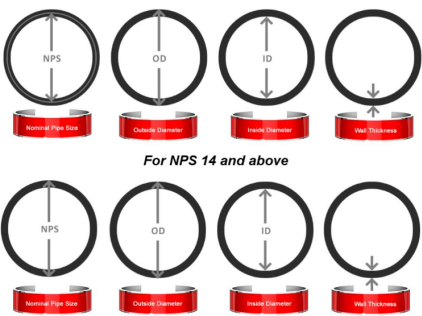


What is the pressure rating of 316 stainless steel pipe?

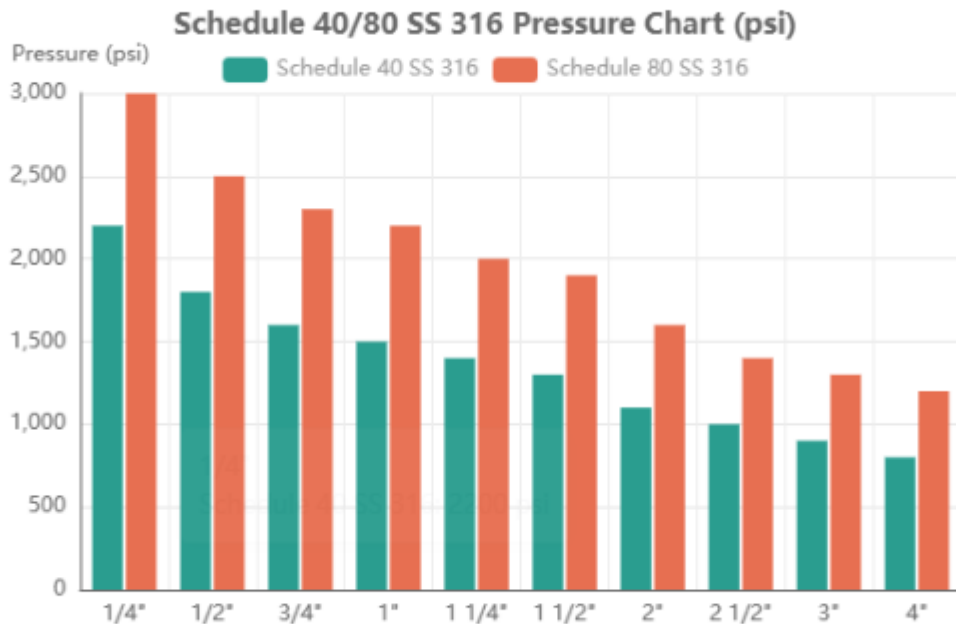
The pressure rating of 316 stainless steel pipe is not a fixed value. At ambient temperature, its pressure range is approximately 1,000 psi to over 5,000 psi, depending entirely on the pipe's diameter, wall thickness (pipe schedule), operating temperature, and specific manufacturing standards (e.g., seamless vs. welded pipe).



ASTM A312 316 Stainless Steel Pipe Pressure Rating

Referenced Standards: e.g., ASME B31.3 (Process Piping), ASME B31.1, or ASTM A312.
Update Date: "Last Updated: January 2026".

Pipe Size (inches)	Pipe Schedule	Outside Diameter (in) (mm)	Wall Thickness (in) (mm)	Pressure Rating (psig) (kPa)								
				Temperature (°F) (deg C)								
				100	200	300	400	500	600	650	700	750
				Allowable Stress (psi) (kPa)								
				16700	16700	16700	15500	14400	13500	13200	12900	12600
1"	40	1.315	0.133	2205	2205	2205	2047	1902	1783	1743	1703	1664
	80	1.315	0.179	3061	3061	3061	2841	2640	2475	2420	2365	2310
	160	1.315	0.250	4493	4493	4493	4170	3874	3632	3552	3471	3390
1 1/2"	40	1.900	0.145	1629	1629	1629	1512	1404	1317	1287	1258	1229
	80	1.900	0.200	2303	2303	2303	2138	1986	1862	1821	1779	1738
	160	1.900	0.281	3362	3362	3362	3120	2899	2717	2657	2597	2536
2"	40	2.375	0.154	1371	1371	1371	1272	1182	1108	1083	1059	1034
	80	2.375	0.218	1985	1985	1985	1843	1712	1605	1569	1534	1498
	160	2.375	0.344	3283	3283	3283	3047	2831	2654	2595	2536	2477
3"	40	3.500	0.216	1301	1301	1301	1208	1122	1052	1028	1005	982
	80	3.500	0.300	1844	1844	1844	1712	1590	1491	1458	1425	1391
	160	3.500	0.438	2787	2787	2787	2587	2403	2253	2203	2153	2103
4"	40	4.500	0.237	1102	1102	1102	1023	950	891	871	851	831
	80	4.500	0.337	1596	1596	1596	1482	1377	1291	1262	1233	1204
	160	4.500	0.531	2611	2611	2611	2424	2552	2111	2064	2017	1970
5"	40	5.563	0.258	965	965	965	896	832	780	763	746	728
	80	5.563	0.375	1428	1428	1428	1325	1231	1154	1129	1103	1077
	160	5.563	0.625	2474	2474	2474	2296	2133	2000	1955	1911	1866
6"	40	6.625	0.280	877	877	877	814	756	709	693	677	661
	80	6.625	0.432	1379	1379	1379	1280	1189	1115	1090	1065	1040
	160	6.625	0.719	2382	2382	2382	2211	2054	1925	1883	1840	1797
8"	40	8.625	0.322	771	771	771	716	665	623	610	596	582
	80	8.625	0.500	1218	1218	1218	1131	1050	985	963	941	919
	160	8.625	0.906	2298	2298	2298	2133	1982	1858	1817	1775	1734
10"	40	10.750	0.365	699	699	699	649	603	565	553	540	528
	80	10.750	0.594	1159	1159	1159	1075	999	937	916	895	874
	160	10.750	1.125	2289	2289	2289	2124	1974	1850	1809	1768	1727



Note: The pressure data in this chart is based on typical values at room temperature. Actual pressure ratings may vary depending on specific material grades, pipe manufacturing standards, and operating conditions. Always consult the manufacturer's certified data and relevant design codes for your specific application.

Schedule 40/80 SS 316 Pressure Chart Analysis:

- Pressure Comparison:** Schedule 80 SS 316 pipes have higher pressure ratings than Schedule 40 SS 316 pipes due to their thicker walls. For example, a 1/4" Schedule 80 pipe can handle 3000 psi, while a 1/4" Schedule 40 pipe can only handle 2200 psi.
- Size Impact:** As the pipe size increases, the pressure rating decreases for both Schedule 40 and Schedule 80 pipes. This is because larger diameter pipes experience more hoop stress under the same internal pressure.
- Temperature Effect:** It's important to note that pressure ratings decrease at higher temperatures. For example, at 500°F (260°C), the pressure rating of a Schedule 40 pipe may be reduced by 30-40% compared to its rating at room temperature.
- Material Advantages:** SS 316 stainless steel offers excellent corrosion resistance, making it suitable for use in marine, chemical, food processing, and pharmaceutical applications.

How to Calculate Stainless Steel Pipe Pressure Rating?

The commonly used calculation formula is:

$$P = \frac{2St}{D}$$

- P = Maximum allowable pressure
- S = Allowable stress of material
- t = Pipe wall thickness
- D = Outside diameter

Example:

1" 316 Schedule 40 pipe
 Wall thickness = 3.38 mm
 Calculated pressure ≈ 1500–2000 psi

What is the pressure rating for 316 stainless steel pipes at high temperatures?

At higher temperatures, the pressure rating of 316 stainless steel pipes decreases. For example, at 500°F (260°C), the pressure rating may be reduced by 30-40%. Always consult a detailed pressure rating chart considering the operating temperature of your system.

Allowable Working Pressure at Temperature																											
Temperature (°C):				50	100	150	200	250	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650	675	700	725	
Design Strength (MPa):				138	138	138	130	122	115	113	111	110	107	105	103	101	100	97	90	78	64	51	41	33	27	21	
Size			Sch No	WT (mm)	Allowable Working Pressure (MPa)																						
DN	NPS	mm																									
10	¾	17.15	10S	1.65	25.4	25.4	25.4	23.9	22.4	21.1	20.8	20.4	20.2	19.7	19.3	18.9	18.6	18.4	17.8	16.5	14.3	11.8	9.4	7.5	6.1	5.0	3.9
		17.15	40S	2.31	36.9	36.9	36.9	34.7	32.6	30.7	30.2	29.7	29.4	28.6	28.1	27.5	27.0	26.7	25.9	24.0	20.8	17.1	13.6	11.0	8.8	7.2	5.6
		17.15	80S	3.20	53.9	53.9	53.9	50.7	47.6	44.9	44.1	43.3	42.9	41.8	41.0	40.2	39.4	39.0	37.9	35.1	30.4	25.0	19.9	16.0	12.9	10.5	8.2
15	½	21.34	5S	1.65	20.0	20.0	20.0	18.9	17.7	16.7	16.4	16.1	16.0	15.5	15.2	14.9	14.7	14.5	14.1	13.1	11.3	9.3	7.4	6.0	4.8	3.9	3.0
		21.34	10S	2.11	26.1	26.1	26.1	24.6	23.1	21.8	21.4	21.0	20.8	20.3	19.9	19.5	19.1	18.9	18.4	17.0	14.8	12.1	9.7	7.8	6.3	5.1	4.0
		21.34	40S	2.77	35.4	35.4	35.4	33.3	31.3	29.5	29.0	28.4	28.2	27.4	26.9	26.4	25.9	25.6	24.9	23.1	20.0	16.4	13.1	10.5	8.5	6.9	5.4
		21.34	80S	3.73	49.8	49.8	49.8	46.9	44.1	41.5	40.8	40.1	39.7	38.6	37.9	37.2	36.5	36.1	35.0	32.5	28.2	23.1	18.4	14.8	11.9	9.7	7.6
20	¾	26.67	5S	1.65	15.8	15.8	15.8	14.9	14.0	13.2	12.9	12.7	12.6	12.2	12.0	11.8	11.6	11.4	11.1	10.3	8.9	7.3	5.8	4.7	3.8	3.1	2.4
		26.67	10S	2.11	20.5	20.5	20.5	19.3	18.1	17.1	16.8	16.5	16.4	15.9	15.6	15.3	15.0	14.9	14.4	13.4	11.6	9.5	7.6	6.1	4.9	4.0	3.1
		26.67	40S	2.87	28.7	28.7	28.7	27.0	25.4	23.9	23.5	23.1	22.9	22.2	21.8	21.4	21.0	20.8	20.2	18.7	16.2	13.3	10.6	8.5	6.9	5.6	4.4
		26.67	80S	3.91	40.6	40.6	40.6	38.3	35.9	33.8	33.3	32.7	32.4	31.5	30.9	30.3	29.7	29.4	28.5	26.5	23.0	18.8	15.0	12.1	9.7	7.9	6.2
25	1	33.40	5S	1.65	12.5	12.5	12.5	11.7	11.0	10.4	10.2	10.0	9.9	9.7	9.5	9.3	9.1	9.0	8.8	8.1	7.0	5.8	4.6	3.7	3.0	2.4	1.9
		33.40	10S	2.77	21.6	21.6	21.6	20.3	19.1	18.0	17.7	17.4	17.2	16.7	16.4	16.1	15.8	15.6	15.2	14.1	12.2	10.0	8.0	6.4	5.2	4.2	3.3
		33.40	40S	3.38	26.8	26.8	26.8	25.3	23.7	22.3	22.0	21.6	21.4	20.8	20.4	20.0	19.6	19.4	18.8	17.5	15.2	12.4	9.9	8.0	6.4	5.2	4.1
		33.40	80S	4.55	37.4	37.4	37.4	35.2	33.0	31.1	30.6	30.0	29.8	29.0	28.4	27.9	27.3	27.1	26.3	24.4	21.1	17.3	13.8	11.1	8.9	7.3	5.7
32	1¼	42.16	5S	1.65	9.8	9.8	9.8	9.2	8.7	8.2	8.0	7.9	7.8	7.6	7.4	7.3	7.2	7.1	6.9	6.4	5.5	4.5	3.6	2.9	2.3	1.9	1.5
		42.16	10S	2.77	16.8	16.8	16.8	15.9	14.9	14.0	13.8	13.5	13.4	13.1	12.8	12.6	12.3	12.2	11.8	11.0	9.5	7.8	6.2	5.0	4.0	3.3	2.6
		42.16	40S	3.56	22.0	22.0	22.0	20.7	19.5	18.3	18.0	17.7	17.6	17.1	16.8	16.4	16.1	16.0	15.5	14.4	12.4	10.2	8.1	6.5	5.3	4.3	3.4
		42.16	80S	4.85	30.9	30.9	30.9	29.1	27.3	25.7	25.3	24.8	24.6	24.0	23.5	23.1	22.6	22.4	21.7	20.1	17.5	14.3	11.4	9.2	7.4	6.0	4.7
40	1½	48.26	5S	1.65	8.5	8.5	8.5	8.0	7.5	7.1	7.0	6.8	6.8	6.6	6.5	6.4	6.2	6.2	6.0	5.6	4.8	3.9	3.1	2.5	2.0	1.7	1.3
		48.26	10S	2.77	14.6	14.6	14.6	13.7	12.9	12.2	12.0	11.7	11.6	11.3	11.1	10.9	10.7	10.6	10.3	9.5	8.2	6.8	5.4	4.3	3.5	2.9	2.2
		48.26	40S	3.68	19.7	19.7	19.7	18.6	17.4	16.4	16.2	15.9	15.7	15.3	15.0	14.7	14.4	14.3	13.9	12.9	11.2	9.2	7.3	5.9	4.7	3.9	3.0
		48.26	80S	5.08	28.0	28.0	28.0	26.4	24.8	23.3	22.9	22.5	22.3	21.7	21.3	20.9	20.5	20.3	19.7	18.3	15.8	13.0	10.3	8.3	6.7	5.5	4.3

Schedule 40 316 Stainless Steel Pipe: Pressure Rating vs. Temperature

