	Inside anti-rust paper
4	Inside paper corner armor	5	Outside paper corner armor	6	Plastic cannula	4	Plastic cannula	5	Outside paper corner armor	6	Inside paper corner armor
7	Peripheral corrugated paper	8	Circle protective corrugated paper	9	Periphery wrapper sheet	7	Periphery wrapper sheet	8	Outside iron guard board	9	Circle iron guard board
10	inner guard board	11	circle iron guard board	12	Outside iron guard board	10	Round lid	11	Cross lock catch	12	Latitude strapping
13	Inside iron guard board	14	Latitude strapping	15	Radial strapping	13	Cross strapping	14	Lock catch gasket	15	Bracket
16	Lock catch gasket	17	Lock catch			16	Lock catch				



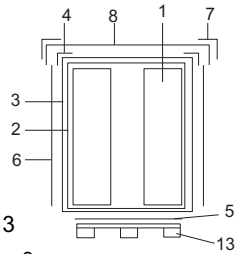
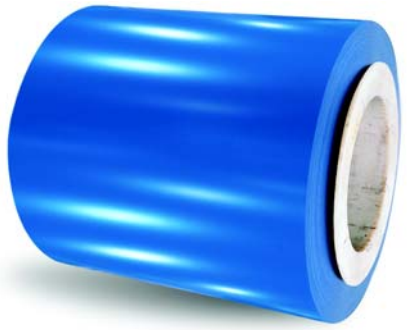


图 3
Figure 3

1 钢卷	2 外周防锈纸	3 塑料套
4 纸外护角	5 圆形瓦楞纸	6 外周包板
7 铁外护角	8 圆盒盖	9 十字锁扣
10 周向捆带	11 十字捆带	12 锁扣垫片
13 托架	14 锁扣	

1 Steel coil	2 Peripheral anti-rust board	3 Plastic cannula
4 Outside paper corner armor	5 Circle protective corrugated paper	6 Periphery wrapper sheet
7 Outside iron guard board	8 Round lid	9 Cross lock catch
10 Latitude strapping	11 Cross strapping	12 Lock catch gasket
13 Bracket	14 Lock catch	



标志

标志按需要应包括：商标、供方名称、品名、标准、规格、捆包号、用户合同号、炉号、镀层重量、颜色、生产日期、计重方式、净重、毛重、收货单位、防护标志等。

质量证明书

每批交货的钢板及钢带(钢卷)必须开具质量证明书。质量证明书上按需要应注明：商标、供方名称、品名、标准、产品规格、钢卷号或捆包号、用户合同号、炉号、颜色、重量、订货单位、件数、标准中规定的各项试验的结果、交货日期、质量证明书签发日期、质量管理部门负责人的签字等。

Label

Upon relevant demand, the content of the label should include: Trade mark, name of supplier, name of a product, standard, specification, tie bag number, contract number for customer, number of the stove, plate layers of weight, color, date of production, weighting way, net weight, gross weight, receiving division, anti-counterfeit mark, etc.

Certificate of quality

The certificate of quality should be presented when deliver each batch of steel plates and steel strip (steel coil), Trade mark, name of supplier, name of product, standard, product specification, steel coil number or of tie bag number, contract number for customer, number of the stove , color, weight, purchase unit, quantity , the results of every test specified in the standard, delivery date , issuing date of quality certificate , signature of the head of quality control department, etc.

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