

## What is a Pipe?

The term pipe covers a specific range of sizes laid down by ANSI specifications. Any sizes not covered by these specifications are tube.

Stainless Steel Pipe dimensions determined by ASME B36.19 covering the outside diameter and the Schedule wall thickness.

Note that stainless wall thicknesses to ANSI B36.19 all have an 'S' suffix. Sizes without an 'S' suffix are to ANSI B36.10 which is intended for carbon steel pipes.

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## REVISION HISTORY

Datasheet Updated	18 July 2019
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This Data is indicative only and as such is not to be relied upon in place of the full specification. In particular, mechanical property requirements vary widely with temper, product and product dimensions. All information is based on our present knowledge and is given in good faith. No liability will be accepted by the Company in respect of any action taken by any third party in reliance thereon.

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## ASTM Pipe

### Introduction

The term pipe covers a specific range of sizes laid down by ANSI specifications. Any sizes not covered by these specifications are tube. Stainless Steel Pipe dimensions determined by ASME B36.19 covering the outside diameter and the Schedule wall thickness. Note that stainless wall thicknesses to ANSI B36.19 all have an 'S' suffix. Sizes without an 'S' suffix are to ANSI B36.10 which is intended for carbon steel pipes.



#### Seamless and Welded

**ASTM A312:** Seamless and straight-seam welded austenitic pipe intended for high temperature and general corrosive service. Filler metal not permitted during welding.

**ASTM A358:** Electric fusion welded austenitic pipe for corrosive and/or high temperature service. Typically only pipe up to 8 inch is produced to this specification. Addition of filler metal is permitted during welding.

**ASTM A790:** Seamless and straight-seam welded ferritic/austenitic (duplex) pipe intended for general corrosive service, with a particular emphasis on resistance to stress corrosion cracking.

**ASTM A409:** Straight-seam or spiral-seam electric fusion welded large diameter austenitic light-wall pipe in sizes 14" to 30" with walls Sch 5S and Sch 10S for corrosive and/or high temperature service.

**ASTM A376:** Seamless austenitic pipe for high temperature applications.

**ASTM A813:** Single-seam, single- or double- welded austenitic pipe for high temperature and general corrosive applications.

**ASTM A814:** Cold-worked welded austenitic pipe for high temperature and general corrosive service.

**Note:** Welded pipes manufactured to ASTM A312, A790 and A813 must be produced by an automatic process with NO addition of filler metal during the welding operation.

#### Welded pipe specifications

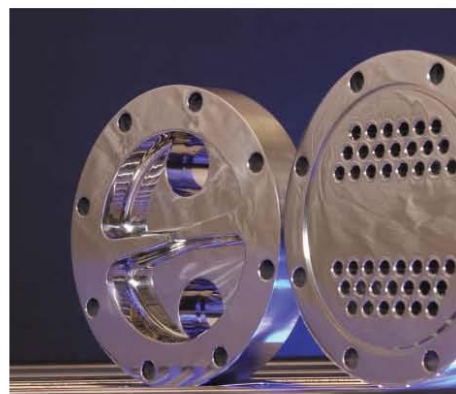
Usually it will be to ASTM A312. If it is to ASTM A358 then there are various Classes available as shown below. The Class Number dictates how the pipe is welded and what non-destructive tests:

- **Class 1:** Pipe shall be double welded by processes employing filler metal in all passes and shall be completely radiographed.
- **Class 2:** Pipe shall be double welded by processes employing filler metal in all passes. No-radiography is required.
- **Class 3:** Pipe shall be welded in one pass by processes employing filler metal and shall be completely radiographed.
- **Class 4:** Same as Class 3 except that the welding process exposed to the inside pipe surface may be made without the addition of filler metal.
- **Class 5:** Pipe shall be double welded by processes employing filler metal in all passes and shall be spot radiographed.

#### Markings on pipe

The full identification of the pipe should be continuously marked down its whole length, including:

- Nominal Pipe Size (Nominal Bore)
- Schedule (Wall Thickness)
- Specification
- Grade
- Method of Manufacture (Seamless or Welded)
- Heat Number
- Manufacturer's Name or Symbol



## ASTM Pipe

### Pipe Sizes - ANSI/ASME B36.19M

#### Dimensions and weights per metre - stainless steel pipe

Nominal Pipe Size	OD		Schedule 5S <sup>1</sup>			Schedule 10S <sup>1</sup>			Schedule 40S			Schedule 80S		
	in	mm	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m
1/8	0.405	10.3	-	-	-	0.049	1.24	0.28	0.068	1.73	0.37	0.095	2.41	0.47
1/4	0.540	13.7	-	-	-	0.065	1.65	0.49	0.088	2.24	0.63	0.119	3.02	0.80
3/8	0.675	17.1	-	-	-	0.065	1.65	0.63	0.091	2.31	0.84	0.126	3.20	1.10
1/2	0.840	21.3	0.065	1.65	0.80	0.083	2.11	1.00	0.109	2.77	1.27	0.147	3.73	1.62
3/4	1.050	26.7	0.065	1.65	1.03	0.083	2.11	1.28	0.113	2.87	1.69	0.154	3.91	2.20
1	1.315	33.4	0.065	1.65	1.30	0.109	2.77	2.09	0.133	3.38	2.50	0.179	4.55	3.24
1 1/4	1.660	42.2	0.065	1.65	1.65	0.109	2.77	2.70	0.140	3.56	3.39	0.191	4.85	4.47
1 1/2	1.900	48.3	0.065	1.65	1.91	0.109	2.77	3.11	0.145	3.68	4.05	0.200	5.08	5.41
2	2.375	60.3	0.065	1.65	2.40	0.109	2.77	3.93	0.154	3.91	5.44	0.218	5.54	7.48
2 1/2	2.875	73.0	0.083	2.11	3.69	0.120	3.05	5.26	0.203	5.16	8.63	0.276	7.01	11.41
3	3.500	88.9	0.083	2.11	4.51	0.120	3.05	6.45	0.216	5.49	11.29	0.300	7.62	15.27
3 1/2	4.000	101.6	0.083	2.11	5.18	0.120	3.05	7.40	0.226	5.74	13.57	0.318	8.08	18.63
4	4.500	114.3	0.083	2.11	5.84	0.120	3.05	8.36	0.237	6.02	16.07	0.337	8.56	22.32
5	5.563	141.3	0.109	2.77	9.47	0.134	3.40	11.57	0.258	6.55	21.77	0.375	9.53	30.97
6	6.625	168.3	0.109	2.77	11.32	0.134	3.40	13.84	0.280	7.11	28.26	0.432	10.97	42.56
8	8.625	219.1	0.109	2.77	14.79	0.148	3.76	19.96	0.322	8.18	42.55	0.500	12.70	64.64
10	10.750	273.1	0.134	3.40	22.63	0.165	4.19	27.78	0.365	9.27	60.31	0.500 <sup>2</sup>	12.70 <sup>2</sup>	96.01 <sup>2</sup>
12	12.750	323.9	0.156	3.96	31.25	0.180	4.57	36.00	0.375 <sup>2</sup>	9.53 <sup>2</sup>	73.88 <sup>2</sup>	0.500 <sup>2</sup>	12.70 <sup>2</sup>	132.08 <sup>2</sup>
14	14.000	355.6	0.156	3.96	34.36	0.188 <sup>2</sup>	4.78 <sup>2</sup>	41.30 <sup>2</sup>	-	-	-	-	-	-
16	16.000	406.4	0.165	4.19	41.56	0.188 <sup>2</sup>	4.78 <sup>2</sup>	47.29 <sup>2</sup>	-	-	-	-	-	-
18	18.000	457	0.165	4.19	46.81	0.188 <sup>2</sup>	4.78 <sup>2</sup>	53.26 <sup>2</sup>	-	-	-	-	-	-
20	20.000	508	0.188	4.78	59.25	0.218 <sup>2</sup>	5.54 <sup>2</sup>	68.61 <sup>2</sup>	-	-	-	-	-	-
22	22.000	559	0.188	4.78	65.24	0.218 <sup>2</sup>	5.54 <sup>2</sup>	75.53 <sup>2</sup>	-	-	-	-	-	-
24	24.000	610	0.218	5.54	82.47	0.250	6.35	94.45	-	-	-	-	-	-
30	30.000	762	0.250	6.35	118.31	0.312	7.92	147.36	-	-	-	-	-	-

Notes

- 1 Schedules 5S and 10S wall thicknesses do not permit threading in accordance with ANSI/ASME B1.20.1.
  - 2 These dimensions and weights do not conform to ANSI/ASME B36.10M.
- The suffix 'S' after the schedule number indicates that the pipe dimensions and weight are in compliance with this stainless steel pipe specification, ANSI/ASME B36.19M-1985, and not the more general ANSI/ASME B36.10M-1995 specification.
  - Although this specification is applicable to stainless steel, quoted weights are for carbon steel pipe and should be multiplied by 1.014 for austenitic and duplex steels, or by 0.985 for ferritic and martensitic steels.

## ASTM Pipe

### Pipe Sizes - ANSI/ASME B36.10M

ASTM Pipe - Pipe Sizes - ANSI/ASME B36.10M

#### Dimensions and weights per metre - steel pipe

Nominal Pipe Size	OD		Schedule 10			Schedule 20			Schedule 30			Schedule 40		
	in	mm	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m
1/8	0.405	10.3	-	-	-	-	-	-	0.057	1.45	0.32	0.068	1.73	0.37
1/4	0.540	13.7	-	-	-	-	-	-	0.073	1.85	0.54	0.088	2.24	0.63
3/8	0.675	17.1	-	-	-	-	-	-	0.073	1.85	0.70	0.091	2.31	0.84
1/2	0.840	21.3	-	-	-	-	-	-	0.095	2.41	1.12	0.109	2.77	1.27
3/4	1.050	26.7	-	-	-	-	-	-	0.095	2.41	1.44	0.113	2.87	1.69
1	1.315	33.4	-	-	-	-	-	-	0.114	2.90	2.18	0.133	3.38	2.50
1 1/4	1.660	42.2	-	-	-	-	-	-	0.117	2.97	2.87	0.140	3.56	3.39
1 1/2	1.900	48.3	-	-	-	-	-	-	0.125	3.18	3.53	0.145	3.68	4.05
2	2.375	60.3	-	-	-	-	-	-	0.125	3.18	4.48	0.154	3.91	5.44
2 1/2	2.875	73.0	-	-	-	-	-	-	0.188	4.78	8.04	0.203	5.16	8.63
3	3.500	88.9	-	-	-	-	-	-	0.188	4.78	9.92	0.216	5.49	11.29
3 1/2	4.000	101.6	-	-	-	-	-	-	0.188	4.78	11.41	0.226	5.74	13.57
4	4.500	114.3	-	-	-	-	-	-	0.188	4.78	12.91	0.237	6.02	16.07
5	5.563	141.3	-	-	-	-	-	-	-	-	-	0.258	6.55	21.77
6	6.625	168.3	-	-	-	-	-	-	-	-	-	0.280	7.11	28.26
8	8.625	219.1	-	-	-	0.250	6.35	33.31	0.277	7.04	36.81	0.322	8.18	42.55
10	10.750	273.0	-	-	-	0.250	6.35	41.77	0.307	7.80	51.03	0.365	9.27	60.31
12	12.750	323.8	-	-	-	0.250	6.35	49.73	0.330	8.38	65.20	0.406	10.31	79.73
14	14.000	355.6	0.250	6.35	54.69	0.312	7.92	67.90	0.375	9.53	81.33	0.438	11.13	94.55
16	16.000	406.4	0.250	6.35	62.64	0.312	7.92	77.83	0.375	9.53	93.27	0.500	12.70	123.30
18	18.000	457	0.250	6.35	70.57	0.312	7.92	87.71	0.438	11.13	122.38	0.562	14.27	155.80
20	20.000	508	0.250	6.35	78.55	0.375	9.53	117.15	0.500	12.70	155.12	0.594	15.09	183.42
22	22.000	559	0.250	6.35	86.54	0.375	9.53	129.13	0.500	12.70	171.09	-	-	-
24	24.000	610	0.250	6.35	94.53	0.375	9.53	141.12	0.562	14.27	209.64	0.688	17.48	255.41
26	26.000	660	0.312	7.92	127.36	0.500	12.70	202.72	-	-	-	-	-	-
28	28.000	711	0.312	7.92	137.32	0.500	12.70	218.69	0.625	15.88	271.21	-	-	-
30	30.000	762	0.312	7.92	147.28	0.500	12.70	234.67	0.625	15.88	292.18	-	-	-
32	32.000	813	0.312	7.92	157.24	0.500	12.70	250.64	0.625	15.88	312.15	0.688	17.48	342.91
34	34.000	864	0.312	7.92	167.20	0.500	12.70	266.61	0.625	15.88	332.12	0.688	17.48	364.90
36	36.000	914	0.312	7.92	176.96	0.500	12.70	282.27	0.625	15.88	351.70	0.750	19.05	420.42
38	38.000	965	-	-	-	-	-	-	-	-	-	-	-	-
40	40.000	1016	-	-	-	-	-	-	-	-	-	-	-	-
42	42.000	1067	-	-	-	-	-	-	-	-	-	-	-	-
44	44.000	1118	-	-	-	-	-	-	-	-	-	-	-	-
46	46.000	1168	-	-	-	-	-	-	-	-	-	-	-	-
48	48.000	1219	-	-	-	-	-	-	-	-	-	-	-	-

Notes  
- This specification is applicable to all steel pipe including stainless steel. Quoted weights are for carbon steel pipe and should be multiplied by 1.014 for austenitic and duplex steels, or by 0.985 for ferritic and martensitic steels.



## ASTM Pipe

### Pipe Sizes - ANSI/ASME B36.10M

#### Dimensions and weights per metre - steel pipe

Nominal Pipe Size	OD		Schedule (STD)			Schedule 60			Extra Strong (XS)			Schedule 80		
	in	mm	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m
1/8	0.405	10.3	0.068	1.73	0.37	-	-	-	0.095	2.41	0.47	0.095	2.41	0.47
1/4	0.540	13.7	0.088	2.24	0.63	-	-	-	0.119	3.02	0.80	0.119	3.02	0.80
3/8	0.675	17.1	0.091	2.31	0.84	-	-	-	0.126	3.20	1.10	0.126	3.20	1.10
1/2	0.840	21.3	0.109	2.77	1.27	-	-	-	0.147	3.73	1.62	0.147	3.73	1.62
3/4	1.050	26.7	0.113	2.87	1.69	-	-	-	0.154	3.91	2.20	0.154	3.91	2.20
1	1.315	33.4	0.133	3.38	2.50	-	-	-	0.179	4.55	3.24	0.179	4.55	3.24
1 1/4	1.660	42.2	0.140	3.56	3.39	-	-	-	0.191	4.85	4.47	0.191	4.85	4.47
1 1/2	1.900	48.3	0.145	3.68	4.05	-	-	-	0.200	5.08	5.41	0.200	5.08	5.41
2	2.375	60.3	0.154	3.91	5.44	-	-	-	0.218	5.54	7.48	0.218	5.54	7.48
2 1/2	2.875	73.0	0.203	5.16	8.63	-	-	-	0.276	7.01	11.41	0.276	7.01	11.41
3	3.500	88.9	0.216	5.49	11.29	-	-	-	0.300	7.62	15.27	0.300	7.62	15.27
3 1/2	4.000	101.6	0.226	5.74	13.57	-	-	-	0.318	8.08	18.63	0.318	8.08	18.63
4	4.500	114.3	0.237	6.02	16.07	-	-	-	0.337	8.56	22.32	0.337	8.56	22.32
5	5.563	141.3	0.258	6.55	21.77	-	-	-	0.375	9.53	30.97	0.375	9.53	30.97
6	6.625	168.3	0.280	7.11	28.26	-	-	-	0.432	10.97	42.56	0.432	10.97	42.56
8	8.625	219.1	0.322	8.18	42.55	0.406	10.31	53.08	0.500	12.70	64.64	0.500	12.70	64.64
10	10.750	273.0	0.365	9.27	60.31	0.500	12.70	81.55	0.500	12.70	81.55	0.594	15.09	96.01
12	12.750	323.8	0.375	9.53	73.88	0.562	14.27	108.96	0.500	12.70	97.46	0.688	17.48	132.08
14	14.000	355.6	0.375	9.53	81.33	0.594	15.09	126.71	0.500	12.70	107.39	0.750	19.05	158.10
16	16.000	406.4	0.375	9.53	93.27	0.656	16.66	160.12	0.500	12.70	123.30	0.844	21.44	203.53
18	18.000	457	0.375	9.53	105.16	0.750	19.05	205.74	0.500	12.70	139.15	0.938	23.83	254.55
20	20.000	508	0.375	9.53	117.15	0.812	20.62	247.83	0.500	12.70	155.12	1.031	26.19	311.17
22	22.000	559	0.375	9.53	129.13	0.875	22.23	294.25	0.500	12.70	171.09	1.125	28.58	373.83
24	24.000	610	0.375	9.53	141.12	0.969	24.61	355.26	0.500	12.70	187.06	1.219	30.96	442.08
26	26.000	660	0.375	9.53	152.87	-	-	-	0.500	12.70	202.72	-	-	-
28	28.000	711	0.375	9.53	164.85	-	-	-	0.500	12.70	218.69	-	-	-
30	30.000	762	0.375	9.53	176.84	-	-	-	0.500	12.70	234.67	-	-	-
32	32.000	813	0.375	9.53	188.82	-	-	-	0.500	12.70	250.64	-	-	-
34	34.000	864	0.375	9.53	200.31	-	-	-	0.500	12.70	266.61	-	-	-
36	36.000	914	0.375	9.53	212.56	-	-	-	0.500	12.70	282.27	-	-	-
38	38.000	965	0.375	9.53	224.54	-	-	-	0.500	12.70	298.24	-	-	-
40	40.000	1016	0.375	9.53	236.53	-	-	-	0.500	12.70	314.22	-	-	-
42	42.000	1067	0.375	9.53	248.52	-	-	-	0.500	12.70	330.19	-	-	-
44	44.000	1118	0.375	9.53	260.50	-	-	-	0.500	12.70	346.16	-	-	-
46	46.000	1168	0.375	9.53	272.25	-	-	-	0.500	12.70	351.82	-	-	-
48	48.000	1219	0.375	9.53	284.24	-	-	-	0.500	12.70	377.79	-	-	-

Notes

- This specification is applicable to all steel pipe including stainless steel. Quoted weights are for carbon steel pipe and should be multiplied by 1.014 for austenitic and duplex steels, or by 0.985 for ferritic and martensitic steels.

ASTM Pipe - Pipe Sizes - ANSI/ASME B36.10M

## ASTM Pipe

### Pipe Sizes - ANSI/ASME B36.10M

ASTM Pipe - Pipe Sizes - ANSI/ASME B36.10M

#### Dimensions and weights per metre - steel pipe

Nominal Pipe Size	OD		Schedule 100			Schedule 120			Schedule 140			Schedule 160		
	in	mm	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m	in	mm	kg/m
1/2	0.840	21.3	-	-	-	-	-	-	-	-	-	0.188	4.78	1.95
3/4	1.050	26.7	-	-	-	-	-	-	-	-	-	0.219	5.56	2.90
1	1.315	33.4	-	-	-	-	-	-	-	-	-	0.250	6.35	4.24
1 1/4	1.660	42.2	-	-	-	-	-	-	-	-	-	0.250	6.35	5.61
1 1/2	1.900	48.3	-	-	-	-	-	-	-	-	-	0.281	7.14	7.25
2	2.375	60.3	-	-	-	-	-	-	-	-	-	0.344	8.74	11.11
2 1/2	2.875	73.0	-	-	-	-	-	-	-	-	-	0.375	9.53	14.92
3	3.500	88.9	-	-	-	-	-	-	-	-	-	0.438	11.13	21.35
3 1/2	4.000	101.6	-	-	-	-	-	-	-	-	-	-	-	-
4	4.500	114.3	-	-	-	0.438	11.13	28.32	-	-	-	0.531	13.49	33.54
5	5.563	141.3	-	-	-	0.500	12.70	40.28	-	-	-	0.625	15.88	49.11
6	6.625	168.3	-	-	-	0.562	14.27	54.20	-	-	-	0.719	18.26	67.56
8	8.625	219.1	0.594	15.09	75.92	0.719	18.26	90.44	0.812	20.62	100.92	0.906	23.01	111.27
10	10.750	273.0	0.719	18.26	114.75	0.844	21.44	133.06	1.000	25.40	155.15	1.125	28.58	172.33
12	12.750	323.8	0.844	21.44	159.91	1.000	25.40	186.97	1.125	28.58	208.14	1.312	33.32	236.76
14	14.000	355.6	0.938	23.83	194.96	1.094	27.79	224.65	1.250	31.75	253.56	1.406	35.71	281.70
16	16.000	406.4	1.031	26.19	245.56	1.219	30.96	286.64	1.438	36.53	333.19	1.594	40.49	365.35
18	18.000	457	1.156	29.36	309.62	1.375	34.93	363.56	1.562	39.67	408.26	1.781	45.24	459.37
20	20.000	508	1.281	32.54	381.53	1.500	38.10	441.49	1.750	44.45	508.11	1.969	50.01	564.81
22	22.000	559	1.375	34.93	451.42	1.625	41.28	527.02	1.875	47.63	600.63	2.125	53.98	672.26
24	24.000	610	1.531	38.89	547.71	1.812	46.02	640.03	2.062	52.37	720.15	2.344	59.54	808.22

Nominal Pipe Size	OD		Double Extra Strong (XXS)		
	in	mm	in	mm	kg/m
1/2	0.840	21.3	0.294	7.47	2.55
3/4	1.050	26.7	0.308	7.82	3.64
1	1.315	33.4	0.358	9.09	5.45
1 1/4	1.660	42.2	0.382	9.70	7.77
1 1/2	1.900	48.3	0.400	10.15	9.56
2	2.375	60.3	0.436	11.07	13.44
2 1/2	2.875	73.0	0.552	14.02	20.39
3	3.500	88.9	0.600	15.24	27.68

Nominal Pipe Size	OD		Double Extra Strong (XXS) continued		
	in	mm	in	mm	kg/m
continued					
3 1/2	4.000	101.6	-	-	-
4	4.500	114.3	0.674	17.12	41.03
5	5.563	141.3	0.750	19.05	57.43
6	6.625	168.3	0.864	21.95	79.22
8	8.625	219.1	0.875	22.23	107.92
10	10.750	273.0	1.000	25.40	155.15
12	12.750	323.8	1.000	25.40	186.97

Notes  
- This specification is applicable to all steel pipe including stainless steel. Quoted weights are for carbon steel pipe and should be multiplied by 1.014 for austenitic and duplex steels, or by 0.985 for ferritic and martensitic steels.

**ASTM Pipe**

Chemical Compositions - ASTM A240/A240M

Grade	UNS	Composition Percentage, Max or Range																		
		Carbon C	Manganese Mn	Phosphorus P	Sulphur S	Silicon Si	Nickel Ni	Chromium Cr	Molybdenum Mo	Titanium Ti	Niobium Nb	Tantalum Ta	Nitrogen N	Vanadium Va	Copper Cu	Cerium Ce	Boiron Bo	Aluminium Al	Tungsten W	Selenium Se
201	S20100	0.15	5.50-7.50	0.060	0.030	1.00	3.5-5.5	16.00-18.00	-	-	-	0.25	-	-	-	-	-	-	-	-
202	S20200	0.15	7.50-10.0	0.060	0.030	1.00	4.00-6.00	17.00-19.00	-	-	-	0.25	-	-	-	-	-	-	-	-
301	S30100	0.15	2.00	0.045	0.030	1.00	6.00-8.00	16.00-18.00	-	-	-	0.10	-	-	-	-	-	-	-	-
302	S30200	0.15	2.00	0.045	0.030	0.75	8.00-10.00	17.00-19.00	-	-	-	0.10	-	-	-	-	-	-	-	-
304	S30400	0.07	2.00	0.045	0.030	0.75	8.00-10.50	17.50-19.50	-	-	-	0.10	-	-	-	-	-	-	-	-
304L	S30403	0.030	2.00	0.045	0.030	0.75	8.00-12.00	17.50-19.50	-	-	-	0.10	-	-	-	-	-	-	-	-
304H	S30409	0.04-0.10	2.00	0.045	0.030	0.75	8.00-10.50	18.00-20.00	-	-	-	-	-	-	-	-	-	-	-	-
308S	S30908	0.08	2.00	0.045	0.030	0.75	12.00-15.00	22.00-24.00	-	-	-	-	-	-	-	-	-	-	-	-
310S	S31008	0.08	2.00	0.045	0.030	1.50	19.00-22.00	24.00-26.00	-	-	-	-	-	-	-	-	-	-	-	-
310H	S31009	0.04-0.10	2.00	0.045	0.030	0.75	19.00-22.00	24.00-26.00	-	-	-	-	-	-	-	-	-	-	-	-
316	S31600	0.08	2.00	0.045	0.030	0.75	10.00-14.00	16.00-18.00	2.00-3.00	-	-	0.10	-	-	-	-	-	-	-	-
316L	S31603	0.03	2.00	0.045	0.030	0.75	10.00-14.00	16.00-18.00	2.00-3.00	-	-	0.10	-	-	-	-	-	-	-	-
316H	S31609	0.04-0.10	2.00	0.045	0.030	0.75	10.00-14.00	16.00-18.00	2.00-3.00	-	-	-	-	-	-	-	-	-	-	-
317	S31700	0.08	2.00	0.045	0.030	0.75	11.00-13.00	18.00-20.00	3.00-4.00	-	-	0.10	-	-	-	-	-	-	-	-
317L	S31703	0.03	2.00	0.045	0.030	0.75	11.00-13.00	18.00-20.00	3.00-4.00	-	-	0.10	-	-	-	-	-	-	-	-
321	S32100	0.08	2.00	0.045	0.030	0.75	9.00-12.00	17.00-19.00	5(C+N) min, 0.70 max	-	-	0.10	-	-	-	-	-	-	-	-
347	S34700	0.08	2.00	0.045	0.030	0.75	9.00-13.00	17.00-19.00	10xC min, 1.00 max	-	-	0.17	-	-	-	-	-	-	-	-
409	S40910	0.03	1.00	0.040	0.020	1.00	0.50	10.50-11.70	-	-	-	0.03	-	-	-	-	-	-	-	-
410	S41000	0.08-0.15	1.00	0.040	0.030	1.00	0.75	11.5-13.5	-	-	-	-	-	-	-	-	-	-	-	-
430	S43000	0.12	1.00	0.040	0.030	1.00	0.75	16.00-18.00	-	-	-	-	-	-	-	-	-	-	-	-
439	S43035	0.03	1.00	0.040	0.030	1.00	0.050	17.00-19.00	0.20 + 4(C+N) min, 1.10 max	-	-	0.03	-	-	-	-	0.15	-	-	-

ASTM Pipe – Chemical Compositions - ASTM A240/A240M

## ASTM Pipe

### Dimensional Tolerances - ASTM A530/A530M

ASTM Pipe – Dimensional Tolerances - ASTM A530/A530M

#### Standard cross-section and weight tolerances (ASTM A530/A530M)

NPS	Outside Diameter (OD) <sup>1</sup>				Wall Thickness (t) <sup>2</sup>		Weight <sup>3</sup>	
	Under		Over		Under	Over	Under	Over
	in	mm	in	mm	%	%	%	%
1/8 to 1 1/2	0.031	0.8	0.015	0.4	12.5	20	3.5	10
>1 1/2 to 4	0.031	0.8	0.031	0.8	12.5	20	3.5	10
>4 to 8	0.031	0.8	0.062	1.6	12.5	22.5	3.5	10
>8 to 12	0.031	0.8	0.093	2.4	12.5	22.5	3.5	10
>12 to 18	0.031	0.8	0.093	2.4	12.5	22.5	5	10
>18 to 26	0.031	0.8	0.125	3.2	12.5	22.5	5	10
>26 to 34	0.031	0.8	0.156	4.0	12.5	22.5	5	10
>34 to 48	0.031	0.8	0.187	4.8	12.5	22.5	5	10

Notes

1 Includes ovality tolerance except for thin wall pipe (i.e.  $t > 3\%$  OD).

2 Min wall thickness = Nominal wall thickness (t) x 0.875. Not applicable if filler metal added.

3 Refer to pages 1-2 to 1-5 for standard pipe weights. For non standard pipes  $W(\text{lb/ft}) = 10.68(\text{OD}-t)t$ , or  $W(\text{kg/m}) = 0.02466(\text{OD}-t)t$

• **Standard Cut Lengths.** Pipe ordering alternatives are:

- **Random.** Standard lengths are in the range 15 to 24 feet. Shorter lengths as agreed with the purchaser.
- **Specified Lengths.** Cut lengths as specified, with end finish also specified.

• **Length tolerances.** No pipe shall be shorter than specified. No pipe shall be more than 1/4 in (6mm) longer than specified. Tighter tolerances may be specified, e.g. for bevelled pipe.

• **Straightness.** All finished pipe shall be reasonably straight. For metal-arc welded pipe maximum deviation from straight = 1/8 in (3.2mm) in 10 ft (3 m).



## ASTM Pipe

### Pipe Specifications - ASTM A312/A312M

#### Seamless and welded austenitic stainless steel pipes

This specification covers austenitic steel pipe intended for high temperature and general corrosive service. H grades in the chemical composition table are specifically for high temperature service.

#### Manufacture

- Manufacture.** In order to comply with this specification welded pipe must be manufactured by an automatic welding process using no filler metal, or it must be a seamless pipe. If a welded pipe has a nominal pipe size greater than 14 then it may be constructed from two longitudinal sections, and hence have two longitudinal welds. The pipe may be either hot finished or cold finished.

#### Finish and repair

- Finish.** The surface of the pipe must be clean and free of scale and contaminating iron particles. It can be bright annealed but may be pickled, blasted or can be passivated.
- Repair by welding.** Permitted on  $\leq 20\%$  of the weld seam length of welded pipe if  $\geq \text{NPS } 6$  and having a wall thickness  $\geq 0.200$  in (mm). Tungsten-arc welding process is used for repairs, with filler metal to a grade as specified in A 312 (not repeated here). Weld repairs must be identified on the pipe and in test certificate.

#### Tensile requirements

Grade	UNS	Tensile Strength min		Yield Strength min		Elongation in 2 in (50mm) or 4D min	
		ksi	MPa	ksi	MPa	Longit %	Trans %
<b>All</b>	<b>All</b>	<b>75</b>	<b>515</b>	<b>30</b>	<b>205</b>	<b>35</b>	<b>25</b>
<b>All = All grades listed in the chemical composition table except those listed below</b>							
TP304L	S30403	70	485	25	170	35	25
TP304N	S30451	80	550	35	240	35	25
	S31272	65	450	29	200	35	25
TP316L	S31603	70	485	25	170	35	25
TP316N	S31651	80	550	35	240	35	25
TP321	S32100	75(70 <sup>1</sup> )	515(485 <sup>1</sup> )	30(25 <sup>1</sup> )	205(170 <sup>1</sup> )	35	25
TP321H	S32109	75(70 <sup>1</sup> )	515(485 <sup>1</sup> )	30(25 <sup>1</sup> )	205(170 <sup>1</sup> )	35	25

Notes

<sup>1</sup> Values for wall thickness  $> \frac{3}{8}$  in (9.5mm)

## ASTM Pipe

### Pipe Specifications - ASTM A358/A358M

ASTM Pipe – Pipe Specifications - ASTM A358/A358M

#### Electric-fusion-welded austenitic chromium-nickel alloy steel pipe for high-temperature service

This specification covers electric-fusion-welded austenitic chromium-nickel alloy steel pipe suitable for high temperature and general corrosive service.

#### Tolerances

- **Tolerances.** ASTM A530 requirements, apply unless otherwise stated below.
- **Outside Diameter.**  $\pm 0.5\%$  of specified OD.
- **Wall Thickness.** Minimum wall thickness shall be  $\leq 0.01$  in (0.3mm) under nominal thickness.
- **Out-of-Roundness.** Major and minor outside diameters to differ by less than 1%.
- **Alignment.** The gap between the pipe and a 10 ft (3 m) straight edge shall  $\leq \frac{1}{8}$  in (3mm)

#### Finish and repair

- **Appearance.** Finished pipe will have a workmanlike finish.
- **Plate Defect Repair by Grinding.** Defects may be repaired by machining or grinding, provided the wall thickness is not reduced below the minimum.
- **Plate Defect Repair by Welding.** Defects which give unsatisfactory wall thickness can be repaired by welding if the purchaser agrees. Repair welds must be suitably NDT examined or lengths pressure tested if repair depth is  $> \frac{1}{4}$  wall thickness.
- **Finish.** Pipe will be free of scale and contaminating iron particles. Bright annealed pipe need not be pickled, or blasted. The purchaser may request a passivating treatment.