LORD STEEL
INDUSTRY COMPANY LIMITED

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LORD STEEL

*Many Solutions, One Decision Here*

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 inventation 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 |



# LSI PRODUCTS

### 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 :

1. MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
2. RAW MATERIAL CERTIFICATION
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6. QUALITY WARRANTY LETTER

## 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.

**Application :**

Nuclear Industry
Chemical Industry
Petrochemical Industry
HVAC (Heating Ventilation Air Conditioning), Refrigeration
Food and Beverages
Power Generation

### 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 |





# LSI PRODUCTS

### 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. | Outside diameter (mm) \ Wall thickness | 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
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
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 substrutes 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=(2TxS)/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 | 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
ROUGNESS 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 :**

a. MTC (MATERIAL TEST CERTIFICATION) ACCORDING TO EN10204/3.1 OR EN 10204/3.2
b. RAW MATERIAL CERTIFICATION
c. ALL THE TEST & INSPECTION REPORTS AS PER PO AND STANDARDS
d. HEAT TREATMENT REPORT
e. SHIPPING NOTIFICATION BEFORE SHIPMENT
f. 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 inbetween 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*

# QC SYSTEM

## Quality Control / *ISO9001:2008Quality 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*

Incoming Raw Material → 100%Inspection & Test → Good / Reject / Waiting for re-check

**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,flarring,tensiletest
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

# 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<br>2. WOODEN SLATE<br>3. STEEL BAND (1 POINT BINDING PER 1.5 METERS) |
| WOODEN BOX PACKING | | 1. POLYETHYLENE FILM PACKING<br>2. STRONG WOODEN BOX, TRANSPORTATION-WORTHY<br>3. STEEL BAND (1 POINT BINDING PER 1 METERS) |
| PLYWOOD BOX PACKING | | 1. POLYETHYLENE FILM PACKING<br>2. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY<br>3. STEEL BAND (1 POINT BINDING PER 1 METERS) |
| BUNDLE PACKING | | 1. POLYETHYLENE FILM PACKING<br>2. STEEL BAND (1 POINT BINDING PER 1.5 METERS) |
| WOODEN BOX PACKING | U-TUBE | 1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS<br>2. WOODEN SLATES FOR DIFFERENT RADIUS<br>3. POLYETHYLENE FILM PACKING<br>4. STRONG WOODEN BOX, TRANSPORTATION-WORTHY<br>5. STEEL BAND (1 POINT BINDING PER 1 METERS) |
| PLYWOOD BOX PACKING | | 1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS<br>2. WOODEN SLATES FOR DIFFERENT RADIUS<br>3. POLYETHYLENE FILM PACKING<br>4. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY<br>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<br>2. POLYETHYLENE BAGS PACKING FOR EACH TUBING<br>3. POLYETHYLENE FILM PACKING<br>4. STRONG WOODEN BOX, TRANSPORTATION-WORTHY<br>5. STEEL BAND (1 POINT BINDING PER 1 METERS) |
| PLYWOOD BOX PACKING | | 1. SOFT PLASTIC PLUGS/CAPS ON BOTH ENDS<br>2. POLYETHYLENE BAGS PACKING FOR EACH TUBING<br>3. POLYETHYLENE FILM PACKING<br>4. STRONG PLYWOOD BOX, TRANSPORTATION-WORTHY<br>5. STEEL BAND (1 POINT BINDING PER 1 METERS) |

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

# 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

# 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.

# OUR CLIENTS

| PROJECT INVOLVING COMPANY LOGO | CUSTOMER & BUSINESS PARTNER LOGO | CUSTOMER & BUSINESS PARTNER LOGO |
|---|---|---|
| | | Hy-Lok |
| ExxonMobil | AMC | |
| bp | THE LINDE GROUP | CSR |
| 中国石化 SINOPEC | OGPC | CSCEC |
| | ABB | CCESCC |
| TOTAL | ALSTOM | TATA |
| BAYER | CFE Comisión Federal de Electricidad | CNNC |
| Eni | Lurgi | KRAFT |
| SAMSUNG | AIR PRODUCTS | CNC |
| GAZPROM | SANY | ABG ABG Shipyard Limited |