

Baosteel Nuclear Power Steel

宝钢核电用钢

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

www.baosteel.com



目 录

Contents

前言	I
Foreword	I
宝钢股份质量保证体系	3
Baosteel's Quality Assurance System	3
主要认证	3
Main Certification	3
认证证书	4
Accreditation Certificate	4
主要制造单元及工艺介绍	6
Main Production Units & Production Process Flow	6
核电用钢主要制造单元	6
Main Production Units	6
制造工艺流程	10
Production Process Flow	10
典型核电用钢介绍	13
Overview of Typical Steel for Nuclear Power Application	13
碳钢钢板	14
Carbon Steel Plate	14
不锈钢及合金板带	15
Stainless Steel and Alloy Plate and Sheet	15
碳钢及合金钢无缝钢管	16
Seamless Tubes of Carbon Steel and Alloy Steel	16
不锈钢无缝钢管	17
Seamless Stainless Steel Tube	17
690合金U型管	18
690 Alloy U-shaped Tube	18
不锈钢及镍基合金棒、丝、带材、锻件	20
Rod, Wire, and Strip Material and Forged Parts Made from Stainless Steel and Nickel-based Alloy	20
钢筋及线材	22
Reinforcing Bar and Wire Rod	22
宝钢股份检验检测	23
Test and Detection of Baosteel	23
实验室认可证书	23
Laboratory Accreditation Certificate	23
主要检验检测项目及设备	24
Main Test and Detection Projects and Equipment	24
全程贸易服务	27
One-stop Trading Services	27
售前技术商谈	27
Pre-sale Technical Consultation	27
售中精益运营	29
Lean Operation During Sales	29
售后跟踪服务	31
After Service	31
便捷的远程服务	32
Convenient Remote Service	32

1. 前言

Foreword



宝山钢铁股份有限公司（简称宝钢股份），是中国最大、最现代化的钢铁联合企业，以其诚信、人才、创新、管理、技术诸方面综合优势，奠定了在国际钢铁市场上世界级钢铁联合企业的地位。《世界钢铁业指南》评定宝钢股份在世界钢铁行业的综合竞争力为前三名，认为是未来最具发展潜力的钢铁企业。

宝钢股份为实现核电用钢国产化目标，不断完善核电用钢生产装备和产品系列，相继建成了具备国际先进水平的电炉、大型真空感应炉、快锻和径锻机、热挤压机等关键设备以及高合金棒线材、宽厚板和合金板带等产线，形成了碳钢、不锈钢、特钢三大产品体系，产品包括碳钢、不锈钢、镍基合金、钴基合金以及配套焊接材料，覆盖板、管、棒、丝、锻件等形态，是国内核电用钢品种、规格、形态覆盖面最广的供应商。

宝钢股份生产的符合核安全 I、II、III 级要求的核电用钢产品已用于制造堆内构件、控制棒驱动机构、燃料组件、安全壳、稳压器、蒸发器等关键设备。在秦山一期、秦山二期扩建、巴基斯坦恰希玛一期及二期、广东岭澳核电二期扩建、辽宁红沿河、福建宁德和浙江三门、山东海阳以及华能石岛湾等核电站工程建设中发挥了重要作用。

宝钢股份注重核电用钢的技术拓展和服务，组建了宝钢核电用钢技术专家团队和专业的贸易服务团队，在生产装备、技术力量、质保体系、管理体系、营销体系等方面形成了较强的实力。宝钢股份已成为国内核电用钢的重要供应商。

宝钢股份愿竭诚为国内外核电设备制造商、核电站建设工程，提供优质产品和全方位的技术、贸易服务。

1. 前言

Foreword

Baoshan Iron & Steel Co., Ltd. (hereinafter referred to as Baosteel) is the largest and most advanced integrated steel company in China. By means of leveraging comprehensive advantages such as good faith, talents, innovation, management, and technology, Baosteel is also recognized as a world leading steel company by the global steel market. According to World Steel Dynamics, the company ranks No. 3 in the world in terms of comprehensive competency; it is also believed to have the greatest development potential.

To realize localized production of nuclear power steel, and to consistently improve the production facilities and product series of nuclear power steel, Baosteel has consecutively constructed various key facilities and equipment such as world-standard and advanced electric furnace, large vacuum induction furnace, fast forging machine and radial forging machine, heat extrusion machine, and several lines for the production of high-alloy bar and wire materials, heavy plate, alloy plate and sheet, thus forming three product systems of carbon steel, stainless steel and special steel, including such products as carbon steel, stainless steel, nickel-based alloy, Co-based alloy and supporting welding materials, covering various forms such as plate, pipe, rod, thread, forged piece, etc. Baosteel is China's domestic supplier of nuclear power steel with the most extensive coverage of types, specifications and forms.

Those such steel products applied to nuclear power in compliance with nuclear safety Level I, II and III as produced by Baosteel have been used for the manufacture of key equipment such as reactor internals, control rod drive mechanism, fuel assembly, containment vessel, pressurizer and steam generator etc., and have been playing important role in the engineering and construction of Qinshan Phase I, Qinshan Phase II Expansion, Chashma Nuclear Power Plant Phase I and II in Pakistan, Guangdong Ling'ao Nuclear Power Station Phase II Expansion, and several other nuclear power plants and stations such as Hongyanhe in Liaoning, Ningde in Fujian, Sanmin in Zhejiang, Haiyang in Shandong, Huaneng Shidao Bay in Shandong, etc.

Baosteel attaches importance to technological exploration and service on steel products for nuclear power applications, and has established specific technological expert teams and professional trading service teams, thus forged her great strength in terms of production equipment, technology, quality assurance system, management system, marketing system, etc. Baosteel has become an important domestic supplier of steel products applied to nuclear power industry.

Baosteel wholeheartedly dedicates to providing domestic and foreign nuclear-power equipment manufacturers and construction projects of nuclear-power plants with quality products and comprehensive technology and trading service.

2.

宝钢股份 质量保证 体系

Baosteel's Quality Assurance System

宝钢股份已按照核电质保要求建立了覆盖相关生产单元的核质保体系，制订了核质保大纲和相应的体系文件，建立了相应的制度，并定期组织核电法规、质保大纲的专项培训以及内部监查活动，持续改进核电质量管理体系以保障体系有效运行。

According to nuclear-power quality assurance requirement, Baosteel has developed her nuclear quality assurance system which covers the relevant production units, formulated nuclear quality assurance guideline and corresponding documentation system, had corresponding system established, regularly organized special training and internal monitoring and inspection activities concerning the rules and regulations and QA guideline of nuclear power, and continuously improved the nuclear power quality management system for the effective operation of the assurance system.

主要认证

Main Certification

- 1995年 通过英国BSI公司质量管理体系 (ISO 9001) 认证;
- 1998年 通过华夏认证公司环境管理体系 (ISO 14001) 认证;
- 2004年 通过英国BSI公司质量、环境和职业健康安全管理体系 (OHSAS18001) 体系一体化认证;
- 2005年 通过中启质量体系认证中心测量管理体系认证;
- 2007年 按照ASME NCA3800的要求建立了完备的核电质保体系;
- 2009年 获得国家核安全局颁发的《中华人民共和国民用核安全机械设备制造许可证》(核安全二级、三级不锈钢无缝管)。

- Accredited by British Standard Institution (BSI) in 1995 the Company Quality Management System (ISO9001);
- Accredited by Huaxia Certification Company in 1998 the Environment Management System (ISO14001);
- Accredited by British Standard Institution (BSI) in 2004 the Integrated Certification of Quality, Environment and Occupational Health and Safety Administration System (OHSAS18001);
- Accredited by Zhongqi Quality System Certification Centre in 2005 the Measurement Management System;
- Established complete nuclear quality assurance system in 2007 according to the requirement of ASME NCA3800;
- Awarded by State Nuclear Safety Bureau in 2009 the *License of PRC for the Manufacture of Civil Nuclear Security Machinery and Equipment* (Nuclear Safety Level II and III Seamless Stainless Steel Tube)

2.

宝钢股份 质量保证 体系

Baosteel's Quality Assurance System

认证证书 Accreditation Certificate



图1
ISO9001认证证书

Fig. 1
ISO9001 Accreditation Certificate



图2
ISO14001认证证书

Fig. 2
ISO14001 Accreditation Certificate



图3
OHSAS18001认证证书

Fig. 3
OHSAS18001
Accreditation Certificate



图4
测量管理体系认证证书

Fig. 4
Measurement Management
Accreditation Certificate



图5 民用核安全设备制造许可证

Fig. 5 Civil Nuclear Safety Equipment Production Permit

3.

主要制造单元及工艺介绍

Major Production Unit of Steel Products for Nuclear Power Application

核电用钢主要制造单元 Main Production Units

产品种类 Product Category	主要制造单元 Major Production Units	主要产品 Main Products	产线介绍	
碳 钢 Carbon Steel	热轧厂 Hot Rolling Plant	热轧板卷 Hot Rolled Coils	<ul style="list-style-type: none"> 2050mm热连轧产线广泛采用热装工艺、CVC技术、液压厚度自动控轧等新技术,可生产核电用低碳钢、低合金钢、容器用钢和管线用钢等板卷。 1880mm热连轧产线采用快速冷却、低温卷取等新技术,可生产核电用高强度板卷。 可根据用户的要求,将卷板加工成钢板、平整卷及纵切钢带产品。 	
	厚板厂 Heavy Plate Plant	中厚板 Medium and Heavy Plates	<ul style="list-style-type: none"> 5m厚板产线和4.2m厚板产线分别采用高精度轧制技术、TMCP技术、强力矫直自动化控制技术、自动化剪切技术、在线自动化探伤技术、无氧化热处理、自动标记和多功能AGC液压厚度控制技术、CVC板形控制技术、PSG板形检测技术、低速大压下等多项先进的工艺技术,可生产核电用低碳钢、低合金钢、容器用钢等中厚板。 交货状态包括热轧、控轧、调质、正火、正火加回火、回火等。 	
	钢管条钢事业部 Tube, Pipe and Bar Business Unit	钢管、线材 Pipe and Wire Rod	<ul style="list-style-type: none"> 拥有初轧、高速线材、无缝钢管、HFW焊管和UOE焊管多条世界先进的现代化生产线,形成了以钢管、线材、钢坯三大系列为核心的产品体系。 无缝钢管产线采用狄塞尔导盘二辊式斜轧穿孔、全浮动长芯棒连续轧制、在线壁厚检测等多项新技术,可生产核电用管材。 线材产线全线采用全连续无扭控轧工艺,可生产核电用焊接用钢盘条等。 	

	Introduction of Prouducton Lines	产品优势	Product Features
	<ul style="list-style-type: none"> New techniques such as hot charging rolling, CVC techniques, hydraulic automatic gauge control (AGC) rolling, etc. are adopted for the 2050mm hot tandem rolling production line which produces nuclear-power coils of low-carbon steel, low-alloy steel, and steels for vessels and pipelines. New techniques such as fast cooling and low-temperature rolling take-up are adopted in the 1880mm hot tandem rolling production line which produces high-strength coils for nuclear power application. Process the coils into steel plates, skin pass coils and slitting strip products according to the requirement of clients. 	<ul style="list-style-type: none"> 板型优良 尺寸精度高 易于加工成型 焊接性优良 	<ul style="list-style-type: none"> Excellent plate shapes High-precision size Easy processing Good welding performance
	<ul style="list-style-type: none"> Various advanced techniques such as high-precision rolling, TMCP, forcible straightening automation control, automatic cutting, online automatic flaw detection, non-oxidation heat treatment, automatic marking and multi-purpose hydraulic automatic gauge control (AGC), CVC plate shape control, PSG plate shape detection, low-speed high-pressure, etc. are adopted upon the 5m heavy plate production line and 4.2m heavy plate production line, which produce medium and heavy plates of low-carbon steel, low-alloy steel, vessel steel, etc. for nuclear power application. Delivery status includes hot-rolling, controlled rolling, quenching and tempering, normalizing, normalizing and tempering, tempering, etc. 	<ul style="list-style-type: none"> 板面宽 板型优良 定尺精确 表面质量优良 	<ul style="list-style-type: none"> Broad width Excellent plate shape Accurate cut-to-length Excellent surface quality
	<ul style="list-style-type: none"> Various world advanced production line of blooming, high-speed wire rod, seamless steel pipe (tube), HFW pipe, UOE pipe, etc., forming the product system with steel tube, wire rod and steel billet as the three core series of products. Various new techniques such as two skew-roll piercing process with Diesel guide disk, fully-floating longmandrel mill process, online wall thickness testing, etc. for the production of steel tubes for nuclear power application. Continuous non-torsion control rolling technique is completely applied for wire rod line, which produces wire rod of core wire of covered electrodes for nuclear power applications. 	<ul style="list-style-type: none"> 钢质纯净 成分均匀稳定 尺寸精度高 综合力学性能优良 工艺性能优良 	<ul style="list-style-type: none"> High purity Homogeneous and stable composition High accuracy of dimension Excellent comprehensive mechanical properties Excellent technical performance

3.

主要
制造单元及
工艺介绍Major Production Unit of Steel Products for
Nuclear Power Application

产品种类 Product Category	主要制造单元 Major Production Units	主要产品 Main Products	产线介绍	
碳 钢 Carbon Steel	硅钢部 Silicon Steel Department	电工钢 Silicon steel	<ul style="list-style-type: none"> 退火涂层机组采用板温自动温度控制、膜厚检测反馈控制、自动纠偏等多项新技术，可生产核电装备用全规格、全牌号高等级无取向电工钢。 	
	广州钢铁股份有限公司 (以下简称广钢股份)、 南通宝钢钢铁有限公司 (以下简称宝通钢铁) Guangzhou Iron & Steel Co., Ltd. (Guangzhou Steel), Nantong Baosteel Iron & Steel Co., Ltd. (Baotong Steel)	钢筋、线材 Reinforcing bars, Wire rod	<ul style="list-style-type: none"> 拥有转炉炼钢、电炉炼钢、连续轧钢、高速线材等先进生产设备以及炼钢全连铸、切分轧制、高精度无缝钢管等先进生产技术，配备有先进的检测、试验和自动控制的装备和手段。 可按照中国、英国、美国和加拿大等国家标准，生产核电用热轧带肋钢筋、光圆钢筋、盘圆、盘螺等。 	
不锈钢 Stainless Steel	不锈钢事业部 Stainless Steel Business Unit	不锈钢冷、热轧卷板， 碳钢卷板 Cold/hot rolled stainless steel coils and sheets, carbon steel coils and sheets	<ul style="list-style-type: none"> 本部拥有炼铁、炼钢、热轧、冷轧等配套完整的不锈钢和碳钢联合生产线。 下辖宁波宝新不锈钢有限公司专业生产冷轧不锈钢薄板和冷轧不锈钢焊管。 可生产核电用铁素体、奥氏体、马氏体、双相钢四大系列不锈钢产品。 	
特 钢 Special Steel	特钢事业部 Special Steel Business Unit	以镍基合金、钴基合金、钛合金、不锈钢、合金钢等为主的热冷轧卷板、中厚板、管、棒、丝、锻件 Hot/cold-rolled plates, medium and heavy plates, tubes, rods, wire, forged parts, etc. of nickel-based alloy, Co-based alloy, Ti-based alloy, stainless steel, alloy steel, etc.	<ul style="list-style-type: none"> 拥有特种冶金、超塑等温锻、快锻及径锻产线、不锈钢长型材、高合金钢、银亮钢、合金板带及热挤压等多条世界一流的新产线。 可生产核岛控制棒驱动机构、堆内构件、蒸汽发生器用690合金U型传热管等关键设备用钢。 	

	Introduction of Prouducton Lines	产品优势	Product Features
	<ul style="list-style-type: none"> Various new techniques such as auto-control of plate temperature, film thickness detection feedback control, automatic rectifying-deviation , etc. are applied in the Annealing and Coating Line which produces full-spec all-grade high grade non-oriented electric steel. 	<ul style="list-style-type: none"> 性能稳定 尺寸精度高 表面绝缘性能优良 	<ul style="list-style-type: none"> Stable property High accuracy of dimension Excellent surface insulation property
	<ul style="list-style-type: none"> With BOF, EAF, Continuous rolling, High-speed wire etc. advanced equipments and Steelmaking and continuous casting, slit rolling, high precise seamless tube producing techniques, also equipped with testing and experimenting and automatic controlling systems. Can produce hot-rolled ribbed and plain steel bar, wire rod according to China, UK, USA and Canada standards. 	<ul style="list-style-type: none"> 获“国家免检产品”、“实物金杯奖”等荣誉称号 广钢股份生产的钢筋是岭澳核电一期、二期工程唯一指定钢筋。 	<ul style="list-style-type: none"> Awards and Certificates: “Product Exempted from National Quality Surveillance and Inspection”, “Golden Cup Prize for Actual Quality of Nonferrous Metals Products”, etc. The reinforcing bars produced by Guangzhou Steel are exclusively assigned to be used in Ling'ao Nuclear Power Plant Project Phase I and II.
	<ul style="list-style-type: none"> Our department has a complete integrated stainless steel and carbon steel production line for iron-making, steel-making, hot rolling, cold rolling, etc. The affiliated Ningbo Baoxin Stainless Steel Co., Ltd. which focuses on the production of cold-rolling stainless steel sheet and cold-rolling stainless steel welded tubes. Produce 4 series of steel products such as ferrite steel, austenitic steel, martensite steel, dual-phase steel. 	<ul style="list-style-type: none"> 耐磨性优良 耐蚀性优良 高温性能优异 机械加工性能优良 	<ul style="list-style-type: none"> Excellent wear-resisting property Excellent corrosion resistance Excellent high-temperature performance Excellent machining properties
	<ul style="list-style-type: none"> Various world advanced production line of Special metallurgical, super-plastic die forging, fast forging and radial forging ,Stainless steel long products , high-alloy steel, silver bright steel, alloy plate and sheet, hot-extruding, etc. Produces the steel for the application of key equipments such as control rod drive mechanism, reactor internals, 690 U-shaped tube applied in steam generator, etc. 	<ul style="list-style-type: none"> 纯洁度高 组织均匀性高 尺寸精度高 表面质量优良 	<ul style="list-style-type: none"> High purity Highly homogeneous quality High precision of dimension Excellent surface quality

Major Production Unit of Steel Products for Nuclear Power Application

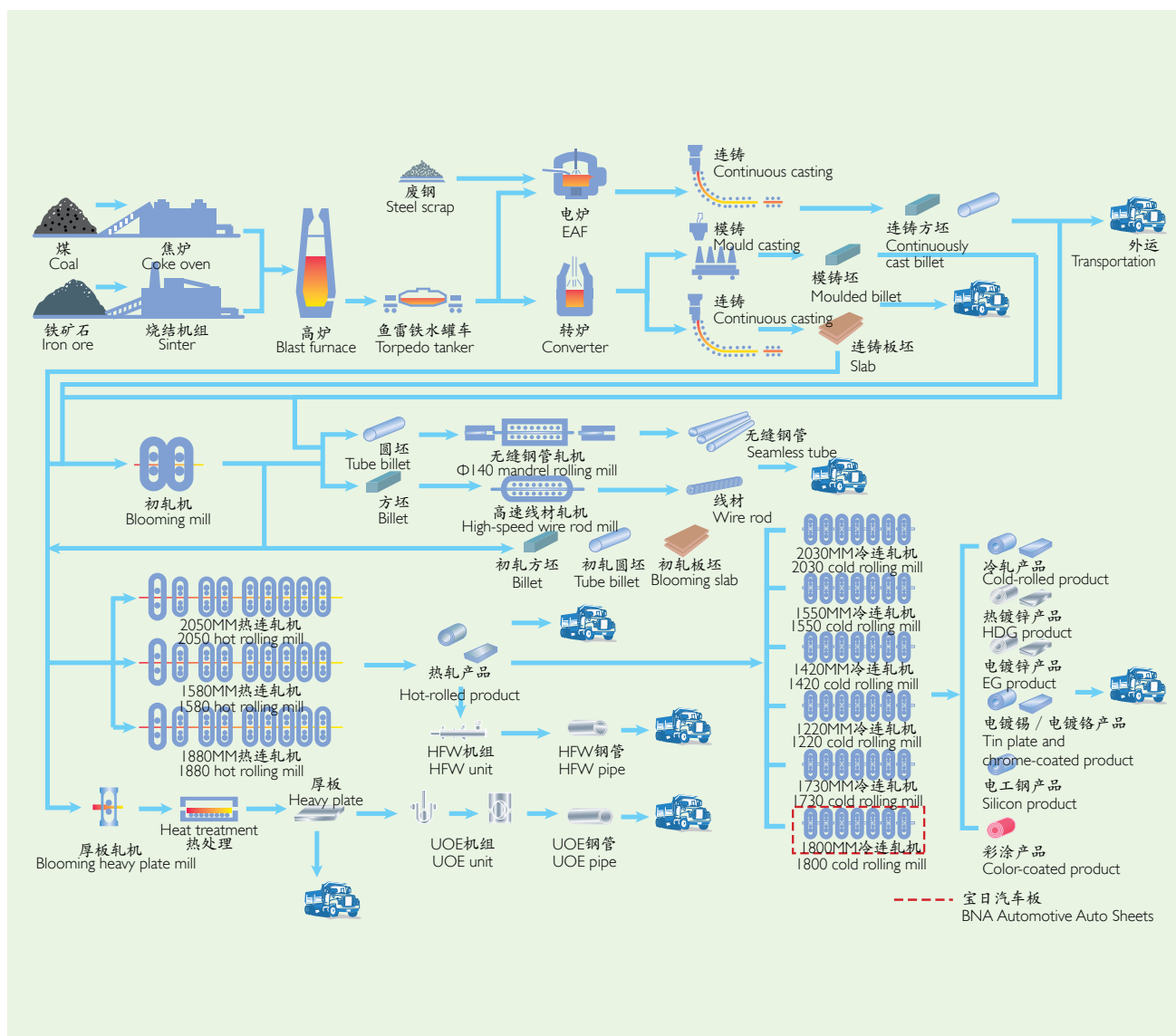


Fig. 6 Process Flowsheet for Carbon Steel

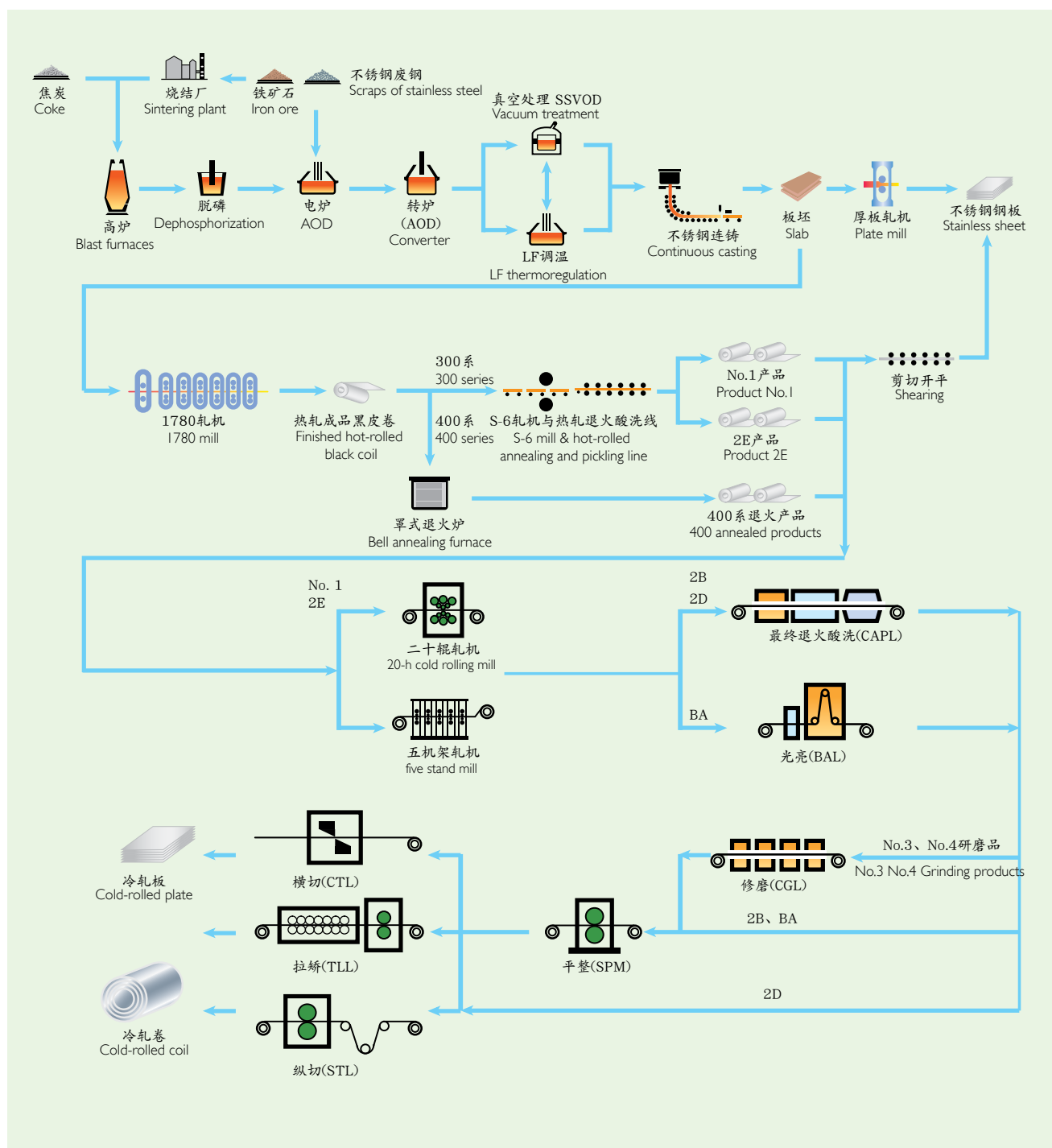


图7 不锈钢制造工艺流程图

Fig. 7 Process Flowsheet for Stainless Steel

3. 主要制造单元及工艺介绍

Major Production Unit of Steel Products for Nuclear Power Application

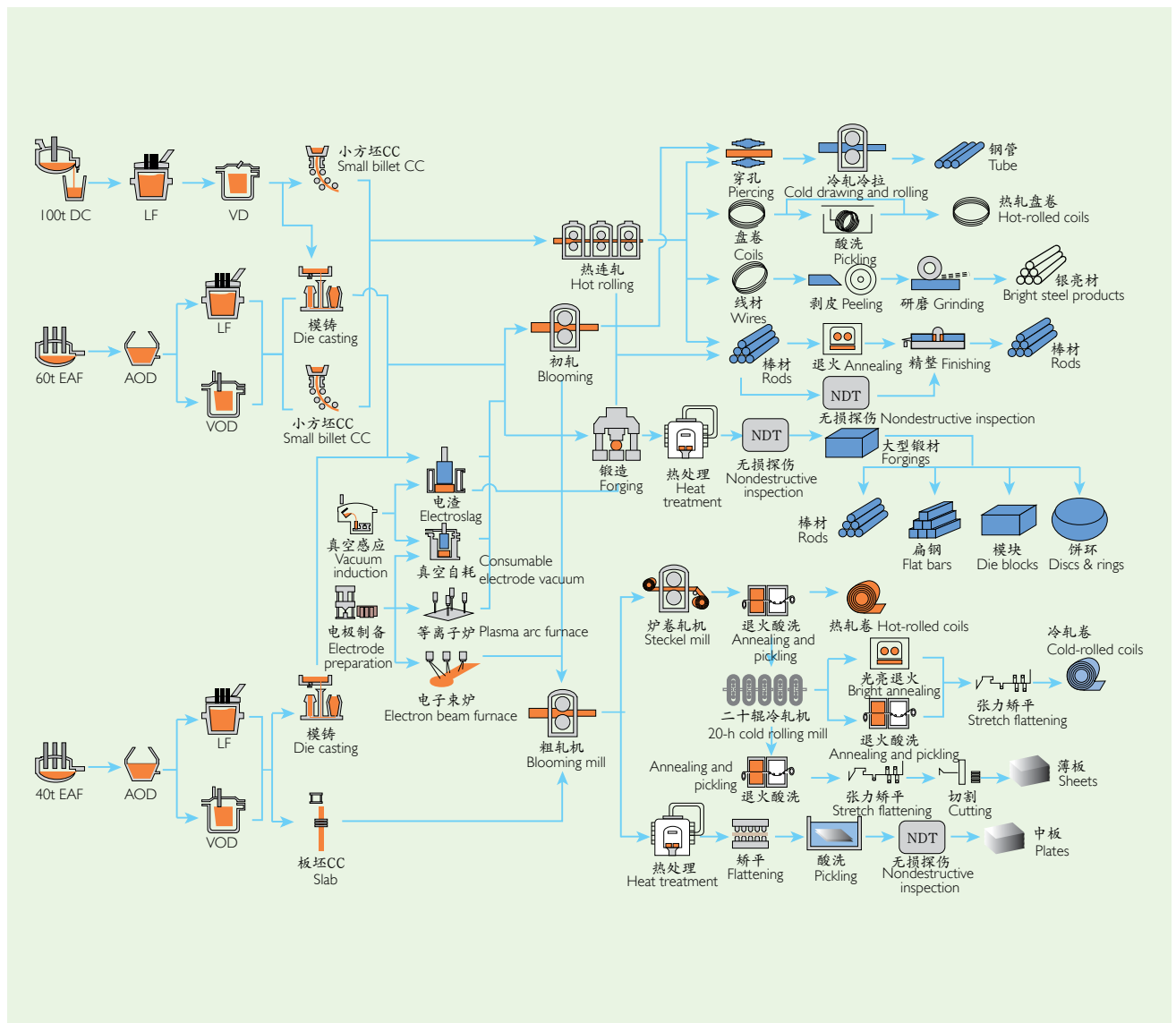


图8 特钢制造工艺流程图
Fig. 8 Process Flowsheet for Special Steel

4.

典型核电 用钢介绍

Overview of Typical Steel for Nuclear Power Application

- 宝钢核电用钢产品可按照中国国家标准、RCC—M规范、EN标准、ASME规范、ASTM标准及用户技术协议供货, 符合核安全 I、II、III 级要求。
- 宝钢核电用钢产品可用于制造堆内构件、控制棒驱动机构、燃料组件、安全壳、稳压器、蒸发器等关键核电设备以及核电站土建施工用材。
- 宝钢提供核电用钢的同时, 还可提供与钢材配套的焊接用钢盘条, 如与SA738 Gr.B钢板配套的气体保护焊丝用盘条。



- Baosteel supplies steel products for nuclear power application in accordance with China National Standard, RCC-M Code, EN Standard, ASME Code, ASTM Standard and the technical agreement of clients. The products meet the requirement of nuclear safety level I, II and III.
- The nuclear-power steel products supplied by Baosteel may be applied to make key nuclear-power equipment such as reactor internals, control rod drive mechanism, fuel assembly, containment vessel, pressurizer, steam generator, etc. and those material used for civil construction of nuclear-power plants.
- While supplying steel for nuclear power application, Baosteel also provides wire rod for electrode to match up with their steel material, such as the wire rod for gas metal arc welding wire which matches with SA738 Gr.B steel plate.

4.

典型核电
用钢介绍Overview of
Typical Steel for Nuclear Power Application

碳钢板

Carbon Steel Plate

常用规格范围

Common Size Range

品种 Product Categories	厚度 (mm) Thickness (mm)	宽度 (mm) Width (mm)	钢板长度 (mm) Length (mm)	交货状态 Delivery Status
热轧板卷 Hot rolled steel sheets and coils	2-18	900-1850	2000-12000	热轧 Hot rolled
中厚板 Medium and heavy plates	10-150	900-4800	最大长度25000 Maximum length: 25000	调质 Quenched
	5-400			控轧/正火等 Controlled rolling/ normalization
高牌号无取向电工钢 High-grade non- oriented electric steel	0.20、0.35、0.5、0.65	800-1290	20T (最大卷重) 20T (maximum coil weight)	退火 Annealing

典型牌号工程应用举例

Engineering Application Example of Typical Grade Steel Products

品种 Product Categories	典型牌号 Typical Grade	用途举例 Application Example	工程项目名称 Project Name
热轧板卷 Hot rolled steel sheets and coils	P265GH	结构衬板、支承件等 Structural liner, support, etc.	岭澳核电站二期扩建项目、 阳江核电项目、宁德核电项 目、福清核电项目、昌江核 电项目、三门核电项目、方 家山核电项目、海阳核电项 目、石岛湾核电项目
中厚板 Medium and Heavy Plate	SA738 Gr.B	安全壳 Containment vessel	Ling'ao Nuclear Plant Phase II Expansion Project, Yangjiang Nuclear Plant Project, Ningde
	A588M Gr.B	稳压器重型支撑 Pressurizer heavy support	Nuclear Plant Project, Changjiang Nuclear Plant Project, Sanmen Nuclear Plant Project, Fangjiaoshan Nuclear Plant Project, Haiyang Nuclear Plant Project, Shidaowan Nuclear Plant Project
	SA533 Type B Cl.1	安注箱 Safety injection tank	
	SA516Gr.70	汽水分离器 Steam or moisture separator	
	12Cr2Mo1R	堆内构件 Reactor internals	
	P265GH、20HR	蒸发器 Steam generator	
	P295GH、Q245R、S235J0、 S275J0-Z25、S355J2、 16MnHR、Q345C	结构件 Structural component	
高牌号无取向电工钢 High-grade non- oriented electric steel	B50A230、B50A250、B50A270、 B50A290、B50A310、B50A350	大型电机、发电设备 Large motor and power generation equipment	广西大化水力发电项目 Guangxi Dahua Hydropower Project

不锈钢及合金板带 Stainless Steel and Alloy Plate and Sheet

常用规格范围 Common Size Range

产品种类 Product Categories		厚度 (mm) Thickness (mm)	宽度 (mm) Width (mm)	钢板长度 (mm) Length (mm)	交货状态 Delivery Status
热轧板卷 Hot-rolled steel sheets and coils	不锈钢 Stainless steel	2-10	1000-3100	C	NO.1
	镍基合金 Nickel-based alloy	4.5-5	1500-2500	2000-13000	固溶、酸洗 Solution treated, pickling
冷轧板卷 Cold-rolled steel sheets and coils	不锈钢 Stainless steel	0.2-5	1000-1600	C	2D 2B
	镍基合金 Nickel-based alloy	1-3	1000-1600	C	固溶、酸洗 Solution treated, pickling
中厚板 Medium and heavy plates	不锈钢 Stainless steel	4-100	600-3500	2000-13000	No.1
	镍基合金 Nickel-based alloy	4.5-40	600-2500	2000-8000	固溶、酸洗 Solution treated, pickling
冷轧带 Cold-rolled Strip Steel	不锈钢 Stainless steel	0.05-0.5	≤300	C	冷轧、固溶 Cold-rolling, solution treated
	镍基合金 Nickel-based alloy				

典型牌号工程应用举例 Engineering Application Example of Typical Grade Steel Products

产品种类 Product Categories	典型牌号 Typical Grade	用途举例 Application Example	工程项目名称 Project Name
不锈钢板 Stainless steel plates	Z2CND18-12 (控氮) (nitrogen control)、 Z2CN19-10 (控氮) (nitrogen control)	安注箱、卸压箱 Safety injection tank, pressure relief tank,	岭澳核电站二期扩建项目、阳江核电项目、防城港核电项目、宁德核电项目、福清核电项目、昌江核电项目、秦山核电项目、三门核电项目、方家山核电项目、海阳核电项目、石岛湾核电项目、红沿河核电项目 Ling'ao Nuclear Power Plant Phase II Expansion Project, Yangjiang Nuclear Power Plant Project, Fangchenggang Nuclear Power Plant Project, Ningde Nuclear Power Plant Project, Fuqing Nuclear Power Plant Project, Changjiang Nuclear Power Plant Project, Qinshan Nuclear Power Plant Project, Sanmen Nuclear Power Plant Project, Fangjianshan Nuclear Power Plant Project, Haiyang Nuclear Power Plant Project, Shidaowan Nuclear Power Plant Project, Hongyanhe Nuclear Power Plant Project
	304、304L	常规岛储罐 Conventional nuclear island storage tank	
	410S、0Cr13、06Cr13	汽水分离器 Steam or moisture separator	
	00Cr19Ni10	核岛隔栅 Nuclear island lattice	
	022Cr19Ni10	硼酸存储罐 Boric acid storage tank	
	06Cr19Ni10、 Z2CN18-10、 Z2CND18-12、 Z2CN19-10(控氮) (nitrogen control)	预埋件、水池覆面板、管道支撑板、核岛辅助系统罐体、核岛厂房用板 Embedded parts, pool cover panel, tube support plate, tank of nuclear island auxiliary system, plates for nuclear island building	
	X2CrNiMo17.12.2	电气防腐系统 Electrical anti-corrosion system	
	X5CrNi18.10	蒸发器减震件 Steam generator damping parts	

4.

典型核电 用钢介绍

Overview of Typical Steel for Nuclear Power Application

碳钢及合金钢无缝钢管 Seamless Tubes of Carbon Steel and Alloy Steel

常用规格范围 Common Size Range

材质 Material	形态 Shape	外径 (mm) OD (mm)	壁厚 (mm) Wall Thickness (mm)	交货状态 Delivery Status
碳钢、合金钢 Carbon steel, alloy steel	无缝钢管 Seamless steel tube	φ16~φ457	2-55	热处理或热轧 Heat treatment or hot rolling

典型牌号工程应用举例 Engineering Application Example of Typical Grade Steel Products

产品种类 Product Categories	典型牌号 Typical Grade	用途举例 Application Example	工程项目名称 Project Name
碳钢无缝钢管 Seamless carbon steel tube	20	钢衬 Steel liner	宁德核电项目 Ningde Nuclear Power Plant Project



不锈钢无缝钢管
 Seamless Stainless Steel Tube

常用规格范围
 Common Size Range

材质 Material	形态 Shape	外径 (mm) OD (mm)	壁厚 (mm) Wall Thickness (mm)	交货状态 Delivery Status	核安全级 Nuclear Safety Level
不锈钢 Stainless Steel	无缝钢管 Seamless steel tube	8-325	0.5-40	酸洗、固溶 pickling, solution treated	非核级 Non-nuclear class
	无缝钢管 Seamless steel tube	≤57	≤12	酸洗、固溶或时效 pickling, solution treated or aging	核2、3级 Nuclear class II and III

典型牌号工程应用举例
 Engineering Application Example of Typical Grade Steel Products

产品种类 Product Categories	典型牌号 Typical Grade	用途举例 Application Example	工程项目名称 Project Name
不锈钢无缝钢管 Seamless stainless steel tube	0Cr17Ni7Al	控制棒驱动机构 Control rod drive mechanism	PC I 期/II 期核电项目、红沿河核电项目、宁德核电项目、福清核电项目、方家山核电项目、昌江核电项目 PC Nuclear Power Plant Phase I/II Project, Hongyanhe Nuclear Power Plant Project, Ningde Nuclear Power Plant Project, Fuqing Nuclear Power Plant Project, Fangjashan Nuclear Power Plant Project, Changjiang Nuclear Power Plant Project
	0Cr18Ni10Ti	导向管、通量管、包壳管 Thimble guide tube, flux tube, cladding tube	
不锈钢无缝钢管管坯 Seamless stainless steel tube blank	Z2CND18-12NS	热交换管 Heat exchange tube	
	00Cr19Ni10		
	Z2CN19-10NS Z5CN18-10		

4.

典型核电 用钢介绍

Overview of Typical Steel for Nuclear Power Application

690合金U型管 690 Alloy U-shaped Tube

蒸汽发生器用690合金U型传热管是核电站核岛中关键材料之一，也是我国核电站建设实施核电装备材料国产化的重点产品。

宝钢将蒸汽发生器用690合金U型传热管的产业化列为重中之重项目，组建了由宝钢股份控股的宝银特种钢管股份有限公司，投资十多亿元建设国内第一条690合金U型管专业生产线；成立核电蒸汽发生器用690合金U型传热管国产化项目组，结合产线的建设进行科研试制工作。目前，该项目已经取得令人瞩目的进展，从国外引进的装备已经安装就绪，从挤压荒管到U型管的产线已经贯通。宝银特种钢管股份有限公司690合金U型管生产线的生产许可正在接受国家核安全局的审查，该产线的投产将指日可待。届时，宝钢将成为国内首家、世界上第四家能够生产核电蒸汽发生器用690合金U型管的企业。

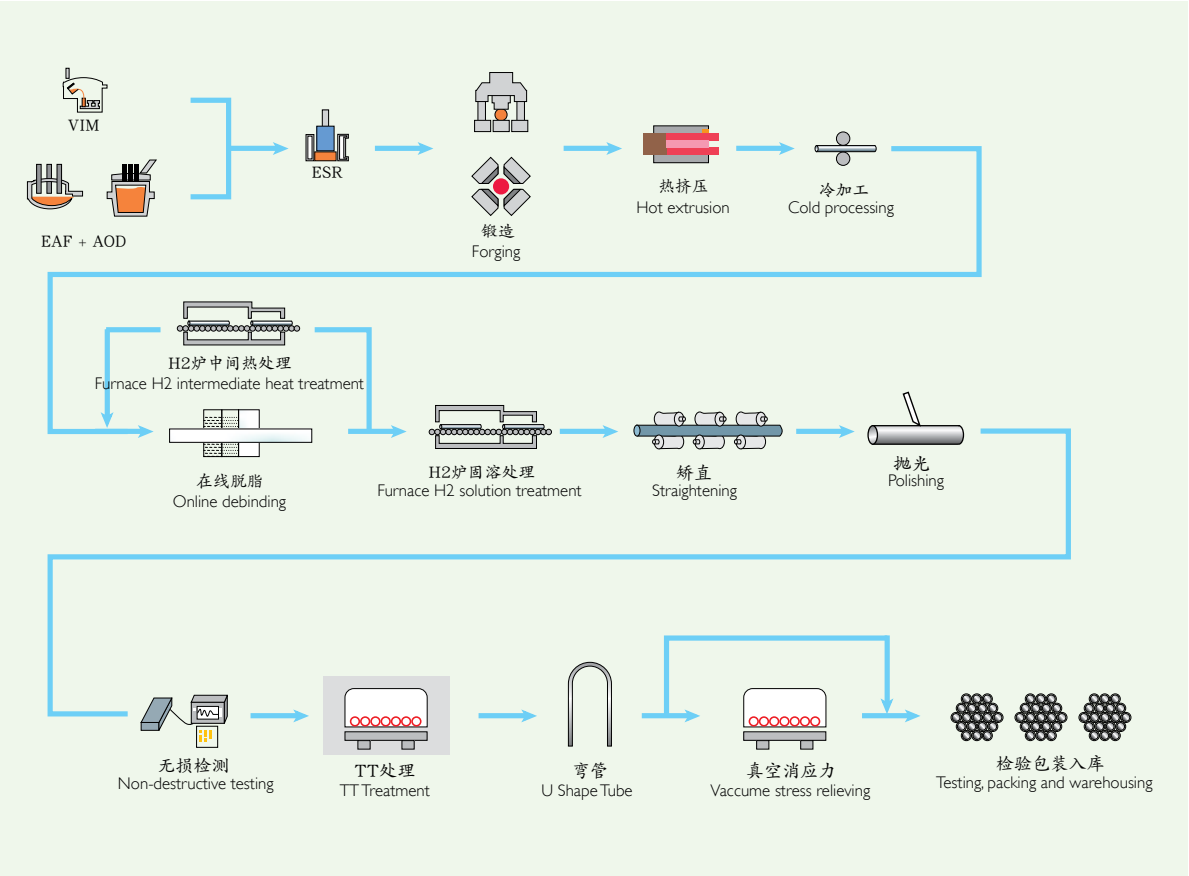
蒸汽发生器用690合金U型管专业生产线的建成投产，标志着我国核电蒸汽发生器用690合金U型管打破了国外公司在该领域长期垄断的局面，从此实现国产化，对保障我国核电设施长期有效运行及国家核安全具有重大意义。

The 690 alloy U-shaped tube used in steam generator is one of the key material applied in the nuclear island of a nuclear power plant, and is regarded as key product for the localization of nuclear power equipment and material for nuclear power plant construction in China.

Baosteel regards the industrialization of 690 alloy U-shaped heat exchange tube used in steam generator as the overriding project, and established Baoyin Special Steel Tube Co., Ltd. with Baosteel as the holding company, and invested billions of Yuan to build China's first professional production line of 690 alloy U-shaped tubes; Baosteel also set up a project team for the localization of 690 alloy U-shaped heat exchange tubes used in steam generators, and conduct scientific research and trial production in consideration of the construction of the production line. Currently this project has made remarkable progress. The equipment introduced from abroad has been installed in place, and the production lines from that of extruding tube blank to that of U-shaped tubes are all ready for operation. The production license of Baoyin Special Steel Tube Co., Ltd. on the production line of 690 alloy U-shaped tubes is currently under the verification of State Nuclear Safety Bureau, and the production line is expected to be put into operation soon. At that moment Baosteel will become China's first and the world's fourth enterprise which is capable of producing 690 alloy U-shaped tubes used in steam generator for the application of nuclear power system.

The completion and operation of the professional production line of 690 alloy U-shaped tube used in steam generator means that China has broken the long period of monopoly of such product by foreign companies, and thus realized the localization of the product, which is of great significance for the long-term and effective operation of China's nuclear power facilities, and for the nuclear safety of the country.

制造工艺流程
Production Process Flow



▲ 图9 690合金U型管制造工艺流程图

Fig. 9 Process Flowsheet for 690 Alloy U-shaped Tube

常用规格范围
Common Size Range

材质 Material	形态 Shape	外径 (mm) OD (mm)	壁厚 (mm) Wall Thickness (mm)	交货状态 Delivery Status	标准 Standard
690	U型管 U-shaped tube	Φ19.05	1.09	TT态 TT status	RCCM M4105
		Φ17.48	1.04	TT态 TT status	ASME SB163

4.

典型核电 用钢介绍

Overview of Typical Steel for Nuclear Power Application

不锈钢及镍基合金棒、丝、带材、锻件 Rod, Wire, and Strip Material and Forged Parts Made from Stainless Steel and Nickel-based Alloy

常用规格范围 Common Size Range

产品种类 Product Categories	形态 Shape	规格 (mm) Size (mm)	交货状态 Delivery Status
镍基合金 Nickel-based alloy	棒 Rod	外径: $\Phi 8$ - $\Phi 300$ OD: $\Phi 8$ - $\Phi 300$	固溶+时效, 磨光、车(铣)光 Solution treated + aging, polished, peeled (milled)
	丝 Wire	直径: $\Phi 0.5$ - $\Phi 8$ Diameter: $\Phi 0.5$ - $\Phi 8$	
	锻造扁材(模块) Forged flat products (die block)	厚度: 80-300 宽度: 80-300 Width: 80-300 Thickness: 80-300	
不锈钢 Stainless steel	棒 Rod	外径: $\Phi 8$ - $\Phi 1200$ OD: $\Phi 8$ - $\Phi 1200$	热处理, 磨光、车(铣)光 Heat treatment, polished, peeled (milled)
	丝 Wire	直径: $<\Phi 8$ Diameter: $<\Phi 8$	
	锻造扁材 Forged flat products	厚度: 40-600 宽度: 200*1800 Width: 40-600 Thickness: 200*1800	



典型牌号工程应用举例

Engineering Application Example of Typical Grade Steel Products

产品种类 Product Categories	典型牌号 Typical Grade	用途举例 Application Example	工程项目名称 Project Name
镍基合金 Nickel-based alloy	GH4169 (A) (In718、NC19FeNb)	燃料组件、控制棒驱动机构和堆内构件 Fuel assembly, control rod drive mechanism, reactor internals	岭澳核电二期扩建项目、 阳江核电项目、昌江核电项 目、福清核电项目、宁德核电 项目、秦山核电二期扩建项 目、方家山核电项目、红沿 河核电项目、三门核电项目 Ling'ao Nuclear Power Plant Phase II Expansion Project, Yangjiang Nuclear Power Plant Project, Changjiang Nuclear Power Plant Project, Fuqing Nuclear Power Plant Project, Ningde Nuclear Power Plant Project, Qinshan Nuclear Power Plant Phase II Expansion Project, Fangjashan Nuclear Power Plant Project, Hongyanhe Nuclear Power Plant Project, Sanmen Nuclear Power Plant Project
	NC15Fe (GH3600)	压力容器、蒸发器、堆内构件 Reactor pressure vessel, steam generator, reactor internals	
	NC15FeTiNbA (GH4145、X750)	堆内构件、控制棒驱动机构 Reactor internals, control rod drive mechanism	
	GH2132 (A286)	控制棒驱动机构 Control rod drive mechanism	
	GH605 (HS-25)	控制棒驱动机构 Control rod drive mechanism	
	GH690	压力容器、控制棒驱动机构 Reactor pressure vessels, control rod drive mechanism	
不锈钢 Stainless steel	Z2CN19-10NS Z6CND17-12 Z2CND18-12NS 321(0Cr18Ni10Ti)	堆内构件 Reactor internals	
	0Cr19Ni9 0Cr17Ni12Mo2 0Cr25Ni20 X10CrNi18-8 X6CrNiCu17-04 0Cr17Ni7Al 0Cr13、1Cr13	控制棒驱动机构 Control rod drive mechanism	
	0Cr18Ni10Ti	燃料组件 Fuel assembly	
	Z2CN18-10 00Cr19Ni10 Z5CN18-10	管道 Pipeline	
	X12Cr13 0Cr18Ni10Ti	蒸发器 Steam generator	

4.

典型核电 用钢介绍

Overview of Typical Steel for Nuclear Power Application

钢筋及线材

Reinforcing Bar and Wire Rod

常用规格范围

Common Size Range

产品种类 Product Categories	牌号 Grade	规格 (mm) Size (mm)
热轧光圆钢筋/热轧带肋钢筋 Hot-rolled plain bar / hot-rolled ribbed bar	HPB235、HRB335、HRB400、HRB500、GRA460、ASTM400	Φ5.5-Φ50

典型牌号工程应用举例

Engineering Application Example of Typical Grade Steel Products

产品种类 Product Categories	牌号 Grade	直径 (mm) Diameter (mm)	用途举例 Application Example	工程项目名称 Project Name
热轧光圆钢筋/热轧带肋钢筋 Hot-rolled plain bar / hot-rolled ribbed bar	HPB235 HRB335 HRB400 HRB500	Φ5.5-Φ50	核岛、常规岛土 建施工 Civil construction of nuclear island and conventional nuclear island	岭澳一期/二期核电项目、阳江 核电项目、台山核电项目、方家 山核电项目、三门核电项目 Ling'ao Nuclear Power Plant Phase II Expansion Project, Yangjiang Nuclear Power Plant Project, Taishan Nuclear Power Plant Project, Fangjia Shan Nuclear Power Plant Project, Sanmen Nuclear Power Plant Project



5. 宝钢股份 检验检测

Test and Detection of Baosteel

宝钢股份拥有化学、力学、物理性能检测和相应测试技术研究开发的综合性实验室，并配有性能先进、精度优良的检测设备。核电产品的检验主要由宝钢工程技术集团有限公司宝钢工业检测公司和特钢事业部检测中心完成。

Baosteel owns comprehensive labs for the test of chemical, mechanical and physical properties and for the research and development of corresponding testing technologies, with detection and test equipment of advanced performance and excellent accuracy. The test and detection of nuclear power products are mainly implemented and completed by Baosteel Engineering & Technology Group Co., Ltd Shanghai Baosteel Industry Inspection Corp. and the testing center in Special Steel Business Unit.



实验室认可证书 Laboratory Accreditation Certificate



◀ 图10
宝钢股份实验室认可证书

Fig. 10 Laboratory Accreditation Certificate for Baosteel

5. 宝钢股份 检验检测

Inspection & Testing

主要检验检测项目及设备

Main Test and Detection Projects and Equipment

主要检验检测项目

Main Test and Detection Projects

化学成分检验、力学性能检验、工艺性能检验、金相检验、物理性能检验、化学性能检验、无损检验等。

Chemical composition testing, mechanical properties testing, technical performance testing, metallographic testing, physical properties testing, chemical properties testing, non-destructive testing, etc.

主要检测设备

Main Test and Detection Equipment



▲ 图11 氧氮分析仪
Fig. 11 Oxygen and Nitrogen Analyzer



▲ 图12 碳硫分析仪
Fig. 12 Carbon and Sulfur Analyzer



▲ 图13 ARL4460光谱分析仪
Fig. 13 ARL4460 Optical Spectrum Analyzer



▲ 图14 维氏硬度计
Fig. 14 Vickers Hardness Tester



▲ 图15 全自动拉伸试验机
Fig. 15 Automatic Tensile Testing Machine



▲ 图16 全自动冲击试验机
Fig. 16 Automatic Impact Testing Machine



▲ 图17 落锤试验机 (SANS 40000J摆锤式冲击试验机)
Fig. 17 Drop-testing Machine (SANS 40000J Pendulum Impact Testing Machine)



▲ 图18 金相显微镜
Fig. 18 Metallographic Microscope

5. 宝钢股份 检验检测

Inspection & Testing



▲ 图19 硅钢磁性测量仪
Fig. 19 Silicon Steel Magnetic Meter



▲ 图20 棒材漏磁探伤设备
Fig. 20 Bar Magnetic Flux Leakage Testing Equipment



▲ 图21 棒材超声探伤设备
Fig. 21 Bar Ultrasonic Flaw Detection Equipment



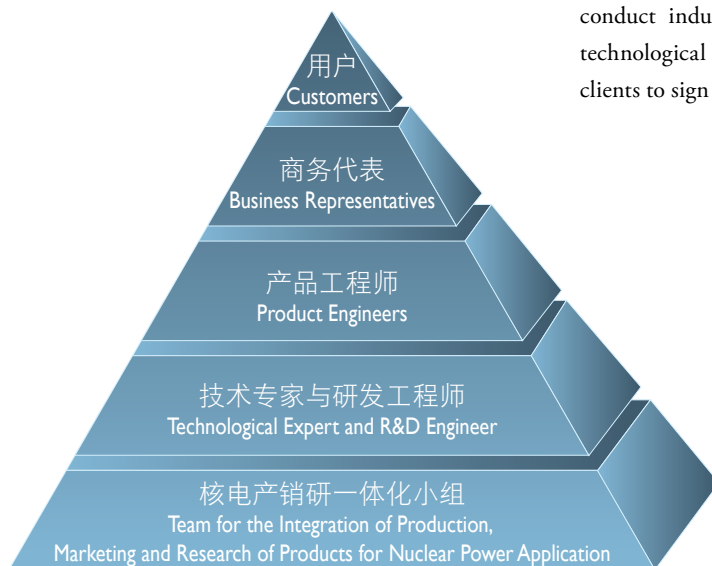
▲ 图22 棒材涡流探伤设备
Fig. 22 Bar Vortex Flaw Detection Equipment

售前技术商谈

Pre-sale Technical Consultation

宝钢核电贸易服务团队由经过专门技术培训、由较高技术水平的商务代表和销售工程师组成,可根据用户的特殊需求联络宝钢核电技术团队的专家,先期介入,以最快的速度开展行业产品认证、组织技术评审,并协助用户与宝钢签订技术协议。

Baosteel nuclear power trade service team is composed of business representatives and sales engineers who have taken special technical training and are of very high level of technology. The team is able to contact experts of Baosteel nuclear power technological teams according to special needs of clients and intervene at an earlier phase, so as to conduct industrial product certification and to organize technological reviews with the fastest speed, and to assist clients to sign technological agreement with Baosteel.



❖ 商务代表:

是用户采购宝钢核电产品的商务联络人和技术联络人,负责为用户提供选材咨询、订货、物流跟踪、货款结算、加工配送、质量异议处理、信息沟通等全方位服务。

❖ 产品工程师:

来自宝钢制造单元的资深工程师,为用户提供核电产品的生产、使用技术服务,并根据用户的特殊需求进行个性化的质量设计,与商务代表共同解决技术难题,必要时提供现场服务。

❖ Business Representatives

A business representative is the contact on business and technical affairs for clients to purchase Baosteel's nuclear power products. Business representatives are responsible to provide clients with comprehensive service such as material selection advisory, receiving orders, logistics tracking, payment settlement, processing and delivery, quality objection handling, information communication, etc.

❖ Product Engineers

Senior engineers from Baosteel's manufacture unit provide clients with technological service on the production and operation of nuclear power products, conduct individual quality design according to the special needs of clients, collaborate with business representatives to resolve technical problems, and provide on-site service if necessary.

5. 宝钢股份 检验检测

Inspection & Testing



❖ 技术专家与研发工程师:

来自宝钢研究院、制造部、直属厂的技术专家与首席工程师, 针对用户和市场的需求, 开发核电用钢新产品和配套技术; 跟踪新品试制流程, 改进与优化生产工艺, 提供使用技术指导。

❖ 核电产销研一体化小组:

是宝钢集中优势资源, 以推进核电用钢国产化工作为核心, 由科研管理、研发、制造、销售等各单元的骨干力量组成, 发挥协同工作合力, 以专业的团队方式解决用户使用及生产、研发方面的问题, 提高宝钢核电产品的市场竞争力。

❖ Technological Expert and R&D Engineer

Technological experts and chief engineers from Baosteel Research Institute, Manufacture Management Dept. and affiliated factories are engaged in developing new steel products and supporting technology for nuclear power application in accordance with the needs of the clients and market, tracking the trial manufacturing process of new products, improving and optimizing production techniques, and providing guidance on using techniques.

❖ Team for the Integration of Production, Marketing and Research of Products for Nuclear Power Application

Baosteel concentrates superior resources to promote the localization of nuclear power steel by establishing a team for the integration of production, marketing and research on products for nuclear power application. The team is composed of the backbone of various units such as S&T management, R&D, manufacture, marketing, etc. Baosteel takes the advantage of synergy effect to resolve clients' problems in terms of production, research and development, etc. by means of the professional team, and thus has enhanced the market competitiveness of Baosteel's nuclear power products.

售中精益运营 Lean Operation During Sales

宝钢能够为您提供：快速的需求响应、可靠的交货保证、全程的质量跟踪、全程的物流跟踪、完善的储运配送。

Baosteel provides you with instant demand response, reliable delivery assurance, whole-range quality tracking and logistics tracking, and the complete service on storage, transportation and distribution.

- ❖ 订货流程:
- ❖ Ordering Process



- ❖ 合同跟踪:

在合同执行期间，宝钢将为您提供从合同下发、合同排产到产品出厂的全程跟踪信息，包括生产进度信息、质保书信息、运输跟踪信息等。宝钢的商务代表也将实时应答您的订单询问，准确反馈您的订单生产进度。

- ❖ 现场监造:

如果您订购的产品在生产过程中需进行现场监造，宝钢的商务代表将会及时通知您生产排产时间，帮助您协调驻厂监造的相关事宜，对监造过程中提出的问题及时进行协调解决，确保监造工作顺利进行。

- ❖ Contract Tracking

During the period of contract implementation, Baosteel will provide you with the information of whole-range tracking from contract issuing and scheduling till product outgoing, such as production progress, quality documents, transportation tracking, etc. Baosteel's business representatives will also instantly respond to your inquiry about orders, and will give you accurate feedbacks on the production schedule concerning your orders.

- ❖ Onsite Production Supervision

If any product you ordered needs to be supervised on-site during its production, Baosteel's responsible business representative will notice you the production scheduled time, and help you to coordinate the relevant issues on entering our factory for supervision, so that those questions and problems raised during the supervision may be answered and resolved in good time, thus ensuring the smooth progress of supervision and production.

❖ 仓储运输：

宝钢在多年的钢铁物流服务中，累积了丰富的经验，建立了完善的仓储体系和科学规范的承运商管理体系及运营机制。宝钢的绝大部分仓库都配备了仓库管理系统以及先进的条形码设备，配合一批高质量的承运商团队，能够为您提供准确、高效的仓储运输服务。

- 代运服务：根据合同要求，宝钢可为您代为安排承运商进行产品的物流运输服务。
- 如果您选择自行提货，当合同进入准发状态，宝钢会及时通知您。
- 宝钢还可以根据您的需求，提供个性化的物流服务，降低您的物流成本。

❖ 加工配送：

宝钢加工配送中心拥有国内领先的加工设备和高素质的钢材加工专家队伍。宝钢可根据您的生产要求，提供适时加工配送服务，协助您的精益生产。

❖ 工程配套：

宝钢发挥钢材品质高、品种齐全、交货及时、精品物流和高效研发的综合优势，为您提供专用的定制化工程配套材料，如中厚板、彩板、配套焊接材料、预应力钢丝、钢绞线及建筑用钢筋等产品。

❖ Storage and Transportation

After years of steel logistics service operation, Baosteel has accumulated rich experience and established a complete storage system and a scientific and standard carrier management system and operation mechanism. Most Baosteel's warehouses are equipped with warehouse management system and advanced barcode equipment. Besides, Baosteel also has a quality team of carriers who are capable of providing you with accurate and highly efficient storage and transportation service.

- Transport Agency Service: Baosteel can deal with carriers on behalf of you for the arrangement of product logistics and transportation according to contract requirement.
- If you choose to pick up product by yourself, Baosteel will notice you at appropriate moment when products are ready for delivery according to contract requirement.
- Baosteel will also provide customized logistics service in accordance with your needs so that your logistics cost may be reduced.

❖ Processing and Distribution

Baosteel's processing and distribution centre boasts her domestic leading processing equipment and a highly qualified team of steel processing experts. Baosteel is capable of providing timely processing and distribution service according to your production requirement, thus contributing to your lean production.

❖ Engineering Support

Baosteel takes the advantage of her comprehensive strength in terms of high steel quality, full range of product categories, timely delivery, excellent logistics and high-efficiency research and development, etc. and provides you with special and customized supporting materials such as medium and heavy plates, color plates, supporting welding material, reinforcement wire, steel strand, steel bars for building constructions, etc.

售后跟踪服务 After Service

❖ 产品使用跟踪

宝钢非常关注核电产品在用户现场的使用情况，对核电产品的使用情况进行全过程跟踪。对客户提出的疑问，在第一时间提供技术解决方案，必要时提供现场技术服务，为您排解后顾之忧。

❖ 定期会晤交流

宝钢将与核电用户定期进行互访，定期召开用户座谈会，加强与用户之间的沟通，对核电的进展情况和宝钢的制造现状进行交流，做到知己知彼，互通有无，不断促进与用户之间的合作。

❖ Tracking the Application of Products

Baosteel gives special attention to and conducts whole-range tracking on the application of its nuclear-power products at the client's site. Baosteel provides technical solutions on first time in response to client inquiries, and leaves you no worries by providing onsite technical service if necessary.

❖ Regular Meeting and Communication

Baosteel will arrange mutual visit with its nuclear power clients on a regular basis and will periodically convene client forums to strengthen the communication with the clients to exchange the progress of nuclear power projects and the status pro of Baosteel's production, thus promoting the partnership with clients.



6.

全程 贸易服务

One-stop Trading Services

便捷的远程服务

Convenient Remote Service

宝钢应用先进的信息化技术, 大力发展远程服务支持, 最大限度的满足用户对服务的方便、高效、和快捷的要求。

服务热线: 400-820-8590

传真服务: 86-21-26648000

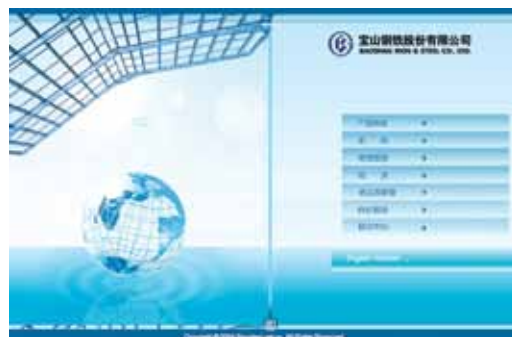
宝钢在线: www.baosteel.net.cn

Baosteel is using advanced information technology and has vigorously developed its remote service support to satisfy clients' requirement of convenient, efficient and fast-speed service to the uttermost.

Service Hotline: 400-820-8590

Fax: 86-21-26648000

Baosteel Online: www.baosteel.net.cn



宝山钢铁股份有限公司
http://www.baosteel.com

BAOSHAN IRON & STEEL CO., LTD.
http://www.baosteel.com

营销管理部
Marketing Administrative Dept.

电话: 021-26642855
传真: 021-26645289

上海宝钢不锈钢贸易有限公司
Shanghai Baosteel Stainless Steel Trading Co., Ltd.

电话: 021-66933311
传真: 021-66932879

宝钢服务热线
Baosteel Service Hot-line

400-820-8590

宝钢在线
http://www.baosteel.net.cn

国内贸易公司

上海宝钢钢材贸易有限公司 电话: 021-50509696 传真: 021-68404618	广州宝钢南方贸易有限公司 电话: 020-32219999 传真: 020-32219555	天津宝钢北方贸易有限公司 电话: 022-84905800 传真: 022-84905806	成都宝钢西部贸易有限公司 电话: 028-85335388 传真: 028-85335680
武汉宝钢华中贸易有限公司 电话: 027-84298800 传真: 027-84298224	上海宝钢商贸有限公司 电话: 021-56121212 传真: 021-56126584	上海宝钢浦东国际贸易有限公司 电话: 021-36014655 传真: 021-51266522 51266533	上海宝钢宝山钢材贸易有限公司 电话: 021-36014688 传真: 021-51266500
长春宝钢钢材贸易有限公司 电话: 0431-85889320 传真: 0431-85889317	沈阳宝钢钢材贸易有限公司 电话: 024-62220699 传真: 024-88210198		

亚澳地区 Asia and Australia

宝和通商株式会社 HOWA TRADING CO., LTD. TEL: 0081-3-3237-9121 FAX: 0081-3-3237-9123	宝和通商首尔事务所 HOWA TRADING CO., LTD., SEOUL OFFICE TEL: 0082-2-5080893 FAX: 0082-2-5080891	宝钢澳大利亚贸易有限公司 BAO AUSTRALIA PTY LTD. TEL: 0061-8-94810535 FAX: 0061-8-94810536
宝钢新加坡贸易有限公司 BAOSTEEL SINGAPORE PTE LTD. TEL: 0065-63336818 FAX: 0065-63336819	越南代表处 VIETNAM REPRESENTATIVE OFFICE TEL: 0084-8-39100126 FAX: 0084-8-39100124	泰国代表处 THAILAND REPRESENTATIVE OFFICE TEL: 0066-2-6543008 FAX: 0066-2-6543010

欧非地区 Europe and Africa

宝钢欧洲有限公司 BAOSTEEL EUROPE GMBH TEL: 0049-40-4199410 FAX: 0049-40-41994120	宝钢西班牙有限公司 BAOSTEEL ESPAÑA, S.L. TEL: 0034-93-4119325 FAX: 0034-93-4119330	宝钢中东公司 BAOSTEEL MIDDLE EAST FZE TEL: 00971-4-8810788 FAX: 00971-4-8810789
宝钢意大利钢材集散中心有限公司 BAOSTEEL ITALIA DISTRIBUTION CENTER SPA TEL: 0039-010-530881 FAX: 0039-010-5308895	宝钢东欧代表处 BAOSTEEL CENTRAL AND EASTERN EUROPE OFFICE TEL: 0048-32-7315012 FAX: 0048-32-7315011	

美洲地区 America

宝钢美洲贸易有限公司 BAOSTEEL AMERICA INC. TEL: 001-201-3073355 FAX: 001-201-3073358	底特律代表处 DETROIT REPRESENTATIVE OFFICE TEL: 001-248-2089918 FAX: 001-248-2080999	休斯顿代表处 HOUSTON REPRESENTATIVE OFFICE TEL: 001-281-4847333 FAX: 001-281-4842655
洛杉矶代表处 LOS ANGELES REPRESENTATIVE OFFICE TEL: 001-949-7526789 FAX: 001-949-7521234	里约代表处 BAOSTEEL DO BRAZIL LTDA. TEL: 0055-21-25311363 FAX: 0055-21-25310298	

