



# Yantai Baosteel

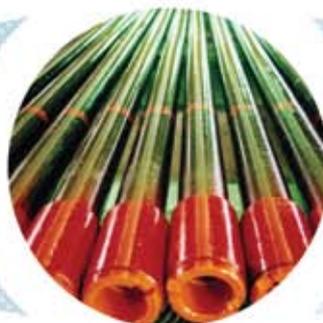
Products Catalog

## 烟台宝钢460机组

产品手册



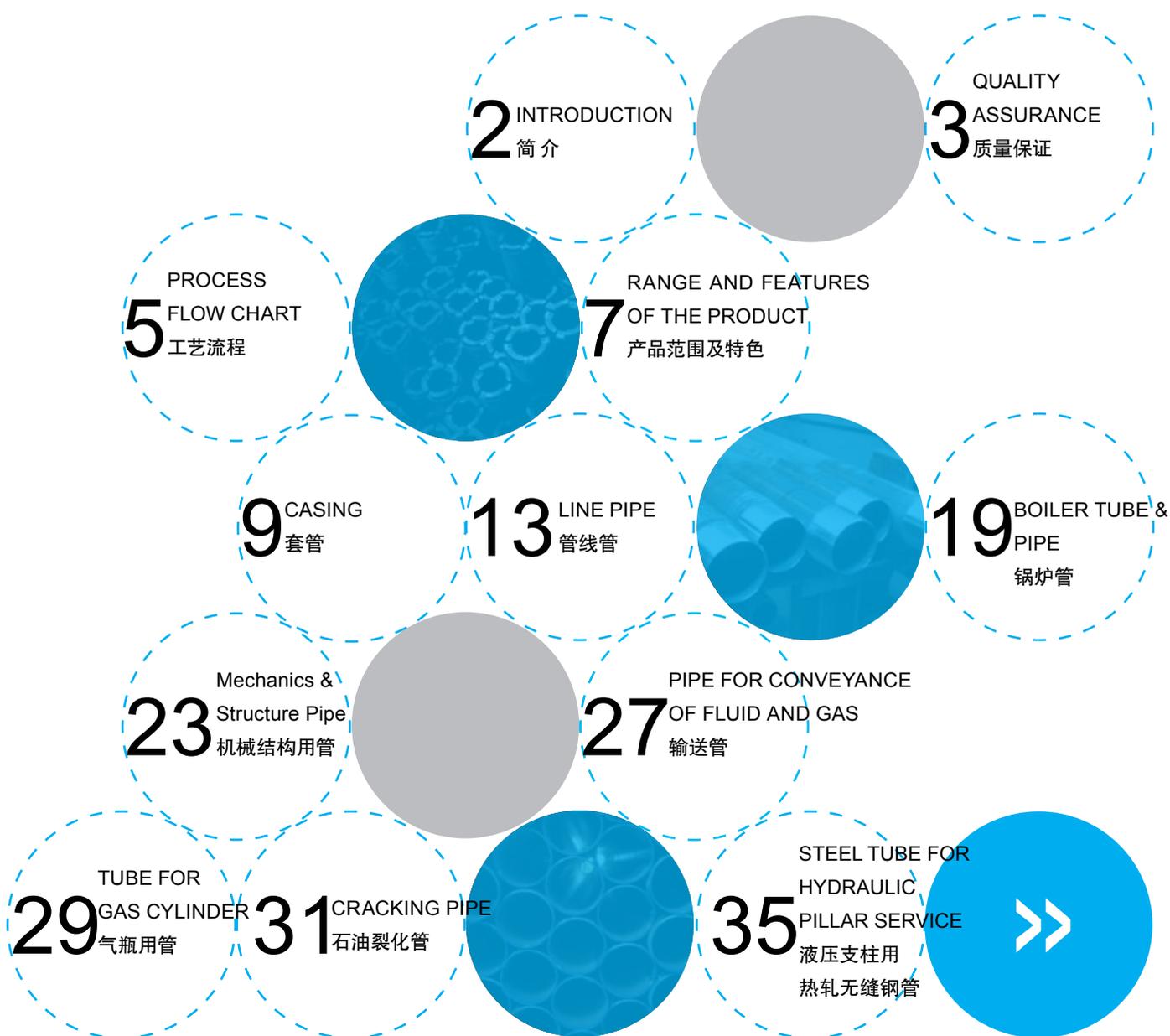
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宝山钢铁股份有限公司  
BAOSHAN IRON & STEEL CO., LTD.

# CONTENT

## 目录





# INTRODUCTION

## 简介

烟台宝钢钢管有限责任公司地处港口城市烟台市福山区高新技术产业区内，水陆交通便捷。按照宝钢“精品+规模”的战略规划，由宝山钢铁股份有限公司与烟台鲁宝钢管有限责任公司共同投资兴建，其中：宝钢股份控股 80%，鲁宝公司占股 20%。设计年产套管 32 万吨，高压锅炉管 8 万吨，机械结构用管 5 万吨，管线管 6 万吨，气瓶管 3 万吨，石化用管 6 万吨。

公司拥有一支有较高业务水平的自主研发队伍，拥有一条引进德国 SMS Meer 公司的 PQF 无缝钢管生产线，拥有一套行业先进的完备的检测手段，是目前世界上最为先进的无缝钢管生产线之一。

管加工线、接箍生产线、连续热处理线于 2009 年 11 月投产，热轧线、一般管精整线、高压锅炉管精整线、辊底式光亮炉等将于 2011 年 4 月建成投产。

公司秉承“品质竞一流、诚信至永久”的企业理念，以用户满意为标准，引用现代管理模式，精益运营，持续创新，结合先进的设备和技术，保证提供高质量的产品和服务。

Yantai Baosteel Steel Pipe Co., Ltd. is located in Fushan District High-tech Industry Zone, Yantai, a port city endowed with the access to well-developed land and waterway transportations. In line with Baosteel's cardinal strategic plan called "premium steel plus production scale", this company was established jointly by Baosteel Iron & Steel Co., Ltd. whose stake is 80% and Yantai Lubao Steel pipe Co., Ltd. who holds 20% share. The company is designed to produce 320,000 t/a of casing, 80,000 t/a of high pressure boiler tube & pipe, 50,000 t/a of mechanical and structural tube, 60,000 t/a of line pipe, 30,000 t/a of gas cylinder tube and 60,000 t/a of petrochemical pipe as well.

The company has a strong R&D force, a PQF seamless steel pipe production line, imported from SMS Meer, Germany, and the sophisticated inspection tube & pipe. Therefore, it is one of the most advanced seamless tube & pipe mill worldwide.

Its tube & pipe processing line, coupling line, continuous heat treatment line were put into production in November 2009, while its hot tube & pipe rolling line, finishing line, high pressure boiler tube & pipe finishing line, roller hearth bright annealing furnace are scheduled to come on stream, by April 2011.

By adhering to the concept of "top quality, permanent trustworthiness", the company takes the customer satisfaction as benchmark, applies the modern management pattern, carries out lean production, pursues innovation and works hard to fully use the advanced technology and equipment, so as to offer high quality product and service.



### ○管理体系

烟台宝钢钢管有限责任公司获得了 ISO9001 认证证书、ISO14001 认证证书、GB/T28001 认证证书、API 5CT 认证证书。

正在推进的认证有：API 5L 认证、压力管道元件制造许可认证、PED( 欧盟承压设备指令 ) 认证、CCS( 中国船级社 ) 认证、ABS( 美国船级社 ) 认证、DNV( 挪威船级社 ) 认证、LR( 英国劳氏船级社 ) 认证、KR( 韩国船级社 ) 认证、BV( 法国船级社 ) 认证。

### ○一贯制质量管理

烟台宝钢钢管有限责任公司是宝钢股份钢管条钢事业部的生产单元，这样就实现了全过程的一贯制管理，包括炼铁、炼钢、连铸、初轧、轧管、热处理、管加工等，具有全流程工艺策划、质量控制、持续改进和快速反应的能力。

### ○检测技术

烟宝各产线配备齐全的检测和试验设备，对产品制造的全过程进行监控、检测、跟踪和验证，包括：

热轧线液压小仓自动控制、CARTA 系统控制、QAS 质量保证系统、在线外径、壁厚、温度、长度检测，热处理工艺参数连续自动检测，钢管在线标识，水压数据自动采集，在线超声波探伤，在线漏磁探伤，在线管端磁粉探伤，在线管端超声波探伤等。

配备世界先进的理化检测设备和高素质技术人员，钢管静水压爆破试验、H<sub>2</sub>S 应力腐蚀试验、钢管 DWTT( 落锤撕裂 ) 试验由宝钢研究院完成，为产品按国内外标准生产奠定基础。

设备 Equipment	试验项目 Test Item	数量 Quantity
拉伸试验机 Tensile Testing Machine	拉伸试验 Tensile Testing	2
冲击试验机 Impact Tester	冲击试验 Impact Test	2
压扁试验机 Flattening Test Machine	压扁试验 Flattening Test	1
硬度试验机 Hardness Tester	硬度检测 Hardness Test	4
光学显微镜 Optical Microscope	金相分析 Metallographic Phase Analysis	2
直读光谱仪 Direct Reading Spectrometer	化学分析 Chemical Analysis	1
氧氮分析仪 ON Analyzer	化学分析 Chemical Analysis	1

## Advanced Testing Equipment 先进试验设备

- ① HORIBA 全自动氧氮分析仪  
HORIBA Full-Auto ON Analyzer
- ② THERMO 光谱仪  
THERMO Spectrometer
- ③ 蔡司金相显微镜  
Zeiss Metallographic Microscope
- ④ 低温自动送样冲击试验机  
Low Temperature Auto Sample Feeding Impact Test Machine
- ⑤ 布氏、洛氏、表面洛氏、维氏硬度计  
Testers For Brinell Hardness, Rockwell hardness, Superficial Rockwell Hardness, Vickers hardness

### ○ Management System

The company has been certified by ISO 9001, ISO 4001, GB/T 28001 and API 5CT.

Now, the company is undergoing a series of certifications like: API 5L, licence for pressure pipe parts manufacture, PED, CCS, ABS, DNV, LR, KR and BV.

### ○ Throughout-Process Quality Management

As a production section of Tube, Pipe and Bar Business Unit of Baosteel, the company has implemented the throughout-Process Quality Management that covers a total metallurgical process including ironmaking, steelmaking, continuous casting, slabbing, tube rolling, heat treatment, tube processing, etc. It has a full range of capacity in the total process planning, quality control, continued improvement and quick response as well.

### ○ Inspection Technology

Completely equipped with all detection and measuring devices and inspection and testing tools, the company is able to conduct the monitoring, inspection, tracking and examination for the total production process. The following is its major job:

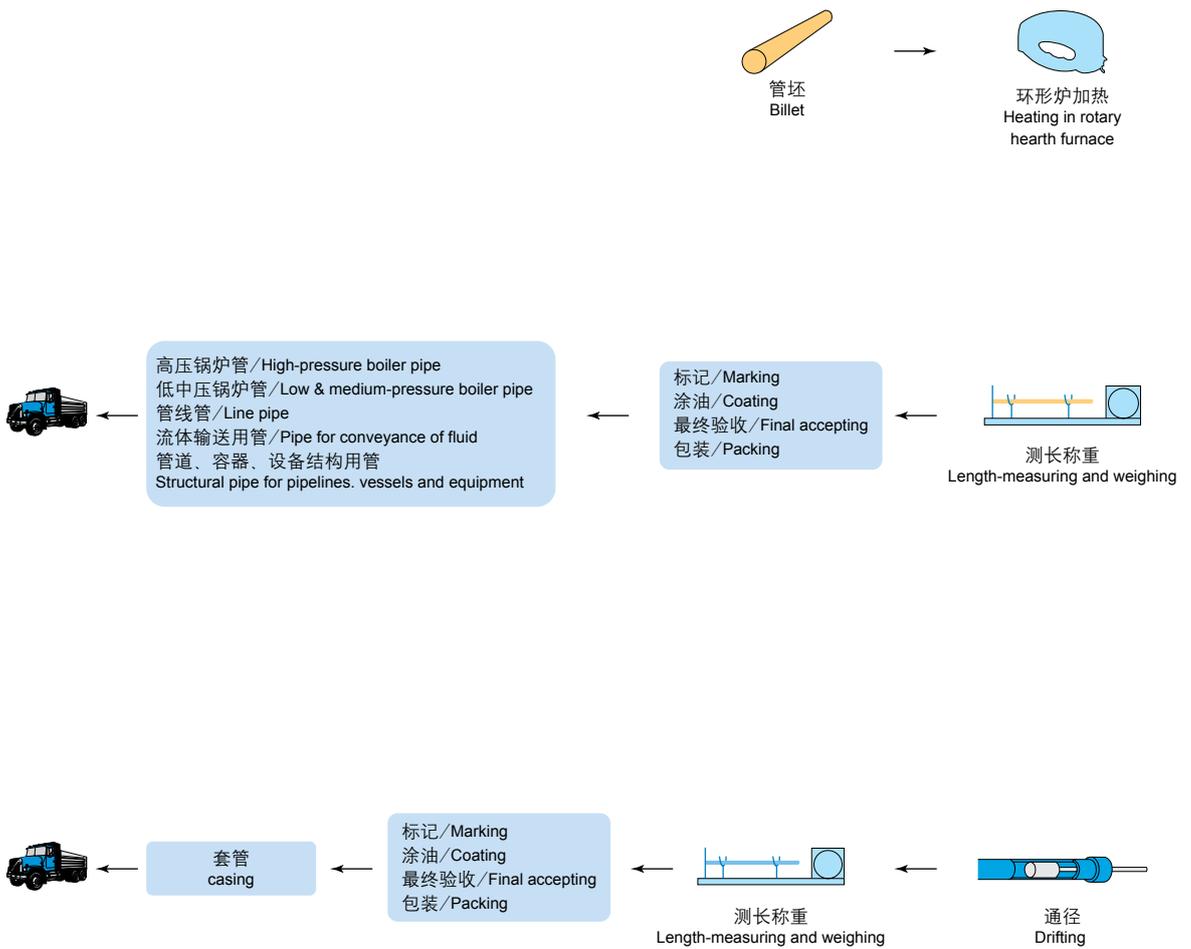
- Automatic control of hydraulic cell for hot rolling
- CARTA system control
- QAS
  - On-line measurement of outer diameter, wall thickness, temperature and length
  - Continuous detection of heat treatment process data
  - On-line markingsystem
  - Automatic collection of hydrostatic data
  - On-line ultrasonic flaw detection
  - On-line magnetic leakage flaw detection
  - On-line pipe end magnetic powder flaw detection
  - On-line tube & pipe end ultrasonic flaw detection

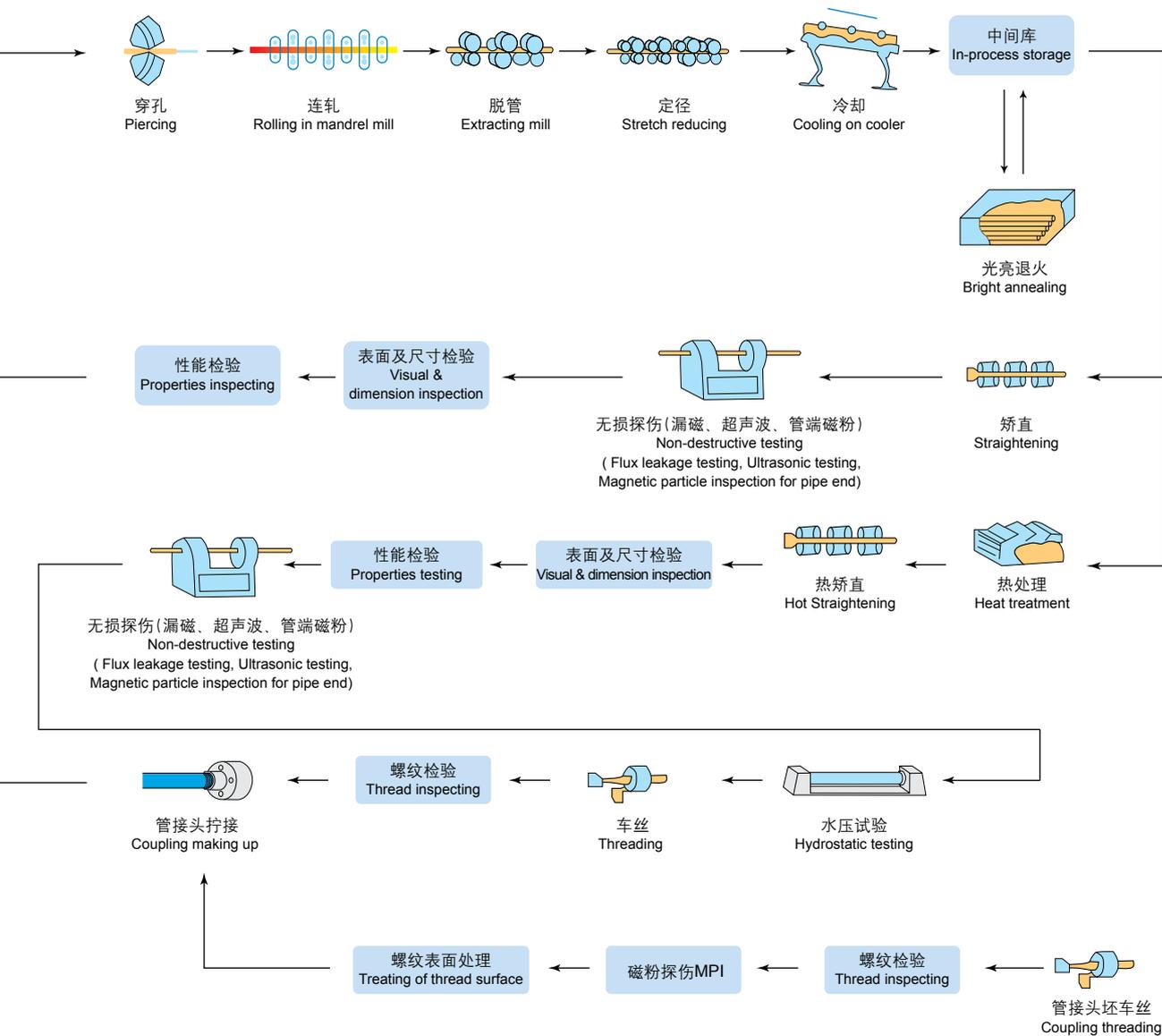
The company boasts the talented technical force and the state-of-art laboratory equipment. In addition, it enjoys the support of Baosteel R&D center for fulfilling hydrostatic pressure explosion test, H2S stress corrosion test and DWTT. And this helps laying a sound foundation for manufacturing tube as per international standards.



# PROCESS FLOW CHART

## 工艺流程





# RANGE AND FEATURES OF THE PRODUCT

## 产品范围及特色

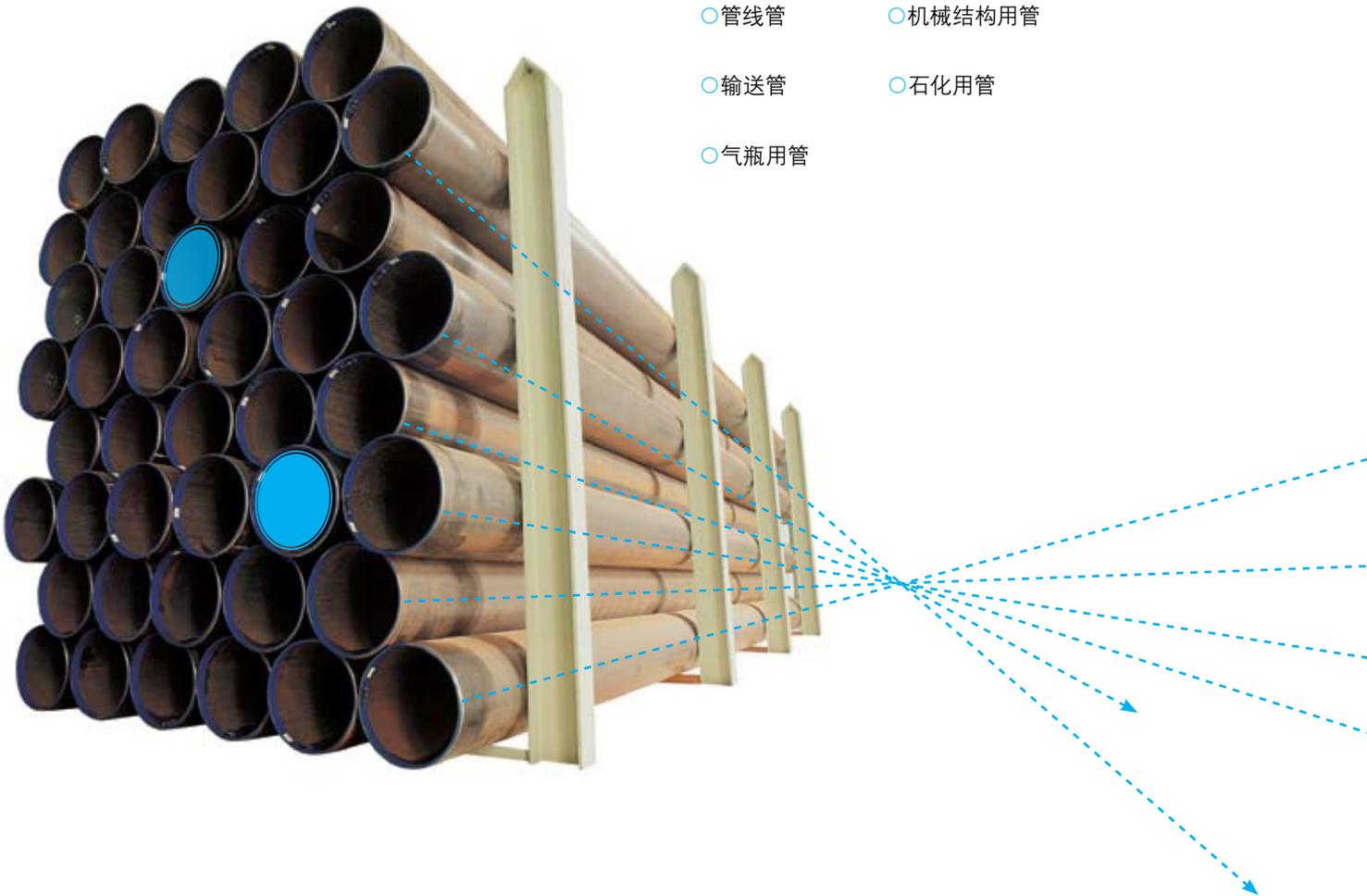


产品为热轧无缝钢管。

产品钢质纯净，成分均匀稳定，表面质量好，几何尺寸精度高，综合力学性能及工艺性能优良。

产品外径为  $\phi 177.8 \sim 457$  mm，壁厚为 6.1~55mm( 不锈钢 max 40mm)，品种有：

- 套管
- 高压锅炉管
- 管线管
- 机械结构用管
- 输送管
- 石化用管
- 气瓶用管



The Products are Hot-rolled Seamless Steel Tube & pipe.

The Products are made of pure steel with uniform and stable composition, featuring high surface quality, precise geometric dimension, excellent comprehensive mechanical and process performance.

The Range of the Product dimension:

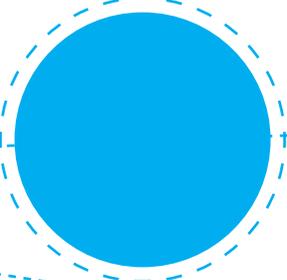
Outside Diameter: 177.8mm - 457mm

Wall thickness: 6.1mm - 55mm

(Max.40mm for stainless steel product)

The Products include:

- Casing
- Line Pipe
- Fluid Conveying Pipe
- Steel Pipe for Gas Cylinder
- High Pressure Boilers Tube & Pipe
- Mechanics And Structure Tube
- Steel Pipes for Petrochemical Industry





## API 套管 API Casing

○标准 Standard:

API SPEC 5CT、API SPEC 5B

○用途 Uses:

套管用作油气井的井壁。

Casing serves as wall of a well.

○长度 Lengths:

	范围1/Range 1	范围2/Range 2	范围3/Range 3
套管/Casing	4.88~7.62	7.62~10.36	10.36~14.63

○规格 Size:

代号 <sup>a</sup> Labels		外径 Outside diameter		壁厚 Wall thickness		端部加工形式 / Type of end-finish					
						钢级 / Grade					
1	2	英寸 in	毫米 mm	英寸 in	毫米 mm	J55/K55	L80	N80-1/Q	C90	P110	Q125
7	20.00	7.000	177.80	0.272	6.91	PS	—	—	—	—	—
7	23.00	7.000	177.80	0.317	8.05	PSLB	PLB	PLB	PLB	—	—
7	26.00	7.000	177.80	0.362	9.19	PSLB	PLB	PLB	PLB	PLB	—
7	29.00	7.000	177.80	0.408	10.36	—	PLB	PLB	PLB	PLB	—
7	32.00	7.000	177.80	0.453	11.51	—	PLB	PLB	PLB	PLB	—
7	35.00	7.000	177.80	0.498	12.65	—	PLB	PLB	PLB	PLB	PLB
7	38.00	7.000	177.80	0.540	13.72	—	PLB	PLB	PLB	PLB	PLB
7-5/8	26.40	7.625	193.68	0.328	8.33	PSLB	PLB	PLB	PLB	—	—
7-5/8	29.70	7.625	193.68	0.375	9.52	—	PLB	PLB	PLB	PLB	—
7-5/8	33.70	7.625	193.68	0.430	10.92	—	PLB	PLB	PLB	PLB	—
7-5/8	39.00	7.625	193.68	0.500	12.70	—	PLB	PLB	PLB	PLB	PLB
7-5/8	42.80	7.625	193.68	0.562	14.27	—	PLB	PLB	PLB	PLB	PLB
7-5/8	45.30	7.625	193.68	0.595	15.11	—	PLB	PLB	PLB	PLB	PLB
7-5/8	47.10	7.625	193.68	0.625	15.88	—	PLB	PLB	PLB	PLB	PLB

代号 <sup>a</sup> Labels		外径 Outside diameter		壁厚 Wall thickness		端部加工形式 / Type of end-finish					
						钢级 / Grade					
1	2	英寸 in	毫米 mm	英寸 in	毫米 mm	J55/K55	L80	N80-1/Q	C90	P110	Q125
8-5/8	24.00	8.625	219.08	0.264	6.71	PS	—	—	—	—	—
8-5/8	32.00	8.625	219.08	0.352	8.94	PSLB	—	—	—	—	—
8-5/8	36.00	8.625	219.08	0.400	10.16	PSLB	PLB	PLB	PLB	PLB	—
8-5/8	40.00	8.625	219.08	0.450	11.43	—	PLB	PLB	PLB	PLB	—
8-5/8	44.00	8.625	219.08	0.500	12.70	—	PLB	PLB	PLB	PLB	—
8-5/8	49.00	8.625	219.08	0.557	14.15	—	PLB	PLB	PLB	PLB	PLB
9-5/8	36.00	9.625	244.48	0.352	8.94	PSLB	—	—	—	—	—
9-5/8	40.00	9.625	244.48	0.395	10.03	PSLB	—	PLB	PLB	—	—
9-5/8	43.50	9.625	244.48	0.435	11.05	—	PLB	PLB	PLB	PLB	—
9-5/8	47.00	9.625	244.48	0.472	11.99	—	PLB	PLB	PLB	PLB	PLB
9-5/8	53.50	9.625	244.48	0.545	13.84	—	PLB	PLB	PLB	PLB	PLB
9-5/8	58.40	9.625	244.48	0.595	15.11	—	PLB	PLB	PLB	PLB	PLB
10-3/4	40.50	10.750	273.05	0.350	8.89	PSB	—	—	—	—	—
10-3/4	45.50	10.750	273.05	0.400	10.16	PSB	—	—	—	—	—
10-3/4	51.00	10.750	273.05	0.450	11.43	PSB	PSB	PSB	PSB	PSB	—
10-3/4	55.50	10.750	273.05	0.495	12.57	—	PSB	PSB	PSB	PSB	—
10-3/4	60.70	10.750	273.05	0.545	13.84	—	—	—	PSB	PSB	PSB
10-3/4	65.70	10.750	273.05	0.595	15.11	—	—	—	PSB	PSB	PSB
11-3/4	47.00	11.750	298.45	0.375	9.53	PSB	—	—	—	—	—
11-3/4	54.00	11.750	298.45	0.435	11.05	PSB	—	—	—	—	—
11-3/4	60.00	11.750	298.45	0.489	12.42	PSB	PSB	PSB	PSB	PSB	PSB
11-3/4	65.00	11.750	298.45	0.534	13.56	—	P	P	P	P	P
11-3/4	71.00	11.750	298.45	0.582	14.78	—	P	P	P	P	P
13-3/8	54.50	13.375	339.72	0.380	9.65	PSB	—	—	—	—	—
13-3/8	61.00	13.375	339.72	0.430	10.92	PSB	—	—	—	—	—
13-3/8	68.00	13.375	339.72	0.480	12.19	PSB	PSB	PSB	PSB	PSB	—
13-3/8	72.00	13.375	339.72	0.514	13.06	—	PSB	PSB	PSB	PSB	PSB

注：a：供订货时参考；

P—平端光管 (P),S—短圆螺纹 (STC),L—长圆螺纹 (LC),B—偏梯形螺纹 (BC)；

Note: a-reference for ordering,

P-Plain-end;S-Short round thread;L-Long round thread;B-Buttress thread.

## ○化学成分 Chemical Composition(%):

钢级 Grade	化学成分 / Chemical Composition												
	C		Mn		Mo		Cr		Ni	Cu	P	S	Si
	min	max	min	max	min	max	min	max	max	max	max	max	max
J55	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
K55	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
N80-1	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
N80-Q	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
L80-1	-	0.43	-	1.9	-	-	-	-	0.25	0.35	0.030	0.030	0.45
C90-1	-	0.35	-	1.20	0.25	0.85	-	1.50	0.99	-	0.020	0.010	-
C90-2	-	0.50	-	1.90	-	NL	-	NL	0.99	-	0.030	0.010	-
BG80S(SS)	-	0.35	-	1.20	0.05	0.5	0.05	0.8	-	-	0.015	0.005	0.5
BG90S(SS)	-	0.35	-	1.20	0.05	0.8	0.05	1.0	-	-	0.015	0.005	0.5
BG95S(SS)	-	0.35	-	1.20	0.05	1.0	0.05	1.2	-	-	0.015	0.005	0.5
BG110S(SS)	-	0.35	-	1.20	0.05	1.2	0.05	1.6	-	-	0.015	0.005	0.5
P110	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
BG110T	-	-	-	-	-	-	-	-	-	-	0.030	0.030	-
BG100H	-	0.30	-	1.50	-	-	-	1.2	-	-	0.030	0.030	-
BG110H	-	0.30	-	1.50	-	-	-	1.2	-	-	0.030	0.030	-
Q125-1	-	0.35	-	1.35	-	-	-	1.50	0.99	-	0.020	0.010	-
Q125-2	-	0.35	-	1.00	-	-	-	-	0.99	-	0.020	0.020	-
Q125-3	-	0.50	-	1.90	-	-	-	-	0.99	-	0.030	0.010	-
Q125-4	-	0.50	-	1.90	-	-	-	-	0.99	-	0.030	0.020	-
BG125TH	-	0.32	-	1.50	-	-	-	1.20	-	-	0.030	0.030	-
BG140	-	0.28	-	-	-	1.8	-	-	-	-	0.020	0.015	0.32

注：经协商也可供应其它牌号的钢管。

Note: Grades other than the a.m. chart can be made available through consultations.



○机械性能 Mechanical Properties:

钢级 Grade	屈服强度 Yield strength		抗拉强度 Tehsile strength	硬度 Hardness		规定壁厚 Specified wall thickness	允许硬度变化 Allowable hardness variation
	最低/min	最高/max	最低/min	最高/max			
	MPa	MPa	MPa	HRC	HBW		
J55	379	552	517	-	-	-	-
K55	379	552	655	-	-	-	-
N80-1	552	758	689	-	-	-	-
N80-Q	552	758	689	-	-	-	-
L80-1	552	655	655	23	241	-	-
C90	621	724	689	25.4	255	≤12.70	3.0
C90	621	724	689	25.4	255	12.71~19.04	4.0
C90	621	724	689	25.4	255	19.05~23.59	5.0
C90	621	724	689	25.4	255	≥25.40	6.0
BG80S(SS)	552	655	655	23	241	-	-
BG90S(SS)	621	724	689	25.4	255	-	-
BG95S(SS)	655	758	724	25.4	255		
BG110S(SS)	758	862	800	30	285		
P110	758	965	862	-	-	-	-
BG110T	758	965	862	-	-	-	-
BG110H	758	965	862	-	-	-	-
Q125	862	1034	931	-	-	≤12.70	3.0
Q125	862	1034	931	-	-	12.71~19.04	4.0
Q125	862	1034	931	-	-	≥19.05	5.0
BG125TH	862	1034	931	-	-	-	-
BG140	965	1172	1034	-	-	-	-



○标准 Standard:

API SPEC 5L

○用途 Uses:

用于石油、天然气工业中的气、水、油输送。

For conveying gas,water,and oil in both the oil and natural gas industries

○化学成分 Chemical Composition(%):

标准 Standard	钢级 Grade	C	Si	Mn	P	S	V	Nb	Ti
		max	max	max	max	max	max	max	max
API SPEC 5L	PSL1								
	L210/A	0.22	-	0.90	0.030	0.030	-	-	-
	L245/B	0.28	-	1.20	0.030	0.030	a,b	a,b	b
	L290/X42	0.28	-	1.30	0.030	0.030	b	b	b
	L320/X46,L360/X52,L390/X56	0.28	-	1.40	0.030	0.030	b	b	b
	L415/X60	0.28	-	1.40	0.030	0.030	c	c	c
	L450/X65,X70	0.28	-	1.40	0.030	0.030	c	c	c
	PSL2								
	L245R/BR,L245N/BN	0.24	0.40	1.20	0.025	0.015	a	a	0.04
	L290R/X42R, L290N/X42N	0.24	0.40	1.20	0.025	0.015	0.06	0.05	0.04
	L290Q/X42Q	0.18	0.45	1.40	0.025	0.015	0.05	0.05	0.04
	L320N/X46N	0.24	0.40	1.40	0.025	0.015	0.07	0.05	0.04
	L320Q/X46Q	0.18	0.45	1.40	0.025	0.015	0.05	0.05	0.04
	L360N/X52N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04
	L360Q/X52Q	0.18	0.45	1.50	0.025	0.015	0.05	0.05	0.04
	L390N/X56N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04
	L390Q/X56Q	0.18	0.45	1.50	0.025	0.015	0.07	0.05	0.04
	L415N/X60N	0.24	0.45	1.40	0.025	0.015	0.10	0.05	0.04
	L415Q/X60Q	0.18	0.45	1.70	0.025	0.015	c	c	c
	L450Q/X65Q	0.18	0.45	1.70	0.025	0.015	c	c	c
L485Q/X70Q	0.18	0.45	1.80	0.025	0.015	c	c	c	
L555Q/X80Q	0.18	0.45	1.90	0.025	0.015	c	c	c	

注：a. 除另有协议外，铌含量和钒含量之和应 $\leq 0.06\%$ 。

b. 铌含量、钒含量和钛含量之和应 $\leq 0.15\%$ 。

c. 除另有协议外，铌含量、钒含量和钛含量之和应 $\leq 0.15\%$ 。

Note: a Unless otherwise agreed,the sum of the niobium and vanadium contents shall be  $\leq 0.06\%$ .

b The sum of the niobium,vanadium and titanium concentrations shall be  $\leq 0.15\%$ .

c Unless otherwise agreed, the sum of the niobium,vanadium and titanium concentrations shall be  $0.15\%$ .



○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	屈服强度 Yield strength		抗拉强度 Tensile strength		延伸率 Elongation (%)
		MPa		MPa		
API SPEC 5L	PSL1					
	L210/A	≥210		≥335		查API SPEC 5L 表6和表7 See table 6 and table 7 of API SPEC 5L
	L245/B	≥245		≥415		
	L290/X42	≥290		≥415		
	L320/X46	≥320		≥435		
	L360/X52	≥360		≥460		
	L390/X56	≥390		≥490		
	L415/X60	≥415		≥520		
	L450/X65	≥450		≥535		
	L485/X70	≥485		≥570		
	PSL2					
			min	max	min	max
	L245N/BN		245	450	415	760
	L290R/X42R,L290N/X42N,L290Q/X42Q		290	495	415	760
	L320N/X46N,L320Q/X46Q		320	525	435	760
	L360N/X52N,L360Q/X52Q		360	530	460	760
	L390N/X56N,L390Q/X56Q		390	545	490	760
	L415N/X60N,L415Q/X60Q		415	565	520	760
	L450Q/X65Q		450	600	535	760
	L485Q/X70Q		485	635	570	760
L555Q/X80Q		555	705	625	825	

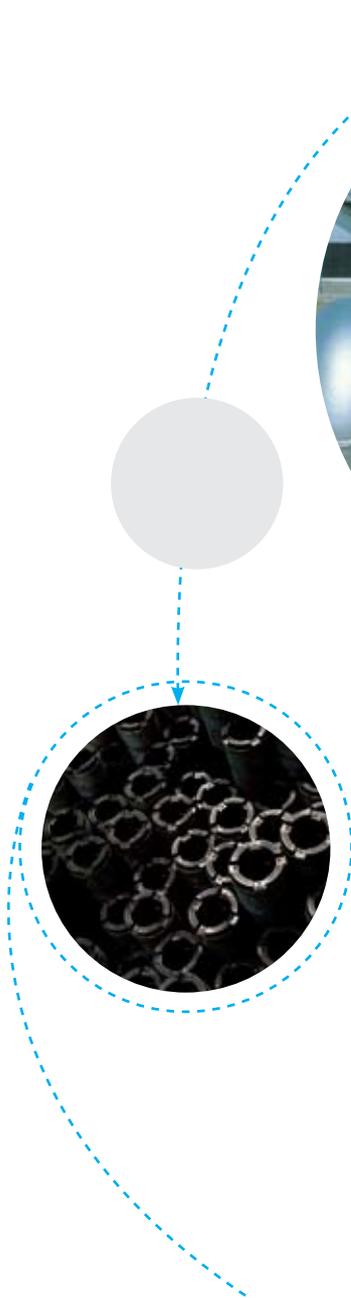
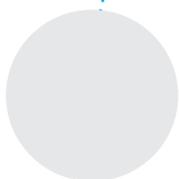
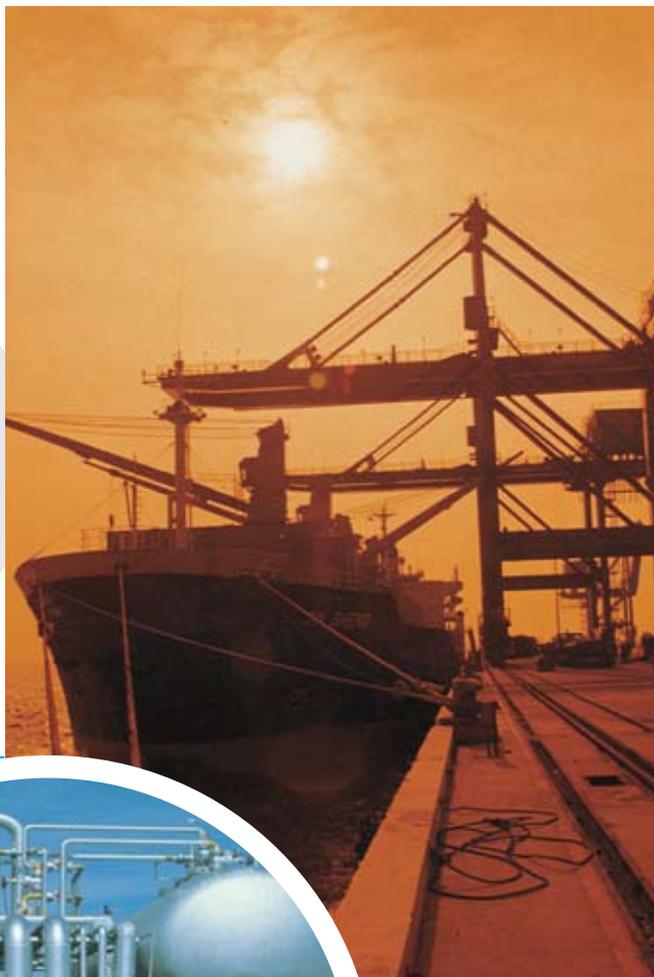
○规格 Size:

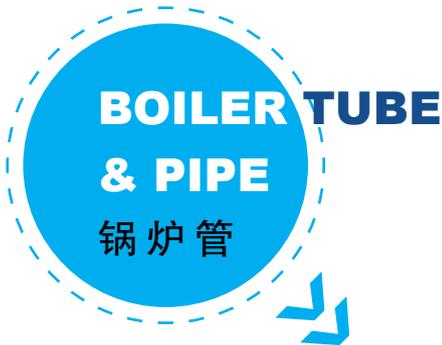
名义尺寸 NPS	外径 Outside diameter		壁厚 Wall thickness		平端单位长度重量 Plain-end weight
	inch	mm	inch	mm	lb/ft
8-5/8	8.625	219.1	0.277	7.04	24.72
	8.625	219.1	0.312	7.92	27.73
	8.625	219.1	0.322	8.18	28.58
	8.625	219.1	0.344	8.74	30.45
	8.625	219.1	0.375	9.53	33.07
	8.625	219.1	0.438	11.13	38.33
	8.625	219.1	0.500	12.70	43.43
	8.625	219.1	0.562	14.27	48.44
	8.625	219.1	0.625	15.88	53.45
	8.625	219.1	0.719	18.26	60.77
	8.625	219.1	0.750	19.05	63.14
	8.625	219.1	0.812	20.62	67.82
	8.625	219.1	0.875	22.23	72.49
	8.625	219.1	1.000	25.40	81.51
10-3/4	10.750	273.1	0.250	6.35	28.06
	10.750	273.1	0.279	7.09	31.23
	10.750	273.1	0.307	7.80	34.27
	10.750	273.1	0.344	8.74	38.27
	10.750	273.1	0.365	9.27	40.52
	10.750	273.1	0.438	11.13	48.28
	10.750	273.1	0.500	12.70	54.79
	10.750	273.1	0.562	14.27	61.21
	10.750	273.1	0.625	15.88	67.65
	10.750	273.1	0.719	18.26	77.1
	10.750	273.1	0.812	20.62	86.26
	10.750	273.1	0.875	22.23	92.37
	10.750	273.1	0.938	23.83	98.39
	10.750	273.1	1.000	25.40	104.23
10.750	273.1	1.250	31.75	126.94	

名义尺寸 NPS	外径 Outside diameter		壁厚 Wall thickness		平端单位长度重量 Plain-end weight	
	inch	mm	inch	mm	lb/ft	
12-3/4	12.750	323.9	0.312	7.92	41.48	
	12.750	323.9	0.330	8.38	43.81	
	12.750	323.9	0.344	8.74	45.62	
	12.750	323.9	0.375	9.53	49.61	
	12.750	323.9	0.406	10.31	53.57	
	12.750	323.9	0.438	11.13	57.65	
	12.750	323.9	0.500	12.70	65.48	
	12.750	323.9	0.562	14.27	73.22	
	12.750	323.9	0.625	15.88	81.01	
	12.750	323.9	0.688	17.48	88.71	
	12.750	323.9	0.750	19.05	96.21	
	12.750	323.9	0.812	20.62	103.63	
	12.750	323.9	0.875	22.23	111.08	
	12.750	323.9	0.938	23.83	118.44	
	12.750	323.9	1.000	25.40	125.61	
	12.750	323.9	1.062	26.97	132.69	
	14	14.000	355.6	0.312	7.92	45.65
		14.000	355.6	0.344	8.74	50.22
14.000		355.6	0.375	9.53	54.62	
14.000		355.6	0.406	10.31	59	
14.000		355.6	0.438	11.13	63.5	
14.000		355.6	0.469	11.91	67.84	
14.000		355.6	0.500	12.70	72.16	
14.000		355.6	0.562	14.27	80.73	
14.000		355.6	0.625	15.88	89.36	
14.000		355.6	0.688	17.48	97.91	
14.000		355.6	0.750	19.05	106.23	
14.000		355.6	0.812	20.62	114.48	
14.000		355.6	0.875	22.23	122.77	
14.000		355.6	0.938	23.83	130.98	
14.000		355.6	1.000	25.40	138.97	
14.000		355.6	1.062	26.97	146.88	
14.000		355.6	1.125	28.58	154.84	
14.000		355.6	1.250		170.37	

○规格 Size:

名义尺寸 NPS	外径 Outside diameter		壁厚 Wall thickness		平端单位长度重量 Plain-end weight
	inch	mm	inch	mm	lb/ft
16	16.000	406.4	0.406	10.31	67.68
	16.000	406.4	0.438	11.13	72.86
	16.000	406.4	0.469	11.91	77.87
	16.000	406.4	0.500	12.70	82.85
	16.000	406.4	0.562	14.27	92.75
	16.000	406.4	0.625	15.88	102.72
	16.000	406.4	0.688	17.48	112.62
	16.000	406.4	0.750	19.05	122.27
	16.000	406.4	0.812	20.62	131.84
	16.000	406.4	0.875	22.23	141.48
	16.000	406.4	0.938	23.83	151.03
	16.000	406.4	1.000	25.40	160.35
	16.000	406.4	1.062	26.97	169.59
	16.000	406.4	1.125	28.58	178.89
	16.000	406.4	1.188	30.18	188.11
16.000	406.4	1.250	31.75	197.1	
18	18.000	457.2	0.375	9.53	70.65
	18.000	457.2	0.406	10.31	76.36
	18.000	457.2	0.438	11.13	82.23
	18.000	457.2	0.469	11.91	87.89
	18.000	457.2	0.500	12.70	93.54
	18.000	457.2	0.562	14.27	104.76
	18.000	457.2	0.625	15.88	116.09
	18.000	457.2	0.688	17.48	127.32
	18.000	457.2	0.750	19.05	138.3
	18.000	457.2	0.812	20.62	149.2
	18.000	457.2	0.875	22.23	160.18
	18.000	457.2	0.938	23.83	171.08
	18.000	457.2	1.000	25.40	181.73
	18.000	457.2	1.062	26.97	192.29
	18.000	457.2	1.125	28.58	202.94
18.000	457.2	1.188	30.18	213.51	
18.000	457.2	1.250	31.75	223.82	





○标准 Standard:

美国机械工程师协会标准 /American Society of Mechanical Engineers  
 ASME SA-106、ASME SA-335、ASME SA-312  
 美国材料试验协会标准 /American Society for Testing and Materials  
 ASTM A 335、ASTM A 312  
 欧盟标准 /European Standard  
 EN 10216-2  
 中国国家标准 /China National Standard  
 GB 3087、GB 5310

○用途 Uses:

用于蒸汽锅炉、管道用无缝钢管  
 For manufacture steam boilers and steam pipeline of boilers.

○机械性能 Mechanical Properties:

标准 Standard	钢种 Grade	抗拉强度 (MPa) Tensile strength	屈服强度 (MPa) Yield strength			延伸率 (%) 不小于 Elongation not less than	冲击功 (J) 不小于 Impact energy not less than
			S≤16mm	16mm<S≤40	40mm<S≤55		
GB3087	10	335~475	≥205	≥195	≥195	24	
	20	410~550	≥245	≥235	≥235	20	
EN 10216-2	13CrMo4-5	440~590	≥290	≥290	≥280	L22 T20	L40 T27
	P195GH	320~440	≥195	-	-	L27 T25	L40 T27
	P235GH	360~500	≥235	≥225	≥215	L25 T23	L40 T27
	P265GH	410~570	≥265	≥255	≥245	L23 T21	L40 T27
	16Mo3	450~600	≥280	≥270	≥260	L22 T20	L40 T27
	10CrMo9-10	480~630	≥280	≥280	≥270	L22 T20	L40 T27
	15NiCuMoNb5-6-4	610~780	≥440	≥440	≥440	L19 T17	L40 T27
X10CrMoVNb9-1	630~830	≥450	≥450	≥450	L19 T17	L40 T27	
GB5310	20G	410~550	≥245	≥245	≥245	L24 T22	L40 T27
	12CrMoG	410~560	≥205	≥205	≥245	L21 T19	L40 T27
	12Cr1MoVG	470~640	≥255	≥255	≥245	L21 T19	L40 T27
	12Cr2MoG	450~600	≥280	≥280	≥245	L22 T20	L40 T27
	15CrMoG	440~640	≥255	≥255	≥245	L21 T19	L40 T27
07Cr2MoW2VNbB	≥510	≥400	≥400	≥245	L22 T18	L40 T27	
ASME SA-106	SA106B	≥415	≥240	≥240	≥240	625000A <sup>0.2</sup> /U <sup>0.9</sup>	
	SA106C	≥485	≥275	≥275	≥275	625000A <sup>0.2</sup> /U <sup>0.9</sup>	
ASME SA335	P11	≥415	≥205	≥205	≥205	查标准中表3 See table 3 of ASME SA335	
	P12	≥415	≥220	≥220	≥220		
	P22	≥415	≥205	≥205	≥205		
	P91	≥585	≥415	≥415	≥415		
P92	≥620	≥440	≥440	≥440			
ASME SA-312	TP304	≥515	≥205	≥205		L35 T25	
	TP316L	≥485	≥170	≥170		L35 T25	
	TP321	≥485	≥170	≥170		L35 T25	



○化学成分 Chemical Composition(%):

标准 Standard	钢种 Grade	C	Si	Mn	P≤	S≤	Cr	Ni	Cu	Mo	V
GB3087	10	0.07~0.13	0.17~0.37	0.35~0.65	0.035	0.035	≤0.15	≤0.30	≤0.25	-	-
	20	0.17~0.23	0.17~0.37	0.35~0.65	0.035	0.035	≤0.25	≤0.30	≤0.25	-	-
EN 10216-2	13CrMo4-5	0.10~0.17	≤0.35	0.40~0.70	0.025	0.020	0.70~1.15	-	≤0.30	0.40~0.60	-
	P195GH	≤0.13	≤0.35	≤0.70	0.025	0.020	≤0.30	≤0.30	≤0.30	≤0.08	≤0.02
	P235GH	≤0.16	≤0.35	≤1.20	0.025	0.020	≤0.30	≤0.30	≤0.30	≤0.08	≤0.02
	P265GH	≤0.20	≤0.40	≤1.40	0.025	0.020	≤0.30	≤0.30	≤0.30	≤0.08	≤0.02
	16Mo3	0.12~0.20	≤0.35	0.40~0.90	0.025	0.020	≤0.30	≤0.30	≤0.30	0.25~0.35	-
	10CrMo9-10	0.08~0.14	≤0.50	0.30~0.70	0.025	0.020	2.00~2.50	≤0.30	≤0.30	0.90~1.10	-
	15NiCuMoNb5-6-4	≤0.17	0.25~0.50	0.80~1.20	0.025	0.020	≤0.30	1.00~1.30	0.50~0.80	0.25~0.50	-
	X10CrMoVNb9-1	0.08~0.12	0.25~0.50	0.30~0.60	0.020	0.010	8.00~9.50	≤0.40	≤0.30	0.85~1.05	0.18~0.25
GB5310	20G	0.17~0.23	0.17~0.37	0.35~0.65	0.025	0.015	-	-	-	-	-
	12CrMoG	0.08~0.15	0.17~0.37	0.40~0.70	0.025	0.015	-	-	-	-	-
	12Cr2MoG	0.08~0.15	≤0.50	0.40~0.60	0.025	0.015	2.0~2.5	-	-	0.90~1.13	-
	12Cr1MoVG	0.08~0.15	0.17~0.37	0.40~0.70	0.025	0.010	0.9~1.2	-	-	0.25~0.35	0.15~0.30
	15CrMoG	0.12~0.20	0.17~0.37	0.40~0.70	0.025	0.015	0.8~1.1	-	-	0.40~0.55	-
	07Cr2MoW2VNbB	0.04~0.10	≤0.50	0.10~0.60	0.025	0.010	1.90~2.60	-	-	0.05~0.30	0.20~0.30
ASME SA-106	SA106B	≤0.30	>0.1	0.29~1.06	0.035	0.035	≤0.40	≤0.40	≤0.40	≤0.15	≤0.08
	SA106C	≤0.35	>0.1	0.29~1.06	0.035	0.035	≤0.40	≤0.40	≤0.40	≤0.15	≤0.08
ASME SA335	P11	0.05~0.15	0.50~1.00	0.30~0.60	0.025	0.025	1.00~1.50	-	-	0.44~0.65	-
	P12	0.05~0.15	≤0.50	0.30~0.61	0.025	0.025	0.80~1.25	-	-	0.44~0.65	-
	P22	0.05~0.15	≤0.50	0.30~0.60	0.025	0.025	1.90~2.60	-	-	0.87~1.13	-
	P91	0.08~0.12	0.20~0.50	0.30~0.60	0.020	0.010	8.00~9.50	≤0.40	-	0.85~1.05	-
	P92	0.07~0.13	≤0.50	0.30~0.60	0.020	0.010	8.50~9.50	≤0.40	-	0.30~0.60	-
ASME SA-312	TP304	0.08	1.00	2.00	0.045	0.030	18.0~20.0	8.0~11.0	-	-	-
	TP316L	0.035	1.00	2.00	0.045	0.030	16.0~18.0	10.0~14.0	-	2.00~3.00	-
	TP321	0.08	1.00	2.00	0.045	0.030	17.0~19.0	9.0~12.0	-	-	-

注：经协商也可供应其它牌号的钢管。

Note :Grades other than the a.m. chart can be made available through consultations.

○规格表 :GB 规格系列 Size:Range.GB

注 : 经协商也可提供其它规格的钢管。

Note: Other size can also be provided after consulting with customers.

外径 /mm	壁厚/mm															
	6.5	7	7.5	8	8.5	9.0	9.5	10	11	12	13	14	15	16	17	18
单位长度理论重量/(kg/m)																
219.1		36.6	39.12	41.63	44.13	46.61	49.08	51.54	56.43	61.26	66.04	70.78	75.46	80.10	84.69	89.23
245 (244.5)	38.23	41.09	43.93	46.76	49.58	52.38	55.17	57.95	63.48	68.95	74.38	79.76	85.08	90.36	95.59	100.77
273	42.72	45.92	49.11	52.28	55.45	58.60	61.73	64.86	71.07	77.24	83.36	89.42	95.44	101.41	107.33	113.2
299 (299.5)				57.41	60.90	64.37	67.83	71.27	78.13	84.93	91.69	98.40	105.06	111.67	118.23	124.74
325				62.54	66.35	70.14	73.92	77.68	85.18	92.63	100.03	107.38	114.68	121.93	129.13	136.28
340 (339.7)				65.50	69.49	73.47	77.43	81.38	89.25	97.05	104.84	112.56	120.23	127.85	135.42	142.94
351				67.67	71.80	75.91	80.01	84.10	92.23	100.32	108.36	116.35	124.29	132.19	140.03	147.82
356 (355.6)			64.46	68.65	72.84	77.02	81.18	85.33	93.59	101.8	109.97	118.08	126.14	134.16	142.12	150.04
377								90.51	99.29	108.02	116.70	125.33	133.91	142.45	150.93	159.36
406								97.66	107.15	116.6	126	135.34	144.64	153.89	163.09	172.24
426							97.58	102.59	112.58	122.52	132.41	142.25	152.04	161.78	171.47	181.11
457							104.84	110.24	120.99	131.69	142.35	152.95	163.51	174.01	184.47	194.88



	19	20	22	24	25	26	28	30	32	34	36	38	40	42	45	48	50	55
	93.71	98.15	106.88	115.42	119.61	123.75	131.89	139.83										
	105.90	110.98	120.99	130.80	135.64	140.42	149.84	159.07	168.09	176.92	185.55							
	119.02	124.79	136.18	147.38	152.9	158.38	169.18	179.78	190.19	200.4	210.41	220.23	229.85					
	131.20	137.61	150.29	162.77	168.93	175.05	187.13	199.02	210.71	222.20	233.50	244.59	255.49	266.20	281.88	297.12	307.04	
	173.38	150.44	164.39	178.16	184.96	191.72	205.09	218.25	231.23	244	256.58	268.96	281.14	293.13	310.74	327.9	339.1	
	150.41	157.83	172.53	187.03	194.21	201.34	215.44	229.35	243.06	256.58	269.90	283.02	295.94	308.66	327.38	345.66	357.59	
	155.57	163.26	178.50	193.54	200.99	208.39	223.04	237.49	251.75	265.80	279.66	293.32	306.79	320.06	339.59	358.68	371.16	
	157.91	165.73	181.21	196.5	204.07	211.6	226.49	241.19	255.69	269.99	284.1	298.01	311.72	325.24	345.14	364.6	377.32	
	167.75	176.08	192.61	208.93	217.02	225.06	240.99	256.73	272.26	287.60	302.75	317.69	332.44	346.99	368.44	389.46	403.22	
	181.34	190.39	208.34	226.1	234.9	243.66	261.02	278.18	295.15	311.92	328.49	344.87	361.05	377.03	400.63	423.78	438.98	
	190.71	200.25	219.19	237.93	247.23	256.48	274.83	292.98	310.93	328.69	346.25	363.61	380.77	397.74	422.82	447.46	463.64	
	205.23	215.54	236.01	256.28	266.34	276.36	296.23	315.91	335.4	354.68	373.77	392.66	411.35	429.85	457.23	484.16	501.86	545.27



○标准 Standard:

GB/T 8162	China National Standard
DIN 1629	Deutsche Industrie Normen
EN 10210-1	European Standard

○用途 Uses:

用于制造管道、容器、设备、管件及钢结构

For manufacture of pipelines, Vessels, equipment, pipe fittings and steel structures.

○化学成分 Chemical Composition(%):

标准 Standard	牌号 Grade	C	Si	Mn	P≤	S≤	Cr≤	Ni≤	Cu≤	V
GB/T8162	10	0.07~0.13	0.17~0.37	0.35~0.65	0.035	0.035	0.15	0.30	0.25	-
	20	0.17~0.23	0.17~0.37	0.35~0.65	0.035	0.035	0.25	0.30	0.25	-
	35	0.32~0.39	0.17~0.37	0.50~0.80	0.035	0.035	0.25	0.30	0.25	-
	45	0.42~0.50	0.17~0.37	0.50~0.80	0.035	0.035	0.25	0.30	0.25	-
	Q345A	≤0.20	≤0.55	1.00~1.60	0.035	0.035	0.30	0.30	0.30	-
	Q345B	≤0.20	≤0.55	1.00~1.60	0.035	0.035	0.30	0.30	0.30	-
	Q345C	≤0.20	≤0.55	1.00~1.60	0.025	0.025	0.30	0.30	0.30	0.02~0.15
	Q345D	≤0.18	≤0.55	1.00~1.60	0.025	0.025	0.30	0.30	0.30	0.02~0.15
	Q345E	≤0.18	≤0.55	1.00~1.60	0.025	0.025	0.30	0.30	0.30	0.02~0.15
DIN 1629	St37.0	≤0.17	0.17~0.37	0.35~0.65	0.025	0.025	0.25	0.25	0.25	-
	St44.0	≤0.21	0.17~0.37	0.50~0.80	0.025	0.025	0.25	0.25	0.25	-
	St55	0.33~0.41	0.17~0.37	0.50~0.80	0.025	0.025	0.25	0.25	0.25	-
	St52.0	≤0.22	≤0.55	≤1.60	0.025	0.025	0.25	0.25	0.25	-
	Ck45	0.42~0.50	0.17~0.37	0.50~0.80	0.025	0.025	0.25	0.25	0.25	-
EN 10210-1	S355	≤0.22	≤0.55	≤1.60	0.025	0.025	0.25	0.25	0.25	-

注：经协商也可提供其它牌号的钢管。

Note: Other grade can also be provided after consulting with customers.



○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	抗拉强度 (MPa) 不小于 Tensile strength not less than	屈服强度 (MPa) 不小于 Yield strength not less than			延伸率 (%) 不小于 Elongation not less than	冲击功 (J) 不小于 Impact energy not less than
			S≤16mm	S > 16~30mm	S > 30mm		
GB/T 8162	10	335	205	195	185	24	
	20	410	245	235	225	20	
	35	510	305	295	285	17	
	45	590	335	325	315	14	
	Q345A	470~630	345	325	295	20	-
	Q345B	470~630	345	325	295	20	20°C 34
	Q345C	470~630	345	325	295	21	0°C 34
	Q345D	470~630	345	325	295	21	-20°C 34
DIN 1629	St37.0	350~480	235	225 <sup>a</sup>	215 <sup>b</sup>	25	
	St44.0	420~550	275	265 <sup>a</sup>	255 <sup>b</sup>	21	
	St55	540~645	295	285 <sup>a</sup>	275 <sup>b</sup>	17	
	St52.0	500~650	355	345 <sup>a</sup>	335 <sup>b</sup>	21	
	Ck45	590~730	335	325 <sup>a</sup>	315 <sup>b</sup>	14	
EN 10210-1	S355	490~630	355	345	335	22	27

注 :a 壁厚范围为 16~40mm

b 壁厚范围为 40~65mm

Note:a wall thickness is 16~40mm

b wall thickness is 40~65mm

○规格表 :GB/T8162 规格系列 Size: Range acc. GB/T8162

注 : 经协商也可提供其它规格的钢管。

Note: Other size can also be provided after consulting with customers.

外径 /mm	壁厚/mm															
	6.5	7	7.5	8	8.5	9.0	9.5	10	11	12	13	14	15	16	17	18
	单位长度理论重量/(kg/m)															
219.1		36.6	39.12	41.63	44.13	46.61	49.08	51.54	56.43	61.26	66.04	70.78	75.46	80.10	84.69	89.23
245 (244.5)	38.23	41.09	43.93	46.76	49.58	52.38	55.17	57.95	63.48	68.95	74.38	79.76	85.08	90.36	95.59	100.77
273	42.72	45.92	49.11	52.28	55.45	58.60	61.73	64.86	71.07	77.24	83.36	89.42	95.44	101.41	107.33	113.2
299 (299.5)				57.41	60.90	64.37	67.83	71.27	78.13	84.93	91.69	98.40	105.06	111.67	118.23	124.74
325				62.54	66.35	70.14	73.92	77.68	85.18	92.63	100.03	107.38	114.68	121.93	129.13	136.28
340 (339.7)				65.50	69.49	73.47	77.43	81.38	89.25	97.05	104.84	112.56	120.23	127.85	135.42	142.94
351				67.67	71.80	75.91	80.01	84.10	92.23	100.32	108.36	116.35	124.29	132.19	140.03	147.82
356 (355.6)			64.46	68.65	72.84	77.02	81.18	85.33	93.59	101.8	109.97	118.08	126.14	134.16	142.12	150.04
377								90.51	99.29	108.02	116.70	125.33	133.91	142.45	150.93	159.36
406								97.66	107.15	116.6	126	135.34	144.64	153.89	163.09	172.24
426							97.58	102.59	112.58	122.52	132.41	142.25	152.04	161.78	171.47	181.11
457							104.84	110.24	120.99	131.69	142.35	152.95	163.51	174.01	184.47	194.88



	19	20	22	24	25	26	28	30	32	34	36	38	40	42	45	48	50	55
	93.71	98.15	106.88	115.42	119.61	123.75	131.89	139.83										
	105.90	110.98	120.99	130.80	135.64	140.42	149.84	159.07	168.09	176.92	185.55							
	119.02	124.79	136.18	147.38	152.9	158.38	169.18	179.78	190.19	200.4	210.41	220.23	229.85					
	131.20	137.61	150.29	162.77	168.93	175.05	187.13	199.02	210.71	222.20	233.50	244.59	255.49	266.20	281.88	297.12	307.04	
	173.38	150.44	164.39	178.16	184.96	191.72	205.09	218.25	231.23	244	256.58	268.96	281.14	293.13	310.74	327.9	339.1	
	150.41	157.83	172.53	187.03	194.21	201.34	215.44	229.35	243.06	256.58	269.90	283.02	295.94	308.66	327.38	345.66	357.59	
	155.57	163.26	178.50	193.54	200.99	208.39	223.04	237.49	251.75	265.80	279.66	293.32	306.79	320.06	339.59	358.68	371.16	
	157.91	165.73	181.21	196.5	204.07	211.6	226.49	241.19	255.69	269.99	284.1	298.01	311.72	325.24	345.14	364.6	377.32	
	167.75	176.08	192.61	208.93	217.02	225.06	240.99	256.73	272.26	287.60	302.75	317.69	332.44	346.99	368.44	389.46	403.22	
	181.34	190.39	208.34	226.1	234.9	243.66	261.02	278.18	295.15	311.92	328.49	344.87	361.05	377.03	400.63	423.78	438.98	
	190.71	200.25	219.19	237.93	247.23	256.48	274.83	292.98	310.93	328.69	346.25	363.61	380.77	397.74	422.82	447.46	463.64	
	205.23	215.54	236.01	256.28	266.34	276.36	296.23	315.91	335.4	354.68	373.77	392.66	411.35	429.85	457.23	484.16	501.86	545.27



○标准 Standard:

GB/T 8163 China National Standard  
 ASTM A106 Standard of American Society for Testing & Materials  
 ASTM A53 Standard of American Society for Testing & Materials

○用途 Uses:

石油、天然气输送以及其它流体、气体输送用无缝钢管。

For conveying oil, gas and other fluids and gas.

○化学成分 Chemical Composition(%):

标准 Standard	牌号 Grade	C	Si	Mn	P≤	S≤	Cr≤	Ni≤	Cu≤	Mo≤	V
GB/T8163	10	0.07-0.13	0.17-0.37	0.35-0.65	0.035	0.035	0.15	0.30	0.25		-
	20	0.17-0.23	0.17-0.37	0.35-0.65	0.035	0.035	0.25	0.30	0.25		-
	Q295A	≤0.16	≤0.55	0.80-1.50	0.035	0.035	0.30	0.30	0.30		-
	Q295B	≤0.16	≤0.55	0.80-1.50	0.035	0.035	0.30	0.30	0.30		-
	Q345A	≤0.20	≤0.55	1.00-1.60	0.035	0.035	0.30	0.30	0.30		-
	Q345B	≤0.20	≤0.55	1.00-1.60	0.035	0.035	0.30	0.30	0.30		-
	Q345C	≤0.20	≤0.55	1.00-1.60	0.025	0.025	0.30	0.30	0.30		0.02-0.15
	Q345D	≤0.18	≤0.55	1.00-1.60	0.025	0.025	0.30	0.30	0.30		0.02-0.15
	Q345E	≤0.18	≤0.55	1.00-1.60	0.025	0.025	0.30	0.30	0.30		0.02-0.15
ASTM A53	A	≤0.25	0.17~0.37	≤0.95	0.035	0.035	0.40	0.40	0.40	0.15	0.08
	B	≤0.30	0.17~0.37	≤1.20	0.035	0.035	0.40	0.40	0.40	0.15	0.08
ASTM A106	A	≤0.25	≥0.55	0.27~0.93	0.035	0.035	0.40	0.40	0.40	0.15	0.08
	B	≤0.30	≥0.55	0.29~1.06	0.035	0.035	0.40	0.40	0.40	0.15	0.08
	C	≤0.35	≥0.55	0.29~1.06	0.035	0.035	0.40	0.40	0.40	0.15	0.08

注：经协商也可提供其它牌号的钢管。

Note: Other grade can also be provided after consulting with customers.



○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	抗拉强度 (MPa) Tensile strength	屈服强度 (MPa) 不小于 Yield strength not less than			延伸率 (%) 不小于 Elongation not less than	冲击功 Impact energy	
			S≤16mm	S> 16~30mm	S> 30mm		温度 ℃	(J) not less than
GB/T 8162	10	335~475	205	195	185	24	-	-
	20	410~550	245	235	225	20	-	-
	Q295A	430~610	295	275	255	22	-	-
	Q295B	430~610	295	275	255	22	+20	34
	Q345A	470~630	345	325	295	20	-	-
	Q345B	470~630	345	325	295	20	+20	34
	Q345C	470~630	345	325	295	21	0	34
	Q345D	470~630	345	325	295	21	-20	34
	Q345E	470~630	345	325	295	21	-40	27
ASTM A53	A	≥330	205			查标准中表3 See table 3 of ASTM A53	-	-
	B	≥415	240				-	-
	A	≥330	205			查标准中表2 See table 2 of ASTM A106	-	-
	B	≥415	240				-	-
ASTM A106	C	≥485	275				-	-



○标准 Standard:

GB 18248 China National Standard

○用途 Uses:

气瓶制造

Manufacturing gas cylinder

○规格表 :GB 18248 规格系列 Size: Range acc. GB 18248

注: 经协商也可提供其它规格的钢管。

Note: Other size can also be provided after consulting with customers.

外径 /mm	壁厚/mm																
	6.5	7	7.5	8	8.5	9.0	9.5	10	11	12	13	14	15	16	17	18	
单位长度理论重量/(kg/m)																	
219.1		36.6	39.12	41.63	44.13	46.61	49.08	51.54	56.43	61.26	66.04	70.78	75.46	80.10	84.69	89.23	
245 (244.5)	38.23	41.09	43.93	46.76	49.58	52.38	55.17	57.95	63.48	68.95	74.38	79.76	85.08	90.36	95.59	100.77	
273	42.72	45.92	49.11	52.28	55.45	58.60	61.73	64.86	71.07	77.24	83.36	89.42	95.44	101.41	107.33	113.2	
299 (299.5)				57.41	60.90	64.37	67.83	71.27	78.13	84.93	91.69	98.40	105.06	111.67	118.23	124.74	
325				62.54	66.35	70.14	73.92	77.68	85.18	92.63	100.03	107.38	114.68	121.93	129.13	136.28	
340 (339.7)				65.50	69.49	73.47	77.43	81.38	89.25	97.05	104.84	112.56	120.23	127.85	135.42	142.94	
351				67.67	71.80	75.91	80.01	84.10	92.23	100.32	108.36	116.35	124.29	132.19	140.03	147.82	
356 (355.6)			64.46	68.65	72.84	77.02	81.18	85.33	93.59	101.8	109.97	118.08	126.14	134.16	142.12	150.04	
377								90.51	99.29	108.02	116.70	125.33	133.91	142.45	150.93	159.36	
406								97.66	107.15	116.6	126	135.34	144.64	153.89	163.09	172.24	
426							97.58	102.59	112.58	122.52	132.41	142.25	152.04	161.78	171.47	181.11	
457							104.84	110.24	120.99	131.69	142.35	152.95	163.51	174.01	184.47	194.88	

○化学成分 Chemical Composition(%):

标准 Standard	牌号 Grade	C	Si	Mn	P≤	S≤	Cr	Ni	Cu	Mo	V
GB18248	37Mn	0.34~0.40	0.10-0.30	1.35-1.75	0.020	0.020	≤0.30	≤0.30	≤0.20	-	-
	34Mn2V	0.30~0.37	0.17~0.37	1.40-1.75	0.020	0.020	≤0.30	≤0.30	≤0.20	-	0.07~0.12
	30CrMo	0.26~0.34	0.17~0.37	0.40-0.70	0.020	0.020	0.8~1.1	≤0.30	≤0.20	0.15~0.25	-
	34CrMo4	0.30~0.37	≤0.40	0.60-0.90	0.020	0.020	0.90~1.20	≤0.30	≤0.20	0.15~0.30	-
	35CrMo	0.32~0.40	0.17~0.37	0.40-0.70	0.020	0.020	0.8~1.1	≤0.30	≤0.20	0.15~0.25	-

注：经协商也可提供其它牌号的钢管。  
 Note: Other grade can also be provided after consulting with customers.

○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	抗拉强度 (MPa) 不小于 Tensile strength not less than	屈服强度 (MPa) 不小于 Yield strength not less than	延伸率 (%) 不小于 Elongation not less than	冲击功 (J) Impact energy	
					温度℃ Temperature	不小于 not less than
GB/T 8162	37Mn	750	630	16	-50	27
	34Mn2V	745	530	16	-20	27
	30CrMo	930	785	12	-50	27
	34CrMo4	980	835	12	-50	27
	35CrMo	980	835	12	-50	27

19	20	22	24	25	26	28	30	32	34	36	38	40	42	45	48	50	55
93.71	98.15	106.88	115.42	119.61	123.75	131.89	139.83										
105.90	110.98	120.99	130.80	135.64	140.42	149.84	159.07	168.09	176.92	185.55							
119.02	124.79	136.18	147.38	152.9	158.38	169.18	179.78	190.19	200.4	210.41	220.23	229.85					
131.20	137.61	150.29	162.77	168.93	175.05	187.13	199.02	210.71	222.20	233.50	244.59	255.49	266.20	281.88	297.12	307.04	
173.38	150.44	164.39	178.16	184.96	191.72	205.09	218.25	231.23	244	256.58	268.96	281.14	293.13	310.74	327.9	339.1	
150.41	157.83	172.53	187.03	194.21	201.34	215.44	229.35	243.06	256.58	269.90	283.02	295.94	308.66	327.38	345.66	357.59	
155.57	163.26	178.50	193.54	200.99	208.39	223.04	237.49	251.75	265.80	279.66	293.32	306.79	320.06	339.59	358.68	371.16	
157.91	165.73	181.21	196.5	204.07	211.6	226.49	241.19	255.69	269.99	284.1	298.01	311.72	325.24	345.14	364.6	377.32	
167.75	176.08	192.61	208.93	217.02	225.06	240.99	256.73	272.26	287.60	302.75	317.69	332.44	346.99	368.44	389.46	403.22	
181.34	190.39	208.34	226.1	234.9	243.66	261.02	278.18	295.15	311.92	328.49	344.87	361.05	377.03	400.63	423.78	438.98	
190.71	200.25	219.19	237.93	247.23	256.48	274.83	292.98	310.93	328.69	346.25	363.61	380.77	397.74	422.82	447.46	463.64	
205.23	215.54	236.01	256.28	266.34	276.36	296.23	315.91	335.4	354.68	373.77	392.66	411.35	429.85	457.23	484.16	501.86	545.27



○标准 Standard:

GB 9948 China National Standard

美国机械工程师协会标准 /American Society of Mechanical Engineers

ASTM A333 ASTM A335 ASTM A312

美国材料试验协会标准 /American Society for Testing and Materials

ASME-SA333 ASME SA-335 ASME SA-312

○用途 Uses:

用于制造石油精炼厂的炉管, 热交换器管和管道

For manufacture of furnace tubes, heat exchangers and pipelines in refineries.

○化学成分 Chemical Composition(%):

标准 Standard	牌号 Grade	C	Si	Mn	P≤	S≤	Cr	Ni	Mo
GB9948	10	0.07~0.13	0.17~0.37	0.35-0.65	0.030	0.020	-	-	-
	20	0.17~0.23	0.17~0.37	0.35-0.65	0.030	0.020	-	-	-
	15CrMo	0.12~0.18	0.17~0.37	0.40-0.70	0.030	0.020	0.8~1.1	-	0.40~0.55
	12CrMo	0.08~0.15	0.17~0.37	0.40-0.70	0.030	0.020	0.40~0.70	-	0.40~0.55
GB5310	25MnG	0.22~0.27	0.17~0.37	0.7~1.0	0.025	0.015	-	-	-
	12Cr2MoG	0.08~0.15	≤0.50	0.40~0.60	0.025	0.015	2.00~2.50	-	-
ASME SA333	SA333-6	≤0.30	>0.1	0.29~1.06	0.025	0.025	-	-	-
ASTM A333	A333-6	≤0.30	>0.1	0.29~1.06	0.025	0.025	-	-	-
ASME SA-335 /ASTM A 335	P5	≤0.15	≤0.50	0.30~0.60	0.025	0.025	4.00~6.00	-	0.45~0.65
	P9	≤0.15	0.50~1.00	0.30~0.60	0.025	0.025	8.00~10.0	-	0.90~1.10
	P11	0.05~0.15	0.50~1.00	0.30~0.60	0.025	0.025	1.00~1.50	-	0.44~0.65
	P12	0.05~0.15	≤0.50	0.30~0.61	0.025	0.025	0.80~1.25	-	0.44~0.65
	P21	0.05~0.15	≤0.50	0.30~0.60	0.025	0.025	2.65~3.35	-	0.80~1.06
	P22	0.05~0.15	≤0.50	0.30~0.60	0.025	0.025	1.90~2.60	-	0.87~1.13
	P91	0.08~0.12	0.20~0.50	0.30~0.60	0.020	0.010	8.00~9.50	≤0.40	0.85~1.05
	P92	0.07~0.13	≤0.50	0.30~0.60	0.020	0.010	8.50~9.50	≤0.40	0.30~0.60
	P5	≤0.15	≤0.50	0.30~0.60	0.025	0.025	4.00~6.00	-	0.45~0.65
	P9	≤0.15	0.50~1.00	0.30~0.60	0.025	0.025	8.00~10.0	-	0.90~1.10
	P11	0.05~0.15	0.50~1.00	0.30~0.60	0.025	0.025	1.00~1.50	-	0.44~0.65
	P12	0.05~0.15	≤0.50	0.30~0.61	0.025	0.025	0.80~1.25	-	0.44~0.65
	P21	0.05~0.15	≤0.50	0.30~0.60	0.025	0.025	2.65~3.35	-	0.80~1.06
	P22	0.05~0.15	≤0.50	0.30~0.60	0.025	0.025	1.90~2.60	-	0.87~1.13
P23	0.04~0.10	≤0.50	0.10~0.60	0.025	0.025	1.90~2.60	-	0.05~0.30	
P91	0.08~0.12	0.20~0.50	0.30~0.60	0.020	0.010	8.00~9.50	≤0.40	0.85~1.05	
P92	0.07~0.13	≤0.50	0.30~0.60	0.020	0.010	8.50~9.50	≤0.40	0.30~0.60	
ASME SA-312 /ASTMA312	TP304	0.08	1.00	2.00	0.045	0.030	18.0~20.0	8.0~11.0	-
	TP321	0.08	1.00	2.00	0.045	0.030	17.0~19.0	9.0~12.0	-
	TP316L	0.035	1.00	2.00	0.045	0.030	16.0~18.0	10.0~14.0	2.00~3.00
	TP304	0.08	1.00	2.00	0.045	0.030	18.0~20.0	8.0~11.0	-
	TP321	0.08	1.00	2.00	0.045	0.030	17.0~19.0	9.0~12.0	-
	TP316L	0.035	1.00	2.00	0.045	0.030	16.0~18.0	10.0~14.0	2.00~3.00

注: 经协商也可提供其它牌号的钢管。

Note: Other grade can also be provided after consulting with customers.



○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	抗拉强度 (MPa) Tensile strength	屈服强度 (MPa) Yield strength			延伸率 (%) Elongation	冲击功 Impact energy	
			≤16	> 16~30	> 30		纵向	横向
GB9948	10	335~475	205	195	185	25	35	
	20	410~550	245	235	225	21	35	
	12CrMo	410~560	205	195	185	21	35	
	15CrMo	440~640	235	225	215	21	35	
GB5310	25MnG	485~640	275			L20 T18	40	27
	12Cr2MoG	450~600	280			L22 T20	40	27
ASME SA-333	SA333-6	≥415	240			查标准中表3 See table 3	查标准中表4 See table 4	
ASTM A-333	A333-6	≥415	240			查标准中表3 See table 3	查标准中表4 See table 4	
ASME SA-335	P5	≥415	205			查标准中表3 See table 3	-	
	P9	≥415	205				-	
	P11	≥415	205				-	
	P12	≥415	220				-	
	P21	≥415	205				-	
	P22	≥415	205				-	
	P91	≥585	415				-	
	P92	≥620	440				-	
ASTM A-335	P5	≥415	205			查标准中表4 See table 4	-	
	P9	≥415	205				-	
	P11	≥415	205				-	
	P12	≥415	220				-	
	P21	≥415	205				-	
	P22	≥415	205				-	
	P23	≥510	400				-	
	P91	≥585	415				-	
P92	≥620	440			-			
ASME SA-312	TP304	≥515	205			L35 T25	-	
	TP321	≥515	205			L35 T25	-	
	TP316L	≥485	170			L35 T25	-	
ASTM A-312	TP304	≥515	205			L35 T25	-	
	TP321	≥515	205			L35 T25	-	
	TP316L	≥485	170			L35 T25	-	

○规格表 :GB 9948 规格系列 Size: Range acc. GB 9948

注 : 经协商也可提供其它规格的钢管。

Note: Other size can also be provided after consulting with customers.

外径 /mm	壁厚/mm															
	6.5	7	7.5	8	8.5	9.0	9.5	10	11	12	13	14	15	16	17	18
	单位长度理论重量/(kg/m)															
219.1		36.6	39.12	41.63	44.13	46.61	49.08	51.54	56.43	61.26	66.04	70.78	75.46	80.10	84.69	89.23
245 (244.5)	38.23	41.09	43.93	46.76	49.58	52.38	55.17	57.95	63.48	68.95	74.38	79.76	85.08	90.36	95.59	100.77
273	42.72	45.92	49.11	52.28	55.45	58.60	61.73	64.86	71.07	77.24	83.36	89.42	95.44	101.41	107.33	113.2
299 (299.5)				57.41	60.90	64.37	67.83	71.27	78.13	84.93	91.69	98.40	105.06	111.67	118.23	124.74
325				62.54	66.35	70.14	73.92	77.68	85.18	92.63	100.03	107.38	114.68	121.93	129.13	136.28
340 (339.7)				65.50	69.49	73.47	77.43	81.38	89.25	97.05	104.84	112.56	120.23	127.85	135.42	142.94
351				67.67	71.80	75.91	80.01	84.10	92.23	100.32	108.36	116.35	124.29	132.19	140.03	147.82
356 (355.6)			64.46	68.65	72.84	77.02	81.18	85.33	93.59	101.8	109.97	118.08	126.14	134.16	142.12	150.04
377								90.51	99.29	108.02	116.70	125.33	133.91	142.45	150.93	159.36
406								97.66	107.15	116.6	126	135.34	144.64	153.89	163.09	172.24
426							97.58	102.59	112.58	122.52	132.41	142.25	152.04	161.78	171.47	181.11
457							104.84	110.24	120.99	131.69	142.35	152.95	163.51	174.01	184.47	194.88



	19	20	22	24	25	26	28	30	32	34	36	38	40	42	45	48	50	55
	93.71	98.15	106.88	115.42	119.61	123.75	131.89	139.83										
	105.90	110.98	120.99	130.80	135.64	140.42	149.84	159.07	168.09	176.92	185.55							
	119.02	124.79	136.18	147.38	152.9	158.38	169.18	179.78	190.19	200.4	210.41	220.23	229.85					
	131.20	137.61	150.29	162.77	168.93	175.05	187.13	199.02	210.71	222.20	233.50	244.59	255.49	266.20	281.88	297.12	307.04	
	173.38	150.44	164.39	178.16	184.96	191.72	205.09	218.25	231.23	244	256.58	268.96	281.14	293.13	310.74	327.9	339.1	
	150.41	157.83	172.53	187.03	194.21	201.34	215.44	229.35	243.06	256.58	269.90	283.02	295.94	308.66	327.38	345.66	357.59	
	155.57	163.26	178.50	193.54	200.99	208.39	223.04	237.49	251.75	265.80	279.66	293.32	306.79	320.06	339.59	358.68	371.16	
	157.91	165.73	181.21	196.5	204.07	211.6	226.49	241.19	255.69	269.99	284.1	298.01	311.72	325.24	345.14	364.6	377.32	
	167.75	176.08	192.61	208.93	217.02	225.06	240.99	256.73	272.26	287.60	302.75	317.69	332.44	346.99	368.44	389.46	403.22	
	181.34	190.39	208.34	226.1	234.9	243.66	261.02	278.18	295.15	311.92	328.49	344.87	361.05	377.03	400.63	423.78	438.98	
	190.71	200.25	219.19	237.93	247.23	256.48	274.83	292.98	310.93	328.69	346.25	363.61	380.77	397.74	422.82	447.46	463.64	
	205.23	215.54	236.01	256.28	266.34	276.36	296.23	315.91	335.4	354.68	373.77	392.66	411.35	429.85	457.23	484.16	501.86	545.27

# SEAMLESS HOT-ROLLED STEEL TUBES FOR HYDRAULIC PILLAR SERVICE

## 液压支柱用热轧无缝钢管

### ○标准 Standard:

GB/T 17396 Chinese National Standard

### ○用途 Uses:

煤矿液压支架和支柱的缸、柱，也可用于其它的液压缸、柱用。

For manufacture of coal mine hydraulic bracket and pillar, also can be used for other hydraulic cylinder and pillar.

### ○化学成分 Chemical Composition(%):

标准 Standard	牌号 Grade	C	Si	Mn	P≤	S≤	Cr≤	Ni≤	Cu≤
GB/T17396	20	0.17~0.24	0.17~0.37	0.35~0.65	0.035	0.035	0.25	0.25	0.20
	35	0.32~0.40	0.17~0.37	0.50~0.80	0.035	0.035	0.25	0.25	0.20
	45	0.42~0.50	0.17~0.37	0.50~0.80	0.035	0.035	0.25	0.25	0.20
	27SiMn	0.24~0.32	1.10~1.40	1.10~1.40	0.035	0.035	0.30	0.30	0.30

注：经协商也可提供其它牌号的钢管。

Note: Other grade can also be provided after consulting with customers.



○机械性能 Mechanical Properties:

标准 Standard	钢级 Grade	试样热处理制度 Heat Treatment	抗拉强度 (MPa) 不小于 Tensile strength not less than	屈服强度 (MPa) 不小于 Yield strength not less than	延伸率 (%) 不小于 Elongation not less than	冲击功 (J) 不小于 Impact energy not less than
GB/T 17396	20	-	400	245	20	-
	35	-	510	305	17	-
	45	-	590	335	14	-
	27SiMn	920°C ± 20°C 水淬 450°C ± 50°C 回火 冷却剂: 油或水 Quenching: 920°C ± 20°C Tempering: 450°C ± 50°C Coolant: Oil or Water	980	835	12	39

○规格表：GB/T 17396 规格系列 Size: Range acc. GB/T 17396

注：经协商也可提供其它规格的钢管。

Note: Other size can also be provided after consulting with customers.

外径 /mm	壁厚/mm															
	6.5	7	7.5	8	8.5	9.0	9.5	10	11	12	13	14	15	16	17	18
单位长度理论重量/(kg/m)																
219.1		36.6	39.12	41.63	44.13	46.61	49.08	51.54	56.43	61.26	66.04	70.78	75.46	80.10	84.69	89.23
245 (244.5)	38.23	41.09	43.93	46.76	49.58	52.38	55.17	57.95	63.48	68.95	74.38	79.76	85.08	90.36	95.59	100.77
273	42.72	45.92	49.11	52.28	55.45	58.60	61.73	64.86	71.07	77.24	83.36	89.42	95.44	101.41	107.33	113.2
299 (298.5)				57.41	60.90	64.37	67.83	71.27	78.13	84.93	91.69	98.40	105.06	111.67	118.23	124.74
325				62.54	66.35	70.14	73.92	77.68	85.18	92.63	100.03	107.38	114.68	121.93	129.13	136.28
340 (339.7)				65.50	69.49	73.47	77.43	81.38	89.25	97.07	104.84	112.56	120.23	127.85	135.42	142.94
351				67.67	71.80	75.91	80.01	84.10	92.23	100.32	108.36	116.35	124.29	132.19	140.03	147.82
356 (355.6)			64.46	68.65	72.84	77.02	81.18	85.33	93.59	101.8	109.97	118.08	126.14	134.16	142.12	150.04
377								90.51	99.29	108.02	116.70	125.33	133.91	142.45	150.93	159.36
406								97.66	107.15	116.6	126	135.34	144.64	153.89	163.09	172.24
426							97.58	102.59	112.58	122.52	132.41	142.25	152.04	161.78	171.47	181.11
457							104.84	110.24	120.99	131.69	142.35	152.95	163.51	174.01	184.47	194.88



	19	20	22	24	25	26	28	30	32	34	36	38	40	42	45	48	50	55
	93.71	98.15	106.88	115.42	119.61	123.75	131.89	139.83										
	105.90	110.98	120.99	130.80	135.64	140.42	149.84	159.07	168.09	176.92	185.55							
	119.02	124.79	136.18	147.38	152.9	158.38	169.18	179.78	190.19	200.4	210.41	220.23	229.85					
	131.20	137.61	150.29	162.77	168.93	175.05	187.13	199.02	210.71	222.20	233.50	244.59	255.49	266.20	281.88	297.12	307.04	
	173.38	150.44	164.39	178.16	184.96	191.72	205.09	218.25	231.23	244	256.58	268.96	281.14	293.13	310.74	327.9	339.1	
	150.41	157.83	172.53	187.03	194.21	201.34	215.44	229.35	243.06	256.58	269.90	283.02	295.94	308.66	327.38	345.66	357.59	
	155.57	163.26	178.50	193.54	200.99	208.39	223.04	237.49	251.75	265.80	279.66	293.32	306.79	320.06	339.59	358.68	371.16	
	157.91	165.73	181.21	196.5	204.07	211.6	226.49	241.19	255.69	269.99	284.1	298.01	311.72	325.24	345.14	364.6	377.32	
	167.75	176.08	192.61	208.93	217.02	225.06	240.99	256.73	272.26	287.60	302.75	317.69	332.44	346.99	368.44	389.46	403.22	
	181.34	190.39	208.34	226.1	234.9	243.66	261.02	278.18	295.15	311.92	328.49	344.87	361.05	377.03	400.63	423.78	438.98	
	190.71	200.25	219.19	237.93	247.23	256.48	274.83	292.98	310.93	328.69	346.25	363.61	380.77	397.74	422.82	447.46	463.64	
	205.23	215.54	236.01	256.28	266.34	276.36	296.23	315.91	335.4	354.68	373.77	392.66	411.35	429.85	457.23	484.16	501.86	545.27

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