

COYLE SUPPLY, INC

Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
		Steel		A (square feet)										
		Iron Pipe Size	Pipe Schedule					<i>a</i> (square inches)						
1/8	0.405	.	.	10S	.049	.307	.0548	.0740	.00051	.00088	.19	.032	.106	.00437
				40S	.068	.269	.0720	.0568	.00040	.00106	.025	.106	.00523	
				80S	.095	.215	.0925	.0364	.00025	.00122	.016	.106	.00602	
1/4	0.540	.	.	10S	.065	.410	.0970	.1320	.00091	.00279	.33	.057	.141	.01032
				40S	.088	.364	.1250	.1041	.00072	.00331	.045	.141	.01227	
				80S	.119	.302	.1574	.0716	.00050	.00377	.031	.141	.01395	
3/8	0.675	.	.	10S	.065	.545	.1246	.2333	.00162	.00586	.42	.101	.178	.01736
				40S	.091	.493	.1670	.1910	.00133	.00729	.083	.178	.02160	
				80S	.126	.423	.2173	.1405	.00098	.00862	.061	.178	.02554	
1/2	0.840	.	.	5S	.065	.710	.1583	.3959	.00275	.01197	.54	.172	.220	.02849
				10S	.083	.674	.1974	.3568	.00248	.01431	.155	.220	.03407	
				40S	.109	.622	.2503	.3040	.00211	.01709	.132	.220	.04069	
3/4	1.050	.	.	80S	.147	.546	.3200	.2340	.00163	.02008	1.09	.102	.220	.04780
				.	.187	.466	.3836	.1706	.00118	.02212	.074	.220	.05267	
				.	.294	.252	.5043	.050	.00035	.02424	.022	.220	.05772	
1	1.315	.	.	5S	.065	.920	.2011	.6648	.00462	.02450	.69	.288	.275	.04667
				10S	.109	.884	.2521	.6138	.00426	.02969	.266	.275	.05655	
				40S	.133	.824	.3326	.5330	.00371	.03704	.231	.275	.07055	
1 1/4	1.660	.	.	80S	.179	.742	.4335	.4330	.00300	.04479	1.47	.188	.275	.08531
				.	.250	.815	.8365	.5217	.00362	.1251	.128	.275	.10036	
				.	.358	.599	1.0760	.282	.00196	.1405	.064	.275	.11032	
1 1/2	1.915	.	.	5S	.065	1.185	.2553	1.1029	.00766	.04999	.87	.478	.344	.07603
				10S	.109	1.097	.4130	.9452	.00656	.07569	.409	.344	.11512	
				40S	.133	1.049	.4939	.8640	.00600	.08734	.375	.344	.1328	
2	2.375	.	.	80S	.179	.957	.6388	.7190	.00499	.1056	2.17	.312	.344	.1606
				.	.250	.815	.8365	.5217	.00362	.1251	.230	.344	.1903	
				.	.358	.599	1.0760	.282	.00196	.1405	.122	.344	.2136	
2 1/2	3.063	.	.	5S	.065	1.530	.3257	1.839	.01277	.1038	1.11	.797	.435	.1250
				10S	.109	1.442	.4717	1.633	.01134	.1605	.708	.435	.1934	
				40S	.140	1.380	.6685	1.495	.01040	.1947	.649	.435	.2346	
3	4.313	.	.	80S	.191	1.278	.8815	1.283	.00891	.2418	3.00	.555	.435	.2913
				.	.250	1.160	1.1070	1.057	.00734	.2839	.458	.435	.3421	
				.	.382	.896	1.534	.630	.00438	.3411	.273	.435	.4110	

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Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
		Steel		<i>A</i> (square feet)										
		Iron Pipe Size	Pipe Schedule					<i>a</i> (square inches)						
1 1/2	1.900	.	.	5S	.065	1.770	.3747	2.461	.01709	.1579	1.066	.497	.1662	
				10S	.109	1.682	.6133	2.222	.01543	.2468	.963	.497	.2598	
				40S	.145	1.610	.7995	2.036	.01414	.3099	.882	.497	.3262	
				80S	.200	1.500	1.068	1.767	.01225	.3912	.765	.497	.4118	
				.	.281	1.338	1.429	1.406	.00976	.4824	.608	.497	.5078	
				.	.400	1.100	1.885	.950	.00660	.5678	.42	.497	.5977	
2	2.375	.	.	5S	.065	2.245	.4717	3.958	.02749	.3149	1.72	.622	.2652	
				10S	.109	2.157	.7760	3.654	.02538	.4992	1.58	.622	.4204	
				40S	.154	2.067	1.075	3.355	.02330	.6657	1.45	.622	.5606	
				80S	.218	1.939	1.477	2.953	.02050	.8679	1.28	.622	.7309	
				.	.344	1.687	2.190	2.241	.01556	1.162	.97	.622	.979	
				.	.436	1.503	2.656	1.774	.01232	1.311	.77	.622	1.104	
2 1/2	2.875	.	.	5S	.083	2.709	.7280	5.764	.04002	.7100	2.50	.753	.4939	
				10S	.120	2.635	1.039	5.453	.03787	.9873	2.36	.753	.6868	
				40S	.203	2.469	1.704	4.788	.03322	1.530	2.07	.753	1.064	
				80S	.276	2.323	2.254	4.238	.02942	1.924	1.87	.753	1.339	
				.	.375	2.125	2.945	3.546	.02463	2.353	1.54	.753	1.638	
				.	.552	1.771	4.028	2.464	.01710	2.871	1.07	.753	1.997	
3	3.500	.	.	5S	.083	3.334	.8910	8.730	.06063	1.301	3.78	.916	.7435	
				10S	.120	3.260	1.274	8.347	.05796	1.822	3.62	.916	1.041	
				40S	.216	3.068	2.228	7.393	.05130	3.017	3.20	.916	1.724	
				80S	.300	2.900	3.016	6.605	.04587	3.894	2.6	.916	2.225	
				.	.438	2.624	4.205	5.408	.03755	5.032	2.35	.916	2.876	
				.	.600	2.300	5.466	4.155	.02885	5.993	1.80	.916	3.424	
3 1/2	4.000	.	.	5S	.083	3.834	1.021	11.545	.08017	1.960	5.00	1.047	.9799	
				10S	.120	3.760	1.463	11.104	.07711	2.755	4.81	1.047	1.378	
				40S	.226	3.548	2.680	9.886	.06870	4.788	4.29	1.047	2.394	
				80S	.318	3.364	3.678	8.888	.06170	6.280	3.84	1.047	3.140	
				.	.438	3.152	5.466	7.880	.05420	7.780	3.38	1.047	8.791	
				.	.674	2.875	9.400	6.170	.04870	10.170	4.02	1.047	14.178	
4	4.500	.	.	5S	.083	4.334	1.152	14.75	.10245	2.810	6.39	1.178	1.249	
				10S	.120	4.260	1.651	14.25	.09898	3.963	6.18	1.178	1.761	
				40S	.237	4.026	3.174	12.73	.08840	7.233	5.50	1.178	3.214	
				80S	.337	3.826	4.407	11.50	.07986	9.610	4.98	1.178	4.271	
				.	.438	3.624	5.595	10.31	.0716	11.65	4.47	1.178	5.178	
				.	.531	3.438	6.621	9.28	.0645	13.27	4.02	1.178	5.898	

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Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)																																																																																																											
		Iron Pipe Size	Steel Pipe Schedule	Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)																																																																																																																
															Steel Schedule																																																																																																										
5	5.563	.	.	.	.109	1.868	22.44	.1558	6.947	6.36	9.72	1.456	2.498																																																																																																								
														STD	40	10S	.	.	.134	2.285	22.02	.1529	8.425	7.77	9.54	1.456	3.029																																																																																														
																												XS	80	40S	.	.	.258	4.300	20.01	.1390	15.16	14.62	8.67	1.456	5.451																																																																																
																																										.	120	80S	.	.	.375	6.112	18.19	.1263	20.67	20.78	7.88	1.456	7.431																																																																		
																																																								.	160	.	.	.500	7.953	16.35	.1136	25.73	27.04	7.09	1.456	9.250																																																					
																																																																					XXS625	9.696	14.61	.1015	30.03	32.96	6.33	1.456	10.796																																								
																																																																																	750	11.340	12.97	.0901	33.63	38.55	5.61	1.456	12.090																											
																																																																																														109	2.231	32.24	.2239	11.85	7.60	13.97	1.734	3.576														
																																																																																																												STD	40	10S	.	.	.134	2.733	31.74	.2204	14.40	9.29	13.75	1.734	4.346
.	120	80S	.	.	.432	8.405	26.07	.1810	40.49	28.57	11.29	1.734	12.22																																																																																																												
														.	160	.	.	.562	10.70	23.77	.1650	49.61	36.39	10.30	1.734	14.98																																																																																															
																											XXS718	13.32	21.15	.1469	58.97	45.35	9.16	1.734	17.81																																																																																		
																																							864	15.64	18.84	.1308	66.33	53.16	8.16	1.734	20.02																																																																					
																																																				109	2.916	55.51	.3855	26.44	9.93	24.06	2.258	6.131																																																								
																																																																		STD	40	10S	.	.	.148	3.941	54.48	.3784	35.41	13.40	23.61	2.258	8.212																																										
																																																																																XS	60	40S	.	.	.250	6.57	51.85	.3601	57.72	22.36	22.47	2.258	13.39																												
																																																																																														.	80	.	.	.277	7.26	51.16	.3553	63.35	24.70	22.17	2.258	14.69															
																																																																																																											XXS	140	.	.	.322	8.40	50.03	.3474	72.49	28.55	21.70	2.258	16.81		
																																																																																																																								.	160
.	.	.	.	.500	12.76	45.66	.3171	105.7	43.39	19.78	2.258	24.51																																																																																																									
												594	14.96	43.46	.3018	121.3	50.95	18.83	2.258	28.14																																																																																																
																									719	17.84	40.59	.2819	140.5	60.71	17.59	2.258	32.58																																																																																			
																																						812	19.93	38.50	.2673	153.7	67.76	16.68	2.258	35.65																																																																						
																																																			875	21.30	37.12	.2578	162.0	72.42	16.10	2.258	37.56																																																									
																																																																906	21.97	36.46	.2532	165.9	74.69	15.80	2.258	38.48																																												

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Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)	
		Iron Pipe Size	Steel Pipe Schedule	Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)						
															Steel Schedule
14	14.00	.	.	5S	.156	13.688	6.78	147.15	1.0219	162.6	63.77	3.665	23.2		
		.	.	10S	.188	13.624	8.16	145.78	1.0124	194.6	194.6	63.17	3.665	27.8	
		.	10	.	.250	13.500	10.80	143.14	.9940	255.3	255.3	62.03	3.665	36.6	
		.	20	.	.312	13.376	13.42	140.52	.9758	314.4	314.4	60.89	3.665	45.0	
		STD	30	.	.375	13.250	16.05	137.88	.9575	372.8	372.8	59.75	3.665	53.2	
		.	40	.	.438	13.124	18.66	135.28	.9394	429.1	429.1	58.64	3.665	61.3	
		XS	.	.	.500	13.000	21.21	132.73	.9217	483.8	483.8	57.46	3.665	69.1	
		.	60	.	.594	12.812	24.98	128.96	.8956	562.3	562.3	55.86	3.665	80.3	
		.	80	.	.750	12.500	31.22	122.72	.8522	678.3	678.3	53.18	3.665	98.2	
		.	100	.	.938	12.124	38.45	115.49	.8020	824.4	824.4	50.04	3.665	117.8	
		.	120	.	1.094	11.812	44.32	109.62	.7612	929.6	929.6	47.45	3.665	132.8	
		.	140	.	1.250	11.500	50.07	103.87	.7213	1027.0	1027.0	45.01	3.665	146.8	
		.	160	.	1.406	11.188	55.63	98.31	.6827	1117.0	1117.0	42.60	3.665	159.6	
		16	16.00	.	.	5S	.165	15.670	8.21	192.85	1.3393	257.3	83.57	4.189	32.2
				.	.	10S	.188	15.624	9.34	191.72	1.3314	291.9	83.08	4.189	36.5
				.	10	.	.250	15.500	12.37	188.69	1.3103	383.7	383.7	81.74	4.189	48.0
.	20			.	.312	15.376	15.38	185.69	1.2895	473.2	473.2	80.50	4.189	59.2	
STD	30			.	.375	15.250	18.41	182.65	1.2684	562.1	562.1	79.12	4.189	70.3	
XS	40			.	.500	15.000	24.35	176.72	1.2272	731.9	731.9	76.58	4.189	91.5	
.	60			.	.656	14.688	31.62	169.44	1.1766	932.4	932.4	73.42	4.189	116.6	
.	80			.	.844	14.312	40.14	160.92	1.175	1155.8	1155.8	69.73	4.189	144.5	
.	100			.	1.031	13.938	48.48	152.58	1.0596	1364.5	1364.5	66.12	4.189	170.5	
.	120			.	1.219	13.562	56.56	144.50	1.0035	1555.8	1555.8	62.62	4.189	194.5	
.	140			.	1.438	13.124	65.78	135.28	.9394	1760.3	1760.3	58.64	4.189	220.0	
.	160			.	1.594	12.812	72.10	128.96	.8956	1893.5	1893.5	55.83	4.189	236.7	

COYLE SUPPLY, INC

Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)																																																																																																																																																																																																			
		Iron Pipe Size	Steel Pipe Schedule	Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)																																																																																																																																																																																																								
															Steel Schedule																																																																																																																																																																																																		
22	22.00	.	.	.	.188	12.88	367.25	2.5503	766.2	43.80	159.14	5.760	69.7																																																																																																																																																																																																
														.	.	5S	21.624	14.92	.218	14.92	365.21	2.5362	884.8	50.71	158.26	5.760	80.4																																																																																																																																																																																						
																												.	10	.	21.500	17.08	.250	17.08	363.05	2.5212	1010.3	58.07	157.32	5.760	91.8																																																																																																																																																																								
																																										STD	20	.	21.250	25.48	.375	25.48	354.66	2.4629	1489.7	86.61	153.68	5.760	135.4																																																																																																																																																										
																																																								XS	30	.	21.000	33.77	.500	33.77	346.36	2.4053	1952.5	114.81	150.09	5.760	117.5																																																																																																																																												
																																																																						.	60	.	20.250	58.07	.875	58.07	322.06	2.2365	3244.9	197.41	139.56	5.760	295.0																																																																																																																														
																																																																																				.	80	.	19.75	73.78	1.125	73.78	306.35	2.1275	4030.4	250.81	132.76	5.760	366.4																																																																																																																
																																																																																																		.	100	.	19.25	89.09	1.375	89.09	291.04	2.0211	4758.5	302.88	126.12	5.760	432.6																																																																																																		
																																																																																																																.	120	.	18.75	104.02	1.625	104.02	276.12	1.9175	5432.0	353.61	119.65	5.760	493.8																																																																																				
																																																																																																																														.	140	.	18.25	118.55	1.875	118.55	261.59	1.8166	6053.7	403.00	113.36	5.760	550.3																																																																						
																																																																																																																																												.	160	.	17.75	132.68	2.125	132.68	247.45	1.71840	6626.4	451.06	107.23	5.760	602.4																																																								
																																																																																																																																																										.	.	5S	23.564	16.29	.218	16.29	436.10	3.0285	1151.6	55.37	188.98	6.283	96.0																																										
																																																																																																																																																																								.	10	10S	23.500	18.65	.250	18.65	433.74	3.0121	1315.4	63.41	187.95	6.283	109.6																												
																																																																																																																																																																																						STD	20	.	23.250	27.83	.375	27.83	424.56	2.9483	1942.0	94.62	183.95	6.283	161.9														
																																																																																																																																																																																																				XS	.	.	23.000	36.91	.500	36.91	415.48	2.8853	2549.5	125.49	179.87	6.283	212.5
.	40	.	22.624	50.31	.688	50.31	402.07	2.7921	3421.3	171.29	174.23	6.283	285.1																																																																																																																																																																																																				
														.	60	.	22.062	70.04	.969	70.04	382.35	2.6552	4652.8	238.35	165.52	6.283	387.7																																																																																																																																																																																						
																												.	80	.	21.562	87.17	1.219	87.17	365.22	2.5362	5672.0	296.58	158.26	6.283	472.8																																																																																																																																																																								
																																										.	100	.	20.938	108.07	1.531	108.07	344.32	2.3911	6849.9	367.39	149.06	6.283	570.8																																																																																																																																																										
																																																								.	120	.	20.376	126.31	1.812	126.31	326.08	2.2645	7825.0	429.39	141.17	6.283	652.1																																																																																																																																												
																																																																						.	140	.	19.876	142.11	2.062	142.11	310.28	2.1547	8625.0	483.12	134.45	6.283	718.9																																																																																																																														
																																																																																				.	160	.	19.312	159.41	2.344	159.41	292.98	2.0346	9455.9	542.13	126.84	6.283	787.9																																																																																																																
																																																																																																		.	10	.	25.376	25.18	.312	25.18	505.75	3.5122	2077.2	85.60	219.16	6.806	159.8																																																																																																		
																																																																																																																STD	.	.	25.250	30.19	.375	30.19	500.74	3.4774	2478.4	102.63	216.99	6.806	190.6																																																																																				
																																																																																																																														XS	20	.	25.000	40.06	.500	40.06	490.87	3.4088	3257.0	136.17	212.71	6.806	250.5																																																																						
																																																																																																																																												.	10	.	27.376	27.14	.312	27.14	588.61	4.0876	2601.0	92.26	255.07	7.330	185.8																																																								
																																																																																																																																																										STD	.	.	27.250	32.54	.375	32.54	583.21	4.0501	3105.1	110.64	252.73	7.330	221.8																																										
																																																																																																																																																																								XS	20	.	27.000	43.20	.500	43.20	572.56	3.9761	4084.8	146.85	248.11	7.330	291.8																												
																																																																																																																																																																																						.	30	.	26.750	53.75	.625	53.75	562.00	3.9028	5037.7	182.73	243.53	7.330	359.8														
																																																																																																																																																																																																				.	.	5S	29.500	23.37	.250	23.37	683.49	4.7465	2585.2	79.43	296.18	7.854	172.3
STD	.	.	29.250	34.90	.375	34.90	671.96	4.6664	3829.4	118.65	291.18	7.854	255.3																																																																																																																																																																																																				
														XS	20	.	29.000	46.34	.500	46.34	660.52	4.5869	5042.2	157.53	286.22	7.854	336.1																																																																																																																																																																																						
																												.	30	.	28.750	57.68	.625	57.68	649.18	4.5082	6224.0	196.08	281.31	7.854	414.9																																																																																																																																																																								

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Pipe Size (inches)	Outside Diameter (inches)	Identification			Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
		Steel		<i>A</i> (square feet)										
		Iron Pipe Size	Pipe Schedule					<i>a</i> (square inches)						
32	.	10	.	.312	31.376	31.06	773.19	5.3694	3898.9	105.59	335.05	8.378	243.7	
	STD	.	.	.375	31.250	37.26	766.99	5.3263	4658.5	126.66	332.36	8.378	291.2	
	XS	20	.	.500	31.000	49.48	754.77	5.2414	6138.6	168.21	327.06	8.378	383.7	
	.	30	.	.625	30.750	61.60	742.64	5.1572	7583.4	209.43	321.81	8.378	474.0	
34	32.00	40	.	.688	30.624	67.68	736.57	5.1151	8298.3	230.08	319.18	8.378	518.6	
	.	10	.	.344	33.312	36.37	871.55	6.0524	5150.5	123.65	377.67	8.901	303.0	
	STD	.	.	.375	33.250	39.61	868.31	6.0299	5599.3	134.67	376.27	8.901	329.4	
	XS	20	.	.500	33.000	52.62	855.30	5.9396	7383.5	178.89	370.63	8.901	434.3	
36	.	30	.	.625	32.750	65.53	842.39	5.8499	9127.6	222.78	365.03	8.901	536.9	
	34.00	40	.	.688	32.624	72.00	835.92	5.8050	9991.6	244.77	362.23	8.901	587.7	
	.	10	.	.312	35.376	34.98	982.90	6.8257	5569.5	118.92	425.92	9.425	309.4	
	STD	.	.	.375	35.250	41.97	975.91	6.7771	6658.9	142.68	422.89	9.425	369.9	
42	XS	20	.	.500	35.000	55.76	962.11	6.6813	8786.2	189.57	416.91	9.425	488.1	
	.	30	.	.625	34.750	69.46	948.42	6.5862	10868.4	236.13	417.22	9.425	603.8	
	36.00	40	.	.750	34.500	83.06	934.82	6.4918	12906.1	282.35	405.09	9.425	717.0	
	STD	.	.	.375	41.250	49.08	1336.3	.	10627	167	579.3	10.99	506.1	
42	XS	20	.	.500	41.000	65.18	1320.2	.	14037	222	572.3	10.99	668.4	
	.	30	.	.625	40.720	81.28	1304.1	.	17373	276	565.4	10.99	827.3	
	42.00	40	.	.750	40.500	97.23	1288.2	.	20689	330	558.4	10.99	985.2	

1 in (inch) = 25.4 mm

STD, XS and XXS

To distinguish different weights of pipe, three long standing traditional designations are used: standard wall (Std.), extra strong wall (XS), and double extra strong wall (XXS). These last two designations are sometimes referred to as extra heavy wall (XH), and double extra heavy wall (XXH).

Pipe Size (inches)	Outside Diameter (inches)		Identification		Wall Thickness - <i>t</i> - (inches)	Inside Diameter - <i>d</i> - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - <i>I</i> - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
	Iron Pipe Size	Pipe Schedule	Steel	Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					

The following is for theoretical information only. Users are responsible for determining correct suitability of pipe for the intended application.

Pressure Determinations: Barlow's Formula is commonly used to determine:

1. Internal Pressure at Minimum Yield

2. Ultimate Bursting Pressure

3. Maximum Allowable Working Pressure

4. Mill Hydrostatic Test Pressure

This formula is expressed as $P = 2St$ where: P = Pressure, psig, I = Nominal wall thickness, inches D = Outside Diameter, inches

S = Allowable Stress, psi, which depends on the pressure being determined

To illustrate, assume a piping systems 8 5/8" O.D. x .375" wall has a specified minimum yield strength (SMYS) of 35,000 psi and a specified minimum tensile strength of 80,000 psi.

For 1. Internal Pressure of Minimum Yield

S = SMYS (35,000) psi and

$P = 2St = (2)(35,000)(0.375)$

D 8.625 = 3043 or 3040 psig (rounded to nearest 10 psig)

For 2. Ultimate Bursting Pressure

S = Specified Minimum Tensile Strength (60,000 psi) and

$P = 2St = (2)(60,000)(0.375)$

D 8.625 = 5217 or 5220 psig (rounded to nearest 10 psig)

Pipe Size (inches)	Outside Diameter (inches)		Identification		Wall Thickness - t - (inches)	Inside Diameter - d - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - I - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
	Iron Pipe Size	Steel	Stainless Steel Schedule No.	Pipe Schedule				a (square inches)	A (square feet)					

For 3. Maximum Allowable Working Pressure (MAOP)

$S = SMYS$ (35,000 psi) reduced by a design factor, usually 0.72 and

$$P = 2St = \frac{2}{(35,000 \times 2)}(0.375)$$

$$D \ 8.625 = 2191 \text{ or } 2190 \text{ psig (rounded to nearest 10 psig)}$$

For 4. Mill Hydrostatic Test Pressure

$S = SMYS$ (35,000 psi) reduced by a factor depending on O.D., grade (0.60 for 8 5/8" O.D., grade B) and

$$P = 2St = \frac{2}{(35,000 \times 0.60)}(0.375)$$

$$D \ 8.625 = 1826 \text{ or } 1830 \text{ psig (rounded to nearest 10 psig)}$$

Wall Thickness

Barlow's Formula is also useful in determining the wall thickness required for a piping system. To illustrate, assume a piping system has been designed with the following criteria:

1. A working pressure of 2,000 psi (P)
2. The pipe to be used is 8 5/8" O.D. (D) specified to ASTM A53 grade B (SMYS - 35,000 psi)

Rearranging Barlow's Formula to solve for wall thickness gives:

$$t = \frac{PD}{2S} = \frac{(2,000)(8.625)}{2(35,000)} = 0.246" \text{ wall}$$

$$2S(2)(35,000)$$

pipe is identical; however, the inside diameter of the extra-strong is smaller than the inside diameter of the standard weight because the wall thickness is greater in the extra-strong pipe.

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Pipe Size (inches)	Outside Diameter (inches)		Identification		Wall Thickness - t - (inches)	Inside Diameter - d - (inches)	Area of Metal (square inches)	Transverse Internal Area		Moment of Inertia - I - (inches)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in ³)
	Iron Pipe Size	Pipe Schedule	Steel	Stainless Steel Schedule No.				a (square inches)	A (square feet)					

5. WATER DISCHARGE MEASUREMENTS: To calculate the volume being displaced through a pipe or the amount of volume of an irrigation well, the following formula is applicable:

$$Q = 3.61 A H \% Y$$

Where:

Q = Discharge in Gallons per minutes

A = Area of the pipe, inches squared

H = Horizontal measurement, inches

Y = vertical measurement, inches

Example: Calculate the discharge of a 10" pipe which has an area of 78.50 in², a horizontal measurement of 12" and a vertical measurement of 12".

$$Q = 3.61 A H$$

$\% Y$

$$Q = 3.61 (78.50) (12)$$

$$0.12$$

$$Q = 3400.62$$

$$3.464$$

$$Q = 981.70 \text{ gallons per minute}$$

distance horizontally to the point of the 12" vertical measurement.