



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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>1/8</b>	0.405	.	.	10S	.049	.307	.0548	.0740	.00051	.00088	<b>.19</b>	.032	.106	.00437
		STD	40	40S	.068	.269	.0720	.0568	.00040	.00106	<b>.24</b>	.025	.106	.00523
		XS	80	80S	.095	.215	.0925	.0364	.00025	.00122	<b>.31</b>	.016	.106	.00602
		.	.	.	.	.	.	.	.	.	.	.	.	.
<b>1/4</b>	0.540	.	.	10S	.065	.410	.0970	.1320	.00091	.00279	<b>.33</b>	.057	.141	.01032
		STD	40	40S	.088	.364	.1250	.1041	.00072	.00331	<b>.42</b>	.045	.141	.01227
		XS	80	80S	.119	.302	.1574	.0716	.00050	.00377	<b>.54</b>	.031	.141	.01395
		.	.	.	.	.	.	.	.	.	.	.	.	.
<b>3/8</b>	0.675	.	.	10S	.065	.545	.1246	.2333	.00162	.00586	<b>.42</b>	.101	.178	.01736
		STD	40	40S	.091	.493	.1670	.1910	.00133	.00729	<b>.57</b>	.083	.178	.02160
		XS	80	80S	.126	.423	.2173	.1405	.00098	.00862	<b>.74</b>	.061	.178	.02554
		.	.	.	.	.	.	.	.	.	.	.	.	.
<b>1/2</b>	0.840	.	.	5S	.065	.710	.1583	.3959	.00275	.01197	<b>.54</b>	.172	.220	.02849
		.	.	10S	.083	.674	.1974	.3568	.00248	.01431	<b>.67</b>	.155	.220	.03407
		STD	40	40S	.109	.622	.2503	.3040	.00211	.01709	<b>.85</b>	.132	.220	.04069
		XS	80	80S	.147	.546	.3200	.2340	.00163	.02008	<b>1.09</b>	.102	.220	.04780
		.	160	.	.187	.466	.3836	.1706	.00118	.02212	<b>1.31</b>	.074	.220	.05267
		XXS	.	.	.294	.252	.5043	.050	.00035	.02424	<b>1.71</b>	.022	.220	.05772
<b>3/4</b>	1.050	.	.	5S	.065	.920	.2011	.6648	.00462	.02450	<b>.69</b>	.288	.275	.04667
		.	.	10S	.083	.884	.2521	.6138	.00426	.02969	<b>.86</b>	.266	.275	.05655
		STD	40	40S	.113	.824	.3326	.5330	.00371	.03704	<b>1.13</b>	.231	.275	.07055
		XS	80	80S	.154	.742	.4335	.4330	.00300	.04479	<b>1.47</b>	.188	.275	.08531
		.	160	.	.219	.612	.5698	.2961	.00206	.05269	<b>1.94</b>	.128	.275	.10036
		XXS	.	.	.308	.434	.7180	.148	.00103	.05792	<b>2.44</b>	.064	.275	.11032
<b>1</b>	1.315	.	.	5S	.065	1.185	.2553	1.1029	.00766	.04999	<b>.87</b>	.478	.344	.07603
		.	.	10S	.109	1.097	.4130	.9452	.00656	.07569	<b>1.40</b>	.409	.344	.11512
		STD	40	40S	.133	1.049	.4939	.8640	.00600	.08734	<b>1.68</b>	.375	.344	.1328
		XS	80	80S	.179	.957	.6388	.7190	.00499	.1056	<b>2.17</b>	.312	.344	.1606
		.	160	.	.250	.815	.8365	.5217	.00362	.1251	<b>2.84</b>	.230	.344	.1903
		XXS	.	.	.358	.599	1.0760	.282	.00196	.1405	<b>3.66</b>	.122	.344	.2136
<b>1 1/4</b>	1.660	.	.	5S	.065	1.530	.3257	1.839	.01277	.1038	<b>1.11</b>	.797	.435	.1250
		.	.	10S	.109	1.442	.4717	1.633	.01134	.1605	<b>1.81</b>	.708	.435	.1934
		STD	40	40S	.140	1.380	.6685	1.495	.01040	.1947	<b>2.27</b>	.649	.435	.2346
		XS	80	80S	.191	1.278	.8815	1.283	.00891	.2418	<b>3.00</b>	.555	.435	.2913
		.	160	.	.250	1.160	1.1070	1.057	.00734	.2839	<b>3.76</b>	.458	.435	.3421
		XXS	.	.	.382	.896	1.534	.630	.00438	.3411	<b>5.21</b>	.273	.435	.4110



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		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>1 ½</b>	1.900	.	.	5S	.065	1.770	.3747	2.461	.01709	.1579	<b>1.28</b>	1.066	.497	.1662
		.	.	10S	.109	1.682	.6133	2.222	.01543	.2468	<b>2.09</b>	.963	.497	.2598
		STD	40	40S	.145	1.610	.7995	2.036	.01414	.3099	<b>2.72</b>	.882	.497	.3262
		XS	80	80S	.200	1.500	1.068	1.767	.01225	.3912	<b>3.63</b>	.765	.497	.4118
		.	160	.	.281	1.338	1.429	1.406	.00976	.4824	<b>4.86</b>	.608	.497	.5078
		XXS	.	.	.400	1.100	1.885	.950	.00660	.5678	<b>6.41</b>	.42	.497	.5977
<b>2</b>	2.375	.	.	5S	.065	2.245	.4717	3.958	.02749	.3149	<b>1.61</b>	1.72	.622	.2652
		.	.	10S	.109	2.157	.7760	3.654	.02538	.4992	<b>2.64</b>	1.58	.622	.4204
		STD	40	40S	.154	2.067	1.075	3.355	.02330	.6657	<b>3.65</b>	1.45	.622	.5606
		XS	80	80S	.218	1.939	1.477	2.953	.02050	.8679	<b>5.02</b>	1.28	.622	.7309
		.	160	.	.344	1.687	2.190	2.241	.01556	1.162	<b>7.46</b>	.97	.622	.979
		XXS	.	.	.436	1.503	2.656	1.774	.01232	1.311	<b>9.03</b>	.77	.622	1.104
<b>2 ½</b>	2.875	.	.	5S	.083	2.709	.7280	5.764	.04002	.7100	<b>2.48</b>	2.50	.753	.4939
		.	.	10S	.120	2.635	1.039	5.453	.03787	.9873	<b>3.53</b>	2.36	.753	.6868
		STD	40	40S	.203	2.469	1.704	4.788	.03322	1.530	<b>5.79</b>	2.07	.753	1.064
		XS	80	80S	.276	2.323	2.254	4.238	.02942	1.924	<b>7.66</b>	1.87	.753	1.339
		.	160	.	.375	2.125	2.945	3.546	.02463	2.353	<b>10.01</b>	1.54	.753	1.638
		XXS	.	.	.552	1.771	4.028	2.464	.01710	2.871	<b>13.69</b>	1.07	.753	1.997
<b>3</b>	3.500	.	.	5S	.083	3.334	.8910	8.730	.06063	1.301	<b>3.03</b>	3.78	.916	.7435
		.	.	10S	.120	3.260	1.274	8.347	.05796	1.822	<b>4.33</b>	3.62	.916	1.041
		STD	40	40S	.216	3.068	2.228	7.393	.05130	3.017	<b>7.58</b>	3.20	.916	1.724
		XS	80	80S	.300	2.900	3.016	6.605	.04587	3.894	<b>10.25</b>	2.6	.916	2.225
		.	160	.	.438	2.624	4.205	5.408	.03755	5.032	<b>14.32</b>	2.35	.916	2.876
		XXS	.	.	.600	2.300	5.466	4.155	.02885	5.993	<b>18.58</b>	1.80	.916	3.424
<b>3 ½</b>	4.000	.	.	5S	.083	3.834	1.021	11.545	.08017	1.960	<b>3.48</b>	5.00	1.047	.9799
		.	.	10S	.120	3.760	1.463	11.104	.07711	2.755	<b>4.97</b>	4.81	1.047	1.378
		STD	40	40S	.226	3.548	2.680	9.886	.06870	4.788	<b>9.11</b>	4.29	1.047	2.394
		XS	80	80S	.318	3.364	3.678	8.888	.06170	6.280	<b>12.50</b>	3.84	1.047	3.140
<b>4</b>	4.500	.	.	5S	.083	4.334	1.152	14.75	.10245	2.810	<b>3.92</b>	6.39	1.178	1.249
		.	.	10S	.120	4.260	1.651	14.25	.09898	3.963	<b>5.61</b>	6.18	1.178	1.761
		STD	40	40S	.237	4.026	3.174	12.73	.08840	7.233	<b>10.79</b>	5.50	1.178	3.214
		XS	80	80S	.337	3.826	4.407	11.50	.07986	9.610	<b>14.98</b>	4.98	1.178	4.271
		.	120	.	.438	3.624	5.595	10.31	.0716	11.65	<b>19.0</b>	4.47	1.178	5.178
		.	160	.	.531	3.438	6.621	9.28	.0645	13.27	<b>22.51</b>	4.02	1.178	5.898
XXS	.	.	.674	3.152	8.101	8.101	7.80	.0542	15.28	<b>27.54</b>	3.38	1.178	6.791	



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		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>5</b>	5.563	.	.	5S	.109	5.345	1.868	22.44	.1558	6.947	<b>6.36</b>	9.72	1.456	2.498
		.	.	10S	.134	5.295	2.285	22.02	.1529	8.425	<b>7.77</b>	9.54	1.456	3.029
		STD	40	40S	.258	5.047	4.300	20.01	.1390	15.16	<b>14.62</b>	8.67	1.456	5.451
		XS	80	80S	.375	4.813	6.112	18.19	.1263	20.67	<b>20.78</b>	7.88	1.456	7.431
		.	120	.	.500	4.563	7.953	16.35	.1136	25.73	<b>27.04</b>	7.09	1.456	9.250
		.	160	.	.625	4.313	9.696	14.61	.1015	30.03	<b>32.96</b>	6.33	1.456	10.796
		XXS	.	.	.750	4.063	11.340	12.97	.0901	33.63	<b>38.55</b>	5.61	1.456	12.090
<b>6</b>	6.625	.	.	5S	.109	6.407	2.231	32.24	.2239	11.85	<b>7.60</b>	13.97	1.734	3.576
		.	.	10S	.134	6.357	2.733	31.74	.2204	14.40	<b>9.29</b>	13.75	1.734	4.346
		STD	40	40S	.280	6.065	5.581	28.89	.2006	28.14	<b>18.97</b>	12.51	1.734	8.496
		XS	80	80S	.432	5.761	8.405	26.07	.1810	40.49	<b>28.57</b>	11.29	1.734	12.22
		.	120	.	.562	5.501	10.70	23.77	.1650	49.61	<b>36.39</b>	10.30	1.734	14.98
		.	160	.	.718	5.187	13.32	21.15	.1469	58.97	<b>45.35</b>	9.16	1.734	17.81
		XXS	.	.	.864	4.897	15.64	18.84	.1308	66.33	<b>53.16</b>	8.16	1.734	20.02
<b>8</b>	8.625	.	.	5S	.109	8.407	2.916	55.51	.3855	26.44	<b>9.93</b>	24.06	2.258	6.131
		.	.	10S	.148	8.329	3.941	54.48	.3784	35.41	<b>13.40</b>	23.61	2.258	8.212
		.	20	.	.250	8.125	6.57	51.85	.3601	57.72	<b>22.36</b>	22.47	2.258	13.39
		.	30	.	.277	8.071	7.26	51.16	.3553	63.35	<b>24.70</b>	22.17	2.258	14.69
		STD	40	40S	.322	7.981	8.40	50.03	.3474	72.49	<b>28.55</b>	21.70	2.258	16.81
		.	60	.	.406	7.813	10.48	47.94	.3329	88.73	<b>35.64</b>	20.77	2.258	20.58
		XS	80	80S	.500	7.625	12.76	45.66	.3171	105.7	<b>43.39</b>	19.78	2.258	24.51
		.	100	.	.594	7.437	14.96	43.46	.3018	121.3	<b>50.95</b>	18.83	2.258	28.14
		.	120	.	.719	7.187	17.84	40.59	.2819	140.5	<b>60.71</b>	17.59	2.258	32.58
		.	140	.	.812	7.001	19.93	38.50	.2673	153.7	<b>67.76</b>	16.68	2.258	35.65
		XXS	.	.	.875	6.875	21.30	37.12	.2578	162.0	<b>72.42</b>	16.10	2.258	37.56
		.	160	.	.906	6.813	21.97	36.46	.2532	165.9	<b>74.69</b>	15.80	2.258	38.48



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		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>10</b>	10.750	.	.	5S	.134	10.482	4.36	86.29	.5992	63.0	<b>15.19</b>	37.39	2.814	11.71
		.	.	10S	.165	10.420	5.49	85.28	.5922	76.9	<b>18.65</b>	36.95	2.814	14.30
		.	20	.	.250	10.250	8.24	82.52	.5731	113.7	<b>28.04</b>	35.76	2.814	21.15
		.	30	.	.307	10.136	10.07	80.69	.5603	137.4	<b>34.24</b>	34.96	2.814	25.57
		STD	40	40S	.365	10.020	11.90	78.86	.5475	160.7	<b>40.48</b>	34.20	2.814	29.90
		XS	60	80S	.500	9.750	16.10	74.66	.5185	212.0	<b>54.74</b>	32.35	2.814	39.43
		.	80	.	.594	9.562	18.92	71.84	.4989	244.8	<b>64.43</b>	31.13	2.814	45.54
		.	100	.	.719	9.312	22.63	68.13	.4732	286.1	<b>77.03</b>	29.53	2.814	53.22
		.	120	.	.844	9.062	26.24	64.53	.4481	324.2	<b>89.29</b>	27.96	2.814	60.32
		.	140	.	1.000	8.750	30.63	60.13	.4176	367.8	<b>104.13</b>	26.06	2.814	68.43
		.	160	.	1.125	8.500	34.02	56.75	.3941	399.3	<b>115.64</b>	24.59	2.814	74.29
<b>12</b>	12.75	.	.	5S	.156	12.438	6.17	121.50	.8438	122.4	<b>20.98</b>	52.65	3.338	19.2
		.	.	10S	.180	12.390	7.11	120.57	.8373	140.4	<b>24.17</b>	52.25	3.338	22.0
		.	20	.	.250	12.250	9.82	117.86	.8185	191.8	<b>33.38</b>	51.07	3.338	30.2
		.	30	.	.330	12.090	12.87	114.80	.7972	248.4	<b>43.77</b>	49.74	3.338	39.0
		STD	.	40S	.375	12.000	14.58	113.10	.7854	279.3	<b>49.56</b>	49.00	3.338	43.8
		.	40	.	.406	11.938	15.77	111.93	.7773	300.3	<b>53.52</b>	48.50	3.338	47.1
		XS	.	80S	.500	11.750	19.24	108.43	.7528	361.5	<b>65.42</b>	46.92	3.338	56.7
		.	60	.	.562	11.626	21.52	106.16	.7372	400.4	<b>73.15</b>	46.00	3.338	62.8
		.	80	.	.688	11.374	26.03	101.64	.7058	475.1	<b>88.63</b>	44.04	3.338	74.6
		.	100	.	.844	11.062	31.53	96.14	.6677	561.6	<b>107.32</b>	41.66	3.338	88.1
		.	120	.	1.000	10.750	36.91	90.76	.6303	641.6	<b>125.49</b>	39.33	3.338	100.7
.	140	.	1.125	10.500	41.08	86.59	.6013	700.5	<b>139.67</b>	37.52	3.338	109.9		
.	160	.	1.312	10.126	47.14	80.53	.5592	781.1	<b>160.27</b>	34.89	3.338	122.6		



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		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>14</b>	14.00	.	.	5S	.156	13.688	6.78	147.15	1.0219	162.6	<b>23.07</b>	63.77	3.665	23.2
		.	.	10S	.188	13.624	8.16	145.78	1.0124	194.6	<b>27.73</b>	63.17	3.665	27.8
		.	10	.	.250	13.500	10.80	143.14	.9940	255.3	<b>36.71</b>	62.03	3.665	36.6
		.	20	.	.312	13.376	13.42	140.52	.9758	314.4	<b>45.61</b>	60.89	3.665	45.0
		STD	30	.	.375	13.250	16.05	137.88	.9575	372.8	<b>54.57</b>	59.75	3.665	53.2
		.	40	.	.438	13.124	18.66	135.28	.9394	429.1	<b>63.44</b>	58.64	3.665	61.3
		XS	.	.	.500	13.000	21.21	132.73	.9217	483.8	<b>72.09</b>	57.46	3.665	69.1
		.	60	.	.594	12.812	24.98	128.96	.8956	562.3	<b>85.05</b>	55.86	3.665	80.3
		.	80	.	.750	12.500	31.22	122.72	.8522	678.3	<b>106.13</b>	53.18	3.665	98.2
		.	100	.	.938	12.124	38.45	115.49	.8020	824.4	<b>130.85</b>	50.04	3.665	117.8
		.	120	.	1.094	11.812	44.32	109.62	.7612	929.6	<b>150.79</b>	47.45	3.665	132.8
		.	140	.	1.250	11.500	50.07	103.87	.7213	1027.0	<b>170.28</b>	45.01	3.665	146.8
		.	160	.	1.406	11.188	55.63	98.31	.6827	1117.0	<b>189.11</b>	42.60	3.665	159.6
<b>16</b>	16.00	.	.	5S	.165	15.670	8.21	192.85	1.3393	257.3	<b>27.90</b>	83.57	4.189	32.2
		.	.	10S	.188	15.624	9.34	191.72	1.3314	291.9	<b>31.75</b>	83.08	4.189	36.5
		.	10	.	.250	15.500	12.37	188.69	1.3103	383.7	<b>42.05</b>	81.74	4.189	48.0
		.	20	.	.312	15.376	15.38	185.69	1.2895	473.2	<b>52.27</b>	80.50	4.189	59.2
		STD	30	.	.375	15.250	18.41	182.65	1.2684	562.1	<b>62.58</b>	79.12	4.189	70.3
		XS	40	.	.500	15.000	24.35	176.72	1.2272	731.9	<b>82.77</b>	76.58	4.189	91.5
		.	60	.	.656	14.688	31.62	169.44	1.1766	932.4	<b>107.50</b>	73.42	4.189	116.6
		.	80	.	.844	14.312	40.14	160.92	1.175	1155.8	<b>136.61</b>	69.73	4.189	144.5
		.	100	.	1.031	13.938	48.48	152.58	1.0596	1364.5	<b>164.82</b>	66.12	4.189	170.5
		.	120	.	1.219	13.562	56.56	144.50	1.0035	1555.8	<b>192.43</b>	62.62	4.189	194.5
		.	140	.	1.438	13.124	65.78	135.28	.9394	1760.3	<b>223.64</b>	58.64	4.189	220.0
		.	160	.	1.594	12.812	72.10	128.96	.8956	1893.5	<b>245.25</b>	55.83	4.189	236.7



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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>18</b>	18.00	.	.	5S	.165	17.670	9.25	245.22	1.7029	367.6	<b>31.43</b>	106.26	4.712	40.8
		.	.	10S	.188	17.624	10.52	243.95	1.6941	417.3	<b>35.76</b>	105.71	4.712	46.4
		.	10	.	.250	17.500	13.94	240.53	1.6703	549.1	<b>47.39</b>	104.21	4.712	61.1
		.	20	.	.312	17.376	17.34	237.13	1.6467	678.2	<b>58.94</b>	102.77	4.712	75.5
		STD	.	.	.375	17.250	20.76	233.71	1.6230	806.7	<b>70.59</b>	101.18	4.712	89.6
		.	30	.	.438	17.124	24.17	230.30	1.5990	930.3	<b>82.15</b>	99.84	4.712	103.4
		XS	.	.	.500	17.000	27.49	226.98	1.5763	1053.2	<b>93.45</b>	98.27	4.712	117.0
		.	40	.	.562	16.876	30.79	223.68	1.5533	1171.5	<b>104.67</b>	96.93	4.712	130.1
		.	60	.	.750	16.500	40.64	213.83	1.4849	1514.7	<b>138.17</b>	92.57	4.712	168.3
		.	80	.	.938	16.124	50.23	204.24	1.4183	1833.0	<b>170.92</b>	88.50	4.712	203.8
		.	100	.	1.156	15.688	61.17	193.30	1.3423	2180.0	<b>207.96</b>	83.76	4.712	242.3
		.	120	.	1.375	15.250	71.81	182.66	1.2684	2498.1	<b>244.14</b>	79.07	4.712	277.6
		.	140	.	1.562	14.876	80.66	173.80	1.2070	2749.0	<b>274.22</b>	75.32	4.712	305.5
.	160	.	1.781	14.438	90.75	163.72	1.1369	3020.0	<b>308.50</b>	70.88	4.712	335.6		
<b>20</b>	20.00	.	.	5S	.188	19.624	11.70	302.46	2.1004	574.2	<b>39.78</b>	131.06	5.236	57.4
		.	.	10S	.218	19.564	13.55	300.61	2.0876	662.8	<b>46.06</b>	130.27	5.236	66.3
		.	10	.	.250	19.500	15.51	298.65	2.0740	765.4	<b>52.73</b>	129.42	5.236	75.6
		STD	20	.	.375	19.250	23.12	290.04	2.0142	1113.0	<b>78.60</b>	125.67	5.236	111.3
		XS	30	.	.500	19.000	30.63	283.53	1.9690	1457.0	<b>104.13</b>	122.87	5.236	145.7
		.	40	.	.594	18.812	36.15	278.00	1.9305	1703.0	<b>123.11</b>	120.46	5.236	170.4
		.	60	.	.812	18.376	48.95	265.21	1.8417	2257.0	<b>166.40</b>	114.92	5.236	225.7
		.	80	.	1.031	17.938	61.44	252.72	1.7550	2772.0	<b>208.87</b>	109.51	5.236	277.1
		.	100	.	1.281	17.438	75.33	238.83	1.6585	3315.2	<b>256.10</b>	103.39	5.236	331.5
		.	120	.	1.500	17.000	87.18	226.98	1.5762	3754.0	<b>296.37</b>	98.35	5.236	375.5
		.	140	.	1.750	16.500	100.33	213.82	1.4849	4216.0	<b>341.09</b>	92.66	5.236	421.7
		.	160	.	1.969	16.062	111.49	202.67	1.4074	4585.5	<b>379.17</b>	87.74	5.236	458.5



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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>22</b>	22.00	.	.	5S	.188	21.624	12.88	367.25	2.5503	766.2	<b>43.80</b>	159.14	5.760	69.7
		.	.	10S	.218	21.564	14.92	365.21	2.5362	884.8	<b>50.71</b>	158.26	5.760	80.4
		.	10	.	.250	21.500	17.08	363.05	2.5212	1010.3	<b>58.07</b>	157.32	5.760	91.8
		STD	20	.	.375	21.250	25.48	354.66	2.4629	1489.7	<b>86.61</b>	153.68	5.760	135.4
		XS	30	.	.500	21.000	33.77	346.36	2.4053	1952.5	<b>114.81</b>	150.09	5.760	117.5
		.	60	.	.875	20.250	58.07	322.06	2.2365	3244.9	<b>197.41</b>	139.56	5.760	295.0
		.	80	.	1.125	19.75	73.78	306.35	2.1275	4030.4	<b>250.81</b>	132.76	5.760	366.4
		.	100	.	1.375	19.25	89.09	291.04	2.0211	4758.5	<b>302.88</b>	126.12	5.760	432.6
		.	120	.	1.625	18.75	104.02	276.12	1.9175	5432.0	<b>353.61</b>	119.65	5.760	493.8
		.	140	.	1.875	18.25	118.55	261.59	1.8166	6053.7	<b>403.00</b>	113.36	5.760	550.3
.	160	.	2.125	17.75	132.68	247.45	1.71840	6626.4	<b>451.06</b>	107.23	5.760	602.4		
<b>24</b>	24.00	.	.	5S	.218	23.564	16.29	436.10	3.0285	1151.6	<b>55.37</b>	188.98	6.283	96.0
		.	10	10S	.250	23.500	18.65	433.74	3.0121	1315.4	<b>63.41</b>	187.95	6.283	109.6
		STD	20	.	.375	23.250	27.83	424.56	2.9483	1942.0	<b>94.62</b>	183.95	6.283	161.9
		XS	.	.	.500	23.000	36.91	415.48	2.8853	2549.5	<b>125.49</b>	179.87	6.283	212.5
		.	30	.	.562	22.876	41.39	411.00	2.8542	2843.0	<b>140.68</b>	178.09	6.283	237.0
		.	40	.	.688	22.624	50.31	402.07	2.7921	3421.3	<b>171.29</b>	174.23	6.283	285.1
		.	60	.	.969	22.062	70.04	382.35	2.6552	4652.8	<b>238.35</b>	165.52	6.283	387.7
		.	80	.	1.219	21.562	87.17	365.22	2.5362	5672.0	<b>296.58</b>	158.26	6.283	472.8
		.	100	.	1.531	20.938	108.07	344.32	2.3911	6849.9	<b>367.39</b>	149.06	6.283	570.8
		.	120	.	1.812	20.376	126.31	326.08	2.2645	7825.0	<b>429.39</b>	141.17	6.283	652.1
.	140	.	2.062	19.876	142.11	310.28	2.1547	8625.0	<b>483.12</b>	134.45	6.283	718.9		
.	160	.	2.344	19.312	159.41	292.98	2.0346	9455.9	<b>542.13</b>	126.84	6.283	787.9		
<b>26</b>	26.00	.	10	.	.312	25.376	25.18	505.75	3.5122	2077.2	<b>85.60</b>	219.16	6.806	159.8
		STD	.	.	.375	25.250	30.19	500.74	3.4774	2478.4	<b>102.63</b>	216.99	6.806	190.6
		XS	20	.	.500	25.000	40.06	490.87	3.4088	3257.0	<b>136.17</b>	212.71	6.806	250.5
<b>28</b>	28.00	.	10	.	.312	27.376	27.14	588.61	4.0876	2601.0	<b>92.26</b>	255.07	7.330	185.8
		STD	.	.	.375	27.250	32.54	583.21	4.0501	3105.1	<b>110.64</b>	252.73	7.330	221.8
		XS	20	.	.500	27.000	43.20	572.56	3.9761	4084.8	<b>146.85</b>	248.11	7.330	291.8
		.	30	.	.625	26.750	53.75	562.00	3.9028	5037.7	<b>182.73</b>	243.53	7.330	359.8
<b>30</b>	30.00	.	.	5S	.250	29.500	23.37	683.49	4.7465	2585.2	<b>79.43</b>	296.18	7.854	172.3
		.	10	10S	.312	29.376	29.10	677.76	4.7067	3206.3	<b>98.93</b>	293.70	7.854	213.8
		STD	.	.	.375	29.250	34.90	671.96	4.6664	3829.4	<b>118.65</b>	291.18	7.854	255.3
		XS	20	.	.500	29.000	46.34	660.52	4.5869	5042.2	<b>157.53</b>	286.22	7.854	336.1
		.	30	.	.625	28.750	57.68	649.18	4.5082	6224.0	<b>196.08</b>	281.31	7.854	414.9



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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											
<b>32</b>	32.00	.	10	.	.312	31.376	31.06	773.19	5.3694	3898.9	<b>105.59</b>	335.05	8.378	243.7
		STD	.	.	.375	31.250	37.26	766.99	5.3263	4658.5	<b>126.66</b>	332.36	8.378	291.2
		XS	20	.	.500	31.000	49.48	754.77	5.2414	6138.6	<b>168.21</b>	327.06	8.378	383.7
		.	30	.	.625	30.750	61.60	742.64	5.1572	7583.4	<b>209.43</b>	321.81	8.378	474.0
		.	40	.	.688	30.624	67.68	736.57	5.1151	8298.3	<b>230.08</b>	319.18	8.378	518.6
<b>34</b>	34.00	.	10	.	.344	33.312	36.37	871.55	6.0524	5150.5	<b>123.65</b>	377.67	8.901	303.0
		STD	.	.	.375	33.250	39.61	868.31	6.0299	5599.3	<b>134.67</b>	376.27	8.901	329.4
		XS	20	.	.500	33.000	52.62	855.30	5.9396	7383.5	<b>178.89</b>	370.63	8.901	434.3
		.	30	.	.625	32.750	65.53	842.39	5.8499	9127.6	<b>222.78</b>	365.03	8.901	536.9
		.	40	.	.688	32.624	72.00	835.92	5.8050	9991.6	<b>244.77</b>	362.23	8.901	587.7
<b>36</b>	36.00	.	10	.	.312	35.376	34.98	982.90	6.8257	5569.5	<b>118.92</b>	425.92	9.425	309.4
		STD	.	.	.375	35.250	41.97	975.91	6.7771	6658.9	<b>142.68</b>	422.89	9.425	369.9
		XS	20	.	.500	35.000	55.76	962.11	6.6813	8786.2	<b>189.57</b>	416.91	9.425	488.1
		.	30	.	.625	34.750	69.46	948.42	6.5862	10868.4	<b>236.13</b>	417.22	9.425	603.8
		.	40	.	.750	34.500	83.06	934.82	6.4918	12906.1	<b>282.35</b>	405.09	9.425	717.0
<b>42</b>	42.00	STD	.	.	.375	41.250	49.08	1336.3	.	10627	<b>167</b>	579.3	10.99	506.1
		XS	20	.	.500	41.000	65.18	1320.2	.	14037	<b>222</b>	572.3	10.99	668.4
		.	30	.	.625	40.720	81.28	1304.1	.	17373	<b>276</b>	565.4	10.99	827.3
		.	40	.	.750	40.500	97.23	1288.2	.	20689	<b>330</b>	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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											

**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

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

$$D 8.625 = 3043 \text{ or } 3040 \text{ psig (rounded to nearest 10 psig)}$$

For 2. **Ultimate Bursting Pressure**

S = Specified Minimum Tensile Strength (80,000 psi) and

$$P = 2St = (2)(80,000)(0.375)$$

$$D 8.625 = 5217 \text{ or } 5220 \text{ psig (rounded to nearest 10 psig)}$$



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 <sup>3</sup> )
		Steel		Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule											

**For 3. Maximum Allowable Working Pressure (MAOP)**

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

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

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

**For 4. Mill Hydrostatic Test Pressure**

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

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

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

**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:

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

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

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.



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 <sup>3</sup> )
		Steel	Stainless Steel Schedule No.				<i>a</i> (square inches)	<i>A</i> (square feet)					
		Iron Pipe Size	Pipe Schedule										

**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 in<sup>2</sup>, 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.