



石油化工用钢管

Petroleum & Chemical steel pipe

宝钢特钢有限公司
BAOSTEEL SPECIAL METALS CO., LTD.

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宝钢特钢有限公司

BAOSTEEL SPECIAL METALS CO., LTD.



公司介绍 Company introduction

宝钢特钢有限公司位于上海的东北角，是宝钢集团的全资子公司和唯一的特殊钢制造单元，前身为创建于1958年的五钢公司，是我国最早建设的特殊钢生产基地之一。

经过五十多年发展，宝钢特钢已经成为了国际化的金属材料制造商和高品质特殊钢的研发基地。目前，宝钢特钢已经拥有特种冶炼，锻造，长材，板带材及钢管等多条现代化的生产线，主要产品包括钛及钛合金，高温合金，不锈钢，结构钢，轴承钢和工模钢等，产品的形态多种多样包括圆锭，扁锭，锻件，棒材，板材，带材，卷材和管材等。特钢的产品已经广泛应用于化工，油气，航空航天，国防，轨道交通，能源等行业和领域。

未来宝钢特钢将持续致力于为海内外的客户提供超值的特钢产品和服务，建成国际一流，国内最具竞争力的特殊钢企业，打造具有强大综合竞争力的特钢新材料、新工艺和新技术的研发基地。

As a wholly-owned subsidiary and the exclusive special metal manufacturing unit of Baosteel Group, Baosteel Special Metals Co., Ltd. (BSMC) is one of the earliest special metal production bases in China. BSMC evolved from its predecessor known as Shanghai No.5 Steel Plant (estab.1958), located by the side of the Yangtze River in Baoshan District, Northeast of Shanghai.

After more than 50 years of development, BSMC has become an international integrated materials manufacturer and research center of high quality special metals. BSMC mainly offers special metals including titanium and titanium alloy, structure steel, bearing alloy, tooling & die alloy, stainless steel and super alloy in the forms of ingot, slab, billet, bar, plate, sheet, coil & strip, tube, etc. Our products have been widely used in the fields of petrochemical, oil & gas, aerospace and defense, transportation, energy, ship building, automotive, sports, etc.

BSMC will be built into the premium steel base with world class, domestically leading comprehensive competitiveness, as well as special steel R&D base with new material, new process and new technology. We are committed to pursue and promote mutually beneficial cooperation with domestic and overseas customers by offering high quality products and service.

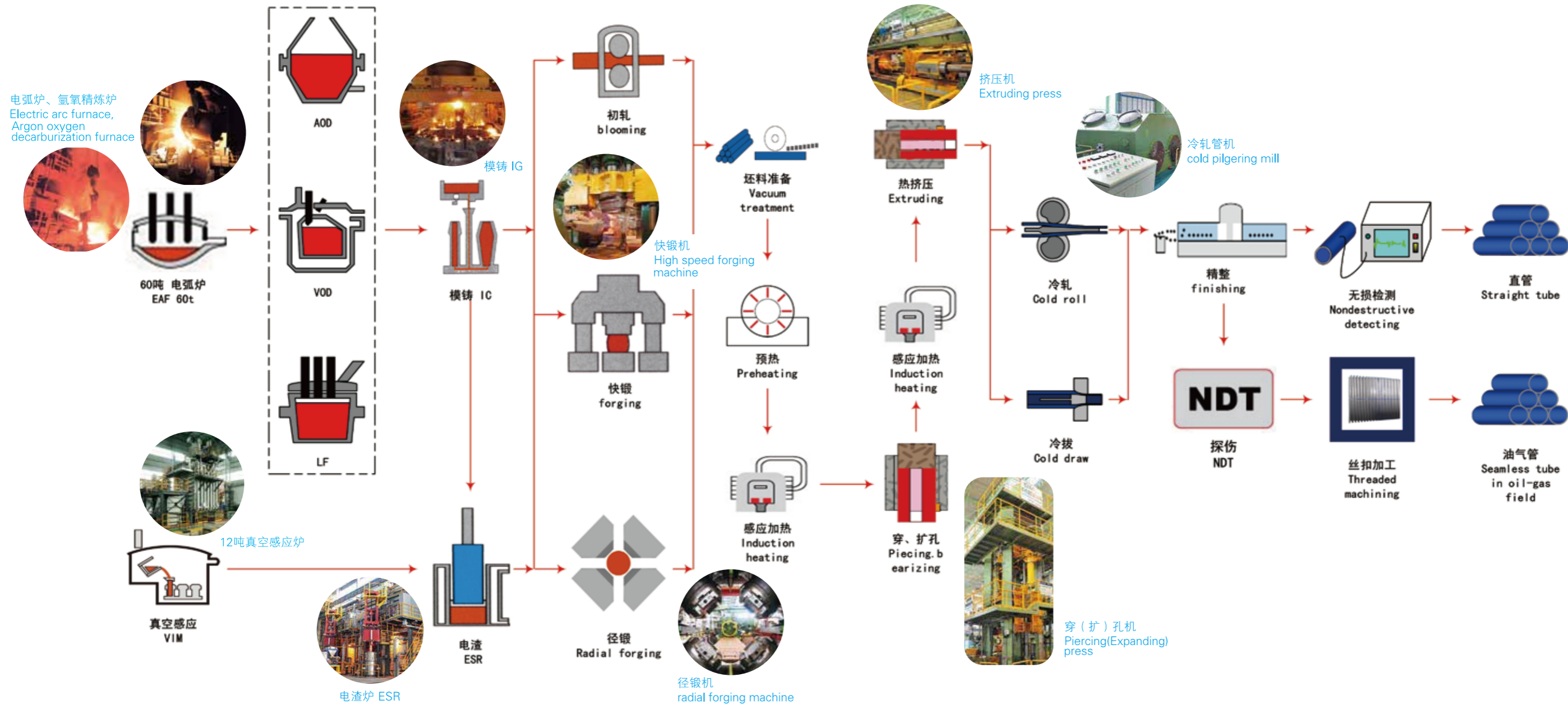
特殊钢管产线

由热挤压/穿孔管、核电U型管、冷轧合金管、特殊合金管等产线组成。拥有目前中国最大的60MN卧式挤压机以及与之配套的装备技术最先进、最完善的冷轧、热处理、后道处理及在线无损检测控制等手段。主要装备有环形炉、感应加热炉、辊底式连热处理炉、25MN立式穿/扩孔机、60MN式挤压机、冷轧管机，弯管机、以及精密矫直机、特种抛光机、内涡流检测仪等。

Special steel tube production line

It is composed of production lines of hot extrusion/perforated pipe, nuclear power U-type pipe, cold-rolled alloy pipe, special alloy pipe, etc., and equipped with China's largest 60MN horizontal extrusion press as well as the most advanced and perfect matching technologies such as cold rolling, heat treatment, finishing treatment, online nondestructive detection and control, etc. The main equipment includes rotary hearth furnace, induction heating furnace, Roller bottom furnace, 25MN vertical piercing/expanding machine, 60MN horizontal extrusion press, cold rolling machine, pipe-bending machine, precision straightener, special polishing machine, internal eddy current testing instrument, etc.





石化用镍基耐蚀合金无缝钢管

Nickle based corrosion-resistant alloy seamless tube

用途:

具有优良的耐应力腐蚀性能和耐高温腐蚀性能,对碱有高的抗蚀性,在还原性介质及氧化性介质中具有良好的耐蚀性。应用常规电厂、化工、石化工业以及海洋开发制造加热器、换热器、蒸发器、冷凝器及输送管线。

订货标准/Product standard:

ASME SB163、ASME SB167、ASME SB407、ASME SB444、ASME SB 622、ASME SB668、ASME SB423、ASME SB829、企业标准、技术协议

交货状态:

热挤压、冷加工、热处理态

Usage:

Widely Used In Manufacturing Of Petrochemical Industry And Ocean Exploitation Such As Heater,Heat Exchanger,Evaporator,Condensator And Pipelines,Etc.

可供规格/Product specification:

外径5-508mm,壁厚0.33-50mm;
OD: 5-508mm, WTK: 0.33-50mm;

Product condition:

hot extrusion, cold worked, heat treatment state

化学成分

Chemical composition

宝钢牌号 Baosteel	UNS	Chemical composition (weight percent) %										
		C	Ni	Cr	Mo	Cu	Fe	Si	Mn	S	P	其它others
BT200	N02200	≤0.15	≥99.0	/	/	≤0.25	≤0.40	≤0.35	≤0.35	≤0.010	≤0.03	/
BT201	N02201	≤0.02	≥99.0	/	/	≤0.25	≤0.40	≤0.35	≤0.35	≤0.010	≤0.03	/
BT400	N04400	≤0.30	≥63	/	/	28/34	≤2.5	≤0.5	≤2.0	≤0.020	≤0.03	/
BT800	N08800	≤0.100	30.0/35.0	19.0/23.0	/	≤0.75	≥39.5	≤1.0	≤1.5	≤0.015	≤0.02	Al:0.15/0.60 Ti:0.15/0.60
BT800H	N08810	0.05/0.10	30.0/35.0	19.0/23.0	/	≤0.75	≥39.5	≤1.0	≤1.5	≤0.015	≤0.02	Al:0.15/0.60 Ti:0.15/0.60 Al+Ti≤0.70
BT800HT	N08811	0.06/0.10	30.0/35.0	19.0/23.0	/	≤0.75	≥39.5	≤1.0	≤1.5	≤0.015	≤0.02	Al:0.15/0.60 Ti:0.15/0.60 Al+Ti:0.85/1.2
BT600	N06600	≤0.150	≥72.0	14.0/17.0	/	≤0.50	6.0/10.0	≤0.5	≤1.0	≤0.015	≤0.03	/
BT690	N06690	≤0.05	≥58.0	27.0/31.0	/	≤0.50	7.0/11.0	≤0.5	≤0.5	≤0.015	≤0.03	/
BG2830	N08028	≤0.03	29.5/32.5	26.0/28.0	3.0/4.0	0.6/1.4	余	≤1.0	≤2.5	≤0.03	≤0.03	
BG2250	N06985	≤0.015	余	21.0/23.5	6.0/8.0	1.5/2.5	18.0/21.0	≤1.0	≤1.0	≤0.030	≤0.03	W≤1.5 Co≤5.0 Nb+Ta≤0.5
BT825	N08825	≤0.050	38.0/46.0	19.5/23.5	2.50/3.50	1.5/3.0	≥22.0	≤0.5	≤0.5	≤0.03	≤0.04	Al≤0.20 Ti:0.6/1.2
BT625	N06625	≤0.100	≥58.0	20.0/23.0	8.00/10.0	/	≤5.0	≤0.5	≤0.08	≤0.015	≤0.015	Al≤0.40 Ti ≤0.40 Nb+Ta:3.15/4.15
BTC276	N10276	≤0.010	余	14.5/16.5	15.0/17.0	/	4.0/7.0	≤0.08	≤0.08	≤0.03	≤0.04	W:3.0/4.5 Co≤2.5 V≤0.35

牌号对照

Grade parallel table

宝钢牌号 Baosteel	中国GB	UNS	UNS	德国DIN	日本JIS
BT200		N02200	N02200		
BT201		N02201	N02201		NW2201
BT400	-	N04400	N04400	1743	NW4400
BT800	NS1101	N08800	N08800	-	NCF800
BT800H	NS1102	N08810	N08810		NCF800H
BT800HT	-	N08811	N08811	-	
BT600	NS3102	N06600	N06600	2.4816	NCF600
BT690		N06690	N06690		NCF690
BG2830		N08028	N08028		
BG2250		N06985	N06985		
BT825	NS1402	N08825	N08825	2.4858	NCF825
BT625	NS3306	N06625	N06625	2.4856	NCF625
BTC276	NS3304	N10276	N10276	2.4819	NW0276

室温力学性能

Room-temperature mechanical property

宝钢牌号 Baosteel	状态 Condition	抗拉强度 Rm,min, MPa	屈服强度 Rp 0.2% min, MPa	延伸率 A50,min,%	晶粒度 Grain size	
BT200	solution	379	103	40	-	
BT201	solution	345	83	40	-	
BT400	OD≥127mm	annealing	480	195	35	-
	OD < 127mm	annealing	480	170	35	-
BT800	solution	520	205	30	-	
BT800H	solution	450	170	30	≤5	
BT800HT	solution	450	170	30	≤5	
BT600	OD≥127mm	solution	550	205	35	-
	OD < 127mm	solution	550	240	30	-
BT690	solution	586	205	35	-	
BG2830	solution	500	214	40	-	
BG2250	solution	621	241	40	-	
BT825	solution	586	241	30	-	
BT625	annealing	827	414	30	-	
	solution	276	690	30	-	
BTC276	solution	283	690	40	-	

石化用镍基耐蚀合金无缝钢管

Nickle based corrosion-resistant alloy seamless tube

高温力学性能

High temperature mechanical property

宝钢牌号 Baosteel	机械性能 Mechanical property	状态 Condition	温度 Temperature, °C					
			350	450	550	650	750	850
BT800H	Rm, MPa	固溶 Solid solution	485	490	480	420	270	149
	Rp0.2, MPa		162	165	169	155	125	95
	A4.52, %		52.5	56.0	52.5	50.0	69.5	101.5
BT825	Rm, MPa	固溶 Solid solution	560	550	527	485	345	197
	Rp0.2, MPa		205	195	191	169	170	176
	A 4.52, %		47.5	51.5	49.0	52.5	64.0	92.0
	Rm, MPa		-	-	-	610	480	345
BT625	Rp0.2, MPa	固溶 Solid solution	-	-	-	210	225	215
	A4.52, %		-	-	-	96.5	114.0	117.0

物理性能

Physical property

宝钢牌号 Baosteel	密度Density g·cm ³	熔点Melting range/°C	膨胀系数 Coefficient of expansion μ m/m °C		导热系数 Thermal conductivity W·(m·°C) ⁻¹		电阻率 Electrical Resistivity μΩ·m	弹性模量 Modulus of elasticity GPa
			100°C	300°C	300°C	300°C		
BT400	8.80	1300-1350	14.2	15.2	15.2	26.9	0.51	26.0
BT800	7.94	1357-1385	14.1	16.2	16.2	16.3	0.989	196.5
BT600	8.47	1354-1413	10.4	14.2	14.2	19.0	1.03	214.0
BT690	8.19	1343-1377	14.06	14.53	14.53	17.3	1.148	211.0
BG2830	8.0	1342-1359	15.0	16.0	16.0	16.0	0.99	200
BG2250	8.14	1260-1343	14.6	14.6	14.6	15.9	1.12	199.0
BT825	8.14	1370-1400	14.1	15.3	15.3	15.4	1.13	196
BT625	8.44	1290-1350	-	-	-	14.1	1.29	204.8
BTC276	8.89	1325-1370	12.2	12.9	12.9	14.7	1.22	205

晶间腐蚀性能

Intergranular corrosion resistance

按ASTM G 28 A法(硫酸铁-硫酸法)测定的腐蚀速率

Intergranular corrosion rate according ASTM G 28 (ferric sulfate - sulfuric acid method)

宝钢牌号 Baosteel	状态 Condition	时间 H	腐蚀速率 Corrosion rate(mm/a)	腐蚀深度 Corrosion depth μm
BT800	固溶 Solid solution	120	0.42	
BT800H		120	1.464	
BT600		120	0.96	
BT825		120	0.324	≤50
BT625		120	0.535	≤50

按GB/T15260-94标准中D法65%硝酸法测定的腐蚀速率

Intergranular corrosion rate according GB/T15260-94 (65% HNO₃)

宝钢牌号 Baosteel	状态 Condition	腐蚀速率 Corrosion rate(mm/a)					平均腐蚀速率 Average corrosion rate (mm/a)
		1	2	3	4	5	
BT800H	固溶 Solid solution	时间/48h	时间/48h	时间/48h	时间/48h	时间/48h	0.348
BT600		0.204	0.12	0.168	0.252	1.02	0.371
BT825		0.288	0.30	0.324	0.432	0.528	0.264
BT625		0.348	0.204	0.24	0.192	0.312	0.489

应用

Application



氟化工用反应器 (BT600)
Fluorine chemical reactor (BT600)



醋酸装置换热器 (BTC276)
Acetic acid plant heat exchanger (BTC276)



石化空冷器 (BT825)
Petrochemical air cooler (BT825)



多晶硅加热器
Polysilicon heater (BT800H)

油气开采用耐蚀合金无缝钢管

Corrosion-resistant alloy seamless tube used as casing, tubing and coupling stock

用途:

油井管、油套管及工具适用于含氯离子、硫化氢、二氧化碳等腐蚀介质的油气田开采领域。

Usage:

Tubing, casing and tools suitable for chlorine ion, hydrogen sulfide, carbon dioxide, and other areas of the corrosive medium of oil and gas field exploitation.

耐蚀合金油井管产品制造过程实行一贯制质量管理, 确保了产品质量受控; 宝钢是国内唯一一家具有全流程生产镍基耐蚀合金油套管的企業。

It construct the quality management during the corrosion resistant alloy pipe manufacturing process, ensure the product quality control; Baosteel is also the only domestic production enterprise of whole process of nickel base corrosion resistant alloy oil casing & tubing.

订货标准/Product standard:

ISO13680、ISO 15156-3

可供规格/Product specification :

油(套)管外径(Outside diameter)26.67-244.48mm (1.05" ~ 9-5/8"), 壁厚(Thickness) 2.87-22.22mm;

接箍按油(套)管规格配套。Coupling will match with tubing & casing.

化学成分

Chemical composition

材料类型	宝钢牌号	UNS	Chemical composition (weight percent) %											
			C	Ni	Cr	Mo	Cu	Fe	Si	Mn	Co	S	P	其它
4c	BG2830	N08028	≤0.030	29.5-32.5	26.0-28.0	3.0-4.0	0.6-1.4	bal.	≤1.00	≤2.50	-	≤0.030	≤0.030	-
	BG2532	N08535	≤0.030	29.0-36.5	24.0-27.0	2.5-4.0	≤1.50	bal.	≤0.50	≤1.00	-	≤0.030	≤0.030	-
	BG2235	N08135	≤0.03	33.0-38.0	20.5-23.5	4.0-5.0	≤0.70	rem	≤0.75	≤1.00	-	≤0.030	≤0.030	W0.2-0.8
4d	BG2242	N08825	≤0.050	38.0-46.0	19.5-23.5	2.5-3.5	1.5-3.0	bal	≤0.50	≤1.00	-	≤0.030	≤0.030	Ti0.6-1.2, Al≤0.2
	BG2250	N06985	≤0.015	bal.	21.0-23.5	6.0-8.0	1.5-2.5	18.0-21.0	≤1.00	≤1.00	≤5.0	≤0.030	≤0.040	Nb+Ta≤0.50, W≤1.5
	BG2050*	N06950	≤0.015	50.0min	19.0-21.0	8.0-10.0	≤0.5	15.0-20.0	≤1.00	≤1.00	≤2.5	≤0.015	≤0.040	Nb+Ta≤0.50, V≤0.04, W≤1.0
4e	BG1570*	N10276	≤0.020	bal.	14.5-16.5	15.0-17.0	-	4.0-7.0	≤0.08	≤1.00	≤2.5	≤0.030	≤0.030	V≤0.35, W3.0-4.5

注: *在研制中。

*during research period

力学性能

Mechanical property

宝钢牌号 (Baosteel)	钢级 Grade	交货状态 Delivery condition	腐蚀速率 Corrosion rate(mm/a)				
			min	max	max	min	max
BG2830	110	冷加工硬化 (CH)	758	965	793	11	35
	125	冷加工硬化 (CH)	862	1034	896	10	37
	140	冷加工硬化 (CH)	965	1103	1000	9	38
BG2532	110	冷加工硬化 (CH)	758	965	793	11	35
	125	冷加工硬化 (CH)	862	1034	896	10	37
	140	冷加工硬化 (CH)	965	1103	1000	9	38
BG2235	110	冷加工硬化 (CH)	758	965	793	11	35
	125	冷加工硬化 (CH)	862	1034	896	10	37
BG2242	110	冷加工硬化 (CH)	758	965	793	11	35
	125	冷加工硬化 (CH)	862	1034	896	10	37
BG2250	110	冷加工硬化 (CH)	758	965	793	11	35
	125	冷加工硬化 (CH)	862	1034	896	10	37
	140	冷加工硬化 (CH)	965	1103	1000	9	38

常用油套管规格

Specified dimension and masses of pipe

代号 Labels	外径 Outside diameter	壁厚 thickness	内径 ^a Inside diameter	通径直径 ^b Drift diameter	替代通径直径 alternative Drift diameter	平端管米重 Mass Plain end
	D	t	d			Wpe
1	2	mm	mm	mm	mm	kg/m
1	2	3	4	5	6	7
2-7/8	6.40	73.02	5.51	62.00	59.62	-
3-1/2	9.20	88.90	6.45	76.00	72.82	-
3-1/2	10.20	88.90	7.34	74.22	71.04	-
4-1/2	11.60	114.30	6.35	101.60	98.42	-
4-1/2	13.50	114.30	7.37	99.56	96.38	-
4-1/2	15.10	114.30	8.56	97.18	94.00	-
4-1/2	26.10	114.30	16.00	82.30	79.12	-
5	18.00	127.00	9.19	108.62	105.44	-
5	21.40	127.00	11.10	104.80	101.62	-
7	23.00	177.80	8.05	161.70	158.52	158.75
7	26.00	177.80	9.19	159.42	156.24	-
7	35.00	177.80	12.65	152.50	149.32	-
7-5/8	39.00	193.68	12.70	168.28	165.10	-
8-5/8	49.00	219.08	14.15	190.78	187.60	-

a d = D - 2t。

b 通径直径= d - 常数 (油管为0.094" 或0.125" ; 套管0.125" 或0.156")。Drift diameter=d-constant

c 重量(Mass)= 0.024 661 5 × (D - t) × t - t为不同组材料需要乘以的系数(for the multiplication factors with regards to the groups)。

油气开采用耐蚀合金无缝钢管

Corrosion-resistant alloy seamless tube used as casing, tubing and coupling stock

冷加工态镍基合金的应用环境和材料限制

Environmental and materials limits for annealed and cold-worked, solid-solution nickel-based alloys used as any equipment or component

Materials type	Temperature max. °C (° F)	Partial pressure H2S PH2S max. Kpa (psi)	Chlorid conc. max. mg/L	PH	Sulfur-resistant	Remarks
4c, 4d 和 4e 冷加工合金钢	232 (450)	200 (30)	See "Remarks" column	See "Remarks" column	No	任何Cl-1 含量及pH 值 Any combination of chloride concentration and in situ pH occurring in production environments is acceptable.
	218 (425)	700 (100)			No	
	204 (400)	1000 (150)			No	
	177 (350)	1400 (200)			No	
4d 和 4e 冷加工合金钢	218 (425)	2000 (300)	See "Remarks" column	See "Remarks" column	No	任何Cl-1 含量及pH 值 Any combination of chloride concentration and in situ pH occurring in production environments is acceptable.
	149 (300)	See "Remarks" column	See "Remarks" column	See "Remarks" column	Yes	任何H2S含量, Cl-1 含量及pH 值 Any combination of hydrogen sulfide, chloride concentration and in situ pH in production environments is acceptable.
4e 冷加工合金钢	232 (450)	7000(1000)	See "Remarks" column	See "Remarks" column	Yes	任何Cl-1 含量及pH 值 Any combination of chloride concentration and in situ pH occurring in production environments is acceptable.
	204 (450)	See "Remarks" column			Yes	任何H2S含量, Cl-1 含量及pH 值 Any combination of hydrogen sulfide, chloride concentration and in situ pH in production environments is acceptable.

应用 Application



大湾下井报告



龙岗26井



元坝102-2H钻井平台



宝钢第一根BG2532-125套管送入井内

超级奥氏体不锈钢无缝钢管

Super austenitic stainless steel tube

用途:

可以应用于磷肥工业生产中的硫酸储罐；磷酸厂的氟硅酸反应器；化肥工业生产中氯酸盐结晶器；制药厂的通风系统；溶剂回收行业过滤器、冷凝器、管路；纸浆与造纸行业中漂白设备、压滤机等；海上平台的生产用管道，集水系统；脱盐处理中多级闪蒸、低温多效脱盐等；发电厂海水冷凝器用等等。

订货标准:

ASTM A312、ASME SB677、企业标准、技术协议
Product standard: ASTM A312、ASME SB677,etc.

交货状态/Product condition:

热挤压、冷加工、热处理
Hot extrusion, cold worked, heat treatment state

化学成分

Chemical composition

ASTM UNS	牌号 Grade	Chemical composition (weight percent) %										
		C	Ni	Cr	Mo	Cu	Fe	Si	Mn	N	S	P
N08904	904L	≤0.020	23.00/28.00	19.00/23.00	4.00/5.00	1.00/2.00	余 bal.	≤1.00	≤2.00	-	≤0.035	≤0.045
N08367	AL-6XN	≤0.030	23.5/25.5	20.00/22.00	6.00/7.00	≤0.75	余 bal.	≤1.00	≤2.00	0.18/0.25	≤0.040	≤0.040
S31254	254SMo	≤0.020	17.50/18.50	19.50/20.50	6.00/6.50	0.5/1.0	余 bal.	≤0.80	≤1.00	0.18/0.22	≤0.010	≤0.03
S32654	654SMo	≤0.020	21.00/23.00	24.00/25.00	7.00/8.00	0.30/0.60	余 bal.	≤0.30	2.00/4.00	0.45/0.55	≤0.005	≤0.03

室温力学性能

Room-temperature mechanical property

ASTM UNS	热处理温度 Heat Treatment Temperature	抗拉强度, Rm, min, MPa	屈服强度 Rp0.2% min, MPa	伸长率A50,min,%
N08904	≥1100℃	490	220	35
N08637	≥1100℃	690	310	30
S31254	≥1150℃	675	310	35
S32654	≥1150℃	750	430	35

Usage:

It is widely used in Sulfuric acid storage tank in the phosphate fertilizer industry, Fluorosilicic acid reactor phosphoric acid plant; chlorate Crystallizer in the production of fertilizer; ventilation system in pharmaceutical factory; solvent recovery filter, condenser, pipeline; bleaching equipment and filter in the pulp and paper industry; pipelines and water collecting system in offshore platforms; multi-stage flash distillation, low-temperature multi effect desalination; seawater condenser for power plant and so on.

可供规格:

外径5.8-508mm，壁厚0.3-50mm；
OD: 5.8-508mm，WTK: 0.3-50mm；

晶间腐蚀性能

Intergranular corrosion resistance

按ASTM G 28 A法(硫酸铁-硫酸法)测定的腐蚀速率

Intergranular corrosion rate according ASTM G 28 (ferric sulfate – sulfuric acid method)

宝钢牌号 Baosteel	状态 Condition	时间 H	腐蚀速率 Corrosion rate(mm/a)	腐蚀深度 corrosion depth μm
N08904	固溶Solid solution	120	0.35	≤50

按GB/T15260-94标准中D法65%硝酸法测定的腐蚀速率

Intergranular corrosion resistance according GB/T15260-94 (65% HNO₃)

宝钢牌号 Baosteel	状态 Condition	腐蚀速率 Corrosion rate(mm/a)					平均腐蚀速率 Average corrosion rate (mm/a)
		1	2	3	4	5	
		时间/48h	时间/48h	时间/48h	时间/48h	时间/48h	
N08904	固溶 solution	0.19	0.18	0.29	0.48	0.67	0.36



双相不锈钢管

Duplex stainless tube

用途:

适用于原油脱盐装置中的热交换器和管道; 甲醇生产制作管式反应器的催化剂管束; 氯乙烯生产制作预冷凝器; 纸浆和造纸工业硫酸蒸煮液预热器管束; 陆上和海上油气工业的输送管道和集气管; 海上石油平台的热交换器、水处理和供水系统、消防系统、喷水系统、稳水系统; 化工系统加工和运输各种化学品的压力容器、管道、罐和热交换器。

产品标准:

GB/T21833-2008、ASTM A789/ASME SA789、ASTM A790/ASME SA790

Standard:

GB/T21833-2008, ASTM A789/ASME SA789, ASTM A790/ASME SA790, and enterprise standards, etc.

Hot extrusion, cold worked, heat treatment state

化学成分

Chemical composition

牌号 Grade	Chemical composition (weight percent) %									
	C	Ni	Cr	Mo	Cu	Si	Mn	N	S	P
022Cr19Ni5Mo3Si2N	≤0.030	4.30-5.20	18.0-19.0	2.50-3.00		1.4-2.0	1.2-2.0	0.05-0.10		≤0.030
022Cr22Ni5Mo3N	≤0.030	4.50-6.50	21.0-23.0	2.50-3.50		≤1.0	≤2.0	0.08-0.20	≤0.020	≤0.030
022Cr23Ni5Mo3N	≤0.030	4.50-6.50	22.0-23.0	3.00-3.50		≤1.0	≤2.0	0.14-0.20	≤0.020	≤0.030
022Cr25Ni7Mo4N	≤0.030	6.00-8.00	24.0-26.0	3.00-5.00	≤0.5	≤0.8	≤1.2	0.24-0.32	≤0.020	0.035

牌号对照

Grade parallel table

China	US	SW	DE
GB/T21833			
022Cr19Ni5Mo3Si2N	00Cr18Ni5Mo3Si2	S31500	3RE60
022Cr22Ni5Mo3N	00Cr22Ni5Mo3N	S31803	1.4462
022Cr23Ni5Mo3N	00Cr22Ni5Mo3N	S32205	SAF2205
022Cr25Ni7Mo4N	00Cr25Ni7Mo4N	S32750	SAF2507

Usage:

Heat exchanger and tube on oil desalt device, catalyst tubebank of tubular reactor for methanol manufacturing, precondenser for VCM, convey pipe and header of land/ocean oil/gas industry; heat exchanger, water treatment and supply system, fire extinguishing system, spraying system and water stablizing system of onsea petrol platform; pressure vessel, chanel, tanks, and heat exchanger used in chemicals process and transportation in chemical industry.

产品规格:

size: 外径OD: 16~508 mm, 壁厚WTK: 1~45mm

金相组织

固溶状态下的金相组织为铁素体-奥氏体双相, 其奥氏体含量为40~60%, 不允许有σ相等脆性相析出。

综合性能

- 具有高的强度与韧性、综合机械性能好。
- 良好的抗点蚀及缝隙腐蚀能力。
- 良好的抗压力腐蚀破裂能力。
- 高的抗均匀腐蚀能力。
- 导热系数大, 线膨胀系数小。
- 良好的可焊性, 热裂倾向小。

力学性能

Mechanical Properties

Grade	Rm (MPa)	Rp0.2 (MPa)	A[50]%	HRC
022Cr19Ni5Mo3Si2N	≥630	≥440	≥30	≤30
022Cr22Ni5Mo3N	≥620	≥450	≥25	≤30
022Cr23Ni5Mo3N	≥655	≥485	≥25	≤30
022Cr25Ni7Mo4N	≥800	≥550	≥15	≤32

物理性能

Physical property

物理性能 physical property	单位Unit	温度 TEP (° C)			
		20°C	100°C	200°C	300°C
密度 (Density)	g/cm ³	7.8			
电阻 (Electrical Resistivity)	μ Ω m	0.80	0.85	0.90	1.00
热导率 (Thermal conductivity)	W/m°C	15	16	17	18
比热容 (Specific Heat)	J/kg°C	500	530	560	590
弹性模量 (Modulus of elasticity)	GPa	200	194	186	180
柏松比 (Poissons ratio)		0.3			
线膨胀系数 (室温-T) (coefficient of expansion (Room temperature))	× 10 ⁻⁶ /°C		13.0	13.5	14.0



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