



## Stainless Steel Pipe



Due to hollow section, the steel pipes are suitable for transporting pipeline of liquid, gas, and solid; Compared with the same weight of round steel, the steel tubes has big section coefficient and large bending torsional strength, so it has become a major material for all kinds of mechanical and architectural structure. Under the equal weight condition, the structure and components made with stainless steel tube have larger section modulus than the solid parts. Therefore, stainless steel pipe is a kind of economic cross section steel of saving metal and is an important part of efficient steel. Above all, the oil drilling, refining and transportation etc. have bigger demand. Next, stainless steel tubes have a wide scope in geological drilling, chemical industry, building industry, aircraft and automobile manufacture as well as boiler, medical equipment, furniture and bicycle production etc. With development of new technology in rocket, missile and aerospace industry, stainless steel pipes have become more and more important in defense industry, science and technology and economic development. Therefore, it is important for you to select a reliable stainless steel pipe manufacturer.

### Main Grade of Stainless Steel Pipe and Applications

Grades	Applications
<b>301</b>	It is used for forming products with good ductility and good weldability. Abrasion resistance and fatigue strength is better than that of 304 stainless steel. It can harden rapidly by mechanical processing.
<b>302</b>	The corrosion resistance of 302 is the same with 304. Due to high carbon content, intensity is better.
<b>303</b>	It is easier to cut processing than 304 by adding a little sulfur and phosphorus.
<b>304</b>	It is 18/8 stainless steel. GB brand is 0Cr18Ni9.
<b>316</b>	After 304, it is the second to get widest applications. It is mainly used to food industry, pharmaceutical industry and surgical equipment. Adding molybdenum elements make 316 stainless steel gets a special structure of corrosion resistant. Because it has much better ability to resist chloride corrosion, it is often used as marine steel. SS316 is usually used for nuclear fuel recycling equipment.
<b>400</b>	400 series Ferrite and martensite stainless steel
<b>408</b>	Weak corrosion resistance and good heat resistance. Cr: 11%; Ni: 8%



<b>409</b>	The cheapest model (), it is usually used as auto vent pipe and is a ferritic stainless steel (chrome steel).
<b>410</b>	Martensite stainless steel with good abrasion resistance and weak corrosion resistance.
<b>416</b>	Adding sulfur can improve the processing properties of material.
<b>420</b>	Rj martensitic steel which is similar to brinell high chromium steel. It is used as surgical tools.
<b>430</b>	Ferritic stainless steel with good formability and poor temperature resistance and corrosion resistance. It is mainly used to decorate.
<b>440</b>	High strength cutting steel with high carbon. After appropriate heat treatment, it can obtain higher yield strength, the hardness can reach 58 HRC. It belongs to the most hardest stainless steel. The most common example is razor blade. Common models:440A, 440B, 440C.
<b>500</b>	500 series-heat resistant chromium alloy steel
<b>600</b>	600 series-martensitic precipitation hardening stainless steel pipe

According to different applications, stainless steel pipe is divided into oil well pipe (casing pipe, oil pipe and drill pipe), line pipe, boiler pipe, mechanical structural pipe, hydraulic prop tube, vessel tube, geological tube, chemical pipe (high pressure fertilizer pipe, oil cracking pipe) and marine pipe etc.

**Table 1 Domestic Stainless Steel Standard Grade**

China	Japan	U.S.A	U.K.	Germany	France	Russia
GB1220-92 GB3280-92	JIS	AISIUNS	BS970BS1449	DIN17440 DIN17224	NFA35-575 NFA35-576	ГОСТ5632
0Cr13	SUS410S	S410				
1Cr13	SUS410	410	410S21	X7Cr13	Z6C13	08X13
2Cr13	SUS420J1	420J1	420S29	X20Cr13	Z20C13	20x13
1Cr17	SUS430	430				
7Cr17	SUS440A	440A				
9Cr18	SUS440C	440C		X105CrMo17	Z100CD17	95X18
0Cr18Ni9	SUS304	304	304S15	X5CrNi189	Z6CN18.09	08X18H10
00Cr19Ni10	SUS304L	304L	304S12	X2CrNi189	Z2CN18.09	03X18H11
0Cr17Ni12Mo2	SUS316	316	316S16	X5CrNiMo1812	Z6CND17.12	
00Cr17Ni14Mo2	SUS316L	316L	316S12	X2CrNiMo1812	Z2CND17.12	03X17H14M2
0Cr18Ni11Ti	SUS321	321		X10CrNiTi189	Z6CNT18.10	08X18H10T
0Cr18Ni11Nb	SUS347	347	347S17	X10CrNiNb189	Z6CNNb18.10	08X18H12F


**Table 2 Chemical Compositions of Martensite, Ferrite, Austenite and Diphasic Stainless Steel**

Grade	Mark	Chemical Compositions(%)										
		C	Cr	Ni	Mn	P	S	Mo	Si	Cu	N	Others
201	1Cr17Mn 6Ni5N	≤0.15	16.00- 18.00	3.50- 5.50	5.50 — 7.50	≤0.060	≤0.03	-	≤1.00	-	≤0.25	-
201L	03Cr17Mn 6Ni5N	≤0.03	16.00- 18.00	3.50- 5.50	5.50 — 7.50	≤0.060	≤0.03		≤1.00		≤0.25	
202	1Cr18Mn 8Ni5N	≤0.15	17.00- 19.00	4.00- 6.00	7.50- 10.00	≤0.060	≤0.03		≤1.00	-	≤0.25	-
204	03Cr16Mn 8Ni2N	≤0.03	15.00- 17.00	1.50- 3.50	7.00- 9.00						0.15- 0.30	
China	1Cr18Mn10Ni 5Mo3N	≤0.10	17.00- 19.00	4.00- 6.00	8.50- 12.00			2.8- 3.5			0.20- 0.30	
Russia	2Cr13Mn 9Ni4	0.15- 0.25	12.00- 14.00	3.70- 5.00	8.00- 10.00							
China	2Cr15Mn 15Ni2N	0.15- 0.25	14.00- 16.00	1.50- 3.00	14.00- 16.00						0.15- 0.30	
	1Cr18Mn 10Ni5Mo3N	≤0.15	17.00- 19.00	4.00- 6.00	8.50- 12.00	≤0.060	≤0.03	2.8- 3.5	≤1.00	-	0.20- 0.30	-
301	1Cr17Ni7	≤0.15	16.00- 18.00	6.00- 8.00	≤2.00	≤0.065	≤0.03	-	≤1.00	-	-	-
302	1Cr18Ni9	≤0.15	17.00- 19.00	8.00- 10.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
303	Y1Cr18Ni9	≤0.15	17.00- 19.00	8.00- 10.00	≤2.00	≤0.20	≤0.03	1)	≤1.00	-	-	-
303se	Y1Cr18Ni 9Se	≤0.15	17.00- 19.00	8.00- 10.00	≤2.00	≤0.20	≤0.03	-	≤1.00	-	-	Se≥0.15
304	0Cr18Ni9	≤0.07	17.00- 19.00	8.00- 10.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
304L	00Cr19Ni10	≤0.03	18.00- 20.00	8.00- 10.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
304N1	0Cr19Ni9N	≤0.08	18.00- 20.00	7.00- 10.50	≤2.00	≤0.035	≤0.03	-	≤1.00	-	0.10- 0.25	-
304N2	0Cr18Ni 10NbN	≤0.08	18.00- 20.00	7.00- 10.50	≤2.00	≤0.035	≤0.03	-	≤1.00	-	0.15- 0.30	Nb≤0.15
304LN	00Cr18Ni 10N	≤0.03	17.00- 19.00	8.50- 11.50	≤2.00	≤0.035	≤0.03	-	≤1.00	-	0.12- 0.22	-





305	1Cr18Ni12	≤0.12	17.00-19.00	10.50-13.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
309S	0Cr23Ni13	≤0.08	22.00-24.00	12.00-15.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
310S	0Cr25Ni20	≤0.08	24.00-26.00	19.00-22.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	-
316	0Cr17Ni12Mo2	≤0.08	16.00-18.50	10.00-14.00	≤2.00	≤0.035	≤0.03	2.00-3.00	≤1.00	-	-	-
	1Cr18Ni12Mo2Ti6)	≤0.12	16.00-19.00	10.00-14.00	≤2.00	≤0.035	≤0.03	1.80-2.50	≤1.00	-	-	Ti5 (C%-0.02)~0.08
	0Cr18Ni12Mo2Ti	≤0.08	16.00-19.00	10.00-14.00	≤2.00	≤0.035	≤0.03	1.80-2.50	≤1.00	-	-	Ti5*C%-0.70
316L	00Cr17Ni14Mo2	≤0.03	16.00-18.00	12.00-15.00	≤2.00	≤0.035	≤0.03	2.00-3.00	≤1.00	-	-	-
316N	0Cr17Ni12Mo2N	≤0.08	16.00-18.00	10.00-14.00	≤2.00	≤0.035	≤0.03	2.00-3.00	≤1.00	-	-	-
316N	00Cr17Ni13Mo2N	≤0.03	16.00-18.50	10.50-14.50	≤2.00	≤0.035	≤0.03	2.00-3.00	≤1.00	-	-	-
316J1	0Cr18Ni12Mo2Cu2	≤0.08	17.00-19.00	10.50-14.50	≤2.00	≤0.035	≤0.03	1.20-2.75	≤1.00	1.00-2.50	-	-
316J1L	00Cr18Ni14Mo2Cu2	≤0.03	17.00-19.00	12.00-16.00	≤2.00	≤0.035	≤0.03	1.20-2.75	≤1.00	1.00-2.50	-	-
317	0Cr19Ni13Mo3	≤0.12	18.00-20.00	11.00-15.00	≤2.00	≤0.035	≤0.03	3.00-4.00	≤1.00	-	-	-
317L	00Cr19Ni13Mo3	≤0.08	18.00-20.00	11.00-15.00	≤2.00	≤0.035	≤0.03	3.00-4.00	≤1.00	-	-	-
	1Cr18Ni12Mo3Ti6)	≤0.12	16.00-19.00	11.00-14.00	≤2.00	≤0.035	≤0.03	2.50-3.50	≤1.00	-	-	Ti5 (C%-0.02)~0.08
	0Cr18Ni12Mo3Ti	≤0.08	16.00-19.00	11.00-14.00	≤2.00	≤0.035	≤0.03	2.50-3.50	≤1.00	-	-	Ti5*C%-0.70
317J1	0Cr18Ni16Mo5	≤0.04	16.00-19.00	15.00-17.00	≤2.00	≤0.035	≤0.03	4.00-6.00	≤1.00	-	-	-
321	1Cr18Ni9Ti6)	≤0.12	17.00-19.00	8.00-11.00	≤2.00	≤0.035	≤0.030	-	≤1.00	-	-	Ti5 (C%-0.02)~0.08
	0Cr18Ni10Ti	≤0.08	17.00-19.00	9.00-12.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	Ti≥5*C%



347	0Cr18Ni11Nb	≤0.08	17.00-19.00	9.00-13.00	≤2.00	≤0.035	≤0.03	-	≤1.00	-	-	Nb≥10*C%
XM7	0Cr18Ni9Cu3	≤0.08	17.00-19.00	8.50-10.50	≤2.00	≤0.035	≤0.03	-	≤1.00	3.00-4.00	-	-
XM15J1	0Cr18Ni13Si4	≤0.08	15.00-20.00	11.50-15.00	≤2.00	≤0.035	≤0.03	-	3.00-5.00	-	-	2)

