



食品医药行业用钢

STEEL PRODUCT FOR FOOD AND MEDICINE INDUSTRY

太钢产品分行业系列册

Products Serial Catalogs Of Tisco For Different Industries

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太原钢铁(集团)有限公司
Taiyuan Iron & Steel(Group) Co., Ltd.

02、太钢简介	Brief on TISCO
05、工艺流程	Process Flow
07、研发能力	Research and Development
08、认证/荣誉	Certification & Honors
09、常规产品	Conventional Products
11、成分性能	Composition and Property of Product
14、产品介绍	Product Introduction
14、使用指南	User Instruction
18、主要特点	Main Features
19、服务承诺	Service Promise
20、合作伙伴	Cooperative Partner
21、联系方式	Contacting Manners of the Main Business Sections

太钢简介

Brief on TISCO

太原钢铁（集团）有限公司（简称太钢）是中国特大型钢铁联合企业和全球产能最大、工艺技术装备水平最高、品种规格最全的不锈钢企业。经过70年发展，已具备1000万吨以上钢、铁、材的生产能力，其中不锈钢产能达300万吨。



太钢是中国第一炉不锈钢、第一炉硅钢、第一张硅钢片的诞生地。拥有铁矿石等钢铁冶炼原料的采掘与加工、钢铁冶炼、钢铁材料压力加工、冶金设备及备品备件制造等方面先进技术和装备，主要产品有不锈钢、冷轧硅钢片（卷）、热连轧卷板、车轴钢、合金模具钢、军工钢等。产品广泛应用于石油化工、交通运输、建筑装饰、家用电器、医疗食品等行业及神舟系列飞船、嫦娥一号、“东风”系列火箭等高端领域，进入三峡水利、西气东输、奥运场馆等国家重点工程。

太钢的发展目标是，加快建设全球最具竞争力的不锈钢企业，到2010年，以不锈钢为主的品种、质量、成本、研发、节能、环保、效率、服务等各项指标达到国际一流水平，建设具有国际竞争力的大企业集团。

Taiyuan Iron and Steel (Group) Co. Ltd. (TISCO) is a gigantic steel complex in China and a world leading stainless steel producer with largest capacity, full range of products and state of the art facility. With 70 years development, the capacity of pig iron, crude steel and rolled products increased over 10 million ton, including 3 million tons of stainless steel.

TISCO produced the first heat of stainless steel, first heat of silicon steel and first sheet of silicon steel. It is well equipped for mining and beneficiation (such as iron ores), ironmaking, steelmaking, rolling and manufacture of metallurgical equipment and spare parts. Main products include cold rolled stainless and silicon sheet/coil, hot rolled coil, axle steel, die steel and military steel. They are widely used in petrochemical industry, transportation, construction, decoration, home appliance, medical apparatus and food industry, they are also used for high-end application and national key projects as Shenzhou spaceship, Chang'e-1 Moon Detector, Dongfeng rocket series, Three Gorges project, West-East natural gas transmission project and Olympic games facility.

Our goal in development is to expedite building TISCO as the most competitive stainless steel producer in the world, holding the world leading position by 2010 in terms of range, quality, cost, R&D, energy saving, environment protection, efficiency and service. Our target is to create an international enterprises group of strong competitive edges out of Taigang.

◆ 食品医药行业用钢概况

不锈钢在食品、医药行业广泛应用于制糖、发酵、粮油加工、罐头食品加工、烟草、饮料、调味品、屠宰加工、食品冷藏、食品加工、废料利用、制药机械、医疗器械、仪器配件、手术台等。

太钢长期致力于食品、医药产业用钢的研究与开发，在常规产品304系列、316系列大量使用的基础上，先后开发了双相钢用于制盐工业，铁素体抗菌不锈钢（TKJF系列）和奥氏体抗菌不锈钢（TKJA系列），经国家权威机构检测，太钢生产的不同系列抗菌不锈钢对大肠杆菌、金黄色葡萄球菌、铜绿假单胞菌及白念珠菌的抗菌率均大于99%；各系列抗菌不锈钢与同类不锈钢相比综合力学性能、腐蚀性能及加工性能相当。在食品加工、家电、餐厨具、医疗器械及公共设施领域更具有广阔的应用前景。为食品行业的产业升级、食品机械设备、医药和医疗器械的更新换代起到了很好的推进作用。

◆ 与行业客户的合作关系

目前，我公司与国内主要的大型加工中心及经销用户均建立了长期合作关系，产品定位为中高端酒类、饮料的设备和制糖、味精、醋酸等设备。公司与五粮液、泸州老窖、山西汾酒、泰安市普瑞特机械制造有限公司、山东泰山恒信机械有限公司、宁波乐惠食品设备制造有限公司、南京轻工业机械集团、江苏新美星包装机械有限公司、新麦机械（无锡）有限公司、岷江机械制造有限公司、上海医疗器械有限公司等建立了合作关系，产品市场占有率国内第一。

◆ Brief on food and medicine industry steel

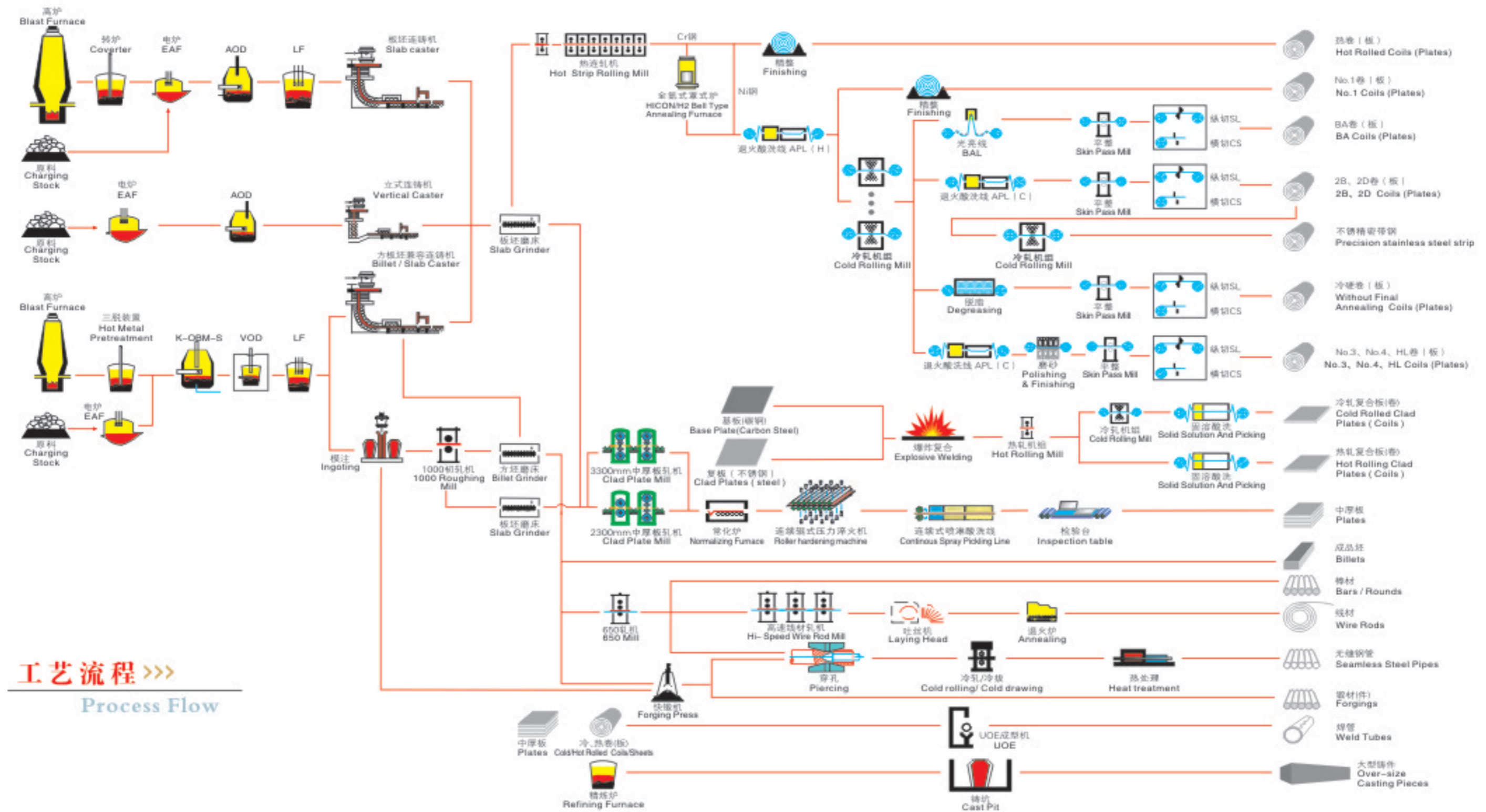
Stainless steel is widely used in food & medicine industry, such as refine sugar, ferment, grain and cooking oil processing, canned food processing, tobacco, beverage, condiment, butchering and processing, refrigerated storage of food, waste utilization of food processing, pharmaceutical machinery, medical apparatus and instruments, accessory of instruments, operating table, etc.

TISCO constantly strives to research and develop steel product for food and medicine industry, on the base of largely using conventional product 304 series and 316 series, TISCO has developed duplex steel used in salt industry, ferritic antibacterial stainless steel (TKJF series) and austenitic antibacterial stainless steel (TKJA series), testing by the national authoritative organization, all antibacterial rates of various TISCO antibacterial stainless steel series are more than 99% for colon bacillus, staphylococcus aureus, pseudomonas aeruginosa and candida albicans; comparing to same series of stainless steel, comprehensive mechanical property, anti-corrosion property and processing performance of various of antibacterial stainless steel are similar. There are a broader prospect and more potential application in fields of food processing, household electrical appliance, cooking utensils, medical apparatus and public utilities. It has been enhancing the upgrade of the food industry, food machinery and equipment, pharmaceuticals and medical apparatuses.

◆ Cooperative relationship with industrial customers

At present, our company has been establishing long-term cooperation relationship with the nation's main large processing center and dealer & end-user, products include equipment for making high-end alcohol and beverage, equipment for refine sugar, monosodium glutamate and acetic acid, etc. Corporate customers of TISCO are listed as: Wuliangye Group, Luzhou Laojiao Group, Shanxi Fenjiu Group, Tai'an City Pratt Machining Manufacturing Co. Ltd, Shandong Taishan Hengxin Machinery Co. Ltd, Ningbo Lehui Food Equipment Manufacturing Co. Ltd, Nanjing Light Industry Machinery Group, Jiangsu Xinmeixing Package Machinery Co. Ltd, Xinmai Machinery Co. Ltd (Wuxi), Minjiang Machining Manufacturing Co. Ltd, Shanghai Medical Apparatuses Co. Ltd, etc. The market share of TISCO product is the first place in China.





工艺流程 >>>
Process Flow



研发能力 >>>

Research and Development

国家级实验室
National level laboratory



2007年在国家认定的438家企业技术中心中，太钢技术中心排名第4位。
Tisco technology center ranks 4th among enterprise-based 438 technology centers accredited by the state in 2007.



认证、荣誉 >>>

Certification & Honors



- ◆《高质量不锈钢板材技术开发》获国家科技进步二等奖；
- ◆《AOD炉炉龄、工艺技术开发》等三项成果获山西省科技进步一、二等奖；
- ◆《太钢含氮不锈钢研制》等九项成果获冶金科学技术进步一、二、三等奖；
- ◆《双相不锈钢复合板》等六种产品分别获得国家重点新产品奖、山西省优秀新产品奖；
- ◆不锈钢2B板被科技部认定为国家高新技术产品；
- ◆《AOD炉用氮气进行氮合金化工艺》《VOD冶炼不锈钢高碳区脱氮方法》等专利80余项；
- ◆不锈钢中板通过了TUV认证，并获得了冶金实物质量金杯奖。

- ◆ "Technical development of high quality stainless steel flat product" won second prize of state technical progresses.
- ◆ "AOD campaign, production technology development" and other two won the first and second prizes of Shanxi technical progresses.
- ◆ "Production technology and new grade development of Nitrogen-containing stainless steel by TISCO" won second prize of state technical progresses.
- ◆ Duplex stainless steel clad plate and so on six products were honored as among statewide new products and Shanxi great new products, respectively.
- ◆ Stainless steel 2B grade was approved by the Ministry of Science & Technology as the state hi-tech products.
- ◆ More than 80 patents such as "Nitrogen alloying process by nitrogen gas in AOD" and "Denitrication process in the phase of high carbon of stainless steel smelting in VOD".
- ◆ Stainless steel plate passed TUV examination and was rewarded Golden Cup of physical quality of metallurgical product.



扫描电镜
Scanning Electron Microscope



热模拟试验机
Thermal Simulating Tester



透射电镜
Transition Electron Microscope



全自动电子拉伸试验机
Automatic electronic tensile tester



常规产品 >>>

Conventional Products

◆ 在食品、医药行业可生产的不锈钢常规产品
Conventional stainless steel for food and medicine industries

钢种 Steel grade	牌号 Grade	规格 (mm) Specifications		单重 Weight t	标准 Standard	主要用途 Application	
		厚度 Thickness	宽度 Width				
冷轧不锈钢 Cold rolled stainless steel	0Cr18Ni9 00Cr19Ni10	0.3-8.0	1000-2000	12-38	GB/T3280-92 GB/3280-2007 ASTMA240/240M JISG4305 EN10088-2	深冲型部件和输酸管道、容器等。 Deep punching component, acid transportation pipe and vessel, etc.	
	0Cr18Ni10Ti 1Cr18Ni9Ti					耐酸容器和设备的衬里和管道等, 不推荐作装饰部件。 Acid-proof vessel, liner of equipment and pipe, they are not recommended as decorative materials.	
	0Cr17Ni12Mo2 00Cr17Ni14Mo2					主要用于耐点蚀材料。用于抵抗硫酸、磷酸、甲酸、乙酸的设备。 Mainly used as anti-corrosion materials, used for the equipments which resist sulfuric acid, phosphorus acid, methanoic acid and acetic acid.	
	0Cr18Ni12Mo2Ti 1Cr18Ni12Mo2Ti					适用于使用含氯水溶液或微咸水作为冷却介质的热交换器 Suitable for heat exchanger which uses chloric water solution or salt water as cooling medium.	
	00Cr22Ni5Mo3N						
	TKJF-1	0.3-8.0	1000-2000	12-38	Q/太新013-2005	铁素体抗菌钢, 用于一般腐蚀介质下的食品制品、医疗器械。 Ferrite antimicrobial coated steel is used for food equipment and medical apparatuses which undergo the normal corrosive medium.	
	TKJF-2	0.3-8.0	1000-2000	12-38			
	TKJA-1	0.3-8.0	1000-2000	12-38	Q/太新014-2006	奥氏体抗菌钢, 用于较强腐蚀介质下的食品制品、医疗器械。 Austenite antimicrobial coated steel is used for food equipment and medical apparatuses which undergo the stronger corrosive medium.	
	热轧不锈钢 Hot rolled stainless steel	0Cr18Ni9 1Cr18Ni9Ti 0Cr18Ni10Ti	3-14	1000-2000 (含毛边)	12-38	GB/T4237-92	用于食品设备、一般化工设备等。 Used for food equipment and general chemical equipment, etc.
		0Cr17Ni12Mo2 00Cr17Ni14Mo2	3-14	1000-2000 (含毛边)			GB/T4237-92
0Cr18Ni12Mo2Ti 1Cr18Ni12Mo2Ti							
00Cr22Ni5Mo3N							
0Cr18Ni9 (封头)		3.0-5.0	1000-2000 (含毛边)			Q/TB3060-2008	适用于制作罐体封头等。 Suitable to make end cover for tank, etc.
1Cr18Ni9Ti (封头)		3.0-5.0	1000-2000 (含毛边)			Q/TB3060-2008	适用于制作罐体封头等。 Suitable to make end cover for tank, etc.
1Cr13, 2Cr13 3Cr13		3.0-14.0	1000-2000 (含毛边)			GB/T4237-92	刀具、刃具、餐具等。 Suitable to make cutter, cutting tool, table ware, etc.

◆ 在食品、医药行业可生产的不锈钢常规产品
Conventional stainless steel for food and medicine industries

钢种 Steel grade	牌号 Grade	规格 (mm) Specifications		单重 Weight t	标准 Standard	主要用途 Application
		厚度 Thickness	宽度 Width			
碳素钢板 Carbon steel plate	Q195 Q215A Q235A	≥1.5-2.0	900-2130		≤4.0执行 GB/T912-1989 >4.0执行 GB/T3274-1988	一般结构用钢。 General structure steel.
	16MnR, 20R	6.0-20.0	1000-2000		GB6654-1996	中常温压力容器受压元件用。 Used as pressure parts for middle and ambient temperature pressure vessel.
	SA414-G	2.4-6.0	900-1380		Q/TB3077-2008	
不锈钢平板 Stainless steel plate	0Cr18Ni9 00Cr19Ni10	6-80	1500-3000		GB/T4237-2007	用于食品设备、一般化工设备等。 Used for food equipment and general chemical equipment, etc.
	1Cr18Ni9Ti 0Cr18Ni10Ti	6-80	1500-3000		GB/T4237-2007	耐晶间腐蚀性较好, 但不推荐作装饰部件。 Excellent inter granular corrosion resistant properties, but they are not recommended as decorative materials.
	0Cr17Ni12Mo2 00Cr17Ni14Mo2	6-80	1500-3000		GB/T4237-2007	用于抵抗硫酸、磷酸、甲酸、乙酸的设备。 Used for the equipments which resist sulfuric acid, phosphorus acid, methanoic acid and acetic acid.
	0Cr18Ni12Mo2Ti 1Cr18Ni12Mo2Ti					
	00Cr22Ni5Mo3N	6-80	1500-3000		GB/T4237-2007	适用于使用含氯水溶液或微咸水作为冷却介质的热交换器。 Suitable for heat exchanger which uses chloric water solution or brackish water as cooling medium.
	0Cr18Ni9 (封头)	6-20	1600上		Q/TB3060-2008	适用于制作罐体封头等。 Suitable to make end cover for tank, etc.
	1Cr18Ni9Ti (封头)	6-20	1600上		Q/TB3060-2008	适用于制作罐体封头等。 Suitable to make end cover for tank, etc.
	碳素钢板 Carbon steel plate	Q195-Q235A (B, C)	6.0-80	1400-2900		GB/T274-1988
16MnR, 20R		6.0-40	1400-2000		GB6654-1996	中常温压力容器受压元件用。 Used as pressure parts for middle and ambient temperature pressure vessel.
热轧板 Hot plate	304, 316系列	2-14+6-140	1100-3000		GB/T8165-1997	适用制造化工、化肥、工业设备、容器、热交换器等。 Suitable to make chemical equipment, chemical fertilizer equipment, industrial equipment, vessel and heat exchanger, etc.
无缝管 Seamless pipe	304, 316系列 双相钢, T90系列 304, 316 series, duplex steel, T90 series	壁厚0.8-28, 外径6-530 Wall thickness 0.8-28, outer diameter 6-530			GB/T14976等	适用制造化工、化肥、工业设备、容器、热交换器等。 Suitable to make chemical equipment, chemical fertilizer equipment, industrial equipment, vessel and heat exchanger, etc.

产品成分、性能 >>>

Composition and Property of Product

◆ 化学成分 (典型值)

Chemical composition (Typical value)

牌号 Grade	C	Si	Mn	P	S	Ni	Cr	Mo	Ti	N
0Cr18Ni9	0.08	0.75	2.00	0.045	0.030	8.00 ~ 10.50	18.00 ~ 20.00			0.10
00Cr19Ni10	0.03	0.75	2.00	0.045	0.030	8.00 ~ 12.00	18.00 ~ 20.00			0.10
0Cr18Ni10Ti	0.08	0.75	2.00	0.045	0.030	9.00 ~ 12.00	17.00 ~ 19.00		≥5C	0.10
0Cr17Ni12Mo2	0.08	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00		0.10
00Cr17Ni14Mo2	0.03	0.75	2.00	0.045	0.030	10.00 ~ 14.00	16.00 ~ 18.00	2.00 ~ 3.00		0.10
00Cr22Ni5Mo3N	0.03	1.00	2.00	0.030	0.020	4.50 ~ 6.50	21.00 ~ 23.00	2.50 ~ 3.50		0.08~0.20
TKJP-1	0.008	0.5	0.35	0.014	0.003		17.07			
TKJP-2	0.016	0.5	0.35	0.016	0.004		13.01			
TKJA-1	0.028	0.48	1.05	0.029	0.003	8.76	18.01			
00Cr18Mo2	0.025	1.00	1.00	0.040	0.030	1.00	17.50 ~ 19.50	1.75 ~ 2.50		0.035
1Cr13	0.15	1.00	1.00	0.040	0.030	0.60	11.50 ~ 13.50			
2Cr13	0.16~ 0.25	1.00	1.00	0.040	0.030	0.60	12.00 ~ 14.00			
3Cr13	0.26~ 0.35	1.00	1.00	0.040	0.030	0.60	12.00 ~ 14.00			

◆ 经固溶处理的奥氏体钢的力学性能

Mechanical property of austenitic steel after solution treatment

牌号 Grade	规定非比例 延伸强度 R _{0.2} /MPa Given non-proportional elongation strength	抗拉强度 Tensile strength R _m /MPa	断后伸长率 Elongation after fracture A/%	硬度值 Hardness		
				HBW	HRB	HV
不小于 ≥			不大于 ≤			
0Cr18Ni9	205	515	40	201	92	210
00Cr19Ni10	170	485	40	201	92	210
0Cr18Ni10Ti	205	515	40	217	95	220
0Cr17Ni12Mo2	205	515	40	217	95	220
00Cr17Ni14Mo2	170	485	40	217	95	220
00Cr22Ni5Mo3N	450	620	25	293	31	
TKJP-1	370	490	35			142
TKJP-2	295	430	31			131
TKJA-1	230	560	65			156
00Cr18Mo2	275	415	20	217	96	230
1Cr13	205	450	20	217	96	210
2Cr13	225	520	18	223	97	234
3Cr13	225	540	18	235	99	247

牌号 Grade	密度 Density (g/cm ³)	磁性 Magnetic	比热 Specific heat (J/g·°C)	热导率100°C Heat conductivity (W/m·°C)	热膨胀率20~100°C Heat expansion rate (10 ⁻⁶ /°C)
00Cr22Ni5Mo3N	7.8	有 (Have)	0.45	19.0	13.7
TKJP-1	7.72	有 (Have)	0.46	26.9	12.2
TKJP-2	7.76	有 (Have)	0.46	33.9	12.5
TKJA-1	7.86	无 (Non)	0.5	16.9	16
00Cr18Mo2	7.75	有 (Have)	0.46	36.9	10.6/200°C
1Cr13	7.7	有 (Have)	0.46	24.2	11
2Cr13	7.75	有 (Have)	0.46	22.2	10.3
3Cr13	7.76	有 (Have)	0.47	25.1	10.5

产品介绍 >>>

Product Introduction



我公司以上产品，广泛应用于白酒储罐、粮油设备、啤酒瓶装生产线、大型贮罐、葡萄酒设备、配料罐蒸汽搅拌器、酱油酿造罐、不锈钢保温熬糖锅、不锈钢奶罐、不锈钢食品、果汁罐、医用核磁共振设备等。

Our company's products mentioned above are widely used in Chinese spirits storage tank, grain and oil equipment, beer bottling line, large scale storage tank, wine equipment, steam agitator of make-up tank, sauce brewing tank, stainless steel heat-insulation cooker for sugaring off, stainless steel milk tank, stainless steel food equipment, fruit juice tank, medical nuclear magnetic resonance etc.

用户使用指南 >>>

User Instruction

1、0Cr18Ni9和00Cr19Ni10奥氏体不锈钢

两钢种均具有良好的冷、热加工性能，可采用通用的各种热、冷加工工艺，热加工温度范围为900-1100℃。由于两种钢易于冷加工硬化，当冷变形量过大时，须进行中间退火处理，以利于进一步加工。焊接0Cr18Ni9和00Cr19Ni10可采用通用的方法进行焊接。手工电焊时，含碳量0.04-0.06%的截面尺寸的0Cr18Ni9可采用奥002焊条，焊后可不产生晶间腐蚀倾向，对于厚截面尺寸欲保持焊后的耐晶间腐蚀性能，需进行焊后热处理，若不能进行热处理，应改用00Cr19Ni10或稳定化型的奥氏体不锈钢。00Cr19Ni10的焊条为奥002焊条。

1. 0Cr18Ni9 and 00Cr19Ni10 austenite stainless steel

They both have good cold and thermal processability, applicable to various general cold and thermal processes, and thermal process temperature ranges 900-1100℃. As both of them are easy to cold hardening, intermediate annealing must be applied so as to further process if amount of cold deformation is overlarge. General welding method is applicable to 0Cr18Ni9 and 00Cr19Ni10. As to manual welding, austenite 002 welding rod can be used for 0Cr18Ni9 section size with 0.04-0.06% carbon content, which will not cause inter-crystalline corrosion. As to thicker section size, heat treatment is necessary, which can remain anti-inter-crystalline corrosion after welding. If heat treatment is not available, 00Cr19Ni10 or stable type of austenite stainless steel should be applied to. Austenite 002 is used for 00Cr19Ni10.

2、0Cr17Ni12Mo2和00Cr17Ni14Mo2奥氏体不锈钢

0Cr17Ni12Mo2和00Cr17Ni14Mo2钢均具有良好的冷、热加工性能，钢的热塑性良好，过热敏感性低，适宜的热加工温度为900-1200℃。由于钢中含钼量较高，其变形抗力较0Cr18Ni9和00Cr19Ni10钢明显提高。钢的冷加工性能良好，可进行冷轧、冷拔、深冲、弯曲、卷边、折叠等冷加工和冷成形。两个钢种可采用通用的方法进行焊接，常用的方法是钨极氩弧焊、金属极氩弧焊和手工电弧焊。0Cr17Ni12Mo2钢手工焊条采用奥202、奥201或E316-15（美国牌号），为保持良好的耐晶间腐蚀性能，焊后应进行固溶处理，若不允许热处理，应选用00Cr17Ni14Mo2。其手工焊条为奥022，焊后可不进行热处理，仍具有良好的耐晶间腐蚀能力。

3、抗菌不锈钢系列

抗菌不锈钢系列与同类不锈钢相比综合力学性能、腐蚀性能及加工性能相当。

2. 0Cr17Ni12Mo2 and 00Cr17Ni14Mo2 austenite stainless steel

Both 0Cr17Ni12Mo2 and 00Cr17Ni14Mo2 have good cold and thermal processability, with high thermoplasticity and low overheating sensibility, and appropriate temperature ranges 900-1200℃. Compared with 0Cr18Ni9 and 00Cr19Ni10, resistance of deformation increased greatly due to high molybdenum content. With good cold processability, cold rolling, cold drawing, deep punching, bending, crimping and folding etc. can be processed or shaped. General welding method is applicable to these two kinds of steel, tungsten electrode argon arc welding, metal electrode argon arc welding, and manual arc welding are applied more often. Austenite 202, 201 or E316-15(US trademark) can be used as 0Cr17Ni12Mo2 manual welding rod. In order to keep good anti-inter-crystalline corrosion, solution treatment applied after welding. If heat treatment is not allowed, 00Cr17Ni14Mo2 should be selected, which use austenite 202 as manual welding rod, possessing good anti-inter-crystalline corrosion even without heat treatment after welding.

3. Antimicrobial stainless steel series

Antimicrobial stainless steel series equals to the same kind of stainless steel in the property of comprehensive mechanics, corrosion and processing.

4、00Cr22Ni5Mo3N双相钢

耐蚀性能非常好，在耐点蚀PRE值为25，与316L钢的数值相当。在300mV电位下，NaCl溶液中2205钢耐蚀性好于304L，和316L相当。耐应力腐蚀方面，体现出双相钢优异的耐应力腐蚀性能，比奥氏体不锈钢好很多。耐晶间腐蚀方面，能够通过CuSO₄+H₂SO₄铜屑法检验，体现出良好的耐蚀性。在酸性环境中，在硝酸中有很好的耐蚀性，与304L相当，在硫酸中，与316L相当，而在有机酸中，如甲酸，甚至还优于316L。有好的焊接性，焊前不需预热，焊后不需热处理。适宜采用SMAW, GTAW, GMAW及SAW法进行焊接。采用GTAW法焊接时，需要填丝，并要使用纯氩或Ar+2%N₂的保护气体。在热成型加工时，成型温度范围为1100-950℃，成型后淬火处理。冷成型加工时，开始变形困难，达到屈服极限后，变形与奥氏体相同。在深拉、冷旋压成型时要比奥氏体不锈钢困难。主要用于制造胺回收设备、碳氢化合物的发酵设备，还可用于制造工业的热交换器，纸浆和造纸工业的蒸煮预热器及湿热、近海地区的金属制品等。

4. 00Cr22Ni5Mo3N dual phase steel

Superior corrosion resistance, and PRE value is 25, which equals to 316L. Under electrical potential of 300mV, corrosion resistance of steel 2205 inside NaCl solution is better than that of 304L, equivalent to 316L. In the field of stress corrosion resistance, superior characteristic of dual phase steel is much better than that of austenite stainless steel. In the field of anti-inter-crystalline corrosion, dual phase steel has also good performance, in capable of going through copper scraps examination CuSO₄+H₂SO₄. In the environment of acidity, the corrosion resistance in nitric acid and sulphuric acid equals to 304L and 316L respectively, while in organic acid, it is even superior to 316L. Pre-heating and heat treatment before and after welding are not required due to good weldability. Welding method of SMAW, GTAW, GMAW and SAW are more appropriate. If GTAW applied, filler wire and protective gas like pure argon or Ar+2%N₂ must be used. As to thermal shaping process, temperature ranges 1100-950℃, and quenching after shaped. As to cold forming process, it is hard to shape in the beginning, however, as yield limit reached it is similar to austenite stainless steel. As to deep drawing and cold rotary extrusion, shaping is harder than that of austenite stainless steel. The application of dual phase steel is mainly used to manufacture amine recycling unit and fermentation equipment of hydrocarbon, and also industrial heat exchanger, stewing pre-heater in paper pulp, paper making and metalwork in the area of moist heat or coast.

5、1Cr13

1Cr13钢的冷塑性及深冲性、抛光性和切削加工性能良好，板材的深冲度与其厚度有关，板材愈厚深冲度愈高。1Cr13钢的热加工温度以850~1200℃为宜，随后需灰冷或砂冷。1Cr13具有良好的焊接性能，可采用0Cr13或奥107、奥207的焊条焊接，为防止焊接接头的冷裂纹，焊前应该预热，预热温度为200~300℃，焊后经700~750℃热处理可获得良好的性能，选用奥氏体焊接材料焊接，焊后不进行热处理。应该强调的是，当焊后焊缝需进行机械加工时应进行退火处理。

6、2Cr13

钢的热加工性能良好，适宜的热加工温度区间为850~1200℃，热变型终了应用砂冷及时退火，热加工的升温操作应缓慢，在低于850℃时应缓慢加热，冷装炉温度 \leq 800℃。冷加工性能良好，可进行冷轧、冷冲压、深拉等加工操作，消除应力退火可采取730~780℃回火。2Cr13钢焊后硬化倾向大，易出现裂纹，若用Cr202、Cr207焊条焊接时，焊前需经250~350℃预热，焊后经700~750℃回火；若用奥107、奥207的焊条焊接，焊后不进行热处理。

5. 1Cr13

1Cr13 has good properties of cold plasticity, deep punching, polishing and cutting processing. The deep punching degree is related to sheet thickness, i.e. the thicker sheet is, the higher deep punching degree is. Appropriate temperature ranges 850~1200℃, and ash or sands cooling required afterwards. With good weldability, 0Cr13 or austenite 107, 207 can be used. Cold cracks in welding joint can prevented by pre-heating with temperature 200~300℃ before welding, and good performance can be obtained by heat treatment with temperature 700~750℃ after welding. It is no need of heat treatment if austenite welding materials applied. What should be emphasized is that annealing must be adopted if any mechanical machining to welding line.

6. 2Cr13

With good thermal processability, appropriate temperature ranges 850~1200℃, and sands cooling must be applied promptly at the end of thermal deformation. Heating up operation must be slowly if temperature lower than 850℃, and cold charging temperature \leq 800℃. With good cold processability, 2Cr13 can be cold rolled, cold punched and deep drew etc. annealing temperature for stress eliminating ranges 730~780℃ tempering. If welding rod Cr202, Cr207 applied, pre-heating with 250~350℃ and tempering with 700~750℃ before and after welding respectively is necessary due to 2Cr13 high tendency of hardening and cracking. There is no need of heat treatment after welding if austenite 107, 207 adopted.

7、3Cr13

热加工温度为850~1200℃，适宜的热加工温度为1160~1200℃，在850℃以前应缓慢加热，冷装炉温应小于800℃。热加工后缓冷或及时退火。冷加工性能较差，不推荐冷加工操作，但3Cr13钢可生产冷拉材，冷轧板带和丝材。3Cr13冷裂纹倾向更强，一般不能焊接。

7. 3Cr13

Thermal processing temperature ranges 850~1200℃, among which, 1160~1200℃ is more appropriate. Heating up operation must be slowly if temperature lower than 850℃, and cold charging temperature $<$ 800℃. Slow cold or prompt annealing needed after thermal processing. Cold processing is not recommended due to weak cold processability, however, cold drawing bar, cold rolling sheet and wire can be produced in 3Cr13. With stronger tendency of cold crack, it is incapable of welding normally.

主要特点 >>>

Main Features

2010年中国食品工业总产值将达到25000亿元，年均增长率约为8%左右，随着中国对食品行业重抓食品发展四大工程（放心食品、绿色食品、功能食品和特色食品工程）和九大基地（肉类加工、方便食品和功能性食品、饮料制造业、水产品加工、果蔬贮运加工基、调味品生产、制糖、焙烤和糖制品、食品添加剂基地）的建设，全力推进传统食品产业的现代化升级发展，对食品机械设备和包装设备需求将进一步扩大。

China food industry production value totals 2.5 trillion by 2010, with annual growth rate 8% approximately. As Chinese government focusing highly on construction of 4 great projects (quality-assured food, green food, Functional Food and Speciality Food) and 9 large bases (meat processing, convenient food and Functional Food, Beverage manufacturing, sea food processing, fresh product storage, flavouring production, sugar making, bake and sugar products, food additive) in food industry, modernization upgrading of traditional food industry has been promoted with full effort, which further enlarge requirements of food mechanical unit and packing unit.

为适应市场发展，一是要加快和完善销售网络中心建设，在各大城市和经济发达区逐步建设产品加工配送中心，以满足不同客户的个性化需求。二是开发节镍型不锈钢，替代300系不锈钢产品。如2304、UNS 31803等产品，2304合金是由23%铬、4%镍构成的复式不锈钢，它所具有的抗腐蚀特性与316L相似。另外，它的机械性能如耐压强度是304 / 316奥氏体等级的两倍。与304和316奥氏体相比，由于2304合金本身的复式微观结构，较低的镍含量和较高的铬含量，使得它的抗应力腐蚀能力较强，在一定范围可以替代316L。2304的复式结构机械加工性更强，它的性能与316L相当。另外，2304的抗腐蚀能力及洁净度更强，不需硫元素，局部抗腐蚀能力也更强，具有更好的机械加工性。

In order to adapt to market development: Firstly, speed up improvement of sales network center construction, and establish gradually processing and distribution center for our products among various big cities and developed regions in economy. Secondly, develop economical type of nickel stainless steel to substitute 300 series stainless steel. Take 2304、UNS 31803 as example, alloy 2304 is duplex type of stainless steel comprised of 23% chrome and 4% nickel, which has similar corrosion resistance to 316L. In addition, the mechanical property like compressive strength is twice times that of 304 / 316 austenite. Compared with 304 and 316 austenite, alloy 2304 possess stronger anti-stress corrosion performance due to duplex microstructure in itself with lower nickel content and higher chrome content, which, to a certain range, can substitute 316L. With stronger machining property, alloy 2304 has equivalent performance to 316L. Besides, it has stronger corrosion resistance and cleanliness, in no need of element Sulphur. Also stronger corrosion resistance partially, and better machining property.

服务承诺 >>>

Service Promise

- 为客户提供个性化成份、性能、包装、卷重、质保书的设计。
- 为客户在选材和加工工艺方面提供技术支持。
- 交货准确及时。
- 对客户异议，在24小时内答复。
- Provide for consumers with the personalized designs on composition, properties, package and the quality certificate.
- Technical support to customers in material selection and fabrication.
- Accurate and prompt delivery.
- Response to customer's claim within 24 hours.



合作伙伴 >>>

Cooperative Partner



主要业务部门联系方式 >>>

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