

# ASTM A312 seamless stainless steel pipe

ASTM A312 seamless pipe is austenitic stainless steel pipe intended for high temperature and general corrosive service, including petroleum, chemical, food, or auto industry and for mechanical structural components.



- Certificate: ISO
- Standard: ASTM A312, TP304 / TP316L
- Length: 6m / 5.8m / 11.8m / 12m / 20ft, etc.
- End: Plain (square cut) / beveled to 30° / NPT thread as ANSI B1.20.1 / BSPT thread as ISO 7-1
- Surface: Pickling white / No.2B matte finish

## Available size for Schedule 40S pipe

Size		Thickness	Mass	Test pressure (MPa)		Ref. No.	
NPS	DN			TP304	TP316L		
1/2"	15	21.3	2.77	1.27	17.0	17.0	P2201
3/4"	20	26.7	2.87	1.69	17.0	17.0	P2202
1"	25	33.4	3.38	2.50	17.0	17.0	P2203
1-1/4"	32	42.2	3.56	3.39	17.0	14.3	P2204
1-1/2"	40	48.3	3.68	4.05	15.6	13.0	P2205
2"	50	60.3	3.91	5.44	13.3	11.0	P2206
2-1/2"	65	73.0	5.16	8.63	14.5	12.0	P2207
3"	80	88.9	5.49	11.29	12.7	10.5	P2208
4"	100	114.3	6.02	16.08	10.8	9.0	P2209
5"	125	141.3	6.55	21.77	9.5	7.9	P2210
6"	150	168.3	7.11	28.26	8.7	7.2	P2211
8"	200	219.1	8.18	42.55	7.7	6.3	P2212
10"	250	273.0	9.27	60.29	7.0	5.8	P2213
12"	300	323.8	9.53	73.86	6.0	5.0	P2214
14"	350	355.6	9.53	81.33	5.5	4.6	P2215
16"	400	406.4	9.53	93.27	4.8	4.0	P2216
18"	450	457.0	9.53	105.17	4.3	3.5	P2217
20"	500	508.0	9.53	117.15	3.8	3.2	P2218
24"	600	610.0	9.53	141.12	3.2	2.7	P2219

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Available size for Schedule 80S pipe

Size			Thickness	Mass	Test pressure (MPa)		Ref. No.
NPS	DN	OD (mm)	T (mm)	kg/m	TP304	TP316L	
1/2"	15	21.3	3.73	1.62	17.0	17.0	P2221
3/4"	20	26.7	3.91	2.20	17.0	17.0	P2222
1"	25	33.4	4.55	3.24	17.0	17.0	P2223
1-1/4"	32	42.2	4.85	4.47	17.0	17.0	P2224
1-1/2"	40	48.3	5.08	5.41	17.0	17.0	P2225
2"	50	60.3	5.54	7.48	17.0	15.6	P2226
2-1/2"	65	73.0	7.01	11.41	17.0	16.3	P2227
3"	80	88.9	7.62	15.27	17.0	14.6	P2228
4"	100	114.3	8.56	22.32	15.4	12.7	P2229
5"	125	141.3	9.53	30.97	13.8	11.5	P2230
6"	150	168.3	10.97	42.56	13.4	11.1	P2231
8"	200	219.1	12.70	64.64	11.9	9.9	P2232
10"	250	273.0	12.70	81.53	9.5	7.9	P2233
12"	300	323.8	12.70	97.44	8.0	6.7	P2234
14"	350	355.6	12.70	107.40	7.3	6.1	P2235
16"	400	406.4	12.70	123.31	6.4	5.3	P2236
18"	450	457.0	12.70	139.16	5.7	4.7	P2237
20"	500	508.0	12.70	155.13	5.1	4.3	P2238
24"	600	610.0	12.70	187.07	4.3	3.5	P2239

Available size for Schedule 10S pipe

Size			Thickness	Mass	Test pressure (MPa)		Ref. No.
NPS	DN	OD (mm)	T (mm)	kg/m	TP304	TP316L	
1/2"	15	21.3	2.11	1.00	17.0	16.8	P2241
3/4"	20	26.7	2.11	1.28	16.2	13.4	P2242
1"	25	33.4	2.77	2.09	17.0	14.1	P2243
1-1/4"	32	42.2	2.77	2.69	13.5	11.2	P2244
1-1/2"	40	48.3	2.77	3.11	11.8	9.7	P2245
2"	50	60.3	2.77	3.93	9.4	7.8	P2246
2-1/2"	65	73.0	3.05	5.26	8.6	7.1	P2247
3"	80	88.9	3.05	6.46	7.0	5.8	P2248
4"	100	114.3	3.05	8.37	5.5	4.5	P2249
5"	125	141.3	3.40	11.56	4.9	4.1	P2250
6"	150	168.3	3.40	13.83	4.1	3.4	P2251
8"	200	219.1	3.76	19.97	3.5	2.9	P2252
10"	250	273.0	4.19	27.78	3.1	2.6	P2253
12"	300	323.8	4.57	35.98	2.9	2.4	P2254
14"	350	355.6	4.78	41.36	3.7	3.0	P2255
16"	400	406.4	4.78	47.34	3.2	2.7	P2256
18"	450	457.0	4.78	53.31	2.1	1.8	P2257
20"	500	508.0	5.54	68.65	2.2	1.9	P2258
24"	600	610.0	6.35	94.53	2.1	1.8	P2259

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## Chemical compositions (%) and Mechanical properties

Grade	C	Mn	P	S	Si	Cr	Ni	Mo	Ti	N
TP304	≤ 0.08	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	18.0-20.0	8.0-11.0	-	-	-
TP316L	≤ 0.035	≤ 2.00	≤ 0.045	≤ 0.030	≤ 1.00	16.0-18.0	10.0-14.0	2.0-3.0	-	-
Grade	Tensile strength (MPa)			Upper yield strength (Mpa)			Longitudinal elongation (%)			
TP304	≥ 515			≥ 205			≥ 35			
TP316L	≥ 485			≥ 170			≥ 35			

\* Where horizontal line appears in this table, there is no requirement and analysis for the element need not be determined or reported.

\* The pipes shall be furnished in the heat-treated condition (Solution treatment). The heat treating temperature is min 1040°C, and then quenched in water or rapidly cooled by other means, at a rate sufficient to prevent re-precipitation of carbides.



### Hydrostatic test and NDE test

- Each pipe shall be subjected to the hydrostatic test for min 5s. (Refer to ASTM A999)
- The min test pressure need not exceed 2500 psi (17.0 MPa) for pipe ≤ NPS 3", nor 2800 psi (19.0 MPa) for pipe > NPS 3". (Refer to ASTM A999)
- Nondestructive electric test (NDE) is alternative to hydrostatic test, including ASTM E213 Ultrasonic testing, ASTM E309/ E426 Eddy current examination, ASTM E570 Flux leakage examination. (Refer to ASTM A999)

### Note:

The equation of hydrostatic test pressure follows ASTM A999:  $P = 2St/D$ .

P = Hydrostatic test pressure in psi or MPa.

S = Pipe wall stress in psi or MPa, 50% of the minimum yield strength.

t = Pipe wall thickness in inch or mm.

D = Pipe outer diameter in inch or mm.



### Other tests

- Mechanical test: Tensile test, flattening test, bend test.
- Product analysis: one billet or one length of flat-rolled stock from each heat, or two pipes from each lot shall be made.
- Straightness: The finished pipe shall be reasonably straight.
- Ovality (out of roundness): It is included in OD tolerance. For thin-wall pipe, any one cross-section shall not exceed 1.5% of OD (Refer to ASTM A999).
- Surface / coating test.
- Quantity and weight measurement.