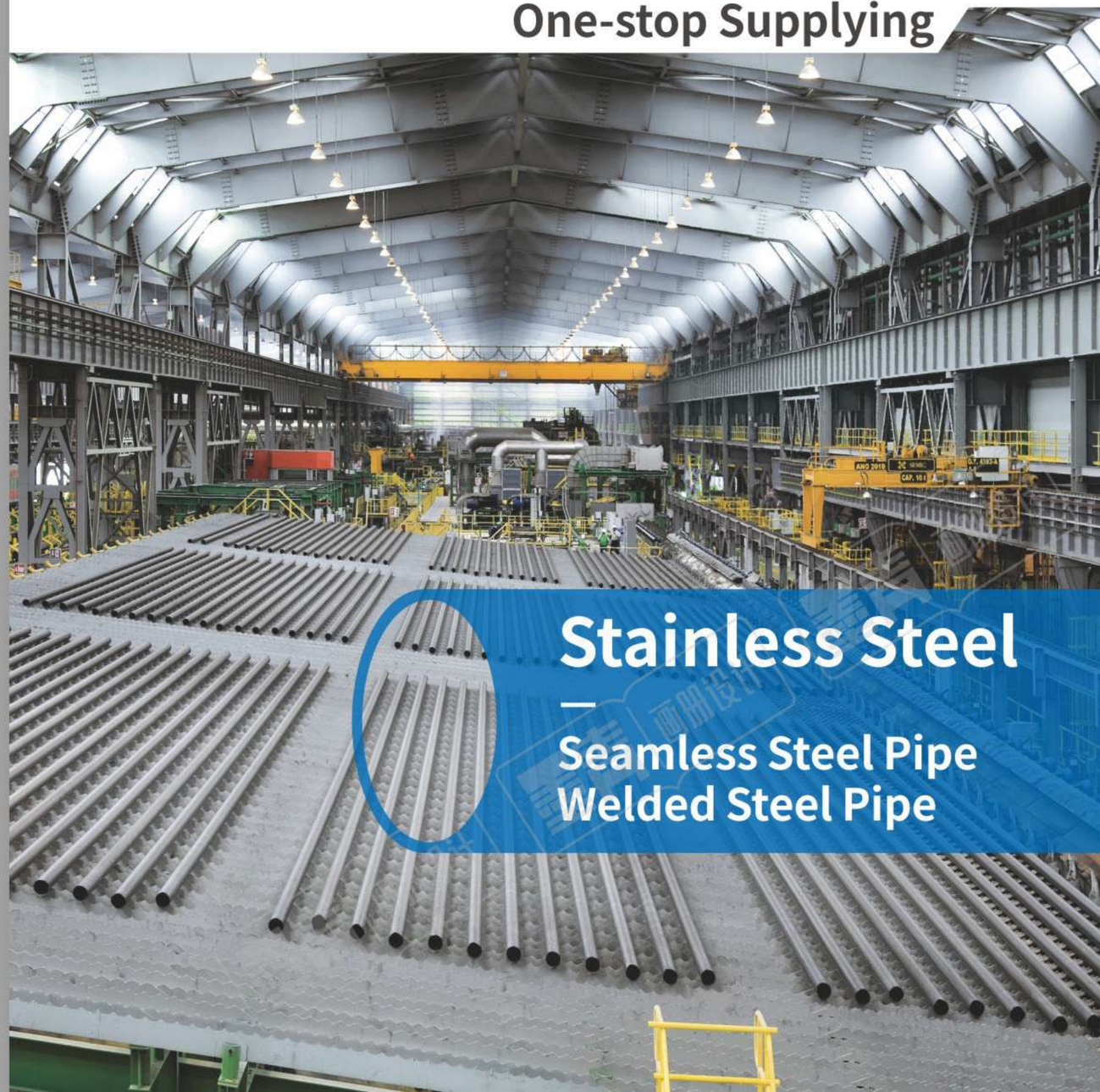
Sole Agent: Essential Trading Co.,Ltd
Address: 15/F., Toi Shan Centre,
128 Johnston Road, Wanchai,
Hong Kong
Tel: 28339906
Fax: 28385587
E-mail: essenthk@essential.imsbiz.com.hk
Website: http://essential-hk.com/

湖南格润德管业有限公司
HUNAN GREAT STEEL PIPE CO.,LTD

Address:
No.9 Xiangfu Rd, Yuhua District,
Changsha, Hunan, China

SINOTEC
湖南格润德管业有限公司
HUNAN GREAT STEEL PIPE CO.,LTD

One-stop Supplying



Stainless Steel

—

Seamless Steel Pipe
Welded Steel Pipe

CONTENTS

PROFILE

SHINESTAR STEEL GROUP is a proudly Chinese owned business that is specialized in steel pipeline manufacturing, stocking and one-stop supplying all over the world. Our products including steel plate, steel pipe, pipe fittings, flanges, valves, bolts and nuts to serving the industry of Oil and Gas, Power and Energy, Mining, Marine, Fire Service etc.

Founded in 1993, we started our business named as “Yu Feng” and primarily focused on steel pipe trading in Hunan Province. Thanks for the Chinese Economic Reform in 1989, the company expanded its market as steel pipe manufacturer and stockist in the first 20 years. At that time, we supply our steel pipe throughout China and we started to build our own brand “Shinestar”.

With the successfully held on 2008 Beijing Olympics, Chinese international status rose, the Founder Mr. Guoyu Yi seized the international business opportunities and started to supply “Shinestar” brand steel pipe globally. Based in China, Serving the World. Today, with the registered capital of 280 million, We have been awarded the Chinese top 500 private enterprise and Hunan province top 100 private enterprise.

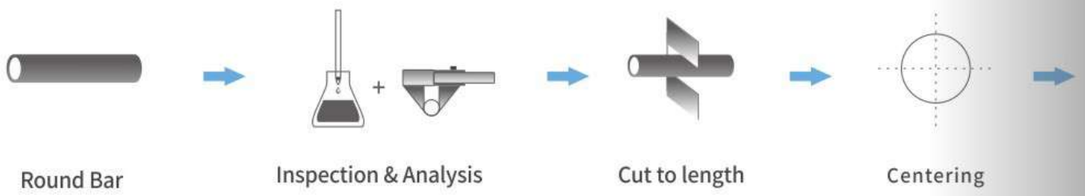
We aim to create a century model enterprise in the steel industry with the fundamental principles of creating values for both employees and clients. We are insisting in the international development strategy and global distribution, regarding the “ internal staff achievements and external clients success” as the corporation mission.

Hunan Great Steel Pipe Co., Ltd is the longest established and the largest operated subsidiary under the group. Starting from the supplying of steel pipe, after years of developing, now we have a complete products matrix to meet the needs of different clients in piping system area internationally. Our professional team provides knowledgeable input to assist clients in achiving their project outcomes. We ensure the best quality of products by assigning skillful experts at every stage of activities.

Thanks to the unwavering dedication of our team, we are proud to be a designated supplier for PetroChina and a qualified supplier for esteemed organizations such as China General Nuclear Power, Three Gorges Group, Datang Power, and Water Supplies Department and Drainage Services Department in Hong Kong SAR..

PRODUCTION PROCESS

Seamless Steel Pipe

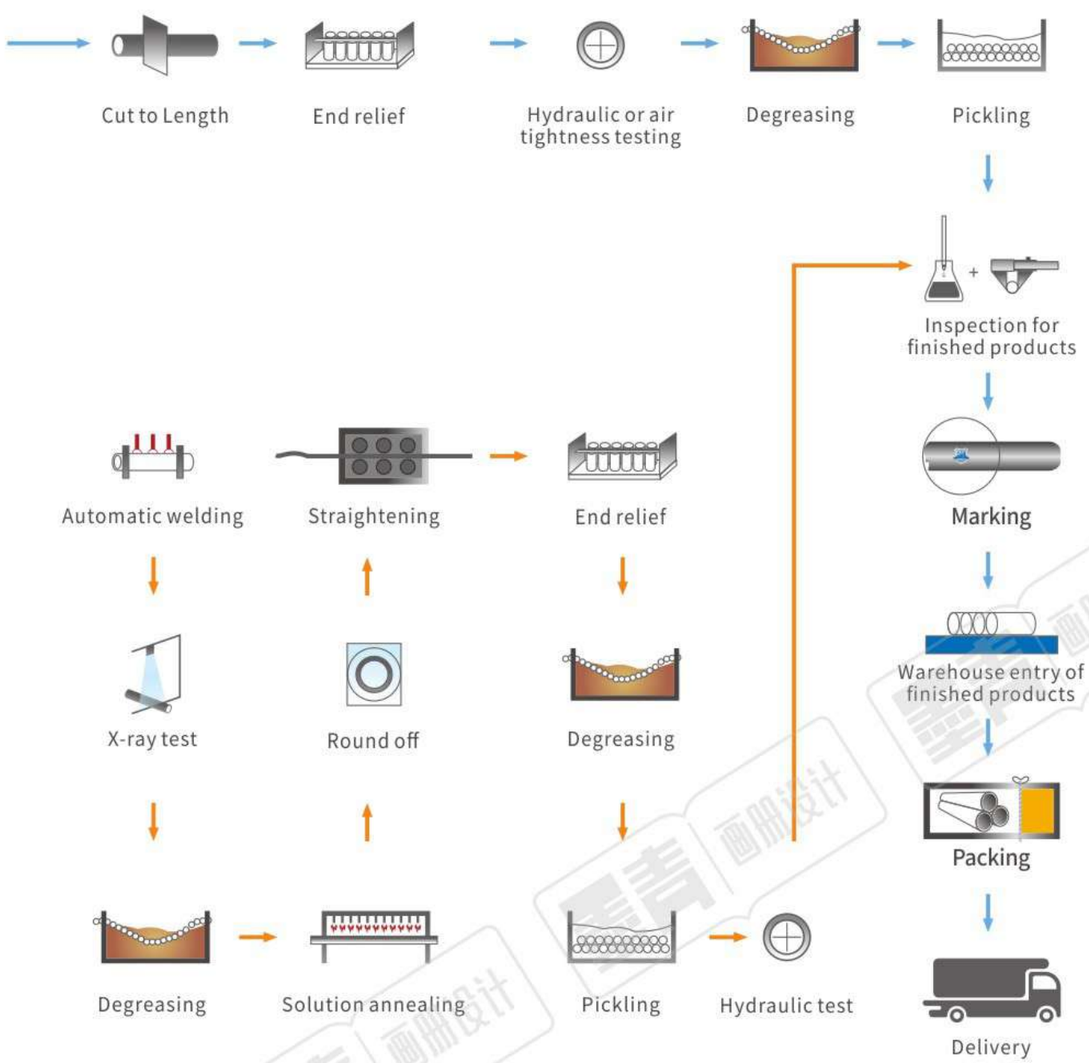


- Including
- Physical Inspection
- Hydrostatic Test
- Technology Test
- Non-destructive Inspection
- Intergranular Corrosion Test

Welded Steel Pipe

The continuous Forming production process flow chart
(The production line equipment products)

The single Forming production process flow chart
(Large-caliber industrial welded pipes)



FACTORY EQUIPMENT

Seamless Steel Pipe

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No.	Equipment Name	Model Specification	Unit	Quantity
001	Hydraulic cold drawing unit	5T/10T/20T/45T/60T/80T/ 120T/200T/500T/1000T	Sets	30
002	Cold rolling mill	LG30/40/60/60H/90H/120H	Sets	8
003	Pickling tank	2mX2mX16m	Sets	5
004	Solution treatment furnace	20X1.2m	Sets	3
005	Straightening unit	Φ12-32/Φ33-159	Sets	5
006	Pressure value unit	200T/500T/800T	Sets	4
007	Pipe cutting, flat head unit	Φ6-630mm	Sets	5
008	Ultrasonic flaw detector for steel pipe	TTS-6280/UD-MC2A/ UT-530/UT-159	Sets	4
009	Steel pipe eddy current flaw detector	ECT-308E/ET-219	Sets	2
010	Hydraulic testing machine	D168	Sets	2
011	Direct Reading Spectrometer	XLt898SW/WA-5	Sets	2
012	Intergranular corrosion tester	4X8	Sets	1
013	Rockwell hardness tester	HR-150DT	Sets	1
014	Screen display type electro-hydraulic universal testing machine	WA-D	Sets	1
015	Carbon and sulfur combined measurement analyzer	HXE-80	Sets	1
016	Metallurgical microscope	4X8	Sets	1
017	Spectrophotometer	721 16C	Sets	1
018	Stereo microscope	PXS	Sets	1

Welded Steel Pipe

No.	Equipment Name	Model Specification	Unit	Quantity
001	Hydraulic cold drawing unit	5T/10T/20T/45T/60T/80T/120T/200T/500T/1000T	Sets	30
002	Cold rolling mill	LG30/40/60/60H/90H/120H	Sets	8
003	Pickling tank	2mX2mX16m	Sets	5
004	Solution treatment furnace	20X1.2m	Sets	3
005	Straightening unit	Φ12-32/Φ33-159	Sets	5
006	Pressure value unit	200T/500T/800T	Sets	4
007	Pipe cutting, flat head unit	Φ6-630mm	Sets	5
008	Ultrasonic flaw detector for steel pipe	TTS-6280/UD-MC2A/UT-530/UT-159	Sets	4
009	Steel pipe eddy current flaw detector	ECT-308E/ET-219	Sets	2
010	Hydraulic testing machine	D168	Sets	2
011	Direct Reading Spectrometer	XLt898SW/WA-5	Sets	2
012	Intergranular corrosion tester	4X8	Sets	1
013	Rockwell hardness tester	HR-150DT	Sets	1
014	Screen display type electro-hydraulic universal testing machine	WA-D	Sets	1
015	Carbon and sulfur combined measurement analyzer	HXE-80	Sets	1
016	Metallurgical microscope	4X8	Sets	1
017	Spectrophotometer	721 16C	Sets	1
018	Stereo microscope	PXS	Sets	1

QUALITY GUARANTEE

Test Equipment

HGSP has quality control sytem including all production process starting from raw material and manufacturing till to transportation.

Quality Control is one of the most important function that all required tests and inspections are carried out in compliance with the customer requirements and related standards by using modern inspection and testing equipments.

The tests are guaranteed through test conducted by using modern measurement and equipments, the calibration of these equipments performed periodically by the acrredited corporations.

Magnetic flux leakage & ultrasonic testing line

Functions: It can realize the function of bidirectional detection, wall thickness measurement and layered defect detection.

High Temperature Rupture Creep Testing Machine

Functions: used to test the mental and non-mental, such as tension, compression rupture, relaxation test, high temperature tensile, etc.

600T Flattening Machine

Functions: test the ultimate plastic deformation of a metal tube under a given condition without a crack defect.

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HUNAN GREAT STEEL PIPE CO.,LTD

Test Requirement Table

	Chemical Composition	Stretch-ing Test	Rockwell Hardness	Flatten	Flar-ing	Water ① Pressure	Ultra-sound	Vortex	Intergranular Corrosion ④	Grain Size	Surface Quality	Size
ASTM A312	●	●	○	●	○	●	○	○	○	○②	●	●
ASTM A213	●	●	●	●	●	●	○	○	○	○②	●	●
ASTM A269	●	○	●	○	●	●	○	○	○	○	●	●
ASTM A511	●	○	○	○	○	○	○	○	○	○	●	●
JIS G3459	●	●	○	●	○	●	○	○	○	○②	●	●
JIS G3463	●	●	○	●	●	●	○	○	○	○②	●	●
DIN 17456	●	●	○	○	○	●	○	○	○	○	●	●
DIN 17458	●	●	○	●	●	●	●③	●③	○	○	●	●
GB/T 14975-20	●	●	○	●	○	●	○	○	○	○	●	●
GB/T 14976-20	●	●	○	○	○	●	○	○	●	○	●	●
GB 13296-2007	●	●	●	●	●	●	●	●	●	○	●	●
GB 5310-2008	●	●	●	●	○	●	●	●	○	●	●	●
GB 9948-2006	●	●	○	●	●	●	●	●	○	○	●	●

● Mandatory ○ Optional/Supplementary

①NDT can replace HT

②H grad requires grain size test

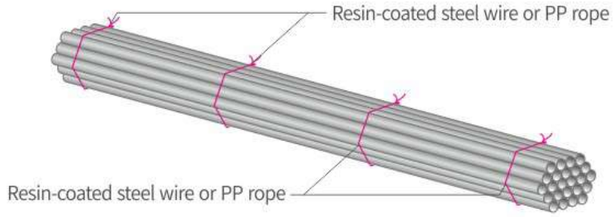
③Pipes with OD≤101.6mm，WT≤5.6mm is subjected to agreement

④Marine pipe requires I.C test

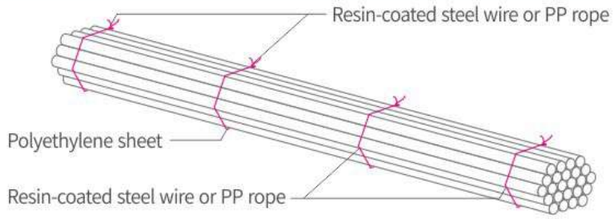
CERTIFICATE

PACKING

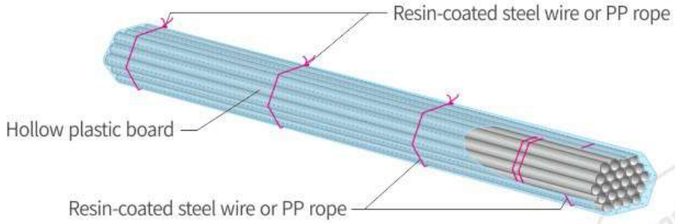
Bare packing



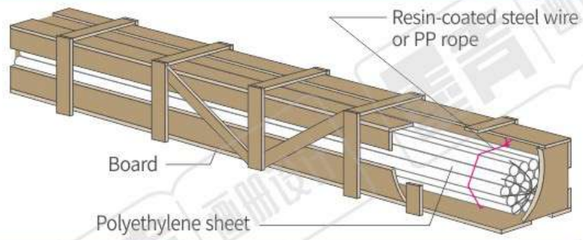
Polyethylene sheet packing



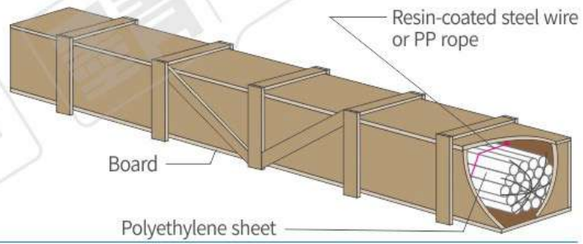
Hollow plastic board packing



Open wood box packing



Closed wood box packing



PRODUCT RANGE

Seamless Steel Pipe

Item	Grade	Size Range	Max Length	Processing Technic	Delivery Status	Standard	Surface
Austenitic Stainless Steel	304/L/H/LN、316/L/H/LN/Ti、321/H、317/L/LN、347/H、310S/H、309S	OD6-38*0.5-6MM	38M	Cold-rolled or Cold Drawn	ANNEALING	GB、ASME、ASTM、JIS、EN、DIN、GOST	Bright Tube, Pickling Passivation, Finishing Polish, Wiredrawing
		OD42-168*2-30MM	18M				
		OD219-325*3-45mm	14M				
		OD377-764*5-60MM	14M	Cold Drawn			
Super Austenitic Stainless Steel	N08904(904L)、S31254、S30432、S31042、N08367(6Mo)	OD12-325*0.8-20MM	12M	Cold-rolled or Cold Drawn		GB、ASME、ASTM、JIS、EN、DIN、GOST	
Super Duplex Stainless Steel	S31500、S32101、S32003、S32304、S31803、S32205、S32750、S32760	OD12-325*0.8-20MM	12M			GB、ASME、ASTM、JIS、EN、DIN、GOST	
High Temperature Nickel Alloy Pipe	N02200、N02201、N04400、N06600、N06690、N06625、N06985(G3)、N08028、N08800、N8810、N8811、N08825、N10276、N10624、N10629、N10675	OD12-325*0.8-20MM	12M			GB、ASME、ASTM、JIS、EN、DIN、GOST	

Welded Steel Pipe

Item	Grade	Size Range	Max Length	Processing Technic	Delivery Status	Standard	Surface
Austenitic Stainless Steel	304/L/H/LN、316/L/H/LN/Ti、321/H、317/L/LN、347/H、310S/H、309S、N08904 (904L)	OD12-630*0.5-16MM	12M	Automatic On-line Welding	Soild Solution Pickling or As -welded Condition	GB、ASME、ASTM、JIS、EN、DIN、GOST	Pickling Passivation, Finishing Polish
		OD168-3000*2-100MM	12M	Single Rolling Automatic Welding			
Super Duplex Stainless Steel	S31803、S32205、S32750、S32760	OD12-3000*2-60MM	12M				
High Temperature Nickel Alloy Pipe	N02200、N02201、N04400、N06600、N06690、N06625、N06985(G3)、N08028、N08800、N08810、N08811、N08825、N10276	OD12-3000*2-30MM	12M				

Seamless Steel Pipe Spec

NPS	Imperial Nominal Pipe (mm)				O.D./W.T.	0.8	1	1.2	1.4	1.6	1.8	2	2.5	3	4	5	6	8	10	12	14	16	18	20	25	30	35	40	45	50
	5S	10S	40S	80S																										
					6.0																									
					8.0																									
1/8		1.24	1.73	2.41	10.3																									
1/4		1.65	2.21	3.02	13.7																									
3/8		1.65	2.31	3.20	17.1																									
					20.0																									
1/2	1.65	2.11	2.77	3.73	21.3																									
					22.0																									
					25.0																									
3/4	1.65	2.11	2.87	3.91	26.7																									
1	1.65	2.11	3.38	4.55	33.4																									
					32.0																									
					38.0																									
1 (1/4)	1.65	2.77	3.56	4.85	42.2																									
1 (1/2)	1.65	2.77	3.68	5.08	48.3																									
					51.0																									
					57.0																									
2	1.65	2.77	3.91	5.54	60.3																									
					68.0																									
2 (1/2)	2.11	3.05	5.16	7.01	73.0																									
					80.0																									
3	2.11	3.05	5.49	7.62	88.9																									
					95.0																									
3 (1/2)	2.11	3.05	5.74	8.80	101.6																									
					108.0																									
4	2.11	3.05	8.02	8.56	114.3																									
					121.0																									
5	2.77	3.40	6.55	9.53	141.3																									
					159.0																									
6	2.77	3.40	7.11	10.97	168.3																									
					177.0																									
8	2.77	3.76	8.18	12.70	219.1																									
					254.0																									
10	3.4	4.19	9.27	12.70	273.1																									
					304.0																									
12	3.96	4.57	9.53	12.70	323.9																									
					330.0																									
14	3.96	4.78			355.6																									
16	4.19	4.78			406.4																									
18	4.19	4.78			457.0																									
20	4.78	5.54			508.0																									
22	4.78	5.54			559.0																									
24	5.54	6.35			610.0																									
					660.0																									
					711.0																									
30	6.35	7.92			762.0																									

Welded Steel Pipe Spec

NPS	Imperial Nominal Pipe (mm)				O.D./W.T.	0.8	1	1.2	1.4	1.6	1.8	2	2.5	3	4	5	6	8	10	12	14	16	18	20	25	30	35	40	45	50
	5S	10S	40S	80S																										
1/8		1.24	1.73	2.41	10.3																									
1/4		1.65	2.21	3.02	13.7																									
3/8		1.65	2.31	3.20	17.1																									
1/2	1.65	2.11	2.77	3.73	21.3																									
3/4	1.65	2.11	2.87	3.91	26.7																									
1	1.65	2.11	3.38	4.55	33.4																									
1(1/4)	1.65	2.77	3.56	4.85	42.2																									
1(1/2)	1.65	2.77	3.68	5.08	48.3																									
2	1.65	2.77	3.91	5.54	60.3																									
2(1/2)	2.11	3.05	5.16	7.01	73.0																									
3	2.11	3.05	5.49	7.62	88.9																									
3(1/2)	2.11	3.05	5.74	8.80	101.6																									
4	2.11	3.05	8.02	8.56	114.3																									
5	2.77	3.40	6.55	9.53	141.3																									
6	2.77	3.40	7.11	10.97	168.3																									
8	2.77	3.76	8.18	12.70	219.1																									
10	3.4	4.19	9.27	12.70	273.1																									
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20	4.78	5.54			508.0																									
22	4.78	5.54			559.0																									
24	5.54	6.35			610.0																									
30	6.35	7.92			762.0																									
35					889.0																									
40					1016.0																									
45					1143.0																									
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55					1397.0																									
60					1524.0																									
65					1651.0																									
70					1778.0																									
75					1905.0																									
80					2032.0																									
85					2159.0																									
90					2286.0																									
95					2413.0																									
100					2540.0																									

Industrial Stainless Steel Pipe

Application areas: Pipes for fluid (liquid, gas, dry powder, materials and other media) transportation in industries or engineering projects such as petroleum, chemical, energy, paper, marine, metallurgical heat delivery, water supply and drainage, pipe fittings, valves, etc.:

ASTM A312, ASTM A778, ASTM A358 specifications and sizes are as follows (size specifications only comply with ASME B36.19M); GB/T12771, HG20537 and other standards of specifications and sizes as a reference or agreement between the buyer and the seller:

OD		Outside Diameter	Nominal Wall Thickness		
			sch5S	sch10S	sch40S
DN	NPS	mm	mm	mm	mm
8	1/4"	13.72	1.24	1.65	2.24
10	3/8"	17.15	1.24	1.65	2.31
15	1/2"	21.34	1.65	2.11	2.77
20	3/4"	26.67	1.65	2.11	2.87
25	1"	33.4	1.65	2.77	3.38
32	1-1/4"	42.16	1.65	2.77	3.56
40	1-1/2"	48.26	1.65	2.77	3.68
50	2"	60.33	1.65	2.77	3.91
65	2-1/2"	73.03	2.11	3.05	5.16
80	3"	88.9	2.11	3.05	5.49
90	3-1/2"	101.6	2.11	3.05	5.74
100	4"	114.3	2.11	3.05	6.02
125	5"	141.3	2.77	3.40	6.55
150	6"	168.28	2.77	3.40	7.11
200	8"	219.08	2.77	3.76	8.18
250	10"	273.05	3.40	4.19	9.27
300	12"	323.85	3.96	4.57	9.53

Other outer diameter and thickness refer to ASMEB36.10M specification size:

JIS G3459 Specification

Nominal Diameter		Outside Diameter	Nominal Wall Thickness			
			sch5S	sch10S	sch20S	sch40S
(A)	(B)	mm	mm	mm	mm	mm
8	1/4"	13.8	1.2	1.65	2.0	2.2
10	3/8"	17.3	1.2	1.65	2.0	2.3
15	1/2"	21.7	1.65	2.1	2.5	2.8
20	3/4"	27.2	1.65	2.1	2.5	2.9
25	1"	34.0	1.65	2.8	3.0	3.4
32	1(1/4)"	42.7	1.65	2.8	3.0	3.6
40	1(1/2)"	48.6	1.65	2.8	3.0	3.7
50	2"	60.5	1.65	2.8	3.5	3.9
65	2(1/2)"	76.3	2.1	3.0	3.5	5.2
80	3"	89.1	2.1	3.0	4.0	5.5
90	3(1/2)"	101.6	2.1	3.0	4.0	5.7
100	4"	114.3	2.1	3.0	4.0	6.0
125	5"	139.8	2.8	3.4	5.0	6.6
150	6"	165.2	2.8	3.4	5.0	7.1
200	8"	216.3	2.8	4.0	6.5	8.2
250	10"	267.4	3.4	4.0	6.5	9.3
300	12"	318.5	4.0	4.5	6.5	10.3

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HUNAN GREAT STEEL PIPE CO.,LTD

Stainless steel pipes for large-caliber industrial piping (application areas: petroleum, chemical, paper, energy, metallurgical heat transmission, marine engineering, sewage and other industries or engineering projects)

ASTM A312, ASTM A778, ASTM A358 super large diameter pipe specification size table (specification and size only comply with ASME B36.19M):

OD		Outside Diameter	Nominal Wall Thickness		
			sch5S	sch10S	sch40S
DN	NPS	mm	mm	mm	mm
350	14''	355.6	3.96	4.78	9.53
400	16''	406.4	4.19	4.78	9.53
450	18''	457	4.19	4.78	9.53
500	20''	508	4.78	5.54	9.53
550	22''	559	4.78	5.54	-
600	24''	610	5.54	6.35	9.53
750	30''	762	6.35	7.92	-

Dimension Tolerance Table

Standard	Outside Diameter		Thickness(mm)	Length(mm)
ASTM A312	≤48.26	+0.40 -0.80	+Unspecified -12.50%	Definite cut length +6.40 -0
	>48.26-114.30	+0.80 -0.80		
	>114.30-219.08	+1.60 -0.80		
	>219.08-457.20	+2.40 -0.80		
	>457-660	+3.20 / -0.80		
JIS G3459	<30.00 ±0.30 ≥30.00 ±1.00% (Outer diameter benchmark)		<2.00 ±0.20 ≥2.00 ±10%	Definite cut length
GB/T 12771	<13.00 ±0.20 13.00-40.00 ±0.30 ≥40.00 ±0.80% (Outer diameter benchmark)		≤4.00 +0.50 -0.6 > 4.00 ±10% (Outer diameter benchmark)	+20.00 -0
EN 10217-7	D1±1.50% with ±0.75mm(min) D2±1.00% with ±0.50mm(min) D3±0.75% with ±0.30mm(min) D4±0.50% with ±0.10mm(min) EN ISO 1127		T1±15.00% ±with 0.60mm(min) T2±12.5% ±with 0.40mm(min) T3±10.00% ±with 0.20mm(min) T4±7.50% ±with 0.15mm(min) T5±5.00% ±with 0.10mm(min) EN ISO 1127	≤6000 +5.00 -0 6000-12000 +10.00 -0

Weight Calculating Formula Table of Stainless Steel

Grade		p (kg/m³)	Calculation Formula
0Cr18Ni9(06Cr19Ni10) SUS304 TP304	00Cr19Ni10(022Cr19Ni10) SUS304L TP304L	7.93	W=0.02491 t(D-t)
0Cr17Ni12Mo2 SUS316 TP316	00Cr17Ni14Mo2 SUS316L TP316L	7.98	W=0.02507 t(D-t)

Stainless Steel Mechanical Tubing

Round Tubing

Outside Diameter (inch)	Outside Diameter (mm)	Thickness(mm) 0.5	0.6	0.7	0.8	0.9	1	1.2	1.5	2	2.5	3	4	5
	9.5													
	12													
1/2"	12.7													
	13													
	14													
5/8"	15.9													
3/4"	19.1													
7/8"	22.2													
1"	25.4													
1-1/8"	28.6													
1-1/4"	31.8													
1-1/2"	38.1													
	40													
	45													
2"	50.8													
	52													
2-1/4"	57.15													
2-3/8"	60.3													
2-1/2"	63.5													
	70													
3"	76.2													
	85													
3-1/2"	88.9													
4"	101.6													
4-1/8"	104.78													
4-1/4"	107.95													
4-1/2"	114.3													
5-1/4"	133.35													
6-1/4"	158.75													
8-5/8"	219.08													

Dimension Tolerance Table of Round Tubing

Standard	Outside Diameter (mm)	Thickness (mm)	Outside Diameter Tolerance(mm)	Thickness Tolerance (mm)	Length Tolerance (mm)
ASTM A554	≤12.7	0.51-1.24	±0.10	±10.00% T (10.00% of nominal wall thickness)	+4.08 -0
	>12.7-25.4	0.51-1.65	±0.13		
		>1.65-3.4	±0.25		
	>25.4-38.1	0.64-1.65	±0.20		
		>1.65-3.40	±0.25		
	>38.1-50.8	0.64-1.24	±0.25		
		>1.24-2.11	±0.28		
	>50.8-63.5	>2.11-3.78	±0.30		
		0.81-1.65	±0.30		
		>1.65-2.77	±0.33		
	>63.5-88.9	>2.77-4.19	±0.36		
		0.81-4.19	±0.36		
	>88.9-127.0	0.89-4.19	±0.51		
		>4.19	±0.64		
	>127.0-190.5	1.24-6.35	±0.64		
		>6.35	±0.76		
GB/T 12770	<25		±0.15	Cold rolled ≤0.50 ±0.05 >0.50-1.00 ±0.11 >1.00-2.00 ±0.17 >2.00-3.00 ±7.00%S >3.00 ±10.00%S Hot rolled ±10.00%S	+20.00 -0
	≥25-40		±0.18		
	≥40-50		±0.20		
	≥50-60		±0.23		
	≥60-70		±0.30		
	≥70-80		±0.30		
	≥80-90		±0.30		
	≥90-100		±0.40		
	≥100-200		±0.50%D		
	≥200		To be agread		
JIS G3446	<50		±0.25	<3.00 ±0.30	+50 -0
	≥50		±0.5%	≥3.00 ±10.00%	

ASTM A249、ASTM A269 Tubing

Outside Diameter (inch)	(mm)	Thickness(mm) 0.5	0.6	0.7	0.8	0.9	1	1.2	1.5	2	2.5	3	4	5
	9.5													
	12													
1/2"	12.7													
	13													
	14													
5/8"	15.9													
3/4"	19.1													
7/8"	22.2													
1"	25.4													
1-1/8"	28.6													
1-1/4"	31.8													
1-1/2"	38.1													
	40													
	45													
2"	50.8													
	52													
2-1/4"	57.15													
2-3/8"	60.3													
2-1/2"	63.5													
	70													
3"	76.2													
	85													
3-1/2"	88.9													
4"	101.6													
4-1/8"	104.78													
4-1/4"	107.95													
4-1/2"	114.3													
5-1/4"	133.35													
6-1/4"	158.75													
8-5/8"	219.08													

The green part is just for ASTM A269 The blue part is just for both ASTM A249 & ASTM A269

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Product Specifications and Technical Parameters

Dimension Tolerance Table of ASTM A249

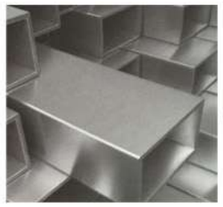
Outside Diameter		Thickness	Length
＜25.4mm	±0.10mm	±10%	OD＜50.8mm +3.0mm −0mm OD≥50.8mm +5.0mm −0mm
≥25.4-38.1mm	±0.15mm		
≥38.1-50.8mm	±0.20mm		
≥50.8-63.5mm	±0.25mm		
≥63.5-76.2mm	±0.30mm		
≥76.2-101.6mm	±0.38mm		
≥101.6-190.5mm	+0.38mm −0.64mm		
≥190.5-228.6mm	+0.38mm −1.14mm		

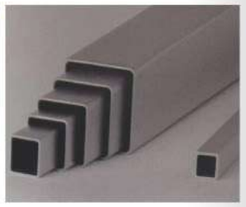
Dimension Tolerance Table of ASTM A269

Outside Diameter		Thickness	Length
＜38.1mm	±0.13mm	OD＜12.7mm ±15% OD≥12.7mm ±10%	OD＜38.1mm +3.2mm −0mm OD≥38.1mm +4.8mm −0mm
≥38.1-88.9mm	±0.25mm		
≥88.9-139.7mm	±0.38mm		
≥139.7-203.2mm	±0.76mm		
≥203.2-304.8mm	±1.01mm		
≥304.8-355.6mm	±1.26mm		

Stainless Steel Square & Rectangular Tube

Item	Grade	Size Range	Max Length	Processing Technic	Delivery Status	Standard	Surface
Seamless rectangular tube	304/L/H、316/L/H/Ti、321/H	20*20-400*400*2-30	12M	Cold drawing forming	Hard state or solid solution soft state	GB、ASME、ASTM、JIS、EN、DIN、GOST	Pickling Passivation , Finishing Polish , Wiredrawing
Welded rectangular tube	304/L/H、316/L/H/Ti、321/H	20*20-400*400*0.5-15	12M	Rolling welding	Solder polished or solid solution soft	GB、ASME、ASTM、JIS、EN、DIN、GOST	



Stainless Steel Sanitary Pipe

Item	Grade	Size Range	Max Length	Processing Technic	Delivery Status	Standard	Surface
Seamless sanitary grade pipe	304、304L、316L	OD12-325*0.5-12MM	12M	Precision rolling mechanical polishing	Hard or soft polishing	GB、ASME、ASTM、JIS、EN、DIN、GOST	Polished 400grit,0.2μ
Welded sanitary grade pipe				Automatic on-line welding,mechanical polishing			



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HUNAN GREAT STEEL PIPE CO.,LTD

Super Duplex Stianless Steel Pipe

(Super)Duplex stainless steels have a mixed microstructure of austenite and ferrite, combining the most beneficial properties of many ferritic and austenitic steels. It has excellent resistance to pitting corrosion, crevice corrosion, stress corrosion, uniform corrosion, due to the high content of Cr, Mo, N and other elements. And their advantages include good plasticity and hardening performance, cold deformation ability, good welding performance and so on, which are similar with austenitic stainless steel.

Duplex stainless steel is widely used in marine engineering, sea water treatment, chemical transport, transportation equipment, ship heat exchangers equipment, pipelines and other fields.

Our company fully grasps the performance and characteristics of the materials S32205 (S31803), S32750, and combines cold drawing and cold rolling process that precisely controls the cold deformation, heat treatment temperature time and cooling time of duplex stainless steel to avoid the long period stop during 850°C-950°C and 350°C-523°C range in order to achieve the best material performance of duplex stainless steel pipes.

Our company mastered more than ten technologies and obtained two national patents on duplex stainless steel.

Grade	C MAX	Si MAX	Mn MAX	P MAX	S MAX	Cr	Ni	Mo	N	Cu MAX
S32205	0.03	1.0	2.0	0.03	0.02	22.0-23.0	4.5-6.5	3.0-3.5	0.14-0.20	0.5
S31803	0.03	1.0	2.0	0.03	0.02	22.0-23.0	4.5-6.5	3.0-3.5	0.14-0.20	0.5
S32750	0.03	0.8	1.2	0.035	0.02	24.0-26.0	6.0-8.0	3.0-5.0	0.24-0.32	0.5

Grade	Density g/cm	Temperature °C	Coefficient of thermal expansion Mm/m°C	Annealing Temperature °C	Tensile Strength >Pm (Mpa) Min	Yield Strength Rp0.2 (>Mpa) Min	Elongation Min %
S32205	7.8	20-100	13.7	1025-1100	655	485	25
S31803	7.8	20-100	13.7	1025-1100	655	485	25
S32750	7.8	20-100	11.5	1025-1125	800	550	15

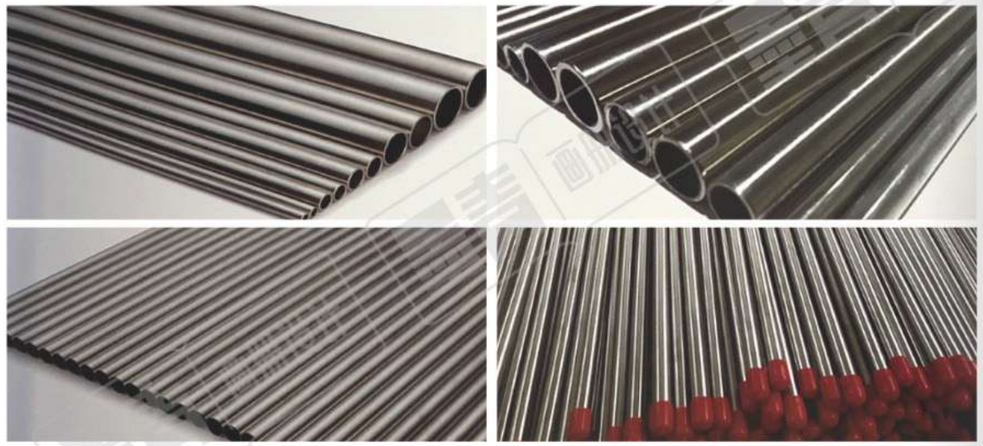



Precision Stainless Steel Seamless Pipe

Precision stainless steel seamless pipes require the precision of size tolerance, which are mainly used in ships, marine platforms, bullet train, aerospace equipment and so on for the fine dense card sets connected instrument pipe, hydraulic brake pipe, oil well control pipeline, chemical injection pipe and electric heating steam heating pipe.

Our company has introduced advanced high-speed precision multi-roll mill and bright annealing furnace. High-speed precision multi-roll machine can greatly improve the pipe diameter and wall thickness tolerance. The precision stainless steel pipe diameter tolerance our company produces is up to 0.3% D, and the wall thickness tolerance we can produce is up to 3% S, which effectively solve the problem of size tolerance of connection of precision steel pipes and cutting sleeves. Our company uses advanced bright annealing process by using a closed furnace under the protection of argon and nitrogen to make the surface of the steel pipes not exposed to oxygen to produce oxide skin, which can keep the inside and outside of the steel pipe and the original surface of metal bright and clean. During the process of bright annealing, the furnace temperature will be controlled accurately. The normal furnace temperature will be controlled at up and down 5°C to make the steel pipe annealing evenly and fully insulated so that the steel pipes will have better mechanical performance, which can be bent and reaming treatment.

Grade	Size Range	Max Length	Processing Technic	Delivery Status	Standard	OD Tolerance	W.T. Tolerance	Inspection	Remark
304/L/H/LN、316/L/H/LN/Ti、321/H、317/L/LN	OD14-89* 0.5-12MM	12M	Precision Rolling	Bright Annealing	EN10216-5DIN2391	±0.5%D or ±0.1mm take the maximum	±0.5%S or ±0.1mm take the maximum	100% ET, UT and water pressure hydraulic	Pre-bending processing
S31803、S32205、S32750	OD6-89* 0.8-12MM								



SINOTEC
湖南格润德管业有限公司
HUNAN GREAT STEEL PIPE CO.,LTD

Nickle Alloy Tube

Shinestar Steel Group has fully grasp the various material performances of high-temperature nickel alloy and the characteristics of pipe process through years of independent research on high-temperature nickel alloy pipes technologies. Our company uses advanced high-speed precision rolling mill, continuous automatic temperature control natural gas roller furace, automatic temperature control box annealing furnace and different material high temperature nickel alloy pickling process to produce 34 different materials of high-temperature nickel alloy seamless pipe. Our company has achieved 20 key technologies and 11 national patents. Our products have approved comprehensively by National Steel Materials Testing Center and SGS Testing Center, which have reached international standards and successfully replaced some of same imported products.

Key technologies: The uniformity and material purity of chemical composition of materials, the precise control of the variant amount of pipe process, the precise heat treatment temperature and time, different materials with acid formula process and the pickling time.

Item	Material	Size Range	Max Length	Processing Technic	Delivery status	Standard	Surface
High Temperature Nickel Alloy Pipe	N02200、N02201、N04400、N06600、N06690、N06625、N06985 (G3)、N08028、N08800、N08810、N08811、N08825、N10276、N10324、N10629、N10375	OD12-325* 0.8-20MM	12M	Cold-rolled	Annealing	GB、ASME、ASTM、JIS、EN、DIN、GOST	Bright tube, pickling, passivation, finishing polish, wire drawing

composition, physical and mechanical performance parameters of high temperature nickel-based alloys, and the production standards of steel pipes are shown in the table below.

TECHNICAL DATA

Standard Comparison Table

Standard / Item	ASTM A213/ A213M	ASTM A269/ A269M	ASTM A312/ A312M	ASTM A789/ A789M	ASTM A790/ A790M	ASTM B677	EN 10216-5	JIS-G3463	GB13296 -2007	GB/T14976 -2002
Grade	TP304 TP304L TP304H△ TP309S TP309H* TP310S TP310H* TP316 TP316L TP316H TP316Ti TP317 TP317L TP321 TP321H△ TP347 TP347H△	TP304 TP304L TP316 TP316L TP317 TP321 TP347 N08904	TP304 TP304L TP304H△ TP309S TP309H TP310S TP310H TP316 TP316L TP316H TP316Ti TP317 TP317L TP321 TP321H△ TP347	S31260 S31803 S32205 S32304 S32750 S32760	S31260 S31803 S32205 S32304 S32750 S32760	UNS N08904 (904L)	1.4307 1.1306 1.4301 1.4541 1.4550 1.4335 1.4404 1.4401 1.4571 1.4436 1.4435 1.4539 1.4948 1.4940 1.4912 1.4918 1.4462 1.4362 1.4410 1.4507 1.4501	SUS304TB/SUS304HBT/SUS304LTB/SUS309TB/SUS309STB/SUS310TB/SUS316TB/SUS316HTB/SUS316LTB/SUS310STB/SUS317TB/SUS317LTB/SUS321TB/SUS3321HTB/SUS347TB/SUS3347HTB/SUS329J1TB/SUS329J3TB/SUS329J4TB/SUS316TiTB/	0Cr18Ni9/00Cr19Ni10/1Cr19Ni9/0Cr18Ni11Nb/0Cr17Ni12Mo2/00Cr17Ni14Mo2/1Cr18Ni12Mo2Ti/1Cr18Ni12Mo3Ti/1Cr18NI9Ti/0Cr19Ni13Mo3/1Cr18Ni11Ti*/1Cr18Ni9/0Cr18Ni102Ti/1Cr19Ni11Nb/1Cr17Ni12Mo2/0Cr18Ni12Mo2Ti/1Cr18Ni12Mo3Ti/0Cr25Ni20/2Cr25Ni20/00Cr19Ni13Mo3	0Cr18Ni9/00Cr19Ni10/0Cr17Ni12Mo2/0Cr17Ni14Mo2/1Cr18Ni12Mo2Ti/1Cr18Ni12Mo3Ti/0Cr18Ni11N/0Cr18Ni9Ti/1Cr18Ni9Ti/0Cr25Ni20/0Cr18Ni12Mo2Ti/0Cr18Ni12Mo3Ti/00Cr19Ni13Mo3/0Cr19Ni13Mo3
YieldPoint (Mpa)	⩾170Mpa,⩾205Mpa		⩾170,⩾205	⩾450,⩾485, ⩾550	⩾450,⩾485, ⩾550	⩾220	⩾180;⩾160;⩾195;⩾200;⩾205;⩾190;⩾210;⩾230;⩾185;⩾450;⩾400;⩾500;⩾550	⩾205;⩾175;⩾390;⩾450	⩾175,⩾205	⩾175,⩾205
Tensile Strength (Mpa)	⩾480Mpa,⩾515Mpa		⩾480,⩾515	⩾620,⩾690, ⩾655, ⩾750,⩾800	⩾620,⩾690, ⩾655, ⩾750,⩾800	⩾490	⩾640;⩾700;⩾600;⩾800;⩾500;⩾510;⩾520;⩾490;⩾470;⩾460	⩾520;⩾480;⩾590;⩾620	⩾480,⩾520, ⩾550	⩾480,⩾520, ⩾550
Elongation (100%)	⩾35%		⩾35%	⩾25,⩾15	⩾25,⩾15	⩾35	⩾20;⩾22;⩾25;⩾35;⩾40;⩾45	⩾27;⩾30;⩾35;⩾10;⩾13;⩾18	⩾35,⩾40	⩾35,⩾40
Flattening Test(mm)	H=1.09t/(0.09+t/D) And test integrity	H=1.09t/ (0.09+t/D)	H=1.09t/(0.09+t/D) And test integrity		H=1.09t/(0.09+t/D) And test integrity		H=1.09t/(0.09+t/D)And test integrity,D＞150mmnot to do	H=1.09t/(0.09+t/D) And test integrity	S⩽10mm, H=1.09S/(0.09+S/D)	Choose to do S⩽10mm, H=1.09S/(0.09+S/D)
Flaring Test	Internal meridian expansion rate 21-68%D	a=600,Flaring rate 21-68%D		ASTM A450 inner diameter Expansion value⩾10%			a=600,Flaring rate 9-17%D, T＜10mm not to do	a=600, Flaring rate：20%D	S⩽10mm, GB/T242, a=600,Flaring rate：18%D	Choose to do S⩽10mm, GB/T242, a=300 400 600,Flaring rate：10%D
Grain Size	“*” “△”ASTM112, “△”7# or Thicker “*”6#or Thicker		H grade steel grade accord-ing to ADTM 112:7or Thicker (310H6or Thicker)	Agreement requirements (ferrite content)45-55%)	Agreement requirements (ferrite content)45-55%)			JIS G0551 7#or Thicker	90	
Hydraulic Test(Mpa)	D / Pmax: ＜25.4 / 7; 25.4-38.1 / 10; 38.1-50.8 / 14; 50.8-76.2 / 17; 76.2-127 / 24; ⩾127 / 31. Water pressure test P=220.6S/D user specified can be re-placed by non-destructive testing	P=220.6t/D,It can be replaced by E213 ultrasonic or E426 water pressure	P=2St/D,S=50%Rp0.2; D⩽88.9, Pmax⩽17;D＞88.9, Pmax⩽19; Choose one of ultrasonic, eddy current, water pressure	P=220.6t/D,It can be replaced by E213 ultrasonic or E426 water pressure, subject to negotiation	P=2St/D,S=50%Rp0.2;D⩽88.9, Pmax⩽17;D＞88.9, Pmax⩽19;Choose one of ultrasonic, eddy current, water pressure	P=2St/D,S=20000Psi(138Mpa);Choose one of ultrasonic, eddy current, water pressure	Test pressure 7Mpa; or P=2St/D, R=70%Rp0.2 in the formula; eddy current can be used instead	P=2St/D, R=Rm/4 in the formula; it can be replaced by non-destructive testing	8	GB/T241, P=2SR/D whereR=40%Rm, Pmax=20, eddy current flaw detection GB/T7735A level or GB/T5777C12.5 canbe used instead of water pressure
Heat Treatment	Requirement	Requirement	Requirement	Requirement	Requirement	Requirement	Requirement	Requirement	Requirement	Requirement
Tolerance For O.D (mm)	O.D.Range(D) / Allowable deviation: ⩽25.4 ±0.10; 25.4-38.1 ±0.15; ＞38.1-＜50.8 ±0.20; 50.8-＜63.5 ±0.25; 63.5-＜76.2 ±0.30; 76.2-101.6 ±0.38; ＞101.6-190.5 +0.38/-0.64; ＞190.5-228.6 +0.38/-1.14	O.D.Range(D) / Allowable deviation: ⩽12.7 ±0.13; ＞12.7-38.1 ±0.13; ＞38.1-88.9 ±0.25; ＞88.9-139.7 ±0.38; ＞139.7-203.2 ±0.76	O.D.Range(D) / Allowable deviation: 10.29-48.26 +0.4/-0.8; ＞48.26-114.3 +0.8/-0.8; ＞114.3-＜219.08 +1.6/-0.8; ＞219.08-457.2 +2.4/-0.8; ＞457.2-660.4 +3.2/-0.8; ＞660.4-864 +4.0/-0.8; ＞864-1219.2 +4.8/-0.8	O.D.Range(D) / Allowable deviation: ⩽12.7 ±0.13; ＞12.7-31.8 ±0.13; ＞31.8-88.9 ±0.25; ＞88.9-139.7 ±0.38; ＞139.7-203.2 ±0.76	O.D. / Allowable deviation: 10.29-48.26 +0.4/-0.8; ＞48.26-114.3 +0.8/-0.8; ＞114.3-219.08 +1.6/-0.8; ＞219.08-457.2 +2.4/-0.8	O.D. / Allowable deviation: 10-＜16 ±0.13; 16-38 ±0.19; ＞38-76 ±0.25; ＞76-114 ±0.38; ＞114-152 ±0.51; ＞152-168 ±0.64; ＞168-219 ±0.79; ＞219-356 +1.57/-0.79; ＞356-610 +3.18/-0.79	O.D. / Allowable deviation: D3 ±0.7%与±0.30mm Choose the larger one; D4 ±0.5%与±0.10mm Choose the larger one	O.D. / Allowable deviation: ＜60 ±0.25; 60-＜80 ±0.30; 80-＜100 ±0.40; 100-＜120 +0.4/-0.6; 120-＜160 +0.4/-0.8; 160-＜200 +0.4/-1.2; ⩾200 +0.4/-1.6	O.D. / Allowable deviation: 6-30 +0.15/-0.2; ＞30-50 ±0.30; ＞50 ±0.75%D	O.D. / Ordinary / Higher level: 6-10 ±0.20 ±0.15; ＞10-30 ±0.30 ±0.20; ＞30-50 ±0.40 ±0.30; ＞50 ±0.9%D ±0.8%D
Tolerance For W.T. (mm)	W.T. / Allowable deviation: ⩽38.1 ±20%, -0; ＞38.1 ±22%, -0	W.T. / Allowable deviation: ⩽12.7 ±15%; ＞12.7-203.2 ±10%	W.T. / Allowable deviation: 10.29-73.03 +20%/-12.5%; 88.9-457.2 (t/D⩽5%) +22.5%/-12.5%; 88.9-457.2 (t/D＞5%) +15%/-12.5%	W.T. / Allowable deviation: ⩽12.7 ±15%; ＞12.7-203.2 ±10%	W.T. / Allowable deviation: 10.29-73.03 +20%/-12.5%; 88.9-457.2 (t/D⩽5%) +22.5%/-12.5%; 88.9-457.2 (t/D＞5%) +15%/-12.5%	W.T. / Allowable deviation: 10-＜16 ±15%; 16-114 ±10%; ＞114-219 ±12.5%; ＞219-610 +15%/-12.5%	W.T. / Allowable deviation: T3 ±10%与±0.20mm Choose the larger one; T4 ±7.5%与±0.15mm Choose the larger one	W.T. / Allowable deviation: D＜40, t＜2 +0.4/0; D＜40, t⩾2 +20%t-0; D⩾40 +20%t-0	W.T. / Allowable deviation: ⩽38 +20%, -0; ＞38 +22%, -0	W.T. / Ordinary / Higher level: ⩽3 ±0.14%S +12.55 -10%S; ＞3 +12.5S -10%S ±10%S
Bending (mm/m)	D⩽127, 0.833 127＜D⩽203.2,1.25 203.2＜D⩽323.9,1.67	D⩽127, 0.833 127＜D⩽203.2,1.25 203.2＜D⩽323.9,1.67	D⩽127, 0.833 127＜D⩽203.2,1.25 203.2＜D⩽323.9,1.67	D⩽127, 0.833 127＜D⩽203.2,1.25 203.2＜D⩽323.9,1.67	Reasonably Straight	Reasonably Straight	⩽0.0015L (Tube length) and 3mm/m	Practicality straight	⩽1.5mm/m	S⩽15⩽1.5mm/m S＞15⩽2mm/m
Hardness	When the wall thickness is the average wall thickness, the wall thickness tolerance is 10%S	HRB<=90, t<1.65mm can be made as table or HV, inner diameter<6.4, t<=0.51 can not be made		HRB⩽290(S32750/S32760⩽300) HRC⩽30(S32750⩽32)	HRB⩽290(S32750/S32760⩽300) HRC⩽30(S32750⩽32)	HRB⩽290(S32750/S32760⩽300) HRC⩽30(S32750⩽32)		HRB⩽90 (special requirements)	Optional hardness test HRB<=90; after negotiation, the allowable deviation of the wall thickness of heat exchanger tubes with outer diameter<=38mm can be determined according to Delivery within ±0.01%S, the allowable deviation of wall thickness for heat exchanger tubes with outer diameter >38mm can be delivered at ±0.01%S	

Chemical Requirement

U.S.A Stainless Steel Grade Chemical Composition Table (A312/A312m)

Grade	UNS Design-ation[A]	C	Mn	P	S	Si	Cr	Ni	Mo	Ti	Nb	Ta max	N	Other
TP304	S30400	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0						
TP304L	S30403	0.035[D]	2.00	0.045	0.030	1.00	18.0-20.0	8.0-13.0						
TP304H	S30409	0.04-0.10	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0						
TP304N	S30451	0.08	2.00	0.045	0.030	1.00	18.0-20.0	8.0-11.0					0.10-0.16	
TP304LN	S30453	0.035	2.00	0.045	0.030	1.00	18.0-20.0	8.0-12.0					0.10-0.16	
TP3095	S30908	0.08	2.00	0.045	0.030	1.00	22.0-24.0	12.0-15.0	0.75					
TP309H	S30909	0.04-0.10	2.00	0.045	0.030	1.00	22.0-24.0	12.0-15.0						
TP309Cb	S30940	0.08	2.00	0.045	0.030	1.00	22.0-24.0	12.0-16.0	0.75		10*Cmin, 1.10max			
TP309HCb	S30941	0.04-0.10	2.00	0.045	0.030	1.00	22.0-24.0	12.0-16.0	0.75		10*Cmin, 1.10max			
TP310S	S31008	0.08	2.00	0.045	0.030	1.00	24.0-26.0	19.0-22.0	0.75					
TP31CH	S31009	0.04-010	2.00	0.045	0.030	1.00	24.0-26.0	19.0-22.0						
TP310Cb	S31040	0.08	2.00	0.045	0.030	1.00	24.0-26.0	19.0-22.0	0.75		10*Cmin, 1.10max			
TP310HCb	S31041	0.04-0.10	2.00	0.045	0.030	1.00	24.0-26.0	19.0-22.0	0.75		10*Cmin, 1.10max			
TP316	S31600	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00					
TP316L	S31603	0035[D]	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00					
TP316H	S31609	0.04-0.10	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00					
TP316Ti	S31635	0.08	2.00	0.045	0.030	0.75	16.0-18.0	10.0-14.0	2.00-3.00	5*(C+N) -0.70			0.10	
TP316N	S31651	0.08	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00				0.10-0.16	
TP316LN	S31653	0.035	2.00	0.045	0.030	1.00	16.0-18.0	10.0-14.0	2.00-3.00				0.10-0.16	
TP317	S31700	0.08	2.00	0.045	0.030	1.00	18.0-20.0	11.0-15.0	3.00-4.00					
TP317L	S31703	0.035	2.00	0.045	0.030	1.00	18.0-20.0	11.0-15.0	3.00-4.00					
TP321	S32100	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0		F			0.10	
TP321H	S32109	0.04-0.10	2.00	0.045	0.030	1.00	17.0-19.0	9.0-12.0		4*(C+N)min; 0.70max			0.10	
TP347	S34700	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0			G			
TP347H	S34709	0.04-0.10	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0			H			
TP347LN	S34751	0.005-0.020	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0			0.20-0.50[I]		0.06-0.10	
TP348	S34800	0.08	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0			G	0.10		
TP348H	S34809	0.04-0.10	2.00	0.045	0.030	1.00	17.0-19.0	9.0-13.0			H	0.10		

A. New designation established in accordance with Practice E527 and SAE J1086.

B. Maximum, unless otherwise indicated.

C. The method of analysis for nitrogen shall be a matter of agreement between the purchaser and manufacturer.

D. For small diameter or thin walls or both, where many drawing passes are required, a carbon maximum of 0.040% is necessary in grades TP304L and TP316L. Small outside diameter tubes are defined as those less than 0. 500 in. (12.7 mm) in outside diameter and light wall tubes as those less than 0.049 in. (1.20 mm) in average wall thickness (0.044) in.[(1.10 mm) in minimum wall thickness].

E. For welded pipe, the phosphorus maximum shall be 0.045%.

F.Ti 5 × (C+N] min, 0.70 max.

G. The niobium content shall be not less than ten times the carbon content and not more than 1.00 %.H. The niobium content shall be not less then eight times the carton content and not more than 1.00%.I. Grade S34751 shall have a niobium content of not less than 15 times the carbon content.

China Stainless Steel Grade Chemical Composition Table (Gb/T20878)

Type	S/N	GB/T 20878 UNS Designation	Grade	C	Si	Mn	P	S	Ni	Cr	Mo	Cu	N	Other
Austenite	1	S30210	12Cr18Ni9	0.15	1.00	2.00	0.035	0.030	8.00-10.00	17.00-19.00			0.10	
	2	S30408	06Cr19Ni10	0.08	1.00	2.00	0.035	0.030	8.00-10.00	18.00-20.00				
	3	S30403	022Cr19Ni10	0.03	1.00	2.00	0.035	0.030	8.00-12.00	18.00-20.00				
	4	S30458	06Cr19Ni10N	0.08	1.00	2.00	0.035	0.030	8.00-11.00	18.00-20.00			0.10-0.16	
	5	S30478	06Cr19Ni9NbN	0.08	1.00	2.50	0.035	0.030	7.50-10.50	18.00-20.00			0.15-0.30	Nb:0.15
	6	S30453	022Cr19Ni10N	0.03	1.00	2.00	0.035	0.030	8.00-11.00	18.00-20.00			0.10-0.16	
	7	S30908	06Cr23Ni13	0.08	1.00	2.00	0.035	0.030	12.00-15.00	22.00-24.00				
	8	S31008	06Cr25Ni20	0.08	1.50	2.00	0.035	0.030	19.00-22.00	22.00-26.00				
	9	S31608	06Cr17Ni12Mo2	0.08	1.00	2.00	0.035	0.030	10.00-14.00	16.00-18.00	2.00-3.00			
	10	S31603	022Cr17Ni12Mo2	0.03	1.00	2.00	0.035	0.030	10.00-14.00	16.00-18.00	2.00-3.00			
	11	S31609	07Cr17Ni12Mo2	0.04-0.10	1.00	2.00	0.035	0.030	10.00-14.00	16.00-18.00	2.00-3.00			
	12	S31668	06Cr17Ni12Mo2Ti	0.08	1.00	2.00	0.035	0.030	10.00-14.00	16.00-18.00	2.00-3.00			Ti5C-0.70
	13	S31658	06Cr17Ni12Mo2N	0.08	1.00	2.00	0.035	0.030	10.00-13.00	16.00-18.00	2.00-3.00		0.10-0.16	
	14	S31653	022Cr17Ni12Mo2N	0.03	1.00	2.00	0.035	0.030	10.00-13.00	16.00-18.00	2.00-3.00		0.10-0.16	
	15	S31688	06Cr18Ni12Mo2Cu2	0.08	1.00	2.00	0.035	0.030	10.00-14.00	17.00-19.00	1.20-2.75	1.00-2.50		
	16	531683	022Cr18Ni14Mo2Cu2	0.03	1.00	2.00	0.035	0.030	12.00-16.00	17.00-19.00	1.20-2.75	1.00-2.50		
	17	S31708	06Cr19Ni13Mo3	0.08	1.00	2.00	0.035	0.030	11.00-15.00	18.00-20.00	3.00-4.00			
	18	S31703	022Cr19Ni13Mo3	0.03	1.00	2.00	0.035	0.030	11.00-15.00	18.00-20.00	3.00-4.00			
	19	S32168	06Cr18Ni11Ti	0.08	1.00	2.00	0.035	0.030	9.00-12.00	17.00-19.00				Ti:5C-0.70
	20	S32169	07Cr19Ni11Ti	0.04-0.10	0.75	2.00	0.035	0.030	9.00-13.00	17.00-20.00				Ti:4C-0.60
	21	S34778	06Cr18Ni11Nb	0.08	1.00	2.00	0.035	0.030	9.00-12.00	17.00-19.00				Nb:10C-1.10
	22	S34779	07Cr18Ni11Nb	0.04-0.10	1.00	2.00	0.035	0.030	9.00-12.00	17.00-19.00				Nb:8C-1.10
Ferrite	23	S11348	06Cr13Al	0.08	1.00	1.00	0.035	0.030	0.60	11.50-14.50				Al:0.10-0.30
	24	S11510	10Cr15	0.12	1.00	1.00	0.035	0.030	0.60	14.00-16.00				
	25	S11710	10Cr17	0.12	1.00	1.00	0.035	0.030	0.60	16.00-18.00				
	26	S11863	022Cr18Ti	0.03	0.75	1.00	0.035	0.030	0.60	16.00-19.00				Ti or Nb:0.10-1.00
	27	S11972	019Cr19Mo2NbTi	0.025	1.00	1.00	0.035	0.030	0.60	17.50-19.50	1.75-2.50		0.035	(Ti+Nb):[0.20+ 4(C+N)]-0.80
Marten-sitic	28	S41008	06Cr13	0.08	1.00	1.00	0.035	0.030	0.60	11.50-13.50				
	29	S41010	12Cr13	0.15	1.00	1.00	0.035	0.030	0.60	11.50-13.50				

Except for the indicated range or minimum value, the components listed in the table are all maximum values.

The value in the brackets is the maximum value allowed

Super Austenitic Stainless UNS N08904(904L)

AVAILABLE STANDARDS: AST/ASME A312/SA312; ASME B677;EN0216-5

Properties & Applications

904L is Super stainless stell with low carbon, high Ni and Mo.Good activation-passivation transition ability, good resistance to sulfur, acetic acid, methane acid and phosphoric acid corrosion. With low carbon (max.0.020%), there is no carbide precipitation in normal heat treatment and welding, thus eliminating subsequent risk of intergranular corrosion.

Applications

Equipments like reactors for petro-chemical industry. Gas desulfurization equipment, like tower shell, flue, shutter spray system. Washers and fans used in organic acid process system. Equipments for sea water processing, paper pulp, sulfur, nitric acid and pharmacy. Food equipment/jars/bottes, centrifugal machine, reactors used in pharmaceutical factory.

Cherical Compositon

C max	Si max	Mn max	P max	S max	Cr	Ni	Mo	N max	Cu max
0.02	1.0	2.0	0.040	0.030	19.0-23.0	23.0-28.0	4.0-5.0	0.10	1.0-2.0

Density & Coefficient of Expansion

Density	Temperature	Coefficient of Expansion
8.24g/cm³	20-100°C	15.0*10-6k-μm/m°C
	20-200°C	15.6*10-6k-μm/m°C
	20-300°C	16.1*10-6k-μm/m°C

Physical Properties

Condition	Tensile Strength ⩾Pm (Mpa)	Yield Strength Rp0.2 (⩾Mpa)	Elongation Min
Annealing 1100-1040°C	520-720	230	35

Available Size Range for Seamless

Pipe/Tubes	OD	Thickness
	OD:6-114mm	WT:0.5-15mm

SINOTEC
湖南格润德管业有限公司
HUNAN GREAT STEEL PIPE CO.,LTD

Physical Properties Table

Stainless Steel Grade Chemical Composition Table

No.		German DIN Grade	C max	Si max	Mn max	P max	S max	Cr	Mo	Ti	Cu max	Fe max	Al max	Ni	Co max	W	V	Mg	Nb	Li	Total Impu -rities	Mark
1	MonelK500 (UNS NO5500)	W.-Nr.2.4360	0.3	0.5	2		0.024				28-34	2.5		⩾63								
2	Monel400 (UNS NO440	W.-Nr.2.4	0.3	0.5	2		0.024			0.35 -0.85	28-34	2.5	2.3-3.15	63-66								
3	N2		0.005	0.003	0.002		0.001				0.001	0.007		⩾99.98				0.003			0.02	
4		2.4068	0.01	0.03	0.002		0.001				0.015	0.04		⩾99.9				0.001			0.1	
5	No2200 (N6)	2.4066	0.1	0.1	0.05		0.005				0.06	0.1		⩾99.6				0.1			0.5	
6	N8		0.2	0.15	0.2		0.015				0.15	0.3		⩾99				0.02			0.35	
7	DN		0.02 -0.10	0.02 -0.1	0.05		0.005				0.06	0.1		⩾99.35				0.1			0.3	
8	NY1		0.02	0.1			0.005				0.1	0.1		⩾99.7				0.1			0.6	
9	NY2			0.1			0.002 -0.01				0.01 -0.1	0.1		⩾99.4							1	
10	NY3		0.1	0.2			0.005				0.15	0.25		⩾99				0.1			0.4	
11	NMg 0.1		0.05	0.02	0.05		0.005				0.05	0.07		⩾99.6				0.07 -0.15				
12	NS10.19		0.1	0.15 -0.25	0.05		0.005				0.05	0.07		⩾99.4				0.05			0.5	
13	UNS NO6600 (Inconel 600)	W.-Nr.2.4816	0.15	0.5	1	0.015	0.015	14-17			0.5	6-10		⩾72								
14	UNS NO6601 (Inconel 601)	W.-Nr.2.4815	0.1	0.5	1.5	0.02	0.015	21-25			1	Margin	1.0-1.7	59-63								
15	Hastelloy C276 (UNS N10276)	W.-Nr.2.4819	0.01	0.08	1	0.04	0.03	14.5 -16.5	15-17			4-7		Margin	2.5	3-4.5	0.35					
16	Hastelloy C		0.08	1	1	0.04	0.03	14.5 -16.5	15-17			4-7		Margin	2.5	3-4.5	0.35					
17	Hastelloy C22 (UNS N6022)	W.-Nr.2.4602	0.015	0.08	0.5	0.02	0.02	20 -22.5	12.5 -14.5			2-6		Margin	2.5	3-4.5	0.35					
18	Hastelloy B-2 (UNS N10665)	W.-Nr.2.4617	0.02	0.1	1.0	0.04	0.03	1.0	26-30			2-7		Margin	1.0							
19	Hastelloy B		0.05	1.0	1.0	0.04	0.03	1.0	26-30			4-6		Margin	2.5		0.2-0.4					
20	UNS NO6625 (Inconel 625)	W.-Nr.2.4856	0.1	0.5	0.5	0.015	0.015	20-23	8-10	0.4	0.5	5		⩾58					3.15 -4.15	0.4		
21	UNS NO7718 (Inconel 718)	W.-Nr.2.4668	0.08	0.35	0.35		0.01	17-21	2.8-3.3	0.7 -1.15	0.3	Margin	0.2-0.8	50-55	1				4.75 -5.5			
22	UNS NO8825 (Incoloy 825)	W.-Nr.2.4858	0.05	0.5	1	0.02	0.03	19.5 -23.5	2.5-3.5	0.6 -1.2	1.5-3	Margin		38-46								
23	UNS NO8800 (Incoloy 800)	1.4876	0.1	1	1.5		0.015	19-23		0.15 -0.6	0.75	Margin	0.15-0.6	30-35								Al+Ti= 0.85-1.20
24	UNS NO8810 (Incoloy 800H)	1.4958	0.05 -0.1	1	1.5		0.015	19-23		0.15 -0.6	0.75	Margin	0.15-0.6	30-35								Al+Ti= 0.85-1.20
25	UNS NO8811 (Incoloy 800HT)	1.4959	0.06 -0.1	1	1.5		0.015	19-23		0.15 -0.6	0.75	Margin	0.15-0.6	30-35								Al+Ti= 0.85-1.20

Physical Properties Table

No.	United States UNS Grade	German DIN Grade	Density (g/cm^3)	Melting Point(°C)	Alloy and State	Tensile Strength (Rm N/mm^2)	Yield Strength (RP0.2N/mm^2)	Elongation (A5%)	Brinell Hardness
1	Monel400 (UNS NO440)	W.-Nr. 2.4	8.83	1300-1390		480	170	35	
2	MonelK500 (UNS NO5500)	W.-Nr. 2.4360	8.84	1316-1400		960	390	20	
3	NO2200	2.4066	8.9	1500-1600	200 201	380	100	40	
4	NO2201	2.4068							
5	UNS NO6600 (inconel 600)	W.-Nr. 2.4816	8.4	1370-1425	Annealing treatment	550	240	30	⩽195
					Solution treatment	500	180	35	⩽185
6	UNS NO6601 (inconel 601)	W.-Nr. 2.4815	8.1	1320-1370	Annealing treatment	650	300	30	
					Solution treatment	600	240	30	⩽220
7	Hastelloy C276 (UNS N10276)	W.-Nr. 2.4819	8.9	1325-1370	Hastelloy C/C276	690	283	40	
8	Hastelloy C								
9	Hastelloy C22 (UNS N6022)	W.-Nr. 2.4602	8.9	1325-1370	Hastelloy C/C22	690	283	40	
10	Hastelloy B-2 (UNS N10665)	W.-Nr. 2.4617	9.24	1330-1380	Hastelloy B-2	690	310	40	
11	Hastelloy B								
12	UNS NO6625 (inconel 625)	W.-Nr. 2.4856	8.4	1390-1350	625	760	345	30	⩽220
13	UNS NO7718 (inconel 718)	W.-Nr. 2.4668	8.2	1260-1340	Solution treatment	965	550	30	⩽363
14	UNS NO8825 (incoloy 825)	W.-Nr. 2.4858	8.1	1370-1400	825	500	220	30	
15	UNS NO8800 (incoloy 800)	1.4876	8.0	1350-1400	800	500	210	35	
16	UNS NO8810 (incoloy 800H)	1.4958	8.0	1350-1400	800H	450	180	35	

Outer Diameter And Wall Thickness

Nominal Diameter		Tube Outer Diameter	AISI B36.10 B36.19																	
ND	NPS	D	Sch5S	Sch10S	Sch10	Sch20	Sch30	Sch40S	STD	Sch40	Sch60	Sch80	XS	Sch80S	Sch100	Sch120	Sch140	Sch160	XXS
6	1/8	10.3	-	1.24	-	-	-	1.73	1.73	1.73	-	2.41	2.41	2.41	-	-	-	-	-
8	1/4	13.7	-	1.65	-	-	-	2.24	2.24	2.24	-	3.02	3.02	3.02	-	-	-	-	-
10	3/8	17.1	-	1.65	-	-	-	2.31	2.31	2.31	-	3.20	3.20	3.20	-	-	-	-	-
15	1/2	21.3	1.65	2.11	-	-	-	2.77	2.77	2.77	-	3.73	3.73	3.73	-	-	-	4.78	7.47
20	3/4	26.7	1.65	2.11	-	-	-	2.87	2.87	2.87	-	3.91	3.91	3.91	-	-	-	5.56	7.82
25	1	33.4	1.65	2.77	-	-	-	3.38	3.38	3.38	-	4.55	4.55	4.55	-	-	-	6.35	9.09
32	1 (1/4)	42.2	1.65	2.77	-	-	-	3.56	3.56	3.56	-	4.85	4.85	4.85	-	-	-	6.35	9.70
40	1(1/2)	48.3	1.65	2.77	-	-	-	3.68	3.68	3.68	-	5.08	5.08	5.08	-	-	-	7.14	10.15
50	2	60.3	1.65	2.77	-	-	-	3.91	3.91	3.91	-	5.54	5.54	5.54	-	-	-	8.74	11.07
65	2(1/2)	73.0	2.11	3.05	-	-	-	5.16	5.16	5.16	-	7.01	7.01	7.01	-	-	-	9.53	14.02
80	3	88.9	2.11	3.05	-	-	-	5.49	5.49	5.49	-	7.62	7.62	7.62	-	-	-	11.13	15.24
90	3(1/2)	101.6	2.11	3.05	-	-	-	5.74	5.74	5.74	-	8.08	8.08	8.08	-	-	-	-	-
100	4	114.3	2.11	3.05	-	-	-	6.02	6.02	6.02	-	8.56	8.56	8.56	-	11.13	-	13.49	17.12
125	5	141.3	2.77	3.4	-	-	-	6.55	6.55	6.55	-	9.53	9.53	9.53	-	12.70	-	15.88	19.05
150	6	168.3	2.77	3.4	-	-	-	7.11	7.11	7.11	-	10.97	10.97	10.97	-	14.27	-	18.26	21.95
200	8	219.1	2.77	3.76	-	6.35	7.04	8.18	8.18	8.18	10.31	12.70	12.70	12.70	15.09	18.26	20.62	23.01	22.23
250	10	273.1	3.40	4.19	-	6.35	7.80	9.27	9.27	9.27	12.70	15.09	12.70	12.70	18.26	21.44	25.40	28.58	25.40
300	12	323.9	3.96	4.57	-	6.35	8.38	9.53	9.53	10.31	14.27	17.48	12.70	12.70	21.44	25.40	28.58	33.32	25.40
350	14	355.6	3.96	4.78	6.35	7.92	9.53	-	9.53	11.13	15.09	19.05	12.70	-	23.83	27.79	31.75	35.71	-
400	16	406.4	4.19	4.78	6.35	7.92	9.53	-	9.53	12.70	16.66	21.44	12.70	-	26.19	30.96	36.53	40.49	-
450	18	457.2	4.19	4.78	6.35	7.92	11.13	-	9.53	14.27	19.05	23.83	12.70	-	29.36	34.93	39.67	45.24	-
500	20	508.0	4.78	5.54	6.35	9.53	12.70	-	9.53	15.09	20.62	26.19	12.70	-	32.54	38.10	44.45	50.01	-
550	22	559	4.78	5.54	6.35	9.53	12.70	-	9.53	-	22.23	28.58	12.70	-	34.93	41.28	47.63	53.98	-
600	24	610	5.54	6.35	6.35	9.53	14.27	-	9.53	17.48	24.61	30.96	12.70	-	38.89	46.02	52.37	59.54	-
650	26	660	-	-	7.92	12.70	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
700	28	711	-	-	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
750	30	762	6.35	7.92	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
800	32	813	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
850	34	864	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
900	36	914	-	-	7.92	12.70	15.88	-	9.53	19.05	-	-	12.70	-	-	-	-	-	-
950	38	965	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1000	40	1016	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1050	42	1067	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1100	44	1118	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1150	46	1168	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1200	48	1219	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-