Precision

Steel Tube

Shanghai T.S. Industrial Co.,Ltd

www.lordtubing.com

公司介绍 COMPANY PROFILE

友道实业（上海）有限公司始终致力于为全球客户提供高性能的高精度液压钢管及其深加工服务。我们的产品涵盖光亮、镀锌、磷化、钝化等多种表面处理的液压管和焊接或无缝钢管，并能按照ASTM/DIN/EN/JIS/GB等国家标准生产，广泛用于汽车、工程机械、液压系统等领域。

We are committed to providing global clients with high-performance, high-precision hydraulic steel tubes and value-added processing services. Our product range includes hydraulic tubes with various surface treatments such as bright finishing, galvanizing, phosphating, and passivation, available in both welded and seamless forms.

生产设备

产品介绍 PRODUCT DETAILS

1. 无缝精密钢管 Seamless Precision Steel Tube

专为高压流体传输系统设计，采用优质钢材冷拔/冷轧工艺制造，兼具高精度尺寸公差与卓越的机械性能。钢管外表面磷化或镀锌涂层强化防腐能力，适应多种复杂工况。产品符合DIN 2391，EN 10305等国际标准，广泛应用于工程机械、航空航天及船舶液压系统。

Engineered for high-pressure fluid transfer systems, our tubes are manufactured using premium-grade steel materials through cold-drawn/cold-rolled processes, achieving both high-precision dimensional tolerances and exceptional mechanical properties.

Featuring surface treatments with phosphating or galvanizing coatings for enhanced corrosion resistance, these tubes excel in diverse and demanding operating environments. Compliant with DIN 2391, EN 10305, and other international standards, they are widely utilized in hydraulic systems across engineering machinery, aerospace, and marine applications.

生产标准 Standard:

- DIN 2391/C
- EN 10305-1/4
- DIN 2445-2
- SAE J524

材料明细 Material Grade:

- E235 (St 35, St 37.4, 10#)
- E255 (St 45, 20#)
- E355 (St 52, St 52.4, 16Mn)

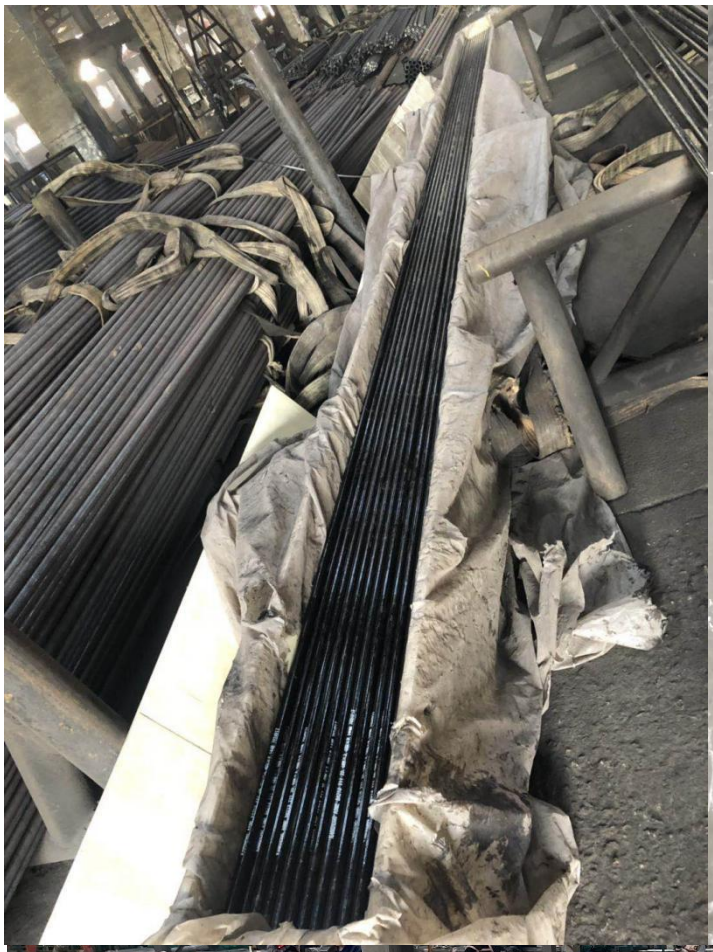
钢级 Steel Grade	化学成分Chemical Composition (%)					
	C	Mn	P	S	Si	Al
E235	≤0.10	≤0.70	≤0.025	≤0.015	≤0.05	≥0.025
E255	≤0.17	≤1.20	≤0.025	≤0.015	≤0.35	-
E355	≤0.22	≤1.60	≤0.025	≤0.015	≤0.55	-

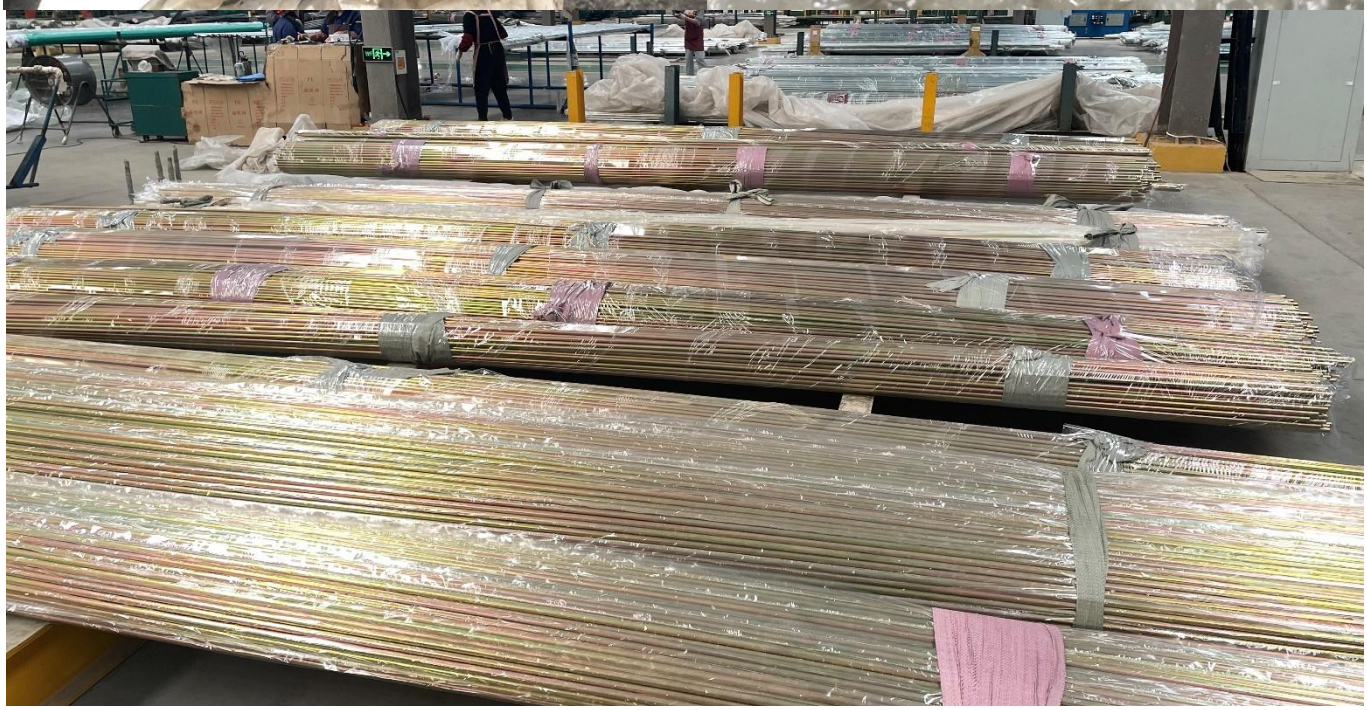
表面处理 Surface Finish:

- Bright
- Black Phosphated
- White & Color Galvanized
- Army Green Passivated
- White & Color Galvanized
- Army Green Passivated

交货条件 Delivery Condition:

- BK (+C) —— Cold drawn/hard
- BKW (+LC) —— Cold drawn/soft
- BKS (+SR) —— Cold drawn and stress relieved
- GBK (+A) —— Soft annealed
- NBK (+N) —— Normalized



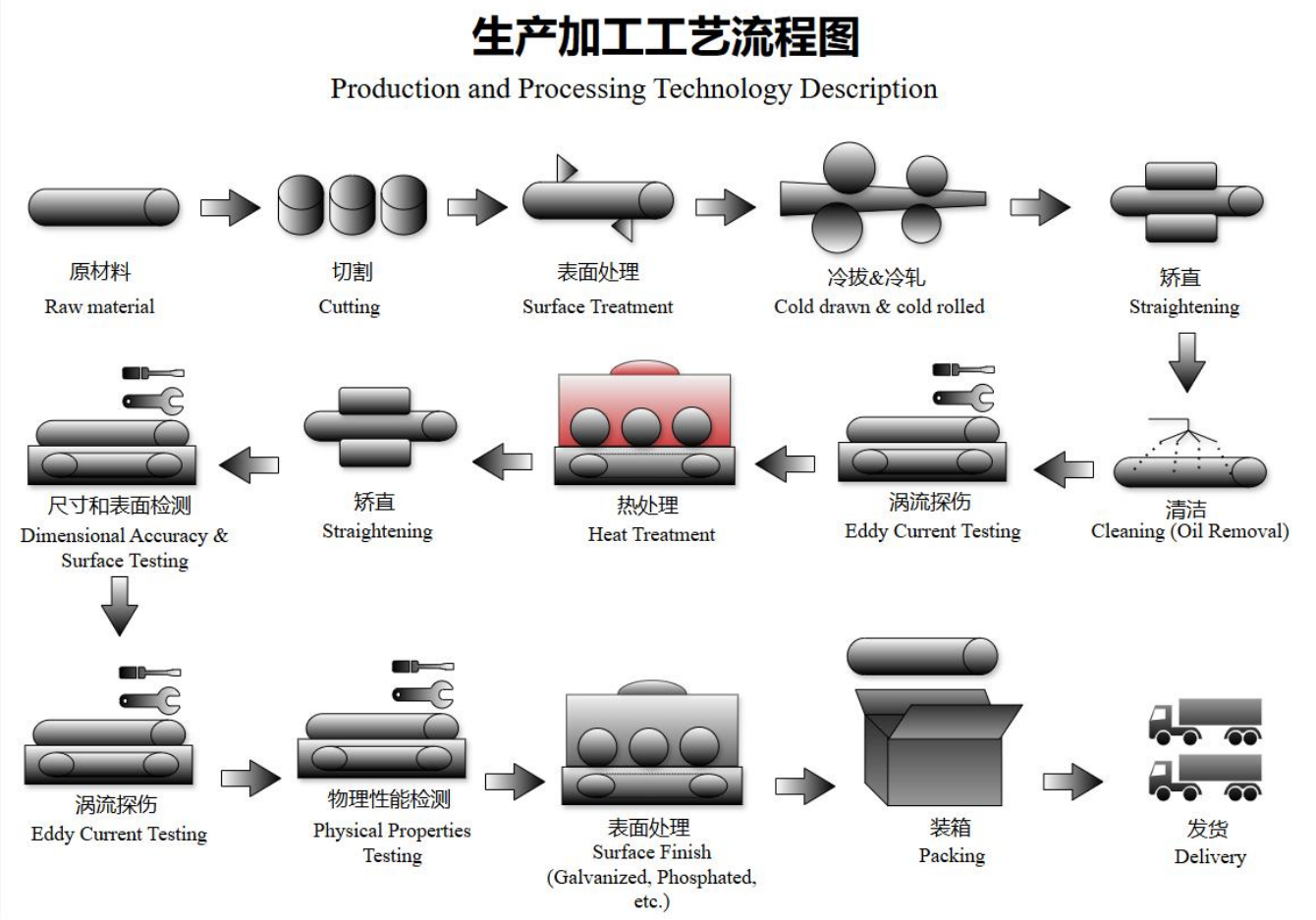


常规尺寸规格 Common Size:

- **外径 (Outside Diameter):** 4mm-60mm
- **壁厚 (Wall Thickness):** 0.5mm-6mm

外径及公差 OD & Tol.		壁厚 Wall Thickness																
		0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5	5	5.5	6
		内径及公差 Inside Diameter & Tolerance																
4	±0.08	3	2.4	2	1.6													
		±0.15																
5		4	3.4	3	2.6													
		±0.15																
6		5	4.4.	4	3.6	3	2.4	2										
		±0.15																
7		6	5.4	5	4.6	4	3.4	3										
		±0.15																
8		7	6.4	6	5.6	5	4.4.	4	3.6	3								
		±0.15								±0.25								
9		8	7.4	7	6.6	6	5.4	5	4.6	4	3.4							
		±0.15								±0.25								
10		9	8.4	8	7.6	7	6.4	6	5.6	5	4.4	4						
		±0.15									±0.25							
12		11	10.4	10	9.6	9	8.4	8	7.6	7	6.4	6	5	4				
		±0.15										±0.25						
14		13	12.4	12	11.6	11	10.4	10	9.6	9	8.4	8	7	6	5			
		±0.08			±0.15									±0.25				
15		14	13.4	13	12.6	12	11.4	11	10.6	10	9.4	9	8	7	6	5		
		±0.08			±0.15										±0.25			
16		15	14.4	14	13.6	13	12.4	12	11.6	11	10.4	10	9	8	7	6	5	4
				±0.08			±0.15									±0.25		
18		17	16.4	16	15.6	15	14.4	14	13.6	13	12.4	12	11	10	9	8	7	6
				±0.08					±0.15								±0.25	
20		19	18.4	18	17.6	17	16.4	16	15.6	15	14.4	14	13	12	11	10	9	8
				±0.08					±0.15									±0.25
22		21	20.4	20	19.6	19	18.4	18	17.6	17	16.4	16	15	14	13	12	11	10
				±0.08						±0.15								
25		24	23.4	23	22.6	22	21.4	21	20.6	20	19.4	19	18	17	16	15	14	13
						±0.08					±0.15							
26		25	24.4	24	23.6	23	22.4	22	21.6	21	20.4	20	19	18	17	16	15	14
						±0.08					±0.15							
28		27	26.4	26	25.6	25	24.4	24	23.6	23	22.4	22	21	20	19	18	17	16
						±0.08						±0.15						
30		29	28.4	28	27.6	27	26.4	26	25.6	25	24.4	24	23	22	21	20	19	18
						±0.08						±0.15						
32	±0.15	31	30.4	30	29.6	29	28.4	28	27.6	27	26.4	26	25	24	23	22	21	20
										±0.15								
35		34	33.4	33	32.6	32	31.4	31	30.6	30	29.4	29	28	27	26	25	24	23
										±0.15								
38		37	36.4	36	35.6	35	34.4	34	33.6	33	32.4	32	31	30	29	28	27	26
										±0.15								
40		39	38.4	38	37.6	37	36.4	36	35.6	35	34.4	34	33	32	31	30	29	28
										±0.15								
42	±0.20			40	39.6	39	38.4	38	37.6	37	36.4	36	35	34	33	32	31	30
											±0.20							
45				43	42.6	42	41.4	41	40.6	40	39.4	39	38	37	36	35	34	33
											±0.20							
48				46	45.6	45	44.4	44	43.6	43	42.4	42	41	40	39	38	37	36
											±0.20							
50				48	47.6	47	46.4	46	45.6	45	44.4	44	43	42	41	40	39	38
											±0.20							
55	±0.25			53	52.6	52	51.4	51	50.6	50	49.4	49	48	47	46	45	44	43
				±0.20							±0.25							
60				58	57.6	57	56.4	56	55.6	55	54.4	54	53	52	51	50	49	48
				±0.20							±0.25							

加工流程图 Processing Flowchart



产品介绍 PRODUCT DETAILS

2. 冷拔焊接精密钢管 Drawn Over Mandrel Tubing （DOM Tube）

精密焊管采用焊管为原材料，经过一系列的拉拔工艺，去除内部焊缝，形成光滑的内表面。以获得更小直径和更高精度。这种工艺不仅提高了钢管的强度和硬度，还改善了其表面质量和尺寸精度。

Also known as DOM tubing, drawn over mandrel tubing utilizes welded steel tubes as base material. Through a series of mandrel drawing processes, it effectively eliminates internal weld seams to produce a smooth inner surface, enabling reduced tube diameters with superior dimensional precision.

The manufacturing process not only enhances the tubing's tensile strength and hardness but also significantly improves surface finish consistency and dimensional accuracy control.

常规尺寸 Common Size:

- OD: 10mm-120mm
- WT: 1.2mm-20mm

外径 Outside Diameter (OD)	壁厚 Wall Thickness (WT)
10mm - 120mm	1.2mm - 20mm

生产标准 Standard:

ASTM A513

产品形状 Tubing shape:

Round

产品特点 Features

■ 与普通焊管相比，精密焊管的精度更高。
With a higher precision compared with ordinary welded tubes.

■ 精密焊管的焊缝与内外表面质量优良。
With excellent weld seam quality & good inner and outer surface quality.

■ 壁厚均匀
Uniform wall thickness.

外径 O.D.	壁厚 Wall Thickness (mm)																	
	1.2	1.3	1.4	1.5	1.6	1.8	2	2.1	2.3	2.5	2.6	2.8	3	3.2	3.3	3.5	3.6	8.6
16	√	√	√	√														
18	√	√	√	√	√													
23	√	√	√	√	√	√												
25	√	√	√	√	√	√	√											
27.4	√	√	√	√	√	√	√	√										
32.4	√	√	√	√	√	√	√	√	√									
37.4	√	√	√	√	√	√	√	√	√	√								
43	√	√	√	√	√	√	√	√	√	√	√							
45	√	√	√	√	√	√	√	√	√	√	√	√						
50.8	√	√	√	√	√	√	√	√	√	√	√	√	√					
54		√	√	√	√	√	√	√	√	√	√	√	√					
56			√	√	√	√	√	√	√	√	√	√	√					
60				√	√	√	√	√	√	√	√	√	√	√				
63.5					√	√	√	√	√	√	√	√	√	√	√			
65						√	√	√	√	√	√	√	√	√	√			
68							√	√	√	√	√	√	√	√	√	√		
70								√	√	√	√	√	√	√	√	√	√	√
73									√	√	√	√	√	√	√	√	√	√
75										√	√	√	√	√	√	√	√	√

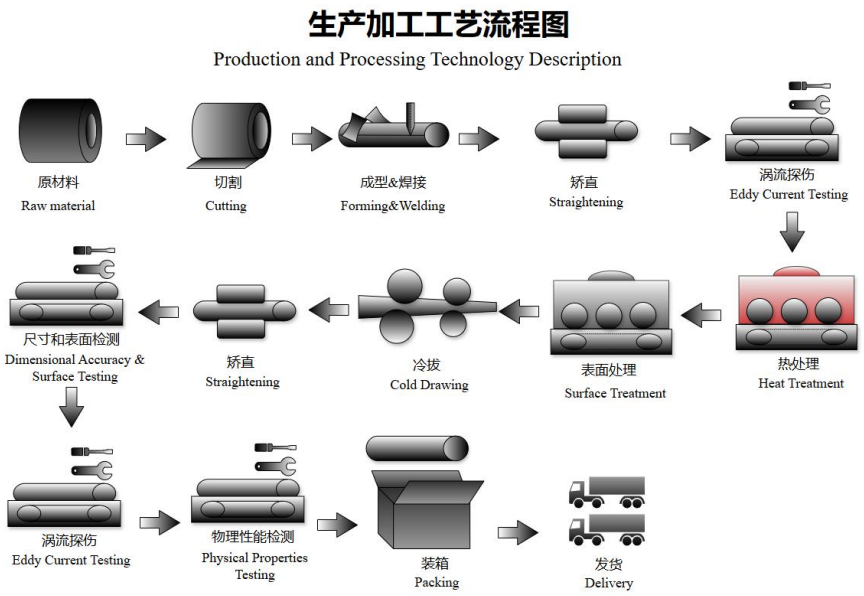
外径&内径公差 O.D. & I.D. Tolerance

外径范围 O.D. Range		公差 Tolerance			
		外径 O.D.		内径 I.D.	
in.	mm	in.	mm	in.	mm
0.394-0.499	10-12.67	+0.004/-0	+0.1/-0	-	-
0.500-1.699	12.7-43.15	+0.005/-0	+0.13/-0	+0/-0.005	+0/-0.13
1.700-2.099	43.18-53.31	+0.006/-0	+0.15/-0	+0/-0.006	+0/-0.15
2.100-2.499	53.34-63.47	+0.007/-0	+0.18/-0	+0/-0.007	+0/-0.18
2.500-2.899	63.5-73.63	+0.008/-0	+0.2/-0	+0/-0.008	+0/-0.2
2.900-3.299	73.66-83.79	+0.009/-0	+0.23/-0	+0/-0.009	+0/-0.23
3.300-3.699	83.82-93.95	+0.010/-0	+0.25/-0	+0/-0.010	+0/-0.25
3.700-4.099	93.98-104.11	+0.011/-0	+0.28/-0	+0/-0.011	+0/-0.28
4.100-4.499	104.14-114.27	+0.012/-0	+0.3/-0	+0/-0.012	+0/-0.3
4.500-4.899	114.30-124.43	+0.013/-0	+0.33/-0	+0/-0.013	+0/-0.33

壁厚公差 W.T. Tolerance

壁厚 W.T. (mm)	外径尺寸 O.D. Size (mm)			
	10≤OD≤20	20<OD≤50	50<OD≤100	100<OD≤120
1.24	+0.05/-0.05	+0.05/-0.08	+0.05/-0.08	-
1.65	+0.05/-0.05	+0.05/-0.08	+0.05/-0.08	+0.1/-0.1
2.11	+0.05/-0.05	+0.05/-0.08	+0.08/-0.08	+0.1/-0.13
2.41	+0.05/-0.05	+0.05/-0.08	+0.08/-0.08	+0.1/-0.13
2.77	+0.05/-0.08	+0.05/-0.1	+0.08/-0.08	+0.13/-0.13
3.05	+0.08/-0.08	+0.05/-0.1	+0.08/-0.08	+0.13/-0.13
3.4	-	+0.05/-0.1	+0.08/-0.08	+0.13/-0.13
3.76	-	+0.05/-0.1	+0.08/-0.08	+0.13/-0.13
4.19	-	+0.08/-0.1	+0.08/-0.1	+0.13/-0.15
4.57	-	+0.1/-0.1	+0.08/-0.13	+0.15/-0.15
5.16	-	+0.1/-0.13	+0.1/-0.13	+0.15/-0.18
5.59	-	+0.1/-0.15	+0.1/-0.15	+0.18/-0.18
6.05	-	+0.13/-0.15	+0.13/-0.15	+0.18/-0.18
6.58	-	+0.13/-0.15	+0.13/-0.13	+0.18/-0.18
7.21	-	+0.13/-0.15	+0.13/-0.15	+0.18/-0.18
7.62	-	+0.15/-0.15	+0.15/-0.15	+0.2/-0.2
8.13	-	+0.18/-0.18	+0.18/-0.18	+0.2/-0.2
8.74	-	+0.2/-0.2	+0.2/-0.2	+0.23/-0.23
9.53	-	-	+0.23/-0.23	+0.23/-0.23
10.16	-	-	+0.25/-0.25	+0.25/-0.25
11.13	-	-	+0.28/-0.28	+0.28/-0.28
11.68	-	-	+0.3/-0.3	+0.3/-0.3
12.19	-	-	+0.3/-0.3	+0.3/-0.3
13.49	-	-	+0.33/-0.33	+0.33/-0.33
14.3	-	-	+0.33/-0.33	+0.33/-0.33
14.73	-	-	+0.36/-0.36	+0.36/-0.36
15.24	-	-	+0.38/-0.38	+0.38/-0.38
15.88	-	-	+0.41/-0.41	+0.41/-0.016
16.51	-	-	+0.43/-0.43	+0.43/-0.43

加工流程图 Processing Flowchart



产品介绍 PRODUCT DETAILS

3. 无缝不锈钢管 Stainless Steel Seamless Tube

不锈钢无缝管采用SS304、SS316等优质原材料。按照国际ASTM/ASME, EN, DIN等标准，采用冷拔或冷轧工艺制成。尺寸精度高，有多种表面处理可供选择，广泛用于食品医疗、生物制药、仪器仪表等领域。

Our premium stainless steel seamless tubes are crafted from high-quality raw materials including SS304 and SS316, manufactured through cold-drawn or cold-rolled processes in compliance with international standards ASTM/ASME, EN, and DIN. Featuring precision dimensional accuracy and multiple surface treatment options, these tubes deliver exceptional performance for critical applications across food processing equipment, medical devices, biopharmaceutical systems, instrumentation installations, and specialized industrial sectors.

生产标准 Standard:
ASTM A269
ASTM A213
EN 10216-5

材料明细 Material Grade:
TP 304/L
TP 316/L

Steel Grade	UNS	Chemical Composition, %							
		C	Mn	P	S	Si	Ni	Cr	Mo
TP 304	S30400	≤0.08	≤2.00	≤0.045	≤0.030	≤1.00	8.00-11.00	18.00-20.00	-
TP 304L	S30403	≤0.035	≤2.00	≤0.045	≤0.030	≤1.00	8.00-12.00	18.00-20.00	-
TP 316	S31600	≤0.08	≤2.00	≤0.045	≤0.030	≤1.00	10.00-14.00	16.00-18.00	2.00-3.00
TP 316L	S31603	≤0.035	≤2.00	≤0.045	≤0.030	≤1.00	10.00-15.00	16.00-18.00	2.00-3.00

常规尺寸 Common Size:

- O.D.: 3.18mm-50.8mm
- W.T.: 0.7mm-5mm

Tube O.D.		Wall Thickness, inch. [mm]										
		0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.156	0.188
		0.71	0.89	1.25	1.65	2.11	2.41	2.77	3.05	3.4	3.96	4.78
Inch.	mm	Unit Weight, kg/m										
1/8"	3.18	0.04	0.05									
1/4"	6.35	0.1	0.12	0.16	0.19							
3/8"	9.53		0.19	0.26	0.32	0.39						
1/2"	12.70		0.26	0.36	0.45	0.56						
5/8"	15.88			0.46	0.58	0.72	0.81					
3/4"	19.05			0.55	0.72	0.89	1.00	1.12				
1"	25.40				0.98	1.22	1.38	1.56	1.70			
1-1/4"	31.75					1.56	1.76	2.00	2.18	2.40	2.74	
1-1/2"	38.10					1.89	2.14	2.44	2.66	2.94	3.37	3.97
2"	50.80							3.31	3.63	4.01	4.62	5.48

日标尺寸规格 JIS Size Standard

外径 O.D.		壁厚 W.T. (mm)	
in.	mm	5S	10S
6A	10.5	1	1.2
8A	13.8	1.2	1.65
10A	17.3	1.2	1.65
15A	21.7	1.65	2.1
20A	27.2	1.65	2.1
25A	34	1.65	2.8
32A	42.7	1.65	2.8
40A	48.6	1.65	2.8
50A	60.5	1.65	2.8
65A	76.3	2.1	3
80A	89.1	2.1	3
90A	114.3	2.1	3
100A	139.8	2.8	3.4
125A	165.2	2.8	3.4
150A	216.3	2.8	4
200A	267.4	3.4	4
250A	318.5	4	4.5

技术规范与包装 Technical Spec. & Packaging

表面处理 Surface Finish

BA (Bright Annealed) 光亮退火

EP (Electropolished) 电解抛光

MP (Mechanical Polished) 机械抛光

AP (Acid Pickled) 酸洗

表面粗糙度 Surface Roughness

类型 Type	数值Value
BA	≤ 0.5 μm
EP	≤ 0.2 μm
MP	≤ 0.5 μm
AP	≤ 2.5 μm

热处理 Heat Treatment

- **光亮退火 Bright Annealing**
- **酸洗退火 Pickling & Annealing**

用途 Applications

- **仪器仪表 Instruments**
- **生物制药 Biopharmaceuticals**
- **食品行业 Food Industry**

出口包装 Export Package

两端管帽封口，外部套有双层防静电袋。

With caps in both tube ends and covered with a double-layer anti-static bag on the outside.

产品介绍 PRODUCT DETAILS

4. 无缝镍基合金管 Nickel Alloy Seamless Tube

镍基合金在650～1000℃高温下有较高的强度与一定的抗氧化腐蚀能力，可以分为高温合金、耐蚀合金、耐磨合金等类型。无缝镍基合金管因其优良的耐腐蚀性和高温强度，被广泛应用于石油、化工、航空和核能等领域。

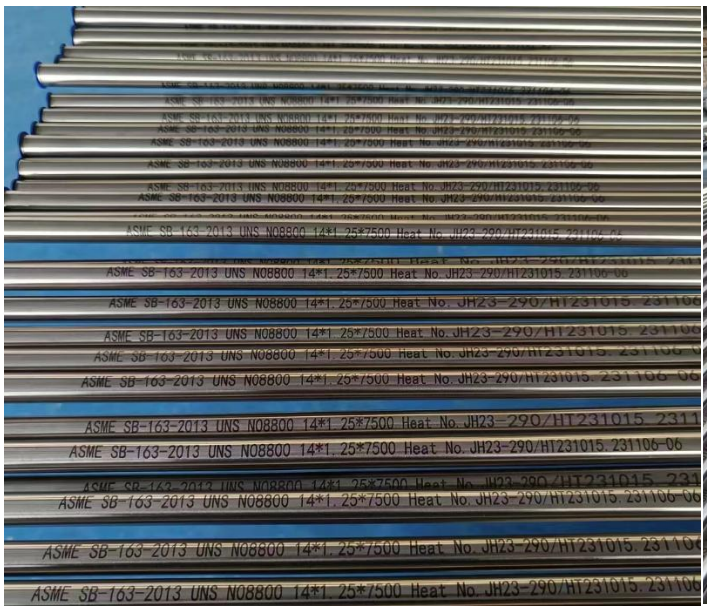
Nickel-based alloys exhibit superior strength and notable oxidation and corrosion resistance at elevated temperatures ranging from 650°C to 1000°C, with primary classifications including high-temperature alloys, corrosion-resistant alloys, and wear-resistant alloys. The seamless nickel alloy tubing demonstrates exceptional corrosion resistance and high-temperature mechanical stability, making it an essential material for critical applications across multiple industries such as petroleum refining, chemical processing, aerospace engineering, and nuclear power systems.

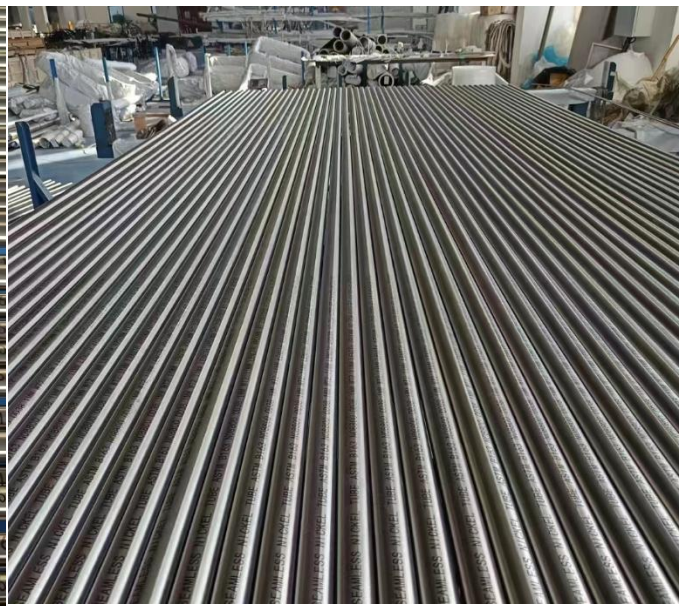
生产标准和材料牌号 Standards & Materials

ASTM/ASME	Specification	Material Grade
B161/SB161	Nickel Seamless Pipe and Tube	N02200, N02201
B163/SB163	Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes	N02200, N02201, N04400, N06600, N06601, N08800, N08811, N08825
B167/SB167	Nickel-Chromium-Aluminum Alloys, Nickel-Chromium-Iron Alloys, Nickel-Chromium-Cobalt-Molybdenum Alloy, Nickel-Iron-Chromium-Tungsten Alloy, and Nickel-Chromium-Molybdenum-Copper Alloy Seamless Pipe and Tube	N06600, N06601
B407/SB407	Nickel-Iron-Chromium Alloy Seamless Pipe and Tube	N08800, N08810, N08811
B423/SB423	Nickel-Iron-Chromium-Molybdenum-Copper Alloy Seamless Pipe and Tube	N08825
B444/SB444	Nickel-Chromium-Molybdenum-Columbium Alloys and Nickel-Chromium-Molybdenum-Silicon Alloy Pipe and Tube	N06625
B622/SB622	Seamless Nickel and Nickel-Cobalt Alloy Pipe and Tube	N10665, N10675, N10276, N06022, N06200
B668/SB668	Seamless Pipe and Tube	N08028
B829/SB829	General Requirements for Nickel and Nickel Alloy Seamless Pipe and Tube	
B983/SB983	Precipitation Hardened or Cold Worked, Seamless Nickel Alloy Pipe and Tube	N10276

材料对照表 Material Comparison Table

Material	UNS	GB	JIS	W.Nr.	BS	AFNOR	EN
Ni 200	N02200	NS5200/N7	NW2200	2.4066/ 2.4060	NA11	-	-
Ni 201	N02201	NS5201/N5	NW2201	2.4068	NA12	-	-
Monel 400	N04400	NS6400 Ni68Cu28Fe	NW4400	2.4360	NA13	NU30	NiCu30Fe
Hastelloy C-22 Inconel 622 Nickel Alloy 22	N06022	NS3308	NW6022	2.4602 NiCr21Mo14W Nicrofer 5621 hMoW	-	-	NiCr21Mo14W
Hastelloy C-2000	N06200	NS3405	-	2.4675	-	-	NiCr23Mo16Cu
Inconel 600 Nickel Alloy 600	N06600	NS3102/NS312 1CrNi75Fe8	NCF600	2.4816 NiCr15Fe	NA14	NC15Fe	-
Inconel 601 Nickel Alloy 601	N06601	NS3103/NS313 1Cr23Ni60Fe13Al	NCF601	2.4851 NiCr23Fe	NA49	NC23FeA	-
Inconel 625 Nickel Alloy 625	N06625	NS3306/NS336 0Cr20Ni65Mo10Nb4	NCF625	2.4856 NiCr22Mo9Nb	NA21	NC22DNb	-
Incoloy 28	N08028	NS1404 BG2830	-	1.4563	-	-	-
Incoloy 800	N08800	NS1101/NS111 0Cr20Ni32AlTi	NCF800	1.4876	NA15	Z8NC32.21	-
Incoloy 800H	N08810	NS1102/NS112 1Cr20Ni32AlTi	NCF800H	-	NA15 (H)	-	-
Incoloy 800HT	N08811	NS1104	-	-	-	-	-
Incoloy 825 Nickel Alloy 825	N08825	NS1402/NS142	NCF825	2.4858 NiCr21Mo	NA16	NC21FeDu	-
Hastelloy C-276	N10276	NS3304/NS334 00Cr15Ni60Mo16W5Fe5	NW0276	2.4819 NiMo16Cr15W	NC17D	-	NiMo16Cr15W
Hastelloy B-2	N10665	NS3202/NS322 00Ni70Mo28	NW0665	2.4617 NiMo28 Nimofer 6928	-	NiMo28	NiMo28
Hastelloy B-3	N10675	NS3203	-	2.4600	-	-	NiMo29Cr



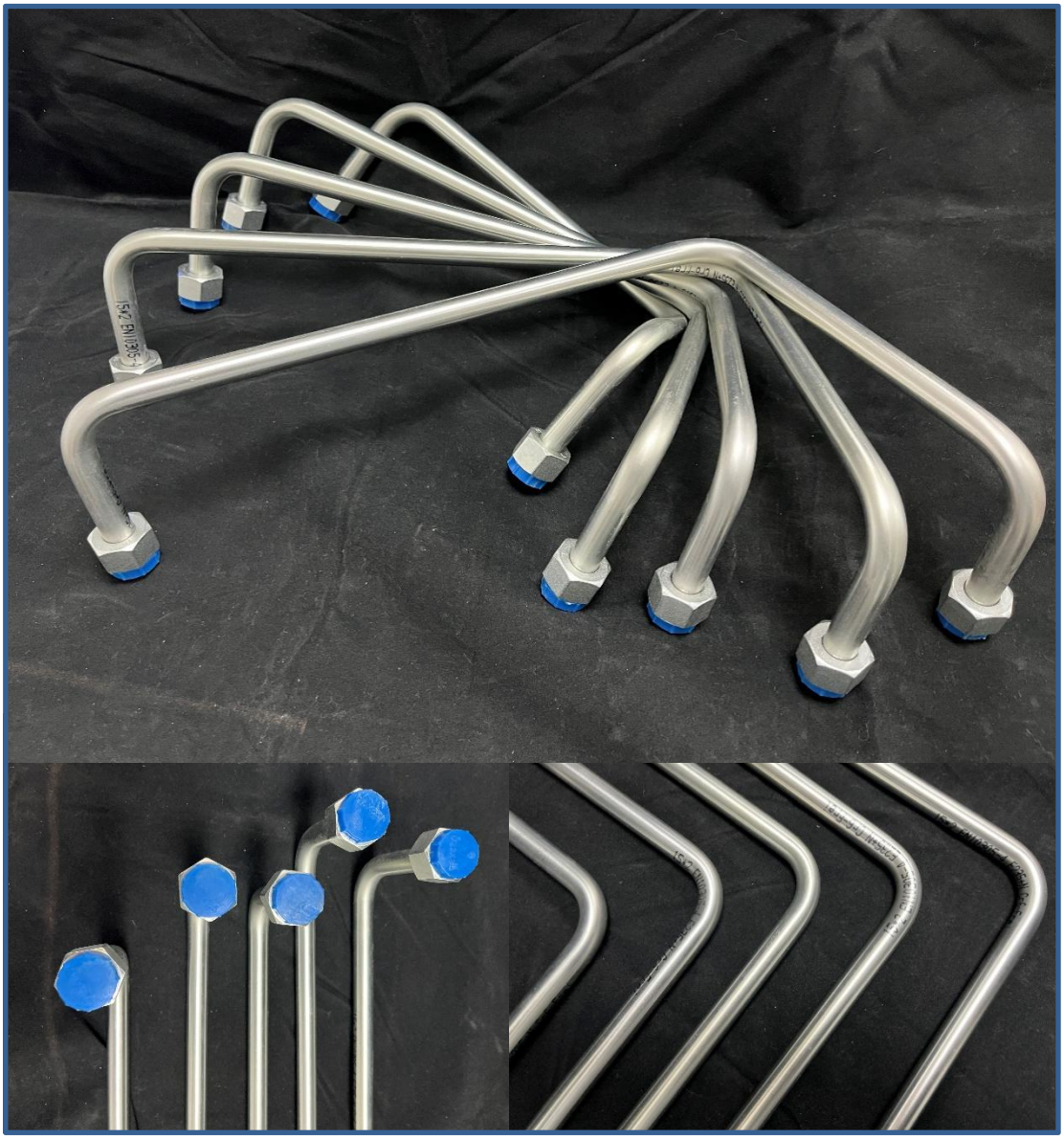


产品介绍 PRODUCT DETAILS

5. 精密钢管深加工 Precision Steel Tube Fabrication

我们提供全面的附加值加工服务，以满足您的确切要求。我们提供完整的液压硬管总成制造服务。基于您提供的参数或图纸，我们的专家团队将进行精确的切割、专业弯管、去毛刺清洗，并焊接高质量的接头。每一件总成都会经过严格的压力测试和清洁度检测，确保其达到即装即用的标准，为您节省宝贵的组装时间，并从根本上降低系统泄漏的风险。

We offer comprehensive value-added fabrication services to meet your exact requirements. We specialize in the fabrication of custom hydraulic tube assemblies. From your specifications or drawings, we perform precision cutting, professional bending, deburring, cleaning, and welding of high-quality connectors. Each assembly is rigorously pressure tested and checked for cleanliness, guaranteeing a "ready-to-install" solution that saves you valuable assembly time and eliminates the risk of system leakage.



产品介绍 PRODUCT DETAILS

6. 盘管 Coil Pipe for Coolers

我们的盘管采用高导热性材料并通过先进的弯管工艺制成，设计用于最大化热交换表面积，实现卓越的冷却或加热效率。盘管结构紧凑，能在有限空间内提供最大的热交换能力，广泛应用于液压油冷却、空气压缩系统、制冷设备及工业流程冷却等领域

Fabricated from high thermal conductivity materials using advanced bending techniques, our coil pipes are engineered to maximize the heat transfer surface area, delivering superior cooling or heating efficiency. Their compact design allows for maximum thermal capacity within minimal space, making them ideal for applications such as hydraulic oil cooling, compressed air systems, refrigeration.

材料 Material:

- Stainless Steel & carbon steel

可以根据客户的冷却器外壳尺寸定制盘管的直径、圈数、管径和长度。盘管的端部有多种接口可供选择。

We offer full customization to fit your specific cooler housing.

- Coil Dimensions: The diameter, number of coils, tube size, and length can all be tailored to your shell's dimensions.
- Connection Options: A variety of end-connection interfaces are available to meet your system requirements.

6. 出口包装 Export Package

Shanghai T.S. Industrial Co.,Ltd

Add: Lane 1588, Youyi Road, Baoshan, Shanghai, China

Tel: 0086-021-66030009

Fax: 0086-021-66030005

Email: sales@lordtubing.com

Website: www.lordtubing.com