



LORD STEEL
Many Solutions, One Decision Here

 **LORD STEEL
INDUSTRY COMPANY LIMITED**

ADD : NO.5 XINGHAI ROAD, CHINA-SINGAPORE SUZHOU INDUSTRY PARK,
SUZHOU, JIANGSU PROVINCE, CHINA, 215021

PHONE : +86-512-62861001

FAX : +86-512-62382470

EMAIL : enquiry@lordsteel.com

WEB : www.lordsteel.com

LORD STEEL INDUSTRY COMPANY LIMITED



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ABOUT LSI

Due to the fiercely competition in the market of stainless steel tube and pipe, our clients demand a new kind of business model and business partner, who shall be with powerful R&D capability and competitive price in their best solution in the industry.

Since 1990's, LSI experts start their R&D in the anti-corrosion materials and the stainless steel tube/pipe in Asia. With the development of the stainless steel tube and pipe, LSI has already got great achievements in such industry all these years. We end up many years' control in supplying super ferritic stainless steel materials (UNS S44400 and UNS S44660) by US manufacturers in China.

LSI People not only see our products as normal industry products, we take them as artwork with high quality value. In every LSI people's heart, Quality is

always first. High service level shall be our add value in the products, Competitive price and our promise in the lead time shall Strengthen the mutual trust relationship between LSI people and our clients.

LSI train our people to be the most professional team in such industry, no matter for our engineers, experts, salesman, but also for our staffs and workers.

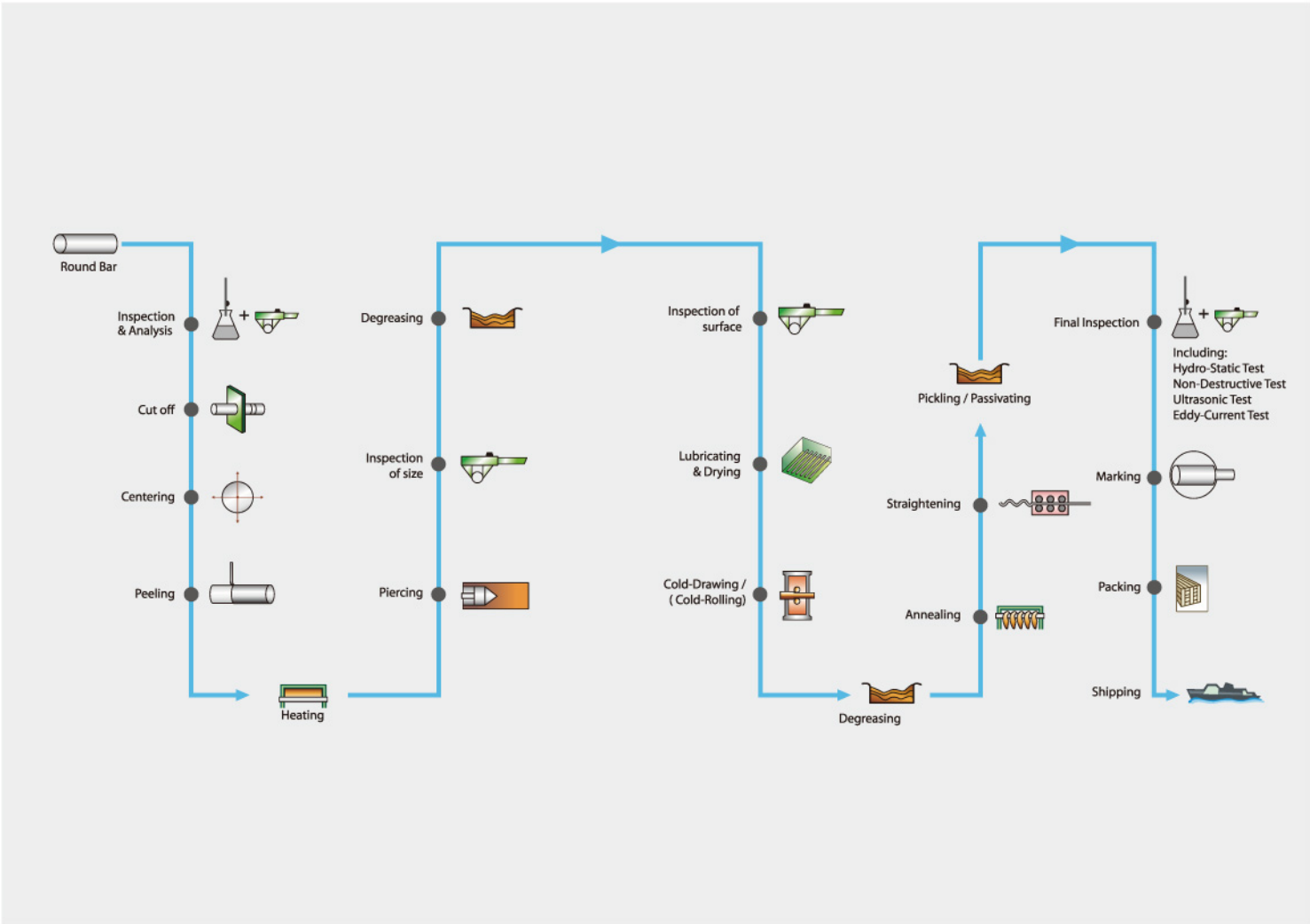
We insist that the more professional we are, the more satisfaction we can get from our clients.

LSI people are confidential to say that LSI is one of the most professional, leading manufacturers and solution providers in stainless steel tube and pipe in Asia.



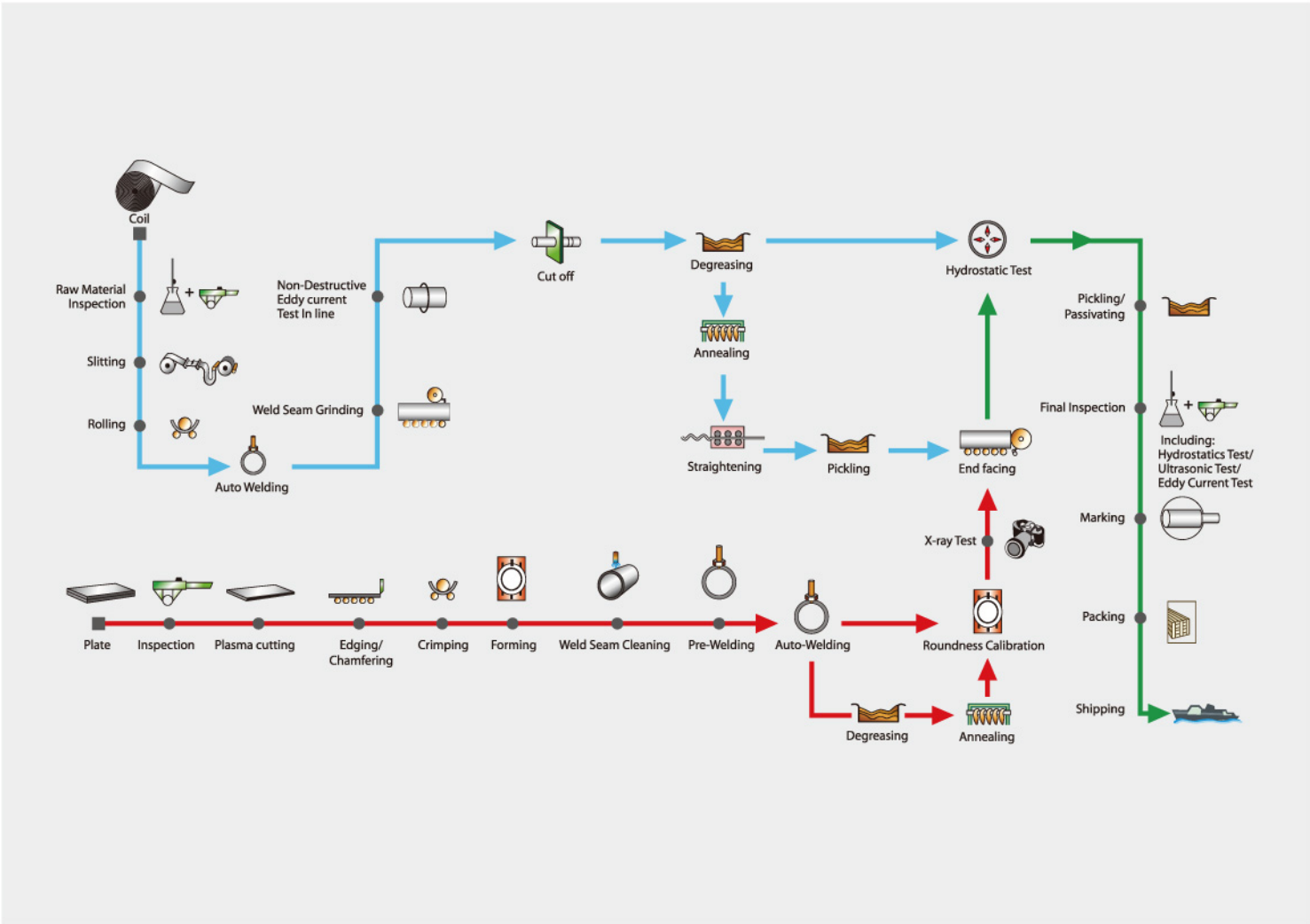
PRODUCTION PROCESS

Seamless Stainless Steel Tube Process



PRODUCTION PROCESS

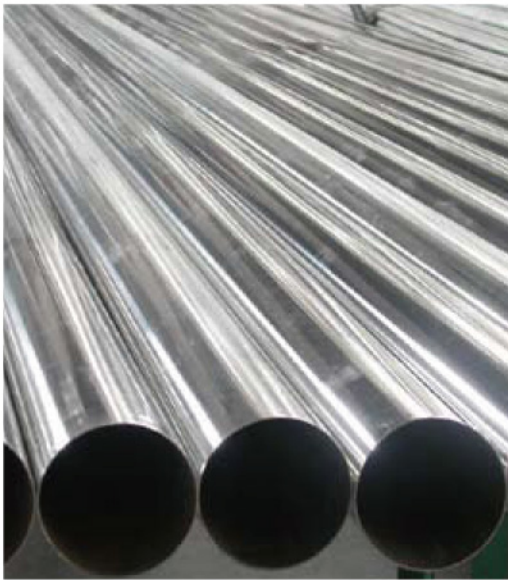
Welded Stainless Steel Tube Process



LSI PRODUCTS

3.1 Super-ferritic Stainless Steel Tube for Industry Solution

Thanks to its outstanding resistance to general and localized corrosion attack properties,Titanium has been successfully established as the commonly used material for seawater cooled heat exchanger tubing, be it for power plants’ surface condensers, thermal desalination plants’ heat exchangers or heat exchangers used in the chemical and petrochemical processing industry. In the current material market context in which Titanium price has increased significantly, engineering companies and end-users have shown an increasing interest for more cost-effective alternative solutions using what are called super alloys which are highly alloyed stainless steels showing a far better corrosion resistance than conventional stainless steels.That is the background for the invention of UNS S44400 and UNS S44660 super-ferritic stainless steel tube.Nowadays, with the development of VOD technology and advanced tube processing technology, people get great profit from such kind of new material. LSI devote all his energy in such material and got great achievement in such kind of material. We and our people are most professional in such material, when you order it or has any queries, please contact us.



GRADE OF MATERIAL

UNS	C	Mn	P	S	Si	Cr	Ni	Mo	N	Others
S44400	0.025	1.00	0.040	0.030	1.00	17.5~19.5	1.00	1.75~2.50	0.035	Ti+Cb: 0.20+4*(C+N)~0.08
S44660	0.030	1.00	0.040	0.030	1.00	25.0~28.0	1.00~3.50	3.00~4.00	0.040	Ti+Cb:0.20~1.00 and 6*(C+N) Min

MECHANICAL PROPERTY

UNS	Tensile Strength Min, Mpa	Yield Strength Min, Mpa	Elongation in 2INCH. Or 50mm Min, %	Hardness Max
S44400	415	275	20	95HRB
S44660	585	450	20	25HRC

APPLIED STANDARD

ASTM A268/ ASME SA268	Seamless and welded ferritic/martensitic stainless steel tubing for general service
ASTM A688	Welded austenitic stainless steel feedwater heater tubes
ASTM A803	Welded ferritic stainless steel feed water heater tubes

DIMENSION RANGE

No.	Outside diameter	Wall thickness	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.5	1.8	2.0	2.5
1	12.70														
2	15.90														
3	17.20														
4	19.05														
5	22.00														
6	25.40														
7	26.70														
8	31.80														
9	38.10														

TEST & INSPECTION PLAN



- 1.100% PMI / SPECTRO CHEMICAL ANALYSIS TESTS
 - 2.100% DIMENSION TESTS & 100% VISUAL EXAMINATION
 - 3.TENSION TEST,FLANGE TESTS,HARDNESS TEST,REVERSED FLATTENING TEST
 - 4.100% HYDROSTATIC TEST AFTER BENDING PLUS 100% NON-DESTRUCTIVE TESTS
 - 5.INTERGRANULAR CORROSION TEST BY LOT ACCORDING TO ASTM A763
 - 6.PITTING RESISTANCE TEST ACCORDING TO ASTM G48 METHOD C
 - 7.RESIDUAL CHLORIDE TEST ACCORDING TO ASME SA803
- NOTES : ALL THE TESTS AND INSPECTION SHALL PROVIDE WITH REPORTS ACCORDING TO STANDARD AND TEST RESULTS.

OPTION TEST & INSPECTION ITEMS :

- 1. STRAIGHTNESS TEST
- 2. ROUGHNESS TEST
- 3. CRYSTALLING PHASE ANALYSIS
- 4. INTERGRANULAR ATTACK TESTS
- 5. IMPACT ATTACK TEST UNDER LOW TEMPERATURE

The documents LSI will provide to you :

- 1. MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
- 2. RAW MATERIAL CERTIFICATION
- 3. ALL THE TEST & INSPECTION REPORTS AS PER PO AND STANDARDS
- 4. HEAT TREATMENT REPORT
- 5. SHIPPING NOTIFICATION BEFORE SHIPMENT
- 6. QUALITY WARRANTY LETTER

3.2 Super-duplex stainless steel tube

Duplex Stainless Steels have a structure that contains both ferrite and austenite. Duplex alloys have higher strength and better stress corrosion cracking resistance than most austenitic alloys and greater toughness than ferritic alloys, especially at low temperatures. The corrosion resistance of duplex alloys depends primarily on their composition, especially the amount of chromium, molybdenum, and nitrogen they contain.



GRADE OF MATERIAL

UNS	JIS	EN	DIN	C	Cr	Ni	Mo	N	Other
S31803	QS2205	1.4462	X2CrNiMoN22-5-3	0.030max	21.0~23.0	4.5~6.5	2.5~3.5	0.08~0.20	/
S32205	QS2205	1.4462	X2CrNiMoN22-5-3	0.030max	22.0~23.0	4.5~6.5	3.0~3.5	0.14~0.20	/
S32304				0.030max	21.5~24.5	3.0~5.5	0.05~0.60	0.05~0.20	Cu:0.05~0.60
S32750		1.4410	X2CrNiMoN22-7-4	0.030max	24.0~26.0	6.0~8.0	3.0~5.0	0.24~0.32	Cu:0.50Max
S32760				0.050max	24.0~26.0	6.0~8.0	3.0~4.0	0.20~0.30	Cu:0.50~1.00

Note: PREN=Cr%+3.3×Mo%+16×N%

MECHANICAL PROPERTY

UNS	Tensile Strength Min,Mpa	Yield Strength Min, Mpa	Elongation in 2INCH, Or 50mm Min, %	Hardness Max, HRC
S31803	620	450	25	30
S32205	655	485	25	30
S32304 ^a	690	450	25	30
S32750	800	550	15	32
S32760	750	550	25	32

Note: a represent OD equal to 1 INCH or Less

APPLIED STANDARD

ASTM A789/ASME SA789	Seamless and welded ferritic/austenitic stainless steel tubing for general service
ASTM A790/ASME SA790	Seamless and welded ferritic/austenitic stainless steel pipe
ASTM A312/ASME SA312	Seamless and welded austenitic stainless steel pipes
ASTM A240	Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
EN10216-5	Seamless steel tubes for pressure purposes - stainless steel tubes
DIN17456	General purpose seamless circular stainless steel tubes - technical delivery conditions
DIN17458	Seamless circular austenitic stainless steel tubes subject to special requirements – technical delivery conditions
JIS G3459	Stainless steel pipes
JIS G3463	Stainless steel boiler and heat-exchanger tubes
GOST 9941	Seamless cold and warm deformed tubes of corrosion-resistant steel - specifications

DIMENSION RANGE

No.	Outside diameter Wall thickness	0.6~0.8	0.9~1.2	1.3~1.6	1.7~2.2	2.3~2.9	3.0~4.5	4.6~5.5	5.6~7.5	7.6~9.0	9.1~12	12.1~16	16.1~24	24.1~32
1	5~7													
2	8~10													
3	11~16													
4	17~25													
5	26~35													
6	36~45													
7	46~56													
8	57~65													
9	66~76													
10	77~100													
11	101~114													
12	115~133													
13	134~159													
14	160~219													
15	220~273													
16	274~325													

TEST & INSPECTION PLAN

100% PMI / SPECTRO CHEMICAL ANALYSIS TESTS 100%
100% DIMENSION TESTS & 100% VISUAL EXAMINATION
TENSION TEST, FLARING TESTS(FOR SEAMLESS TUBE/PIPE)/FLANGE TESTS(FOR WELDED TUBE/PIPE), HARDNESS TEST, REVERSED
FLATTENING TEST
100% HYDROSTATIC TEST/100% NON-DESTRUCTIVE TESTS

NOTES : ALL THE TESTS AND INSPECTION NEED TO PROVIDE WITH REPORTS ACCORDING TO STANDARD AND TEST RESULTS.

OPTION TEST & INSPECTION ITEMS :

STRAIGHTNESS TEST
ROUGHNESS TEST
CRYSTALLING PHASE ANALYSIS
INTERGRANULAR ATTACK TESTS
IMPACT ATTACK TEST UNDER LOW TEMPERATURE



The documents LSI will provide to you :

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LSI PRODUCTS

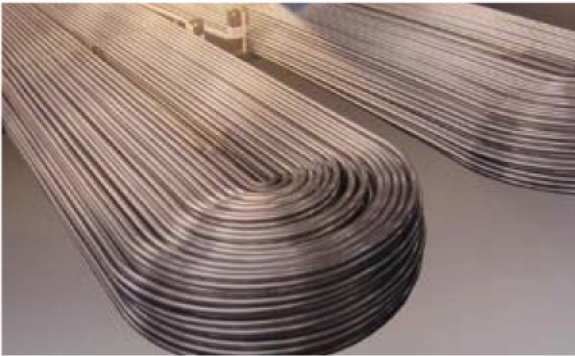
3.3 Heat Exchanger Tube

Heat exchangers are vital components in numerous process plants. With an increasing focus on operating economy and safety, the benefits achieved from baseline inspection and condition monitoring are evident.

LSI's heat exchanger tube provide a safety and economic way for clients focus on producing high-quality heat exchange products.

GRADE OF MATERIAL

Heat Exchanger Tubing for Austenitic Stainless Steel										
ASTM/ASME	JIS	EN	DIN	C	Cr	Ni	Mo	N	Others	Remark
TP304L	SUS304L	1.4307	X2CrNi18-9	0.030	17.5~19.5	8.0~10.0		Max:0.11		Straight/U Bend
TP304L	SUS304L	1.4306	X2CrNi19-11	0.030	18.0~20.0	10.0~12.0		Max:0.11		Straight/U Bend
TP304LN	SUS304LN	1.4311	X2CrNiN18-10	0.035	18.0~20.0	8.0~11.0		0.10~0.16		Straight/U Bend
TP310S	SUS310S	1.4842	X6CrNi25-20	0.080	24.0~26.0	19.0~22.0				Straight/U Bend
TP316L	SUS316L	1.4404	X2CrNiMo17-12-2	0.035	16.0~18.0	10.0~15.0	2.00~3.00			Straight/U Bend
TP316L	SUS316L	1.4436	X3CrNiMo17-13-3	0.050	16.5~18.5	10.5~13.0	2.50~3.00	Max:0.11		Straight/U Bend
TP316LN	SUS316LN			0.035	16.0~18.0	11.0~14.0	2.00~3.00	0.10~0.16		Straight/U Bend
TP317L	SUS317L	1.4438	X2CrNiMo18-15-4	0.035	18.0~20.0	11.0~15.0	3.00~4.00			Straight/U Bend
TP321	SUS321	1.4541	X6CrNiTi18-10	0.080	17.0~20.0	9.00~13.0			Ti: 5*C~0.60	Straight/U Bend
TP347	SUS347	1.4550	X6CrNiNb18-10	0.080	17.0~20.0	9.00~13.0			Cb+Ta:10*C~1.00	Straight/U Bend
N08904	904L	1.4539	X1NiCrMoCu25-20-5	0.020	19.0~23.0	23.0~28.0	4.0~5.0		Cu:1.00~2.00	Straight/U Bend
S30815	Alloy 253MA/F45	1.4835		0.05~0.10	20.0~22.0	10.0~12.0		0.14~0.20		Straight/U Bend
S31254	Alloy 254SMo	1.4547	X1CrNiMoCuN20-18-7	0.020	19.5~20.5	17.5~18.5	6.0~6.5	0.18~0.22	Cu:0.50~1.00	Straight/U Bend
Heat Exchanger Tubing for Ferritic or Martenitic Stainless Steel										
ASTM/ASME	JIS	EN	DIN	C	Cr	Ni	Mo	N	Others	Remark
TP410	SUS410	1.4006	X12Cr13	0.150	11.5~13.5					Straight/U Bend
TP405	SUS405			0.080	11.5~14.5	MAX.0.50			Al:0.10~0.30	Straight/U Bend
TP430	SUS430	1.4016	X6Cr17	0.120	16.0~18.0					Straight/U Bend
TP439		1.4510	X3CrTi17	0.070	17.0~19.0	MAX.0.50		0.04	Ti:0.20+4(C+N)~1.10	Straight
S44400	QS192	1.4521	X2CrMoTi18-2	0.025	17.5~19.5	MAX.1.00	1.75~2.50	MAX.0.035	Ti+Cb: 0.20+4(C+N)~0.8	Straight
Heat Exchanger Tubing for Austenitic Stainless Steel										
UNS	JIS	EN	DIN	C	Cr	Ni	Mo	N	Others	Remark
N10276	QA C276	2.4819		0.010	14.5~16.5	Balance	15.0~17.0			Straight/U Bend
N06455				0.010	14.0~18.0	Min.65	14.0~17.0		Ti: MAX.0.70	Straight/U Bend
N06600	NCF600	2.4610	NiCr15Fe	0.150	14.0~17.0	Min.72			Cu: MAX.050	Straight/U Bend
N06625	QA625	2.4856			20.0~23.0	Min.58	8.0~10.0		Cu: 28.0~34.0	Straight
N04400	QA400	2.4360	NiCu30	0.300		Min.63			Ti: Residual	Straight/U Bend
TI GR2		3.7035		0.100				0.030		Straight/U Bend
T5				0.150	4.0~6.0		0.45~0.65			Straight/U Bend
T9				0.150	8.0~10.0		0.90~1.10			Straight/U Bend
T11				0.05~0.15	1.00~1.50		0.44~0.65			Straight/U Bend
T91				0.08~0.12	8.00~9.50		0.85~1.05			Straight/U Bend



- Application :
- Nuclear Industry

Chemical Industry

Petrochemical Industry

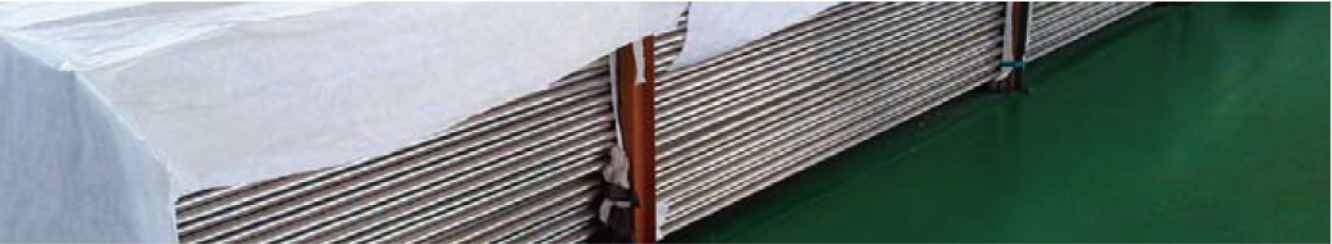
HVAC (Heating Ventilation Air Conditioning), Refrigeration

Food and Beverages

Power Generation

MECHANICAL PROPERTY

UNS	Tensile Strength Min,Mpa	Yield Strength Min, Mpa	Elongation in 2INCH, Or 50mm Min, %	Hardness Max
TP304L	485	170	35	90HRB
TP304L	485	170	35	90HRB
TP304LN	515	205	35	90HRB
TP310S	515	205	35	90HRB
TP316L	485	170	35	90HRB
TP316L	485	170	35	90HRB
TP316LN	515	205	35	90HRB
TP317L	515	205	35	90HRB
TP321	515	205	35	90HRB
TP347	515	205	35	90HRB
N08904	490	216	35	90HRB
S30815	600	310	40	95HRB
S31254	675	310	35	96HRB
TP410	415	205	20	90HRB
TP405	415	205	20	90HRB
TP430	415	240	20	90HRB
TP439	415	205	20	
S44400	415	275	20	
N10276	690	283	40	
N06455	783	365	55	
N06600	500	180	35	185HB
N06625	760	345	30	220HB
N04400	480	170	35	
TI GR2	345	170MPA 0.2 310MP A	24	
T5	415	205	30	89HRB
T9	415	205	30	89HRB
T91	585	415	20	25HRC



3.3 Heat Exchanger Tube

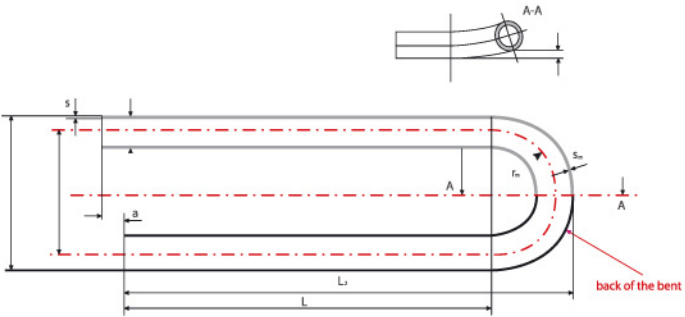


APPLIED STANDARD

ASTM A213/ASME SA213	Seamless ferritic and austenitic alloy steels boiler superheater, and heat-exchanger tubes
ASTM A249/ASME SA249	Welded austenitic steel boiler, superheater, heat-exchanger, and condenser tubes
ASTM A268/ ASME SA268	Seamless and welded ferritic/martensitic stainless steel tubing for general service
ASTM A688	Welded austenitic stainless steel feedwater heater tubes
ASTM A789, ASME SA789	Seamless and welded ferritic/austenitic stainless steel tubing for general service
ASTM A269, ASME SA269	Seamless and welded austenitic stainless steel tubing for general service
ASTM A803	Welded ferritic stainless steel feed water heater tubes
ASTM B163/ASME SB163	Seamless nickel and nickel alloy condenser and heat exchanger tubes
ASTM B165/ASME SB165	Nickel copper alloy (UNS N04400)* seamless pipe and tube
ASTM B167/ASME SB167	Nickel chromium iron alloys (UNS N06600, N06601, and N06690) seamless pipe and tubes
ASTM B338/ASME SB338	Seamless and welded titanium and titanium alloy tubes for condensers and heat Exchangers
ASTM B704/ASTM B705	Welded UNS N06625 and UNS N08825 alloy tubes / Nickel alloy (UNS N06625 AND N08825) welded pipe
EN10216-5	Seamless steel tubes for pressure purposes - stainless steel tubes
DIN 17175	Seamless tubes of heat-resistant steels - technical conditions of delivery
DIN 17459	Seamless circular high-temperature austenitic steel tubes - technical delivery Conditions
DIN 28179	Steel U-tubes for tubular heat exchangers - technical delivery conditions
DIN 28180	Seamless steeltubes for tubular heat exchangers - dimensions, dimensional deviations and Materials
DIN28181	Welded steel tubes for tubularheat exchangers - dimensions, dimensional deviations and Materials
GOST 11017	Steel seamless tubes for high pressure service - technical conditions
JIS G3455	Carbon steel pipes for high pressure service
JIS G3462	Alloy steel boiler and heat-exchanger tubes
JIS G3463	Stainless steel boiler and heat-exchanger tubes
JIS H4631	Titanium pipes and tubes for ordinary piping

U-BEND TUBE

U-TUBE HEAT EXCHANGERS DESIGNED FOR HIGH TEMPERATURE APPLICATIONS, ESPECIALLY STEAM CONDENSING OR HOT OIL SYSTEM. OUR U-BENDING PROCESSING PLANT ALLOW US TO INCREASE EFFICIENT AND REDUCE LEAD TIME, WHILE MAINTAINING THE WORLD-CLASS QUALITY FOR WHICH WE ARE KNOWN.



Bending Radius: From 1.5*od(outside diameter) to 1500mm
(When ordering tubes with bending radius less than 1.5*OD, it is necessary to get the agreement with seller.
Straight tubes maximum length(before bending): 35000 mm.
Leg length: min 1 meter, max. 16500 mm (for max r=1500mm)
Note: other size are available upon agreement.
Heat treatment: stress relieved after u-bending (bending area plus 300mm for each leg).

packaging: In strong transport-worthy pre-fumigated wooden boxes of corresponding dimensions for each tube length, radius, diameter, according to po requirements as well as wrapped in polyethylene films with soft plastic caps on both end of tube

DIMENSION RANGE

No.	Wall thickness Outside diameter (mm)	0.5	0.6	0.8	1.0	1.2	1.6	2.0	2.3	2.6	2.8	2.9	3.2	3.6	4.0
1	12														
2	13.5														
3	14														
4	16														
5	17.2														
6	18														
7	19														
8	19.1														
9	20														
10	21.3														
11	22														
12	25														
13	25.4														
14	26.9														
15	30														
16	31.8														
17	32														
18	33.7														
19	35														
20	38														
21	40														
22	42														
23	42.4														
24	44.5														
25	48.3														
26	51														

TEST & INSPECTION PLAN

- 1. 100% PMI / SPECTRO CHEMICAL ANALYSIS TESTS
- 2. 100% DIMENSION TESTS & 100% VISUAL EXAMINATION
- 3. TENSION TEST, FLANGE TESTS, HARDNESS TEST, REVERSED FLATTENING TEST
- 4. 100% HYDROSTATIC TEST AFTER BENDING PLUS 100% NON-DESTRUCTIVE TESTS
- 5. CHECKING STRESS RELEASED HEAT TREATMENT IN BENDING AREA PLUS 300MM STRAIGHT LEG LENGTH AFTER BENDING WITH AGREEMENT WITH CLIENTS, SIGNING BENDING REPORT

NOTES : ALL THE TESTS AND INSPECTION NEED TO PROVIDE WITH REPORTS ACCORDING TO STANDARD AND TEST RESULTS.

The documents LSI will provide to you :

- 1. MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
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- 4. HEAT TREATMENT REPORT
- 5. SHIPPING NOTIFICATION BEFORE SHIPMENT
- 6. QUALITY WARRANTY LETTER
- 7. BENDING REPORT
- 8. HEAT TREATMENT REPORT AFTER BENDING

OPTION TEST & INSPECTION ITEMS :

- 1. STRAIGHTNESS TEST
- 2. ROUGHNESS TEST
- 3. CRYSTALLING PHASE ANALYSIS
- 4. INTERGRANULAR ATTACK TESTS
- 5. IMPACT ATTACK TEST UNDER LOW TEMPERATURE
- 6. U-BEND BALLING PASS TEST
- 7. PT TEST ON BENDING AREA

3.4 Large Diameter Seamless Stainless Steel Pipe

/ THIN-WALL THICKNESS/HEAVY WALL THICKNESS /

High-quality Seamless Stainless Steel Pipe in large diameters can help clients to extend the anti-corrosion capability and lifetime of products, which will be more efficient in the project when the material utilized.



GRADE OF MATERIAL

ASTM/ASME	JIS	EN	DIN	C	Cr	Ni	Mo	N	Others
TP304L	SUS304L	1.4307	X2CrNi18-9	0.030	17.5~19.5	8.0~10.0		Max:0.11	
TP304L	SUS304L	1.4306	X2CrNi19-11	0.030	18.0~20.0	10.0~12.0		Max:0.11	
TP304H	SUS304H	1.4948	X8CrNi19-10	0.04~0.10	18.0~20.0	8.0~11.0			
TP310S	SUS310S	1.4842	X6CrNi25-20	0.080	24.0~26.0	19.0~22.0			
TP316L	SUS316L	1.4404	X2CrNiMo17-12-2	0.035	16.0~18.0	10.0~15.0	2.00~3.00		
TP316	SUS316	1.4401	X5CrNiMo17-12-2	0.050	16.5~18.5	10.5~13.0	2.50~3.00	Max:0.11	
TP316H	SUS316H	1.4919	X6CrNiMo17-12	0.04~0.10	16.0~18.0	11.0~14.0	2.00~3.00		
TP317L	SUS317L	1.4438	X2CrNiMo18-15-4	0.035	18.0~20.0	11.0~15.0	3.00~4.00		
TP321	SUS321	1.4541	X6CrNiTi18-10	0.080	17.0~20.0	9.00~13.0			Ti: 5*C~0.60
TP321H	SUS312H	1.4878	X12CrNiTi18-9	0.04~0.10	17.0~19.0	9.00~12.0			Ti: 4*C~0.60
TP347	SUS347	1.4550	X6CrNiNb18-10	0.080	17.0~20.0	9.00~13.0			Nb:10*C~1.00
TP347H	SUS347H	1.4961	X6CrNiNb18-12	0.04~0.10	17.0~19.0	9.00~13.0			Nb:8*C~1.00
N08904	904L	1.4539	X1NiCrMoCu25-20-5	0.020	19.0~23.0	23.0~28.0	4.0~5.0		Cu:10*C~2.00
S30815	Alloy 253MA/F45	1.4835		0.05~0.10	20.0~22.0	10.0~12.0		0.14~0.20	
S31803	QS2205	1.4462	X2CrNiMoN22-5-3	0.030 max	21.0~23.0	4.5~6.5	2.5~3.5	0.08~0.20	
S32750		1.4410	X2CrNiMoN25-7-4	0.030 max	24.0~26.0	6.0~8.0	3.0~5.0	0.24~0.32	Cu:0.50Max

MECHANICAL PROPERTY

UNS	Tensile Strength Min,Mpa	Yield Strength Min, Mpa	Elongation in 2INCH, Or 50mm Min, %	Hardness Max
TP304L	485	170	35	90HRB
TP304L	485	170	35	90HRB
TP304H	515	205	35	90HRB
TP310S	515	205	35	90HRB
TP316L	485	170	35	90HRB
TP316	515	205	35	90HRB
TP316H	515	205	35	90HRB
TP317L	515	205	35	90HRB
TP321	515	205	35	90HRB
TP321H	515	205	35	90HRB
TP347	515	205	35	90HRB
TP347H	515	205	35	90HRB
N08904	490	216	35	90HRB
S30815	600	310	40	95HRB
S31803	620	450	25	30HRC
S32750	800	550	15	32HRC

APPLIED STANDARD

ASTM A790/ASME SA790	Seamless and welded ferritic/austenitic stainless steel pipe
ASTM A312/ASME SA312	Seamless and welded austenitic stainless steel pipes
ASTM A511/ASME SA511	Seamless stainless steel mechanical tubing
DIN 2448	Seamless steel pipes and tubes
DIN 6258	Hollow steel bars for machining
GOST 8731	Seamless hot rolled steel pipes - technical requirements
JIS G3459	Stainless steel pipes

DIMENSION RANG

No.	Outside diameter (mm)	Wall thickness	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1	89																												
2	90																												
3	95																												
4	100																												
5	102																												
6	108																												
7	114																												
8	127																												
9	133																												
10	140																												
11	146																												
12	159																												
13	168																												
14	180																												
15	194																												
16	219																												
17	245																												
18	273																												
19	325																												
20	351																												
21	377																												
22	426																												
23	480																												
24	530																												
25	100																												

TEST & INSPECTION PLAN

1. 100% PMI / SPECTRO CHEMICAL ANALYSIS TESTS
2. 100% DIMENSION TESTS & 100% VISUAL EXAMINATION
3. TENSION TEST, FLARING TESTS(FOR SEAMLESS TUBE/PIPE), HARDNESS TEST, FLATTENING TEST (FOR SEAMLESS TUBE/PIPE)
4. 100% HYDROSTATIC TEST/100% NON-DESTRUCTIVE TESTS

NOTES : ALL THE TESTS AND INSPECTION NEED TO PROVIDE WITH REPORTS ACCORDING TO STANDARD AND TEST RESULTS.

The documents LSI will provide to you :

1. MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
2. RAW MATERIAL CERTIFICATION
3. ALL THE TEST & INSPECTION REPORTS AS PER PO AND STANDARDS
4. HEAT TREATMENT REPORT
5. SHIPPING NOTIFICATION BEFORE SHIPMENT
6. QUALITY WARRANTY LETTER

OPTION TEST & INSPECTION ITEMS :

1. STRAIGHTNESS TEST
2. ROUGHNESS TEST
3. CRYSTALLING PHASE ANALYSIS
4. INTERGRANULAR ATTACK TESTS
5. MPACT ATTACK TEST UNDER LOW TEMPERATURE

3.5 Bright Annealing Stainless Steel Tubing/High-purity E-Polishing Stainless Steel Tubing

Designed for critical and purity applications such as semiconductor manufacturing, LSI's high purity tubing delivery of gases, chemicals and solvents, or use in ultra High vacuum piping for reducing out gas rate. From advanced manufacturing processes, including special cold drawing and cold pilgering, not just precision for sizes, but also enhance material substrates density by cold pilgering process. The ID is cold rolling to a 15Ra(0.4µm) finished, by Hydrogen bright annealed process removed tube lubrication and optimum anti-corrosion ability, stress free, good mechanical properties follow by precision cleaning process to removed any residual contaminants, simulated natural light inspection at both ends verifies cleaning before the tubes are nitrogen purged and capped.

Surface Treatment: Bright annealed, polished outside and inside surface, Electronic Polishing.



GRADE OF MATERIAL

Bright Annealing Tubing/High-purity E-Polishing Tubng for Semi-conductor industry								
ASTM/ASME	JIS	EN	DIN	C	Cr	Ni	Mo	Others
TP304	SUS304			0.080	18.0~20.0	8.0~11.0		
TP304L	SUS304L	1.4307	X2CrNi18-9	0.035	18.0~20.0	8.0~12.0		
TP316	SUS316L			0.080	16.0~18.0	10.0~14.0	2.00~3.00	
TP316L	SUS316L	1.4404	X2CrNiMo17-12-2	0.035	16.0~18.0	10.0~15.0	2.00~3.00	
TP316L	SUS316L	1.4436	X3CrNiMo17-13-3	0.050	16.5~18.5	10.5~13.0	2.50~3.00	
TP321	SUS321	1.4541	X6CrNiTi18-10	0.080	17.0~19.0	9.00~12.0		Ti: 5*(C+N)~0.70

MECHANICAL PROPERTY

EN	Tensile Strength Min,Mpa	Yield Strength Min, Mpa	Elongation in 2INCH, Or 50mm Min,%	Hardness Max,
1.4301	500~700	195	35	90HRB
1.4307	460~680	180	35	90HRB
1.4401	510~710	205	30	90HRB
1.4404	490~690	190	30	90HRB
1.4436	510~710	205	30	90HRB
1.4541	500~730	200	30	90HRB

Pressure Ratings: Based on using the more conservative Barlow formula where $P=(2T \times S)/O$
P=burst pressure T=wall thickness S=tensile strength O=outside diameter.

APPLIED STANDARD

ASTM A249/ASME SA249 Welded austenitic steel boiler, superheater, heat-exchanger, and condenser tubes

ASTM A269, ASME SA269 Seamless and welded austenitic stainless steel tubing for general service

EN10305-1 Precision steel tubes

EN10216-5 Seamless steel tubes for pressure purposes

EN10217-5 Welded steel tubes for pressure purposes

ASTM A270/ASME SA270 Seamless and welded austenitic stainless steel sanitary tubing

JIS G3447 Stainless steel sanitary tubing

JIS G3459 Stainless steel pipes

DIMENSION RANG

No.	Outside diameter (mm)	Wall thickness (mm)	0.5	0.6	0.8	1.0	1.2	1.6	2.0	2.3	2.6	2.8	2.9	3.2	3.6	4.0
1	6															
2	6.35															
3	9.53															
4	10															
5	12															
6	16															
7	17.2															
8	19.05															
9	20															
10	21.3															
11	22															
12	25															
13	25.4															
14	26.9															
15	30															
16	31.8															
17	32															
18	33.7															
19	35															
20	38															
21	40															
22	42															
23	42.4															
24	44.5															
25	48.3															
26	60.3															

TEST & INSPECTION PLAN

100% PMI / SPECTRO CHEMICAL ANALYSIS TESTS

100% DIMENSION TESTS & 100% VISUAL EXAMINATION

TENSION TEST, FLARING TESTS(FOR SEAMLESS TUBE/PIPE)/FLANGE TESTS(FOR WELDED TUBE/PIPE), HARDNESS TEST, REVERSED

FLATTENING TEST(FOR WELDED TUBE/PIPE), FLATTENING TEST (FOR SEAMLESS TUBE/PIPE)

100% HYDROSTATIC TEST/100% NON-DESTRUCTIVE TESTS

ROUGHNESS TESTS

STRAIGHTNESS TEST

NOTES : ALL THE TESTS AND INSPECTION NEED TO PROVIDE WITH REPORTS ACCORDING TO STANDARD AND TEST RESULTS.

The documents LSI will provide to you :

- MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
- RAW MATERIAL CERTIFICATION
- ALL THE TEST & INSPECTION REPORTS AS PER PO AND STANDARDS
- HEAT TREATMENT REPORT
- SHIPPING NOTIFICATION BEFORE SHIPMENT
- QUALITY WARRANTY LETTER

OPTION TEST & INSPECTION ITEMS :

- CRYSTALLING PHASE ANALYSIS
IMPACT ATTACK TEST UNDER LOW TEMPERATURE
ULTRO-SONIC TESTING

LSI PRODUCTS

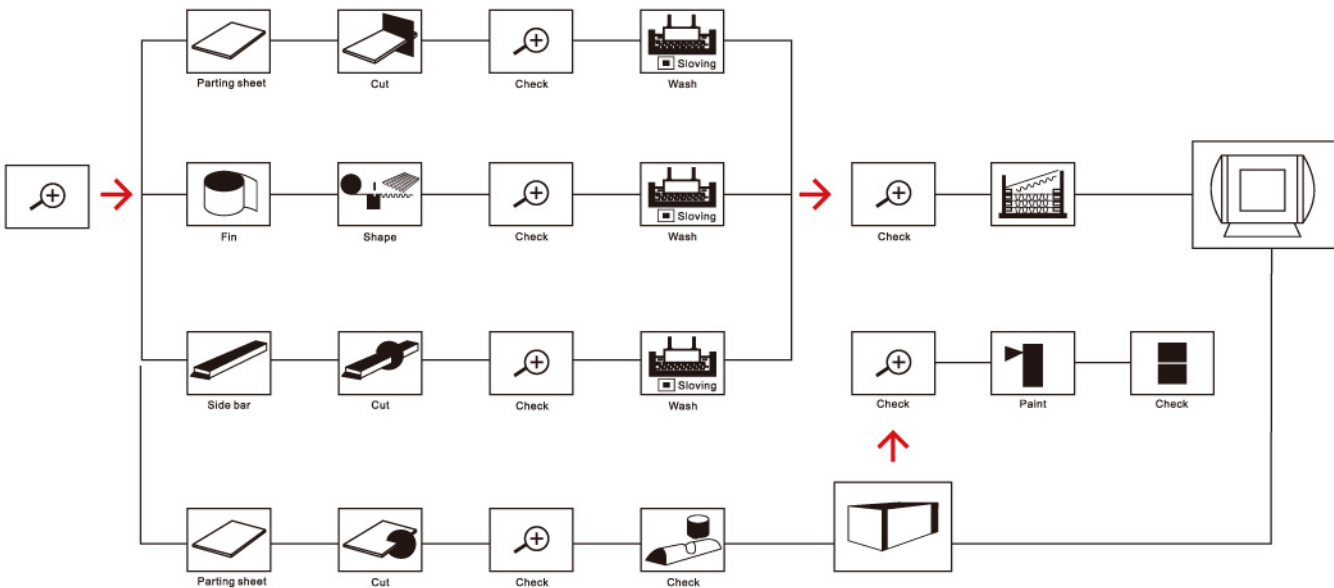
3.6 FINS TUBES

Since many years' experience in stainless steel tubes and other material tubes, LSI has a very stable and reputable partner for processing fins tube. The type we can produce including:

- 1. Extruded fins tube
- 2. Serrated fin tubes
- 3. L Type fins tube
- 4. G Type fins tube
- 5. LL Type fins tube
- 6. H Type fins tube
- 7. KL Type fins tube



MANUFACTURING PROCESS :



Aluminium fins are formed from a bimetallic tube consisting of a bare tube and an aluminium muff tube. The fins are formed on a cold rolling process from the wall thickness of the aluminium muff tube. Extruded fin gives very good corrosion protection to the bare tube, as the bare tube is not visible to the atmosphere in between the fins.

Maximum operating temperature for extruded finned tube is 325 deg C.

- Fin Material - Aluminium (or) Copper
- Tube Material - No theoretical limit

WE Focus more on the quality of products as we take for our life

Quality Control / ISO9001:2008 Quality Management System

Completed Quality System

LSI has completed quality management system under ISO9001 and make it as the principle for our cooperation partners and material suppliers.

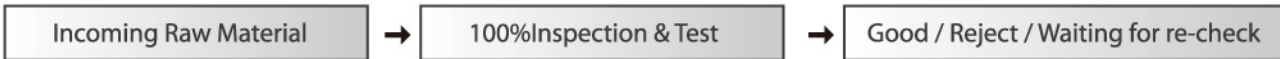
Traceable Management

LSI has traceable management system from the raw material to the end-user

Advanced Test Equipments & Professional QA Engineer

LSI has advanced Test & Inspection equipments and qualified professional QA engineer, we maintain and calibrate the equipments regularly and do training schedule for our staff

Raw Material Control / 100% as per standard , 100% as per Chents requirements



Inspection & Test Content

- 1. Chemical composition analysis (100% PMI Test)
- 2. Surface quality inspection (Make sure the surface quality meet the requirements of processing)
- 3. Inter-granular attack test and metallographic detection as well as physical test

Quality Control In-process

* The rate of randomly check as per the internal mill standard quality manual
* Inspector in process shall be selected according to quality manual and after training

A. Pickling

Check the cleanness of inside and outside of the tubes, the pickling solution and change the pickling solution regularly

B. Cold-drawing & Cold Rolling

Check the working condition for machine and the surface quality after cold-working .

C. Heat treatment

Check the temperature of whole heat treatment pro-cess and doing metallo-graphic detection of tubes as well as check the sur-face quality of tube after heat treatment

D. Straightening

Check the straight-ness of tube and the surface quality of tubes after straightening



Quality of Finished Products

Physical Property Test

Test & Inspection
Flattening, flaring, tensile test
Hardness Test

Chemical Composition Analysis

Chemical Composition
100% PMI Test
SPECTROMAXx
Carbon & Sulphur Analysis

NDT

NDT
Hydrostatic Test
Air under water test
Eddy current test
Ultrasonic Test
PT

Other Inspection and Tests.

Surface quality check
Dimension Test
Straightness Test
Surface roughness Test
Inter-granular Test
Attack Test under low temperature
Anti-fatigue Test
Balling Test for U bend tube



LSI devote to providing superior quality products for industry engineering projects and one-stop services.

PACKING SPECIFICATION & SHIPMENT

CLASSIFICATION	STANDARD APPLICATION	PACKING METHOD
BARE PACKING	CARBON / ALLOY STEEL	1. STEEL BAND (1 POINT BINDING PER 1.5 METERS)
WOODEN SLATE PACKING	CARBON/ALLOY STEEL / STAINLESS STEEL / TITANIUM/OTHERS	1. POLYETHYLENE FILM PACKING 2. WOODEN SLATE 3. STEEL BAND (1 POINT BINDING PER 1.5 METERS)
WOODEN BOX PACKING		1. POLYETHYLENE FILM PACKING 2. STRONG WOODEN BOX, TRANSPORTATION-WORTHY 3. STEEL BAND (1 POINT BINDING PER 1 METERS)
PLYWOOD BOX PACKING		1. POLYETHYLENE FILM PACKING 2. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY 3. STEEL BAND (1 POINT BINDING PER 1 METERS)
BUNDLE PACKING		1. POLYETHYLENE FILM PACKING 2. STEEL BAND (1 POINT BINDING PER 1.5 METERS)
WOODEN BOX PACKING	U-TUBE	1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS 2. WOODEN SLATES FOR DIFFERENT RADIUS 3. POLYETHYLENE FILM PACKING 4. STRONG WOODEN BOX, TRANSPORTATION-WORTHY 5. STEEL BAND (1 POINT BINDING PER 1 METERS)
PLYWOOD BOX PACKING		1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS 2. WOODEN SLATES FOR DIFFERENT RADIUS 3. POLYETHYLENE FILM PACKING 4. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY 5. STEEL BAND (1 POINT BINDING PER 1 METERS)
WOODEN BOX PACKING	BRIGHT ANNEALING TUBING/HIGH-PURITY TUBING PACKING	1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS 2. POLYETHYLENE BAGS PACKING FOR EACH TUBING 3. POLYETHYLENE FILM PACKING 4. STRONG WOODEN BOX, TRANSPORTATION-WORTHY 5. STEEL BAND (1 POINT BINDING PER 1 METERS)
PLYWOOD BOX PACKING		1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS 2. POLYETHYLENE BAGS PACKING FOR EACH TUBING 3. POLYETHYLENE FILM PACKING 4. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY 5. STEEL BAND (1 POINT BINDING PER 1 METERS)



WHY LSI

Advantage Products

Seamless stainless steel tube & pipe

Specializing in producing hollow bars and thin-wall thickness seamless stainless steel tube & pipe.
Expert in producing heat exchanger tube and U bend tube

Welded stainless steel tube & pipe

1.Experts in super-ferritic stainless steel tubing for industry & power station (S44660&S44400)
2.Specializing in special materials

Core Products

Seamless stainless steel tube & pipe

Specializing in producing hollow bars and thin-wall thickness seamless stainless steel tube & pipe.
Expert in producing heat exchanger tube and U bend tube

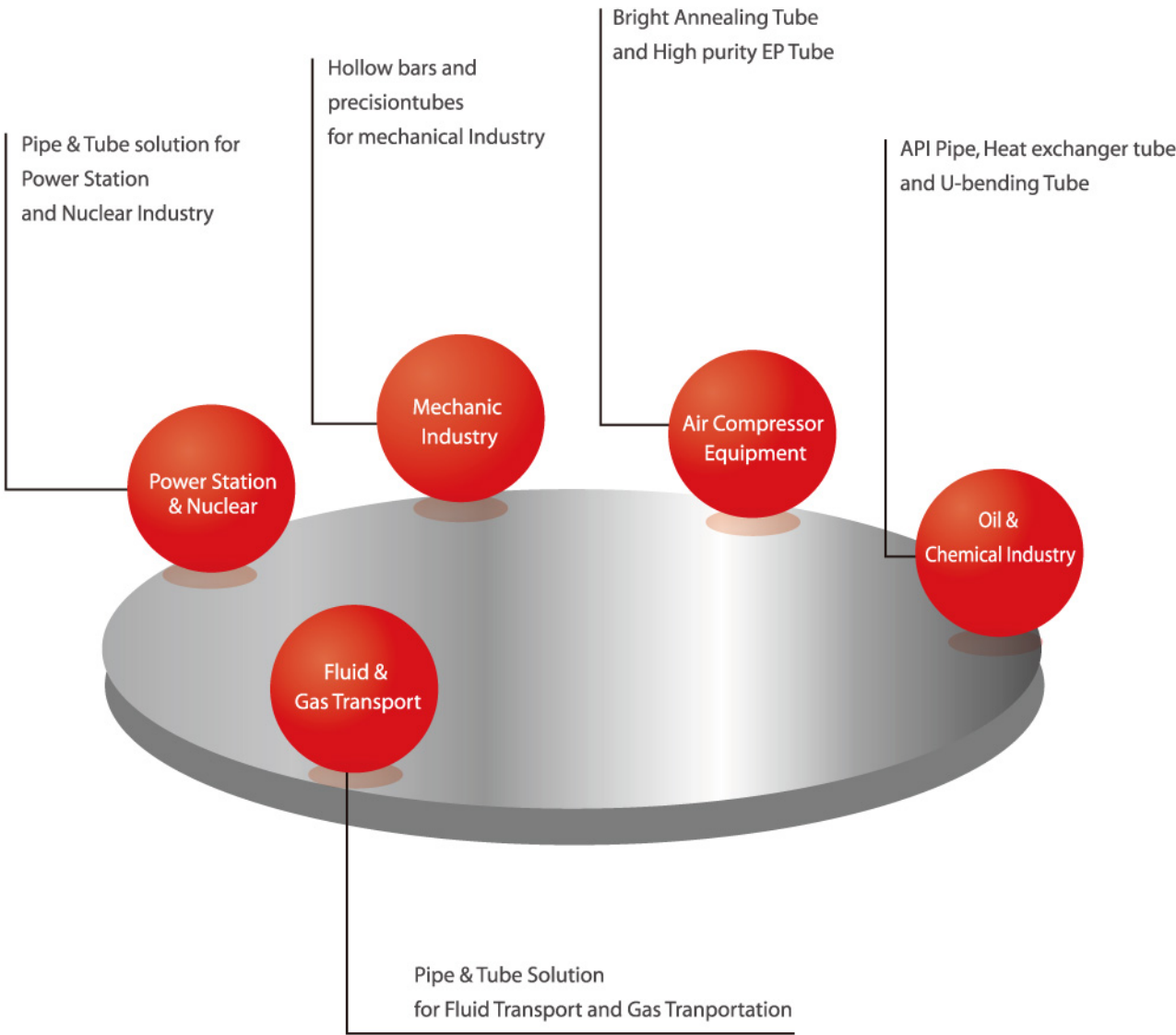
Welded stainless steel tube & pipe

Specializing in precision tubing in small diameters



OUR CLIENTS

APPLICATION AREA



LSI specializing in providing superior-quality products and efficient solution for clients. We Insist in doing our best for what we are good at.

PROJECT INVOLVING COMPANY LOGO	CUSTOMER & BUSINESS PARTNER LOGO	CUSTOMER & BUSINESS PARTNER LOGO
		
		
		
		
		
		
		
		
		
		