



■ Bright Annealed Stainless Steel tubes

B.A(Bright annealed) STS tubes are mainly used for super clean gas pipe line. And surface roughness, dimension tolerance and mechanical properties are controlled by cold drawing process. With high corrosive resistant properties ILJIN clean BA tubes are manufactured by specialty production process.



■ Most advanced production facilities

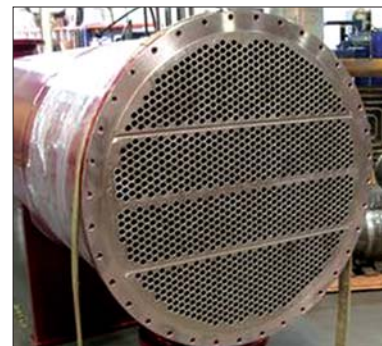
Our production process is focused on best quality products. Newly constructed plant is very clean and all machines are controlled by automation system. For the more the heat treatment furnace and cleaning line are adapted most advanced system and are very proud of ILJIN.



[Pipe Line]

■ Application

- Toxic and high purity gas supply line
- Painting & Sanitary use beverage, drink, Medical)
- Damper & Gas spring
- Power plant Heat exchanger and Boiler
- Automobile parts (Engine fuel rail, Exhaust ion system)
- Precision Roller Shaft
- Tube fitting & Elbow



[Heat Exchanger]



[Damper & Gas Spring]



[Auto Painting]



[Fuel Tube]

■ Product Features

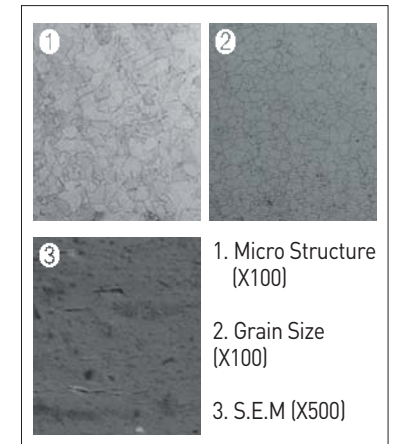


- Special Surface Control (Roughness, surface treatment)
- Special Tolerance Control
- Flexible Production (Mechanical properties control)
- Wide Size Range (O.D:6.35~60.5mm)

• Surface roughness

Size (mm)	Ry (μm)	Ra (μinch)
O.D ≤ 12.7	3.0 Max.	10 Max.
12.7 ≤ O.D ≤ 25.4	3.5 Max.	15 Max.
25.4 < O.D	4.5 Max.	20 Max.

• Micrograph



• Mechanical properties

※ Spec (Actual result)

Alloy	Y.S (MPa)	T.S (MPa)	E.L (%)
AISI304, 316	205min (280)	515min (610)	35min (51)
AISI304L, 316L	170min (260)	485min (590)	35min (53)

• Roughness test example



• High corrosion resistance

- Improved B.A Condition [Pure H₂ Gas Atmosphere]
- Surface Passivation [Formation of Cr₂O₃ Layer]



Passed Inter-granular attacking test. (ASTM A262)



International Standard

SMLS				WELDED			
ASTM/ASME	DIN	EN	JIS	ASTM/ASME	DIN	EN	JIS
A213/SA213	17458	10216-5	G3463	A249/SA249	17457	10216-7	G3463
A312/SA312				A312/SA312			
A269/SA269			A269/SA269				
A632			A632 (Special)	G3459 (Special)			
A270			A270	G3447			

Chemical Composition

(Unit : wt%)

Spec.	Alloy	C	Si	Mn	P	S	Ni	Cr	Mo	
ASTM	TP304	Min.					8	18		
		Max.	0.08	1.00	2.00	0.045	0.03	11	20	
	TP304L	Min.						8	18	
		Max.	0.035	1.00	2.00	0.045	0.03	12	20	
	TP316	Min.						10	16	2
		Max.	0.08	1.00	2.00	0.045	0.03	14	18	3
	TP316L	Min.						10	16	2
		Max.	0.035	1.00	2.00	0.045	0.03	15	18	3
Special	TP316L-LS	Min.					12	16	2	
		Max.	0.025	0.60	0.80	0.040	0.005	15	18	3
	TP316L-HS	Min.					0.005	10	16	2
		Max.	0.035	0.75	1.80	0.040	0.012	14	18	3

※ Although the required material is not shown in above table, it is possible to review the spec.

Size range

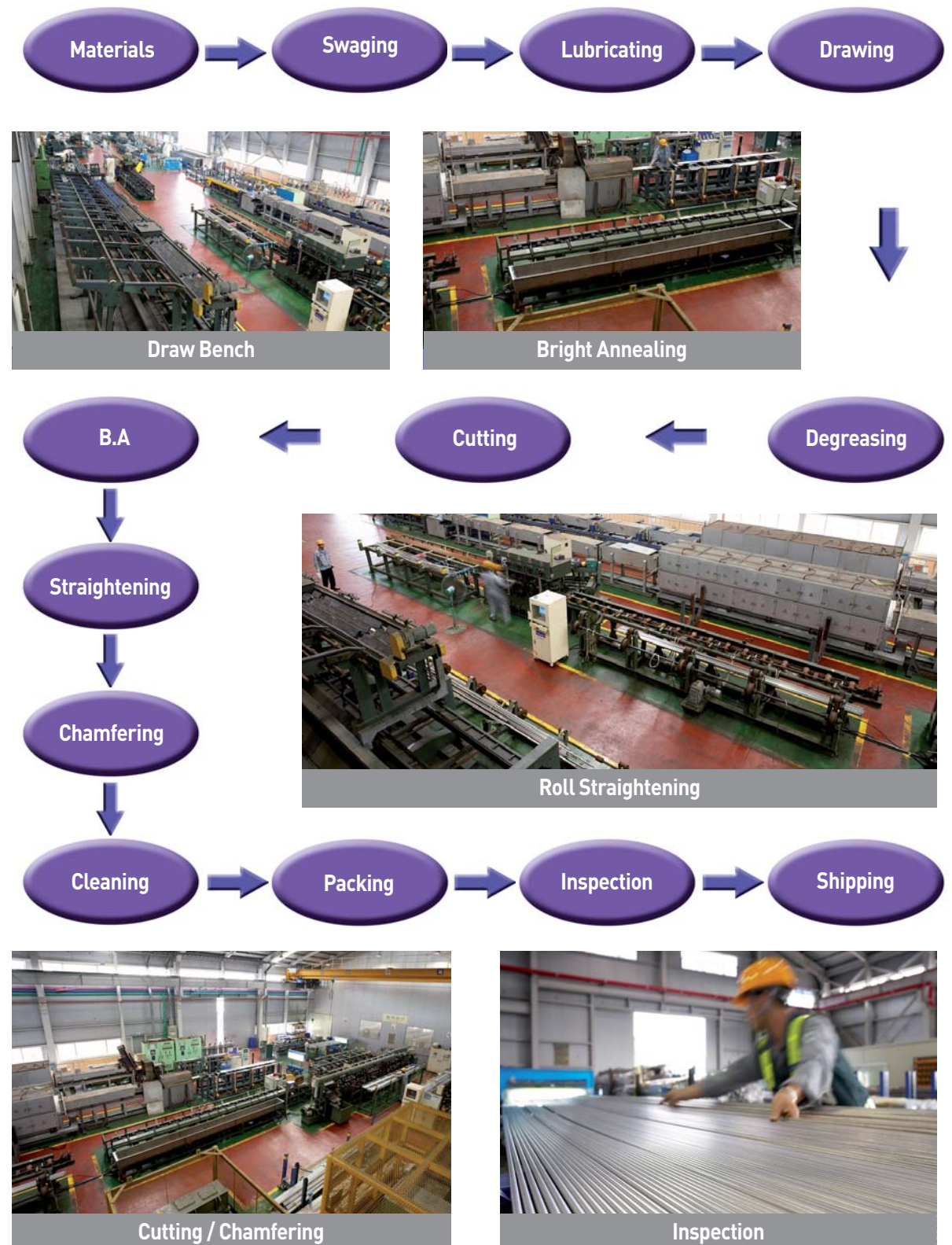
Wall thickness →

	inch	0.031	0.035	0.039	0.049	0.065	0.083	0.098	0.110	0.118
inch	mm	0.8	0.89	1.00	1.24	1.65	2.1	2.5	2.8	3.0
1/4	6.35	o	o	o						
3/8	9.53	o	o	o	o					
1/2	12.7	o	o	o	o					
3/4	19.05	o	o	o	o	o	o			
7/8	22.23	o	o	o	o	o	o	o		
1	25.4	o	o	o	o	o	o	o		
1 1/4	31.75	o	o	o	o	o	o	o		
1 3/8	34.93		o	o	o	o	o	o		
1 1/2	38.1		o	o	o	o	o	o	o	o
1 3/4	44.45				o	o	o	o	o	o
2	50.8					o	o	o	o	o
2 1/2	63.5						o	o	o	o

o Seamless tube
o Welded tube

※ It is possible to review when the required size is out of above range.

Manufacturing Process (BA Tube)



Outer diameter