

NORMA PARA DETERMINAR EL PESO ESPECIFICO DE LA LAMINA Y PLACA

UN PIE

PLACA DE ACERO

PESOS POR PLACA EN KILOGRAMOS

MEDIDAS		1"	7/8"	3/4"	5/8"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"
PIES	METROS	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.
3x6	0.914 x 1.83	333	291	250	208	167	146	125	104	83	62
3x8	0.914 x 2.44	444	389	333	278	222	194	167	139	111	83
3x10	0.914 x 3.05	555	486	416	347	278	243	208	173	139	104
4x8	1.22 x 2.44	592	518	444	370	296	259	222	185	148	111
4x10	1.22 x 3.05	740	648	555	463	370	323	278	231	185	139
4x12	1.22 x 3.66	888	777	666	555	444	388	333	278	222	167
5x10	1.52 x 3.05	925	810	694	578	463	404	347	289	231	174
5x15	1.52 x 4.57	1388	1214	1041	867	867	606	520	434	347	260
5x20	1.52 x 6.10	1850	1619	1388	1157	925	809	694	578	463	347
6x12	1.83 x 3.66	1332	1166	999	833	666	582	500	416	333	
6x18	1.83 x 5.49	1996	1749	1499	1249	999	873	749	625	500	
6x20	1.83 x 6.10	2220	1943	1665	1388	1110	970	831	694	555	
KILOS POR METRO ²		199.18	174.38	149.38	124.49	99.59	87.05	74.69	62.24	49.79	37.35
KILOS POR PIE ²		18.504	16.191	13.878	11.565	9.252	8.09	6.939	5.783	4.626	3.470

ACEROS NACIONALES

NORMA PARA DETERMINAR HASTA QUE ESPESOR SE CONSIDERA COMO LAMINA

EL MATERIAL PESA 10 LIBRAS POR PIE CUADRADO Y POR PULGADA DE ESPESOR

MEDIDAS		1"	7/8"	3/4"	5/8"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"
PIES	METROS	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.
3x6	0.914 x 1.83	333	291	250	208	167	146	125	104	83	62
3x8	0.914 x 2.44	444	389	333	278	222	194	167	139	111	83
3x10	0.914 x 3.05	555	486	416	347	278	243	208	173	139	104
4x8	1.22 x 2.44	592	518	444	370	296	259	222	185	148	111
4x10	1.22 x 3.05	740	648	555	463	370	323	278	231	185	139
4x12	1.22 x 3.66	888	777	666	555	444	388	333	278	222	167
5x10	1.52 x 3.05	925	810	694	578	463	404	347	289	231	174
5x15	1.52 x 4.57	1388	1214	1041	867	867	606	520	434	347	260
5x20	1.52 x 6.10	1850	1619	1388	1157	925	809	694	578	463	347
6x12	1.83 x 3.66	1332	1166	999	833	666	582	500	416	333	
6x18	1.83 x 5.49	1996	1749	1499	1249	999	873	749	625	500	
6x20	1.83 x 6.10	2220	1943	1665	1388	1110	970	831	694	555	
KILOS POR METRO ²		199.18	174.38	149.38	124.49	99.59	87.05	74.69	62.24	49.79	37.35
KILOS POR PIE ²		18.504	16.191	13.878	11.565	9.252	8.09	6.939	5.783	4.626	3.470

TUBERIAS

MEDIDAS		1"	7/8"	3/4"	5/8"	1/2"	7/16"	3/8"	5/16"	1/4"	3/16"
PIES	METROS	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.
3x6	0.914 x 1.83	333	291	250	208	167	146	125	104	83	62
3x8	0.914 x 2.44	444	389	333	278	222	194	167	139	111	83
3x10	0.914 x 3.05	555	486	416	347	278	243	208	173	139	104
4x8	1.22 x 2.44	592	518	444	370	296	259	222	185	148	111
4x10	1.22 x 3.05	740	648	555	463	370	323	278	231	185	139
4x12	1.22 x 3.66	888	777	666	555	444	388	333	278	222	167
5x10	1.52 x 3.05	925	810	694	578	463	404	347	289	231	174
5x15	1.52 x 4.57	1388	1214	1041	867	867	606	520	434	347	260
5x20	1.52 x 6.10	1850	1619	1388	1157	925	809	694	578	463	347
6x12	1.83 x 3.66	1332	1166	999	833	666	582	500	416	333	
6x18	1.83 x 5.49	1996	1749	1499	1249	999	873	749	625	500	
6x20	1.83 x 6.10	2220	1943	1665	1388	1110	970	831	694	555	
KILOS POR METRO ²		199.18	174.38	149.38	124.49	99.59	87.05	74.69	62.24	49.79	37.35
KILOS POR PIE ²		18.504	16.191	13.878	11.565	9.252	8.09	6.939	5.783	4.626	3.470

(Continúa en la página 82)

Table 3. Propiedades físicas del tubo*
(Grinnell Co., Inc.)

Tamaño nominal del tubo y D.E. en pulg	Número de cédula†			Espesor de la pared, pulg	D.I., pulg	Área interior, pulg²	Área del metal, pulg²	Superficie exterior, pie²/pie	Superficie interior, pie²/pie	Peso, lb/pie	Peso de agua, lb/pie	Momento de inercia, pulg⁴	Módulo de sección, pulg³	Radio de giro, pulg
	•	•	•											
3/8 0.406	••	••••	••	0.049	0.307	0.0740	0.0348	0.106	0.0804	0.186	0.0321	0.00088	0.00437	0.1271
	40	Std	40S	0.068	0.269	0.0568	0.0720	0.106	0.0705	0.245	0.0246	0.00106	0.00525	0.1215
	80	XB	80S	0.095	0.215	0.0364	0.0925	0.106	0.0563	0.315	0.0157	0.00122	0.00600	0.1146
3/4 0.640	••	••••	••	0.065	0.410	0.1320	0.0970	0.141	0.1073	0.330	0.0572	0.00279	0.01032	0.1694
	40	Std	40S	0.088	0.364	0.1041	0.1250	0.141	0.0955	0.425	0.0451	0.00331	0.01230	0.1628
	80	XB	80S	0.119	0.302	0.0716	0.1574	0.141	0.0794	0.535	0.0310	0.00378	0.01395	0.1547
3/4 0.676	••	••••	••	0.065	0.545	0.2333	0.1246	0.177	0.1427	0.423	0.1011	0.00586	0.01737	0.2169
	40	Std	40S	0.091	0.493	0.1910	0.1670	0.177	0.1295	0.568	0.0827	0.00730	0.02160	0.2090
	80	XB	80S	0.126	0.423	0.1405	0.2173	0.177	0.1106	0.739	0.0609	0.00862	0.02554	0.1991
3/4 0.840	••	••••	••	0.083	0.674	0.357	0.1974	0.220	0.1765	0.671	0.1547	0.01431	0.0341	0.2692
	40	Std	40S	0.109	0.622	0.304	0.2503	0.220	0.1628	0.851	0.1316	0.01710	0.0407	0.2613
	80	XB	80S	0.147	0.546	0.2340	0.320	0.220	0.1433	1.088	0.1013	0.02010	0.0478	0.2505
1 1.060	••	••••	••	0.187	0.466	0.1706	0.383	0.220	0.1220	1.304	0.0740	0.02213	0.0527	0.2402
	40	Std	40S	0.294	0.252	0.0499	0.504	0.220	0.0660	1.714	0.0216	0.02425	0.0577	0.2192
	80	XB	80S	0.308	0.434	0.1479	0.718	0.220	0.0660	2.441	0.0641	0.0579	0.1104	0.284
1 1.316	••	••••	••	0.065	0.920	0.665	0.2011	0.275	0.2409	0.684	0.2882	0.02451	0.0467	0.349
	40	Std	40S	0.083	0.884	0.614	0.2521	0.275	0.2314	0.857	0.2661	0.02970	0.0566	0.343
	80	XB	80S	0.113	0.824	0.533	0.333	0.275	0.2157	1.131	0.2301	0.0370	0.0706	0.334
1 1.516	••	••••	••	0.154	0.742	0.432	0.494	0.275	0.1943	1.474	0.1875	0.0448	0.0853	0.321
	40	Std	40S	0.218	0.614	0.2961	0.570	0.275	0.1607	1.937	0.1284	0.0527	0.1004	0.304
	80	XB	80S	0.358	0.599	0.2818	0.718	0.275	0.1137	2.441	0.0641	0.0579	0.1104	0.284
1 1/4 1.660	••	••••	••	0.065	1.185	1.103	0.2553	0.344	0.310	0.868	0.478	0.0500	0.0760	0.443
	40	Std	40S	0.109	1.097	0.945	0.413	0.344	0.2872	1.404	0.409	0.0757	0.1151	0.428
	80	XB	80S	0.140	1.049	0.864	0.494	0.344	0.2746	1.679	0.374	0.0874	0.1329	0.421
1 1/4 1.900	••	••••	••	0.250	0.957	0.719	0.639	0.344	0.2520	2.172	0.311	0.1056	0.1606	0.407
	40	Std	40S	0.358	0.815	0.522	0.836	0.344	0.2134	2.844	0.2261	0.1252	0.1903	0.387
	80	XB	80S	0.400	0.599	0.2818	1.076	0.344	0.1570	3.659	0.1221	0.1405	0.2137	0.361
1 1/2 2.000	••	••••	••	0.065	1.530	1.839	0.326	0.434	0.401	1.107	0.797	0.1038	0.1250	0.564
	40	Std	40S	0.109	1.442	1.633	0.531	0.434	0.378	1.805	0.707	0.1605	0.1934	0.550
	80	XB	80S	0.140	1.380	1.496	0.669	0.434	0.361	2.273	0.648	0.1948	0.2346	0.540
1 1/2 2.376	••	••••	••	0.250	1.160	1.057	1.107	0.434	0.304	3.765	0.458	0.2839	0.342	0.506
	40	Std	40S	0.382	0.896	0.631	1.534	0.434	0.2346	5.214	0.2732	0.341	0.411	0.472
	80	XB	80S	0.400	0.896	0.631	1.534	0.434	0.2346	5.214	0.2732	0.341	0.411	0.472
2 2.376	••	••••	••	0.065	1.770	2.461	0.375	0.497	0.463	1.274	1.067	0.1580	0.1663	0.649
	40	Std	40S	0.109	1.682	2.222	0.613	0.497	0.440	2.085	0.882	0.2469	0.326	0.634
	80	XB	80S	0.145	1.610	2.036	0.799	0.497	0.421	2.718	0.882	0.310	0.412	0.605
2 2.876	••	••••	••	0.218	1.500	1.767	1.068	0.497	0.393	3.631	0.765	0.483	0.508	0.581
	40	Std	40S	0.343	1.338	1.406	1.429	0.497	0.350	4.859	0.608	0.568	0.598	0.549
	80	XB	80S	0.436	1.100	0.950	1.885	0.497	0.288	6.408	0.412	0.568	0.598	0.549
2 3.376	••	••••	••	0.065	2.245	3.96	0.472	0.622	0.588	1.604	1.716	0.315	0.2652	0.817
	40	Std	40S	0.109	2.157	3.65	0.776	0.622	0.565	2.638	1.582	0.499	0.420	0.802
	80	XB	80S	0.154	2.067	3.36	1.075	0.622	0.541	3.653	1.455	0.666	0.561	0.787
2 3.876	••	••••	••	0.218	1.939	2.953	1.477	0.622	0.508	5.022	1.280	0.868	0.731	0.766
	40	Std	40S	0.343	1.689	2.240	2.190	0.622	0.442	7.444	0.971	1.163	0.979	0.729
	80	XB	80S	0.436	1.503	1.774	2.656	0.622	0.393	9.029	0.769	1.312	1.104	0.703
2 4.376	••	••••	••	0.083	2.709	5.76	0.728	0.753	0.709	2.475	2.499	0.710	0.494	0.988
	40	Std	40S	0.120	2.635	5.45	1.039	0.753	0.690	3.531	2.361	0.988	0.687	0.975
	80	XB	80S	0.203	2.469	4.79	1.704	0.753	0.646	5.793	2.076	1.530	1.064	0.947
3 4.876	••	••••	••	0.276	2.323	4.24	2.254	0.753	0.608	7.661	1.837	1.925	1.339	0.924
	40	Std	40S	0.375	2.125	3.55	2.945	0.753	0.556	10.01	1.535	2.353	1.637	0.894
	80	XB	80S	0.552	1.771	2.464	4.03	0.753	0.464	13.70	1.067	2.872	1.998	0.844
3 5.600	••	••••	••	0.083	3.334	8.73	0.891	0.916	0.873	3.03	3.78	1.301	0.744	1.208
	40	Std	40S	0.120	3.260	8.35	1.274	0.916	0.853	4.33	3.61	1.822	1.041	1.196
	80	XB	80S	0.216	3.068	7.39	2.228	0.916	0.803	7.58	3.20	3.02	1.724	1.164
3 6.600	••	••••	••	0.300	2.900	6.61	3.02	0.916	0.759	10.25	2.864	3.90	2.226	1.136
	40	Std	40S	0.437	2.626	5.42	4.21	0.916	0.687	14.32	2.348	5.03	2.876	1.094
	80	XB	80S	0.600	2.300	4.15	5.47	0.916	0.602	18.58	1.801	5.99	3.43	1.047
3 1/4 7.600	••	••••	••	0.083	3.834	11.55	1.021	1.047	1.004	3.47	5.01	1.960	0.980	1.363
	40	Std	40S	0.120	3.760	11.10	1.463	1.047	0.984	4.97	4.81	2.756	1.378	1.372
	80	XB	80S	0.226	3.548	9.89	2.680	1.047	0.929	9.11	4.28	4.79	2.394	1.337
3 1/4 8.600	••	••••	••	0.318	3.364	8.89	3.68	1.047	0.881	12.51	3.85	6.28	3.14	1.307
	40	Std	40S	0.437	3.068	7.39	2.228	1.047	0.803	14.32	2.348	5.03	2.876	1.094
	80	XB	80S	0.600	2.300	4.15	5.47	1.047	0.602	18.58	1.801	5.99	3.43	1.047
4 9.600	••	••••	••	0.083	4.334	14.75	1.152	1.178	1.135	3.92	6.40	2.811	1.249	1.562
	40	Std	40S	0.120	4.260	14.25	1.651	1.178	1.115	5.61	6.17	3.96	1.762	1.549
	80	XB	80S	0.237	4.026	12.73	3.17	1.178	1.054	10.79	5.51	7.23	3.21	1.510
4 11.600	••	••••	••	0.337	3.826	11.50	4.41	1.178	1.002	14.98	4.98	9.61	4.27	1.477
	40	Std	40S	0.437	3.626	10.33	5.58	1.178	0.949	18.96	4.48	11.65	5.18	1.445
	80	XB	80S	0.531	3.438	9.28	6.62	1.178	0.900	22.51	4.02	13.27	5.90	1.416
4 13.600	••	••••	••	0.674	3.152	7.80	8.10	1.178	0.825	27.54	3.38	15.29	6.79	1.374

Tamaño nominal del tubo y D.E. en pulg	Número de cédula†			Espesor de la pared, pulg	D.I., pulg	Área interior, pulg²	Área del metal, pulg²	Superficie exterior, pie²/pie	Superficie interior, pie²/pie	Peso, lb/pie	Peso de agua, lb/pie	Momento de inercia, pulg⁴	Módulo de sección, pulg³	Radio de giro, pulg
	•	•	•											
1 1/4 1.000	••	••••	••	0.250	1.160	1.057	1.107	0.434	0.304	3.765	0.458	0.2839	0.342	0.506
	40	Std	40S	0.382	0.896	0.631	1.534	0.434	0.2346	5.214	0.2732	0.341	0.411	0.472
	80	XB	80S	0.400	0.896	0.631	1.534	0.434	0.2346	5.214				

Tabla 3. Propiedades físicas del tubo* (continuación)

Tamaño nominal del tubo y D.E. en pulg	Número de cédula†		Espesor de la pared, pulg	D.I., pulg	Área interior, pulg²	Área del metal, pulg²	Superficie exterior, pie²/pie	Superficie interior, pie²/pie	Peso, lb/pie	Peso de agua, lb/pie	Momento de inercia, pulg⁴	Módulo de sección, pulg³	Radio de giro, pulg
	a	b											
5 6.625	...	...	0.109	5.345	22.44	1.868	1.456	1.399	6.35	9.73	6.95	2.498	1.929
	40	Std	0.134	5.295	22.02	2.285	1.456	1.386	7.77	9.53	8.43	3.03	1.920
	80	XS	0.375	4.813	20.01	4.30	1.456	1.321	14.62	8.66	15.17	5.45	1.878
	120	...	0.500	4.563	16.35	7.95	1.456	1.260	20.78	7.89	20.68	7.43	1.839
	160	XXS	0.625	4.313	14.61	9.70	1.456	1.195	27.04	7.09	25.74	9.25	1.799
6 6.625	...	...	0.750	4.063	12.97	11.34	1.456	1.064	38.55	5.62	33.6	12.10	1.760
	40	Std	0.109	6.407	32.2	2.231	1.734	1.677	5.37	13.98	11.85	3.58	2.304
	80	XS	0.134	6.357	31.7	2.733	1.734	1.664	9.29	13.74	14.40	4.35	2.295
	120	...	0.375	6.065	28.89	5.58	1.734	1.588	18.97	12.51	28.14	8.50	2.245
	160	XXS	0.625	5.819	21.15	13.33	1.734	1.508	28.57	11.29	40.5	12.23	2.195
8 8.625	...	...	0.864	4.897	18.83	15.64	1.734	1.282	53.16	8.17	66.3	20.03	2.153
	40	Std	0.109	8.407	55.5	2.916	2.258	2.201	9.91	24.07	26.45	6.13	3.01
	80	XS	0.148	8.329	54.5	3.94	2.258	2.180	13.40	23.59	35.4	8.21	3.00
	120	...	0.250	8.125	51.8	6.58	2.258	2.127	22.36	22.48	57.7	13.39	2.962
	160	XXS	0.375	7.875	47.9	10.48	2.258	2.045	28.55	21.69	72.5	16.81	2.938
10 10.760	...	...	0.500	7.625	45.7	12.76	2.258	1.996	43.39	19.80	105.7	24.52	2.878
	40	Std	0.593	7.439	43.5	14.96	2.258	1.948	50.87	18.84	121.4	28.14	2.847
	80	XS	0.718	7.189	40.6	17.84	2.258	1.882	60.63	17.60	140.6	32.6	2.807
	120	...	0.812	7.001	38.5	19.93	2.258	1.833	67.76	16.69	153.8	35.7	2.777
	160	XXS	0.875	6.875	37.1	21.30	2.258	1.800	72.42	16.09	162.0	37.6	2.757
12 12.760	...	...	0.906	6.813	36.5	21.97	2.258	1.784	74.69	15.80	165.9	38.5	2.748
	40	Std	0.134	10.482	66.3	4.52	2.815	2.744	15.15	37.4	63.7	11.85	3.75
	80	XS	0.165	10.420	65.3	5.49	2.815	2.728	18.70	36.9	76.9	14.30	3.74
	120	...	0.250	10.250	62.5	8.26	2.815	2.683	28.04	35.8	113.7	21.16	3.71
	160	XXS	0.375	10.192	61.6	9.18	2.815	2.668	31.20	35.3	125.9	23.42	3.70
14 14.000	...	...	0.307	10.136	80.7	10.07	2.815	2.654	34.24	35.0	137.5	25.57	3.69
	40	Std	0.365	10.020	78.9	11.91	2.815	2.623	40.48	34.1	160.8	29.90	3.67
	80	XS	0.500	9.750	74.7	16.10	2.815	2.553	54.74	32.3	212.0	39.4	3.63
	120	...	0.593	9.564	71.8	18.92	2.815	2.504	64.33	31.1	244.9	45.6	3.60
	160	XXS	0.718	9.314	68.1	22.63	2.815	2.438	76.93	29.5	286.2	53.2	3.56
16 16.000	...	...	0.843	9.064	64.5	26.24	2.815	2.373	89.20	28.0	324	60.3	3.52
	40	Std	1.000	8.750	60.1	30.6	2.815	2.291	104.13	26.1	368	68.4	3.47
	80	XS	1.125	8.500	56.7	34.0	2.815	2.225	115.65	24.6	399	74.3	3.43
	120	...	0.165	12.420	121.2	6.52	3.34	3.25	19.56	52.5	129.2	20.27	4.45
	160	XXS	0.180	12.390	120.6	7.11	3.34	3.24	24.20	52.2	140.5	22.03	4.44
18 18.000	...	...	0.250	12.250	117.9	9.84	3.34	3.21	33.38	51.1	191.9	30.1	4.42
	40	Std	0.330	12.090	114.8	12.88	3.34	3.17	43.77	49.7	248.5	39.0	4.39
	80	XS	0.375	12.000	113.1	14.58	3.34	3.14	49.56	49.0	279.3	43.8	4.38
	120	...	0.406	11.938	111.9	15.74	3.34	3.13	53.53	48.5	300	47.1	4.37
	160	XXS	0.500	11.750	108.4	19.24	3.34	3.08	65.42	47.0	362	56.7	4.33
20 20.000	...	...	0.562	11.626	106.2	21.52	3.34	3.04	73.16	46.0	401	62.8	4.31
	40	Std	0.687	11.376	101.6	26.04	3.34	2.978	88.31	44.0	475	74.5	4.27
	80	XS	0.843	11.064	96.1	31.5	3.34	2.897	107.20	41.6	562	88.1	4.22
	120	...	1.000	10.750	90.8	36.9	3.34	2.814	125.49	39.3	642	100.7	4.17
	160	XXS	1.125	10.500	86.6	41.1	3.34	2.749	139.68	37.5	701	109.9	4.13
24 24.000	...	...	1.312	10.126	80.5	47.1	3.34	2.651	160.27	34.9	781	122.6	4.07
	40	Std	0.250	13.500	143.1	10.80	3.67	3.53	36.71	62.1	255.4	36.5	4.86
	80	XS	0.312	13.376	140.5	13.42	3.67	3.50	45.68	60.9	314	44.9	4.84
	120	...	0.375	13.250	137.9	16.05	3.67	3.47	54.57	59.7	373	53.3	4.82
	160	XXS	0.500	13.000	132.7	21.21	3.67	3.40	63.37	58.7	429	61.2	4.80
30 30.000	...	...	0.562	12.876	130.2	23.73	3.67	3.37	72.09	57.5	484	69.1	4.78
	40	Std	0.593	12.814	129.0	24.98	3.67	3.35	80.66	56.5	537	76.7	4.74
	80	XS	0.625	12.750	127.7	26.26	3.67	3.34	89.28	55.9	582	80.3	4.73
	120	...	0.687	12.626	125.2	28.73	3.67	3.31	97.68	54.3	638	91.2	4.71
	160	XXS	0.750	12.500	122.7	31.2	3.67	3.27	106.13	53.2	687	98.2	4.69
40 40.000	...	...	0.875	12.250	117.9	36.1	3.67	3.21	122.66	51.1	781	111.5	4.65
	40	Std	0.937	12.126	115.5	38.5	3.67	3.17	130.73	50.0	825	117.8	4.63
	80	XS	1.093	11.814	109.6	44.3	3.67	3.09	150.67	47.5	930	132.8	4.58
	120	...	1.250	11.500	103.9	50.1	3.67	3.01	170.22	45.0	1,127	146.8	4.53
	160	XXS	1.406	11.188	98.3	55.6	3.67	2.929	189.12	42.6	1,017	159.6	4.48
60 60.000	...	...	0.250	15.500	188.7	12.37	4.19	4.06	42.05	81.8	384	48.0	5.57
	40	Std	0.312	15.376	185.7	15.38	4.19	4.03	52.36	80.5	473	59.2	5.55
	80	XS	0.375	15.250	182.6	18.41	4.19	3.99	62.58	79.1	562	70.3	5.53
	120	...	0.437	15.126	179.7	21.37	4.19	3.96	72.64	77.9	648	80.9	5.50
	160	XXS	0.500	15.000	176.7	24.35	4.19	3.93	82.77	76.5	732	91.5	5.48
80 80.000	...	...	0.562	14.876	173.8	27.26	4.19	3.89	92.66	75.4	813	106.6	5.46
	40	Std	0.625	14.750	170.9	30.2	4.19	3.86	102.63	74.1	894	112.2	5.44
	80	XS	0.656	14.688	169.4	31.6	4.19	3.85	107.50	73.4	933	116.6	5.43
	120	...	0.687	14.626	168.0	33.0	4.19	3.83	112.36	72.7	971	121.4	5.42
	160	XXS	0.750	14.500	165.0	35.0	4.19	3.80	117.23	71.0	1,010	126.3	5.40

Tamaño nominal del tubo y D.E. en pulg	Número de cédula†		Espesor de la pared, pulg	D.I., pulg	Área interior, pulg²	Área del metal, pulg²	Superficie exterior, pie²/pie	Superficie interior, pie²/pie	Peso, lb/pie	Peso de agua, lb/pie	Momento de inercia, pulg⁴	Módulo de sección, pulg³	Radio de giro, pulg
	a	b											
10 10.760	...	...	0.843	9.064	64.5	26.24	2.815	2.373	89.20	28.0	324	60.3	3.52
	40	Std	1.000	8.750	60.1	30.6	2.815	2.291	104.13	26.1	368	68.4	3.47
	80	XS	1.125	8.500	56.7	34.0	2.815	2.225	115.65	24.6	399	74.3	3.43
	120	...	0.165	12.420	121.2	6.52	3.34	3.25	19.56	52.5	129.2	20.27	4.45
	160	XXS	0.180	12.390	120.6	7.11	3.34	3.24	24.20	52.2	140.5	22.03	4.44
12 12.760	...	...	0.250	12.250	117.9	9.84	3.34	3.21	33.38	51.1	191.9	30.1	4.42
	40	Std	0.330	12.090	114.8	12.88	3.34	3.17	43.77	49.7	248.5	39.0	4.39
	80	XS	0.375	12.000	113.1	14.58	3.34	3.14	49.56	49.0	279.3	43.8	4.38
	120	...	0.406	11.938	111.9	15.74	3.34	3.13	53.53	48.5	300	47.1	4.37
	160	XXS	0.500	11.750	108.4	19.24	3.34	3.08	65.42	47.0	362	56.7	4.33
14 14.000	...	...	0.562	11.626	106.2	21.52	3.34	3.04	73.16	46.0	401	62.8	4.31
	40	Std	0.687	11.376	101.6	26.04	3.34	2.978	88.31	44.0	475	74.5	4.27
	80	XS	0.843	11.064									

Tabla 3. Propiedades físicas del tubo* (continuación)

Tamaño nominal del tubo y D.E. en pulg	Número de cédula †			Espesor de la pared, pulg	D.I., pulg	Área interior, pulg ²	Área del metal, pulg ²	Superficie exterior, pie ² /pie	Superficie interior, pie ² /pie	Peso, lb/pie	Peso de agua, lb/pie	Momento de inercia, pulg ⁴	Módulo de sección, pulg ³	Radio de giro, pulg
	a	b	c											
16 16.000	80	...	...	0.750	14.500	165.1	35.9	4.19	3.80	122.15	71.5	1.047	130.9	5.40
	100	...	...	0.842	14.314	160.9	40.1	4.19	3.75	136.46	69.7	1.157	144.6	5.37
	120	...	...	0.875	14.250	159.5	41.6	4.19	3.73	141.35	69.1	1.193	154.1	5.36
	140	...	...	1.031	13.938	152.6	48.5	4.19	3.65	164.83	66.1	1.365	170.6	5.30
	160	...	...	1.218	13.564	144.5	56.6	4.19	3.55	192.29	62.6	1.556	194.5	5.24
18 18.000	80	...	...	0.750	14.500	165.1	35.9	4.19	3.80	122.15	71.5	1.047	130.9	5.40
	100	...	...	0.842	14.314	160.9	40.1	4.19	3.75	136.46	69.7	1.157	144.6	5.37
	120	...	...	0.875	14.250	159.5	41.6	4.19	3.73	141.35	69.1	1.193	154.1	5.36
	140	...	...	1.031	13.938	152.6	48.5	4.19	3.65	164.83	66.1	1.365	170.6	5.30
	160	...	...	1.218	13.564	144.5	56.6	4.19	3.55	192.29	62.6	1.556	194.5	5.24
20 20.000	80	...	...	0.750	14.500	165.1	35.9	4.19	3.80	122.15	71.5	1.047	130.9	5.40
	100	...	...	0.842	14.314	160.9	40.1	4.19	3.75	136.46	69.7	1.157	144.6	5.37
	120	...	...	0.875	14.250	159.5	41.6	4.19	3.73	141.35	69.1	1.193	154.1	5.36
	140	...	...	1.031	13.938	152.6	48.5	4.19	3.65	164.83	66.1	1.365	170.6	5.30
	160	...	...	1.218	13.564	144.5	56.6	4.19	3.55	192.29	62.6	1.556	194.5	5.24
24 24.000	80	...	...	0.750	14.500	165.1	35.9	4.19	3.80	122.15	71.5	1.047	130.9	5.40
	100	...	...	0.842	14.314	160.9	40.1	4.19	3.75	136.46	69.7	1.157	144.6	5.37
	120	...	...	0.875	14.250	159.5	41.6	4.19	3.73	141.35	69.1	1.193	154.1	5.36
	140	...	...	1.031	13.938	152.6	48.5	4.19	3.65	164.83	66.1	1.365	170.6	5.30
	160	...	...	1.218	13.564	144.5	56.6	4.19	3.55	192.29	62.6	1.556	194.5	5.24
30 30.000	80	...	...	0.750	14.500	165.1	35.9	4.19	3.80	122.15	71.5	1.047	130.9	5.40
	100	...	...	0.842	14.314	160.9	40.1	4.19	3.75	136.46	69.7	1.157	144.6	5.37
	120	...	...	0.875	14.250	159.5	41.6	4.19	3.73	141.35	69.1	1.193	154.1	5.36
	140	...	...	1.031	13.938	152.6	48.5	4.19	3.65	164.83	66.1	1.365	170.6	5.30
	160	...	...	1.218	13.564	144.5	56.6	4.19	3.55	192.29	62.6	1.556	194.5	5.24

20 20.000	10	...	...	0.250	19.500	298.6	15.51	5.24	5.11	52.73	129.5	757	75.7	6.98
	20	...	...	0.312	19.376	294.9	19.30	5.24	5.07	65.40	128.1	935	93.5	6.96
	30	...	...	0.375	19.250	291.0	23.12	5.24	5.04	78.60	126.0	1,114	111.4	6.94
	40	...	...	0.437	19.126	287.3	26.86	5.24	5.01	91.31	124.6	1,286	128.6	6.92
	60	...	...	0.500	19.000	283.5	30.6	5.24	4.97	104.13	122.8	1,457	145.7	6.90
24 24.000	10	...	...	0.250	19.500	298.6	15.51	5.24	5.11	52.73	129.5	757	75.7	6.98
	20	...	...	0.312	19.376	294.9	19.30	5.24	5.07	65.40	128.1	935	93.5	6.96
	30	...	...	0.375	19.250	291.0	23.12	5.24	5.04	78.60	126.0	1,114	111.4	6.94
	40	...	...	0.437	19.126	287.3	26.86	5.24	5.01	91.31	124.6	1,286	128.6	6.92
	60	...	...	0.500	19.000	283.5	30.6	5.24	4.97	104.13	122.8	1,457	145.7	6.90
30 30.000	10	...	...	0.250	19.500	298.6	15.51	5.24	5.11	52.73	129.5	757	75.7	6.98
	20	...	...	0.312	19.376	294.9	19.30	5.24	5.07	65.40	128.1	935	93.5	6.96
	30	...	...	0.375	19.250	291.0	23.12	5.24	5.04	78.60	126.0	1,114	111.4	6.94
	40	...	...	0.437	19.126	287.3	26.86	5.24	5.01	91.31	124.6	1,286	128.6	6.92
	60	...	...	0.500	19.000	283.5	30.6	5.24	4.97	104.13	122.8	1,457	145.7	6.90

* Los aceros ferríticos inoxidables pueden tener alrededor del 5% menos y los austeníticos inoxidables alrededor del 2% más que los valores dados en esta tabla, la cual está basada en los pesos del acero al carbono. Las fórmulas siguientes se emplearon en el cálculo de los valores indicados en la tabla:

- Peso del tubo por pie, lb = $10.9802(D - t)$
- Peso del agua, en lb por pie = $0.3405d^2$
- Superficie exterior, en pie² por pie = $0.2618D$
- Superficie interior, en pie² por pie = $0.2618d$
- Área interior, pulg² = $0.785d^2$
- Área del metal, pulg² = $0.785(D^2 - d^2)$
- Momento de inercia, pulg⁴ = $0.0491(D^4 - d^4)$
- Módulo de sección, pulg³ = $A M R_c^3$
- Radio de giro, pulg = $0.0982(D^2 - d^2) / D$

- $A M = 0.25 \sqrt{D^3 + d^3}$
- $A M$ = Área del metal, pulg²
- d = D.I., pulg
- D = D.E., pulg
- R_c = radio de giro, pulg
- t = espesor de pared del tubo, pulg

† a. Números de cédula de tubos de acero ASA B36.10.
 b. Designaciones de espesores nominales de pared de tubos de acero ASA B36.10.
 c. Números de cédula de tubos de acero inoxidable ASA B36.19 (SS no es una norma aprobada).