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## Carbon, Alloy and Stainless Steel Pipes - ASME/ANSI B36.10/19


Pipe sizes, inside and outside diameters, wall thickness, schedules, moment of inertia, transverse area, weight of pipe filled with water - U.S. Customary Units

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**Stainless Steel & Carbon** Up to 30" diameter--165" wide Std designs or per customer specs [www.morrisoncm.com](http://www.morrisoncm.com)

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**ASME A13.1 Pipe Marking** Free guide to piping identification standards for ASME A13.1 [Duralabel.com/asm-a13-1](http://Duralabel.com/asm-a13-1)

AdChoices 

The steel pipe data chart below can be used to find pipe sizes, diameters, wall thickness, working pressures and more The chart is based on ASME/ANSI B 36.10 Welded and Seamless Wrought Steel Pipe and ASME/ANSI B36.19 Stainless Steel Pipe.

Regardless of [schedule number](#), pipes of a particular size all have the same outside diameter (not withstanding manufacturing tolerances). As the schedule number increases, the wall thickness increases, and the actual bore is reduced. For example:

- A 4 inches (100 mm) Schedule 40 pipe has an outside diameter of 4.500 inches (114.30 mm), a wall thickness of 0.237 inches (6.02 mm), giving a bore of 4.026 inches (102.26 mm)
- A 4 inches (100 mm) Schedule 80 pipe has an outside diameter of 4.500 inches (114.30 mm), a wall thickness of 0.337 inches (8.56 mm), giving a bore of 3.826 inches (97.18 mm)

### Outside Diameter, Identification, Wall Thickness, Inside Diameter

- [Area of Metal, Transverse Internal Area, Moment of Inertia, Weight Pipe, Weight Water, External Surface, Elastic Section Modulus](#)

Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - t - (inches)	Inside Diameter - d - (inches)
		Steel		Stainless Steel Schedule No.		
		Iron Pipe Size	Schedule No.			
1/8	0.405	STD	40	10S	.049	.307
		XS	80	40S	.068	.269
				80S	.095	.215
1/4	0.540	STD	40	10S	.065	.410
		XS	80	40S	.088	.364
				80S	.119	.302
3/8	0.675	STD	40	10S	.065	.545
		XS	80	40S	.091	.493
				80S	.126	.423
1/2	0.840	.	.	5S	.065	.710
		.	.	10S	.083	.674
		STD	40	40S	.109	.622
		XS	80	80S	.147	.546
		.	160	.	.187	.466
		XXS	.	.	.294	.252
3/4	1.050	.	.	5S	.065	.920
		.	.	10S	.083	.884
		STD	40	40S	.113	.824
		XS	80	80S	.154	.742
		.	160	.	.219	.612
		XXS	.	.	.308	.434
1	1.315	.	.	5S	.065	1.185
		.	.	10S	.109	1.097
		STD	40	40S	.133	1.049
		XS	80	80S	.179	.957
		.	160	.	.250	.815
		XXS	.	.	.358	.599
1 1/4	1.660	.	.	5S	.065	1.530
		.	.	10S	.109	1.442
		STD	40	40S	.140	1.380
		XS	80	80S	.191	1.278
		.	160	.	.250	1.160
		XXS	.	.	.382	.896
1 1/2	1.900	.	.	5S	.065	1.770
		.	.	10S	.109	1.682
		STD	40	40S	.145	1.610
		XS	80	80S	.200	1.500
		.	160	.	.281	1.338
		XXS	.	.	.400	1.100
2	2.375	.	.	5S	.065	2.245
		.	.	10S	.109	2.157
		STD	40	40S	.154	2.067
		XS	80	80S	.218	1.939
		.	160	.	.344	1.687
		.				

		XXS	.	.	.436	1.503
2 1/2	2.875	.	.	5S	.083	2.709
		.	.	10S	.120	2.635
		STD	40	40S	.203	2.469
		XS	80	80S	.276	2.323
		.	160	.	.375	2.125
		XXS	.	.	.552	1.771
3	3.500	.	.	5S	.083	3.334
		.	.	10S	.120	3.260
		STD	40	40S	.216	3.068
		XS	80	80S	.300	2.900
		.	160	.	.438	2.624
		XXS	.	.	.600	2.300
3 1/2	4.000	.	.	5S	.083	3.834
		.	.	10S	.120	3.760
		STD	40	40S	.226	3.548
		XS	80	80S	.318	3.364
		.	.	.	.	.
4	4.500	.	.	5S	.083	4.334
		.	.	10S	.120	4.260
		STD	40	40S	.237	4.026
		XS	80	80S	.337	3.826
		.	120	.	.438	3.624
		.	160	.	.531	3.438
		XXS	.	.	.674	3.152
5	5.563	.	.	5S	.109	5.345
		.	.	10S	.134	5.295
		STD	40	40S	.258	5.047
		XS	80	80S	.375	4.813
		.	120	.	.500	4.563
		.	160	.	.625	4.313
		XXS	.	.	.750	4.063
6	6.625	.	.	5S	.109	6.407
		.	.	10S	.134	6.357
		STD	40	40S	.280	6.065
		XS	80	80S	.432	5.761
		.	120	.	.562	5.501
		.	160	.	.718	5.189
		XXS	.	.	.864	4.897
8	8.625	.	.	5S	.109	8.407
		.	.	10S	.148	8.329
		.	20	.	.250	8.125
		.	30	.	.277	8.071
		STD	40	40S	.322	7.981
		.	60	.	.406	7.813
		XS	80	80S	.500	7.625
		.	100	.	.594	7.437
		.	120	.	.719	7.187
		.	140	.	.812	7.001
		XXS	.	.	.875	6.875
		.	160	.	.906	6.813
10	10.750	.	.	5S	.134	10.482
		.	.	10S	.165	10.420
		.	20	.	.250	10.250
		.	30	.	.307	10.136
		STD	40	40S	.365	10.020
		XS	60	80S	.500	9.750
		.	80	.	.594	9.562
		.	100	.	.719	9.312
		.	120	.	.844	9.062
		.	140	.	1.000	8.750
		.	160	.	1.125	8.500
12	12.75	.	.	5S	.156	12.438
		.	.	10S	.180	12.390
		.	20	.	.250	12.250
		.	30	.	.330	12.090
		STD	.	40S	.375	12.000
		.	40	.	.406	11.938
		XS	.	80S	.500	11.750
		.	60	.	.562	11.626
		.	80	.	.688	11.374
		.	100	.	.844	11.062
		.	120	.	1.000	10.750
		.	140	.	1.125	10.500
		.	160	.	1.312	10.126
14	14.00	.	.	5S	.156	13.688
		.	.	10S	.188	13.624
		.	10	.	.250	13.500
		.	20	.	.312	13.376
		STD	30	.	.375	13.250
		.	40	.	.438	13.124
		XS	.	.	.500	13.000
		.	60	.	.594	12.812
		.	80	.	.750	12.500
		.	100	.	.938	12.124
		.	120	.	1.094	11.812
		.	140	.	1.250	11.500

		..	160	.	1.406	11.188
16	16.00	.	.	5S	.165	15.670
		.	10	10S	.188	15.624
		.	20	.	.250	15.500
		STD	30	.	.312	15.376
		XS	40	.	.375	15.250
		.	60	.	.500	15.000
		.	80	.	.656	14.688
		.	100	.	.844	14.312
		.	120	.	1.031	13.938
		.	140	.	1.219	13.562
		.	160	.	1.438	13.124
		.			1.594	12.812
18	18.00	.	.	5S	.165	17.670
		.	10	10S	.188	17.624
		.	20	.	.250	17.500
		STD	30	.	.312	17.376
		XS	40	.	.375	17.250
		.	60	.	.438	17.124
		.	80	.	.500	17.000
		.	100	.	.562	16.876
		.	120	.	.750	16.500
		.	140	.	.938	16.124
		.	160	.	1.156	15.688
		.			1.375	15.250
					1.562	14.876
					1.781	14.438

- 1 in (inch) = 25.4 mm

**Area of Metal, Transverse Internal Area, Moment of Inertia, Weight Pipe, Weight Water, External Surface, Elastic Section Modulus**

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - I - (inches <sup>4</sup> )	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in <sup>3</sup> )
		- a - (square inches)	- A - (square feet)					
1/8	.0548	.0740	.00051	.00088	.19	.032	.106	.00437
	.0720	.0568	.00040	.00106	.24	.025	.106	.00523
	.0925	.0364	.00025	.00122	.31	.016	.106	.00602
1/4	.0970	.1320	.00091	.00279	.33	.057	.141	.01032
	.1250	.1041	.00072	.00331	.42	.045	.141	.01227
	.1574	.0716	.00050	.00377	.54	.031	.141	.01395
3/8	.1246	.2333	.00162	.00586	.42	.101	.178	.01736
	.1670	.1910	.00133	.00729	.57	.083	.178	.02160
	.2173	.1405	.00098	.00862	.74	.061	.178	.02554
1/2	.1583	.3959	.00275	.01197	.54	.172	.220	.02849
	.1974	.3568	.00248	.01431	.67	.155	.220	.03407
	.2503	.3040	.00211	.01709	.85	.132	.220	.04069
	.3200	.2340	.00163	.02008	1.09	.102	.220	.04780
	.3836	.1706	.00118	.02212	1.31	.074	.220	.05267
3/4	.5043	.050	.00035	.02424	1.71	.022	.220	.05772
	.2011	.6648	.00462	.02450	.69	.288	.275	.04667
	.2521	.6138	.00426	.02969	.86	.266	.275	.05655
	.3326	.5330	.00371	.03704	1.13	.231	.275	.07055
	.4335	.4330	.00300	.04479	1.47	.188	.275	.08531
1	.5698	.2961	.00206	.05269	1.94	.128	.275	.10036
	.7180	.148	.00103	.05792	2.44	.064	.275	.11032
	.2553	1.1029	.00766	.04999	.87	.478	.344	.07603
	.4130	.9452	.00656	.07569	1.40	.409	.344	.11512
	.4939	.8640	.00600	.08734	1.68	.375	.344	.1328
1 1/4	.6388	.7190	.00499	.1056	2.17	.312	.344	.1606
	.8365	.5217	.00362	.1251	2.84	.230	.344	.1903
	1.0760	.282	.00196	.1405	3.66	.122	.344	.2136
	.3257	1.839	.01277	.1038	1.11	.797	.435	.1250
	.4717	1.633	.01134	.1605	1.81	.708	.435	.1934
1 1/2	.6685	1.495	.01040	.1947	2.27	.649	.435	.2346
	.8815	1.283	.00891	.2418	3.00	.555	.435	.2913
	1.1070	1.057	.00734	.2839	3.76	.458	.435	.3421
	1.534	.630	.00438	.3411	5.21	.273	.435	.4110
	.3747	2.461	.01709	.1579	1.28	1.066	.497	.1662
2	.6133	2.222	.01543	.2468	2.09	.963	.497	.2598
	.7995	2.036	.01414	.3099	2.72	.882	.497	.3262
	1.068	1.767	.01225	.3912	3.63	.765	.497	.4118
	1.429	1.406	.00976	.4824	4.86	.608	.497	.5078
	1.885	.950	.00660	.5678	6.41	.42	.497	.5977
	.4717	3.958	.02749	.3149	1.61	1.72	.622	.2652
	.7760	3.654	.02538	.4992	2.64	1.58	.622	.4204
	1.075	3.355	.02330	.6657	3.65	1.45	.622	.5606
	1.477	2.953	.02050	.8679	5.02	1.28	.622	.7309
	2.190	2.241	.01556	1.162	7.46	.97	.622	.979
	2.656	1.774	.01232	1.311	9.03	.77	.622	1.104
	.7280	5.764	.04002	.7100	2.48	2.50	.753	.4939
	1.039	5.453	.03787	.9873	3.53	2.36	.753	.6868

2 1/2	1.704	4.788	.03322	1.530	5.79	2.07	.753	1.064
	2.254	4.238	.02942	1.924	7.66	1.87	.753	1.339
	2.945	3.546	.02463	2.353	10.01	1.54	.753	1.638
	4.028	2.464	.01710	2.871	13.69	1.07	.753	1.997
3	.8910	8.730	.06063	1.301	3.03	3.78	.916	.7435
	1.274	8.347	.05796	1.822	4.33	3.62	.916	1.041
	2.228	7.393	.05130	3.017	7.58	3.20	.916	1.724
	3.016	6.605	.04587	3.894	10.25	2.6	.916	2.225
	4.205	5.408	.03755	5.032	14.32	2.35	.916	2.876
	5.466	4.155	.02885	5.993	18.58	1.80	.916	3.424
3 1/2	1.021	11.545	.08017	1.960	3.48	5.00	1.047	.9799
	1.463	11.104	.07711	2.755	4.97	4.81	1.047	1.378
	2.680	9.886	.06870	4.788	9.11	4.29	1.047	2.394
	3.678	8.888	.06170	6.280	12.50	3.84	1.047	3.140
4	1.152	14.75	.10245	2.810	3.92	6.39	1.178	1.249
	1.651	14.25	.09898	3.963	5.61	6.18	1.178	1.761
	3.174	12.73	.08840	7.233	10.79	5.50	1.178	3.214
	4.407	11.50	.07986	9.610	14.98	4.98	1.178	4.271
	5.595	10.31	.0716	11.65	19.0	4.47	1.178	5.178
	6.621	9.28	.0645	13.27	22.51	4.02	1.178	5.898
	8.101	7.80	.0542	15.28	27.54	3.38	1.178	6.791
5	1.868	22.44	.1558	6.947	6.36	9.72	1.456	2.498
	2.285	22.02	.1529	8.425	7.77	9.54	1.456	3.029
	4.300	20.01	.1390	15.16	14.62	8.67	1.456	5.451
	6.112	18.19	.1263	20.67	20.78	7.88	1.456	7.431
	7.953	16.35	.1136	25.73	27.04	7.09	1.456	9.250
	9.696	14.61	.1015	30.03	32.96	6.33	1.456	10.796
	11.340	12.97	.0901	33.63	38.55	5.61	1.456	12.090
6	2.231	32.24	.2239	11.85	7.60	13.97	1.734	3.576
	2.733	31.74	.2204	14.40	9.29	13.75	1.734	4.346
	5.581	28.89	.2006	28.14	18.97	12.51	1.734	8.496
	8.405	26.07	.1810	40.49	28.57	11.29	1.734	12.22
	10.70	23.77	.1650	49.61	36.39	10.30	1.734	14.98
	13.32	21.15	.1469	58.97	45.35	9.16	1.734	17.81
	15.64	18.84	.1308	66.33	53.16	8.16	1.734	20.02
8	2.916	55.51	.3855	26.44	9.93	24.06	2.258	6.131
	3.941	54.48	.3784	35.41	13.40	23.61	2.258	8.212
	6.57	51.85	.3601	57.72	22.36	22.47	2.258	13.39
	7.26	51.16	.3553	63.35	24.70	22.17	2.258	14.69
	8.40	50.03	.3474	72.49	28.55	21.70	2.258	16.81
	10.48	47.94	.3329	88.73	35.64	20.77	2.258	20.58
	12.76	45.66	.3171	105.7	43.39	19.78	2.258	24.51
	14.96	43.46	.3018	121.3	50.95	18.83	2.258	28.14
	17.84	40.59	.2819	140.5	60.71	17.59	2.258	32.58
	19.93	38.50	.2673	153.7	67.76	16.68	2.258	35.65
	21.30	37.12	.2578	162.0	72.42	16.10	2.258	37.56
	21.97	36.46	.2532	165.9	74.69	15.80	2.258	38.48
10	4.36	86.29	.5992	63.0	15.19	37.39	2.814	11.71
	5.49	85.28	.5922	76.9	18.65	36.95	2.814	14.30
	8.24	82.52	.5731	113.7	28.04	35.76	2.814	21.15
	10.07	80.69	.5603	137.4	34.24	34.96	2.814	25.57
	11.90	78.86	.5475	160.7	40.48	34.20	2.814	29.90
	16.10	74.66	.5185	212.0	54.74	32.35	2.814	39.43
	18.92	71.84	.4989	244.8	64.43	31.13	2.814	45.54
	22.63	68.13	.4732	286.1	77.03	29.53	2.814	53.22
	26.24	64.53	.4481	324.2	89.29	27.96	2.814	60.32
	30.63	60.13	.4176	367.8	104.13	26.06	2.814	68.43
	34.02	56.75	.3941	399.3	115.64	24.59	2.814	74.29
12	6.17	121.50	.8438	122.4	20.98	52.65	3.338	19.2
	7.11	120.57	.8373	140.4	24.17	52.25	3.338	22.0
	9.82	117.86	.8185	191.8	33.38	51.07	3.338	30.2
	12.87	114.80	.7972	248.4	43.77	49.74	3.338	39.0
	14.58	113.10	.7854	279.3	49.56	49.00	3.338	43.8
	15.77	111.93	.7773	300.3	53.52	48.50	3.338	47.1
	19.24	108.43	.7528	361.5	65.42	46.92	3.338	56.7
	21.52	106.16	.7372	400.4	73.15	46.00	3.338	62.8
	26.03	101.64	.7058	475.1	88.63	44.04	3.338	74.6
	31.53	96.14	.6677	561.6	107.32	41.66	3.338	88.1
	36.91	90.76	.6303	641.6	125.49	39.33	3.338	100.7
	41.08	86.59	.6013	700.5	139.67	37.52	3.338	109.9
	47.14	80.53	.5592	781.1	160.27	34.89	3.338	122.6
14	6.78	147.15	1.0219	162.6	23.07	63.77	3.665	23.2
	8.16	145.78	1.0124	194.6	27.73	63.17	3.665	27.8
	10.80	143.14	.9940	255.3	36.71	62.03	3.665	36.6
	13.42	140.52	.9758	314.4	45.61	60.89	3.665	45.0
	16.05	137.88	.9575	372.8	54.57	59.75	3.665	53.2
	18.66	135.28	.9394	429.1	63.44	58.64	3.665	61.3
	21.21	132.73	.9217	483.8	72.09	57.46	3.665	69.1
	24.98	128.96	.8956	562.3	85.05	55.86	3.665	80.3
	31.22	122.72	.8522	678.3	106.13	53.18	3.665	98.2
	38.45	115.49	.8020	824.4	130.85	50.04	3.665	117.8
	44.32	109.62	.7612	929.6	150.79	47.45	3.665	132.8
	50.07	103.87	.7213	1027.0	170.28	45.01	3.665	146.8
	55.63	98.31	.6827	1117.0	189.11	42.60	3.665	159.6
	8.21	192.85	1.3393	257.3	27.90	83.57	4.189	32.2
	9.34	191.72	1.3314	291.9	31.75	83.08	4.189	36.5

16	12.37	188.69	1.3103	383.7	42.05	81.74	4.189	48.0
	15.38	185.69	1.2895	473.2	52.27	80.50	4.189	59.2
	18.41	182.65	1.2684	562.1	62.58	79.12	4.189	70.3
	24.35	176.72	1.2272	731.9	82.77	76.58	4.189	91.5
	31.62	169.44	1.1766	932.4	107.50	73.42	4.189	116.6
	40.14	160.92	1.1175	1155.8	136.61	69.73	4.189	144.5
	48.48	152.58	1.0596	1364.5	164.82	66.12	4.189	170.5
	56.56	144.50	1.0035	1555.8	192.43	62.62	4.189	194.5
	65.78	135.28	.9394	1760.3	223.64	58.64	4.189	220.0
	72.10	128.96	.8956	1893.5	245.25	55.83	4.189	236.7
18	9.25	245.22	1.7029	367.6	31.43	106.26	4.712	40.8
	10.52	243.95	1.6941	417.3	35.76	105.71	4.712	46.4
	13.94	240.53	1.6703	549.1	47.39	104.21	4.712	61.1
	17.34	237.13	1.6467	678.2	58.94	102.77	4.712	75.5
	20.76	233.71	1.6230	806.7	70.59	101.18	4.712	89.6
	24.17	230.30	1.5990	930.3	82.15	99.84	4.712	103.4
	27.49	226.98	1.5763	1053.2	93.45	98.27	4.712	117.0
	30.79	223.68	1.5533	1171.5	104.67	96.93	4.712	130.1
	40.64	213.83	1.4849	1514.7	138.17	92.57	4.712	168.3
	50.23	204.24	1.4183	1833.0	170.92	88.50	4.712	203.8
	61.17	193.30	1.3423	2180.0	207.96	83.76	4.712	242.3
	71.81	182.66	1.2684	2498.1	244.14	79.07	4.712	277.6
	80.66	173.80	1.2070	2749.0	274.22	75.32	4.712	305.5
	90.75	163.72	1.1369	3020.0	308.50	70.88	4.712	335.6

## STD, XS and XXS

To distinguish different weights of pipe, three long standing traditional designations are used:

- standard wall - STD
- extra strong wall - XS
- double extra strong wall - XXS

The last two designations are sometimes referred to as extra heavy wall (XH), and double extra heavy wall (XXH).

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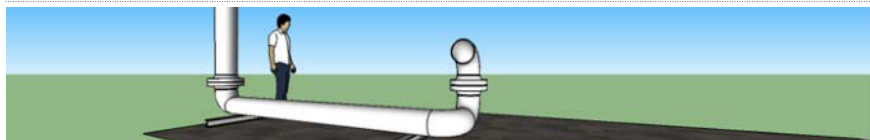
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- [Alloy Steel](#) - Steel with properties due to delements other than carbon
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- [Comparing Friction Loss in Steel, Copper and Plastic Pipes](#) - Water flow and friction head loss (*ft/100 ft*) - steel, copper and PVC plastic pipes
- [Difference between Pipes and Tubes](#) - Pipes and tubes are not the same
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- [Identification Tests for Stainless Steels](#) - Magnetic, spark, hardness and acid identification tests of austenitic, martensitic and ferritic stainless steels
- [Pressure Loss in Schedule 40 Steel Pipes](#) - Water flow and pressure loss in schedule 40 steel pipes - Imperial and SI units - gallons per minute, liters per second and cubic meters per hour
- [Schedule Terminology](#) - An introduction to pipes and the schedule terminology
- [Stainless Steel Pipes - Dimensions and Weights ANSI/ASME 36.19](#) - Dimensions, wall thickness and weights of stainless steel pipes according to ASME B36.19 Stainless Steel Pipe
- [Steel Pipe Schedule 40 - Friction loss and Velocity Diagram](#) - Friction loss and velocity diagrams - in imperial (*psi/100 ft, ft/s*) and SI (*Pa/100m, m/s*) units
- [Steel Pipe Schedule 80 - Friction loss and Velocity Diagram](#) - Water flow in steel pipes schedule 80 - pressure drop and velocity diagrams in SI and Imperial units
- [Steel Pipes - Maximum Water Flow Capacities](#) - Maximum water flow capacity of steel pipes - dimensions ranging 2 - 24 inches
- [Steel Pipes Dimensions - ANSI Schedule 40](#) - Internal and external diameters, areas, weights, volumes and number of threads for schedule 40 steel pipes
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