

# Cold Rolled Steel Sheet

## 冷轧薄板





**BAOSTEEL**





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# 冷轧薄板厂简介

Brief introduction of Cold  
Rolled Steel Sheet Mill



宝钢股份冷轧薄板厂是宝钢股份专业生产薄规格冷轧产品及镀锡产品的生产单元。其前身上海益昌薄板有限公司成立于1989年，1998年上海宝钢集团公司增资控股益昌薄板，更名为上海宝钢益昌薄板有限公司。2004年4月1日，宝钢股份全资收购宝钢益昌，益昌整体进入宝钢股份产销序列，成为宝钢

股份的冷轧生产单元之一——冷轧薄板厂，定位于专业生产薄规格精密冷轧板卷和镀锡板卷。

2000年以来，冷轧薄板厂的主轧机进行了大规模的设备改造，同时新建了高电流密度电解清洗机组、连续退火机组、镀锡镀铬机组、重卷机组以及国

内第一条二次冷轧机组，并对罩式退火机组能力进行了扩容，使冷轧薄板厂的主题生产设备达到了世界先进水平，设计成品规模为100万吨/年。其产品包括普冷薄板45万吨/年，电镀锡板35万吨/年，电镀铬板20万吨/年。



Cold Rolled Steel Sheet Mill of Baosteel is a production unit specialized in producing thin gauge cold rolled steel sheet as well as tin plate. Previously it was named as Shanghai Yichang Steel Strip Company Ltd. which was founded in 1989. In 1998 Shanghai Baosteel held a majority of share of Yichang through increasing investment and then changed its' name into Shanghai Baosteel Yichang Steel Strip Company Ltd. On Apr.1, 2004 Baosteel wholly owned Shanghai Baosteel Yichang Steel Strip Company via buying all the other registered capital

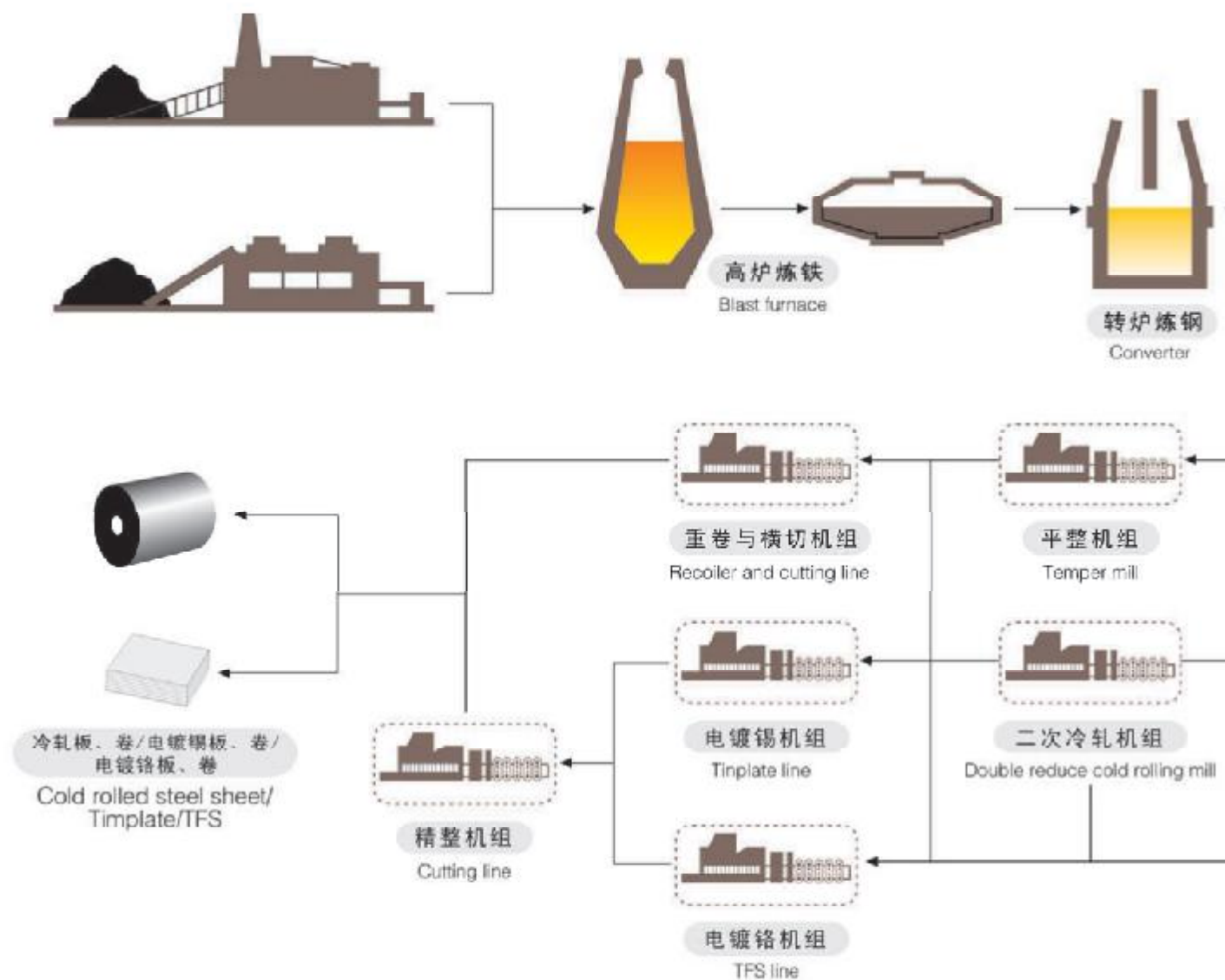
of it. From that time whole Yichang has entered the production and sales system of Baosteel and become one of the cold rolled production unit of Baosteel, Cold Rolled Steel Sheet Mill, which is specialized in producing thin gauge precise cold rolled steel sheet as well as tin plate.

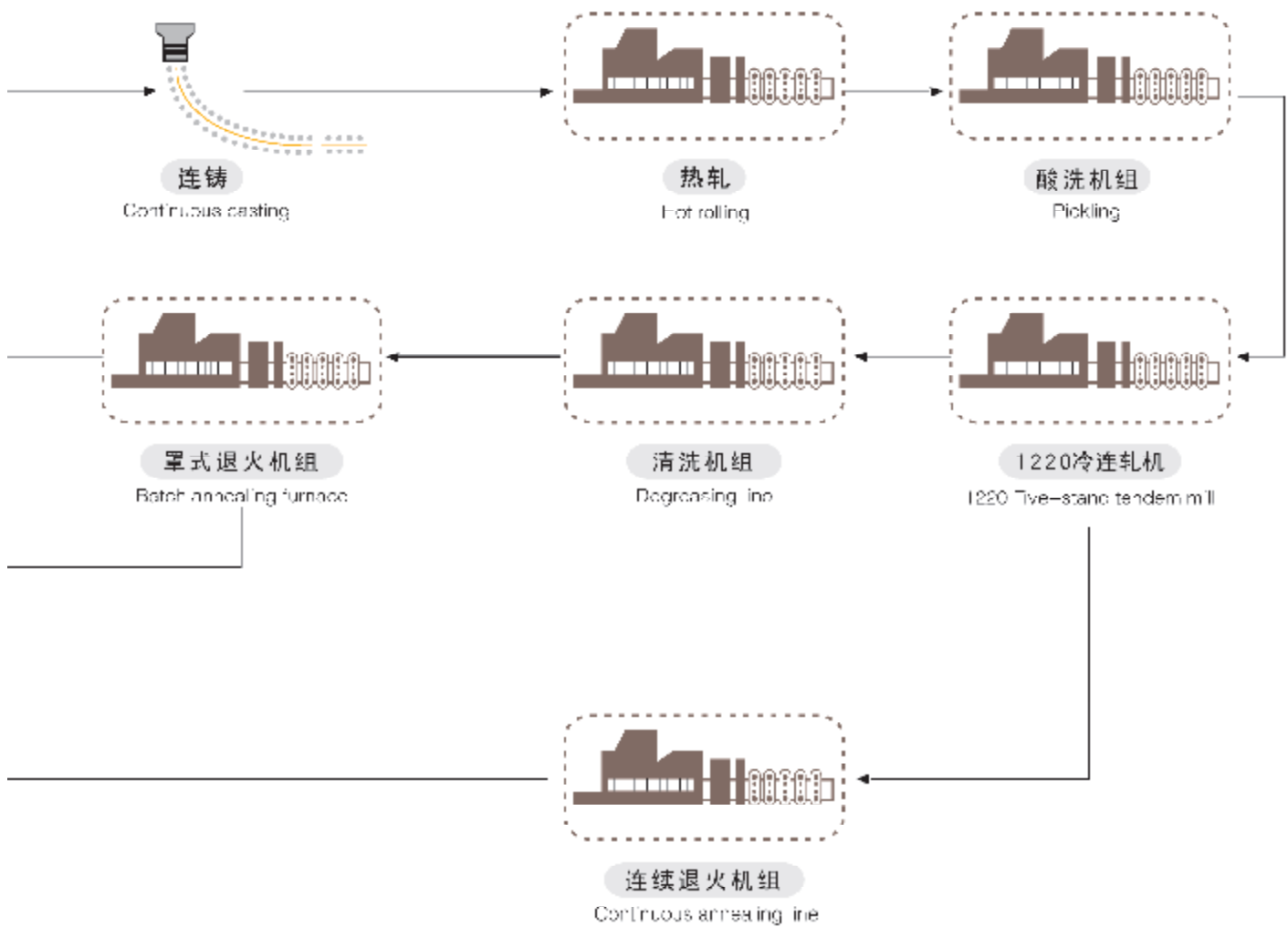
From 2000, the old cold rolling mill had been revamped drastically. Meanwhile new electrolyze degreasing line with high current density, continuous annealing line, new tinplate line, TFS line, recoiler and double reduce cold rolling mill

which is the first production line in China were built up and also some new batch annealing furnaces were founded and put into production. In that case, the general production equipments of Cold Rolled Steel Sheet Mill are now of world advanced level and the design annual production capacity is one million. The products manufactured by this mill include cold rolled steel sheet in coil(450,000t/a), tinplate(350,000t/a), and tin free steel(200,000t/a), etc.

# 冷轧薄板 产品生产流程

Production flow of Cold  
Rolled Steel Sheet





# 冷轧薄板产品 主要生产机组简介

Brief introduction of main equipment of  
Cold Rolled Steel Sheet Products



## 酸洗机组

1990年从奥地利鲁士纳公司引进的浅槽式“推拉酸洗机组”，最大运行速度为每分钟180M，年酸洗能力为55.8万吨，并配有酸再生装置，酸回收率99%以上。

## 冷轧机组

2000年引进日本三菱技术进行了全面技术改造，改造后的轧机由五机架四辊轧机组成，具有6台激光测速仪，五台X射线测厚仪。轧制能力提高到90万吨/年，轧制速度提高到1800M/min。

## 脱脂机组

2002年引进国内第一条大型高速自动化电解清洗机组，由日本川崎制铁提供技术，美国ROCKWELL公司负责电气设计制造，机组最高速度900米/分，是目前世界上最先进的电解清洗机组，设计年产量55万吨。



## Pickling line

The push and pull pickling line with shallow tank was imported from Austrian Ruthner company in 1990. Its' max. running speed is 180m/min and the annual capacity is 558,000mt. It is equipped with acid regeneration system and the acid recycle ratio exceeds 99%.

## Cold Rolling Mill

The rolling mill was general revamped in 2000 by means of importing the technology of Mitsubishi Heavily Industry and Mitsubishi Electric. Now the continuous rolling mill is composed of 5 stands with four high, equipped with 6 sets of laser speed detector and 5 sets of x-rays thickness gauge. The annual rolling capacity is 900,000mt. The max. rolling speed can reach 1800m/min.

## Degreasing line

It was built in 2002 and is the first big automatic electrolyte cleaning line with high speed in China. The technology of this line is supplied by Japanese Kawasaki Steel Corporation. America ROCKWELL company is responsible for the electric design and manufacture. The max. speed of the line is 900m/min. It is the global most advanced electrolyte cleaning line. The design annual production capacity is 550,000mt.

# 冷轧薄板产品 主要生产机组简介

Brief introduction of main equipment of  
Cold Rolled Steel Sheet Products



## 退火机组

现有46台强对流全氢罩式退火炉，其中奥地利EBNER公司罩式炉台38个，德国LOI公司罩式炉台8个，设计年产量46万吨。全氢罩式退火炉采用强制对流的光亮退火工艺，使用的氢气纯度高达99.999%。

## 平整机组

1990年从美国TIPPINS公司引进的双机架平整机组，机组最高速度1500米/分，年生产能力为50万吨。目前该机组正进行整体改造。

## 二次冷轧机组

2004年从日本三菱-日立公司引进，是国内第一条二次冷轧兼平整机组，采用双机架六辊UCM轧机，平整模式最大轧制速度1500米/分，二次冷轧模式最大轧制速度1200米/分，设计年产量25万吨。二次冷轧产品的最薄厚度达到0.08mm。

## 横切机组

1990年从美国DALTA公司引进，最大线速度为150米/分，设计年产量10万吨。



## Annealing Furnace

There are 46 sets of full hydrogen forced convection batch annealing furnace( including 38 sets from Austria EBNER and 8 sets from Germany LOI). The design annual capacity is 460,000mt. The full hydrogen batch annealing furnace adopts force convection bright annealing process. The purity of adopted hydrogen is 99.999%.

## Temper mill (now being rebuilt)

The two stands skin pass mill was imported from America TIPPINS company in 1990. The max. running speed is 1500m/min. The design annual capacity is 500,000mt.

## Double reduce cold rolling mill

It was imported from Japan Mitsubishi-Hitch in 2004 and is the first double reduce cold rolling mill, which can also been used as the temper mill, in China. It is an UCM rolling mill having two stands with six high. The max. speed is 1500m/min when running as the skin pass mode and 1200m/min when running as the double reduce mode. The design annual capacity is 250,000mt. The min. thickness of the product for double reduce is 0.08mm.

## Cut to length line

It was imported from America DALTA company in 1990. The max. speed is 150m/min .The design annual capacity is 100,000mt.

# 冷轧薄板产品 主要生产机组简介

Brief introduction of main equipment of  
Cold Rolled Steel Sheet Products



## 重卷机组

2006年从德国德马格—西马克公司引进，具有EPC、CPC以及刀具间隙自动调节功能，具有延伸率为5%的拉矫功能，机组最大线速度为400米/分，出口最大卷重为15吨，设计年产量25万吨。

## 纵剪机组

1990年从美国DALTA公司引进，具有剪边功能，机组最大线速度为300米/分，设计年产量15万吨。

## 连续退火机组

2008年从法国DMS公司引进，其中炉子段设备由法国STEIN公司提供，清洗段设备由德国UVK公司提供，焊机设备由日本TMEIC公司提供，机组电气设备从瑞士ABB公司引进，炉子段最高速度800mpm，机组年生产能力416500吨。



## Recoiler

It was imported from Germany Demag-SMS company in 2006. It has EPC, CPC and knife gap automatic adjustment function. Its tension leveler equipment can make the elongation of steel strip reach 5%. The max. speed of the line is 400m/min and max. coil weight at the exit section is 15mt. The design annual capacity is 250,000mt.

## Slitting line

It was imported from America DALTA company in 1990. It can slit the edge of the coil. The max. speed is 300m/min. The design annual capacity is 150,000mt.

## Continuous Annealing Line

It was imported from DMS company of France in 2008, among which the furnace, the rinsing unit, the welding machine, and the electric system were supplied respectively by STEIN company of France, UVK company of German, TMEIC company of Japan, and ABB company of Swiss. The max running speed of the furnace is 800mpm and the design annual capacity of the line is 416,500mt.

# 冷轧薄板产品简介

Brief introduction of Cold Rolled Steel Sheet

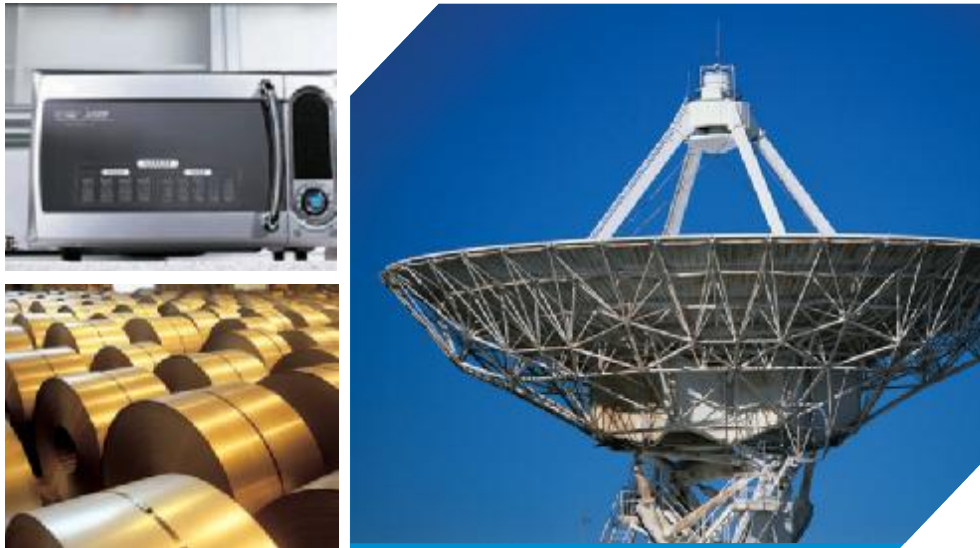


宝钢股份冷轧薄板厂生产的冷轧板卷产品以宝钢股份自产热轧卷为原料，运用了国际冷轧钢带生产的各种新技术、新工艺，先后经过酸洗、连续轧制、脱脂、退火、平整、高精度纵剪、横剪剪切等工序，保证了冷轧板卷的产品质量。

目前宝钢股份冷轧薄板厂生产的冷轧板卷的产品实物质量达到了进口同类产品的质量水平，产品广泛应用于家电、精密焊管、药芯

焊丝、自行车、电池钢壳、汽车配件、日用五金、搪瓷等行业。随着冷轧薄板厂二次冷轧机组的投产，二次冷轧薄板产品也已逐步投放市场并在彩电内磁屏蔽、彩电荫罩等高端产品得到应用。

秉承宝钢股份先进的用户服务理念，冷轧薄板产品始终以用户需求为导向，依托宝钢股份先进的管理理念以及一贯制生产质量管理体系和装备优势，为用户提供高质量的冷轧板卷。



HRC from Baosteel itself is the raw material of Baosteel Cold Rolled Steel Sheet Mill and after pickling, continuous rolling, degreasing, annealing, skin pass, slitting and cut to length line etc. It becomes the finished products which the customer required. Along with it many kinds of new technology and new process of global cold rolling production have been applied. Therefore the quality of the goods could be guaranteed.

Nowadays the actual quality of CRC produced by Baosteel Cold Rolled Steel Sheet Mill has the same quality as that of the imported congeneric goods. It has been widely used in home appliance, precise welding tube, flux cored welding wire,

bicycle, battery shell, automobile fitting, hardware and enameling industry etc. Along with the double reduce cold rolling mill being put into production, the double reduce products has entered the market step by step and been used for some high-end products for example colour TV set inner magnetic shield and kinescope shadow mask etc. Upholding the advanced user service philosophy of Baosteel, taking the orientation according to the customer demand, relying on the advanced management philosophy as well as consistent production quality management system and equipment predominance of Baosteel, the high quality CRC are supplied to the customer.

## 可供产品标准 及尺寸规格范围

Available product standard and gauge range

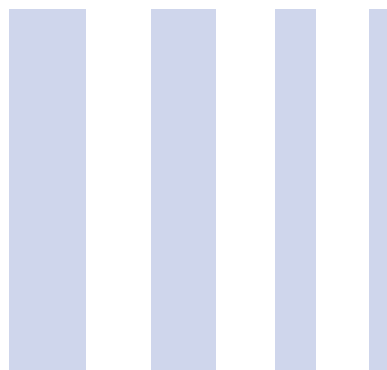
# A .

### 家电用钢及其他 一般用途产品用钢

Steel used for home appliance as well as other general uses products

宝钢股份冷轧薄板产品在家电行业主要用于生产冰箱、洗衣机、冷柜、空调、微波炉、热水器、脱排油烟机、电饭煲、电烤炉等产品。在其他应用行业，主要用于日用搪瓷、办公家具、防盗门、电子元器件、纽扣电池、日用五金、汽车配件等。

The cold rolled steel sheet of Baosteel is mainly used for refrigerator, washing machine, freezer, air conditioner, micro-wave oven, water heater, soot-suck machine, electric rice cooker, electric roaster oven etc. In the other application industries, it is mainly used for enameling, office furniture, burglarproof door, electronic element, fastener battery, hardware, automotive fitting etc.



标准及 牌号 Standard / grade	标准 Standard		产品用途 Product application	可供尺寸范围及重量 Available size as well as unit weight									
	标准号 Standard	牌号 Grade		钢板 Steel sheet				钢卷 Steel coil					
				公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	长度 Length (mm)	单件 重量 Unit weight (T)	公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	钢卷 内径 Coil ID (mm)	卷重 Coil weight (T)		
材料 用途 applic- ation													
家 电 及 一 般 用 途	JISG 3141	Q/BQB 402-2009	SPCC	0.35-0.8	700-1001	2000	0-3	0.1-0.8	轧制边： Mill edge： 720-1020	508	3-5 6-9 9-15		
			SPCD										
			SPCE										
			SPCEN										
			DC01										
		EN10 130	Q/BQB 403-2009									DC03	切边： Slitting edge： 700-1005
												DC04	
Home appliance and general application	ASTM A1008		CS TYPE A/B/C	Refrigerator side plate, Washing machine, Freezer plate, Micro wave oven, Air conditioner Water heater, Electric rice cooker, Electric roast oven, Soot-suck machine Gas cooking utensils Enameling, hardware, Office furniture Burglarproof door, Electronic element, fastener battery, automotive fitting, etc.									
		SAEJ 403			1006								
					1008								
					1010								





## B . 精密焊管用钢

Steel sheet used for Precision welding tube

宝钢股份冷轧薄板厂生产精密焊管用钢已有多年的历史，目前国内主要的精密焊管用户都已经批量使用宝钢股份冷轧薄板厂生产的精密焊管用钢，其生产的单层焊管用钢（牌号为BHG1）和双层卷焊管用钢（牌号为BHG2）广泛用于制冷用冷凝器管、蒸发器管以及各种电加热管和汽车用油管。同时宝钢股份冷轧薄板厂生产的精密焊管用钢已开始批量出口欧、美市场。

Cold Rolled Steel Sheet Mill of Baosteel has produced the steel sheet used for precision welding tube for years. Now in China the main welding tube manufacturers have used our product in batches. The steel used for single wall welding tube (steel grade:BHG1) and double wall welding tube(steel grade: BHG2) are widely used in producing condensator used for refrigeration, evaporator as well as electric heating tube and automobile oil tube. At the same time this product has been entered the Europe, America market etc in batches.

标准及 牌号 Standard / grade	宝钢企业标准 Baosteel standard		产品用途 Product application	可供尺寸范围及重量 Available size as well as unit weight			
	标准号 Standard	牌号 Grade		钢卷 Steel coil			
				公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	钢卷 内径 Coil ID (mm)	卷重 Coil weight (T)
材料 用途 Applica- tion							

精密焊 管用钢 Precision welding tube	Q/BQB 494-2009 BXYZ2005-910	BHG1	制冷用冷凝器管、蒸 发器管； 电加热管 Condensator Evaporator Electric heater	0.50-0.70	700-1020	508	3-5
							6-9
							9-15
		BHG2	汽车用油管； 制冷用冷凝器管、蒸 发器管 Automobile oil tube Condensator Evaporator	0.25-0.50			

## C .

## 药芯焊丝用钢

## Steel used for flux cored welding wire

宝钢股份冷轧薄板厂自2003年开始开发生产牌号为SYHS的药芯焊丝专用冷轧钢卷，供国内主要的药芯焊丝厂家生产各种规格及牌号的药芯焊丝，并于2006年开始批量对外出口。药芯焊丝用钢的化学成分、厚度精度、表面质量及力学性能等质量指标满足了用户的使用要求。

We have begun to develop steel sheet used for flux cored welding wire, grade: SYHS, from 2003 for the main flux cored welding wire manufacturer in China to produce all kinds gauges and grades of flux cored welding wire. From 2006 this product has been exported to overseas market in batches. The composition, thickness accuracy surface quality as well as mechanical property of this product can meet the demands of the customer.



材料 用途 Applica- tion	标准及 牌号 Standard / grade	宝钢企业标准 Baosteel standard		产品用途 Product application	可供尺寸范围及重量 Available size as well as unit weight			
		标准号 Standard	牌号 Grade		钢卷 Steel coil			
					公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	钢卷 内径 Coil ID (mm)	卷重 Coil weight (T)

药芯焊 丝用钢	BZJ465-2008 BXYL2005-902	BHS1 BHS2 BHS3 (SYHS)	各种规格及牌 号的药芯焊丝	0.30-0.90	900-1020	508	3-5 6-9 9-15
Steel sheet used for flux cored welding wire			All kind gauges and grades of flux cored welding wire				

D .

电池用钢

Steel used for battery shell

宝钢股份冷轧薄板厂生产的电池用钢按表面结构状态分为毛面电池用钢和光面电池用钢，毛面电池用钢主要用于冲制可充电电池钢壳，光面电池用钢主要用于冲制碱性电池钢壳。目前宝钢股份冷轧薄板厂生产的电池钢壳专用冷轧钢带已经开始批量在国内的主要用户使用。

The steel sheet used for battery shell has two kinds according to the surface condition. One is bright finish and another is dull finish. The steel sheet with dull finish is mainly used for producing rechargeable battery shell and it with bright finish is mainly used for producing alkaline battery shell. At the present the steel sheet used for battery shell has been used in main customers in China in batches.



材料 用途 Applic- ation	标准及 牌号 Standard / grade	宝钢企业标准 Baosteel standard		产品用途 Product application	可供尺寸范围及重量 Available size as well as unit weight			
		标准号 Standard	牌号 Grade		钢卷 Steel coil			
					公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	钢卷 内径 Coil ID (mm)	卷重 Coil weight (T)

电池用钢			各种规格充电 电池钢壳 各种规格碱性 电池钢壳				
Steel sheet used for battery shell	BZJ495-2008	BDCK	All kind gauges of rechargeable battery shell and alkaline battery shell	0.25-0.50	900-1005	508	3-5 6-9

## E .

## 磁屏蔽钢和荫罩钢带

Steel used for inner magnetic shield and colour kinescope shadow mask

磁屏蔽钢主要用于生产彩色显像管 (CPT) 和彩色显示管 (CDT) 的内磁屏蔽件, 磁屏蔽钢按性能分为硬态钢带 (BCB-2) 和软态钢带 (BCB-1)。荫罩带钢主要用于生产彩色显像管 (CPT) 和彩色显示管 (CDT) 的荫罩网板。

The steel sheet used for magnetic shield are mainly used to producing the inner magnetic part of CPT & CDT. According to the property the steel used for magnetic shield can be classified to hard steel (BCB-2) and soft steel (BCB-1). The steel sheet used for kinescope shadow mask are mainly used to producing shadow mask halftone of CPT & CDT.



材料 用途 Applic- ation	标准及 牌号 Stand- ard / grade	宝钢企业标准 Baosteel standard		产品用途 Product application	可供尺寸范围及重量 Available size as well as unit weight			
		标准号 Standard	牌号 Grade		钢卷 Steel coil			
					公称 厚度 Nominal thickness (mm)	公称 宽度 Nominal width (mm)	钢卷 内径 Coil ID (mm)	卷重 Coil weight (T)
磁屏蔽钢 Steel sheet used for Magnetic shield	新 产 品 New product	BCB-1	冲制各种内 磁屏蔽件 Punch all kinds inner magnetic shield parts	0.13-0.25	650-1005	508	3-5	
		BCB-2						
二次冷轧 荫罩钢带 Steel sheet used for kinescope shadow mask	新 产 品 New product	BDAK-2	生产荫罩网板 Produce kinescope shadow mask halftone	0.13-0.25	650-1005	508	3-5	

# 包装

Package

## 标志 Shipping mark

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。

The shipping Mark shall consist of: Trade mark, Seller's name, Product name, Applicable standards, Specifications, Package No., Contract No., Heat No., Weight of coating film, Color, Production date, Weighting method, Net weight, Gross weight, Consignee and Protection symbols , etc.

## 质量证明书 Quality Certificate

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。

Each shipment of delivered steel sheets or steel coils shall be attached with the Quality Certificate. The Quality Certificate shall cover: trade mark, seller's name, product name, applicable standards, product specifications, coil No. & package No., contract No., heat No., color, weight, buyer, quantity, test results as per standards, delivery time, quality certificate issuance date, signature by chief of the quality control dept., etc.

## 冷轧产品包装方式

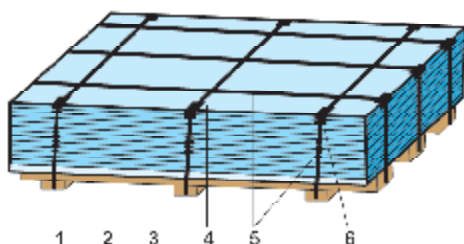


图 1 (Figure 1)

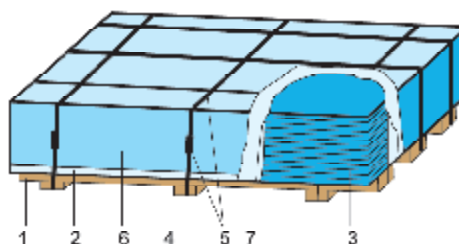


图 2 (Figure 2)

1—托架  
2—底板  
3—钢板

4—盖板  
5—捆带及锁扣  
6—护角

1. Wood bracket  
2. Bottom plate  
3. Steel sheet

4. Top cover plate  
5. Banding strip and lock  
6. Corner guard

1—托架  
2—下盖板  
3—钢板  
4—盖板

1. Wood bracket  
2. Bottom cover plate  
3. Steel sheet  
4. Top cover plate

5—捆带及锁扣  
6—侧护板  
7—防锈纸

5. Banding strip and lock  
6. Side protective plate  
7. Rust-proof paper

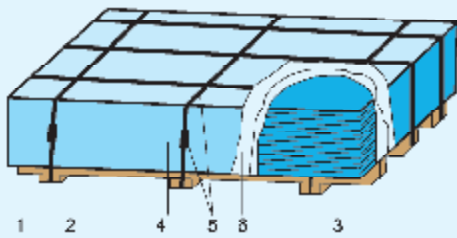


图 3 (Figure 3)

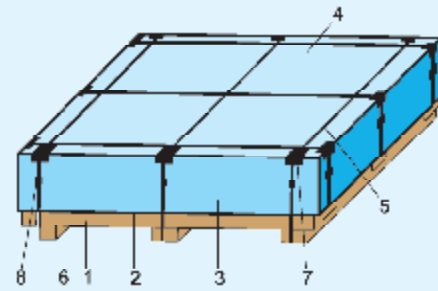


图 4 (Figure 4)

1-托架  
2-下盖板  
3-钢板

4-包装铁盒  
5-捆带及锁扣  
6-防锈纸, 塑料薄膜

1-托架  
2-下盖板  
3-钢板  
4-上盖板

5-横向捆带  
6-纵向捆带  
7-护角  
8-锁扣

1. Wood bracket  
2. Bottom cover plate  
3. Steel sheet

4. Steel package box  
5. Banding strip and lock  
6. Rust-proof paper & plastic membrane

1. Wood bracket  
2. Bottom cover plate  
3. Steel sheet  
4. Top cover plate

5. Horizontal banding strip  
6. Vertical banding strip  
7. Corner guard  
8. Lock

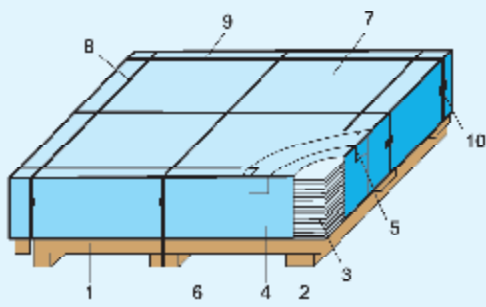


图 5 (Figure 5)

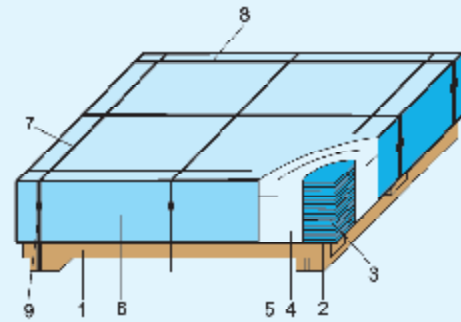


图 6 (Figure 6)

- |        |        |
|--------|--------|
| 1—托架   | 6—侧护板  |
| 2—下盖板  | 7—上盖板  |
| 3—钢板   | 8—横向捆带 |
| 4—防锈纸  | 9—纵向捆带 |
| 5—塑料薄膜 | 10—锁扣  |

- |        |        |
|--------|--------|
| 1—托架   | 6—铁盒盖  |
| 2—下盖板  | 7—横向捆带 |
| 3—钢板   | 8—纵向捆带 |
| 4—防锈纸  | 9—锁扣   |
| 5—塑料薄膜 |        |

- |                       |                             |
|-----------------------|-----------------------------|
| 1. Wood bracket       | 6. Side protective plate    |
| 2. Bottom cover plate | 7. Top cover plate          |
| 3. Steel sheet        | 8. Horizontal banding strip |
| 4. Rust-proof paper   | 9. Vertical banding strip   |
| 5. Plastic membrane   | 10. Lock                    |

- |                       |                             |
|-----------------------|-----------------------------|
| 1. Wood bracket       | 6. Steel package box        |
| 2. Bottom cover plate | 7. Horizontal banding strip |
| 3. Steel sheet        | 8. Vertical banding strip   |
| 4. Rust-proof paper   | 9. Lock                     |
| 5. Plastic membrane   |                             |

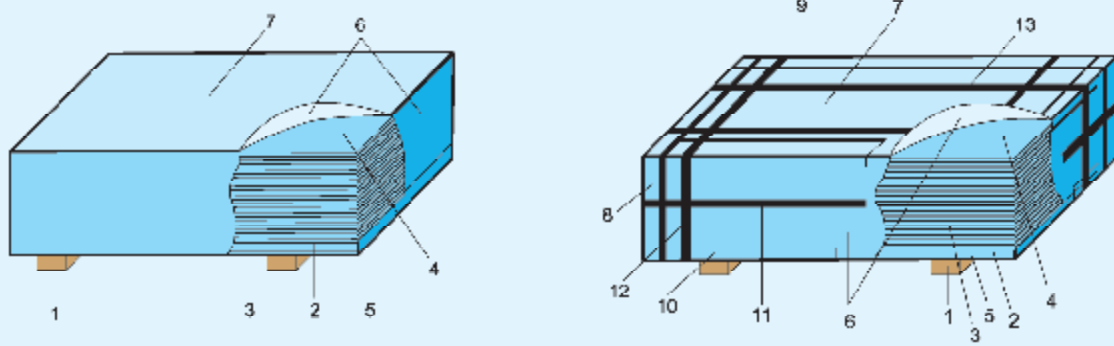


图 7 (Figure 7)

1-木台  
2-下盖板  
3-钢板

4-上盖板  
5-底部瓦楞纸  
6-防锈纸

7-上部瓦楞纸  
8-边部护角  
9-上部护角

10-下部护角  
11-周向捆带  
12-横向捆带  
13-纵向捆带

1. Wood bracket  
2. Bottom cover plate  
3. Steel sheet

4. Top cover plate  
5. Bottom corrugated paper  
6. Rust-proof paper

7. Top corrugated paper  
8. Side corner guard  
9. Top corner guard

10. Bottom corner guard  
11. Circumferential banding strip  
12. Horizontal banding strip  
13. Vertical banding strip

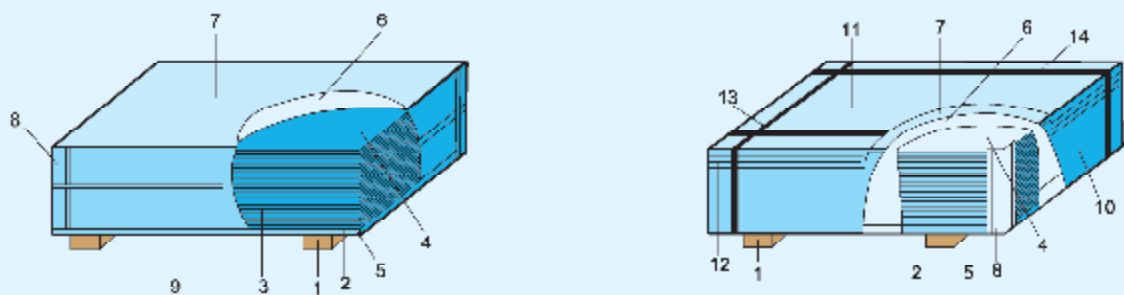


图 8 (Figure 8)

- 1—木台
- 2—上盖板
- 3—钢板
- 4—下盖板
- 5—底部瓦楞纸
- 6—防锈纸
- 7—上部瓦楞纸

- 8—边部护角
- 9—周向捆带（内）
- 10—围板
- 11—铁盒
- 12—周向捆带（外）
- 13—横向捆带（外）
- 14—纵向捆带（外）

- 1. Wood bracket
- 2. Bottom cover plate
- 3. Steel sheet
- 4. Top cover plate
- 5. Bottom corrugated paper
- 6. Rust-proof paper
- 7. Top corrugated paper

- 8. Side corner guard
- 9. Circumferential banding strip (inner)
- 10. Guard plate
- 11. Steel package box
- 12. Circumferential banding strip (outer)
- 13. Horizontal banding strip (outer)
- 14. Vertical banding strip (outer)

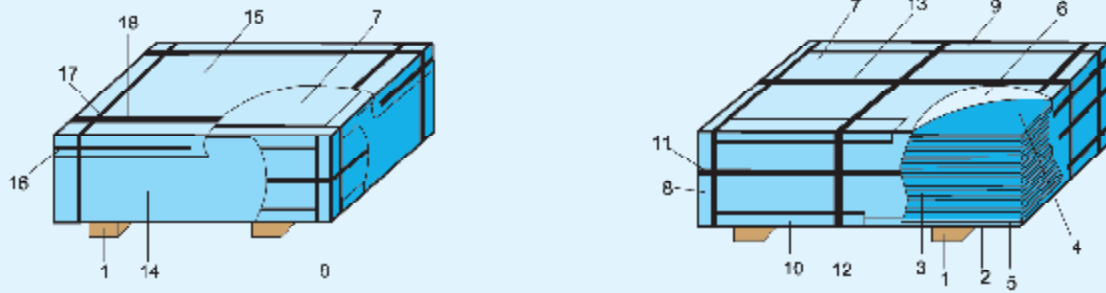


图 9 (Figure 9)

- |         |             |                           |   |
|---------|-------------|---------------------------|---|
| 1—木台    | 10—下部护角     | 1. Wood bracket           | 10. Bottom corner guard                   |
| 2—底板    | 11—周向捆带 (内) | 2. Bottom cover plate     | 11. Circumferential banding strip (inner) |
| 3—钢板    | 12—横向捆带 (内) | 3. Steel sheet            | 12. Horizontal banding strip (inner)      |
| 4—盖板    | 13—纵向捆带 (内) | 4. Top cover plate        | 13. Vertical banding strip (inner)        |
| 5—底部瓦楞纸 | 14—围板       | 5. Bottom corrugate paper | 14. Guard plate                           |
| 6—防锈纸   | 15—铁盒       | 6. Rust-proof paper       | 15. Steel package box                     |
| 7—上部瓦楞纸 | 16—周向捆带 (外) | 7. Top corrugated paper   | 16. Circumferential banding strip (outer) |
| 8—边部护角  | 17—横向捆带 (外) | 8. Side corner guard      | 17. Horizontal banding strip (outer)      |
| 9—上部护角  | 18—纵向捆带 (外) | 9. Top corner guard       | 18. Vertical banding strip (outer)        |

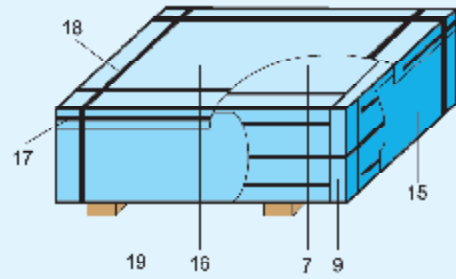
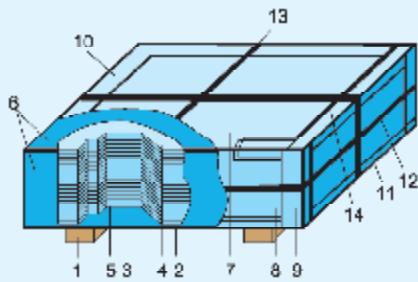


图 10 (Figure 10)

- |         |                           |
|---------|---------------------------|
| 1—木台    | 1. Wood bracket           |
| 2—底板    | 2. Bottom cover plate     |
| 3—钢板    | 3. Steel sheet            |
| 4—盖板    | 4. Top cover plate        |
| 5—底部瓦楞纸 | 5. Bottom corrugate paper |
| 6—防锈纸   | 6. Rust-proof paper       |
| 7—上部瓦楞纸 | 7. Top corrugated paper   |
| 8—端面瓦楞纸 | 8. End corrugated paper   |
| 9—边部护角  | 9. Side corner guard      |

- |             |   |
|-------------|---|
| 10—上部护角     | 10. Top corner guard                      |
| 11—下部护角     | 11. Bottom corner guard                   |
| 12—周向捆带 (内) | 12. Circumferential banding strip (inner) |
| 13—横向捆带 (内) | 13. Horizontal banding strip (inner)      |
| 14—纵向捆带 (内) | 14. Vertical banding strip (inner)        |
| 15—围板       | 15. Guard plate                           |
| 16—铁盒       | 16. Steel package box                     |
| 17—周向捆带 (外) | 17. Circumferential banding strip (outer) |
| 18—横向捆带 (外) | 18. Horizontal banding strip (outer)      |
| 19—纵向捆带 (外) | 19. Vertical banding strip (outer)        |

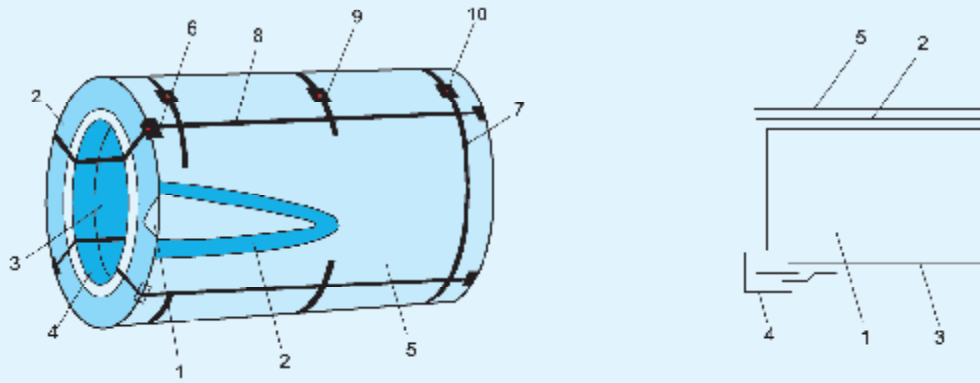


图 11 (Figure 11)

- |         |        |   |                                  |
|---------|--------|---|----------------------------------|
| 1—钢卷    | 6—纸外护角 | 1. Steel coil                           | 6. Paper external corner guard   |
| 2—外周防锈纸 | 7—周向捆带 | 2. External peripheral rust-proof paper | 7. Circumferential banding strip |
| 3—内芯防锈纸 | 8—径向捆带 | 3. Inner core rust-proof paper          | 8. Radial banding strip          |
| 4—铁内护角  | 9—锁扣垫片 | 4. Iron inner corner guard              | 9. Shim for lock                 |
| 5—外周包板  | 10—锁扣  | 5. External peripheral wrapping plate   | 10. Lock                         |

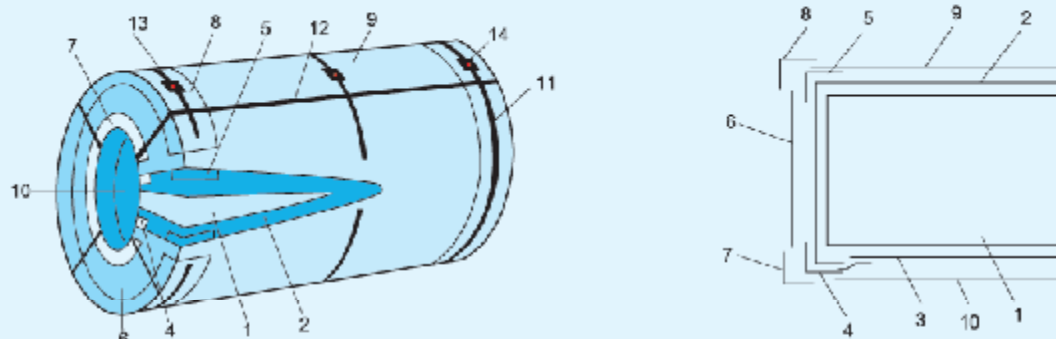


图 12 (Figure 12)

- |         |         |                                     |                                       |
|---------|---------|-------------------------------------|---------------------------------------|
| 1—钢卷    | 8—铁外护角  | 1. Steel coil                       | 8. Iron external corner guard         |
| 2—外周防锈纸 | 9—外周包板  | 2. Circumferential rust-proof paper | 9. External peripheral wrapping plate |
| 3—内芯防锈纸 | 10—内周护板 | 3. Inner core rust-proof paper      | 10. Inner peripheral guard plate      |
| 4—纸内护角  | 11—周向捆带 | 4. Paper inner corner guard         | 11. Circumferential banding strip     |
| 5—纸外护角  | 12—径向捆带 | 5. Paper external corner guard      | 12. Radial banding strip              |
| 6—铁圆护板  | 13—锁扣垫片 | 6. Iron round cover                 | 13. Shim for lock                     |
| 7—铁内护角  | 14—锁扣   | 7. Iron inner corner guard          | 14. Lock                              |

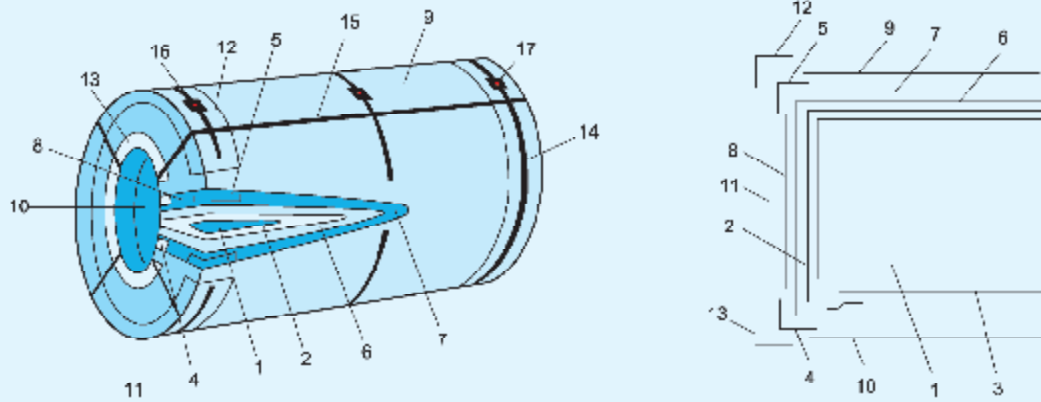


图 13 (Figure 13)

- |         |   |         |                                       |
|---------|---|---------|---------------------------------------|
| 1—钢卷    | 1. Steel coil                           | 9—外周包板  | 9. External peripheral wrapping plate |
| 2—外周防锈纸 | 2. Circumferential rust-proof paper     | 10—内周护板 | 10. Inner peripheral guard plate      |
| 3—内芯防锈纸 | 3. Inner core rust-proof paper          | 11—铁圆护板 | 11. Iron round cover                  |
| 4—纸内护角  | 4. Paper inner corner guard             | 12—铁外护角 | 12. Iron external corner guard        |
| 5—纸外护角  | 5. Paper external corner guard          | 13—铁内护角 | 13. Iron inner corner guard           |
| 6—塑料套   | 6. Plastic sleeve                       | 14—周向捆带 | 14. Circumferential banding strip     |
| 7—外周瓦楞纸 | 7. External peripheral corrugated paper | 15—径向捆带 | 15. Radial banding strip              |
| 8—圆护瓦楞纸 | 8. Round corrugated paper guard         | 16—锁扣垫片 | 16. Shim for lock                     |
|         |   | 17—锁扣   | 17. Lock                              |

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