



Hunan Standard Steel Co.,Ltd.

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Hunan Standard Steel Co.,Ltd
Member of Husteel Industry Group



A Introduction

Company Profile

Hunan Standard Steel Co.,Ltd as the professional manufacturer of steel pipe and pipe fittings, is a Sino-Singapore joint venture enterprise which commenced its construction from 1989 and put into production on July 25, 1990. The company is located in an industrial zone in Xinsha town, Changsha city. Standard Steel will, taking the scientific developments view as guideline in its overall reformation and development, stick to the development of quality-profitability road under the guidance of science and technology, and persist in extraversive development with implementation of strategy of taking central china as standing ground and developing southwest. The group will make the great efforts to reach a production scale of more than 10 million tons with an annual sales income of over 30 billion RMB into the rank of 500 top steel enterprises in the world.

Hunan Standard Steel Co.,Ltd has a capacity to produce full range and a wide variety of quality seamless steel pipes including structure tubes, liquid pipes, boiler tubes, hydraulic pillar tubes, casing, line pipe, drill pipes, petroleum cracking tubes, and owns 3 sets of cold drawn seamless steel pipe production line, which can product pipes with diameter from 10.29mm to 114.3mm, and 2 sets of hot-rolled seamless steel pipe production line, which can product pipes with diameter from 114.3mm to 457.20mm, and 3 sets of hot-expanded seamless steel pipe production line, which can product pipes with diameter from 219.08mm to 914.40mm, besides, we have 4 continuous rolling equipments, which can product pipes with diameter from 60.3mm to 406.40mm. The steel products are widely used in aviation, aerospace, national defense equipment, oil exploration, engineering machinery, automobiles, railway rolling stock, new energy and other industries and fields. Its exporting markets cover over 100 global main regions and countries with ten million tons Iron and steel capability.

So far, Hunan Standard Steel Co.,Ltd is the predecessor of branch of China's oil pipeline and gas pipeline science research institute, as the most authoritative pipeline engineering research institute, consists of eight backbone institute and line pipe bureau postdoctoral research stations, oil and gas pipe is "safe" the main body of the national engineering laboratory on units, is China technology center and plumbing contractor as well as steel products supplier branch of China welding association director branch pipe welding unit, and a large number of sophisticated equipment and high-end talent in pipeline engineering materials, pipe welding technology, piping, special tools and pipeline construction technology, pipeline corrosion protection technology, piping nondestructive testing technology, pipeline safety evaluation, pipe information standard eight fields a leading domestic level, undertake and fulfill the country and provincial key technology research projects more than 200 items, has a number of national patent results at home and abroad, and key pipeline engineering application widely.



EQUIPMENT ENSURE QUALITY

设备保证质量





严密质控 企誉长青

**STRICT QUALITY CONTROL, GOOD
REPUTATION FOREVER**

品质就是品牌，而生产设备是保证品质的前提，也是实现现代化生产的基础，高品质来自于精良的设备和雄厚的科研力量。
Quality is the brand, and production equipment is the precondition to guarantee the quality, but also realize modern production basis, High-quality root in excellent equipment and strong research and development capability.





我们的质量准则

OUR QUALITY PRINCIPLE

质量管理，要从检验最终为结果，
转向全过程控制质量，全员抓质量。

Quality management shall change from checking the final results to control the quality in the whole course and focusing on quality by all employees

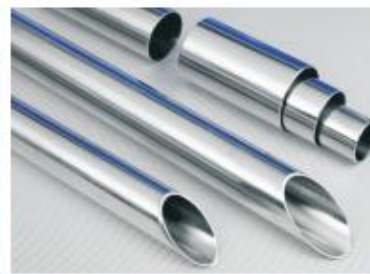




TO PROVIDE CUSTOMERS WITH THE HIGHEST QUALITY PRODUCTS IS OUR ULTIMATE GOAL

为客户提供最优质的产品
是对客户的最终目标

质量引导品牌，品牌严求质量。
一个执著的信念，一路不曾停息的追求。
Quality navigates brand and brand claims quality.
A persistent faith and an unceasingly pursuit along the way;





一点一滴,一个细小的细节,一分一毫,一个高品质的产品,一心一意,服务周全,
不断的创新理念,锐意进取,不断变革只为做的更好.

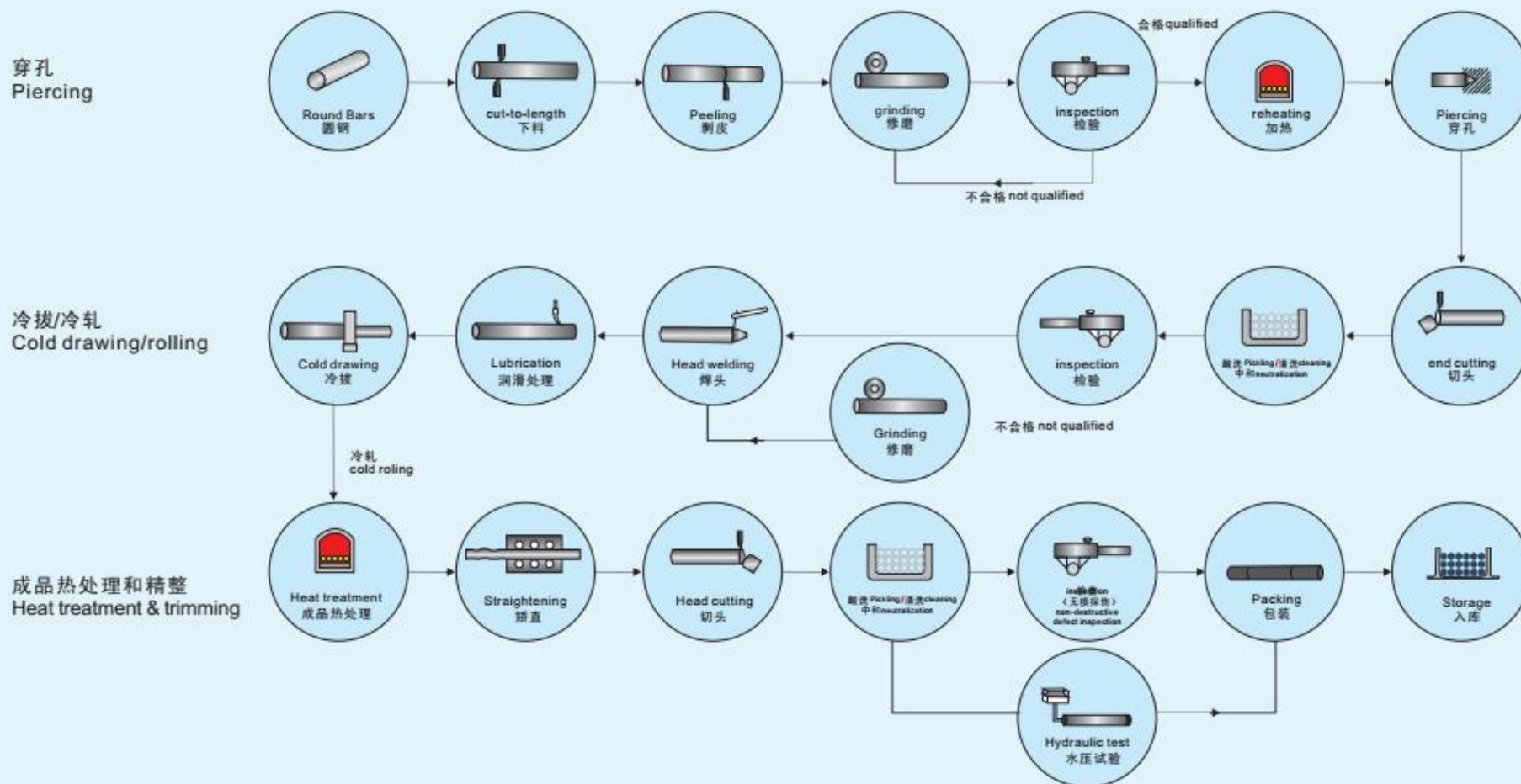
We make quality products by focusing every tiny detail and provide high quality services by our dedication and devotion. Our core values have been innovation, efficiency and continuous improvements. The continuous improvements on quality standards by implementing process control and prevention techniques, provides us momentum in the field that further enables us to provide excellent quality products to our esteemed customers.

PRODUCT QUALITY FIRST, INTEGRITY BASED
DISPLAY 产品展示



PROCESS FLOW

工艺流程





Advantage For Straight Tube, Bright Annealed Tube

直管，光亮管的优点

Superior Surface Finish 表面更加细腻

传统的退火方式是在一个开放式的退火炉中，氧气和钢管表面接触会产生氧化皮，使得钢管表面是粗糙的。我们志发采用的是先进的光亮退火工艺，热处理是在一个封闭式的炉子中进行，在氮气和氢气的保护下，氧气不会和钢管表面接触，不产生氧化皮，相反在退火之后，钢管还是保持了金属原有的表面，干净，光亮和细腻。

特别是对于长度在12米以上的管子，传统工艺的酸洗管内孔不易清洗干净，但是我们的光亮退火管就不存在这种问题，无论是内表面还是外表面，都会非常干净。



Surface Finish 表面处理
Annealed, polished, etc. 退火，酸洗表面，抛光表面
Process Method 加工方法
Cold Drawn/Cold Rolled 冷拔/冷轧
Delivery Conditions 交货条件
Annealed & Pickled 退火、酸洗
Applications 用途
For filications 用途
For fluid and gas transport, structure and machining.
液体和气体运输、建筑和机械加工
Packing 包装
Bundles for each piece then packed in seaworthy wooden cases.
编织带捆扎，或木箱包装

Size 尺寸
ANSI/ASME size as under, other standards of size is for ready choice
O. D. 外径
0.23" to 48" (5.8mm-1219mm)
W. T. 壁厚
0.44" to 2" (1.0mm-50.8mm)
Length 长度
Max. 18 Meters
NPS
1/8"-48"
Schedule
5/5S, 10/10S, 20/20S, 40/40S, 80/80S, 120/120S, 160/160S
acc. to ANSI B36.19/36.10



The traditional Annealing method is performed in a so called open furnace, where the atmospheric oxygen causes scaling of the heat treated materials, which makes the surface rough. MTSCO has developed a special bright annealing process, the heat treatment is performed in a so called closed furnace. The heat treated materials is protected by an inert gas atmosphere, which guarantees the oxygen cannot enter the furnace or come in to contact with the materials and react to form scale on or tarnish the materials. The surface finish is clean, bright and precision, which is an excellent starting point for further process, like electro-polishing and mechanical polishing.

Especially for the tube with length more than 12 meters, the traditional pickling tube is very hard to clean the inner surface, however, with the bright annealing method, our tubing is much cleaner, smoother on both inner and outer surfaces.

P RODUCT DISPLAY 产品展示

QUALITY FIRST, INTEGRITY BASED

优质的产品,完美的呈现,不同的需求,同样的要求!
Quality products, perfect presentation, different needs, same standards.

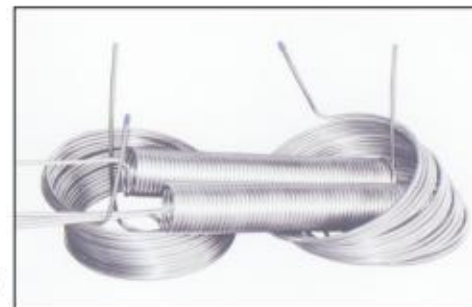


Why choose coiled tubing? 为什么选择盘管?

Reduce Your Cost 降低成本

我们生产盘管长度可能达到1000米以上,这样在安装过程中就大幅度减少了卡套和管接头的使用,简化了整个安装过程,降低了总体的成本,同时减少维护的开销。

The coiled tubing we produce can reach more than 1000 meters, which highly reduces the tubing unions and connections during installation making the installation more convenient, highly reduces the total cost in installation, and also the maintenance cost.



Where the coiled tubing used? 应用领域

油井的控制管线	Control line Tubing in Oil and Gas Well
仪器仪表	Instrument Tubing
化学剂柱入管	Chemical Injection Tubing Line
预绝缘管	Pre-insulated Tubing
电加热或者蒸汽加热线	Electric Heating or Steam Heating Tubing Line
加热器管	Heater Tubing Line

Standard & Tolerance 标准和公差	ASTM A213, ASTM A269, EN10216-5TC1, D4/T3
NDT 无损检测	Eddy Current or Hydraulic Test or UT 涡流, 水压, 超声
Heat Treatment 热处理	Bright Annealed 光亮退火
Quality Assurance 质量保证	MTSCO is ISO 9001 & PED97/23/EC certified with 100% traceability on all instrument Tubes and material test reports (EN10204/3.1B) accompany every shipment upon request. MTSCO拥有ISO9001和PED证书, 所有的材料将提供EN10204/3.1B证书

The grades of materials we can produce

Grade	C max	Si max	Mn max	P max	S max	Cr	Ni	Mo	Ti	N max	Cu max	Fe max	Al max	Co max	Zr	Nb	Tu	Va
Nickel Alloy																		
Inconel 600/N06600/2.4816	0.150	0.50	1.00		0.015	14-17	> =72				0.50	6-10						
Inconel 601/N06601/2.4851	0.100	0.50	1.5		0.015	21.0-25.0	58-63				1.00		1.0-1.7					
Inconel 690/N06690	0.05	0.5	0.5		0.015	27.0-31.0	58.0				0.5	7.0-11.0						
Inconel 625/N06625/2.4856	0.100	0.50	0.50	0.015	0.015	20-23	> =58	6-10	≤0.4			5.0	≤0.4				3.15-4.15	
Inconel 718/N07718/2.4668	0.08	0.35	0.35	0.015	0.015	17.0-21.0	50.0-55.0	2.8-3.3	0.65-1.15	0.006	0.3	Remainder	0.2-0.8	10			4.75-5.5	
Incoloy 800/N08800/2.4876	0.100	1.00	1.50		0.015	19-23	30-35		0.15-0.60		0.75	≥39.5	0.15-0.60					
Incoloy 800H/N08800H/2.4958	0.05-0.10	1.00	1.50		0.015	19-23	30-35		0.15-0.60		0.75	≥39.5	0.15-0.60					
Incoloy 825/N08825/2.4858	0.050	0.50	1.00		0.030	19.5-23.5	38-46		2.5-3.5		1.5-3	≥22	0.2					
C-276/N010276/2.4819	0.01	0.08	1.00	0.040	0.030	14.5-16.5	balance	15-17					4-7			25	3.0-4.5	0.35
Monel 400/N04400/2.4360	0.3	0.50	2.00		0.024		> =63				28-34	2.5						
Monel K-500/N05500	0.18	0.50	1.5		0.01		63.0		0.35-0.85		27.0-33.0	2.0	2.3-3.15					
ALLOY 20/N08020/2.4660	0.07	1.00	2.00	0.045	0.035	19-21	32-38	2-3			3-4	balance					8C-1.0	
ALLOY 28/N08028	0.03	1.00	2.50	0.03	0.03	26-28	30-34	3.0-4.0			0.6-1.4	Remainder						
Duplex Steel																		
S31803/1.4462	0.030	1.00	2.00	0.030	0.020	21.0-23.0	4.5-6.5	2.5-3.5			0.18-0.28							
S32205/1.4462	0.030	1.0	2.00	0.030	0.020	22.0-23.0	4.5-6.5	3.0-3.5			0.14-0.28							
S32750/1.4410	0.030	0.80	1.20	0.035	0.020	24.0-26.0	6.0-8.0	3.0-5.0			0.24-0.32	0.50						
S32760/1.4501	0.05	1.00	1.00	0.030	0.010	24.0-26.0	6.0-8.0	3.0-4.0			0.24-0.32	0.50-1.0						
Austenitic																		
304/1.4301	0.080	1.00	2.00	0.045	0.030	18-20	8.0-10.5											
304L/1.4307	0.035	1.00	2.00	0.045	0.030	18.0-20.0	8.0-12.0											
304H/1.4948	0.04-0.10	1.00	2.00	0.045	0.030	18.0-20.0	8.0-11.0											
316/1.4401	0.080	1.00	2.00	0.045	0.030	16.0-18.0	11.0-14.0	2.0-3.0										
316L/1.4404	0.035	1.00	2.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0										
316H/1.4919	0.04-0.10	1.00	2.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0								0.10		
316Ti/1.4571	0.080	1.00	2.00	0.045	0.030	16.0-18.0	10.0-14.0	2.0-3.0	0.7 > Si(C-N)		0.10							
321/1.4541	0.080	1.00	2.00	0.045	0.030	17.0-19.0	9.0-12.0		0.7 > Si(C-N)									
321H/1.4878	0.04-0.10	1.00	2.00	0.045	0.030	17.0-19.0	9.0-12.0		H							0.10		
317/1.4449	0.08	1.00	2.00	0.045	0.030	18.0-20.0	11.0-14.0	3.0-4.0										
317L/1.4438	0.035	1.00	2.00	0.045	0.030	18.0-20.0	11.0-15.0	3.0-4.0										
347/1.4550	0.080	1.00	2.00	0.045	0.030	17.0-19.0	9.0-12.0										10C-1.0	
347H/1.4912	0.04-0.10	1.00	2.00	0.045	0.030	17.0-19.0	9.0-13.0										8C-1.0	
310S/1.4845	0.080	1.00	2.00	0.045	0.030	24.0-26.0	19.0-22.0			0.11								
310H/1.4845	0.04-0.10	1.00	2.00	0.045	0.030	24.0-26.0	19.0-22.0											
N08904 (904L) /1.4539	0.020	1.00	2.00	0.040	0.030	19.0-23.0	23.0-28.0	4.0-5.0		0.10	1.0-2.0							
S31254 (254Mo) /1.4547	0.020	0.80	1.00	0.030	0.010	19.5-20.5	17.5-18.5	6-6.5		0.18-0.22	0.5-1.0							

Outer Diameter and Wall Thickness

AISI B36.10 B36.19

公称直径 管外径		AISI B36.10 B36.19																		
DN	NPS	D	Sch5s	Sch10s	Sch10	Sch20	Sch30	Sch40s	STD	Sch40	Sch80	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	-	2.11	-	-	-	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	2.77	-	-	-	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	23.1	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	-	28.19	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	-	-	-	-	-	-	-	-	-	-	
700	28	711	-	-	7.92	12.70	15.88	-	9.53	-	-	-	-	-	-	-	-	-	-	
750	30	762	6.35	7.92	7.92	12.70	15.88	-	9.53	-	-	-	-	-	-	-	-	-	-	
800	32	813	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	-	-	-	-	-	-	-	
850	34	864	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	-	-	-	-	-	-	-	
900	36	914	-	-	7.92	12.70	15.88	-	9.53	19.05	-	-	-	-	-	-	-	-	-	
950	38	965	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	
1000	40	1016	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	
1050	42	1067	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	
1100	44	1118	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	
1150	46	1168	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	
1200	48	1219	-	-	-	-	-	-	9.53	-	-	-	-	-	-	-	-	-	-	

Kg/metre=(OD-TK)*TK*coefficient(coefficient for 304 is 0.02491,for 316L is 0.02507)

Some Parts Of Standard Checking Table Of Domestic And Abroad For Stainless Steel Seamless Pipe

国内外不锈钢无缝管的部分标准

Standard Project	ASTM A213/A213M	ASTM A269/A269M	ASTM A312/A312M	ASTM A789/A789M				
Grade	TP304 TP304L TP304H, Δ TP309S TP309H, TP310S TP310H, TP316 TP316L TP316H TP316Ti TP317 TP317L TP321 TP321H, Δ TP347 TP347H, Δ	TP304 TP304L TP316 TP316L TP317 TP321 TP347 N08904	TP304 TP304L TP314H, Δ TP309S TP309H TP310S TP310H TP316 TP316L TP316H TP316Ti TP317 TP317L TP321 TP321H, Δ TP347	S31280 S31803 S32205 S32304 S32750 S32780				
Yield Point (Mpa)	≥170MPa, ≥205MPa		≥170; ≥205	≥450; ≥485; ≥550				
Tensile Strength (Mpa)	≥480MPa, ≥515Pa		≥408; ≥515	≥620; ≥690; ≥655; ≥750; ≥800				
Elongation(100%)	≥35%		≥35%	≥25; ≥15				
Flattening Test (mm)	H=1.09t/ (0.09+t/D) 并实验完好性	H=1.09t (0.09+t/D)	H=1.09t/ (0.09+t/D) 并试验完好性					
Flaring Test	内径扩张率为21-68ND	a=60°, 扩口率21-68ND		ASTM A450, 内径扩张值≥10%				
Grain Size	"+"、"Δ" ASTM E112, "Δ" 7#或更粗, "+" 6#或更粗		H级钢号按ASTME112:7级或更粗(310#级或更粗)	协议要求 (铁素体含量45-55%)				
Hydraulic Test (MPa)	D	P=220.6t/D, 可用E213超声波或E426水压代替	P=2St/D, S=50Rp/0.2; D≤88.9, Pmax≤17; D>88.9, Pmax≤19 超声波/涡流/水压任选一种	P=220.6t/D, 可用E213超声波或E426水压代替, 需协商				
	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							
Heat Treatment	Requirement	Requirement	Requirement	Requirement				
Tolerance For O.D. (mm)	O. D. Range (D)	允许偏差	O. D. Range (D)	允许偏差	O. D. Range (D)	允许偏差	O. D. Range (D)	允许偏差
	<25.4	±0.10	≤12.7	±0.13	10.29~48.26	+0.4/-0.8	≤12.7	±0.13
	25.4~38.1	±0.15	>12.7~38.1	±0.13	>48.26~114.3	+0.8/-0.8	>12.7~38.1	±0.13
	>38.1~<50.8	±0.20	>38.1~88.9	±0.25	>114.3~219.08	+1.6/-0.8	>38.1~88.9	±0.25
	50.8~<63.5	±0.25	>88.9~139.7	±0.38	>219.08~457.2	+2.4/-0.8	>88.9~139.7	±0.38
	63.5~<76.2	±0.30	>139.7~203.2	±0.76	>457.2~889.4	+3.2/-0.8	>139.7~203.2	±0.76
	76.2~101.6	±0.38			>889.4~1219.2	+4.0/-0.8		
	>101.6~190.5	+0.38/-0.64			>1219.2~1905.1	+4.8/-0.8		
	>190.5~228.6	+0.38/-1.14						
	Tolerance For W.T. (mm)	壁厚S	允许偏差	壁厚S	允许偏差	壁厚S	允许偏差	壁厚S
≤38.1		+20%, -0	≤12.7	±15%	10.29~73.03	+20%/-12.5%	≤12.7	±15%
>38.1		+22%, -0	>12.7~203.2	±10%	88.9~457.2 (t/D≤5%)	+22.5%/-12.5%	>12.7~203.2	±10%
					88.9~457.2 (t/D>5%)	+15%/-12.5%		
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				
Hardness	当壁厚为平均壁厚时, 壁厚公差为10NS	HRB≤90, t<1.65mm 可作表格或HV, 内径<4.1, t≤0.51可不测		HRB≤290 (S32750/S32760≤300) HRC≤30 (S32750≤32)				

Standard Project	ASTM A790/A790M	ASTM B677	EN10216-5	JISG3463				
Grade	S31260 S31803 S32205 S32304 S32750 S32760	UNS N08904 (904L)	1.4307, 1.4306, 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 SUS304HTB SUS304LTB SUS309TB SUS309HTB SUS310TB SUS316TB SUS316HTB SUS316LTB SUS321TB SUS321HTB SUS347TB SUS347HTB SUS329J1TB SUS329J3TB SUS329J4TB SUS316TiTB				
Yield Point (Mpa)	≥450 ; ≥485 ; ≥550	≥220	≥180; ≥160; ≥195; ≥200; ≥205 ≥190; ≥210; ≥230; ≥185; ≥450 ≥400; ≥500; ≥550	≥205; ≥175; ≥390; ≥450				
Tensile Strength (Mpa)	≥620 ; ≥690 ; ≥655 ; ≥750 ; ≥800	≥490	≥640; ≥700; ≥600; ≥800; ≥500 ≥510; ≥520; ≥490; ≥470; ≥460	≥520; ≥480; ≥590; ≥620				
Elongation(100%)	≥25 ; ≥15	≥35	≥20; ≥22; ≥25; ≥35; ≥40; ≥45	≥27; ≥30; ≥35; ≥10; ≥13; ≥18				
Flattening Test (mm)	H=1.09t/ (0.09+t/D) 并试验完好性		H=1.09t/ (0.09+t/D) 并实验完好性, D > 150mm不做	H=1.09t/ (0.09+t/D) 并实验完好性				
Flaring Test			a=60°, 扩口率: 9~17%D, T < 10mm不做	a=60°扩口率: 20%D				
Grain Size	协议要求 (铁素体含量45-55%)			JIS G05517#或更粗				
Hydraulic Test (MPa)	P=2St/D, S=50Rp/0.2; D≤88.9, Pmax≤17; D>88.9, Pmax≤19; 超声波、涡流、水压任选一种	P=2St/D S=20000Psi (138Mpa) ; 超声波、涡流、水压任选一种	实验压力7Mpa; 或P=2St/D; 公式中S=70%Rp/0.2; 可做涡流代替	P=2Rt/D, 公式中R=Rm/4; 可用无损探伤代替				
Heat Treatment	Requirement	Requirement	Requirement	Requirement				
Tolerance For O.D. (mm)	外径	允许偏差	外径 (D)	允许偏差	外径	允许偏差	外径 (D)	允许偏差
	10.29~48.26	+0.4/-0.8	10~<16	±0.13	D3	±0.7%与0.30mm 选较大者执行	<60	±0.25
	>48.26~114.3	+0.8/-0.8	16~38	±0.19		60~<80	±0.3	
	>114.3~219.08	+1.6/-0.8	>38~76	±0.25	D4	±0.5%及±0.10mm 选较大者执行	80~<100	±0.40
	>219.08~457.2	+2.4/-0.8	>76~114	±0.38		100~<120	+0.4/-0.6	
			>114~152	±0.51			120~<160	+0.4/-0.8
			>152~168	±0.64			160~<200	+0.4/-1.2
			>168~219	±0.79			≥200	+0.4/-1.6
			>219~356	±1.57/-0.79				
			>356~610	±3.18/-0.79				
Tolerance For W.T. (mm)	壁厚S	允许偏差	壁厚S	允许偏差	壁厚S	允许偏差	壁厚S	允许偏差
	10.29~73.03	+20%/-12.5%	10~16<	±15%	T3	+10%与0.20mm 选较大者执行	D < 40, t < 2	+0.4/0
	88.9~457.2 (t/D ≤ 5%)	+22.5%/-12.5%	16~114	±10%		D < 40, t ≥ 2	+20%t-0	
	88.9~457.2 (t/D > 5%)	+15%/-12.5%	>114~219	±12.5%	T4	±7.5%及±0.15mm 选较大者执行	D ≥ 40	+22%t-0
		>219~610	+15%/-12.5%					
Bending (mm/m)	Reasonably Straight	Reasonably Straight	≤0.0015L (管长) 及3mm/m	实用性平直				
Hardness	HRB≤290 (S32750/S32760≤300) , HRC≤30 (S32750≤32)	HRB≤290 (S32750/S32760≤300) , HRC≤30 (S32750≤32)		HRB≤90 (特殊要求)				