

# Stainless Steel Pipe – A Guide

## 1. 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.

## 2. Is the pipe seamless or 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 Sch5S 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.

## 3. If the pipe is welded, what specification is required?

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.

## 4. What grades are available?

Types 304L and 316L are readily available from stock in a large range of pipe sizes and wall thicknesses up to about 12 inch Nominal Bore. A wide range of other sizes and grades including duplex types and nickel alloys are manufactured to order.

## 5. What markings will be on the 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










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All Data is indicative only and must not be seen as a substitute for the full specification from which it is drawn. In particular, the mechanical property requirements vary widely with product form and product dimensions. For more complete details please refer to the relevant specification – Specifications for Stainless Steel are listed on a separate Datasheet.

## 6. What are the Pipe Sizes?

### Pipe dimensions and weights per metre ANSI/ASME B36.19M-1985

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

- Schedules 5S and 10S wall thicknesses do not permit threading in accordance with ANSI/ASME B1.20.1.
- 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.

**For more information plus a complete table of sizes and dimensions, including the heavier wall thickness Schedules, please visit the Down-Loads page of the Aalco web site and select the Tubular Products Databook.**

**<http://www.aalco.co.uk/literature/literature.html#stainless>**

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