Introduction

The following pages detail pressure ratings calculations for stainless steel straight pipe under internal pressure

CONTACT

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REVISION HISTORY

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Pressure Ratings for Pipes, Tubes and Fittings

Wall Thickness Calculations for Straight Pipe Under Internal Pressure

The following equations and tables are based on those provided in the Process Piping Specification, ASME B31.3a-1996, ASME Code for Pressure Piping (see Notes for references to source paragraphs and tables in this specification).

Firstly, any one of the following four equations may be used to calculate the 'pressure design wall thickness' (t) of a straight pipe subject to internal pressure.

The equations assume t<D/6 (for pipe with t ≥D/6 or P/SE >0.385 additional factors need to be considered).

The four alternative equations are:

$$t = \frac{PD}{2(SE + PY)}$$

$$t = \frac{PD}{2SE}$$

$$t = \frac{D}{2}\left(1 - \sqrt{\frac{SE - P}{SE + P}}\right)$$

$$t = \frac{P(d + 2c)}{2[SE - P(1 - Y)]}$$

where:

t = Pressure design thickness
d = Inside diameter of pipe. For pressure design calculation, the inside diameter of the pipe is the maximum value allowable under the purchase specification.
P = Internal design pressure.
D = Outside diameter pipe as listed in tables of standards or specifications or as measured.
E = Quality factor. See the table "Basic quality factors 'E' for longitudinal weld joints in stainless steel pipes, tubes and fittings" on page 5-29.
S = Stress value for material from the table "Basic allowable stresses 'S' in tension for stainless steels" on page 5-30.
Y = Coefficient from table "Values of coefficient 'Y' for t<D/6" on page 5-29.

Secondly, the minimum required wall thickness t_m of straight sections of pipe is determined in accordance with the following equation.

$$t_m = t + c$$

where:

t_m = Minimum required thickness, including mechanical, corrosion and erosion allowances.
c = The sum of the mechanical allowances (thread or groove depth) plus corrosion and erosion allowances. For threaded components, the nominal thread depth (dimension h of ASME B1.20.1, or equivalent) shall apply. For machined surfaces or grooves where the tolerance is not specified, the tolerance shall be assumed to be 0.5 mm (0.02 in) in addition to the specified depth of the cut.

The actual minimum thickness for the pipe selected, considering manufacturer's tolerance, shall not be less than t_m

Units of Measure for Calculations

It is important to use compatible units for pressure calculations. ASTM and ASME/ANSI specifications are based upon imperial sizes.

Pipe bends

The equations above may also be used for pipe bends provided the requirement for minimum wall thickness (t_m) is met.

Further Information

Additional pressure rating information is contained in Sections 7 and 8 of this manual.

Refer to ASME B31.3a-1996 paragraph 304 for further details relating to pressure rating and wall thickness calculations applicable to elbows, branch connections, closures, flanges, reducers and other components.

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Worked Example:

Taking the simplest equation: $t = \frac{PD}{2SE}$

A. If you wish to calculate what wall thickness should be used in a design for the following situation:

P = Internal Design Pressure – For this example lets say 2000 pounds per square inch = 2ksi
D = Outside Diameter – For this example lets say 4 inch nominal bore = 4.5 inches
S = Stress Value for material from table below taking into account operating temperature – For this example lets take ASTM A312 TP 316L operating at 500^{O}C for which S = 14.4 ksi
(1ksi = 1,000 psi / psi = Pounds Pressure per Square Inch)
E = Quality Factor from table below according to manufacturing specification – For this example we are using ASTM A312 TP 316L Seamless for which E = 1.0

So this gives: $t = \frac{2 \times 4.5}{2 \times 14.4 \times 1.0} = 0.313$ inches

Thus we would use 4 inch Nominal Bore Schedule 80S which has a wall thickness of 0.337 inches
If the wall thickness calculation leads to a heavier wall than is available then the pipe diameter must be increased. Depending upon the design of the system this may also reduce the pressure.

B. If you wish to calculate what design pressure could be permitted for the following situation:

D = Outside Diameter – For this example lets say 4 inch nominal bore = 4.5 inches
t = Wall Thickness – For this example lets say Schedule 40S = 0.237 inches
S = Stress Value for material from table below taking into account operating temperature – For this example lets take ASTM A312 TP 316L operating at 500^{O}C for which S = 14.4 ksi
(1ksi = 1,000 psi / psi = Pounds Pressure per Square Inch)
E = Quality Factor from table below according to manufacturing specification – For this example we are using ASTM A312 TP 316L Seamless for which E = 1.0

So this gives: $0.237 = \frac{P \times 4.5}{2 \times 14.4 \times 1.0}$

Thus P = 1.51ksi = 1,510 pounds per square inch

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Values of coefficient 'Y' for t<D/6

Materials	Temperature, °F (°C)					
	≤900 (≤482)	950 (510)	1000 (538)	1050 (566)	1100 (593)	≥1150 (≥621)
	Y					
Ferritic Steels	0.4	0.5	0.7	0.7	0.7	0.7
Austenitic Steels	0.4	0.4	0.4	0.4	0.5	0.7
Cast Iron	0.0	-	-	-	-	-

Note
- The above table and the equations are based on paragraph 304.1 of ASME B31.3a-1996
- The value for Y may be interpolated for intermediate temperatures. For t > D/6:

$$Y = \frac{d + 2c}{D + d + 2c}$$

Basic quality factors 'E' for longitudinal weld joints in stainless steel pipes, tubes and fittings

Spec No.	Class (or Type)	Description	E	Notes
A 182	-	Forgings and Fittings	1.00	-
A 268	-	Seamless Tube	1.00	-
	-	Electric Fusion Welded Tube, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Tube, Single Butt Seam	0.80	-
A 269	-	Seamless Tube	1.00	-
	-	Electric Fusion Welded Tube, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Tube, Single Butt Seam	0.80	-
A 312	-	Seamless Pipe	1.00	-
	-	Electric Fusion Welded Pipe, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Pipe, Single Butt Seam	0.80	-
A 358	1, 3, 4	Electric Fusion Welded Pipe, 100% radiographed	1.00	-
	5	Electric Fusion Welded Pipe, Spot radiographed	0.90	-
	2	Electric Fusion Welded Pipe, Double Butt Seam	0.85	-
A 376	-	Seamless Pipe	1.00	-
A 403	-	Seamless Fittings	1.00	-
	-	Welded Fitting, 100% radiographed	1.00	1
	-	Welded Fitting, Double Butt Seam	0.85	-
	-	Welded Fitting, Single Butt Seam	0.80	-
A 409	-	Electric Fusion Welded Pipe, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Pipe, Single Butt Seam	0.80	-
A 430	-	Seamless Pipe	1.00	-
A 789	-	Seamless	1.00	-
	-	Electric Fusion Welded Pipe, 100% radiographed	1.00	-
	-	Electric Fusion Welded Tube, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Tube, Single Butt Seam	0.80	-
A 790	-	Seamless	1.00	-
	-	Electric Fusion Welded Pipe, 100% radiographed	1.00	-
	-	Electric Fusion Welded Pipe, Double Butt Seam	0.85	-
	-	Electric Fusion Welded Pipe, Single Butt Seam	0.80	-

Note
- This table is based on Table A-1B of ASME B31.3a-1996

1 An E factor of 1.00 may be applied only if all welds, including welds in the base material, have passed 100% radiographic examination. Substitution of ultrasonic examination for radiography is not permitted for the purpose of obtaining an E of 1.00.

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Basic allowable stresses 'S' in tension for stainless steels

ASTM Spec No.	Grade	Min Temp °F (for °C see Notes)	Metal Temperature, °F (°C)										Notes
			Min Temp to 100 (37.8)	300 (149)	500 (260)	700 (371)	850 (454)	1000 (538)	1150 (621)	1300 (704)	1400 (760)	1500 (816)	
			Basic Allowable Stress, **S** ksi										
A 312	TP321	-325	16.7	16.7	16.1	14.6	14.0	13.5	5.0	1.7	0.8	0.3	1, 2
A 376	TP321	-325	16.7	16.7	16.1	14.6	14.0	13.5	5.0	1.7	0.8	0.3	1, 2
A 269	TP304L	-425	16.7	16.7	14.8	13.5	12.8	7.8	4.0	2.1	1.1	0.9	2, 3
A 312	TP304L	-425	16.7	16.7	14.8	13.5	12.8	7.8	4.0	2.1	1.1	0.9	-
A 358	304L	-425	16.7	16.7	14.8	13.5	12.8	7.8	4.0	2.1	1.1	0.9	2
A 269	TP316L	-325	16.7	16.7	14.4	12.9	12.1	11.2	8.8	3.5	1.8	1.0	2, 3
A 312	TP316L	-325	16.7	16.7	14.4	12.9	12.1	11.2	8.8	3.5	1.8	1.0	-
A 358	316L	-325	16.7	16.7	14.4	12.9	12.1	11.2	8.8	3.5	1.8	1.0	2
A 312	TP321	-325	16.7	16.7	16.1	14.6	14.0	13.5	6.9	3.2	1.9	1.1	1, 2, 4
A 376	TP321	-325	16.7	16.7	16.1	14.6	14.0	13.5	6.9	3.2	1.9	1.1	1, 2, 4
A 312	TP321H	-325	16.7	16.7	16.1	14.6	14.0	13.5	6.9	3.2	1.9	1.1	1, 2
A 376	TP321H	-325	16.7	16.7	16.1	14.6	14.0	13.5	6.9	3.2	1.9	1.1	-
A 268	TP409	-20	20.0	-	-	-	-	-	-	-	-	-	6
A 268	TP430Ti	-20	20.0	-	-	-	-	-	-	-	-	-	6, 7
A 376	16-8-2H	-325	20.0	-	-	-	-	-	-	-	-	-	5, 6, 8
A 268	TP405	-20	20.0	17.7	17.2	16.2	10.4	4.0	-	-	-	-	6
A 268	TP410	-20	20.0	17.7	17.2	16.2	10.4	6.4	1.8	-	-	-	6
A 268	TP430	-20	20.0	19.6	19.0	17.6	10.4	6.5	2.4	-	-	-	6, 7
A 312	TP317L	-325	20.0	20.0	17.7	16.2	15.2	-	-	-	-	-	-
A 312	TP310	-325	20.0	20.0	20.0	18.3	14.6	11.0	3.6	0.8	0.4	0.2	4, 6, 10
A 358	310S	-325	20.0	20.0	20.0	18.3	14.6	11.0	3.6	0.8	0.4	0.2	2, 4, 5, 6
A 409	TP310	-325	20.0	20.0	20.0	18.3	14.6	11.0	3.6	0.8	0.4	0.2	2, 4, 5, 6, 10
A 312	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	5.0	1.7	0.8	0.3	1
A 358	321	-325	20.0	20.0	19.3	17.5	16.7	16.2	5.0	1.7	0.8	0.3	1, 2
A 376	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	5.0	1.7	0.8	0.3	1, 2
A 409	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	5.0	1.7	0.8	0.3	1, 2
A 312	TP309	-325	20.0	20.0	20.0	18.3	14.6	10.5	5.0	2.3	1.3	0.7	4, 6, 10
A 358	309S	-325	20.0	20.0	20.0	18.3	14.6	10.5	5.0	2.3	1.3	0.7	4, 5, 6, 2
A 409	TP309	-325	20.0	20.0	20.0	18.3	14.6	10.5	5.0	2.3	1.3	0.7	2, 4, 5, 6, 10
A 312	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	-
A 358	347	-425	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 376	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 409	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 312	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	-
A 358	348	-325	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 376	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 409	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	6.1	2.2	1.2	0.8	1, 2
A 312	TP310	-325	20.0	20.0	20.0	18.3	14.6	11.0	7.3	3.5	1.6	0.8	4, 6, 10, 11
A 358	310S	-325	20.0	20.0	20.0	18.3	14.6	11.0	7.3	3.5	1.6	0.8	2, 4, 5, 6, 11

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Basic allowable stresses 'S' in tension for stainless steels (Continued)

ASTM Spec No.	Grade	Min Temp °F (for °C see Notes)	Metal Temperature, °F (°C)										Notes
			Min Temp to 100 (37.8)	300 (149)	500 (260)	700 (371)	850 (454)	1000 (538)	1150 (621)	1300 (704)	1400 (760)	1500 (816)	
			Basic Allowable Stress, **S** ksi										
A 430	FP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2
A 312	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 4
A 358	321	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2, 4
A 376	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2, 4
A 409	TP321	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2, 4
A 430	FP321H	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2
A 376	TP321H	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	1, 2
A 312	TP321H	-325	20.0	20.0	19.3	17.5	16.7	16.2	6.9	3.2	1.9	1.1	-
A 430	FP316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 5, 8,
A 430	FP316H	-325	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 5, 8,
A 269	TP316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 3, 4, 5, 8
A 312	TP316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	4, 8
A 358	316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 4, 5, 8
A 376	TP316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 4, 5, 8
A 409	TP316	-425	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 4, 5, 8
A 312	TP317	-325	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	4, 8
A 409	TP317	-325	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 4, 5, 8
A 376	TP316H	-325	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	2, 5, 8
A 312	TP316H	-325	20.0	20.0	17.9	16.3	15.7	15.3	9.8	4.1	2.3	1.3	8
A 430	FP347	-425	20.0	20.0	18.6	18.2	18.2	18.0	10.5	4.4	2.5	1.3	1, 2
A 430	FP347H	-325	20.0	20.0	18.6	18.2	18.2	18.0	10.5	4.4	2.5	1.3	1, 2
A 376	TP347H	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2
A 312	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	4
A 358	347	-425	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 376	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 409	TP347	-425	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 312	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	4
A 358	348	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 376	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 409	TP348	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	1, 2, 4
A 312	TP347H	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	-
A 312	TP348H	-325	20.0	20.0	19.9	18.6	18.2	18.0	10.5	4.4	2.5	1.3	-
A 430	FP304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 5, 8
A 430	FP304H	-325	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 5, 8
A 269	TP304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 3, 4, 5, 8
A 312	TP304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	4, 8
A 358	304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 4, 5
A 376	TP304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 4, 5, 8
A 376	TP304H	-325	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 5, 8
A 409	TP304	-425	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	2, 4, 5, 8

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Basic allowable stresses 'S' in tension for stainless steels (Continued)

ASTM Spec No.	Grade	Min Temp °F (for °C see Notes)	Metal Temperature, °F (°C)										Notes
			Min Temp to 100 (37.8)	300 (149)	500 (260)	700 (371)	850 (454)	1000 (538)	1150 (621)	1300 (704)	1400 (760)	1500 (816)	
			Basic Allowable Stress, **S** ksi										
A 312	TP304H	-325	20.0	20.0	17.5	16.0	14.9	13.8	7.7	3.7	2.3	1.4	8
A 268	TP443	-20	23.3	21.4	19.4	17.5	15.1	4.5	-	-	-	-	6
A 268	TP446	-20	23.3	21.4	19.4	17.5	15.1	4.5	-	-	-	-	6
A 789	S32304	-60	29.0	26.3	24.9	-	-	-	-	-	-	-	9
A 790	S32304	-60	29.0	26.3	24.9	-	-	-	-	-	-	-	9
A 789	S31803	-60	30.0	28.9	27.2	-	-	-	-	-	-	-	9
A 790	S31803	-60	30.0	28.9	27.2	-	-	-	-	-	-		9
A 789	S32900	-20	30.0	-	-	-	-	-	-	-	-	-	9
A 790	S32900	-20	30.0	-	-	-	-	-	-	-	-	-	9
A 789	S32750	-20	38.7	33.1	31.4	-	-	-	-	-	-	-	9
A 790	S32750	-20	38.7	33.1	31.4	-	-	-	-	-	-	-	9

Notes
- This table is based on Table A-1A of ASME B31.3a-1996.
- For specified minimum tensile and yield strengths refer to the individual ASTM specifications in Sections 2 and 3.
- Minimum temperatures in °C: -20 °F = -29 °C, -60 °F = -51 °C, -325 °F = -199 °C, -425 °F = -254 °C

1 For temperatures above 538 °C (1000 °F), these stress values may be used only if the material has been heat treated at a temperature of 1093 °C (2000°F) minimum.
2 When the material has not been solution heat treated, the minimum temperature shall be -29 °C (-20 °F) unless the material is impact tested.
3 Must be verified by tensile test.
4 For temperatures above 538 °C (1000 °F), these stress values apply only when the carbon content is 0.04% or higher.
5 For temperatures above 538 °C (1000 °F), these stress values may be used only if the material has been heat treated by heating to a minimum temperature of 1038 °C (1900 °F) and quenching in water or rapidly cooling by other means.
6 This steel is intended for use at high temperatures; it may have low ductility and/or low impact properties at room temperature after being used at higher temperatures.
7 If the chemical composition of this Grade is such as to render it hardenable, qualification under P-No. 6 is required.
8 Increasingly tends to precipitate intergranular carbides as the carbon content increases above 0.03%.
9 This steel may develop embrittlement after service at approximately 316 °C (600 °F) and higher temperature.
10 This material when used below -29 °C (-20 °F) shall be impact tested if the carbon content is above 0.10%.
11 The stress values above 538 °C (1000 °F) shall be used only when the micrograin size, is No. 6 or less (coarser grain). Otherwise, the lower stress values listed for the same material, specification, and grade shall be used.

[7 OF 8] CONTINUED

Pipe Sizes - ANSI/ASME B36.19M-1985

Dimensions and weights per metre - stainless steel pipe

Nominal Pipe Size	OD		Schedule 5S[1]			Schedule 10S[1]			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[2]	12.70[2]	96.01[2]
12	12.750	323.9	0.156	3.96	31.25	0.180	4.57	36.00	0.375[2]	9.53[2]	73.88[2]	0.500[2]	12.70[2]	132.08[2]
14	14.000	355.6	0.156	3.96	34.36	0.188[2]	4.78[2]	41.30[2]	-	-	-	-	-	-
16	16.000	406.4	0.165	4.19	41.56	0.188[2]	4.78[2]	47.29[2]	-	-	-	-	-	-
18	18.000	457	0.165	4.19	46.81	0.188[2]	4.78[2]	53.26[2]	-	-	-	-	-	-
20	20.000	508	0.188	4.78	59.25	0.218[2]	5.54[2]	68.61[2]	-	-	-	-	-	-
22	22.000	559	0.188	4.78	65.24	0.218[2]	5.54[2]	75.53[2]	-	-	-	-	-	-
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.