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CARBON STEEL

PIPES

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CARBON STEEL

PIPES & TUBES

LINE PIPE (API 5L)

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure								Test pressure											
									A				B				X42		X46		X52		X56		X60		X65		X70		X80	
									STD		ALT		STD		ALT		STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
3/8	0.675	17.1	STD	0.091	2.3	0.57	0.26	0.84	700	48	-	-	700	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.126	3.2	0.74	0.36	1.10	850	59	-	-	850	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/2	0.840	21.3	STD	0.109	2.8	0.85	0.40	1.28	700	48	-	-	700	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.147	3.7	1.09	0.35	1.61	580	59	-	-	850	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3/4	1.050	26.7	STD	0.113	2.9	1.13	0.52	1.70	700	48	-	-	700	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.154	3.9	1.47	0.67	2.19	850	59	-	-	850	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	1.315	33.4	STD	0.133	3.4	1.68	0.77	2.52	700	48	-	-	700	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.179	4.5	2.17	0.98	3.21	850	59	-	-	850	59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 1/4	1.660	42.2	STD	0.140	3.6	2.27	1.05	3.43	1200	83	-	-	1300	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.191	4.9	3.00	1.38	4.51	1800	124	-	-	1900	131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1 1/2	1.900	48.3	STD	0.145	3.7	2.72	1.24	4.07	1200	83	-	-	1300	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			XS	0.200	5.1	3.63	1.66	5.43	1800	124	-	-	1900	131	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 3/8	2.375	60.3		0.083	2.1	2.03	0.92	3.01	1260	87	1570	-	1470	101	1830	-	1760	2200	1930	2410	2180	2730	2350	2940	2520	3000	2730	3000	2940	3000	3000	3000
				0.109	2.8	2.64	1.21	3.97	1650	-	2070	-	1930	-	2410	-	2310	2890	2530	3000	2860	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.125	3.2	3.00	1.37	4.51	1890	-	2370	-	2210	-	2500	-	2650	3000	2910	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.141	3.6	3.36	1.53	5.03	2140	-	2500	-	2490	-	2500	-	2990	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			STD	0.154	3.9	3.65	1.65	5.42	2330	161	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.172	4.4	4.05	1.85	6.07	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.188	4.8	4.39	2.00	6.57	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.218	5.5	5.02	2.26	7.43	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.250	6.4	5.67	2.59	8.51	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.281	7.1	6.28	2.84	9.31	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
2 7/8	2.875	73.0		0.083	2.1	2.47	1.12	3.67	1040	71	1300	-	1210	83	1210	-	1460	1820	1590	1990	1800	2250	1940	2430	2030	2600	2250	2310	2430	3000	2770	3000
				0.109	2.8	3.22	1.48	4.85	1360	-	1710	-	1590	-	1590	-	1910	2390	2090	2620	2370	2960	2550	3000	2730	3000	2960	3000	3000	3000	3000	3000
				0.125	3.2	3.67	1.68	5.51	1570	-	1960	-	1830	-	1830	-	2190	2740	2400	3000	2710	3000	2920	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.141	3.6	4.12	1.88	6.16	1770	-	2210	-	2060	-	2060	-	2470	3000	2710	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.156	4.0	4.53	2.08	6.81	1950	136	2440	-	2280	158	2280	-	2730	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.172	4.4	4.97	2.27	7.44	2150	150	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.188	4.8	5.40	2.46	8.07	2350	163	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			STD	0.203	5.2	5.79	2.65	8.69	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.216	5.5	6.13	2.79	9.16	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.250	6.4	7.01	3.20	10.51	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.276	7.0	7.66	3.47	11.39	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
3 1/2	3.500	88.9		0.083	2.1	3.03	1.37	4.50	850	59	1070	-	1000	68	1250	-	1200	1490	1310	1640	1480	1850	1590	1990	1710	2130	1850	2310	1990	2490	2280	2850
				0.109	2.8	3.95	1.81	5.95	1120	-	1400	-	1310	-	1640	-	1570	1960	1720	2150	1940	2430	2090	2620	2240	2800	2430	3000	2620	3000	2990	3000
				0.125	3.2	4.51	2.06	6.76	1290	89	1610	-	1500	104	1880	-	1800	2250	1970	2460	2230	2790	2400	3000	2570	3000	2790	3000	3000	3000	3000	3000
				0.141	3.6	5.06	2.31	7.57	1450	-	1810	-	1690	-	2120	-	2030	2540	2220	2780	2510	3000	2710	3000	2900	3000	3000	3000	3000	3000	3000	3000
				0.156	4.0	5.57	2.55	8.37	1600	112	2010	-	1870	130	2340	-	2250	2810	2460	3000	2780	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.172	4.4	6.61	2.80	9.17	1770	123	2210	-	2060	143	2500	-	2480	3000	2710	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.188	4.8	6.65	3.03	9.95	1930	134	2420	-	2260	156	2500	-	2710	3000	2970	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			STD	0.216	5.5	7.58	3.45	11.31	2220	154	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.250	6.4	8.68	3.97	13.02	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.281	7.1	9.66	4.36	14.32	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.300	7.6	10.25	4.65	15.24	2500	172	2500	-	2500	172	2500	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
4	4.000	101.6		0.083	2.1	3.47	1.57	5.15	750	51	930	-	870	60	1090	-	1050	1430	1150	1430	1290	1620	1390	1740	1490	1870	1620	2020	1740	2180	1990	2490
				0.109	2.8	4.53	2.08	6.82	980	68	1230	-	1140	80	1430	-	1370	1720	1500	1880	1700	2130	1830	2290	1960	2450	2130	2660	2290	2860	2620	3000
				0.125	3.2	5.17	2.37	7.76	1130	78	1410	-	1310	91	1640	-	1580	1970	1730	2160	1950	2440	2100	2630	2250	2810	2440	3000	2630	3000	3000	3000
				0.141	3.6	5.81	2.65	8.70	1270	88	1590	-	1480	102	1850	-	1780	2220	1950	2430	2200	2750	2370	2960	2540	3000	2750	3000	2960	3000	3000	3000
				0.156	4.0	6.40	2.94	9.63	1400	98	1760	-	1640	114	2050	-	1970	2460	2150	2690	2430	3000	2620	3000	2810	3000	3000	3000	3000	3000	3000	3000
				0.172	4.4	7.03	3.22	10.55	1550	108	1940	-	1810	125	2260	-	2170	2710	2370	2970	2680	3000	2890	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.188	4.8	7.65	3.49	11.46	1690	117	2120	-	1970	137	2470	-	2370	2960	2590	3000	2930	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			STD	0.226	5.7	9.11	4.11	13.48	1930	139	2540	-	2370	162	2800	-	2850	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.250	6.4	10.01	4.58	15.02	2250	156	2800	-	2630	182	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.281	7.1	11.16	5.04	16.55	2350	174	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.318	8.1	12.50	5.69	18.68	2800	193	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

LINE PIPE (API 5L)

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure								Test pressure													
									A				B				X42		X46		X52		X56		X60		X65		X70		X80	
									STD		ALT		STD		ALT		STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT	STD	ALT
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi	psi
4 1/2	4.500	114.3		0.083	2.1	3.92	1.77	5.81	660	46	830	-	770	53	970	-	930	1160	1020	1270	1150	1440	1240	1550	1330	1660	1440	1800	1550	1940	1770	2210
				0.125	3.2	5.84	2.67	8.77	1000	70	1250	-	1170	81	1460	-	1400	1750	1530	1920	1730	2170	1870	2330	2000	2500	2170	2710	2330	2920	2670	3000
				0.141	3.6	6.56	3.00	9.83	1130	78	1410	-	1320	91	1650	-	1580	1970	1730	2160	1960	2440	2110	2630	2260	2820	2440	3000	2630	3000	3000	3000
				0.156	4.0	7.24	3.32	10.88	1250	87	1560	-	1460	101	1820	-	1750	2180	1910	2390	2160	2700	2330	2910	2500	3000	2700	3000	2910	3000	3000	3000
				0.172	4.4	7.95	3.36	11.92	1380	96	1720	-	1610	111	2010	-	1930	2410	2110	2640	2390	2980	2570	3000	2750	3000	2980	3000	3000	3000	3000	3000
				0.188	4.8	8.66	3.95	12.96	1500	104	1880	-	1750	121	2190	-	2110	2630	2310	2880	2610	3000	2810	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.203	5.2	9.32	4.26	13.99	1620	113	2030	-	1890	132	2370	-	2270	2840	2490	3000	2810	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.219	5.6	10.01	4.58	15.01	1750	122	2190	-	2040	142	2560	-	2450	3000	2690	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			STD	0.237	6.0	10.79	4.88	16.02	1900	130	2370	-	2210	152	2770	-	2650	3000	2910	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.250	6.4	11.35	5.19	17.03	2000	139	2500	-	2330	162	2800	-	2800	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.281	7.1	12.66	5.72	18.77	2250	154	2800	-	2620	180	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.312	7.9	13.96	6.32	20.73	2500	172	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.337	8.6	14.98	6.83	22.42	2700	187	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
				0.438	11.1	19.00	8.61	28.25	2800	193	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.531	13.5	22.51	10.23	33.56	2800	193	2800	-	2800	193	2800	-	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
5 9/16	5.563	141.3		0.083	2.1	4.86	2.20	7.21	540	37	-	-	630	43	-	-	750	-	820	-	930	-	1000	-	1040	-	1160	-	1250	-	1430	-
				0.125	3.2	7.26	3.32	10.90	810	56	-	-	940	65	-	-	1130	-	1240	-	1400	-	1500	-	1630	-	1750	-	1890	-	2160	-
				0.156	4.0	9.01	4.13	13.54	1010	70	-	-	1180	82	-	-	1410	-	1550	-	1750	-	1910	-	2020	-	2120	-	2360	-	2690	-
				0.188	4.8	10.79	4.93	16.16	1220	84	-	-	1420	98	-	-	1700	-	1870	-	2110	-	2270	-	2430	-	2640	-	2840	-	3000	-
				0.219	5.6	12.50	5.71	18.74	1420	98	-	-	1650	115	-	-	1990	-	2170	-	2460	-	2650	-	2830	-	3000	-	3000	-	3000	-
			STD	0.258	6.6	14.62	6.68	21.92	1670	116	-	-	1950	135	-	-	2340	-	2560	-	2890	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.281	7.1	15.85	7.16	23.50	1820	125	-	-	2120	145	-	-	2550	-	2790	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.312	7.9	17.50	7.92	25.99	2020	139	-	-	2360	162	-	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.344	8.7	19.17	8.67	28.45	2230	153	-	-	2600	178	-	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
			XS	0.375	9.5	20.78	9.41	30.88	2430	167	-	-	2800	193	-	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.500	12.7	27.04	12.28	40.28	2800	193	-	-	2800	193	-	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.625	15.9	32.96	14.99	49.17	2800	193	-	-	2800	193	-	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
6 5/8	6.625	168.3		0.083	2.1	5.80	2.62	8.61	450	31	560	39	530	37	660	45	790	-	860	-	980	-	1050	-	1130	-	1220	-	1320	-	1500	-
				0.109	2.8	7.59	3.48	11.43	590	41	740	51	690	48	860	59	1040	-	1140	-	1280	-	1380	-	1480	-	1600	-	1730	-	1970	-
				0.125	3.2	8.68	3.97	13.03	680	47	850	59	790	54	990	68	1190	-	1300	-	1470	-	1580	-	1700	-	1840	-	1980	-	2260	-
				0.141	3.6	9.76	4.46	14.62	770	53	960	66	890	61	1120	77	1340	-	1470	-	1660	-	1790	-	1920	-	2080	-	2230	-	2550	-
				0.156	4.0	10.78	4.94	16.21	850	59	1060	73	990	68	1240	85	1480	-	1620	-	1840	-	1980	-	2120	-	2300	-	2470	-	2830	-
				0.172	4.4	11.85	5.42	17.78	930	64	1170	81	1090	75	1360	94	1640	-	1790	-	2030	-	2180	-	2340	-	2530	-	2730	-	3000	-
				0.188	4.8	12.92	5.90	19.35	1020	70	1280	88	1190	82	1490	103	1790	-	1960	-	2210	-	2380	-	2550	-	2770	-	2980	-	3000	-
				0.203	5.2	13.92	6.37	20.91	1100	76	1380	95	1290	89	1610	111	1930	-	2110	-	2390	-	2570	-	2760	-	2990	-	3000	-	3000	-
				0.219	5.6	14.98	6.85	22.47	1190	82	1490	103	1390	96	1740	120	2080	-	2280	-	2580	-	2780	-	2980	-	3000	-	3000	-	3000	-
				0.250	6.4	17.02	7.79	25.55	1360	94	1700	117	1580	109	1980	136	2380	-	2600	-	2940	-	3000	-	3000	-	3000	-	3000	-	3000	-
			STD	0.280	7.1	18.97	8.60	28.22	1520	105	1900	131	1780	123	2220	153	2660	-	2920	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.312	7.9	21.04	9.53	31.25	1700	117	2120	146	1980	136	2470	170	2970	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.344	8.7	23.08	10.44	34.24	1870	129	2340	161	2180	150	2500	172	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.375	9.5	25.03	11.34	37.20	2040	141	2550	176	2380	164	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
			XS	0.432	11.0	28.57	13.01	42.67	2350	-	2800	-	2740	-	2800	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.500	12.7	32.71	14.85	48.73	2720	187	2800	193	2800	193	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.562	14.3	36.39	16.55	54.31	2800	193	2800	193	2800	193	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.625	15.9	40.05	18.21	59.76	2800	193	2800	193	2800	193	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.719	18.3	45.35	20.26	67.69	2800	193	2800	193	2800	193	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-
				0.750	19.1	47.06	21.42	70.27	2800	193	2800	193	2800	193	2800	193	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-	3000	-

LINE PIPE (API 5L)

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure								Test pressure							
									A				B											
									STD		ALT		STD		ALT		X42	X46	X52	X56	X60	X65	X70	X80
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	psi	psi	psi	psi	psi	psi	psi
8 5/8	8.625	219.1		0.125	3.2	11.35	5.19	17.04	520	36	650	45	610	42	760	52	910	1000	1130	1220	1300	1410	1520	1740
				0.156	4.0	14.11	6.47	21.22	650	45	810	56	760	52	950	65	1140	1250	1410	1520	1630	1760	1900	2170
				0.188	4.8	16.94	7.73	25.37	780	54	980	68	920	63	1140	79	1370	1500	1700	1830	1960	2130	2290	2620
				0.203	5.2	18.26	8.36	27.43	850	-	1060	-	990	-	1240	-	1480	1620	1840	2000	2120	2290	2470	2820
				0.219	5.6	19.66	8.99	29.48	910	63	1140	79	1070	74	1330	92	1600	1750	1980	2130	2290	2480	2670	3000
				0.250	6.4	22.36	10.23	33.57	1040	72	1300	90	1220	84	1520	105	1830	2000	2260	2430	2610	2830	3000	3000
				0.277	7.0	24.70	11.16	36.61	1160	80	1450	100	1350	93	1690	116	2020	2220	2510	2700	2890	3000	3000	3000
				0.312	7.9	27.70	12.54	41.14	1300	90	1630	112	1520	105	1900	131	2280	2500	2820	3000	3000	3000	3000	3000
			STD	0.322	8.2	28.55	13.00	42.65	1340	92	1680	116	1570	108	1960	135	2350	2580	2910	3000	3000	3000	3000	3000
				0.344	8.7	30.42	13.76	45.14	1440	99	1790	123	1680	116	2090	144	2510	2750	3000	3000	3000	3000	3000	3000
				0.375	9.5	33.04	14.97	49.10	1570	108	1960	135	1830	126	2280	157	2740	3000	3000	3000	3000	3000	3000	3000
				0.438	11.1	38.30	17.36	56.94	1830	126	2290	158	2130	147	2670	184	3000	3000	3000	3000	3000	3000	3000	3000
			XS	0.500	12.7	43.39	19.70	64.64	2090	-	2610	-	2430	-	2800	-	3000	3000	3000	3000	3000	3000	3000	3000
				0.562	14.3	48.40	22.10	72.22	2350	162	2800	193	2740	189	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.625	15.9	53.40	24.28	79.67	2610	180	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.719	18.3	60.71	27.62	90.62	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.750	19.1	63.08	28.71	94.20	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	67.76	30.74	100.84	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
10 3/4	10.750	273.1		0.156	4.0	17.65	8.09	26.54	520	36	650	45	610	42	760	52	1040	1130	1280	1380	1480	1600	1730	1970
				0.188	4.8	21.21	9.68	31.76	630	43	790	54	730	50	920	63	1250	1370	1550	1660	1780	1930	2080	2380
				0.203	5.2	22.87	10.47	34.35	680	-	850	-	790	-	990	-	1350	1480	1670	1800	1930	2090	2250	2570
				0.219	5.6	24.63	11.26	36.94	730	50	920	63	860	59	1070	74	1450	1590	1800	1940	2080	2250	2420	2770
				0.250	6.4	28.04	12.83	42.09	840	58	1050	72	980	68	1220	84	1660	1820	2060	2210	2370	2570	2770	3000
				0.279	7.1	31.20	14.19	46.57	930	64	1170	81	1090	75	1360	94	1850	2030	2290	2470	2650	2870	3000	3000
				0.307	7.8	34.24	15.55	51.03	1030	71	1290	89	1200	83	1500	103	2040	2230	2520	2720	2910	3000	3000	3000
				0.344	8.7	38.23	17.29	56.72	1150	79	1440	99	1340	92	1680	116	2280	2500	2830	3000	3000	3000	3000	3000
			STD	0.365	9.3	40.48	18.44	60.50	1220	84	1530	105	1430	99	1780	123	2420	2660	3000	3000	3000	3000	3000	3000
				0.438	11.1	48.24	21.86	71.72	1470	101	1830	126	1710	118	2140	147	2910	3000	3000	3000	3000	3000	3000	3000
			XS	0.500	12.7	54.74	24.86	81.55	1670	-	2090	-	1950	-	2440	-	3000	3000	3000	3000	3000	3000	3000	3000
				0.562	14.3	61.15	27.82	91.26	1880	130	2350	162	2200	152	2740	189	3000	3000	3000	3000	3000	3000	3000	3000
				0.625	15.9	67.58	30.74	100.85	2090	144	2620	181	2440	168	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.719	18.3	77.03	35.05	114.99	2410	166	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	86.18	39.10	128.27	2720	187	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	92.28	41.87	137.36	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	98.30	44.59	146.30	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
12 3/4	12.750	323.9		0.172	4.4	23.11	10.57	34.67	490	34	610	42	570	39	710	49	960	1050	1190	1280	1380	1490	1610	1830
				0.188	4.8	25.22	11.51	37.77	530	37	660	45	620	43	770	53	1050	1150	1300	1400	1500	1630	1750	2010
				0.203	5.2	27.20	12.46	40.87	570	-	720	-	670	-	840	-	1140	1250	1410	1520	1620	1760	1890	2170
				0.219	5.6	29.31	13.40	43.96	620	43	770	53	720	50	900	62	1230	1340	1520	1640	1750	1900	2040	2340
				0.250	6.4	33.38	15.27	50.11	710	49	880	61	820	56	1030	71	1400	1530	1730	1870	2000	2170	2330	2670
				0.281	7.1	37.42	16.91	55.47	790	54	990	68	930	64	1160	80	1570	1720	1950	2100	2250	2440	2620	3000
				0.312	7.9	41.45	18.76	61.56	880	61	1100	73	1030	71	1280	88	1750	1910	2160	2330	2500	2700	2910	3000
				0.330	8.4	43.77	19.92	65.35	930	64	1160	80	1090	75	1360	94	1850	2020	2290	2460	2640	2860	3000	3000
				0.344	8.7	45.58	20.61	67.62	970	67	1210	83	1130	78	1420	98	1930	2110	2390	2570	2750	2980	3000	3000
			STD	0.375	9.5	49.56	22.45	73.65	1060	73	1320	91	1240	85	1540	106	2100	2300	2600	2800	3000	3000	3000	3000
				0.406	10.3	53.52	24.28	79.65	1150	-	1430	-	1340	-	1670	-	2270	2490	2810	3000	3000	3000	3000	3000
				0.438	11.1	57.59	26.10	85.62	1240	85	1550	107	1440	99	1800	124	2450	2690	3000	3000	3000	3000	3000	3000
			XS	0.500	12.7	65.42	29.71	97.46	1410	-	1760	-	1650	-	2060	-	2800	3000	3000	3000	3000	3000	3000	3000
				0.562	14.3	73.15	33.28	109.18	1590	110	1980	136	1850	127	2310	159	3000	3000	3000	3000	3000	3000	3000	3000
				0.625	15.9	80.93	36.81	120.76	1760	121	2210	152	2060	142	2570	177	3000	3000	3000	3000	3000	3000	3000	3000
				0.688	17.5	88.63	40.30	132.23	1940	134	2430	167	2270	156	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.750	19.1	96.12	43.76	143.56	2120	146	2650	183	2470	170	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	103.53	49.96	154.08	2290	158	2800	193	2670	184	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	110.97	50.34	165.17	2470	170	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	119.33	53.68	176.13	2650	183	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000

LINE PIPE (API 5L)

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure								Test pressure							
									A				B											
									STD		ALT		STD		ALT		X42	X46	X52	X56	X60	X65	X70	X80
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	psi	psi	psi	psi	psi	psi	psi
14	14.000	355.6		0.188	4.8	27.73	12.66	41.52	480	33	600	41	560	39	700	48	960	1050	1190	1280	1370	1480	1600	1830
				0.203	5.2	29.91	13.69	44.93	520	36	650	45	610	42	760	52	-	-	-	-	-	-	-	1970
				0.210	5.3	30.93	13.95	45.78	540	-	680	-	630	-	790	-	1070	1170	1330	1430	1530	1660	1790	2040
				0.219	5.6	32.23	14.73	48.33	560	-	700	-	660	-	820	-	1120	1220	1380	1490	1600	1730	1860	2130
				0.250	6.4	36.71	16.80	55.11	640	44	800	55	750	52	940	65	1280	1400	1580	1700	1820	1970	2130	2430
				0.281	7.1	41.17	18.60	61.02	720	50	900	62	840	58	1050	72	1430	1570	1770	1910	2050	2220	2390	2730
				0.312	7.9	45.61	20.65	67.74	800	55	1000	69	940	65	1170	81	1590	1740	1970	2120	2270	2460	2650	3000
				0.344	8.7	50.17	22.68	74.42	880	61	1110	76	1030	71	1290	89	1750	1920	2170	2340	2510	2720	2920	3000
			STD	0.375	9.5	54.57	24.71	81.08	960	66	1210	83	1120	77	1410	97	1910	2090	2370	2550	2730	2960	3000	3000
				0.406	10.3	58.94	26.73	87.71	1040	-	1310		1220	-	1520	-	2070	2270	2560	2760	2960	3000	3000	3000
				0.438	11.1	63.44	28.74	94.30	1130	78	1410	97	1310	90	1640	113	2230	2450	2770	2980	3000	3000	3000	3000
				0.469	11.9	67.78	30.74	100.86	1210	-	1510		1410	-	1760	-	2390	2620	2960	3000	3000	3000	3000	3000
			XS	0.500	12.7	72.09	32.73	107.39	1290	89	1610	111	1500	103	1880	130	2550	2790	3000	3000	3000	3000	3000	3000
				0.562	14.3	80.66	36.69	120.36	1450	100	1810	125	1690	116	2110	145	2870	3000	3000	3000	3000	3000	3000	3000
				0.625	15.9	89.28	40.60	133.19	1610	111	2010	168	1880	130	2340	161	3000	3000	3000	3000	3000	3000	3000	3000
				0.688	17.5	97.81	44.47	145.91	1770	122	2210	152	2060	142	2580	178	3000	3000	3000	3000	3000	3000	3000	3000
				0.750	19.1	106.13	48.31	158.49	1930	133	2410	166	2250	155	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	114.37	51.87	170.18	2090	144	2610	180	2440	168	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	122.65	55.63	182.52	250	155	2800	193	2620	181	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	130.85	59.36	194.74	2412	166	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.000	25.4	138.84	63.04	206.83	2570	177	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.062	27.0	146.74	66.69	218.79	2730	189	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.125	28.6	154.69	70.30	230.63	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.250	31.8	170.21	77.21	253.31	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
16	16.000	406.4		0.188	4.8	31.75	14.49	47.54	420	29	530	37	490	34	620	43	840	920	1040	1120	1200	1300	1400	1600
				0.203	5.2	34.25	15.68	51.45	460	32	570	39	530	37	670	46	910	990	1120	1210	1290	1400	1510	1730
				0.219	5.6	36.91	16.87	55.35	490	34	620	43	570	39	720	50	980	1070	1210	1300	1400	1510	1630	1860
				0.250	6.4	42.05	19.24	63.13	560	39	700	48	660	45	820	56	1120	1220	1380	1490	1590	1730	1860	2130
				0.281	7.1	47.17	21.31	69.91	630	43	790	54	740	51	920	63	1250	1370	1550	1670	1790	1940	2090	2390
				0.312	7.9	52.27	23.66	77.63	700	48	880	61	820	56	1020	70	1390	1520	1720	1860	1990	2150	2320	2650
				0.344	8.7	57.52	26.01	85.32	770	53	970	67	900	62	1130	78	1540	1680	1900	2050	2190	2380	2560	2920
			STD	0.375	9.5	62.58	28.34	92.98	840	58	1050	72	980	68	1230	85	1670	1830	2070	2230	2390	2590	2790	3000
				0.406	10.3	67.62	30.67	100.61	910	-	1110	-	1070	-	1330	-	1810	1980	2240	2420	2790	2800	3000	3000
				0.438	11.1	72.80	32.98	108.20	990	68	1230	85	1150	79	1440	99	1950	2140	2420	2610	2990	3000	3000	3000
				0.469	11.9	77.79	35.29	115.77	1060	-	1320	-	1230	-	1540	-	2090	2290	2590	2790	3000	3000	3000	3000
			XS	0.500	12.7	82.77	37.58	123.30	1120	77	1410	97	1310	90	1640	113	2230	2440	2760	2980	3000	3000	3000	3000
				0.562	14.3	92.66	42.14	138.27	1260	87	1580	109	1480	102	1840	127	2510	2750	3000	3000	3000	3000	3000	3000
				0.625	15.9	102.63	46.67	153.11	1410	97	1760	121	1640	113	2050	141	2790	3000	3000	3000	3000	3000	3000	3000
				0.688	17.5	112.51	51.15	167.83	1550	107	1940	134	1810	125	2260	156	3000	3000	3000	3000	3000	3000	3000	3000
				0.750	19.1	122.15	55.60	182.42	1690	116	2110	145	1970	136	2460	169	3000	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	131.71	59.73	195.98	1830	126	2280	157	2130	147	2660	183	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	141.34	64.11	210.33	1970	136	2460	169	2300	158	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	150.89	68.44	224.55	2110	145	2640	182	2460	169	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.000	25.4	160.20	72.74	238.64	2250	155	2800	193	2620	181	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.062	27.0	169.43	77.00	252.61	2390	165	2800	193	2790	192	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.125	28.6	178.72	81.21	266.45	2530	174	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.188	30.2	187.93	85.40	280.17	2670	185	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.250	31.8	196.91	89.54	293.76	2800	193	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000

LINE PIPE (API 5L)

Nominal size	Outside diameter		Wall thickness			Weight			Test pressure								Test pressure							
									A				B											
									STD		ALT		STD		ALT		X42	X46	X52	X56	X60	X65	X70	X80
in.	in.	mm	Grade	in.	mm	lb/ft	kg/ft	kg/m	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	kPax 100	psi	psi	psi	psi	psi	psi	psi	psi
18	18.000	457.0		0.188	4.8	35.76	16.32	53.53	380	26	470	32	440	30	550	38	750	820	920	990	1070	1150	1240	1420
				0.219	5.6	41.59	19.00	62.34	440	30	550	38	510	35	640	44	870	950	1080	1160	1240	1340	1450	1650
				0.250	6.4	47.39	21.68	71.12	500	34	620	43	580	40	730	50	990	1090	1230	1320	1420	1530	1650	1890
				0.281	7.1	53.18	24.01	78.77	560	39	700	48	660	45	820	56	1110	1220	1380	1490	1590	1730	1860	2120
				0.312	7.9	58.94	26.67	87.49	620	43	780	54	730	50	910	63	1240	1360	1530	1650	1770	1920	2060	2360
				0.344	8.7	64.87	29.32	96.18	690	48	860	59	800	55	1000	69	1360	1490	1690	1820	1950	2110	2270	2600
			STD	0.375	9.5	70.59	31.96	104.84	750	52	940	65	880	61	1090	75	1490	1630	1840	1980	2120	2300	2480	2830
				0.406	10.3	76.29	34.58	113.46	810	-	1020	-	950	-	1180	-	1610	1760	1990	2150	2300	2490	2680	3000
				0.438	11.1	82.15	37.20	122.05	880	61	1100	76	1020	70	1280	88	1740	1900	2150	2320	2480	2690	2900	3000
				0.469	11.9	87.81	39.81	130.62	940	-	1170	-	1090	-	1370	-	1860	2040	2300	2480	2660	2880	3000	3000
			XS	0.500	12.7	93.45	42.41	139.15	1000	69	1250	86	1170	81	1460	101	1980	2170	2460	2640	2830	3000	3000	3000
				0.562	14.3	104.67	47.58	156.11	1120	77	1400	96	1310	90	1640	113	2230	2440	2760	2970	3000	3000	3000	3000
				0.625	15.9	115.98	52.72	172.95	1250	86	1560	107	1460	101	1820	125	2480	2720	3000	3000	3000	3000	3000	3000
				0.688	17.5	127.21	57.81	189.67	1380	95	1720	119	1610	111	2010	138	2730	2990	3000	3000	3000	3000	3000	3000
				0.750	19.1	138.17	62.87	206.25	1500	103	1880	130	1750	121	2190	151	2980	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	149.06	67.57	221.69	1620	112	2030	140	1890	130	2370	163	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	160.03	72.55	238.03	1750	121	2190	151	2040	141	2550	176	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	170.92	77.50	254.25	1880	130	2340	161	2190	151	2740	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.000	25.4	181.56	82.40	270.34	2000	138	2500	172	2330	161	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.062	27.0	192.11	87.26	286.30	2120	146	2660	183	2480	171	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.125	28.6	202.75	92.09	302.14	2250	155	2800	193	2620	181	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.188	30.2	213.31	96.88	317.85	2370	163	2800	193	2770	191	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
				1.250	31.8	223.61	101.63	333.44	2500	172	2800	193	2800	193	2800	193	3000	3000	3000	3000	3000	3000	3000	3000
20	20.000	508.0		0.219	5.6	46.27	21.15	69.38	390	27	490	34	460	32	570	39	830	910	1020	1100	1180	1280	1380	1580
				0.250	6.4	52.73	24.13	79.16	450	31	560	39	520	36	660	45	950	1040	1170	1260	1350	1460	1580	1800
				0.281	7.1	59.18	26.73	87.70	510	35	630	43	590	41	740	51	1060	1160	1320	1420	1520	1640	1770	2020
				0.312	7.9	65.60	29.70	97.43	50	39	700	48	660	45	820	56	1180	1290	1460	1570	1680	1830	1970	2250
				0.344	8.7	72.21	32.65	107.12	620	43	770	53	720	50	900	62	1300	1420	1610	1730	1860	2010	2170	2480
			STD	0.375	9.5	78.60	35.59	116.78	680	47	840	58	790	54	980	68	1420	1550	1760	1890	2030	2190	2360	2700
				0.406	10.3	84.96	38.53	126.41	730	-	910	-	850	-	1070	-	1530	1680	1900	2050	2190	2380	2560	2920
				0.438	11.1	91.51	41.46	136.01	790	54	990	68	920	63	1150	79	1660	1810	2050	2210	2370	2560	2760	3000
				0.469	11.9	97.83	44.37	145.58	840	-	1060	-	980	-	1230	-	1770	1940	2190	2360	2530	2740	2950	3000
			XS	0.500	12.7	104.13	47.28	155.12	900	62	1120	77	1050	72	1310	90	1890	2070	2340	2520	2700	2930	3000	3000
				0.562	14.3	116.67	53.07	174.10	1010	70	1260	87	1180	81	1480	102	2120	2330	2630	2830	3000	3000	3000	3000
				0.625	15.9	129.33	58.81	192.95	1120	77	1410	97	1310	90	1640	113	2360	2590	2930	3000	3000	3000	3000	3000
				0.688	17.5	141.90	64.52	211.68	1240	85	1550	107	1440	99	1810	125	2600	2850	3000	3000	3000	3000	3000	3000
				0.750	19.1	154.19	70.19	230.27	1350	93	1690	116	1580	109	1970	136	2840	3000	3000	3000	3000	3000	3000	3000
				0.812	20.6	166.40	75.47	247.60	1460	101	1830	126	1710	118	2130	147	3000	3000	3000	3000	3000	3000	3000	3000
				0.875	22.2	178.72	81.06	265.95	1580	109	1970	136	1840	127	2300	158	3000	3000	3000	3000	3000	3000	3000	3000
				0.938	23.8	190.96	86.62	284.18	1690	116	2110	145	1970	136	2460	169	3000	3000	3000	3000	3000	3000	3000	3000
				1.000	25.4	202.92	92.13	302.28	1800	124	2250	155	2100	145	2620	181	3000	3000	3000	3000	3000	3000	3000	3000
				1.062	27.0	214.80	97.62	320.26	1910	132	2390	165	2230	154	2750	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.125	28.6	226.78	103.06	338.11	2020	139	2530	174	2360	162	2750	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.188	30.2	238.68	108.46	355.83	2140	147	2670	184	2490	172	2750	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.250	31.8	250.31	113.82	373.43	2250	155	2750	189	2620	181	2750	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.312	33.3	261.86	118.81	389.91	2360	162	2750	189	2750	189	2750	189	3000	3000	3000	3000	3000	3000	3000	3000
				1.375	34.9	273.51	124.11	407.17	2480	171	2750	189	2750	189	2750	189	3000	3000	3000	3000	3000	3000	3000	3000

API 5CT TUBING

Outside diameter		Wall thickness		Plain ends			Threaded & Coupling			H40		J55 & K55		Type of pipe
in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m	STD	ALT	STD	ALT	
1.050	26.7	0.113	2.87	1.13	0.51	1.68	1.14	0.52	1.70	3.000	6.900	3.000	9.500	Non-Upset
		0.113	2. 7	1.13	0.51	1.68	1.20	0.54	1.79	3.000	6.900	3.000	9.500	Ext. Upset
1.315	33.4	0.133	3.38	1.68	0.76	2.50	1.70	0.77	2.53	3.000	6.500	3.000	8.900	Non-Upset
		0.133	3.38	1.68	0.76	2.50	1.72	0.78	2.56	3.000	6.500	3.000	8.900	Integral Joint
		0.133	3.38	1.68	0.76	2.50	1.80	0.82	2.68	3.000	6.500	3.000	8.900	Ext. Upset
1.660	42.2	0.125	3.18	2.05	0.93	3.05	2.10	0.95	3.13	3.000	4.800	3.000	6.600	Integral Joint
		0.140	3.56	2.27	1.03	3.38	2.30	1.04	3.42	3.000	5.400	3.000	7.400	Non-Upset
		0.140	3.56	2.27	1.03	3.38	2.33	1.06	3.47	3.000	5.400	3.000	7.400	Integral Joint
		0.140	3.56	2.27	1.03	3.38	2.40	1.09	3.57	3.000	5.400	3.000	7.400	Ext. Upset
1.900	48.3	0.125	3.18	2.37	1.08	3.53	2.40	1.09	3.57	3.000	4.200	3.000	5.800	Integral Joint
		0.145	3.68	2.72	1.23	4.05	2.75	1.25	4.09	3.000	4.900	3.000	6.700	Non-Upset
		0.145	3.68	2.72	1.23	4.05	2.76	1.25	4.11	3.000	4.900	3.000	6.700	Integral Joint
		0.145	3.68	2.72	1.23	4.05	2.90	1.32	4.32	3.000	4.900	3.000	6.700	Ext. Upset
2.063	52.4	0.156	3.96	3.18	1.44	4.73	3.25	1.47	4.84	3.000	4.800	3.000	6.700	Integral Joint
2 3/8	60.3	0.167	4.24	3.94	1.79	5.86	4.00	1.81	5.95	3.000	4.500	3.000	6.200	Non-Upset
		0.190	4.83	4.44	2.01	6.59	4.60	2.09	6.85	3.000	5.100	3.000	7.000	Non-Upset
		0.190	4.83	4.44	2.01	6.59	4.70	2.13	6.99	3.000	5.100	3.000	7.000	Ext. Upset
2 7/8	73.0	0.217	5.51	6.17	2.79	9.17	6.40	2.90	9.52	3.000	4.800	3.000	6.600	Non-Upset
		0.217	5.51	6.17	2.79	9.17	6.50	2.95	9.67	3.000	4.800	3.000	6.600	Ext. Upset
3 1/2	88.9	0.216	5.49	7.58	3.44	11.28	7.70	3.49	11.46	3.000	3.900	3.000	5.400	Non-Upset
		0.254	6.45	8.81	4.00	13.11	9.20	4.17	13.69	3.000	4.600	3.000	6.400	Ext. Upset
		0.254	6.45	8.81	4.00	13.11	9.30	4.22	13.84	3.000	4.600	3.000	6.400	Ext. Upset
		0.289	7.34	9.92	4.50	14.75	10.20	4.63	15.18	3.000	5.300	3.000	7.300	Non-Upset
4	101.6	0.226	5.74	9.12	4.13	13.56	9.50	4.31	14.14	3.000	3.600	3.000	5.000	Non-Upset
		0.262	6.65	10.47	4.74	15.57	11.00	4.99	16.37	3.000	4.200	3.000	5.800	Ext. Upset
4 1/2	114.3	0.271	6.88	12.25	5.55	18.22	12.60	5.72	18.75	3.000	3.900	3.000	5.300	Non-Upset
		0.271	6.88	12.25	5.55	18.22	12.75	5.78	18.97	3.000	3.900	3.000	5.300	Ext. Upset

API 5CT CASING

Outside diameter		Wall thickness		Weight						Test pressure (psi)				Type of therad		
				Plain ends			Threaded & Coupling			H40		J55 & K55				
in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m	STD	ALT	STD	ALT	Short	Long	Buttress
4 1/2	114.30	0.205	5.21	9.41	4.26	13.99	9.50	4.31	14.14	2.900	-	3.000	4.000	x		
		0.224	5.69	10.24	4.64	15.22	10.50	4.76	15.63	-	-	3.000	4.400	x		x
		0.250	6.35	11.36	5.15	16.89	11.60	5.26	17.26	-	-	3.000	4.900	x	x	x
5	127.00	0.220	5.59	11.24	5.09	16.71	11.50	5.22	17.11	-	-	3.000	3.900	x		
		0.253	6.43	12.84	5.82	19.09	13.00	5.90	19.35	-	-	3.000	4.500	x	x	x
		0.296	7.52	14.88	6.74	22.13	15.00	6.80	22.32	-	-	3.000	5.200	x	x	x
5 1/2	139.70	0.244	6.20	13.71	6.21	20.39	14.00	6.35	20.83	2.800	-	3.000	3.900	x		
		0.275	6.99	15.36	6.96	22.84	15.50	7.03	23.07	-	-	3.000	4.400	x	x	x
		0.304	7.72	16.89	7.65	25.11	17.00	7.71	25.30	-	-	3.000	4.900	x	x	x
6 5/8	168.28	0.288	7.32	19.51	8.84	29.01	20.00	9.07	29.76	2.800	-	-	-	x		
		0.288	7.32	19.51	8.84	29.01	20.00	9.07	29.76	-	-	3.000	3.800	x	x	x
		0.352	8.94	23.60	10.70	35.09	24.00	10.89	35.72	-	-	3.000	4.700	x	x	x
7	177.80	0.231	5.87	16.72	7.57	24.85	17.00	7.71	25.30	2.100	-	-	-	x		
		0.272	6.91	19.56	8.86	29.08	20.00	9.07	29.76	2.500	-	3.000	3.400	x		
		0.317	8.05	22.65	10.26	33.68	23.00	10.43	34.23	-	-	3.000	4.000	x	x	x
		0.362	9.19	25.69	11.64	38.19	26.00	11.79	38.69	-	-	3.000	4.600	x	x	x
7 5/8	193.68	0.300	7.62	23.49	10.65	34.95	24.00	10.89	35.72	2.500	-	-	-	x		
		0.328	8.33	25.59	11.59	38.04	26.40	11.97	39.29	-	-	3.000	3.800	x	x	x
8 5/8	219.08	0.264	6.71	23.60	10.69	35.08	24.00	10.89	35.72	-	-	2.700	-	x		
		0.304	7.72	27.04	12.26	40.21	28.00	12.70	41.67	2.300	-	-	-	x		
		0.352	8.94	31.13	14.11	46.28	32.00	14.51	47.62	2.600	-	-	-	x		
		0.352	8.94	31.13	14.11	46.28	32.00	14.51	47.62	-	-	3.000	3.600	x	x	x
		0.400	10.16	35.17	15.94	52.30	36.00	16.33	53.58	-	-	3.000	4.100	x	x	x
9 5/8	244.48	0.312	7.92	31.06	14.07	46.18	32.30	14.65	48.07	2.100	-	-	-	x		
		0.352	8.94	34.89	15.81	51.88	36.00	16.33	53.58	2.300	-	-	-	x		
		0.352	8.94	34.89	15.81	51.88	36.00	16.33	53.58	-	-	3.000	3.200	x	x	x
		0.395	10.03	38.97	17.66	57.95	40.00	18.14	59.53	-	-	3.000	3.600	x	x	x
10 3/4	273.05	0.279	7.09	31.23	14.15	46.43	32.75	14.86	48.74	1.200	1.700	-	-	x		
		0.350	8.89	38.91	17.64	57.86	40.50	18.37	60.27	1.600	2.100	-	-	x		
		0.350	8.89	38.91	17.64	57.86	40.50	18.37	60.27	-	-	2.100	2.900	x		x
		0.400	10.16	44.26	20.06	65.81	45.50	20.64	67.71	-	-	2.500	3.300	x		x
		0.450	11.43	49.55	22.45	73.67	51.00	23.13	75.90	-	-	2.800	3.700	x		x
11 3/4	298.45	0.333	8.46	40.64	18.42	60.42	42.00	19.05	62.50	1.400	1.800	-	-	x		
		0.375	9.52	45.60	20.67	67.80	47.00	21.32	69.95	-	-	2.100	2.800	x		x
		0.435	11.05	52.62	23.85	78.23	54.00	24.49	80.36	-	-	2.400	3.300	x		x
		0.489	12.42	58.87	26.68	87.52	60.00	27.22	89.29	-	-	2.700	3.700	x		x
13 3/8	339.73	0.330	8.38	46.02	20.86	68.43	48.00	21.77	71.43	1.200	1.600	-	-	x		
		0.380	9.65	52.79	23.92	78.49	54.50	24.72	81.11	-	-	1.900	2.500	x		x
		0.430	10.92	59.50	26.97	88.47	61.00	27.67	90.78	-	-	2.100	2.800	x		x
		0.480	12.19	66.17	29.99	98.38	68.00	30.84	101.20	-	-	2.400	3.200	x		x
16	406.40	0.375	9.52	62.64	28.39	93.13	65.00	29.48	96.73	1.100	-	-	-	x		
		0.438	11.13	72.86	32.99	108.22	75.00	34.02	111.61	-	-	1.800	-	x		x
		0.495	12.57	82.05	37.18	121.99	84.00	38.10	125.01	-	-	2.000	-	x		x
18 5/8	473.08	0.435	11.05	84.59	38.33	125.77	87.50	39.69	130.22	1.100	-	1.500	-	x		
		0.435	11.05	84.59	38.33	125.77	87.50	39.69	130.22	-	-	1.500	-			x
20	508.00	0.438	11.13	91.59	41.51	136.19	94.00	42.64	139.89	1.100	-	1.400	-	x	x	
		0.438	11.13	91.59	41.51	136.19	94.00	42.64	139.89	-	-	1.400	-			x
		0.500	12.70	104.23	47.23	154.97	106.50	48.31	158.49	-	-	1.600	-	x	x	x

MidTech
Engineering Solutions

API 5CT TUBING (FULL–BODY HEAT TREATMENT)

Outside diameter		Wall thickness		Weight						Test pressure (psi)					
				Plain ends			Threaded & Coupling			H40		J55 & K55		N80-1 & N80-Q	L80-1
in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m	STD	ALT	STD	ALT		
1.050	26.7	0.113	2.87	1.13	0.51	1.68	1.14	0.52	1.70	3.000	6.900	3.000	9.500	10000	10000
		0.113	2.87	1.13	0.51	1.68	1.20	0.54	1.79	3.000	6.900	3.000	9.500	-	-
1.315	33.4	0.133	3.38	1.68	0.76	2.50	1.70	0.77	2.53	3.000	6.500	3.000	8.900	10000	10000
		0.133	3.38	1.68	0.76	2.50	1.72	0.78	2.56	3.000	6.500	3.000	8.900	-	-
		0.133	3.38	1.68	0.76	2.50	1.80	0.82	2.68	3.000	6.500	3.000	8.900	-	-
1.660	42.2	0.125	3.18	2.05	0.93	3.05	2.10	0.95	3.13	3.000	4.800	3.000	6.600	-	-
		0.140	3.56	2.27	1.03	3.38	2.30	1.04	3.42	3.000	5.400	3.000	7.400	10000	10000
		0.140	3.56	2.27	1.03	3.38	2.33	1.06	3.47	3.000	5.400	3.000	7.400	-	-
		0.140	3.56	2.27	1.03	3.38	2.40	1.09	3.57	3.000	5.400	3.000	7.400	-	-
1.900	48.3	0.125	3.18	2.37	1.08	3.53	2.40	1.09	3.57	3.000	4.200	3.000	5.800	-	-
		0.145	3.68	2.72	1.23	4.05	2.75	1.25	4.09	3.000	4.900	3.000	6.700	9800	9800
		0.145	3.68	2.72	1.23	4.05	2.76	1.25	4.11	3.000	4.900	3.000	6.700	-	-
		0.145	3.68	2.72	1.23	4.05	2.90	1.32	4.32	3.000	4.900	3.000	6.700	-	-
2.063	52.4	0.156	3.96	3.18	1.44	4.73	3.25	1.47	4.84	3.000	4.800	3.000	6.700	9700	9700
2 3/8	60.3	0.167	4.24	3.94	1.79	5.86	4.00	1.81	5.95	3.000	4.500	3.000	6.200	9000	9000
		0.190	4.83	4.44	2.01	6.59	4.60	2.09	6.85	3.000	5.100	3.000	7.000	10000	10000
		0.190	4.83	4.44	2.01	6.59	4.70	2.13	6.99	3.000	5.100	3.000	7.000	-	-
2 7/8	73.0	0.217	5.51	6.17	2.79	9.17	6.40	2.90	9.52	3.000	4.800	3.000	6.600	9700	9700
		0.217	5.51	6.17	2.79	9.17	6.50	2.95	9.67	3.000	4.800	3.000	6.600	-	-
3 1/2	88.9	0.216	5.49	7.58	3.44	11.28	7.70	3.49	11.46	3.000	3.900	3.000	5.400	7900	7900
		0.254	6.45	8.81	4.00	13.11	9.20	4.17	13.69	3.000	4.600	3.000	6.400	9300	9300
		0.254	6.45	8.81	4.00	13.11	9.30	4.22	13.84	3.000	4.600	3.000	6.400	-	-
		0.289	7.34	9.92	4.50	14.75	10.20	4.63	15.18	3.000	5.300	3.000	7.300	10000	10000
4	101.6	0.226	5.74	9.12	4.13	13.56	9.50	4.31	14.14	3.000	3.600	3.000	5.000	7200	7200
		0.262	6.65	10.47	4.74	15.57	11.00	4.99	16.37	3.000	4.200	3.000	5.800	8400	8400
4 1/2	114.3	0.271	6.88	12.25	5.55	18.22	12.60	5.72	18.75	3.000	3.900	3.000	5.300	7700	7700
		0.271	6.88	12.25	5.55	18.22	12.75	5.78	18.97	3.000	3.900	3.000	5.300	-	-

API 5CT CASING (FULL–BODY HEAT TREATMENT)

Outside diameter		Wall thickness		Weight						Test pressure (psi)					
				Plain ends			Threaded & Coupling			H40		J55 & K55		N80-1 & N80-Q	L80-1
in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m	STD	ALT	STD	ALT		
4 1/2	114.30	0.205	5.21	9.41	4.26	13.99	9.50	4.31	14.14	2.900	-	3.000	4.000	-	-
		0.224	5.69	10.24	4.64	15.22	10.50	4.76	15.63	-	-	3.000	4.400	-	-
		0.250	6.35	11.36	5.15	16.89	11.60	5.26	17.26	-	-	3.000	4.900	7100	7100
5	127.00	0.220	5.59	11.24	5.09	16.71	11.50	5.22	17.11	-	-	3.000	3.900	-	-
		0.253	6.43	12.84	5.82	19.09	13.00	5.90	19.35	-	-	3.000	4.500	-	-
		0.296	7.52	14.88	6.74	22.13	15.00	6.80	22.32	-	-	3.000	5.200	7600	7600
5 1/2	139.70	0.244	6.20	13.71	6.21	20.39	14.00	6.35	20.83	2.800	-	3.000	3.900	-	-
		0.275	6.99	15.36	6.96	22.84	15.50	7.03	23.07	-	-	3.000	4.400	-	-
		0.304	7.72	16.89	7.65	25.11	17.00	7.71	25.30	-	-	3.000	4.900	7100	7100

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CARBON STEEL PIPE IN BLACK & HOT – DIPPED ZINC – COATED (ASTM A53)

NPS Designator	Outside diameter		Wall thickness		Nominal weight Plain ends			Weight class	Schedule No.	Test pressure Plain ends			
										Grade A		Grade B	
in.	in.	mm	in.	mm	lb/ft	kg/ft	kg/m			psi	kPa	psi	kPa
1/2	0.840	21.3	0.109	2.77	0.85	0.39	1.27	STD	40	700	4830	700	4830
			0.147	3.73	1.09	0.49	1.62	XS	80	850	5860	850	5860
3/4	1.050	26.7	0.113	2.87	1.13	0.51	1.69	STD	40	700	4830	700	4830
			0.154	3.91	1.48	0.67	2.20	XS	80	850	5860	850	5860
1	1.315	33.4	0.133	3.38	1.68	0.76	2.50	STD	40	700	4830	700	4830
			0.179	4.55	2.17	0.98	3.24	XS	80	850	5860	850	5860
1 1/4	1.660	42.2	0.140	3.56	2.27	1.03	3.39	STD	40	1200	8270	1300	8960
			0.191	4.85	3.00	1.36	4.47	XS	80	1800	12410	1900	13100
1 1/2	1.900	48.3	0.145	3.68	2.72	1.23	4.05	STD	40	1200	8270	1300	8960
			0.200	5.08	3.63	1.65	5.41	XS	80	1800	12410	1900	13100
2	2.375	60.3	0.154	3.91	3.66	1.66	5.44	STD	40	2300	15860	2500	17240
			0.218	5.54	5.03	2.28	7.48	XS	80	2500	17240	2500	17240
2 1/2	2.875	73.0	0.203	5.16	5.80	2.63	8.63	STD	40	2500	17240	2500	17240
			0.276	7.01	7.67	3.48	11.41	XS	80	2500	17240	2500	17240
3	3.500	88.9	0.216	5.49	7.58	3.44	11.29	STD	40	2220	15310	2500	17240
			0.300	7.62	10.26	4.65	15.27	XS	80	2500	17240	2500	17240
3 1/2	4.000	101.6	0.226	5.74	9.12	4.14	13.57	STD	40	2030	14000	2370	16340
			0.318	8.08	12.52	5.68	18.63	XS	80	2800	19310	2800	19310
4	4.500	114.3	0.237	6.02	10.80	4.90	16.07	STD	40	1900	13100	2210	15240
			0.337	8.56	15.00	6.80	22.32	XS	80	2700	18620	2800	19310
5	5.563	141.3	0.258	6.55	14.63	6.64	21.77	STD	40	1670	11510	1950	13440
			0.375	9.52	20.80	9.43	30.94	XS	80	2430	16750	2800	19310
6	6.625	168.3	0.280	7.11	18.90	8.61	28.26	STD	40	1520	10480	1780	12270
			0.432	10.97	28.60	12.97	42.56	XS	80	2350	16200	2740	18890
8	8.625	219.1	0.250	6.35	22.38	10.15	33.31	-	20	1040	7170	1220	8410
			0.322	8.18	28.58	12.97	42.55	STD	40	1340	9240	1570	10820
			0.500	12.70	43.43	19.70	64.64	XS	80	2090	14410	2430	16750
10	10.750	273.0	0.250	6.35	28.00	12.73	41.75	-	20	840	5790	980	6760
			0.365	9.27	40.52	18.38	60.29	STD	40	1220	8410	1430	9860
			0.500	12.70	54.79	24.85	81.52	XS	60	1670	11510	1950	13440
12	12.750	323.8	0.250	6.35	33.41	15.15	49.71	-	20	710	4900	820	5650
			0.375	9.52	49.61	22.50	73.78	STD	-	1060	7310	1240	8550
			0.406	10.31	53.57	24.32	79.70	-	40	1150	7930	1340	9240
			0.500	12.70	65.48	29.70	97.43	XS	-	1410	9720	1650	11380
14	14.000	355.6	0.250	6.35	36.75	16.67	54.69	-	10	640	4410	750	5170
			0.312	7.92	45.65	20.71	67.90	-	20	800	5520	940	6480
			0.375	9.52	54.62	24.78	81.25	STD	30	960	6620	1120	7720
			0.438	11.13	63.60	28.80	94.55	-	40	1130	7790	1310	9030
			0.500	12.70	72.16	32.73	107.39	XS	-	1290	8890	1500	10340
16	16.000	406.4	0.250	6.35	42.09	19.09	62.64	-	10	560	3860	660	4550
			0.312	7.92	52.32	23.73	77.83	-	20	700	4830	820	5650
			0.375	9.52	62.64	28.41	93.17	STD	30	840	5790	980	6760
			0.500	12.70	82.85	37.58	123.30	XS	40	1120	7720	1310	9030
18	18.000	457.2	0.250	6.35	47.44	21.52	70.60	-	10	500	3450	580	4000
			0.312	7.92	58.99	26.76	87.75	-	20	620	4270	730	5030
			0.375	9.52	70.65	32.85	105.10	STD	-	750	5170	880	6070
			0.438	11.13	82.23	37.30	122.43	-	30	880	6070	1020	7030
			0.500	12.70	93.54	42.43	139.20	XS	-	1000	6890	1170	8070
20	20.000	508.0	0.250	6.35	52.78	23.94	78.55	-	10	450	3100	520	3590
			0.375	9.52	78.67	35.68	117.02	STD	20	680	4690	790	5450
			0.500	12.70	104.23	47.28	155.12	XS	30	900	6210	1050	7240

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STEEL TUBES AND TUBULARS SUITABLE FOR SCREWING TO BS21 PIPES THREADS (BS 1387)

Tube	Nominal size		Outside diameter				Wall thickness		Weight					
			max.		min.				Plain ends			Screwed and socketed		
	in.	mm	in.	mm	in.	mm	in.	mm	lb/ft	kg/ft	kg/m	lb/ft	kg/ft	kg/m
Light (L)	1/4	8	0.535	13.6	0.520	13.2	0.071	1.8	0.346	0.157	0.515	0.349	0.158	0.519
	3/8	10	0.673	17.1	0.657	16.7	0.071	1.8	0.450	0.204	0.670	0.454	0.206	0.676
	1/2	15	0.843	21.4	0.827	21.0	0.079	2.0	0.636	0.289	0.947	0.642	0.291	0.956
	3/4	20	1.059	26.9	1.039	26.4	0.091	2.3	0.927	0.421	1.380	0.934	0.424	1.390
	1	25	1.331	33.8	1.307	33.2	0.102	2.6	1.331	0.603	1.980	1.344	0.610	2.000
	1 1/4	32	1.673	42.5	1.650	41.9	0.102	2.6	1.707	0.774	2.540	1.727	0.783	2.570
	1 1/2	40	1.906	48.4	1.882	47.8	0.114	2.9	2.171	0.984	3.230	2.198	0.997	3.270
	2	50	2.370	60.2	2.346	59.6	0.114	2.9	2.742	1.244	4.080	2.789	1.265	4.150
	2 1/2	65	2.992	76.0	2.961	75.2	0.126	3.2	3.837	1.740	5.710	3.918	1.777	5.830
	3	80	3.492	88.7	3.461	87.9	0.126	3.2	4.516	2.048	6.720	4.630	2.100	6.890
	4	100	4.484	113.9	4.449	113.0	0.142	3.6	6.552	2.972	9.750	6.721	3.048	10.000
Medium (M)	1/4	8	0.547	13.9	0.524	13.3	0.091	2.3	0.431	0.195	0.641	0.433	0.197	0.645
	3/8	10	0.685	17.4	0.661	16.8	0.091	2.3	0.564	0.256	0.839	0.568	0.258	0.845
	1/2	15	0.854	21.7	0.831	21.1	0.102	2.6	0.813	0.396	1.210	0.820	0.372	1.220
	3/4	20	1.071	27.2	1.047	26.6	0.102	2.6	1.048	0.475	1.560	1.055	0.479	1.570
	1	25	1.346	34.2	1.315	33.4	0.126	3.2	1.620	0.735	2.410	1.633	0.741	2.430
	1 1/4	32	1.689	42.9	1.657	42.1	0.126	3.2	2.083	0.945	3.100	2.104	0.954	3.130
	1 1/2	40	1.921	48.8	1.890	48.0	0.126	3.2	2.399	1.088	3.570	2.426	1.100	3.610
	2	50	2.394	60.8	2.354	59.8	0.142	3.6	3.380	1.533	5.030	3.427	1.554	5.100
	2 1/2	65	3.016	76.6	2.969	75.4	0.142	3.6	4.328	1.963	6.440	4.402	1.996	6.550
	3	80	3.524	89.5	3.496	88.1	0.157	4.0	5.625	2.551	8.370	5.739	2.603	8.540
	4	100	4.524	114.9	4.461	113.3	0.177	4.5	8.199	3.718	12.200	8.401	3.810	12.500
	5	125	5.535	140.6	5.461	138.7	0.197	5.0	11.156	5.059	16.600	11.492	5.212	17.100
	6	150	6.539	166.1	6.461	164.1	0.197	5.0	13.239	6.004	19.700	13.643	6.187	20.300
Heavy (H)	1/4	8	0.547	13.9	0.524	13.3	0.114	2.9	0.514	0.233	0.765	0.517	0.234	0.769
	3/8	10	0.685	17.4	0.661	16.8	0.114	2.9	0.685	0.311	1.020	0.692	0.314	1.030
	1/2	15	0.854	21.7	0.831	21.1	0.126	3.2	0.968	0.439	1.440	0.974	0.442	1.450
	3/4	20	1.071	27.2	1.047	26.6	0.126	3.2	1.257	0.570	1.870	1.263	0.573	1.880
	1	25	1.346	34.2	1.315	33.4	0.157	4.0	1.976	0.896	2.940	1.989	0.902	2.960
	1 1/4	32	1.689	42.9	1.657	42.1	0.157	4.0	2.554	1.158	3.800	2.574	1.167	3.830
	1 1/2	40	1.921	48.8	1.890	48.0	0.157	4.0	2.944	1.335	4.380	2.970	1.347	4.420
	2	50	2.394	60.8	2.354	59.8	0.177	4.5	4.160	1.887	6.190	4.207	1.908	6.260
	2 1/2	65	3.016	76.6	2.969	75.4	0.177	4.5	5.329	2.417	7.930	5.410	2.454	8.050
	3	80	3.524	89.5	3.469	88.1	0.197	5.0	6.922	3.139	10.300	7.057	3.200	10.500
	4	100	4.524	114.9	4.461	113.3	0.213	54	9.745	4.419	14.500	9.946	4.511	14.800
	5	125	5.535	140.6	5.461	138.7	0.213	5.4	12.030	5.456	17.900	12.366	5.608	18.400
	6	150	6.539	166.1	6.461	164.1	0.213	5.4	14.315	6.492	21.300	14.718	6.675	21.900

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UL6 RIGID METAL CONDUITS (HEAVY)

Nominal size	Nominal inside diameter		Outside diameter		Nominal wall thickness		Length without coupling		Weight	
in.	in.	mm	in.	mm	in.	mm	ft. & in.	m	P.E	T.C
1/2	0.632	16.05	0.840	21.34	0.104	2.64	9-11 1/4	3.03	0.371	0.376
3/2	0.836	21.23	1.050	26.67	0.107	2.72	9-11 1/4	3.03	0.490	0.499
1	1.049	26.64	1.315	33.40	0.126	3.20	9-11	3.02	0.726	0.739
1 1/4	1.380	35.05	1.660	42.16	0.133	3.38	9-11	3.02	0.985	1.000
1 1/2	1.610	40.89	1.900	48.26	0.138	3.51	9-11	3.02	1.181	1.200
2	2.067	52.50	2.375	60.33	0.146	3.71	9-11	3.02	1.579	1.610
2 1/2	2.469	62.71	2.875	73.03	0.193	4.90	9-10 1/2	3.01	2.509	2.590
3	3.068	77.93	3.500	88.90	0.205	5.21	9-10 1/2	3.01	3.277	3.370
1 1/2	3.548	90.12	4.000	101.60	0.215	5.46	9-10 1/4	3.00	3.945	4.100
4	4.026	102.26	4.500	114.30	0.225	5.72	9-10 1/4	3.00	4.668	4.790
5	5.047	128.19	5.563	141.30	0.245	6.22	9-10	3.00	6.315	6.510
6	6.065	154.05	6.625	168.28	0.266	6.76	9-10	3.00	8.207	8.520

ANSI C80.1 RIGID STEEL CONDUITS, ZINC COATED

Nominal size	Nominal inside diameter		Outside diameter		Nominal wall thickness		Length without coupling		Weight	
in	in.	mm	in.	mm	in.	mm	ft. & in.	m	P.E	T.C.
3/8	0.493	12.5	0.675	17.1	0.091	2.31	9-11 1/2	3.04	51.5	23.36
1/2	0.632	16.1	0.840	21.3	0.104	2.64	9-11 1/4	3.03	79.0	35.83
3/4	0.836	21.2	1.050	26.7	0.107	2.72	9-11 1/4	3.03	105.0	47.63
1	1.063	27.0	1.315	33.4	0.126	3.20	9-11	3.02	153.0	69.40
1 1/4	1.394	35.4	1.660	42.2	0.133	3.38	9-11	3.02	201.0	91.17
1 1/2	1.624	41.2	1.900	48.3	0.138	3.51	9-11	3.02	249.0	112.95
2	2.083	52.9	2.375	60.3	0.146	3.71	9-11	3.02	332.0	150.60
2 1/2	2.489	63.2	2.875	73.0	0.193	4.90	9-10 1/2	3.01	527.0	239.05
3	3.090	78.5	3.500	88.9	0.205	5.21	9-10 1/2	3.01	682.6	309.63
3 1/2	3.570	90.7	4.000	101.6	0.215	5.46	9-10 1/4	3.00	831.0	376.94
4	4.050	102.9	4.500	114.3	0.225	5.72	9-10 1/4	3.00	972.3	441.04
5	5.073	128.9	5.563	141.3	0.245	6.22	9-10	3.00	1313.6	595.85
6	6.093	154.8	6.6625	168.3	0.266	6.76	9-10	3.00	1745.3	791.67

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MANUFACTURING SIZE RANGE / ROUND STEEL PIPE

(Unit : mm)

Thickness	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Outside diameter														
21.7														
22.2														
25.4														
27.2														
34.0														
42.7														
48.6														
60.5														
76.3														
89.1														
114.3														
139.8														
165.2														
216.3														
267.4														
318.5														
355.6														
406.4														
457.2														
508.0														

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MANUFACTURING SIZE RANGE / SQ & RECT PIPE

(Unit : mm)

Thickness		1	2	3	4	5	6	7	8	9	10	11	12	13
Square	Rectangular													
19× 19														
25× 2														
	30× 20													
30× 30														
	40× 20													
40× 40														
	50× 30													
50× 50														
	60× 40													
60× 60														
	75× 45													
75× 75														
	100× 50													
100× 100														
	125× 75													
125× 125														
	150× 75													
150× 150														
	200× 100													
160× 160														
180× 180														
	200× 150													
200× 200														
	250× 150													
250× 250														
	300× 200													
300× 300														
	350× 250													
	400× 200													
350× 350														
	400× 300													
400× 400														
	500× 300													

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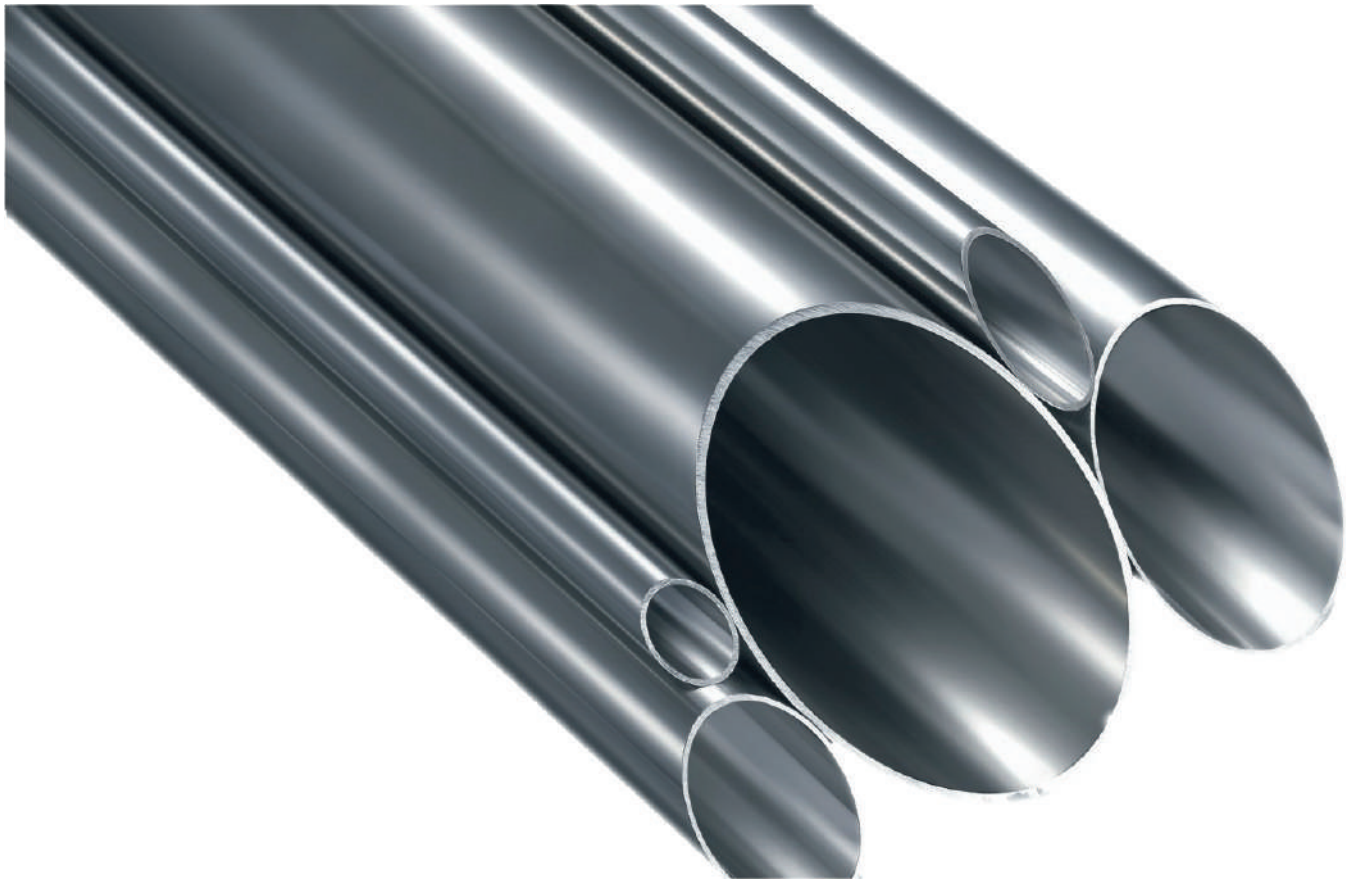

STAINLESS STEEL

PIPES

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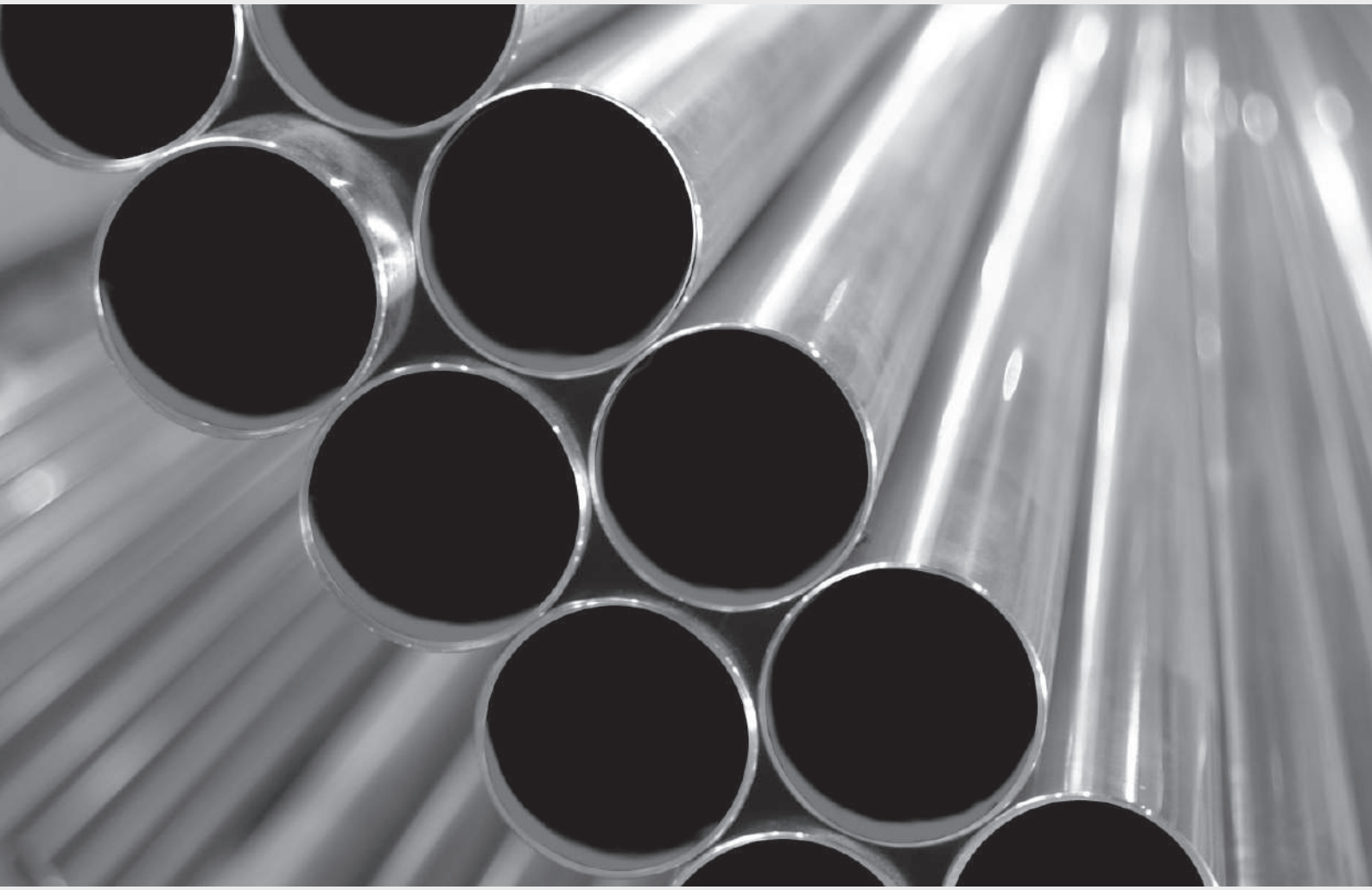

STAINLESS STEEL PIPES & TUBES

Stainless Steel Pipes Data

Seamless & Welded Standard Pipe Tolerances

Nominal Pipe Size Inches	Outside Diameter Tolerances					
	A312 Seamless		A312 Welded		A376 Seamless	
	Plus	Minus	Plus	Minus	Plus	Minus
1/8 IPS to 1 1/2 IPS incl.	.015	.031	.015	.031	.015	.031
2 IPS to 4 IPS incl.	.031	.031	.031	.031	.031	.031
5 IPS to 8 IPS incl.	.062	.031	.062	.031	.062	.031
10 IPS to 12 IPS incl.	.093	.031	.093	.031	.093	.031
Wall Tolerances	By Wt.	12.5%	By Wt.	12.5%	By Wt.	12.5%
Weight Tolerances	10.0%	3.5%	10.0%	3.5%	10.0%	3.5%

Welded A409 Light Wall Pipe Tolerances

Nominal Pipe Size Inches		O.D. Tolerances		Wall Tolerances		Ovality Tolerances	
O.D.	Wall	Plus	Minus	Plus	Minus	Plus	Minus
14 to 30	Under .188	.20%	.20%	*	.018î	1.5%	1.5%
14 to 30	188 & Over	.40%	.40%	*	.018î	1.5%	1.5%

***Wall plus tolerance determined by A480 sheet thickness tolerances**

Welded A358 Heavy Plate Pipe Tolerances

Nominal Pipe Size Inches	O.D. Tolerances		Wall Tolerances		Ovality Tolerances	
	Plus	Minus	Plus	Minus	Plus	Minus
8 IPS and Larger	0.5%	.05%	*	.010î	1.0%	1.0%

***Wall plus tolerance determined by A240 plate thickness tolerances.**

Pipe Description

Specification	Summary
ASTM-A-312	Seamless or Welded Without Filler Metal
ASTM-A-358	Fusion Welded from Plate With Filler Metal
ASTM-A-376	Seamless for High Temperature Service
ASTM-A-409	Welded Light Wall Pipe, Filler Metal Optional

Typical Properties

Material Designation	Tensile Strength Minimum	Yield Strength Minimum	Elongation in 2 Inches Minimum
Standard ì300î Series	75,000 psi	30,000 psi	35%
ì300î Series ìLî Grades	70,000 psi	25,000 psi	35%
ì300î Series ìHî Grades	75,000 psi	30,000 psi	35%

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Stainless Steel Tube

ASW	As Welded	**CFS**	Cold Finished Seamless	**HR**	Hot Rolled
AWAP	As Welded Annealed & Pickled	**CW**	Cold Worked	**S**	Seamless
BA	Bright Annealed	**HD**	Hard Drawn	**W**	Welded
CDS	Cold Drawn Seamless	**HFS**	Hot Finished Seamless	**W&D**	Welded & Drawn

Specifications

	Spec	Material	Class	Temper	Quality
ASTM	A-213	300 Series	CDS or HFS	Annealed	Heat Xchngr.
	A-249	300 Series	WCW or W&D	Annealed	Heat Xchngr.
	A-269	300 series	S, W, W&D	Annealed	Genl. Service
	A-511	300 series	CFS or HFS	Annealed	Mechanical
	A-511	Type 416	CFS	Annealed	Mechanical
	A-554	300 series	Welded	Various	Mechanical
	A-632	300 series	S or W, CF	Annealed	Genl. Service
ASME	SA-213	300 series	CDS or HFS	Annealed	Heat Xchngr.
	SA-249	300 series	WCW or W&D	Annealed	Genl. Service
Military	T-6737	321/347	Welded	Annealed	Ducting
	T-6845	Type 304	S or W&D	1/8 Hard	Hydraulic
	T-8504	Type 304	S or W	Annealed	Hydraulic
	T-8506	Type 304	S or W	Annealed	Structural
	T-8606	304L/321/347	S or W	Annealed	Structural
	T-8808	321/347	S or W&D	Annealed	Hydraulic
	T-8973	304L/321/347	S or W&D	1/8 Hard	Hydraulic
AMS	5556	Type 347	S or W&D	Annealed	Hydraulic
	5557	Type 321	S or W&D	Annealed	Hydraulic
	5558	Type 347	W (Thin Wall)	Annealed	Ducting
	5559	Type 321	W (Thin Wall)	Annealed	Ducting
	5560	Type 304	Seamless	Annealed	LP Hyd.
	5561	21-6-9	W&D	1/8-1/4Hard	Hydraulic
	5562	21-6-9	W&D	Annealed	LP Hyd.
	5565	Type 304	Welded	Annealed	LP Hyd.
	5566	Type 304	S or W&D	1/8 Hard	Hydraulic
	5567	Type 304	S or W&D	Annealed	Hydraulic
	5570	Type 321	Seamless	Annealed	Structural
	5571	Type 347	Seamless	Annealed	Structural
	5573	Type 316	Seamless	Annealed	Structural
	5575	Type 347	Welded	Annealed	Structural
	5576	Type 321	Welded	Annealed	Structural
	5639	Type 304	CFS	Annealed	Mechanical
	5645	Type 321	CFS	Annealed	Mechanical
	5647	Type 304L	CFS	Annealed	Mechanical
	5648	Type 316	CFS	Annealed	Mechanical

Stainless Steel Tube Data

Chemical Composition

AISI Type	Chemistry-Percent								Typical Characteristics
	C	Mn	P	S	SI	CR	NI	Other	
304	0.08 max	2.00 max	0.040 max	0.030 max	.075 max	18.00-20.00	8.00-11.00	-	General purpose "300" series grade for tubing applications.
304L	0.035 max	2.00 max	0.040 max	0.030 max	0.75 max	18.00-20.00	8.00-13.00	-	Low carbon type 304 where greater resistance to carbide precipitation is desired.
304H	0.04-0.10	2.00 max	0.040 max	0.030 max	0.75 max	18.00-20.00	8.00-11.00	-	Carbon modified for improved high temperature strength.
310	0.15 max	2.00 max	0.040 max	0.030 max	0.75 max	24.00-26.00	19.00-22.00	-	High resistance to scaling and oxidation up to 2000°F.
316	0.08 max	2.00 max	0.040 max	0.030 max	0.75 max	16.00-18.00	11.00-14.00	Mo 2.00-3.00	Better corrosion resistance than type 304 in reducing media. Good hi-temp strength.
316L	0.035 max	2.00 max	0.040 max	0.030 max	0.75 max	16.00-18.00	10.00-15.00	Mo 2.00-3.00	Low carbon type 316 where greater resistance to carbide precipitation is desired.
316H	0.04-0.10	2.00 max	0.040 max	0.030 max	0.75 max	16.00-18.00	11.00-14.00	Mo 2.00-3.00	Carbon modified for improved temperature strength.
317	0.08 max	2.00 max	0.040 max	0.030 max	0.75 max	18.00-20.00	11.00-14.00	Mo 3.00-4.00	Similar to type 316 but with better corrosion resistance and creep strength.
321	0.08 max	2.00 max	0.040 max	0.030 max	0.75 max	17.00-20.00	9.00-13.00	Ti 5XC-0.60	Titanium stabilized against carbide precipitation. Similar properties to type 304.
347	0.08 max	2.00 max	0.040 max	0.030 max	0.75 max	17.00-20.00	7.00-13.00	Gb + Ta 10XC-1.00	Columbium and tantalum stabilized against carbide precipitation.
21-6-9	0.04 max	8.00 max	0.060 max	0.030 max	1.00 max	19.00-21.50	5.50-7.50	N 0.15-0.40	High strength-to-weight ratio. Good corrosion resistance.
416	0.15 max	1.25 max	0.060 max	0.15 max	1.00 max	12.00-14.00	-	-	Hardenable by heat treatment. Free machining. Moderate corrosion resistance.

Stainless Steel Pipe

All pipe is Seamless unless noted "W" for Welded

Suffix "L" designates Low Cardon Grades (.035 C Max.)

FG Fitting Grade

HFE Hot Finished Extruded

Specifications

Spec	Material	Class	Temper	Quality	
ASTM	A-312	300 series	Seamless	Annealed	Genl. Service
	A-312	300 series	Weld w/o Filler	Annealed	Genl. Service
	A-358	300 series	Weld w Filler	Annealed	Welded Plate
	A-376	300 series	Seamless	Annealed	Hi Temp Service
	A-409	300 series	Welded	Annealed	Large Diameter
ASME	SA-312	300 series	S or W w/o Filler	Annealed	Genl. Service
	SA-358	300 series	Weld w Filler	Annealed	Welded Plate
	SA-376	300 series	Seamless	Annealed	Hi Temp Service
	SA-409	300 series	Welded	Annealed	Large Diameter

Properties

Material Type & Temper	Tensile PSL	Yield PSL	Elong % in 2"
304L&316L Annealed	70,000	25,000	35
304&304H Annealed	75,000	25,000	35
316&316H Annealed	75,000	30,000	35

Mechanical Properties

Type	Temper	Nominal Mechanical Properties			
		Tensile PSI	Yield PSI	Elong. % In 2"	Rockwell Hardness
304	Annealed	85,000	35,000	55	RB80
	1/8 Hard	105,000	75,000	20	RB95
304 L	Annealed	80,000	30,000	55	RB75
	1/8 Hard	105,000	75,000	20	RB95
304H	Annealed	85,000	35,000	55	RB80
310	Annealed	95,000	45,000	45	RB85
316	Annealed	85,000	35,000	50	RB80
316L	Annealed	80,000	30,000	50	RB75
316H	Annealed	85,000	35,000	50	RB80
317	Annealed	90,000	40,000	45	RB85
321	Annealed	90,000	35,000	55	RB80
	1/8 Hard	105,000	75,000	20	RB95
347	Annealed	95,000	40,000	50	RB85
21-6-9	Annealed	100,000	60,000	45	RB90
	1/8 Hard	142,000	120,000	20	RC30
416	Annealed	75,000	35,000	20	RB95

Properties

Material Type & Temper	Tensile PSI	Yield PSI	Elong. % In 2"	Rockwell Hardness
304/316 Annealed	85,000	35,000	55	R85B
304L/316L Annealed	80,000	30,000	55	R80B
321/347 Annealed	85,000	35,000	55	R85B
304/321 1/8 Hard	105,000	75,000	20	R95B
Type 416 Annealed	75,000	35,000	20	R95B
21-6-9 1/8 Hard	142,000	120,000	20	R30C

The information and data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes.

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 XS	. 40 80	10S 40S 80S	.049 .068 .095	.307 .269 .215
1/4	0.540	. STD XS	. 40 80	10S 40S 80S	.065 .088 .119	.410 .364 .302
3/8	0.675	. STD XS	. 40 80	10S 40S 80S	.065 .091 .126	.545 .493 .423
1/2	0.840	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .083 .109 .147 .187 .294	.710 .674 .622 .546 .466 .252
3/4	1.050	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .083 .113 .154 .219 .308	.920 .884 .824 .742 .612 .434
1	1.315	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .109 .133 .179 .250 .358	1.185 1.097 1.049 .957 .815 .599

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 1/4	1.660	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .109 .140 .191 .250 .382	1.530 1.442 1.380 1.278 1.160 .896
1 1/2	1.900	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .109 .145 .200 .281 .400	1.770 1.682 1.610 1.500 1.338 1.100
2	2.375	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.065 .109 .154 .218 .344 .436	2.245 2.157 2.067 1.939 1.687 1.503
2 1/2	2.875	. . STD XS . XXS	. . 40 80 160 .	5S 10S 40S 80S . .	.083 .120 .203 .276 .375 .552	2.709 2.635 2.469 2.323 2.125 1.771
3	3.500	. . STD XS .	. . 40 80 160	5S 10S 40S 80S .	.083 .120 .216 .300 .438	3.334 3.260 3.068 2.900 2.624

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.			
		XXS	.	.	.600	2.300
3 1/2	4.000	. . STD XS	. . 40 80	5S 10S 40S 80S	.083 .120 .226 .318	3.834 3.760 3.548 3.364
4	4.500	. . STD XS . . XXS	. . 40 80 120 160 .	5S 10S 40S 80S . . .	.083 .120 .237 .337 .438 .531 .674	4.334 4.260 4.026 3.826 3.624 3.438 3.152
5	5.563	. . STD XS . . XXS	. . 40 80 120 160 .	5S 10S 40S 80S . . .	.109 .134 .258 .375 .500 .625 .750	5.345 5.295 5.047 4.813 4.563 4.313 4.063
6	6.625	. . STD XS . . XXS	. . 40 80 120 160 .	5S 10S 40S 80S . . .	.109 .134 .280 .432 .562 .718 .864	6.407 6.357 6.065 5.761 5.501 5.189 4.897
8	8.625	. . .	. . 20	5S 10S .	.109 .148 .250	8.407 8.329 8.125

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.			
		.	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

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.			
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
		.	.	10S	.188	15.624
		.	10	.	.250	15.500
		.	20	.	.312	15.376
		STD	30	.	.375	15.250
		XS	40	.	.500	15.000
		.	60	.	.656	14.688
		.	80	.	.844	14.312
		.	100	.	1.031	13.938
		.	120	.	1.219	13.562
		.	140	.	1.438	13.124
		.	160	.	1.594	12.812

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.			
18	18.00	.	.	5S	.165	17.670
		.	.	10S	.188	17.624
		.	10	.	.250	17.500
		.	20	.	.312	17.376
		STD	.	.	.375	17.250
		.	30	.	.438	17.124
		XS	.	.	.500	17.000
		.	40	.	.562	16.876
		.	60	.	.750	16.500
		.	80	.	.938	16.124
		.	100	.	1.156	15.688
		.	120	.	1.375	15.250
		.	140	.	1.562	14.876
		.	160	.	1.781	14.438

- 1 in (inch) = 25

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 - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
1/8	.0548 .0720 .0925	.0740 .0568 .0364	.00051 .00040 .00025	.00088 .00106 .00122	.19 .24 .31	.032 .025 .016	.106 .106 .106	.00437 .00523 .00602
1/4	.0970 .1250 .1574	.1320 .1041 .0716	.00091 .00072 .00050	.00279 .00331 .00377	.33 .42 .54	.057 .045 .031	.141 .141 .141	.01032 .01227 .01395
3/8	.1246 .1670 .2173	.2333 .1910 .1405	.00162 .00133 .00098	.00586 .00729 .00862	.42 .57 .74	.101 .083 .061	.178 .178 .178	.01736 .02160 .02554
1/2	.1583 .1974 .2503 .3200 .3836 .5043	.3959 .3568 .3040 .2340 .1706 .050	.00275 .00248 .00211 .00163 .00118 .00035	.01197 .01431 .01709 .02008 .02212 .02424	.54 .67 .85 1.09 1.31 1.71	.172 .155 .132 .102 .074 .022	.220 .220 220 .220 220 .220	.02849 .03407 .04069 .04780 .05267 .05772
3/4	.2011 .2521 .3326 .4335 .5698 .7180	.6648 .6138 .5330 .4330 .2961 .148	.00462 .00426 .00371 .00300 .00206 .00103	.02450 .02969 .03704 .04479 .05269 .05792	.69 .86 1.13 1.47 1.94 2.44	.288 .266 .231 .188 .128 .064	.275 .275 .275 .275 .275 .275	.04667 .05655 .07055 .08531 .10036 .11032
1	.2553 .4130 .4939 .6388 .8365	1.1029 .9452 .8640 .7190 .5217	.00766 .00656 .00600 .00499 .00362	.04999 .07569 .08734 .1056 .1251	.87 1.40 1.68 2.17 2.84	.478 .409 .375 .312 .230	.344 .344 .344 .344 .344	.07603 .11512 .1328 .1606 .1903

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Inertia - I - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
	1.0760	.282	.00196	.1405	3.66	.122	.344	.2136
1 1/4	.3257	1.839	.01277	.1038	1.11	.797	.435	.1250
	.4717	1.633	.01134	.1605	1.81	.708	.435	.1934
	.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
1 1/2	.3747	2.461	.01709	.1579	1.28	1.066	.497	.1662
	.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
2	.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
2 1/2	.7280	5.764	.04002	.7100	2.48	2.50	.753	.4939
	1.039	5.453	.03787	.9873	3.53	2.36	.753	.6868
	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

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Inertia - I - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
	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

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Inertia - I - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
	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

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Inertia - I - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
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
16	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
	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	1.175	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

Pipe Size (inches)	Area of Metal (square inches)	Transverse Internal Area		Inertia - I - ($inches^4$)	Weight Pipe (pounds per foot)	Weight Water (pounds per foot)	External Surface (square feet per foot of pipe)	Elastic Section Modulus (in^3)
		- a - (square inches)	- A - (square feet)					
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:

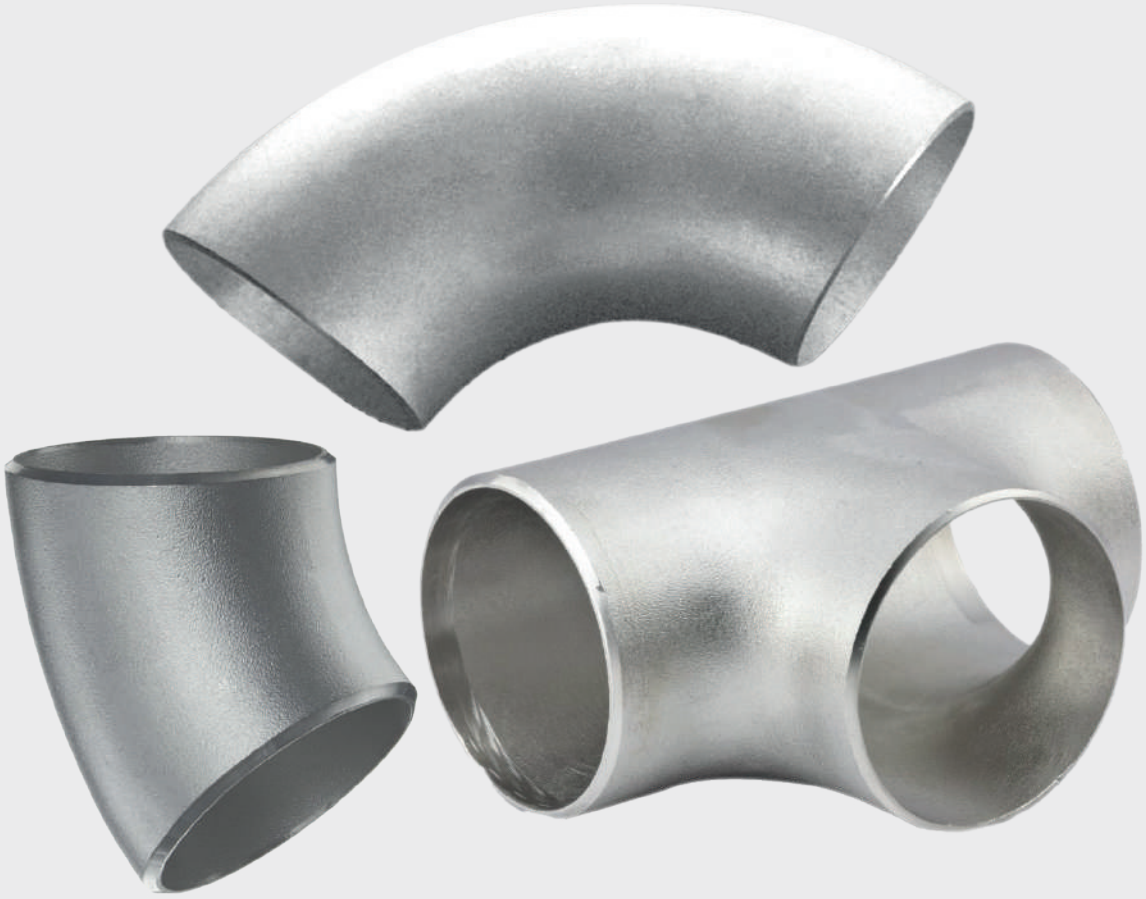
- standard wall - STD
- extra strong wall - XS
- double extra strong wall - XXS

MidTech
Engineering Solutions

CARBON STEEL
STAINLESS STEEL

BUTT-WELD PIPE FITTINGS

MidTech
Engineering Solutions



CARBON STEEL & STAINLESS STEEL

BUTT-WELD PIPE FITTINGS

Stainless Steel Butt-Weld Pipe Fittings

ASTM A403 WP-W, WP-WX, WP-S, MSS-SP43-, ANSI B16.9, B16.28

MATERIAL: 304/304L , 316/316L
THICKNESS: SCH10S , SCH 40S
SIZE: °90 LR 24~"2/1"
°90 SR 6~"1"
°45 LR 24~"2/1"

MATERIAL: 304/304L , 316/316L
THICKNESS: SCH10S , SCH 40S
SIZE: CON-RED 4/3"x12~"2/1"x8"
ECC-RED 4/3"x12~"2/1"x8"

MATERIAL: 304/304L , 316/316L
THICKNESS: SCH10S , SCH 40S
SIZE: Equal-Tee 12~"2/1"
Reducing-Tee 4/3"x12~"2/1"x8"
CAPS 16~"2/1"

MATERIAL: 304/304L , 316/316L
THICKNESS: SCH10S , SCH 40S
SIZE: TYPE A. B. C . 12~"2/1"

STAINLESS STEEL PIPE FITTINGS

ASTMA 403/A 403M WROUGHT AUSTENITIC STAINLESS STEEL PIPE FITTINGS

A 403/403M WP 304	0.08 max.	2.00	1.00	0.030	0.045	18.00 20.00	8.00 11.00	-	-	75000 (515)	3000 (205)	28(Longit) 20(transv.)	-
A 403/403M WP 304L	0.035 max.	2.00	1.00	0.030	0.045	18.00 20.00	18.00 13.00	--	--	70000 (485)	25000 (170)	28(Longit) 20(transv.)	--
A 403/403M WP 309	0.015 max.	2.00	1.00	0.030	0.045	22.00 24.00	12.00 15.00	--	--	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 310	0.015 max.	2.00	1.50	0.030	0.045	24.00 26.00	19.00 22.00	--	--	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 316	0.08 max.	2.00	1.00	0.030	0.045	16.00 18.00	10.00 14.00	2.00 3.00	--	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 316 L N	0.030 max.	2.00	0.75	0.030	0.040	16.00 18.00	11.00 14.00	2.00 3.00	N 0.16-0.1	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 316 L	0.035 max.	2.00	1.00	0.030	0.045	16.00 18.00	10.00 15.00	2.00 3.00	-	70000 (485)	25000 (170)	28(Longit) 20(transv.)	--
A 403/403M WP 316 L	0.030 max.	2.00	1.00	0.030	0.045	18.00 20.00	11.00 15.00	3.00 4.00	-	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 321	0.08 max.	2.00	1.00	0.030	0.045	17.00 20.00	9.00 13.00	-	Ti5-xc=0.70	75000 (515)	30000 (205)	28(Longit) 20(transv.)	--
A 403/403M WP 347H	0.08 max.	2.00	1.00	0.030	0.045	17.00 20.00	9.00 13.00	-	Cb+Ti= 1.10-8.0	75000 (515)	30000 (205)	28(Longit) 20(transy.)	

TECHNICAL DATA FOR PIPE FITTINGS

STAINLESS STEEL	
AUSTENITIC	ASTM/ASME SA 403 WP 304 (L) (H) (LN) (N)
	ASTM/ASME SA 403 WP 321 (H)
	ASTM/ASME SA 403 WP 316 (L) (H) (LN) (N) (TI)
	ASTM/ASME SA 403 WP 347 (H)
	ASTM/ASME SA 403 WP 317 (L)
	ASTM/ASME SA 403 UNS-S%6) 31254- Mo)
AUSTENITIC/ FERRITIC	ASTM/ASME SA 815 UNS-S%22) 31803- CR)
	ASTM/ASME SA 815 UNS-S%25) 32760- CR)
CARBON STEEL	
FOR MODERATE TEMPERATURE	ASTM/ASME SA 234 WPB
	ASTM/ASME SA 234 WPC
FOR LOW TEMPERATURE	ASTM/ASME SA 420 WPC6
CARBON/ NIKEL FOR LOW TEMPERATURE	ASTM/ASME SA 420 WPL3
HIGH YIELD MATERIALS	MSS-SP75 WPHY 42
	MSS-SP75 WPHY 46
	MSS-SP75 WPHY 52
	MSS-SP75 WPHY 56
	MSS-SP75 WPHY 60
	MSS-SP75 WPHY 65
	MSS-SP75 WPHY 70
ALLOY STEEL	
FOR ELEVATED TEMPERATURE	ASTM/ASME SA 234 WP1
	ASTM/ASME SA 234 WP12
	ASTM/ASME SA 234 WP11
	ASTM/ASME SA 234 WP22
	ASTM/ASME SA 234 WP5
	ASTM/ASME SA 234 WP9
	ASTM/ASME SA 234 WP91
NON FERROUS ALLOYS	
ALUMINIUM BASE	ASTM B361 GR. 6061-3003
	ASTM B366 MONEL 400
	ASTM B366 INCONEL 600
	ASTM B366 INCOLOY 800
	ASTM B366 INCOLOY 825
	ASTM B366 HASTELLOY B, C, X
COPPER BASE	CUPRONICKEL 10– 90 AND 30-70
TITANIUM	ASTM B363 WPT2

TECHNICAL DATA FOR PIPE FITTINGS

MANUFACTURING PROGRAM		
SOCKETWELD AND	90 & 45 DEG. LR ELBOWS	4/1» TO 4» NB
THREADED FITTINGS	TEES & REDUCING TEES	4/1"TO 4" NB
PRESSURE RATINGS	COUPLINGS	4/1"TO 4" NB
#9000 ,#6000 ,#3000 ,#2000	CAPS	4/1"TO 4" NB
	UNION	4/1"TO 4" NB
	CROSSES	4/1"TO 4" NB
	PLUGS	4/1"TO 4" NB
	BUSHES	4/1"TO 4" NB
	BOSS	4/1"TO 4" NB
BUTTWELD FITTINGS		
SEAMLESS	90 & 45 DEG. LR/SR ELBOWS	2/1"TO 24" NB
	TEES & REDUCING TEES	2/1"TO 24" NB
	ECC/ CONC. REDUCERS	2/1"TO 24" NB
	CAPS	2/1"TO 36" NB
WELDED	90 & 45 DEG. LR/SR ELBOWS	4"TO 36" NB
	TEES & REDUCING TEES	4"TO 36" NB
	ECC/ CONC. REDUCERS	4"TO 48" NB
	CAPS	26"TO 48" NB
WALL THICKNESSES	ALL SCHEDULES TO ANSI B10 ,36 AND UPTO 100 mm	
SPECIAL PRODUCTS	BENDS RADIUS 2.5D, 3D, 5D, 10D & OTHER SPECIAL RADIUS	
	REDUCING ELBOWS	
	U BENDS OF SPECIAL CROSSES	
	LATERALS 'Y' PIECES	
	WELDOLETS, SWEEPOLETS, LATEROLETS, SOCKO-LETS	
	ELBOWLETS & THREADOLETS	
	SPECIAL FITTINGS ACCORDING TO DRAWINGS	
	PRE-FABRICATED PIPING COMPONENTS AS PER DRAWING.	
MANUFACTURING STANDARDS	ASME B1639 - B16.28 - B16.25	
	MSS-SP87 – 43 - 75	
	DIN 2617 – 2616 - 2615 - 2606 - 2605	
DESIGN CODES	ASME I - ASME III DIV. 1 SUB NB	
	ASME I - ASME III DIV. 1 SUB NC	
	ASME I - ASME III DIV. 1 SUB ND	
	ASTM B1 ,31 - B31.4- - B31.8	

STANDARDS & CODES FOLLOWED	
BUTTWELD, SOCKETWELD & THREADED FITTINGS & FLANGES ARE OFFERED CONFIRMING TO FOLLOWING STANDARDS	
ANSI B 16.9	Wrought Steel Buttwelding Fittings
ANSI B 16.28	Wrought Steel Buttwelding S.R.Elbows & Returns.
ANSI B 16.11	Forged Steel Fittings Socket Welding & Threaded.
ANSI B. 16.5	Pipe Flanges and Flanged Fittings
ANSI B. 16.25	Butt Welding Ends
MSS SP43-	Wrought Stainless Steel Buttwelding Fittings.
MSS SP75-	High Test Wrought Buttwelding Fittings
DIN 2605	Tubes Bends for Butt Welding Steel tubes.
DIN 2605	Tubes Bends Steel for But welding Steel Type 5D.
DIN 2615	But Welding Steel Fittings Tees.
DIN 2616	Butt Welding STeel Fittings Reducers.
DIN 2617	Butt Welding Steel Fittings Caps.
BS 1640	Steel Butt Welding Pipe Fittings for the Petroleum Industry
ASTM A105	Forgings, Carbon Steel for piping components.
ASTM A182	Forged & Rolled Alloy Steel Pipe Flanges, Forged Fittings & Valves and parts for high temperature services.
ASTM A 234	Piping fittings of wrought carbon steel & Alloy Steel for moderate and elevated temperatures.
ASTM A 350	Carbon & Low Alloy Steel, requiring notch toughness testing for piping components.
ASTM A 403	Wrought Austenities stainless steel piping fittings.
ASTM A420	Pipes fittings of wrought carbon steel and alloy steel for low temperature services
JIS B2311	Steel Butt Welding pipe fittings for ordinary use.
JIS B2311	Steel Butt Welding Pipe fittings for special use
API 5L	Line Pipes
API 5LX	High Test Line Pipe
ASTM A 515	Standard specifications for Pressure Vessel Plates Carbon Steel for intermediate and Higher Temp. services.
ASTM A 516	Standard Specifications for Pressure Vessel Plates Carbon steel for Moderate and Lower temp services.
ASTM A 517	Standard specifications for Pressure Vessel Plates Alloy Steel High Strength Quaenched & Tempered.
ASTM A 333	Standard specification for Seamless & Welded Steel Pipe for Low Temperature Serivices.
ASTM A 335	Standard Specification for Seamless Ferritic Alloy steel pipe for High Temperature service.
IS 2002	Specification for steel Plates for Boilers.
IS 2062	Specification for weldable structure steel.
IS 1239	Mild Steel Tubes Tubulars & other wrought steel fittings
IS 3589	specification.
ASTM A 694	Specification for Carbon & Alloy Steel forgings for pipe flanges, fittings, valves & parts for high pressure transmission service.
ASTM A 860	Specification for wrought High Strength Low Alloy Steel butt welding fittings.

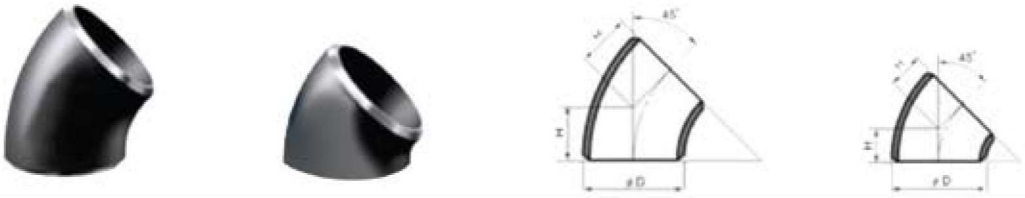
Flanges as per DIN & JIS Standards are also offered.Fittings not covered under above specifications like High Nickel Alloy fittings/MR-01-75 NACE-Corrosion Resistant fittings/High Temperature and high pressure fittings are also offered.

ASTM A234/234M PIPING FITTINGS OF WROUGHT CARBON STEEL FOR MODERATE AND ELEVATED TEMPERATURES												
ASTM GRADE	C	Mn	Si	S	P	Cr	Ni	Mo	Tensile Psi(Mpa)	YIELD Psi(Mpa)	Elongation	Hardness HB
A234 WPB	0.30 max.	0.29 1.06	0.10 min.	0.058 max.	0.050 max.	-	-	-	85000-60000 (585-415)	35000 (240)	30 Recp.Spc. 22Round.Spc.	197
A234 WPC	0.35 max.	0.29 1.06	0.10 min.	0.058 max.	0.050 max.	-	-	-	95000-70000 (655-485)	40000 (275)	30Recp.Spc. 22RoundSpc.	197

ASTM A234/234M PIPE FITTINGS OF WROUGHT ALLOY STEEL FOR MODERATE AND ELEVATED TEMPERATURES											
ASTM GRADE	C	Mn	Si	S	P	Cr	Mo	Tensile Psi(Mpa)	YIELD Psi(Mpa)	Elongation	Hardness HB
A 234/ 234M WP12 CL1-	0.2	0.30 0.80	0.60 MAX	0.045 max.	0.035 max.	-0.80 1.25	0.44 0.65	-60000 85000 (585 -415)	32000 (220)	30Recp.Spc. 22Round Spc.	197
A234/234M WP12 CL2-	0.20	0.30 0.80	0.60 max.	0.045 max.	0.045 max.	-0.80 1.25	0.44 0.65	-70000 95000 (655-485)	40000 (275)	30Recp.Spc. 22RoundSpc.	197
A234/234M WP11CL1-	0.15	0.30 0.60	0.50 1.00	0.030 max.	0.030 max.	1.00 1.50	0.44 0.65	-60000 85000 (585-415)	30000 (205)	30rECP.sPC 22Round.Spc.	197
A234/234M WP11CL2-	0.2	0.30 0.60	0.50 1.50	0.040 max.	0.040 max.	1.00 1.50	0.44 0.65	9500-70000 (655-485)	40000 (275)	30Recp.Spc. 22RoundSpc.	197
A234/234M WP11 CL3-	0.2	0.30 0.60	0.50 1.00	0.040 max	0.040 max	1.00 1.50	0.44 0.65	-75000 100000 (690-520)	450000 (310)	30Recp.Spc. 22RoundSpc.	197
A234/234M WP11 CL1-	0.15	0.30 0.60	0.50 max.	0.040 max	0.040 max	1.90 2.60	0.87 1.13	-60000 85000 (585-415)	30000 (205)	30Recp.Spc. 22RoundSpc.	197
A234/234M WP11 CL3-	0.15	0.30 0.60	0.50 max.	0.040 max	0.040 max	1.90 2.60	0.87 1.13	-75000 100000 (690-520)	45000 (315)	30Recp.Spc. 22RoundSpc.	197
A234/234M WP5	0.15 max.	0.30 0.60	0.50 max.	0.030 max	0.040 max	4.00 6.00	0.44 0.65	-60000 850000 (585-415)	30000 (205)	30Recp.Spc. 22RoundSpc.	217
A234/234M WP 9	0.15 max.	0.30 0.60	0.25 max	0.030 max	0.030 max	8.00 10.00	0.90 1.10	-60000 850000 (585-415)	30000 (225)	30Recp.Spc. 22RoundSpc	217

THREADED FITTINGS - °45 ELBOWS

LONG SHORT LONG SHORT

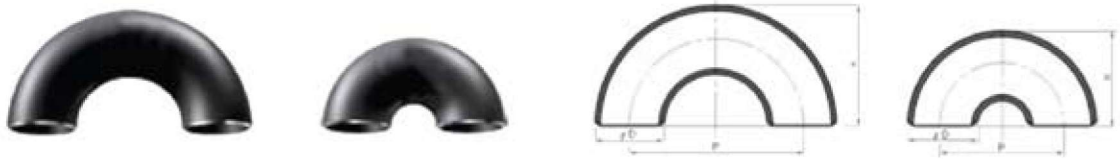


THREADED FITTINGS - °90 ELBOWS

LONG SHORT LONG SHORT

THREADED FITTINGS - °180 ELBOWS

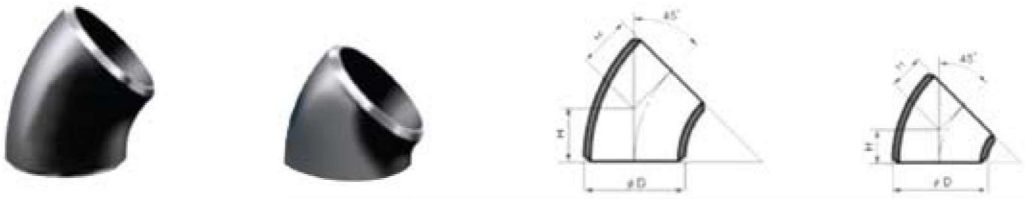
LONG SHORT LONG SHORT



Nominal pipe size		Outside Diameter at Bevel		Center to End			Center to Center		Back to Faces	
				°45 Elbows	°90 Elbows		°180Return			
				H	F		P		K	
DN	INCH	Series A	Series B	LR	LR	SR	LR	SR	LR	SR
15	2/1	21.3	18	16	38	-	76	-	48	-
20	4/3	26.9	25	16	38	-	76	-	51	-
25	1	33.7	32	16	38	25	76	51	56	41
32	$1_{4/1}$	42.4	38	20	48	32	95	64	70	52
40	$1_{2/1}$	48.3	45	24	57	38	114	76	83	62
50	2	60.3	57	32	76	51	152	102	106	81
65	$2_{2/1}$	73)76.1)	76	40	95	64	191	127	132	100
80	3	88.9	89	47	114	76	229	152	159	121
90	$3_{2/1}$	101.6	-	55	133	89	267	178	184	140
100	4	114.3	108	63	152	102	305	203	210	159

THREADED FITTINGS - °45 ELBOWS

LONG SHORT LONG SHORT

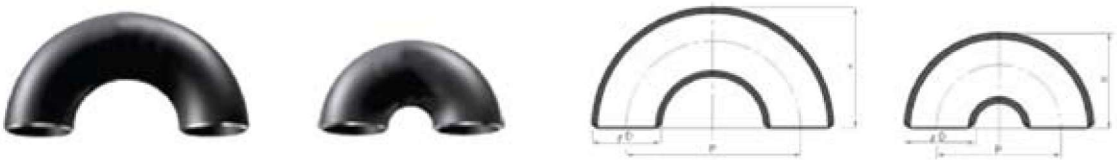


THREADED FITTINGS - °90 ELBOWS

LONG SHORT LONG SHORT

THREADED FITTINGS - °180 ELBOWS

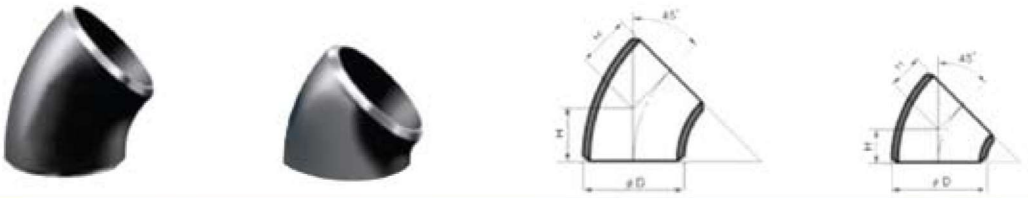
LONG SHORT LONG SHORT



Nominal pipe size		Outside Diameter at Bevel		Center to End			Center to Center		Back to Faces	
				°45 Elbows	°90 Elbows		°180Return			
				H	F		P		K	
125	5	139.7	133	79	190	127	381	254	262	197
150	6	168.3	159	95	229	152	457	305	313	237
200	8	219.1	219	126	305	203	610	406	414	313
250	10	273.0	273	158	381	254	762	508	518	391
300	12	323.9	325	189	457	305	914	610	619	467
350	14	355.6	377	221	533	356	1067	711	711	533
400	16	406.4	426	253	610	406	1219	813	813	610
450	18	457.2	478	284	686	457	1372	914	914	686
500	20	508.0	529	316	762	508	1524	1016	1016	762
550	22	559	-	347	838	559	-	-	-	-
600	24	610	630	379	914	610	-	-	-	-

THREADED FITTINGS - °45 ELBOWS

LONG SHORT LONG SHORT

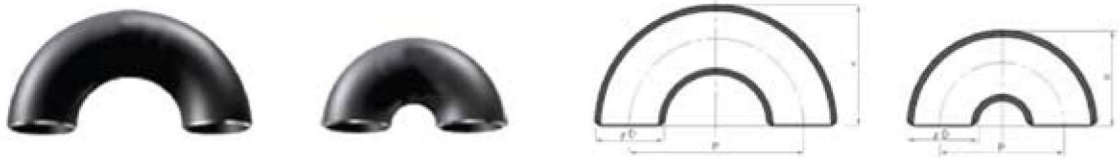


THREADED FITTINGS - °90 ELBOWS

LONG SHORT LONG SHORT

THREADED FITTINGS - °180 ELBOWS

LONG SHORT LONG SHORT

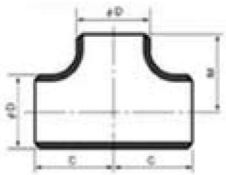
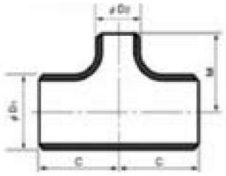


Nominal pipe size		Outside Diameter at Bevel		Center to End			Center to Center		Back to Faces	
				°45 Elbows	°90 Elbows		°180Return			
				H	F		P		K	
650	26	660	-	410	991	660	-	-	-	-
700	28	711	720	442	1067	711	-	-	-	-
750	30	762	-	473	1143	762	-	-	-	-
800	32	813	820	505	1219	813	-	-	-	-
850	34	864	-	537	1295	864	-	-	-	-
900	36	914	920	568	1372	914	-	-	-	-
950	38	965	-	600	1448	965	-	-	-	-
1000	40	1016	1020	631	1524	1016	-	-	-	-
1050	42	1067	-	663	1600	1067	-	-	-	-
1100	44	1118	1120	694	1676	1118	-	-	-	-
1150	46	1168	-	726	1753	1168	-	-	-	-
1200	48	1220	1220	758	1829	1219	-	-	-	-

THREADED FITTINGS - STRAIGHT & REDUCING

STRAIGHT REDUCING STRAIGHT REDUCING



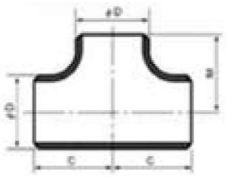
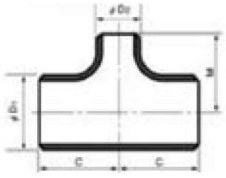



Nominal pipe size DN	Outside Diameter at Bevel				Center to End	
	D1		D2		C	M
	Seri	Series B	Series A	Series B		
15×20	26.9	25	21.3	18	29	29
20×25	33.7	32	26.9	25	38	38
15×25	33.7	32	21.3	18	38	38
25×32	42.4	38	33.7	32	48	48
20×32	42.4	38	26.9	25	48	48
15×32	42.4	38	21.3	18	48	48
32×40	48.3	45	42.4	38	57	57
25×40	48.3	45	33.7	32	57	57
20×40	48.3	45	26.7	25	57	57
15×40	48.3	45	21.3	18	57	57
40×50	60.3	57	48.3	45	64	60
32×50	60.3	57	42.4	38	64	57
25×50	60.3	57	33.7	32	64	51
20×50	60.3	57	26.9	25	64	44
50×65	73)76.1)	76	60.3	57	76	70
40×65	73)76.1)	76	48.3	45	76	67
32×65	73)76.1)	76	42.4	38	76	64
25×65	73)76.1)	76	33.7	32	76	57
65×80	88.9	89	73)76.1)	76	86	83
50×80	88.9	89	60.3	57	86	76
40×80	88.9	89	48.3	45	86	73
32×80	88.9	89	42.4	38	86	70
80×90	101.6	-	88.9	-	95	92
65×90	101.6	-	73)76.1)	-	95	89
50×90	101.6	-	60.3	-	95	83
40×90	101.6	-	48.3	-	95	79
90×100	114.3	-	101.6	-	105	102
80×100	114.3	108	88.9	89	105	98
65×100	114.3	108	73)76.1)	76	105	95
50×100	114.3	108	60.3	57	105	89
40×100	114.3	108	48.3	45	105	86
100×125	139.7	133	114.3	108	124	117
90×125	139.7	-	101.6	-	124	114
80×125	139.7	133	88.9	89	124	111
65×125	139.7	133	73)76.1)	76	124	108
50×125		133	60.3	57	124	105
125×150	168.3	159	139.7	133	143	137
100×150	168.3	159	114.3	108	143	130
90×150	168.3	-	101.6	-	143	127
80×150	168.3	159	88.9	89	143	124
65×150	168.3	159	73)76.1)	76	143	121

THREADED FITTINGS - STRAIGHT & REDUCING

STRAIGHT REDUCING STRAIGHT REDUCING



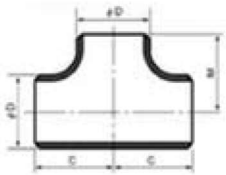
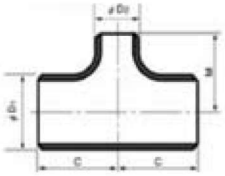



Nominal pipe size DN	Outside Diameter at Bevel				Center to End	
	D1		D2		C	M
	Seri	Series B	Series A	Series B		
150×200	219.1	219	168.3	159	178	168
125×200	219.1	219	139.7	133	178	162
100×200	219.1	219	114.3	108	178	156
90×200	219.1	-	101.6	-	178	152
200×200	273.0	273	219.1	219	216	208
150×200	273.0	273	168.3	159	216	194
125×200	273.0	273	139.7	133	216	191
100×200	273.0	273	114.3	108	216	184
250×300	323.9	325	273.0	273	254	241
200×300	323.9	325	219.1	219	254	229
150×300	323.9	325	168.3	159	254	219
125×300	323.9	325	139.7	133	254	216
300×350	355.6	377	323.9	325	279	270
250×350	355.6	377	273.0	273	279	257
200×350	355.6	377	219.1	219	279	248
150×350	355.6	377	168.3	159	279	238
350×400	406.4	426	355.6	377	305	305
300×400	406.4	426	323.9	325	305	295
250×400	406.4	426	273.0	273	305	283
200×400	406.4	426	219.1	219	305	273
150×400	406.4	426	168.3	159	305	264
400×450	457.2	478	406.4	426	343	330
350×450	457.2	478	355.6	377	343	330
300×450	457.2	478	323.9	325	343	321
250×450	457.2	478	273.0	273	343	308
200×450	457.2	478	219.1	219	343	298
450×500	508.0	529	457.2	478	381	368
100×500	508.0	529	406.4	426	381	356
350×500	508.0	529	355.6	377	381	356
300×500	508.0	529	323.9	325	381	346
250×500	508.0	529	273.0	273	381	333
200×500	508.0	529	219.1	219	381	324
500×550	559	-	508	-	419	406
450×550	559	-	457	-	419	394
400×550	559	-	406	-	419	381
550×600	610	-	559	-	432	432
550×600	610	630	508	530	432	432
450×600	610	630	457	480	432	419
600×650	660	-	610	-	495	483
550×650	660	-	559	-	495	470
500×650	660	-	508	-	495	457

STRAIGHT & REDUCING

STRAIGHT REDUCING STRAIGHT REDUCING



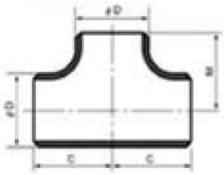
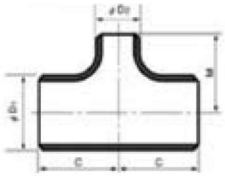



Nominal pipe size DN	Outside Diameter at Bevel				Center to End	
	D1		D2		C	M
	Seri	Series B	Series A	Series B		
650×700	711	-	660	-	521	521
600×700	711	720	610	630	521	508
550×700	711	-	559	-	521	495
700×750	762	-	711	-	559	546
650×750	762	-	660	-	559	546
600×750	762	-	610	-	559	533
750×800	813	-	762	-	597	584
700×800	813	820	711	720	597	572
650×800	813	-	660	-	597	572
800×850	864	-	813	-	635	622
750×850	864	-	762	-	635	610
700×850	864	-	711	-	635	597
850×900	914	-	864	-	673	660
800×900	914	920	813	820	673	648
750×900	914	-	762	-	673	635
900×950	965	-	914	-	711	711
850×950	965	-	864	-	711	698
800×950	965	-	813	-	711	686
950×1000	1016	-	965	-	749	749
900×1000	1016	1020	914	920	749	737
8500×1000	1016	-	864	-	749	724
1000×1000	1067	-	1016	-	762	711
950×1050	1067	-	965	-	762	711
900×1050	1067	-	914	-	762	711
1050×1100	1118	-	1067	-	813	762
1000×1100	1118	1120	1016	1020	813	749
950×1100	1118	-	965	-	813	737
1100×1150	1168	-	1118	-	851	800
1050×1150	1168	-	1067	-	851	787
1000×1150	1168	-	1016	-	851	775
1150×1200	1220	-	1168	-	889	838
1100×1200	1220	1220	1118	1120	889	838
1050×1200	1220	-	1067	-	889	813

STRAIGHT & REDUCING

STRAIGHT REDUCING STRAIGHT REDUCING



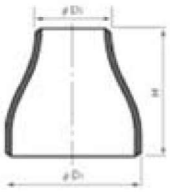
Nominal pipe size		Outside Diameter at Bevel D		Center to End C	Center to End M
DN	INCH	Series A	Series B		
15	2/1	21.3	18	25	
20	4/3	26.9	25	29	
25	1	33.7	32	38	
32	1 4/1	42.4	38	48	
40	1 2/1	48.3	45	57	
50	2	60.3	57	64	
65	2 2/1	73)76.1)	76	76	
80	3	88.9	89	86	
90	3 2/1	101.6	-	95	
100	4	114.3	108	105	
125	5	139.7	133	124	
150	6	168.3	159	143	
200	8	219.1	219	178	
250	10	273.0	273	216	
300	12	323.9	325	254	
350	14	355.6	377	279	
400	16	406.4	426	305	
450	18	457.2	478	343	
500	20	508.0	529	381	
550	22	559	-	419	
600	24	610	630	432	
650	26	660	-	495	
700	28	711	720	521	
750	30	762	-	559	
800	32	813	820	597	
850	34	864	-	635	
900	36	914	920	673	
950	38	965	-	711	
1000	40	1016	1020	749	
1050	42	1067	-	762	711
1100	44	1118	1120	813	762
1150	46	1168	-	851	800
1200	48	1220	1220	889	838

CONCENTRIC & ECCENTRIC

CONCENTRIC

ECCENTRIC

CONCENTRIC



ECCENTRIC

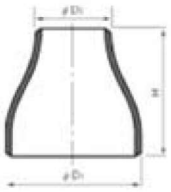
Nominal pipe size DN	Outside Diameter at Bevel				Center to End
	D1		D2		End to End L
	Series A	Series B	Series A	Series B	
15×20	26.9	25	21.3	18	38
20×25	33.7	32	26.9	25	51
15×25	33.7	32	21.3	18	51
25×32	42.4	38	33.7	32	51
20×32	42.4	38	26.9	25	51
15×32	42.4	38	21.3	18	51
32×40	48.3	45	42.4	38	64
25×40	48.3	45	33.7	32	64
20×40	48.3	45	26.7	25	64
15×40	48.3	45	21.3	18	64
40×50	60.3	57	48.3	45	76
32×50	60.3	57	42.4	38	76
25×50	60.3	57	33.7	32	76
20×50	60.3	57	26.9	25	76
50×65	73)76.1)	76	60.3	57	89
40×65	73)76.1)	76	48.3	45	89
32×65	73)76.1)	76	42.4	38	89
25×65	73)76.1)	76	33.7	32	89
65×80	88.9	89	73)76.1)	76	89
50×80	88.9	89	60.3	57	89
40×80	88.9	89	48.3	45	89
32×80	88.9	89	42.4	38	89
80×90	101.6	-	88.9	-	102
65×90	101.6	-	73)76.1)	-	102
50×90	101.6	-	60.3	-	102
40×90	101.6	-	48.3	-	102
32×90	101.6	-	42.4	-	102
90×100	114.3	108	101.6	-	102
80×100	114.3	108	88.9	89	102
65×100	114.3	108	73)76.1)	76	102
50×100	114.3	108	60.3	57	102
40×100	114.3	108	48.3	45	102
100×125	139.7	133	114.3	108	127
90×125	139.7	-	101.6	-	127
80×125	139.7	133	88.9	89	127
65×125	139.7	133	73)76.1)	76	127
50×125	139.7	133	60.3	57	127
125×150	168.3	159	139.7	133	140
100×150	168.3	159	114.3	108	140
90×150	168.3	-	101.6	-	140
80×150	168.3	159	88.9	89	140
65×150	168.3	159	73)76.1)	76	140

CONCENTRIC & ECCENTRIC

CONCENTRIC

ECCENTRIC

CONCENTRIC



ECCENTRIC

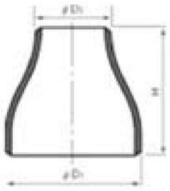
Nominal pipe size DN	Outside Diameter at Bevel				Center to End
	D1		D2		End to End L
	Series A	Series B	Series A	Series B	
150×200	219.1	219	163.8	159	152
125×200	219.1	219	139.7	133	152
100×200	219.1	219	114.3	108	152
90×200	219.1	-	101.6	-	152
200×250	273.0	273	219.1	219	178
150×250	273.0	273	168.3	159	178
125×250	273.0	273	139.7	133	178
100×250	273.0	273	114.3	108	178
250×300	323.9	325	273.0	273	203
200×300	323.9	325	219.1	219	203
150×300	323.9	325	168.3	159	203
125×300	323.9	325	139.7	133	203
300×350	355.6	377	323.9	325	330
250×350	355.6	377	273.0	273	330
200×350	355.6	377	219.1	219	330
150×350	355.6	377	168.3	159	330
350×400	406.4	426	355.6	377	356
300×400	406.4	426	323.9	325	356
250×400	406.4	426	273.0	273	356
200×400	406.4	426	219.1	219	356
400×450	457.2	478	406.4	426	381
350×450	457.2	478	355.6	377	381
300×450	457.2	478	323.9	325	381
250×450	457.2	478	273.0	273	381
450×500	508.0	529	457.2	478	508
400×500	508.0	529	406.4	426	508
350×500	508.0	529	355.6	377	508
300×500	508.0	529	323.9	325	508
500×550	559	-	508	-	508
450×550	559	-	457	-	508
400×550	559	-	406	-	508
350×550	559	-	356	-	508
550×600	610	-	559	-	508
500×600	610	630	508	530	508
450×600	610	630	457	480	508
400×600	610	630	406	426	508
600×650	660	-	610	-	610
550×650	660	-	559	630	610
500×650	660	-	508	-	610
450×650	660	-	457	630	610

CONCENTRIC & ECCENTRIC

CONCENTRIC

ECCENTRIC

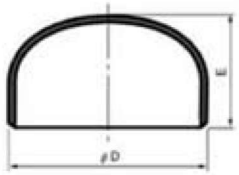
CONCENTRIC



ECCENTRIC

Nominal pipe size DN	Outside Diameter at Bevel				Center to End
	D1		D2		End to End L
	Series A	Series B	Series A	Series B	
650×700	711	-	660	-	610
600×700	711	720	310	720	610
550×700	711	-	559	-	610
500×700	711	720	508	630	610
700×750	762	-	711	-	610
650×750	762	-	660	-	610
600×750	762	-	610	-	610
550×750	762	-	559	-	610
750×800	813	-	762	-	610
700×800	813	820	711	720	610
650×800	813	-	660	-	610
600×800	813	820	610	630	610
800×850	864	-	813	-	610
750×850	864	-	762	-	610
700×850	864	-	711	-	610
650×850	864	-	660	-	610
850×900	914	-	864	-	610
800×900	914	920	813	820	610
750×900	914	-	762	-	610
700×900	914	920	711	820	610
900×950	965	-	914	-	610
850×950	965	-	864	-	610
800×950	965	-	813	-	610
750×950	965	-	762	-	610
950×1000	1016	-	965	-	610
900×1000	1016	1020	914	920	610
850×1000	1016	-	864	-	610
800×1000	1016	1020	813	920	610
1000×1050	1067	-	1016	-	610
950×1050	1067	-	965	-	610
900×1050	1067	-	914	-	610
850×1050	1067	-	864	-	610
1050×1100	1118	-	1067	-	610
1000×1100	1118	1120	1016	1020	610
950×1100	1118	-	965	-	610
900×1100	1118	1120	914	1020	610
1100×1150	1168	-	1118	-	711
1050×1150	1168	-	1067	-	711
1000×1150	1168	-	1016	-	711
950×1150	1168	-	965	-	711
1150×1200	1220	-	1168	-	711
1100×1200	1220	1220	1118	1120	711
1050×1200	1220	-	1067	-	711
1000×1200	1220	1220	1016	1120	711

CAPS



Nominal pipe size - DN	Outside Diameter at Bevel		Length		Limiting Wall Thickness for length E
	Series A	Series B	E	E1	
15	21.3	18	25	-	-
20	26.9	25	25	-	-
25	33.7	32	38	-	-
32	42.4	38	38	-	-
40	48.3	45	38	-	-
50	60.3	57	38	44	5.5
65	73)76.1)	76	38	51	7.0
80	88.9	89	51	64	7.6
90	101.6	-	64	76	8.1
100	114.3	108	64	76	8.6
125	139.7	133	76	89	9.5
150	168.3	159	89	102	11.0
200	219.1	219	102	127	12.7
250	273.0	273	127	152	12.7
300	323.9	325	152	178	12.7
350	355.6	377	165	191	12.7
400	406.4	426	178	203	12.7
450	457.2	478	203	229	12.7
500	508.0	529	229	254	12.7
550	559	-	254		-
600	610	630	267		-
650	660	-	267		-
700	711	720	267		-
750	762	-	267		-
800	813	820	267		-
850	864	-	267		-
900	914	920	267		-
950	965	-	305		-
1000	1016	1020	305		-
1050	1067	-	305		-
1100	1118	1120	343		-
1150	1168	-	343		-
1200	1220	1220	343		-

MidTech
Engineering Solutions

FORGED STEEL & STAINLESS STEEL

FORGED FITTINGS

FORGED STEEL FITINGS

THREADED & SOCKET WELD

Forged Steel Fittings

Threaded Fittings

1. Class 2000, 3000 and 6000 for threaded fittings.
2. Industry standardized thread forms are assured through rigid adherence to ANSI/ASME B1.20.1 standards.
3. Quality threads are assured and controlled by ANPT gauging standards. Qualified gauge calibration programs are maintained on all inspection and test equipment.
4. Extended reinforcing bands beyond the critical depth of threading ensure that wall thickness dimensions are maintained.

Socket Weld Fittings

1. Class 3000, 6000 and 9000 for socket weld fittings.
2. Forging design and geometry ensure minimum thickness conditions are always exceeded.
3. Concentric socket and through bores minimize turbulance and waterway flow restrictions.
4. Extended reinforcing bands and center distance to socket bottom dimension ensure minimum wall thickness dimensions are exceeded.

- Engineered and manufactured from materials in accordance with the relevant ASTM material specifications.

  8/1" - 4" ASTM A 105, ASME SA105
  8/1" - 2 ½" ASTM A182, Grade F5, F9, f11 and F22

- Capitol Forged Steel fittings and Unions meet the latest revisions of ANSI B16.11 and MSS SP83 and MSS SP79 dimensional standards.

- Permanent heat code identification and pipe size markings on fittings and unions ensure full traceability from raw material to finished product.

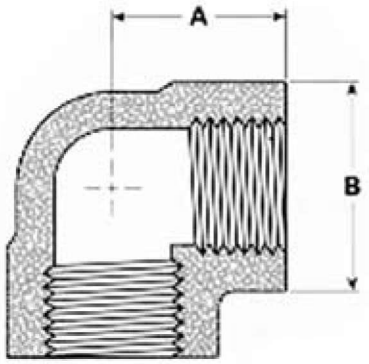
- Forged steel shapes are machined from solid forgings with grain flow and strength designed in to meet the most stringent operating conditions.

- Extensive in-process final inspection, certification and quality assurance records are maintained for future reference.

Forged Steel Threaded Fittings

8/1" - 4" Material ASTM A105; ASME SA105; A234, A350
8/1" - 2/1-2" Material ASTM A182 Grade F5, F9, F11 and F22
Class 3000 ,2000 and 6000

THREADED FITTINGS - °90 ELBOWS



Class 2000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/11	4 8/3	5 4/3
Approx. Wt. #	.17	.17	.28	.49	.70	1.03	1.63	2.04	3.38	6.56	10.00	22.50

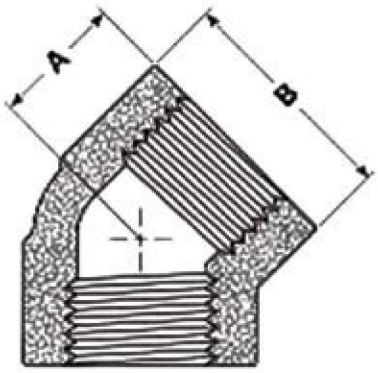
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 2/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	6
Approx. Wt. #	.21	.31	.60	.91	1.43	2.28	2.88	4.88	5.44	10.00	17.13	29.25

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 16/3	---
Dimension B	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	5 4/3	---
Approx. Wt. #	.25	.66	1.00	1.59	2.54	3.56	5.88	7.06	13.00	21.78	36.22	---

THREADED FITTINGS - °45 ELBOWS



Class 2000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	16/13	4/3	8/7	1	1 8/1	1 16/5	1 8/3	1 16/11	2 16/1	2 2/1	3 8/1
Dimension B	---	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	3 32/1	3 32/1	4	4 8/5	5 4/3
Approx. Wt. #	---	.14	.23	.45	.59	.90	1.40	1.65	2.63	7.63	12.00	---

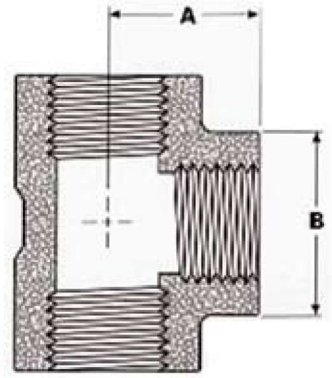
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	4/3	4/3	8/7	1	1 8/1	1 16/5	1 8/3	1 16/11	1 16/13	2 8/1	2 16/9	3 8/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	5 4/3
Approx. Wt. #	.18	.26	.54	.75	1.18	2.03	2.13	4.05	4.25	7.63	12.00	19.75

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	4/3	8/7	1	1 8/1	1 16/5	1 8/3	1 16/11	1 16/13	2 8/1	2 16/9	3 8/1	---
Dimension B	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	5 4/3	---
Approx. Wt. #	.25	.59	.85	1.34	2.25	2.59	4.56	5.75	9.63	15.46	31.21	---

THREADED FITTINGS - TEES



Class 2000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 8/5	4 16/5	5 4/3
Approx. Wt. #	.23	.26	.34	.69	.95	1.35	2.10	2.75	4.25	9.06	13.50	32.50

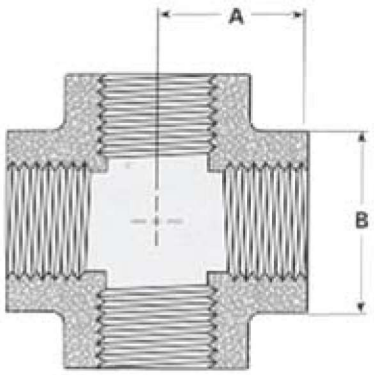
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 2/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	6
Approx. Wt. #	.28	.43	.84	1.23	1.85	3.00	3.63	6.83	7.00	13.75	21.00	38.00

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 16/3	---
Dimension B	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	5 4/3	---
Approx. Wt. #	.44	.92	1.38	2.16	3.63	4.83	7.75	9.75	17.38	28.90	49.60	---

THREADED FITTINGS - CROSSES



Class 2000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 16/3	2 16/7	2 32/31	3 16/11	4 16/5	5 4/3
Approx. Wt. #	.50	.50	.40	.80	1.05	1.65	2.35	3.28	5.00	17.20	22.10	32.70

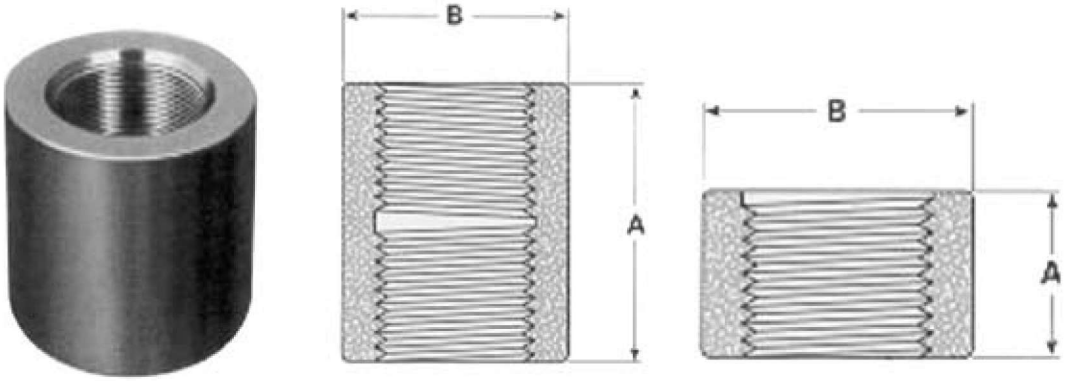
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	4/11	2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	8/11	16/15	2/11	4/13	2	8/23	2/21	3 4/1	4/33	2/41
Dimension B	8/7	64/13	16/15	2/11	16/113	16/23	16/27	32/231	16/35	4	4/43	6
Approx. Wt. #	.59	.50	.96	1.43	2.30	3.73	4.40	8.13	8.31	16.94	20.75	34.13

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	2/11	2	2 2/1	3	4
Dimension A	32/31	8/11	16/15	2/11	1 4/3	2	8/23	2/21	3 4/1	3 4/3	16/43	---
Dimension B	64/13	16/15	2/11	16/113	2 16/3	16/27	32/231	3 16/5	4	4 4/3	4/53	---
Approx. Wt. #	.50	1.12	.55	2.59	4.21	5.64	9.58	11.39	21.37	28.32	55.88	---

THREADED FITTINGS - FULL AND HALF COUPLINGS



Full Coupling, Reducer

Class 3000 (Weight # refers to Full Coupling Only)												
Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1 4/1	1 8/3	1 2/1	1 8/7	2	2 8/3	2 8/5	3 8/1	3 8/3	3 8/5	4 4/1	4 4/3
Dimension B	4/3	4/3	8/7	1 8/1	1 8/3	1 4/3	2 4/1	2 2/1	3	3 8/5	4 4/1	5 2/1
Approx. Wt. #	11.	10.	13.	28..	42.	85.	1.50	2.19	3.02	4.56	6.79	12.00

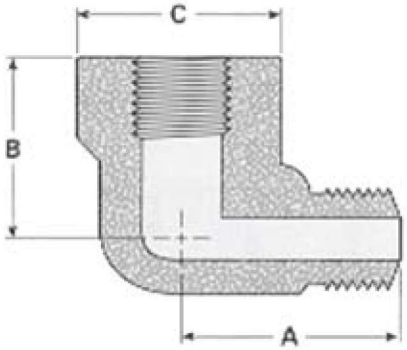
Class 6000 (Weight # refers to Full Coupling Only)												
Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1 4/1	1 8/3	1 2/1	1 8/7	2	2 8/3	2 8/5	3 8/1	3 8/3	3 8/5	4 4/1	4 4/3
Dimension B	8/7	1	1 4/1	1 2/1	1 4/3	2 4/1	2 2/1	3	3 8/5	4 4/1	5	6 4/1
Approx. Wt. #	18.	14.	40.	69.	90.	1.88	2.31	4.00	7.50	9.25	13.44	22.13

Half Coupling

Class 3000												
Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	8/5	16/11	4/3	16/15	1	1 16/3	1 16/5	1 16/9	1 16/11	1 16/13	2 8/1	2 8/3
Dimension B	4/3	4/3	8/7	1 8/1	1 8/3	1 4/3	2 4/1	2 2/1	3	3 8/5	4 4/1	5 2/1
Approx. Wt. #	06.	05.	06.	14.	21.	43.	75.	1.09	1.57	2.28	3.40	6.00

Class 6000												
Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	8/5	16/11	4/3	16/15	1	1 16/3	1 16/5	1 16/9	1 16/11	1 16/13	2 8/1	2 8/3
Dimension B	8/7	1	1 4/1	1 2/1	1 4/3	2 4/1	2 2/1	3	3 8/5	4 4/1	5	6 4/1
Approx. Wt. #	09.	07.	20.	35.	45.	94.	1.15	2.00	3.75	4.62	6.72	11.06

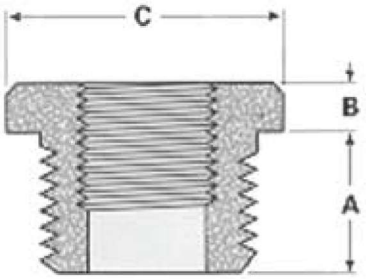
THREADED FITTINGS - STREET ELBOWS



Class 3000

Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	1 4/1	1 2/1	1 8/5	1 8/7	2 4/1	2 8/5	2 16/13	3 16/5	---	---	---
Dimension B	---	8/7	1 8/1	1 4/1	1 8/3	1 4/3	2	2 8/1	2 2/1	---	---	---
Dimension C	---	1	1 16/5	1 2/1	1 4/3	2	2 16/7	2 4/3	3 16/5	---	---	---
Approx. Wt. #	---	25.	36.	53.	85.	1.38	2.25	2.81	5.09	---	---	---

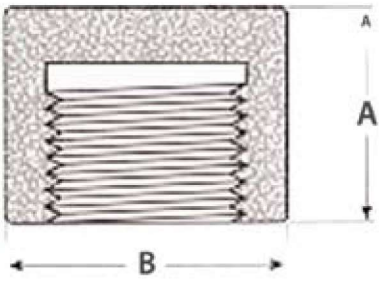
THREADED FITTINGS - HEX BUSHINGS *



Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	2/1	64/33	16/11	32/23	8/7	8/7	16/15	32/31	1 16/3	1 8/3	1 16/9
Dimension B	---	8/1	16/3	16/3	32/7	4/1	16/5	16/5	8/3	2/1	16/9	16/9
Dimension C	---	8/5	16/11	8/7	16/1	1 8/3	1 4/3	2	2 2/1	3	3 8/5	4 8/5
Approx. Wt. #	---	063.	063.	063.	125.	188.	375.	688.	1.62	2.37	3.50	8.31

*** Bushings are not identified by class. They may be used for ratings up to and including class 6000**

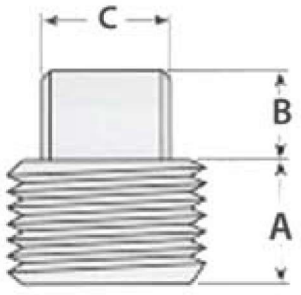
THREADED FITTINGS - CAPS



Class 3000

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	1 16/1	1 16/1	1 16/5	1 2/1	1 16/11	1 32/25	1 16/15	2 8/1	2 8/3	2 16/9	2 16/11
Dimension B	4/3	4/3	8/7	1 8/1	1 8/3	1 4/3	2 4/1	2 2/1	3	3 8/5	4 16/5	5 2/1
Approx. Wt. #	08.	09.	11.	24.	39.	72.	1.32	1.54	2.34	4.05	5.84	10.08

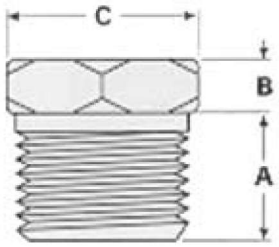
THREADED FITTINGS - PLUGS **



Solid Square Head

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	8/3	16/7	2/1	16/9	8/5	4/3	16/13	16/13	8/7	1 16/1	1 8/1	1 4/1
Dimension B	4/1	4/1	16/5	8/3	16/7	2/1	8/5	8/5	4/3	4/3	16/13	1
Dimension C	32/9	8/3	16/7	16/9	8/5	16/13	16/15	1 8/1	1 16/5	1 2/1	1 16/11	2 2/1
Approx. Wt. #	016.	031.	063.	0125.	188.	313.	563.	875.	1.50	2.25	2.87	7.18

THREADED FITTINGS - PLUGS **

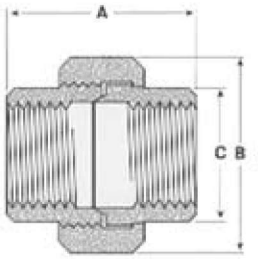


Hex Head

Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/7	32/19	64/33	16/11	32/23	8/7	8/7	16/15	32/31	*1 16/3	*1 8/3	*1 16/9
Dimension B	4/1	4/1	16/5	16/5	8/3	8/3	16/9	8/5	16/11	4/3	16/13	4/3
Dimension C	16/7	8/5	16/11	8/7	1 16/1	1 8/3	1 4/3	2	2 2/1	3	3 4/1	4 8/5
Approx. Wt. #	06.	06.	07.	19.	30.	58.	1.10	1.54	2.54	2.34	6.24	11.0

* Not B16.11

THREADED UNIONS



Solid Round Head

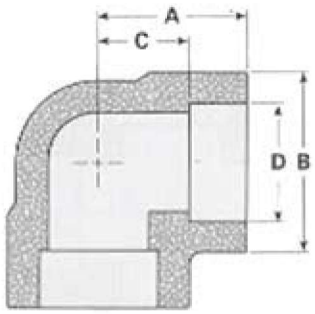
Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1 8/3	1 8/5	1 8/5	1 4/3	1 4/3	2	2	2	2 2/1	2 4/3	2 4/3	3
Dimension B	16/7	16/9	4/3	8/7	1 16/1	1 16/5	1 16/11	2	2 2/1	3	3 8/5	4 8/5
Approx. Wt. #	06.	11.	20.	30.	44.	77.	1.27	1.78	3.48	5.50	8.04	14.28

** Plugs are not identified by class. They may be used for ratings up to and including class 6000.

Class 3000 · MSS-SP83-

Pipe Size	8/1 1	4/1 2	8/3 1	2/1 1	4/3 1	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1.69	1.69	1.85	1.96	2.28	2.49	2.82	3.05	3.45	4.13	4.31	--
Dimension B	1.38	1.38	1.57	1.85	2.20	2.56	3.06	3.42	4.09	4.88	5.75	--
Dimension C	0.88	0.88	1.03	1.23	1.46	1.80	2.18	2.47	3.03	3.65	4.40	--
Approx. Wt. #	34.	34.	49.	68.	1.19	1.68	2.54	3.33	5.30	8.60	12.70	--

SOCKET WELD FITTINGS - °90 ELBOWS



Socket Depth = Dimension A minus Dimension C

Class 6000 · Steel to Steel Seat

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1.69	1.85	1.96	2.28	2.49	2.82	3.05	3.45	4.13	--	--	--
Dimension B	1.38	1.57	1.85	2.20	2.56	3.06	3.42	4.09	4.88	--	--	--
Dimension C	0.88	1.03	1.23	1.47	1.80	2.18	2.47	3.03	3.65	--	--	--
Approx. Wt. #	36.	55.	75.	1.36	2.00	3.10	5.85	6.55	10.50	--	--	--

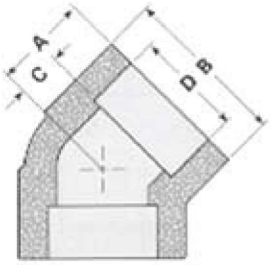
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/11	4 8/3	5 4/3
Dimension C	16/7	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 8/5
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	20.	16.	25.	48.	68.	1.06	1.59	2.13	3.78	6.74	10.94	24.13

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 2/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	6
Dimension C	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 2/1	2 8/7
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	16.	25.	48.	88.	1.38	2.63	3.00	5.31	6.00	10.47	18.84	31.54

SOCKET WELD FITTINGS - °45 ELBOWS



Socket Depth = Dimension A minus Dimension C

Class 9000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	---	---	1 2/1	1 4/3	2	2 8/3	2 2/1	3	---	---	---
Dimension B	---	---	---	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	3 16/11	---	---	---
Dimension C	---	---	---	1	1 8/1	1 4/1	1 8/3	1 2/1	2 8/1	---	---	---
Dimension D	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---
Approx. Wt. #	---	---	---	1.44	2.25	4.09	5.25	6.69	12.00	---	---	---

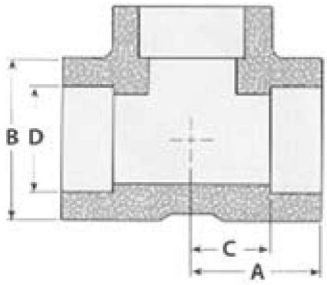
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	4/3	8/7	1	1 8/1	1 16/5	1 8/3	1 16/11	2 8/1	2 16/9	3 8/1
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	4	4 4/3	5 4/3
Dimension C	16/5	16/5	16/5	16/7	2/1	16/9	16/11	16/13	1	1 8/1	1 4/1	1 8/5
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	15.	13.	20.	43.	58.	89.	1.40	1.70	2.69	7.88	11.25	20.75

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	4/3	8/7	1	1 8/1	1 16/5	1 8/3	1 16/11	1 16/13	2 8/1	2 16/9	3 8/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	5 4/3
Dimension C	16/5	16/5	16/7	2/1	16/9	16/11	16/13	1	1 8/1	1 8/1	1 4/1	1 8/5
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	---	---	---	68.	1.14	2.03	2.25	4.22	5.03	8.88	12.76	23.45

SOCKET WELD FITTINGS - TEES



Socket Depth = Dimension A minus Dimension C

Class 9000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	---	---	1 8/1	1 16/5	1 8/3	1 16/11	1 16/13	2 16/1	---	---	---
Dimension B	---	---	---	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	---	---	---
Dimension C	---	---	---	8/5	4/3	16/13	8/7	1	1 8/1	---	---	---
Dimension D	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---
Approx. Wt. #	---	---	---	1.42	2.06	2.50	4.31	6.51	10.44	---	---	---

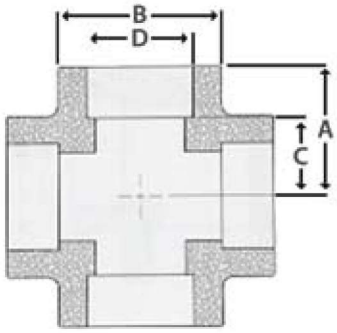
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/11	4 8/3	5 4/3
Dimension C	16/7	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 8/5
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	23.	19.	33.	71.	87.	1.44	2.19	2.98	4.57	8.60	13.00	31.30

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 2/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	6
Dimension C	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 2/1	2 8/7
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	---	---	---	1.16	1.94	3.17	3.95	7.13	7.72	15.30	23.10	34.90

SOCKET WELD FITTINGS -CROSSES



Socket Depth = Dimension A minus Dimension C

Class 9000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	---	---	1 2/1	1 4/3	2	2 8/3	2 2/1	3	---	---	---
Dimension B	---	---	---	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	3 16/11	---	---	---
Dimension C	---	---	---	1	1 8/1	1 4/1	1 8/3	1 2/1	2 8/1	---	---	---
Dimension D	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---
Approx. Wt. #	---	---	---	2.37	4.00	5.35	6.50	7.88	8.75	---	---	---

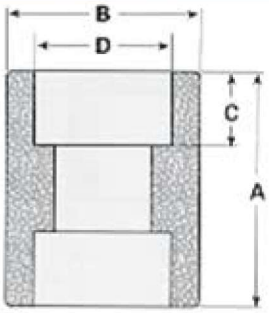
Class 3000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	16/13	32/31	8/1 1	1 16/5	1 2/1	1 4/3	2	2 8/3	3	3 8/3	4 16/3
Dimension B	8/7	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/11	4 16/5	5 4/3
Dimension C	16/7	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 8/5
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	47.	45.	34.	83.	1.03	1.68	2.56	3.46	5.6	13.70	21.10	35.00

Class 6000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	16/13	32/31	1 8/1	1 16/5	1 2/1	1 4/3	2	2 8/3	2 2/1	3 4/1	3 4/3	4 2/1
Dimension B	8/7	1 64/3	1 16/5	1 2/1	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	4	4 4/3	6
Dimension C	16/7	32/17	8/5	4/3	8/7	1 16/1	1 4/1	1 2/1	1 8/5	2 4/1	2 2/1	2 8/7
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	---	---	---	1.38	2.29	3.75	4.65	8.70	9.30	18.10	24.10	38.80

SOCKET WELD FITTINGS - FULL COUPLING, REDUCER



Class 9000

Pipe Size	8/1	4/1	8/3	2/1	4/3	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	---	---	---	1 2/1	1 4/3	2	2 8/3	2 2/1	3	---	---	---
Dimension B	---	---	---	1 16/13	2 4/1	2 2/1	3 32/1	3 16/5	3 16/11	---	---	---
Dimension C	---	---	---	1	1 8/1	1 4/1	1 8/3	1 2/1	2 8/1	---	---	---
Dimension D	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---
Approx. Wt. #	---	---	---	2.50	4.12	1.12	5.12	9.44	22.19	---	---	---

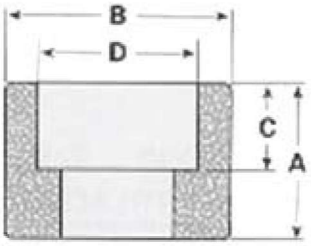
Class 3000

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1 32/1	1 32/1	1 32/1	1 32/5	1 32/13	1 32/15	1 32/15	1 32/15	2	1 16/15	1 16/15	2 16/3
Dimension B	4/3	1	1 16/1	1 4/1	1 2/1	1 8/7	2 4/1	2 2/1	3	3 8/5	4 16/5	5 32/15
Dimension C	8/3	8/3	8/3	8/3	2/1	2/1	2/1	2/1	8/5	8/5	8/5	4/3
Dimension D	.420	.555	.690	.855	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	.09	.16	.16	.24	.39	.63	.80	.90	1.60	2.32	2.84	4.88

Class 6000

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1 32/1	1 32/1	1 32/1	1 32/5	1 32/13	1 32/15	1 32/15	1 32/15	2	1 16/15	1 16/15	2 16/3
Dimension B	8/7	1	1 8/1	1 8/3	1 16/11	2	2 2/1	2 4/3	3 8/5	4 4/1	5	6
Dimension C	8/3	8/3	8/3	8/3	2/1	2/1	2/1	2/1	8/5	8/5	8/5	4/3
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	14.	16.	19.	34.	59.	83.	1.26	1.44	3.63	4.60	6.04	8.53

SOCKET WELD FITTINGS - HALF COUPLING



Class 9000

Pipe Size	1/8	1/4	2	3/8	1	1/4	2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	---	---	---	---	1 32/5	1 32/13	1 16/15	1 16/15	1 16/15	2	---	---	---	---	---
Dimension B	---	---	---	---	1 16/11	2	2 2/1	2 4/3	3	3 8/5	---	---	---	---	---
Dimension C	---	---	---	---	8/3	2/1	2/1	2/1	2/1	8/5	---	---	---	---	---
Dimension D	---	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---	---	---
Approx. Wt. #	---	---	---	---	61.	1.00	1.65	1.78	2.00	3.51	---	---	---	---	---

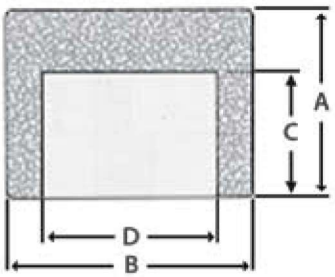
Class 3000

Pipe Size	1/8	1/4	2	3/8	1	1/4	2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	1 32/1	1 32/1	1 32/1	1 32/9	1 32/15	1 8/5	1 16/11	1 4/3	2 4/1	2 16/15	2 8/3	2 8/5			
Dimension B	4/3	1	1 16/1	1 4/1	1 2/1	1 8/7	2 4/1	2 2/1	3	3 8/5	4 16/5	5 32/15			
Dimension C	8/3	8/3	8/3	8/3	2/1	2/1	2/1	2/1	8/5	8/5	8/5	4/3			
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545			
Approx. Wt. #	10.	17.	19.	30.	45.	78.	1.05	1.26	2.11	3.27	4.26	7.06			

Class 6000

Pipe Size	1/8	1/4	2	3/8	1	1/4	2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	1 32/1	1 32/1	1 32/1	1 32/9	1 32/15	1 8/5	1 16/11	1 4/3	2 4/1	2 16/15	2 8/3	2 8/5			
Dimension B	8/7	1	1 8/1	1 8/3	1 16/11	2	2 2/1	2 4/3	3 8/5	4 4/1	5	6			
Dimension C	8/3	8/3	8/3	8/3	2/1	2/1	2/1	2/1	8/5	8/5	8/5	4/3			
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545			
Approx. Wt. #	15.	18.	24.	42.	71.	1.06	1.65	2.01	4.67	6.27	8.57	12.38			

SOCKET WELD FITTINGS - CAPS · ASME B16.11



Class 9000

Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	---	---	---	1 9/32	1 15/32	1 5/8	1 11/16	1 3/4	2 1/4	---	---	---
Dimension B	---	---	---	1 11/16	2	2 1/2	2 3/4	3	3 5/8	---	---	---
Dimension C	---	---	---	3/8	1/2	1/2	1/2	1/2	5/8	---	---	---
Dimension D	---	---	---	855.	1.065	1.330	1.675	1.915	2.406	---	---	---
Approx. Wt. #	---	---	---	74.	1.14	1.99	2.34	2.76	4.85	---	---	---

Class 3000

Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	11/16	11/16	3/4	13/16	15/16	1 1/16	1 1/16	1 1/8	1 5/16	1 7/16	1 5/8	1 7/8
Dimension B	3/4	1	1 1/16	1 1/4	1 1/2	1 7/8	2 1/4	2 1/2	3	3 5/8	4 5/16	5 1/2
Dimension C	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	5/8	5/8	5/8	3/4
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	07.	14.	14.	20.	34.	64.	84.	1.12	1.80	2.95	5.00	8.77

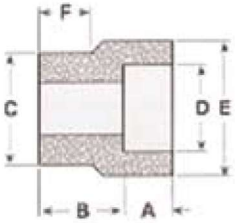
Class 6000

Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	3/4	3/4	13/16	13/16	1	1 1/8	1 1/8	1 3/16	1 3/16	1 9/16	2 11/16	2 11/16
Dimension B	7/8	1	1 1/8	1 3/8	1 11/16	2	2 1/2	2 3/4	3 5/8	4 1/4	5	6
Dimension C	3/8	3/8	3/8	3/8	1/2	1/2	1/2	1/2	5/8	5/8	5/8	3/4
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	12.	14.	19.	30.	50.	79.	1.22	1.56	3.47	5.20	7.64	12.75

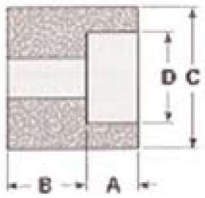
Class 9000

Pipe Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
Dimension A	---	---	---	1 1/16	1 3/16	1 1/4	1 1/4	1 3/8	1 9/16	---	---	---
Dimension B	---	---	---	1 1/16	2	2 1/2	2 3/4	3	3 5/8	---	---	---
Dimension C	---	---	---	3/8	1/2	1/2	1/2	1/2	5/8	---	---	---
Dimension D	420.	555.	690.	855.	1.065	1.330	1.675	1.915	2.406	2.906	3.535	4.545
Approx. Wt. #	---	---	---	59.	93.	1.58	1.81	2.30	3.87	---	---	---

SOCKET WELD FITTINGS - REDUCER INSERTS · MSS-SP79-



Type 1



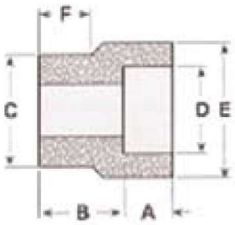
Type 2

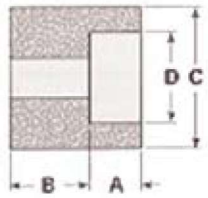
Class 3000 - Schedule 40 BORE

FOR USE WITH SCHEDULE 40 OR 80 PIPE

Pipe Size	Type	A	B	C	D	E	F
x 8/3 2/1	1	16/7	16/13	840.	695.	1 16/1	8/5
x 4/1 2/1	1	8/3	16/13	840.	560.	8/7	8/5
x 8/1 2/1	1	8/3	16/13	840.	425.	8/7	16/11
x 2/1 4/3	1	2/1	8/7	1.050	860.	1 4/1	16/11
x 8/3 4/3	2	16/7	8/5	1.050	695.	---	---
x 4/1 4/3	2	8/3	16/11	1.050	560.	---	---
x 8/1 4/3	2	8/3	16/11	1.050	425.	---	---
x 4/3 1	1	16/9	16/15	1.313	1.070	1 2/1	4/3
x 2/1 1	2	2/1	8/5	1.313	860.	---	---
x 8/3 1	2	16/7	16/11	1.313	695.	---	---
x 4/1 1	2	8/3	4/3	1.313	560.	---	---
x 1 1 4/1	1	16/9	1	1.665	1.335	1 8/7	16/13
x 4/3 1 4/1	1	16/9	16/11	1.665	1.070	1 4/3	16/13
x 2/1 1 4/1	1	16/7	4/3	1.665	860.	1 4/3	16/13
x 1 4/1 1 2/1	1	2/1	1 8/1	1.900	1.680	2 16/3	8/7
x 1 1 2/1	1	2/1	16/11	1.900	1.335	2	8/7
x 4/3 1 2/1	1	2/1	4/3	1.900	1.070	2	8/7
x 2/1 1 2/1	1	8/3	16/13	1.900	860.	2	8/7
x 1 2/1 2	1	2/1	1 4/1	2.375	1.920	2 2/1	1
x 1 4/1 2	1	2/1	16/13	2.375	1.680	2 2/1	1
x 1 2	1	2/1	8/7	2.375	1.335	2 2/1	1
x 4/3 2	1	2/1	16/15	2.375	1.070	2 2/1	1
x 2/1 2	1	8/3	1	2.375	860.	2 2/1	1

SOCKET WELD FITTINGS - REDUCER INSERTS · MSS-SP79-



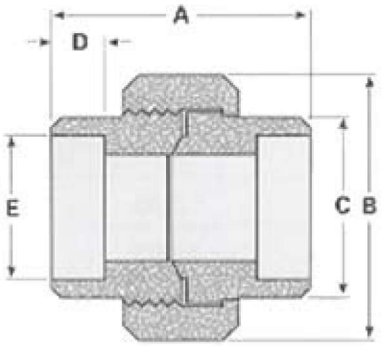


Class 6000 - Schedule 160 BORE

FOR USE WITH SCHEDULE 160 PIPE

Pipe Size	Type	A	B	C	D	E	F
x 8/3 2/1	1	16/7	16/13	840.	695.	1 8/1	8/5
x 4/1 2/1	1	8/3	16/13	840.	560.	1	8/5
x 8/1 2/1	1	8/3	16/13	840.	425.	8/7	16/11
x 2/1 4/3	1	2/1	1	1.050	860.	1 8/3	4/3
x 8/3 4/3	2	16/7	8/5	1.050	695.	---	---
x 4/1 4/3	2	8/3	8/7	1.050	560.	---	---
x 8/1 4/3	2	8/3	16/11	1.050	425.	---	---
x 4/3 1	1	16/9	1 8/1	1.313	1.070	1 4/3	16/13
x 2/1 1	1	2/1	1 8/1	1.313	860.	1 8/3	16/13
x 8/3 1	2	16/7	8/7	1.313	695.	---	---
x 4/1 1	2	8/3	16/15	1.313	560.	---	---
x 1 1 4/1	1	8/5	1 16/3	1.665	1.335	2	8/7
x 4/3 1 4/1	2	16/9	16/13	1.665	1.070	1 4/3	8/7
x 2/1 1 4/1	2	2/1	8/7	1.665	860.	1 4/3	8/7
x 1 4/1 1 2/1	1	16/11	1 8/3	1.900	1.680	2 2/1	1
x 1 1 2/1	1	8/5	1 16/1	1.900	1.335	2	1
x 4/3 1 2/1	2	16/9	1	1.900	1.070	2	1
x 2/1 1 2/1	2	2/1	1 16/1	1.900	860.	2	1
x 1 2/1 2	1	4/3	16/11	2.375	1.920	2 4/3	1 8/1
x 1 4/1 2	2	16/11	16/15	2.375	1.680	---	---
x 1 2	2	8/5	1	2.375	1.335	---	---
x 4/3 2	2	16/9	1 16/1	2.375	1.070	---	---
x 2/1 2	2	2/1	1	2.375	860.	---	---

SOCKET WELD UNIONS



Class 3000 · Steel to Steel Seat or Steel to Brass Seats · MSS-SP83-

SCH. 40 BORE FOR USE WITH SCH. 80 PIPE

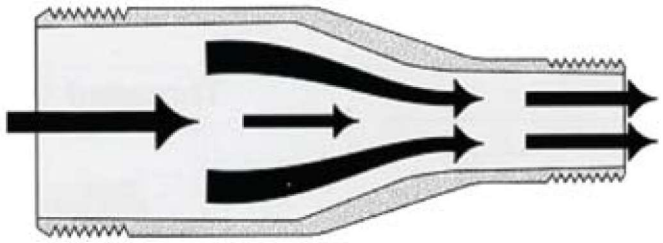
Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1.69	1.69	1.85	1.96	2.28	2.49	2.82	3.05	3.45	4.13	4.31	--
Dimension B	1.38	1.38	1.57	1.85	2.20	2.56	3.06	3.42	4.09	4.88	5.75	--
Dimension C	0.88	0.88	1.03	1.23	1.47	1.80	2.18	2.47	3.03	3.65	4.40	--
Dimension D	438.	438.	563.	500.	562.	625.	687.	750.	875.	875.	1.00	--
Dimension E	425.	560.	695.	860.	1.070	1.335	1.680	1.920	2.411	2.914	3.543	--
Approx. Wt. #	34.	34.	49.	68.	1.19	1.68	2.54	3.33	5.30	8.60	12.70	--

Class 6000 · Steel to Steel Seat

FOR SCH. 160 OR XXH PIPE

Pipe Size	8/11	4/12	8/31	2/11	4/31	1	1 4/1	1 2/1	2	2 2/1	3	4
Dimension A	1.69	1.83	1.96	2.28	2.49	2.82	3.05	3.45	4.13	--	--	--
Dimension B	1.38	1.57	1.85	2.20	2.56	3.06	3.42	4.09	4.88	--	--	--
Dimension C	0.88	1.03	1.23	1.46	1.80	2.18	2.47	3.03	3.74	--	--	--
Dimension D	438.	438.	563.	563.	625.	750.	812.	875.	1.00	--	--	--
Dimension E	425.	560.	695.	860.	1.070	1.335	1.680	1.920	2.411	--	--	--
Approx. Wt. #	34.	49.	68.	1.19	1.68	2.54	3.33	5.30	8.60	--	--	--

SWAGE NIPPLES and BULL PLUGS



Seamless Bull Plugs

I.D. or Nominal Size	Outside Diameter		Length	
	NU	EUE	NU	EUE
8/1	.405	--	1 4/3	--
4/1	.540	--	2	--
8/3	.675	--	2 4/1	--
2/1	.840	--	2 2/1	--
4/3	1.050	1.315	2 4/3	3
1	1.315	1.469	3	3 4/1
1 4/1	1.660	1.812	3 4/1	3 2/1
1 2/1	1.900	2.094	3 2/1	4
2	2.375	2.594	4	5
2 2/1	2.875	3.094	5	6
3	3.500	3.750	6	6 2/1
3 2/1	4.000	4.250	6 2/1	7
4	4.500	4.750	7	--
	5.000	--	8	--
	5.500	--	8 2/1	--
5	5.562	--	8 2/1	--
6	6.625	--	10	--
	7.000	--	10	--
	7.625	--	11	--
8	8.625	--	11	--

Seamless Swage Nipples

I.D. or Nominal Size	Outside Diameter		Length	
	NU	EUE	NU	EUE
8/1	--	--	--	--
4/1	.540	--	2 4/1	--
8/3	.675	--	2 2/1	--
2/1	.840	--	2 4/3	--
4/3	1.050	--	3	--
1	1.315	1.469	3 2/1	4 2/1
1 4/1	1.660	1.812	4	6
1 2/1	1.900	2.094	4 2/1	6
2	2.375	2.594	6 2/1	8
2 2/1	2.875	3.094	7	8
3	3.500	3.750	8	8
3 2/1	4.000	4.250	8	8
4	4.500	4.750	9	9
	5.000	--	10	--
	5.500	--	11	--
5	5.562	--	11	--
6	6.625	--	12	--
	7.000	--	12	--
	7.625	--	13	--
8	8.625	--	13	--

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FORGED STEEL & STAINLESS STEEL

FLANGES

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FORGED STEEL & STAINLESS STEEL

FLANGES

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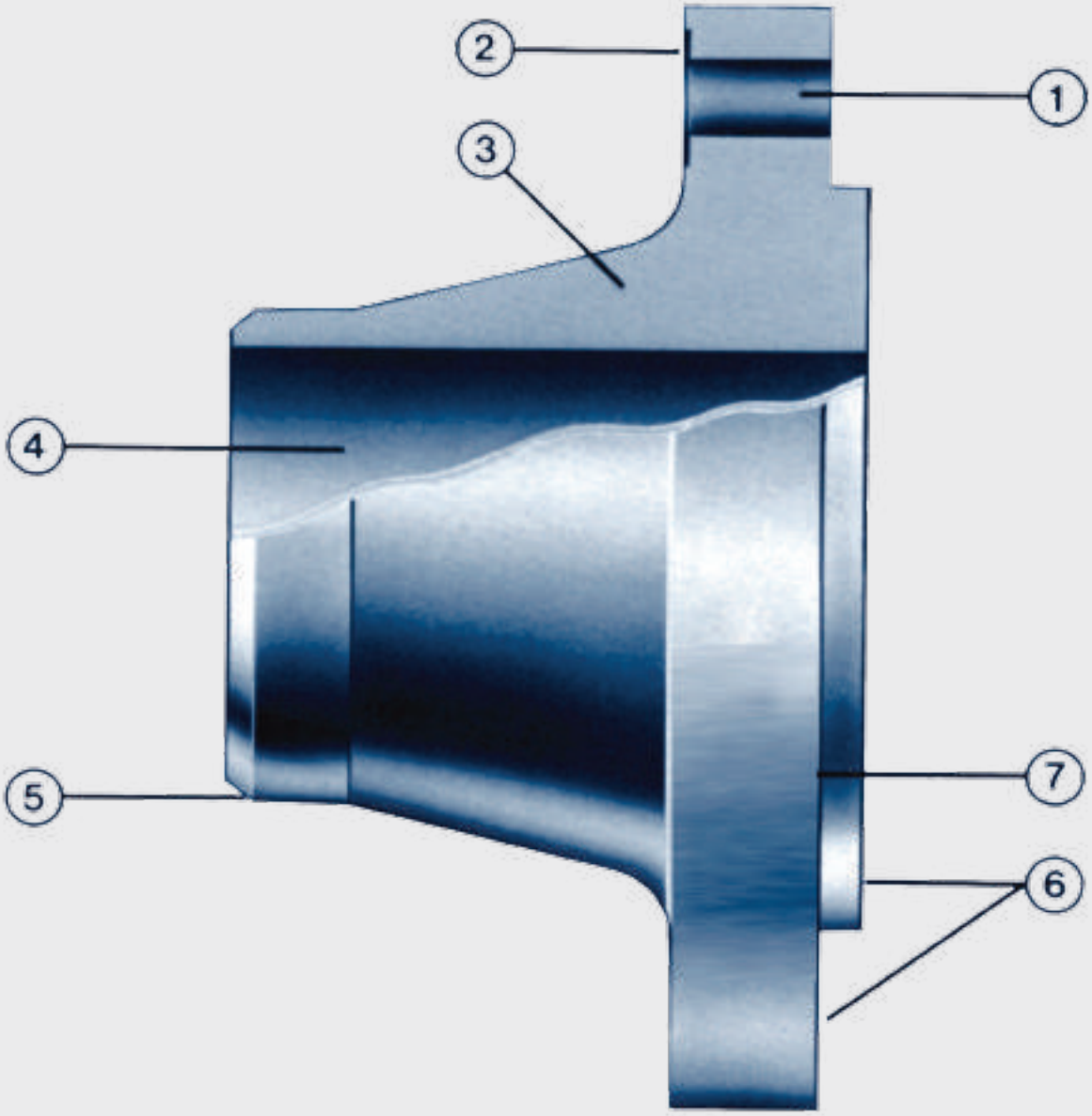

1. Holes accurately drilled for ease of assembly.
2. Spot facing ensures seating of fasteners true and square.
3. Grain flow controlled for maximum strength.
4. Smooth accurate bore for unrestricted flow.
5. Machined bevel and land facilitate good welding.
6. All faces machined within tolerances to ensure true alignment.
7. Full identification of size, pressure class, material and heat code.

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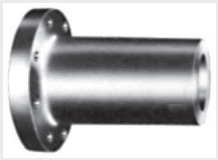
FLANGES CLASS 150 (PN20) to CLASS 2500 (PN 420)
- Welding Neck, Slip-on,
- Threaded, Socket Welding
- Lap Joint, Blind

REDUCING FLANGES
- Welding Neck, Threaded, Slip-on

ORIFICE FLANGES CLASS 1500 - 300 (PN 250-50)
- Welding Neck, Slip-on, Threaded



LONG WELDING NECKS

LARGE DIAMETER FLANGES
- Class 125 LW Slip-on
- Class 125 Welding Neck, Slip-on, Blind
- Class 250
- Class 75
- Class 175
- Class 350
- AWWA Class B, D, E, Slip-on
- Class 150 Series A ASME B16.47
- Class 150 Series B ASME B16.47

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FLANGE TYPES, FACINGS AND FINISHES

ANSI FLANGES

Most forged steel flanges correspond to the requirements of the American Standards Association (ASME/ANSI Standard B16.5) and the ASTM Specification A105-.
The following types are manufactured and stocked:
Welding Neck flanges, available in all pressure ratings and sizes, are butt-welded to the end of the pipe, and are usually specified when service conditions are severe and excellent workmanship necessary. Since the inside diameter of the flange must match that of the pipe, the flange bore should be specified in ordering.
Slip-on flanges, also available in most pressure ratings and sizes, are a popular type due to their ease of application. This flange slips over the end of the pipe and is usually set so that the flange face is about .9.5) "375mm) beyond the end of the pipe. This permits double-welding of the flange - one strength fillet weld to join the hub of the flange to the pipe, and a seal fillet weld inside the flange at the end of the pipe. Where operating conditions permit, the seal weld is omitted.
Slip-on flanges are most frequently used at lower pressure - Class 150 (PN 20) or Class 300 (PN 50) primary service pressure ratings. Many pipe designers are reluctant to use slip-ons for higher pressures, since (1) the joint between the flange and pipe is not as strong as in the welding neck type; and (2) the junction of the flange and pipe is more susceptible to corrosion.
Screwed or Threaded flanges are attached to the pipe like any other screwed fittings, and may be back-welded to seal the joint between pipe and flange. Although still available in most sizes and pressure ratings, screwed fittings today are used almost exclusively in smaller pipe sizes and at low pressures.
Lap Joint or Van Stone flanges are used on piping equipped with lap joint stub ends or with lapped pipe. They may be used at all pressures and are available in a full size range. These flanges slip over the pipe, and are not welded or otherwise fastened to it; bolting pressure is transmitted to the gasket by the pressure of the flange against the back of the pipe lap.
Lap Joint flanges have certain special advantages: (1) freedom to swivel around the pipe facilitates the lining up of opposing flange bolt holes; (2) lack of contact with the fluid in the pipe often permits the use of inexpensive carbon steel flanges with corrosion resistant pipe or tubing; (3) in systems which erode or corrode quickly, the flanges may be salvaged for re-use.
Socket-welding flanges contain a recess in the back of the flange to receive the end of the pipe, which is attached by a fillet weld around the hub of the flange. Since socket-welding connections are not as strong as butt-welded joints, the use of this type of flange is almost always confined to NPS 4 (DN 100) and smaller sizes, and to the lower pressure ratings. Its chief advantage lies in the ease of preparation and installation.
Blind flanges, available in all sizes and pressure ratings, are solid forgings used to close off the end of a piping system and to gain easy access to the interior of the line.
Reducing flanges are available. .

FLANGE FACINGS

Unless otherwise specified, Class 150 (PN 20) and Class 300 (PN 50) flanges in all types except lap joint (or Van Stone) flanges are furnished with a .1.6) "06mm) raised face (which is included in the flange thickness dimension). Heaver pressure ratings are machined with a .6.4) "25 mm) raised face, in addition to the designated flange thickness.
When so ordered, these flange types can be furnished with a variety of other facings, such as male and female, ring joint, tongue and groove, etc.
Lap Joint flanges are machined with a flat face and a fillet radius to accommodate the stub end or pipe lap.

FLANGE FINISHES

The finish of contact faces of pipe flanges and connecting end flanges of fittings shall be judged by visual comparison with AARH Standards and not by instruments having stylus tracers and electronic amplification (see ANSI/ASME B46.1)
The finishes required are given below. Other finishes may be furnished upon application.
RAISED FACE AND LARGE MALE AND FEMALE: Either a serrated-concentric or serrated-spiral finish having from 45 to 55 grooves per inch (0.6 to 1mm pitch) shall be used. The cutting tool employed shall have an approximate 1.6) "0.06mm) or larger radius. The resultant surface shall have a 125 to 250 microinch roughness.
TONGUE AND GROOVE AND SMALL MALE AND FEMALE: The gasket contact shall not exceed 125 microinch roughness.
RING JOINT: The side wall surface of gasket groove shall not exceed 63 microinch roughness.

OTHER TYPES

In addition to the ANSI flanges, the following types are carried in stock:
Orifice flanges are used for measuring fluid flow in piping systems. Their design conforms to the recommendations of the American Gas Association's Committee on Gas Measurement. Commonly furnished as either welding neck or slip-on type, they may also be ordered as screwed flanges. Orifice unions are available in Class 300 (PN 50) and heavier pressure ratings.
Each Orifice flange is equipped with two radially-drilled, tapped holes for metering, and with jack-screws to facilitate separation of the joint for removal of the orifice metering plate. Orifice flanges, unless otherwise specified, are furnished in pairs as a flange union, complete with bolts, nuts and jack-screws - but without the orifice plate. Gaskets are supplied with raised face flange unions, but not for ring-joint faced flanges, which use an integral gasket and orifice plate.
Light Weight Slip-on flanges, drilled to Class 125 ANSI Standards but of lighter construction than the regular slip-on type, are available for low-pressure systems.
Large Diameter flanges, in sizes beyond the B16.5 range, are available for special installations. Dimensions given herein are those most commonly used; however, flanges and rolled rings for large diameter pipe or for vessels and tanks can readily be made to other specifications.
Long Welding Necks are used primarily for outlets for vessels and tanks. Drilled to ANSI Standards, they are forged with long, heavy-wall, straight hubs, and finished with square cut ends.

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MATERIAL AND MANUFACTURING STANDARDS

The manufacturing of forged steel flanges is governed by industry standards written by (1) the American Society for Testing and Materials (ASTM); (2) the American National Standards Institute (ANSI); (3) the Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS); (4) the American Petroleum Institute (API); (5) the Canadian Standards Association (CSA); (6) the American Society of Mechanical Engineers (ASME); and (7) the Pipe Fabrication Institute (PFI). They cover specifications for materials, methods of manufacture, dimensions and quality control procedures.

ASTM SPECIFICATIONS

ASTM specifications are, basically, materials specifications. They regulate approved raw materials from which flanges can be made - ingots, or blooms, billets, slabs or bars. In addition, they govern the methods of manufacture, quality control procedures and markings of forged steel flanges. ASTM specifications are divided into five categories:

A105 - Carbon grades for high temperature service
A181 - Carbon grades for general service
* A182 - Alloy and stainless grades for high temperature service
A350 - Carbon and alloy grades for low temperature service

*Flanges are available in a wide range of alloy and stainless steels, including grades F304, F304L, F316, F316L.

MSS, API, AWWA, ANSI AND CSA STANDARDS

ANSI, MSS and API standards govern flange dimensions and tolerances. ASME/ANSI B16.5, titled "Steel Pipe Flanges and Flanged Fittings", is the basic standard. It covers forged steel flanges, sizes NPS 2/1 (DN 15) through NPS 24 (DN 600). CSA standard CAN-3Z-12 245M96 covers the manufacture, dimensions, tolerances and material requirements for pipe line flanges. ASME/ANSI B16.36 covers Orifice flanges. The following MSS, API and AWWA standards are written to supplement B16.5:

MSS SP6-:	Flange facings
MSS SP9-:	Spot facing for bronze, iron and steel flanges
MSS SP25-:	Marking of flanges
MSS SP39-:	Bolts and nuts for flanges
API6A:	Wellhead equipment
AW WA C207:	Hub flanges

The following codes are not flange specifications, but they influences the manufacture of forged steel flanges:

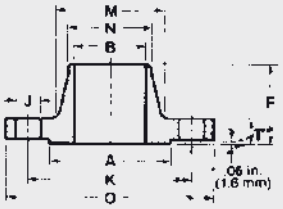
ASME:	Boiler and Pressure Vessel Code
ASME/ANSI B31.1:	Power Piping
ASME/ANSI B31.3:	Petroleum and refinery piping
ASME/ANSI B31.4:	Liquid petroleum transportation piping systems
ASME/ANSI B31.5:	Refrigeration piping
ASME/ANSI B31.8:	Gas transmission and distribution piping systems
ANSI/ASME B36.10M:	Standard for wrought steel pipe
ANSI/ASME B36.19M:	Standard for stainless steel pipe
ANSI/ASME B16.47:	Large diameter pipe line flanges NPS 22 (DN 550) and NPS 26 (DN 650) through NPS 36 (DN900)

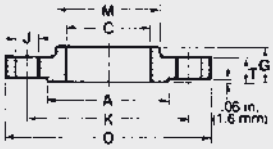
METRIC EQUIVALENTS

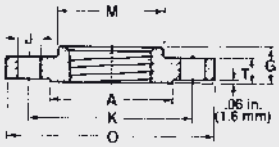
The International System (SI) metric equivalent of British units are shown throughout this catalogue.

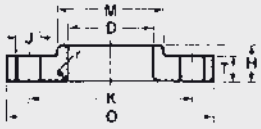
NPS (Nominal Pipe Size)	= DN* (Nominal Diameter)
Operating Pressure Class	= PN* (Pressure Number)
1 inch	= 25.4 millimetres
1 pound, weight	= 0.4536 kilograms
1 pound, pressure	= 0.06895 bars
1 p.s.i., stress	= 0.006895 megapascals (MPa)

*From the SI designations, Diamètre Nominal and Pression Nominale.









NPS	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS MIN.	RAISED FACE DIA.	BORE			LENGTH THRU HUB [2]		
				WELDING NECK & SOCKET WELDING	SLIP-ON & SOCKET WELD SOCKET MIN.	LAP JOINT MIN.	WELDING NECK	SLIP-ON, THREADED & SOCK.WELD	LAP JOINT
DN	O	T	A	B[3]	C	D	F	G	H
1/2	3.50	.44	1.38	.62	.88	.90	1.88	.62	.62
15	89	11.5	34.9	15.8	22.2	22.9	47.6	16	16
3/4	3.88	.50	1.69	.82	1.09	1.11	2.06	.62	.62
20	98	13.0	42.9	20.8	27.8	28.2	52.4	16	16
1	4.25	.56	2.00	1.05	1.36	1.38	2.19	.69	.69
25	108	14.5	50.8	26.7	34.5	34.9	55.6	17	17
1 1/4	4.62	.62	2.50	1.38	1.70	1.72	2.25	.81	.81
32	117	16.0	63.5	35.1	43.2	43.7	57.1	21	21
1 1/2	5.00	.69	2.88	1.61	1.95	1.97	2.44	.88	.88
40	127	17.5	73.0	40.9	49.5	50.0	61.9	22	22
2	6.00	.75	3.62	2.07	2.44	2.46	2.50	1.00	1.00
50	152	19.5	92.1	52.6	61.9	62.5	63.5	25	25
2 1/2	7.00	.88	4.12	2.47	2.94	2.97	2.75	1.12	1.12
65	178	22.5	104.8	62.7	74.6	75.4	69.8	29	29
3	7.50	.94	5.00	3.07	3.57	3.60	2.75	1.19	1.19
80	191	24.0	127.0	78.0	90.7	91.4	69.8	30	30
3 1/2	8.50	.94	5.50	3.55	4.07	4.10	2.81	1.25	1.25
90	216	24.0	139.7	90.2	103.4	104.1	71.4	32	32
4	9.00	.94	61.9	4.03	4.57	4.60	3.00	1.31	1.31
100	229	24.0	157.2	102.4	116.1	116.8	76.2	33	33
5	10.00	.94	7.31	5.05	5.66	5.69	3.50	1.44	1.44
125	254	24.0	185.7	128.3	143.7	144.5	88.9	36	36
6	11.00	1.00	8.50	6.07	6.72	6.75	3.50	1.56	1.56
150	279	25.5	215.9	154.2	170.7	171.4	88.9	40	40
8	13.50	1.12	10.62	7.98	8.72	8.75	4.00	1.75	1.75
200	343	29.0	269.9	202.7	221.5	222.2	101.6	44	44
10	16.00	1.19	12.75	10.02	10.88	10.92	4.00	1.94	1.94
250	406	30.5	323.8	254.5	276.2	277.4	101.6	49	49
12	19.00	1.25	15.00	12.00	12.88	12.92	4.50	2.19	2.19
300	483	32.0	381.0	304.8	327.0	328.2	114.3	56	56
14	21.00	1.38	16.25	To be specified by purchaser	14.14	14.18	5.00	2.25	3.12
350	535	35.0	412.8		359.2	360.2	127.0	57	79
16	23.50	1.44	18.50		16.16	16.19	5.00	2.50	3.44
400	595	37.0	469.9		410.4	411.2	127.0	64	87
18	25.00	1.56	21.00		18.18	18.20	5.50	2.69	3.81
450	635	40.0	533.4		461.8	462.3	139.7	68	97
20	27.50	1.69	23.00		20.20	20.25	5.69	2.88	4.06
500	700	43.0	584.2		513.1	514.3	144.5	73	103
24	32.00	1.88	27.25		24.25	24.25	6.00	3.25	4.38
600	815	48.0	692.2		615.9	615.9	152.4	83	111

[1] Socket Welding Flanges, sizes NPS 2/1 3 (DN 90) and larger are not covered by ASME/ANSI B16.5.
Includes .1.6) "06 mm) raised face.

[2] These dimensions correspond to inside diameters of pipe as given in

[3] ANSI/ASME B36.10M for Standard Wall Pipe. Thickness of Standard Wall is the same as Schedule 40 in size NPS 10 (DN 250) and smaller.

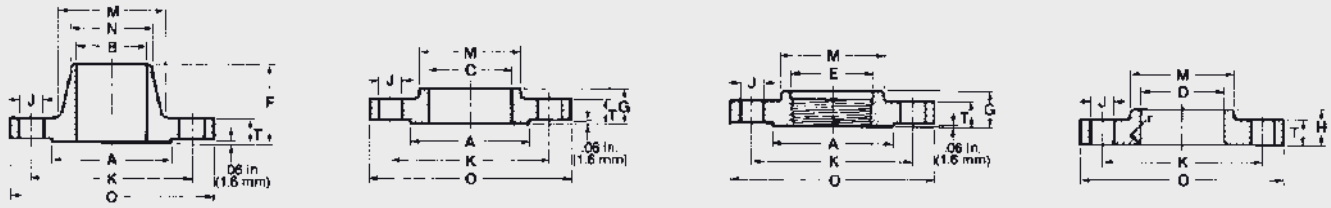
INCHES
MILLIMETRES

CLASS 150 (PN20) FLANGES

FORGED STEEL
ASTM A105-
[1]ASME/ANSI B16.5

NPS / DN	DRILLING			DEPTH[1] OF SOCKET	DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING[1]	BLIND	LAP JOINT
		J	K	L	M	N	r				
1/2	4	.62	2.38	.38	1.19	.84	.12	2	1	1	1
15	4	16	60.3	10	30.2	21.4	3	0.9	.05	0.5	0.5
3/4	4	.62	2.75	.44	1.50	1.05	.12	2	2	2	2
20	4	16	69.8	11	38.1	26.6	3	0.9	0.9	0.9	0.9
1	4	.62	3.12	.50	1.94	1.32	.12	3	2	2	2
25	4	16	79.4	13	49.2	33.5	3	1.4	0.9	0.9	0.9
4	4	.62	3.50	.56	2.31	1.66	.19	3	3	3	3
32	4	16	88.9	14	58.7	42.1	5	1.4	1.4	1.4	1.4
2	4	.62	3.88	.62	2.56	1.90	.25	4	3	4	3
40	4	16	98.4	16	65.1	48.3	6	1.8	1.4	1.8	1.4
2	4	.75	4.75	.69	3.06	2.38	.31	6	5	5	5
50	4	20	120.6	17	77.6	60.4	8	2.7	2.3	2.3	2.3
2	4	.75	5.50	.75	3.56	2.88	.31	8	7	7	7
65	4	20	139.7	19	90.5	73.0	8	3.6	3.2	3.2	3.2
3	4	.75	6.00	.81	4.25	3.50	.38	10	8	9	8
80	4	20	152.4	21	107.9	88.9	10	4.5	3.6	4.1	3.6
4 81	8	.75	7.00	-	4.81	4.00	.38	12	11	13	11
90	8	20	177.8	-	122.2	101.6	10	5.4	5.0	5.9	5.0
4	8	.75	7.50	-	5.31	4.50	.44	15	13	17	13
100	8	20	190.5	-	134.9	114.3	11	6.8	5.9	7.7	5.9
5	8	.88	8.50	-	6.44	5.56	.44	19	15	20	15
125	8	23	215.9	-	163.5	141.3	11	8.6	6.8	9.1	6.8
6	8	.88	9.50	-	7.56	6.63	.50	24	19	26	19
150	8	23	241.3	-	192.1	168.3	13	10.9	8.6	11.8	8.6
8	8	.88	11.75	-	9.69	8.63	.50	39	30	45	30
200	8	23	298.4	-	246.1	219.1	13	17.7	13.6	20.4	13.6
10	12	1.00	14.25	-	12.00	10.75	.50	52	43	70	43
250	12	26	361.9	-	304.8	273.0	13	23.6	19.5	31.8	19.5
12	12	1.00	17.00	-	14.38	12.75	.50	80	64	110	64
300	12	26	431.8	-	365.1	323.8	13	36.3	29.0	49.9	29.0
14	12	1.12	18.75	-	15.75	14.00	.50	110	90	140	105
350	12	29	476.2	-	400.0	355.6	13	50.0	41.0	63.5	47.6
16	16	1.12	21.25	-	18.00	16.00	.50	140	98	180	140
400	16	29	539.7	-	457.2	406.4	13	64.0	44.5	81.6	63.5
18	16	1.25	22.75	-	19.88	18.00	.50	150	130	220	160
450	16	32	577.8	-	504.8	457.2	13	68.0	59.0	99.8	72.6
20	20	1.25	25.00	-	22.00	20.00	.50	180	165	285	195
500	20	32	635.0	-	558.8	508.0	13	81.6	75.0	129.0	88.5
24	20	1.38	29.50	-	26.12	24.00	.50	260	220	430	275
600	20	35	749 3	-	663 6	609 6	13	118	99 8	195 0	125 0

POUNDS
KILOGRAMS



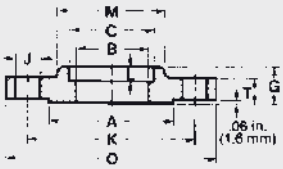
NPS	FLANGE OUTSIDE DIAMETER	FLANGE[2] THICKNESS MIN.	RAISED FACE DIA.	BORE				LENGTH THRU HUB [2]		
				WELDING NECK & SOCKET WELDING	SLIP-ON & SOCKET WELD SOCKET MIN.	LAP JOINT MIN.	THREADED COUNTER-BORE MIN.	WELDING NECK	SLIP-ON, THREADED & SOCK. WELD	LAP JOINT
DN	O	T	A	B[3]	C	D	E	F	G	H
1/2	3.75	.56	1.38	.62	.88	.90	.93	2.06	.88	.88
15	95	14.5	34.9	15.8	22.2	22.9	23.5	52.4	22	22
3/4	4.62	.62	1.69	.82	1.09	1.11	1.14	2.25	1.00	1.00
20	117	16.0	42.9	20.8	27.8	28.2	29.0	57.1	25	25
1	4.88	.69	2.00	1.05	1.36	1.38	1.41	2.44	1.06	1.06
25	124	17.5	50.8	26.6	34.5	34.9	36.0	61.9	27	27
1 1/4	5.25	.75	2.50	1.38	1.70	1.72	1.75	2.56	1.06	1.06
32	133	19.5	63.5	35.1	43.3	43.7	44.5	65.1	27	27
1 1/2	6.12	.81	2.88	1.61	1.95	1.97	1.99	2.69	1.19	1.19
40	156	21.0	73.0	40.9	49.6	50.0	50.5	68.3	30	30
2	6.50	.88	3.62	2.07	2.44	2.46	2.50	2.75	1.31	1.31
50	165	22.5	92.1	52.6	61.9	62.5	63.5	69.8	33	33
2 1/2	7.50	1.00	4.12	2.47	2.94	2.97	3.00	3.00	1.50	1.50
65	191	25.5	104.8	62.7	74.6	75.4	76	76.2	38	38
3	8.25	1.12	5.00	3.07	3.57	3.60	3.63	3.12	1.69	1.69
80	210	29.0	127.0	77.9	90.7	91.4	92	79.4	43	43
3 1/2	9.0	1.19	5.50	3.55	4.07	4.10	4.13	3.19	1.75	1.75
90	229	30.5	139.7	90.1	103.4	104.1	105	81.0	44	44
4	10.0	1.25	6.19	4.03	4.57	4.60	4.63	3.38	1.88	1.88
100	254	32.0	157.2	102.3	116.1	116.8	118	85.7	48	48
5	11.0	1.38	7.31	5.05	5.66	5.69	5.69	3.88	2.00	2.00
125	279	35.0	185.7	128.2	143.7	144.5	145	98.4	51	51
6	12.5	1.44	8.50	6.07	6.72	6.75	6.75	3.88	2.06	2.06
150	318	37.0	215.9	154.1	170.7	171.4	171	98.4	52	52
8	15.0	1.62	10.62	7.98	8.72	8.75	8.75	4.38	2.44	2.44
200	381	41.5	269.9	202.7	221.5	222.2	222	111.1	62	62
10	17.5	1.88	12.75	10.02	10.88	10.92	10.88	4.62	2.62	3.75
250	445	48.0	323.8	254.5	276.2	277.4	276	117.5	67	95
12	20.5	2.00	15.00	12.00	12.88	12.92	12.94	5.12	2.88	4.00
300	520	51.0	381.0	304.8	327.0	328.2	329	130.2	73	102
14	23.0	2.12	16.25	To be specified by purchaser	14.14	14.18	14.19	5.62	3.00	4.38
350	585	54.0	412.8		359.2	360.2	360	142.9	76	111
16	25.5	2.25	18.50		16.16	16.19	16.19	5.75	3.25	4.75
400	650	57.5	469.9		410.4	411.2	411	146.0	83	121
18	28.0	2.38	21.00		18.18	18.20	18.19	6.25	3.50	5.12
450	710	60.5	533.4		461.8	462.3	462	158.7	89	130
20	30.5	2.50	23.00		20.20	20.25	20.19	6.38	3.75	5.50
500	775	63.5	584.2		513.1	514.3	513	161.9	95	140
24	36.0	2.75	27.25		24.25	24.25	24.19	6.62	4.19	6.00
600 915	70.0	692.2			.9 615.9	614	168.3	106		152

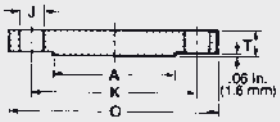
1 Socket Welding Flanges, sizes NPS 3 1/2 (DN 90) and larger are not covered by ASME/ANSI B16.5.

2 Includes .06" (1.6 mm) raised face.

3 These dimensions correspond to inside diameters of pipe as given in ANSI/ASME B36.10M for Standard Wall Pipe. Thickness of Standard Wall is the same as Schedule 40 in size NPS 10 (DN 250) and smaller.

INCHES
MILLIMETRES





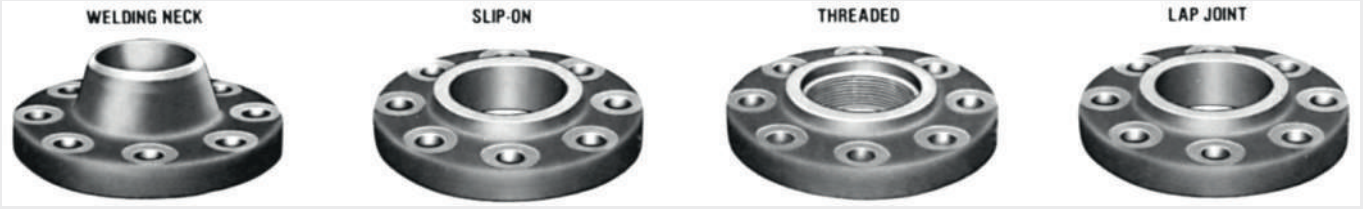
CLASS 300 (PN50) FLANGES

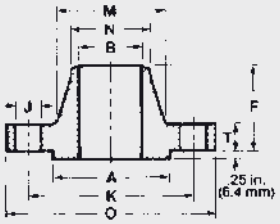
FORGED STEEL ASTM A105-[1]ASME/ANSI B16.5

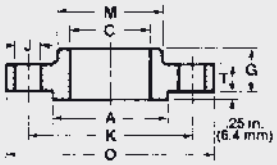
NPS / DN	DRILLING			DEPTH[1] OF SOCKET	DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING[1]	BLIND	LAP JOINT
		J	K	L	M	N	r				
1/2	4	.62	2.62	.38	1.50	.84	.12	2	2	2	2
15	4	16	66.7	10	38.1	21.4	3	0.9	0.9	0.9	0.9
3/4	4	.75	3.25	.44	1.88	1.05	.12	3	3	3	3
20	4	20	82.5	11	47.6	26.6	3	1.4	1.4	1.4	1.4
1	4	.75	3.50	.50	2.12	1.32	.12	4	3	3	3
25	4	.20	88.9	13	53.8	33.5	3	1.8	1.4	1.4	1.4
1 1/4	4	.75	3.88	.56	2.50	1.66	.19	5	4	4	4
32	4	20	98.4	14	63.5	42.1	5	2.3	1.8	1.8	1.8
1 1/2	4	.88	4.50	.62	2.75	1.90	.25	7	6	6	6
40	4	23	114.3	16	69.9	48.3	6	3.2	2.7	2.7	2.7
2	8	.75	5.00	.69	3.31	2.38	.31	9	7	8	7
50	8	20	127.0	17	84.1	60.3	8	4.1	3.2	3.6	3.2
2 1/2	8	.88	5.88	.75	3.94	2.88	.31	12	10	12	10
65	8	23	149.2	19	100.0	73.0	8	5.4	4.5	5.4	4.5
3	8	.88	6.62	.81	4.62	3.50	.38	15	13	16	13
80	8	23	168.3	21	117.5	88.9	10	6.8	5.9	7.3	5.9
3 1/2	8	.88	7.25	-	5.25	4.00	.38	18	17	21	17
90	8	23	184.1	-	133.3	101.6	10	8.2	7.7	9.5	7.7
4	8	.88	7.88	-	5.75	4.50	.44	25	22	27	22
100	8	23	200.0	-	146.0	114.3	11	11.3	10.0	12.2	10.0
5	8	.88	9.25	-	7.00	5.56	.44	32	28	35	28
125	8	23	234.9	-	177.8	141.3	11	14.5	12.7	15.9	12.7
6	12	.88	10.62	-	8.12	6.63	.50	42	39	50	39
150	12	23	269.9	-	206.4	168.3	13	19.0	17.7	22.7	17.7
8	12	1.00	13.0	-	10.25	8.63	.50	67	58	81	58
200	12	26	330.2	-	260.3	219.1	13	30.4	26.3	36.7	26.3
10	16	1.12	15.25	-	12.62	10.75	.50	91	81	125	91
250	16	29	387.3	-	320.7	273.0	13	41.3	36.7	56.7	41.3
12	16	1.25	17.75	-	14.75	12.75	.50	140	115	185	140
300	16	32	450.8	-	374.6	323.8	13	63.5	52.2	83.9	63.5
14	20	1.25	20.25	-	16.75	14.00	.50	180	165	250	190
350	20	32	514.3	-	425.5	355.6	13	81.6	74.8	113	86.2
16	20	1.38	22.50	-	19.00	16.00	.50	250	190	295	250
400	20	35	571.5	-	482.6	406.4	13	113	86.2	134	113
18	24	1.38	24.75	-	21.00	18.00	.50	320	250	395	295
450	24	35	628.6	-	533.4	457.2	13	145	113	179	134
20	24	1.38	27.00	-	23.12	20.00	.50	400	315	505	370
500	24	35	685.80	-	587.4	508.0	13	181	143	229	168
24	24	1.62	32.00	-	27.62	24.00	.50	580	475	790	550
600	24	42	812.80	-	701.7	609.6	13	263	215	358	249

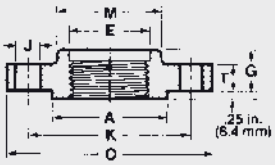
[1] Socket Welding Flanges, sizes NPS 2/1 3 (DN 90) and larger are not covered by ASME/ANSI B16 5

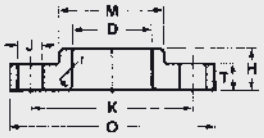
POUNDS
KILOGRAMS









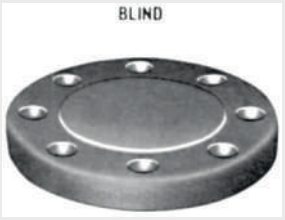


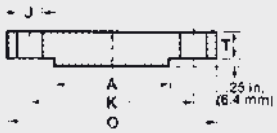
F or sizes NPS 2/1 (DN 15) through NPS 2/1 3 (DN 90) use Class 600 (PN 100) flanges. [1]

NPS	FLANGE OUTSIDE DIAMETER	FLANGE[2] THICKNESS MIN.	RAISED FACE DIA.	BORE				LENGTH TRU HUB [2]		
				WELDING NECK	SLIP-ON, MIN.	LAP JOINT MIN.	THREADED COUNTER-BORE MIN.	WELDING NECK	SLIP-ON, THREADED	LAP JOINT
DN	O	T	A	B	C	D	E	F	G	H
4	10	1.38	6.19	To be specified by purchaser	4.57	4.60	4.63	3.5	2	2
100	254	35.0	157.2		116.1	116.8	118	88.9	51	51
5	11	1.50	7.31		5.66	5.69	5.69	4	2.12	2.12
125	279	38.5	185.7		143.7	144.5	145	101.6	54	54
6	12.5	1.62	8.5		6.72	6.75	6.75	4.06	2.25	2.25
150	318	41.5	215.9		170.7	171.4	171	103.2	57	57
8	15	1.88	10.62		8.72	8.75	8.75	4.62	2.69	2.69
200	381	48.0	269.9		221.5	222.2	222	117.5	68	68
10	17.5	2.12	12.75		10.88	10.92	10.88	4.88	2.88	4
250	445	54.0	323.8		276.2	277.4	276	123.8	73	102
12	20.5	2.25	15.00		12.88	12.92	12.94	5.38	3.12	4.25
300	520	57.5	381.0		327.0	328.2	329	136.5	79	108
14	23	2.38	16.25		14.14	14.18	14.19	5.88	3.31	4.62
350	585	60.5	412.8		359.2	360.2	360	149.2	84	117
16	25.5	2.5	18.50		16.16	16.19	16.19	6	3.69	5
400	650	63.5	469.9		410.4	411.2	411	152.4	94	127
18	28	2.62	21		18.18	18.20	18.19	6.5	3.88	5.38
450	710	67.0	533.4		461.8	462.3	462	165.1	98	137
20	30.5	2.75	23		20.20	20.25	20.19	6.62	4	5.75
500	775	70.0	584.2		513.1	514.3	513	168.3	102	146
24	36	3	27.25		24.25	24.25	24.19	6.88	4.5	6.25
600	915	76.5	692.2		616.0	616.0	614	174.6	114	159

1 Including SOCKET WELDING FLANGES
2 Does not include .6.4) "25 mm) raised face.

INCHES
MILLIMETRES



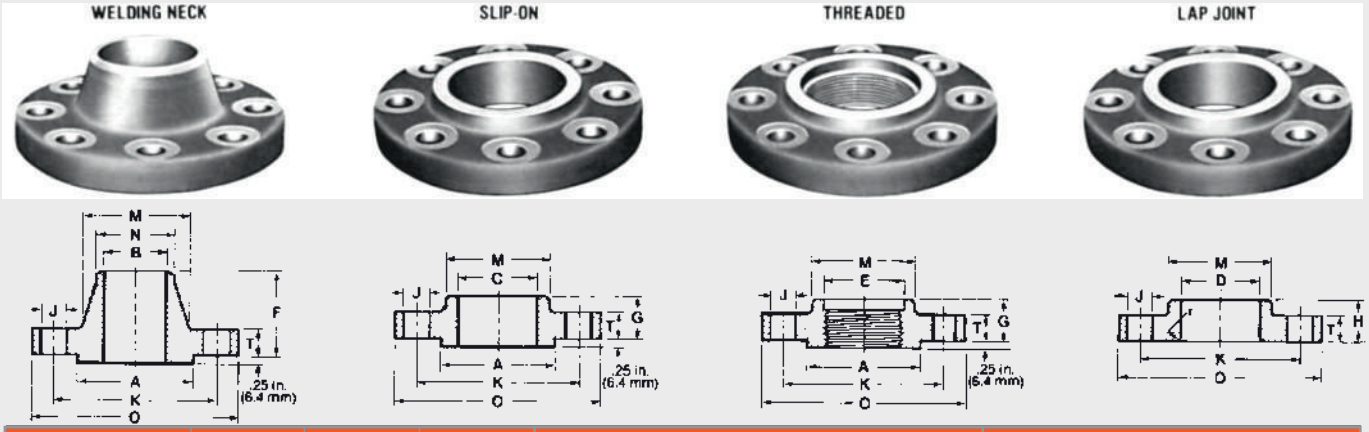


CLASS 400 (PN 68) FLANGES

FORGED STEEL ASTM A105- ASME/ANSI B16.5

NPS	DRILLING			DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIAMETER OF HOLES	DIAMETER OF BOLT CIRCLE	AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED	BLIND	LAP JOINT
DN		J	K	M	N	r				
4	8	1	7.88	5.75	4.50	.44	35	26	33	25
100	8	26	200.0	146.0	114.3	11	15.8	11.7	15	11.3
5	8	1	9.25	7.0	5.56	.44	43	31	44	29
125	8	26	234.9	177.8	141.3	11	19	14	20	13
6	12	1	10.62	8.12	6.63	.5	57	44	61	42
150	12	26	269.9	206.4	168.3	13	25.5	20	27.5	19
8	12	1.12	13.0	10.25	8.63	.5	89	67	100	64
200	12	29	330.2	260.3	219.1	13	40	30	45	29
10	16	1.25	15.25	12.62	10.75	.5	126	91	155	112
250	16	32	387.3	320.7	273.0	13	57	41	70	50
12	16	1.38	17.75	14.75	12.75	.5	177	129	226	152
300	16	35	450.8	374.7	323.8	13	80	58	102	68
14	20	1.38	20.25	16.75	14.00	.5	233	191	310	210
350	20	35	514.3	425.5	355.6	13	105	86	140	95
16	20	1.5	22.5	19.0	16.00	.5	294	253	398	280
400	20	39	571.5	482.6	406.4	13	132	114	179	126
18	24	1.5	24.75	21.0	18.00	.5	360	310	502	345
450	24	39	628.7	533.4	457.2	13	162	140	226	155
20	24	1.62	27	23.12	20.00	.5	445	378	621	420
500	24	42	685.8	587.4	508.0	13	200	170	279	189
24	24	1.88	32	27.62	24.00	.5	640	539	936	615
600	24	48	812.8	701.7	609.6	13	288	243	421	277

For bevel of Welding Neck, see page 48.
Gasket dimensions - page 20.
Bolting dimensions - page 22.
Flange facing dimensions - page 20.



NPS	FLANGE OUTSIDE DIAMETER	FLANGE[2] THICKNESS MIN.	RAISED FACE DIA.	BORE				LENGTH TRU HUB [2]		
				WELDING NECK & [1]SOCKET WELDING	SLIP-ON & [1]SOCK. WELD. SOCKET MIN.	LAP JOINT MIN.	THREADED COUNTER-BORE MIN.	WELDING NECK	SLIP-ON, THREADED [1]SOCKET WELDING	LAP JOINT
DN	O	T	A	B	C	D	E	F	G	H
1/2	3.75	.56	1.38	To be specified by purchaser	.88	.90	.93	2.06	.88	.88
15	95	14.5	34.9		22.2	22.9	23.5	52.4	22	22
3/4	4.62	.62	1.69		1.09	1.11	1.14	2.25	1.00	1.0
20	117	16.0	42.9		27.8	28.2	29.0	57.1	25	25
1	4.88	.69	2.0		1.36	1.38	1.41	2.44	1.06	1.06
25	124	17.5	50.8		34.5	34.9	36.0	61.9	27	27
1 1/4	5.25	.81	2.5		1.70	1.72	1.75	2.62	1.12	1.12
32	133	21.0	63.5		43.3	43.7	44.5	66.7	29	29
1 1/2	6.12	.88	2.88		1.95	1.97	1.99	2.75	1.25	1.25
40	156	22.5	73.0		49.6	50.0	50.5	69.8	32	32
2	6.5	1.0	3.62		2.44	2.46	2.50	2.88	1.44	1.44
50	165	25.5	92.1		61.9	62.5	63.5	73.0	37	37
2 1/2	7.5	1.12	4.12		2.94	2.97	3.00	3.12	1.62	1.62
65	191	29.0	104.8		74.6	75.4	76.0	79.4	41	41
3	8.25	1.25	5.0		3.57	3.60	3.63	3.25	1.81	1.81
80	210	32.0	127.0		90.7	91.4	92.0	82.5	46	46
3 1/2	9.0	1.38	5.5		4.07	4.10	4.13	3.38	1.94	1.94
90	229	35.0	139.7		103.4	104.1	105	85.7	49	49
4	10.75	1.5	6.19		4.57	4.60	4.63	4.0	2.12	2.12
100	273	38.5	157.2		116.1	116.8	118	101.6	54	54
5	13.0	1.75	7.31		5.66	5.69	5.69	4.5	2.38	2.38
125	330	44.5	185.7		143.7	144.5	145	114.3	60	60
6	14.0	1.88	8.5		6.72	6.75	6.75	4.62	2.62	2.62
150	356	48.0	215.9		170.7	171.4	171	117.3	67	67
8	16.5	2.19	10.62		8.72	8.75	8.75	5.25	3.0	3.0
200	419	55.5	269.9		221.5	22.22	222	133.3	76	76
10	20.0	2.5	12.75		10.88	10.92	10.88	6.0	3.38	4.38
250	510	63.5	323.8		276.2	277.4	276	152.4	86	111
12	22.0	2.62	15.0		12.88	12.92	12.94	6.12	3.62	4.62
300	560	66.5	381.0		327.0	328.2	329	155.6	92	117
14	23.75	2.75	16.25		14.14	14.18	14.19	6.5	3.69	5.0
350	605	70.0	412.8		359.2	360.2	360	165.1	94	127
16	27.0	3.0	18.5		16.16	16.19	16.19	7.0	4.19	5.5
400	685	76.5	469.9		410.4	411.2	411	177.5	106	140
18	29.25	3.25	21.0		18.18	18.20	18.19	7.25	4.62	6.0
450	745	83.0	533.4		461.8	462.3	462	184.1	117	152
20	32.0	3.5	23.0		20.20	20.25	20.19	7.5	5.0	6.4
500	815	89.0	584.2		513.1	514.3	513	190.5	127	165
24	37.0	4.0	27.25		24.25	24.25	24.19	8.0	5.5	7.25
600	940	102.0	692.2		615.9	615.9	614	203.2	140	184

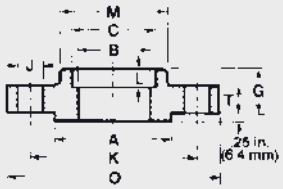
1 Socket Welding Flanges, sizes NPS 2/1 3 (DN 90) and larger are not covered by ASME/ANSI B16.5.

2 Does not include .6.4) "25 mm) raised face.

INCHES
MILLIMETRES

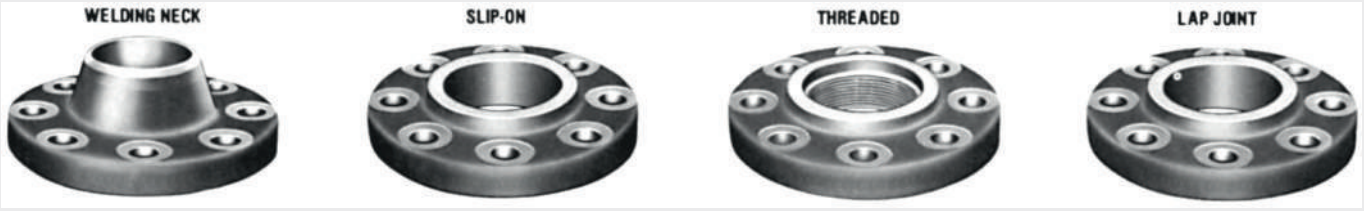
CLASS 600 (PN 100) FLANGES

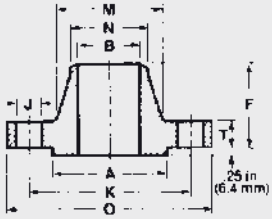
FORGED STEEL
ASTM A105-
[1]ASME/ANSI B16.5

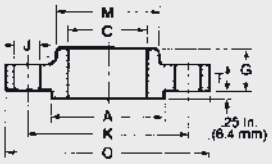


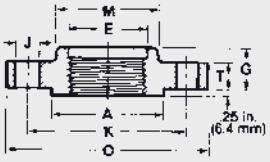
NPS / DN	DRILLING			[1]DEPTH OF SOCKET	DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES	DIA. OF BOLT CIRCLE		AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED & SOCKET WELDING[1]	BLIND	LAP JOINT
		J	K	L	M	N	r				
1/2	4	.62	2.62	.38	1.5	.84	.12	2	2	2	2
15	4	16	66.7	10	38.1	21.4	3	0.9	0.9	0.9	0.9
3/4	4	.75	3.25	.44	1.88	1.05	.12	4	3	3	3
20	4	20	82.5	11	47.6	26.6	3	1.8	1.4	1.4	1.4
1	4	.75	3.5	.50	2.12	1.32	.12	4	4	4	4
25	4	.20	88.9	13	54.0	33.5	3	1.8	1.8	1.8	1.8
1 1/4	4	.75	3.88	.56	2.5	1.66	.19	6	5	5	5
32	4	20	98.4	14	63.9	42.1	5	2.7	2.3	2.3	2.3
1 1/2	4	.88	4.5	.62	2.75	1.90	.25	8	7	8	7
40	4	23	114.3	16	69.8	48.3	6	3.6	3.2	3.6	3.2
2	8	.75	5.0	.69	3.31	2.38	.31	12	9	10	9
50	8	20	127.0	17	84.1	60.3	8	5.4	4.1	4.5	4.1
2 1/2	8	.88	5.88	.75	3.94	2.88	.31	18	13	15	12
65	8	23	149.2	19	100.0	73.0	8	8.2	5.9	6.8	5.4
3	8	.88	6.62	.81	4.62	3.50	.38	23	16	20	15
80	8	23	168.3	21	117.5	88.9	10	10.4	7.3	9.1	6.8
3 1/2	8	1.0	7.25	-	5.25	4.00	.38	26	21	29	20
90	8	26	184.1	-	133.3	101.6	10	11.8	9.5	13.2	9.1
4	8	1.0	8.5	-	6.0	4.50	.44	42	37	41	36
100	8	26	215.9	-	152.4	114.3	11	19.0	16.8	18.6	16.3
5	8	1.12	10.5	-	7.44	5.56	.44	68	63	68	61
125	8	29	266.7	-	188.9	141.3	11	31.0	28.6	30.8	27.7
6	12	1.12	11.5	-	8.75	6.63	.50	81	80	86	78
150	12	29	292.1	-	222.2	168.3	13	36.7	36.3	39.0	35.4
8	12	1.25	13.75	-	10.75	8.63	.50	120	115	140	110
200	12	32	349.2	-	273.0	219.1	13	54.4	52.2	63.5	49.9
10	16	1.38	17.0	-	13.5	10.75	.50	190	170	230	170
250	16	35	431.8	-	342.9	273.0	13	86.2	77.1	104	77.2
12	20	1.38	19.25	-	15.75	12.75	.50	225	200	295	200
300	20	35	488.9	-	400.0	323.8	13	102	90.7	134	90.7
14	20	1.50	20.75	-	17.0	14.0	.50	280	230	355	250
350	20	39	527.0	-	431.8	355.6	13	127	104	161	113
16	20	1.62	23.75	-	19.5	16.0	.50	390	330	495	365
400	20	42	603.2	-	495.2	406.4	13	177	150	225	166
18	20	1.75	25.75	-	21.5	18.0	.50	475	400	630	435
450	20	45	654.0	-	546.1	457.2	13	215	181	286	197
20	24	1.75	28.5	-	24.0	20.0	.50	590	510	810	570
500	24	45	723.9	-	609.6	508.0	13	268	231	367	259
24	24	2.0	33.0	-	28.25	24.0	.50	830	730	1250	810
600	24	51	838.2	-	717.5	609.6	13	376	331	567	367

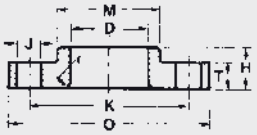
POUNDS
KILOGRAMS









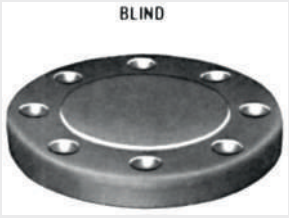


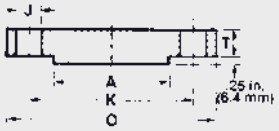
For sizes NPS 2/1 (DN 15) through NPS 2/1 2 (DN 65) use Class 1500 (PN 250) flanges. [1]

NPS / DN	FLANGE OUTSIDE DIAMETER O	FLANGE[2] THICKNESS MIN. T	RAISED FACE DIA. A	BORE: WELDING NECK B	BORE: SLIP-ON, MIN. C	BORE: LAP JOINT MIN. D	BORE: THREADED COUNTER-BORE MIN. E	LENGTH TRU HUB[2]: WELDING NECK F	LENGTH TRU HUB[2]: SLIP-ON, THREADED G	LENGTH TRU HUB[2]: LAP JOINT H
3	9.50	1.50	5.00	To be specified by purchaser	3.57	3.60	3.63	4.00	2.12	2.12
80	241	38.5	127.0		90.7	91.4	92	101.6	54	54
4	11.50	1.75	6.19		4.57	4.60	4.63	4.50	2.75	2.75
100	292	44.5	157.2		116.1	116.8	118	114.3	70	70
5	13.75	2.0	7.31		5.66	5.69	5.69	5.00	3.12	3.12
125	349	51.0	185.7		143.7	144.5	145	127.0	79	79
6	15.00	2.19	8.50		6.72	6.75	6.75	5.50	3.38	3.38
150	381	56.0	215.9		170.7	171.4	171	139.7	86	86
8	18.50	2.5	10.62		8.72	8.75	8.75	67.38	4.00	4.50
200	470	63.5	269.9		221.5	222.2	222	161.9	102	114
10	21.50	2.75	12.75		10.88	10.92	10.88	7.25	4.25	5.00
250	545	70.0	323.8		276.2	277.4	276	184.2	108	127
12	24.00	3.12	15.00		12.88	12.92	12.94	7.88	4.62	5.62
300	610	79.5	381.0		327.0	328.2	329	200.0	117	143
14	25.25	3.38	16.25		14.14	14.18	14.19	8.38	5.12	6.12
350	640	86.0	412.8		359.2	360.2	360	212.7	130	156
16	27.75	3.5	18.50		16.16	16.19	16.19	8.50	5.25	6.50
400	705	89.0	469.9		410.4	411.2	411	215.9	133	165
18	31.00	4.0	21.00		18.18	18.20	18.19	9.00	6.00	7.50
450	785	102.0	533.4		461.8	462.3	462	228.8	152	191
20	33.75	4.25	23.00		20.20	20.25	20.19	9.75	6.25	8.25
500	855	108.0	584.2		513.1	514.3	513	247.6	159	210
24	41.00	5.5	27.25		24.25	24.25	24.19	11.50	8.00	10.50
600	1040	140.0	692.2		615.9	615.9	614	292.1	203	267

1 Including SOCKET WELDING FLANGES
2 Does not include .6.4) "25 mm) raised face.

INCHES
MILLIMETRES



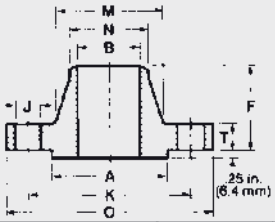


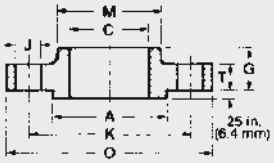
CLASS 900 (PN 150) FLANGES

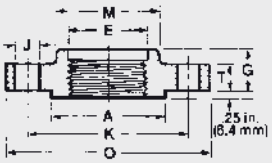
FORGED STEEL
ASTM A105-
ASME/ANSI B16.5

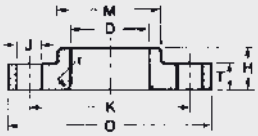
For sizes NPS 2/1 (DN 15) through NPS 2/1 2 (DN 65) use Class 1500 (PN 250) flanges. [1]

NPS / DN	DRILLING			DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIAMETER OF HOLES	DIAMETER OF BOLT CIRCLE	AT BASE	AT CHAMFER		WELDING NECK	SLIP-ON, THREADED	BLIND	LAP JOINT
		J	K	M	N	r				
3	8	1.00	7.50	5.00	3.50	.38	.31	31	31	47
80	8	26	190.5	127.0	88.9	10	14.1	14.1	14.1	21.3
4	8	1.25	9.25	6.25	4.50	.44	51	53	54	51
100	8	32	234.9	158.7	114.3	11	23.1	24.0	24.5	23.1
5	8	1.38	11.00	7.50	5.56	.44	86	83	87	81
125	8	35	279.4	190.5	141.3	11	39.0	37.6	39.5	36.7
6	12	1.25	12.50	9.25	6.63	.50	110	110	115	105
150	12	32	317.5	234.9	168.3	13	49.9	49.9	52.2	47.6
8	12	1.50	15.50	11.75	8.63	.50	175	170	200	190
200	12	39	393.7	298.4	219.1	13	79.4	77.1	90.7	86.2
10	16	1.50	18.50	14.50	10.75	.50	260	245	290	275
250	16	39	469.9	368.3	273.0	13	118	111	132	125
12	20	1.50	21.00	16.50	12.75	.50	325	325	415	370
300	20	39	533.4	419.1	323.8	13	147	147	188	168
14	20	1.62	22.00	17.75	14.00	.50	400	400	520	415
350	20	42	558.8	450.8	355.6	13	181	181	236	188
16	20	1.75	24.25	20.00	16.00	.50	495	425	600	465
400	20	45	615.9	508.0	406.4	13	225	193	272	211
18	20	2.00	27.00	22.25	18.00	.50	680	600	850	650
450	20	51	685.8	565.1	457.2	13	308	272	386	295
20	20	2.12	29.50	24.50	20.00	.50	830	730	1075	810
500	20	54	749.3	622.3	508.0	13	376	331	488	367
24	20	2.62	35.50	29.5	24.00	.50	1500	1400	2025	1550
600	20	67	901.7	749.3	609.6	13	680	635	918	703









NPS	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS [2] MIN.	RAISED FACE DIA.	BORE				LENGTH THRU HUB [2]		
				WELDING NECK & [1]SOCKET WELDING	[1]SLIP-ON & [1]SOCK. WELD. SOCKET MIN.	LAP JOINT MIN.	THREADED COUNTER-BORE MIN.	WELDING NECK	[1]SLIP-ON, THREADED, [1]SOCKET WELDING	LAP JOINT
DN	O	T	A	B	C	D	E	F	G	H
1/2	4.75	.88	1.38	To be specified by purchaser	0.88	.90	.93	2.38	1.25	1.25
15	121	22.5	34.9		22.2	22.9	23.5	60.3	32	32
3/4	5.12	1.00	1.69		1.09	1.11	1.14	2.75	1.38	1.38
20	130	25.5	42.9		27.8	28.2	29.0	69.8	35	35
1	5.88	1.12	2.00		1.36	1.38	1.41	2.88	1.62	1.62
25	149	29.0	50.8		34.5	34.9	36.0	73.0	41	41
1 1/4	6.25	1.12	2.50		1.70	1.72	1.75	2.88	1.62	1.62
32	159	29.0	63.5		43.3	43.7	44.5	73.0	41	41
1 1/2	7.00	1.25	2.88		1.95	1.97	1.99	3.25	1.75	1.75
40	178	32.0	73.0		49.6	50.0	50.5	82.5	44	44
2	8.50	1.50	3.62		2.44	2.46	2.50	4.00	2.25	2.25
50	216	38.5	92.1		61.9	62.5	63.5	101.6	57	57
2 1/2	9.62	1.62	4.12		2.94	2.97	3.00	4.12	2.50	2.50
65	244	41.5	104.8		74.6	75.4	76.0	104.8	64	64
3	10.50	1.88	5.00		-	3.60	3.63	4.62	2.88	2.88
80	267	48.0	127.0		-	91.4	92.0	117.5	73	73
4	12.25	2.12	6.19		-	4.60	4.63	4.88	3.56	3.56
100	311	54.0	157.2		-	116.8	118	123.8	90	90
5	14.75	2.88	7.31		-	5.69	5.69	6.12	4.12	4.12
125	375	73.5	185.7		-	144.5	145	155.6	105	105
6	15.50	3.25	8.50		-	6.75	6.75	6.75	4.69	4.69
150	394	83.0	215.9		-	171.4	171	171.4	119	119
8	19.00	3.62	10.62		-	8.75	8.75	8.38	5.62	5.62
200	483	92.0	269.9		-	222.2	222	212.7	143	143
10	23.00	4.25	12.75		-	10.92	10.88	10.00	6.25	7.00
250	585	108.0	323.8		-	277.4	276	254.0	159	178
12	26.50	4.88	15.00		-	12.92	12.94	11.12	7.12	8.62
300	675	124.0	381.0		-	328.2	329	282.6	181	219
14	29.50	5.25	16.25		-	14.18	-	11.75	-	9.50
350	750	133.5	412.8		-	360.2	-	298.4	-	241
16	32.50	5.75	18.50		-	16.19	-	12.25	-	10.25
400	825	146.5	469.9		-	411.2	-	311.1	-	260
18	36.00	6.38	21.00		-	18.20	-	12.88	-	10.88
450	915	162.0	533.4		-	462.3	-	327.0	-	276
20	38.75	7.00	23.00		-	20.25	-	14.00	-	11.50
500	985	178.0	584.2		-	514.3	-	355.6	-	292
24	46.00	8.00	27.25		-	24.25	-	16.00	-	13.00
600	1170	203.5	692.2		-	615.9	-	406.4	-	330

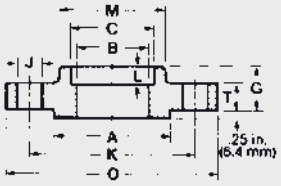
[1] Socket Welding and Slip-on Flanges, size NPS 2/1 3 (DN 80) and larger are not covered by ASME/ANSI B16.5.

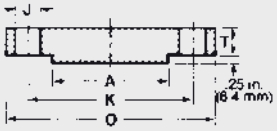
[2] Does not include .6.4) "25 mm) raised face.

INCHES
MILLIMETRES

CLASS 1500 (PN 250) FLANGES

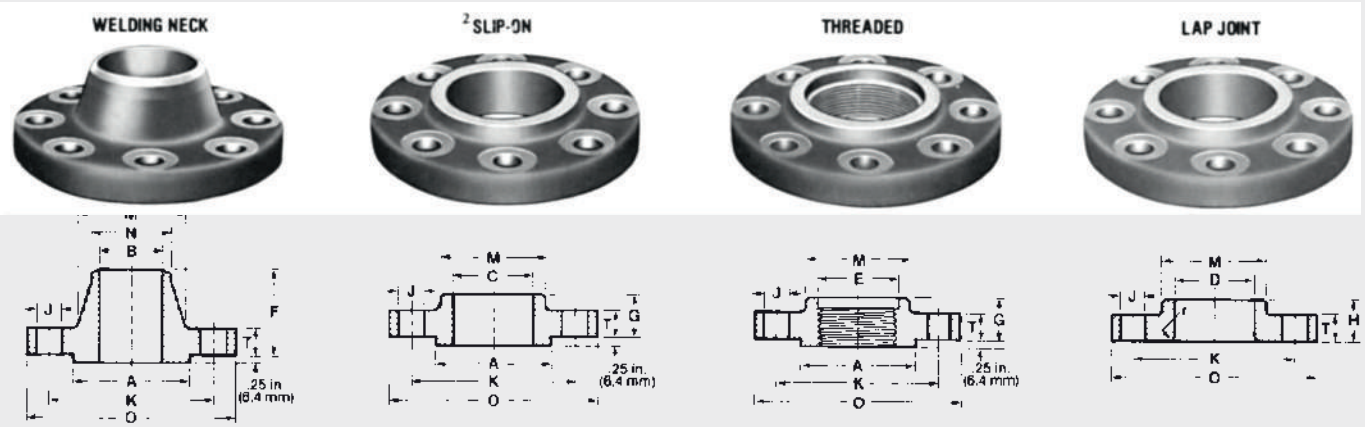
FORGED STEEL
ASTM A105-
ASME/ANSI B16.5





NPS / DN	DRILLING			[1]DEPTH OF SOCKET	DIAMETER OF HUB		LAP JOINT FILLET RADIUS	APPROXIMATE WEIGHT			
	NO. OF HOLES	DIA. OF HOLES J	DIA. OF BOLT CIRCLE K	L	AT BASE M	AT CHAMFER N	r	WELDING NECK	[1]SLIP-ON, THREADED & [1]SOCKET WELDING	BLIND	LAP JOINT
1/2	4	.88	3.25	.38	1.50	.84	.12	5	4	4	4
15	4	23	82.5	10	38.1	21.4	3	2.3	1.8	1.8	1.8
3/4	4	.88	3.50	.44	1.75	1.05	.12	6	5	6	5
20	4	23	88.9	11	44.4	26.6	3	2.7	2.3	2.7	2.3
1	4	1.00	4.00	.50	2.06	1.32	.12	9	8	8	8
25	4	26	101.6	13	52.4	33.5	3	4.1	3.6	3.6	3.6
1 1/4	4	1.00	4.38	.56	2.50	1.66	.19	10	9	9	9
32	4	26	111.1	14	63.5	42.1	5	4.5	4.1	4.1	4.1
1 1/2	4	1.12	4.88	.62	2.75	1.90	.25	13	12	13	12
40	4	29	123.8	16	69.8	48.3	6	5.9	5.4	5.9	5.4
2	8	1.00	6.50	.69	4.12	2.38	.31	25	25	25	25
50	8	26	165.1	17	104.8	60.3	8	11.3	11.3	11.3	11.3
2 1/2	8	1.12	7.50	.75	4.88	2.88	.31	36	36	35	35
65	8	29	190.5	19	123.8	73.0	8	16.3	16.3	15.9	16.0
3	8	1.25	8.00	-	5.25	3.50	.38	48	48	48	47
80	8	32	203.2	-	133.3	88.9	10	21.8	21.8	21.8	21.3
4	8	1.38	9.50	-	6.38	4.50	.44	73	73	73	75
100	8	35	241.3	-	161.9	114.3	11	33.1	33.1	33.1	34.0
5	8	1.62	11.50	-	7.75	5.56	.44	130	130	140	140
125	8	42	292.1	-	196.8	141.3	11	59.0	59.0	63.5	63.5
6	12	1.50	12.50	-	9.00	6.63	.50	165	165	160	170
150	12	39	317.5	-	228.6	168.3	13	75	75	72.6	77.1
8	12	1.75	15.50	-	11.50	8.63	.50	275	260	300	285
200	12	45	393.7	-	292.1	219.1	13	125	118	136	129
10	12	2.00	19.00	-	14.50	10.75	.50	455	435	510	485
250	12	51	482.6	-	368.3	273.0	13	206	197	231	220
12	16	2.12	22.50	-	17.75	12.75	.50	690	580	690	630
300	16	54	571.5	-	450.6	323.8	13	313	263	313	286
14	16	2.38	25.00	-	19.50	14.00	.50	940	-	975	890
350	16	61	635.0	-	495.3	355.6	13	426	-	442	404
16	16	2.62	27.75	-	21.75	16.00	.50	1250	-	1300	1150
400	16	67	704.8	-	552.4	406.4	13	567	-	590	522
18	16	2.88	30.50	-	23.50	18.00	.50	1625	-	1750	1475
450	16	74	774.7	-	569.9	457.2	13	737	-	795	669
20	16	3.12	32.75	-	25.25	20.00	.50	2050	-	2225	1775
500	16	80	831.8	-	641.3	508.0	13	930	-	1010	805
24	16	3.62	39.00	-	30.00	24.00	.50	3325	-	3625	2825
600	16	92	990.6	-	762.0	609.6	13	1510	-	1644	1326

POUNDS
KILOGRAMS



NPS	FLANGE OUTSIDE DIAMETER	FLANGE THICKNESS [1]	RAISED FACE DIA.	BORE				LENGTH THRU HUB [1]		
				WELDING NECK & SOCKET WELDING [2]	SLIP-ON [2] & SOCK. WELD. [2] SOCKET MIN.	LAP JOINT MIN.	THREADED COUNTER-BORE MIN.	WELDING NECK	SLIP-ON [2] THREADED SOCKET [2] WELDING	LAP JOINT
DN	O	T	A	B	C	D	E	F	G	H
1/2	5.25	1.19	1.38	To be specified by purchaser	0.88	.90	0.93	2.88	1.56	1.56
15	133	30.5	34.9		22.2	22.9	23.5	73.0	40	40
3/4	5.50	1.25	1.69		1.09	1.11	1.14	3.12	1.69	1.69
20	140	32.0	42.9		27.8	28.2	29.0	79.4	43	43
1	6.25	1.38	2.00		1.36	1.38	1.41	3.50	1.88	1.88
25	159	35.0	50.8		34.5	34.9	36.0	88.9	48	48
1 1/4	7.25	1.50	2.50		1.70	1.72	1.75	3.75	2.06	2.06
32	184	38.5	63.5		43.3	43.7	44.5	95.2	52	52
1 1/2	8.00	1.75	2.88		1.95	1.97	1.99	4.38	2.38	2.38
40	203	44.5	73.0		49.6	50.0	50.5	111.4	60	60
2	9.25	2.00	3.62		2.44	2.46	2.50	5.00	2.75	2.75
50	235	51.0	92.1		61.9	62.5	63.5	127.0	70	70
2 1/2	10.50	2.25	4.12		2.94	2.97	3.00	5.62	3.12	3.12
65	267	57.5	104.8		74.6	75.4	76	142.9	79	79
3	12.00	2.62	5.00		3.57	3.60	3.63	6.62	3.62	3.62
80	305	67.0	127.0		90.7	91.4	92	168.2	92	92
4	14.00	3.00	6.19		4.57	4.60	4.63	7.50	4.25	4.25
100	356	76.5	157.2		116.1	116.8	118	190.5	108	108
5	16.50	3.62	7.31		5.66	5.69	5.69	9.00	5.12	5.12
125	419	92.5	185.7		143.7	144.5	145	228.6	130	130
6	19.00	4.25	8.50		6.72	6.75	6.75	10.75	6.0	6.0
150	483	108.0	215.9		170.7	171.4	171	273.0	152	152
8	21.75	5.00	10.62		8.72	8.75	8.75	12.50	7.0	7.0
200	552	127.0	269.9		221.5	222.2	222	317.5	178	178
10	26.50	6.50	12.75		10.88	10.92	10.88	16.50	9.0	9.0
250	675	165.5	323.8		276.2	277.4	276	419.4	229	229
12	30.00	7.25	15.00		12.88	12.92	12.94	18.25	10.0	10.0
300	760	184.5	381.0		327.0	328.2	329	463.6	254	254

[1] Dimensions do not include .6.4) "25 mm) raised face.

[2] Class 2500 (PN 420) Socket Welding and Slip-on Flanges not covered by ANSI B16.5

REDUCING FLANGES ASME/ANSI B16.5 —

Hub dimensions shall be at least as large as those of the standard flanges of the size to which the reduction is being made, except that flanges reduced to a size smaller than those shown in the accompanying table may be used without hubs.

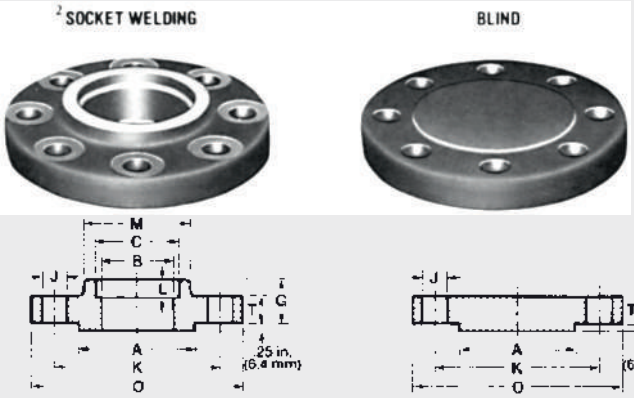
For threaded flanges, tapped smaller than the reduced size in the table, Blind Flanges may be used.

Flange thickness, outside diameter, drilling template and facing dimensions, shall be the same as those of a standard flange of the nominal pipe size from which the reduction is being made.

Reducing flanges are specified by giving firstly the size from which the reduction is made, followed by the reduced size.

Example: NPS 6 x 4 Class 300 reducing threaded flange. (DN 150 x 100, PN 50 reducing threaded flange.)

INCHES
MILLIMETRES



CLASS 2500 (PN 420) FLANGES*

FORGED STEEL
ASTM A105-
[1]ASME/ANSI B16.5

NPS / DN	DRILLING NO. OF HOLES	DRILLING DIA. OF HOLES J	DRILLING DIA. OF BOLT CIRCLE K	DEPTH OF [2]SOCKET L	DIAMETER OF HUB AT BASE M	DIAMETER OF HUB AT CHAMFER N	LAP JOINT FILLET RADIUS r	APPROXIMATE WEIGHT WELDING NECK	APPROXIMATE WEIGHT [2] SLIP-ON, THREADED & SOCKET WELDING	APPROXIMATE WEIGHT BLIND	APPROXIMATE WEIGHT LAP JOINT
1/2	4	.88	3.50	.38	1.69	.84	.12	7	7	7	7
15	4	23	88.9	10	42.9	21.4	3	3.2	3.2	3.2	3.2
3/4	4	.88	3.75	.44	2.00	1.05	.12	8	8	8	8
20	4	23	95.2	11	50.8	26.6	3	3.6	3.6	3.6	3.6
1	4	1.00	4.25	.50	2.25	1.32	.12	12	11	11	11
25	4	26	107.9	13	57.1	33.5	3	5.4	5.0	5.0	5.0
1 1/4	4	1.12	5.12	.56	2.88	1.66	.19	17	16	17	16
32	4	29	130.2	14	73.0	42.1	5	7.7	7.3	7.7	7.3
1 1/2	4	1.25	5.75	.62	3.12	1.90	.25	25	22	23	22
40	4	32	146.0	16	79.4	48.3	6	11.3	10	10.4	10
2	8	1.12	6.75	.69	3.75	2.38	.31	42	38	39	37
50	8	29	171.4	17	95.2	60.3	8	19.0	17.2	17.7	16.8
2 1/2	8	1.25	7.75	.75	4.50	2.88	.31	52	55	56	53
65	8	32	196.8	19.0	114.3	73.0	8	23.6	24.9	25.4	24
3	8	1.38	9.00	-	5.25	3.50	.38	94	83	86	80
80	8	35	228.6	-	133.3	88.9	10	42.6	37.6	39	36.3
4	8	1.62	10.75	-	6.50	4.50	.44	145	125	135	120
100	8	42	273.0	-	165.1	114.3	11	65.8	56.7	61.2	54.4
5	8	1.88	12.75	-	8.00	5.56	.44	245	210	225	205
125	8	48	323.8	-	203.2	141.3	11	111	95.3	102	93.0
6	8	2.12	14.50	-	9.25	6.63	.50	380	325	345	315
150	8	54	368.3	-	234.9	168.3	13	172	147	156	143
8	12	2.12	17.25	-	12.00	8.63	.50	580	485	530	470
200	12	54	438.1	-	304.8	219.1	13	263	220	240	213
10	12	2.62	21.25	-	14.75	10.75	.50	1075	930	1025	900
250	12	67	539.7	-	374.8	273.0	13	488	422	465	408
12	12	2.88	24.38	-	17.38	12.75	.50	1525	1100	1300	1100
300	12	74	619.1	-	441.3	323.8	13	692	499	590	499

* Class 2500 (PN 420) Socket Welding and Slip-on Flanges are not covered by ASME/ANSI B16.5.

Bevel of Welding Neck, see page 48
Flange facing and gasket dimensions, see page 20.
Bolting dimensions, see page 22.

CLASS 150 — 2500 (PN 20 - 420)

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
1	25	1/2
1 1/4	32	1/2
1 1/2	40	1/2
2	50	1
2 1/2	65	1 1/4
3	80	1 1/4

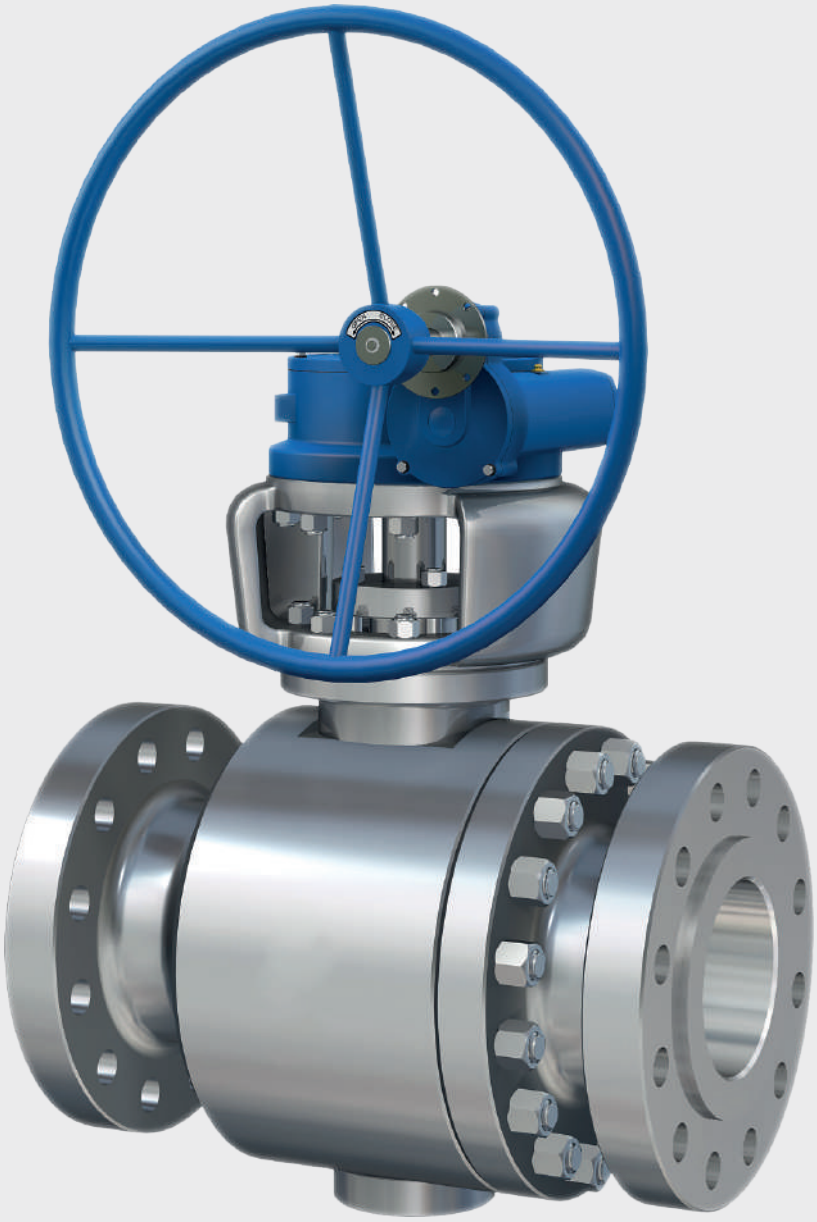
Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
3 1/2	90	1 1/2
4	100	1 1/2
5	125	1 1/2
6	150	2 1/2
8	200	3 1/2
10	250	3 1/2

Nominal Pipe Size	DN	Smallest Size of Reducing Outlet Requiring Hub Flanges
12	300	3 1/2
14	350	3 1/2
16	400	4
18	450	4
20	500	4
24	600	4

Reducing Flanges are generally supplied as Slip-on or Threaded; however Reducing Welding Neck flanges are available by special order.

POUNDS
KILOGRAMS

MidTech
Engineering Solutions



CAST STEEL & STAINLESS STEEL

VALVES

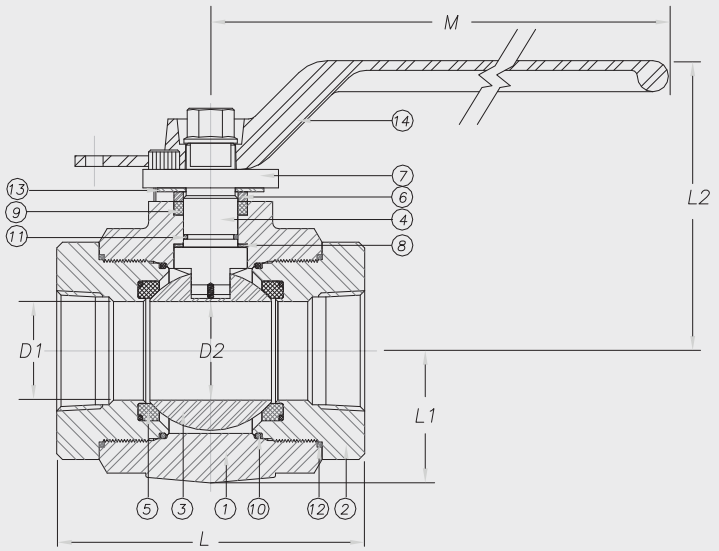
MidTech
Engineering Solutions

CAST STEEL
FORGED STEEL
STAINLESS STEEL

BALL VALVES

3 Piece Threaded Body, Ball Valve,

- 4000 WOG, ½" to 2", NPT, NP T X SW, SW X SW (weld in li ne without taking valve apart)
- Designed and tested to ASME B16.34, API 598, API 607 and NACE MR0175 (2002)
- Standard Features: Locking Lever, Blowout Proof Stem, Antistatic and Mounting Pad.



MATERIALS OF CONSTRUCTION

ITEM	PART NAME	STANDARD/ NACE (2002)	LOW TEMPERATURE/ NACE (2002)	STAINLESS STEEL/ NACE (2002)
1	BODY	A105 /A216 WCB	A350 LF2 / A352 LCC	316 SS / A351 CF8M
2	CAP	A105 /A216 WCB	A350 LF2 / A352 LCC	316 SS / A351 CF8M
3	BALL	CF8M / 316 SS	CF8M / 316 SS	CF8M / 316 SS
4	STEM	A564 GR 630 17/4 PH	A564 GR 630 17/4	A564 GR 630 17/4 PH
5	SEAT (NPT) SEAT (SW)	DELRIN PEEK	DELRIN PEEK	DELRIN PEEK
6	PACKING RING	304SS	304SS	304SS
7	GLAND	CARBON STEEL	CARBON STEEL	CARBON STEEL
8	THRUST WASHER	PTFE	PTFE	PTFE
9	PACKING	GRAPHITE	GRAPHITE	GRAPHITE
10	O-RING	VITON	VITON	VITON
11	O-RING	VITON	VITON	VITON
12	GASKET	GRAPHITE	GRAPHITE	GRAPHITE
13	BELLEVILLE WASHER	302SS	302SS	302SS
14	LEVER	A216 WCB	A216 WCB	A351 CF8

* OTHER MATERIAL AVAILABLE UPON REQUEST

DIMENSIONS

SIZE	SIZE	L(NPT)	L (SW)	L(NPT-SW)	L1	L2	D1	D2	SW O.D.	M
½" FP	12.7	98	127	113	22	83	12.7	12.7	21.8	160
¾" FP	19	108	172	140	30	90	19	19	27.8	160
1" FP	25	108	172	152	34	94	25	25	48.8	200
1 ½" FP	38.1	159	217	188	50	122	38.1	38.1	33.9	250
2" FP	50	159	324	241	63	150	50	50	61.2	315
¾" RP	19	111	172	140	22	83	19	12.7	27.8	160
1" RP	25	108	172	140	30	90	25	19	48.8	160
1 ½" RP	38.1	159	217	188	34	94	38.1	25	33.9	200
2" RP	50	159	217	188	50	122	50	38.1	61.2	250

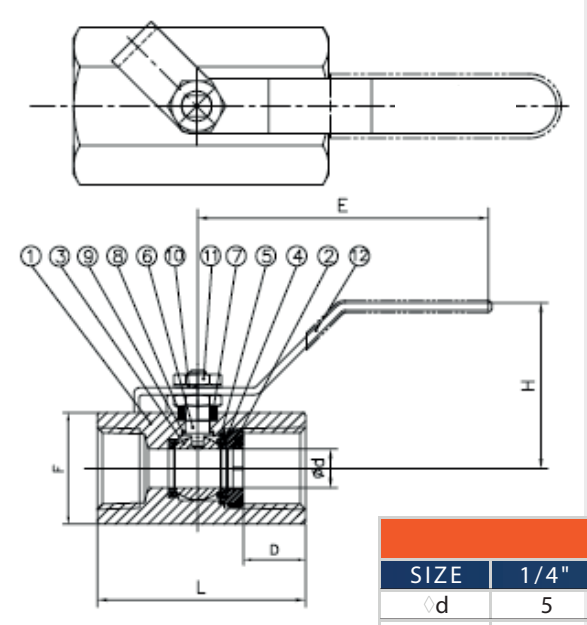
MidTech
Engineering Solutions

CAST STEEL
FORGED STEEL
STAINLESS STEEL

BALL VALVES

1 Piece Forged Carb on Steel Hexagon Bar Stock.

- 2000 WOG, Reduced Bore and Lever Operated Ball Valves.



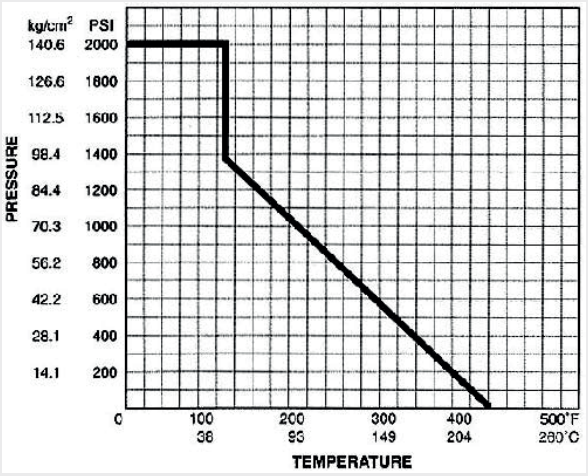
MATERIALS OF CONSTRUCTION		
1	BODY	CARBON STEEL
2	SEAT RETAINER	CARBON STEEL
3	BALL	SS316
4	SEAT	PTFE
5	GASKET	PTFE
6	STEM	SS316
7	GLAND	STAINLESS STEEL
8	PACKING	PTFE
9	THRUST WASHER	PTFE
10	SPRING WASHER	STAINLESS STEEL
11	NUT	CARBON STEEL
12	HANDLE	CARBON STEEL

DIMENSIONS								
SIZE	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	-1/2"	2"
d	5	7	9.2	12.5	16	20	24.5	32
L	43.2	47.2	62.5	69.9	85.9	93.7	101.6	14.3
E	66.7	66.7	118	118	120	146	146	152
H	31.8	33.9	55.5	59	65.4	74	78.7	120
D	12	12.2	17.4	22.3	25.5	27.8	29.6	29.4
F	21	25.4	30	36	46	55	61	75

2000 PSI 1/4" to 2"

- REDUCED PORT
- NPT X NPT
- ONE PIECE BODY
- BLOW OUT PROOF STEM
- ADJUSTABLE PACKING
- NACE (2002) COMPLIANT
- TEST API 598

VALVE SEAT PRESSURE - TEMPERATURE RATING



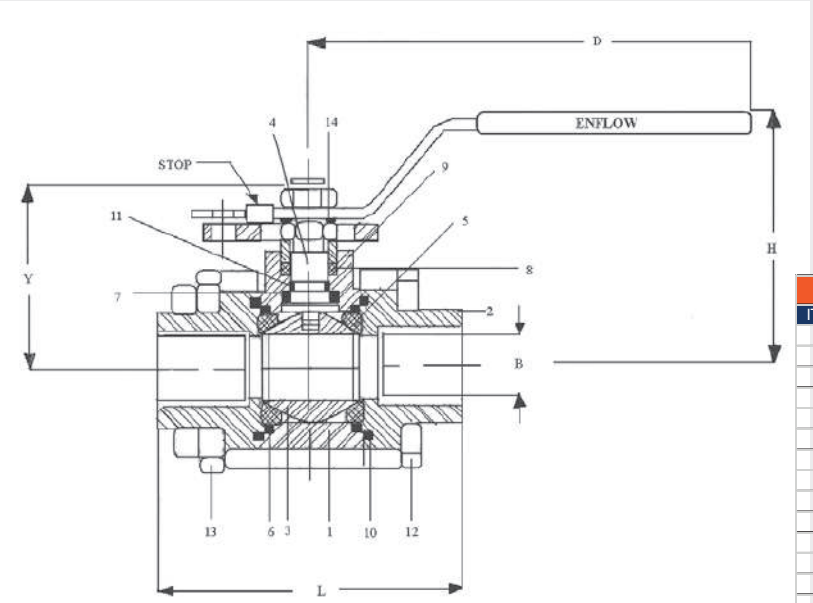
MidTech
Engineering Solutions

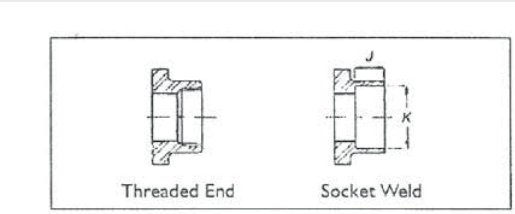
CAST STEEL
FORGED STEEL
STAINLESS STEEL

BALL VALVES

3 Piece Bolted Body, Cast Carbon or Stainless Investment Cast Ball Valve

- 2000 WOG, FP OR RP, NPT OR SW





MATERIALS OF CONSTRUCTION			
ITEM NO.	PART NAME	STANDARD	STAINLESS STEEL
1	BODY	ASTM A216 WCB	ASTM A351 CF8M
2	ADAPTER	ASTM A216 WCB	ASTM A351 CF8M
3	BALL	A182 F316 SS	A182 F316 SS
4	STEM	A182 F316 SS	A182 F316 SS
5	SEAT	PTFE	PTFE
6	GASKET	PTFE	PTFE
7	STEM SEA L	PTFE	PTFE
8	PACKING	GRAPHITE	GRAPHITE
9	PACKING RING	STAINLESS STEE L	STAINLESS STEE L
10	GASKET	GRAPHITE	GRAPHITE
11	O-RING	VITON	VITON
12	BOLT	ASTM A193 B7	ASTM A193 B8
13	NUT	ASTM A194 2H	ASTM A194 8
14	LOCK WASHER	STAINLESS STEE L	STAINLESS STEE L

- FULL PORT OR REGULAR PORT
- NPT x NPT, SW x SW, SW x NPT
- THREE PIECE BODY
- BLOW OUT PROOF STEM
- LOCKING LEVER
- ADJUSTABLE PACKING
- NACE (2002) COMPLIANT
- TEST API 598

TOR QUE Max. Breakawa y Tor que (in. lbs. CV VALUES: US GPM/1 PSI DROP				
SI ZE	FULL PORT		REGULAR PORT	
	TORQUE	CV	TORQUE	CV
1/4"	35	8.0	35	8.0
3/8"	35	8.0	35	8.0
1/2"	60	21.0	35	8.0
3/4"	120	28.0	60	21.0
1"	180	45.5	110	28.0
1-1/4"	210	73.0	180	45.5
1-1/2"	240	102.0	210	73.0
2"	350	200.0	340	102.0

DIMENSIONS																	
		FULL PORT							NET WT.	REGULAR PORT							NET WT.
SIZE	UNIT	B	L	Y	H	D	K	J	KG.	B	L	Y	H	D	K	J	KG.
1/4"	in.	0.39	2.48	1.49	2.36	5.05	0.56	0.4 4	0.08	0.39	2.4 8	1.49	2.36	5.05	0.55	0.44	0.80
8	mm	10	63	38	60	128	14.10	11.18		10	63	38	60	12 8	14.10	11.1 8	
3/8"	in.	0.39	2.48	1.49	2.36	5.08	0.69	0.4 4	0.80	0.39	2.4 8	1.49	2.36	5.05	0.69	0.44	0.80
10	mm	10	63	38	60	128	17.5 2	11.18		10	63	38	60	12 8	17.52	11.1 8	
1/2"	in.	0.50	2.52	1.89	2.67	5.25	0.85	0.4 4	0.90	0.50	2.5 2	1.89	2.67	4.96	0.85	0.44	0.90
15	mm	12.70	64	48	6 8	133	21.7 2	11.18		12.70	6 4	38	68	126	21.72	11.1 8	
3/4"	in.	0.75	3.74	2.36	3.15	5.47	1.06	0.56	1.80	0.50	2.75	1.81	2.56	4.96	1.06	0.56	1.00
20	mm	19.10	95	60	80	139	27.05	14.22		12.70	70	46	65	126	27.05	14.2 2	
1"	in.	1.00	4.00	2.67	3.35	5.51	1.33	0.7 2	2.10	0.75	3.7 4	2.36	3.15	5.8 2	1.33	0.72	2.00
25	mm	25.40	102	68	85	140	33.7 8	18.29		19	95	60	80.00	14 8	33.78	18.29	
1-1/2"	in.	1.50	5.07	4.09	4.33	7.48	1.91	0.7 2	4.50	1.26	4.5 2	3.31	3.78	7.4 8	1.91	0.72	3.80
40	mm	38.10	129	111	110	190	48.6 4	18.29		32	115	84	96	190	48.64	18.29	
2"	in.	2.00	5.51	4.09	4.92	7.87	2.40	0.8 4	6.50	1.50	4.9 2	3.58	4.33	7.4 8	2.40	0.84	4.90
50	mm	50.80	140	104	125	200	61.11	21.33		38.10	125	91	110	190	61.11	21.33	

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CAST STEEL
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STAINLESS STEEL

FLOATING BALL VALVES

Design Features

Rugged Construction

High quality castings poured in a variety of metals including carbon, stainless and other alloys, ensures durable and consistent operation in the harshest service conditions.

Body Construction

2 piece bolted body design incorporates a metal overlapping body joint for enhanced strength with a high temperature controlled seal.

Seat Detail

Seat detail is engineered to supply even pressure on the ball at all times ensuring a reliable bubble tight shut-off on every cycle (exceeds ANSI Class IV level).

Anti-Static

Electrical continuity between stem, ball and body is ensured through anti-static features supplied as standard in all valves.

Anti Blow-Out Stem

Positive blow out proof stem design is achieved from internal stem assembly to enable the stem gland to be removed in line for easy stem packing replacement.

Stem Seal System

Floating ball valves are designed with a multi-independent stem seal system with adjustable packing to provide an economical solution for fugitive emission control.

Fire Safe Design

All valves are tested in accordance with API 607 latest edition.

Locking Device

All Enflow ball valves are equipped with locking devices for both lock-open and lock-closed service.

Control Characteristics

All valves are suitable for on / off control valve service with control characteristics and enhanced shut off capabilities.

NACE (2002) Compliance

All materials supplied for valves meet the requirements of NACE MR-01-75 (2002). Compliance is ensured during the manufacturing process by strict inspection and material control.

Field Repairable

Simple user friendly design allows for quick and easy part replacement requiring minimal "Down Time".

AVAILABLE MATERIALS OF CONSTRUCTION

ITEM	PART NAME	STANDARD NACE (2002)	LOW TEMPERATURE NACE (2002)	STAINLESS STEEL NACE (2002)	DUPLEX	SUPER DUPLEX
1	BODY	A216 WCB	A352 LCC	A182 CF8M	A182 F51	A182 F55
2	CAP	A216 WCB	A352 LCC	A182 CF8M	A182 F51	A182 F55
3	BALL	A216 WCB / ENP	A216 WCB / ENP	A182 CF8M	A182 F51	A182 F55
		A182 CF8M / 316 SS	A182 CF8M / 316 SS			
■4	GASKET	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE
5	STUDS	A193 B7M	A320 L7M	A193 B8M	A193 B8M	A193 B8M
6	NUTS	A194 2HM	A194 7M	A194 GR 8	A194 GR 8	A194 GR 8
■7	SEAT	RTFE	RTFE	RTFE	RTFE	RTFE
		DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API
		PEEK	PEEK	PEEK	PEEK	PEEK
■8	SEAL	VITON	VITON	VITON	VITON	VITON
		PTFE	PTFE	PTFE	PTFE	PTFE
9	STEM	A105N/ ENP	A350 LF2 / ENP	A182 CF8M / 316 SS	A182 F51	A182 F55
		A182 CF8M / 316 SS	A182 CF8M / 316 SS			
10	ANTISTATIC BALL	304 SS	304 SS	304 SS	304SS	304SS
11	ANTISTATIC SPRING	304 SS	304 SS	304 SS	304SS	304SS
■12	STEM WASHER	RTFE	RTFE	RTFE	RTFE	RTFE
		DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API
		PEEK	PEEK	PEEK	PEEK	PEEK
■13	O-RING	VITON	VITON	VITON	VITON	VITON
■14	PACKING	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE
		RTFE	RTFE	RTFE	RTFE	RTFE
15	PACKING RING	304 SS	304 SS	304SS	304SS	304SS
16	GLAND	CARBON STEEL	CARBON STEEL	A182 CF8M	A182 CF8M	A182 CF8M
17	LEVER / WRENCH	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
18	WASHER	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
19	BOLT	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
20	GLAND BOLT	A193 B7	A320 L7	A193 B8	A193 B8	A193 B8

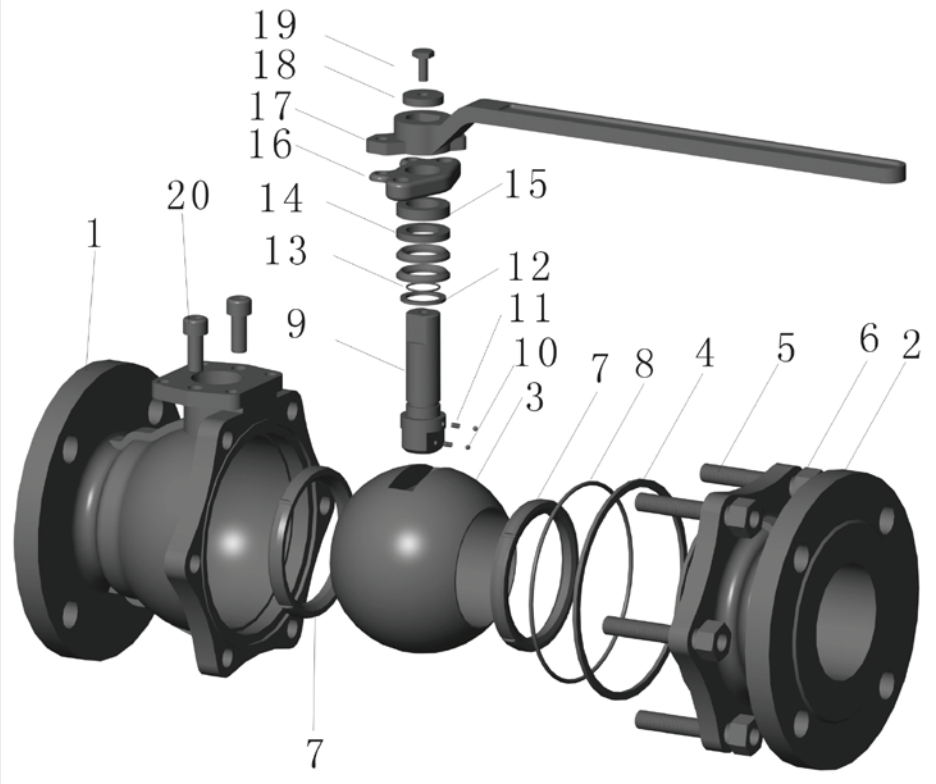
Other materials available upon request

■ **INDICATES PARTS INCLUDED IN MINOR REPAIR KIT**

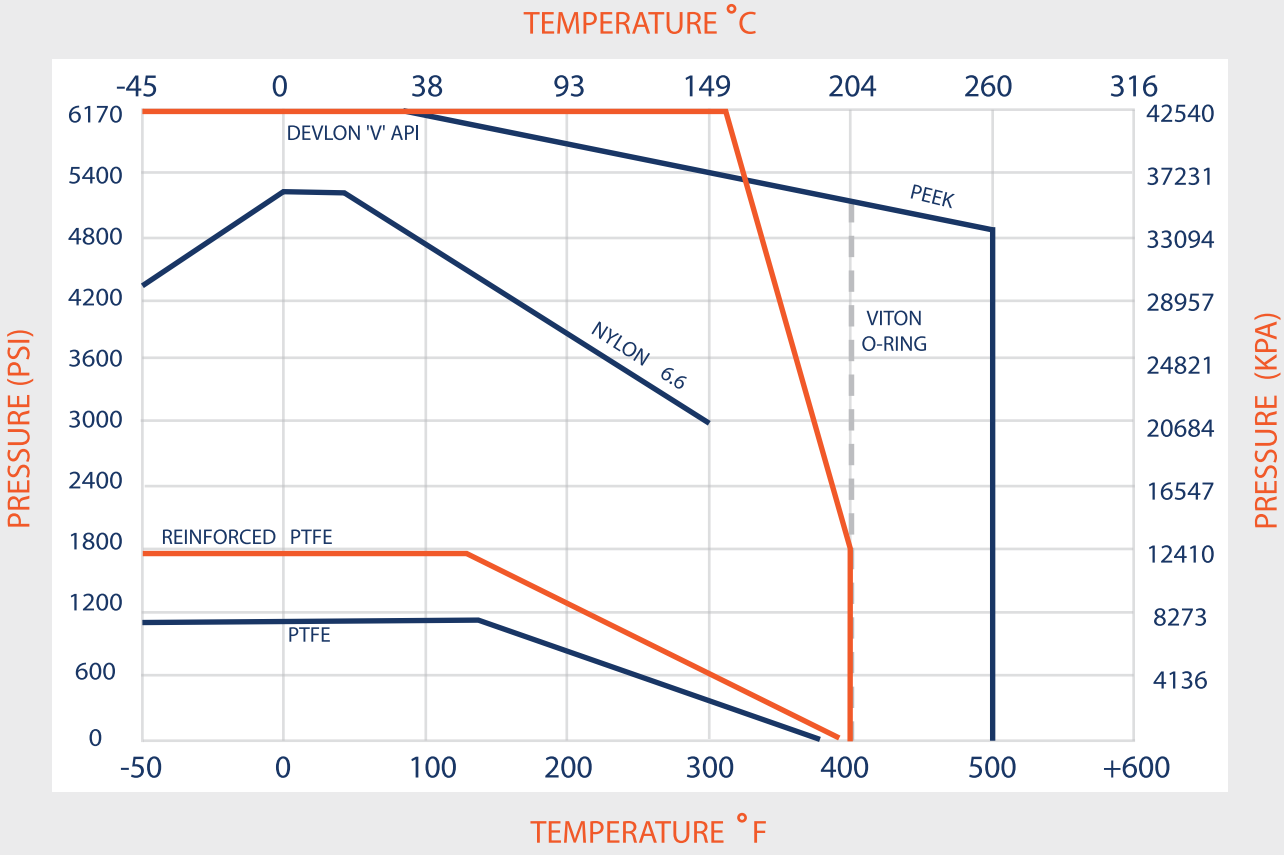
PRESSURE TEST TO API 598

TEST	MEDIUM	PRESSURE
SHELL TEST	WATER	1.5 TIMES NOMINAL PRESSURE
LOW PRESSURE CLOSURE TEST	AIR	80 PSI (.6 MPA)
HIGH PRESSRUE CLOSURE TEST*	WATER	1.1 TIMES NOMINAL PRESSURE

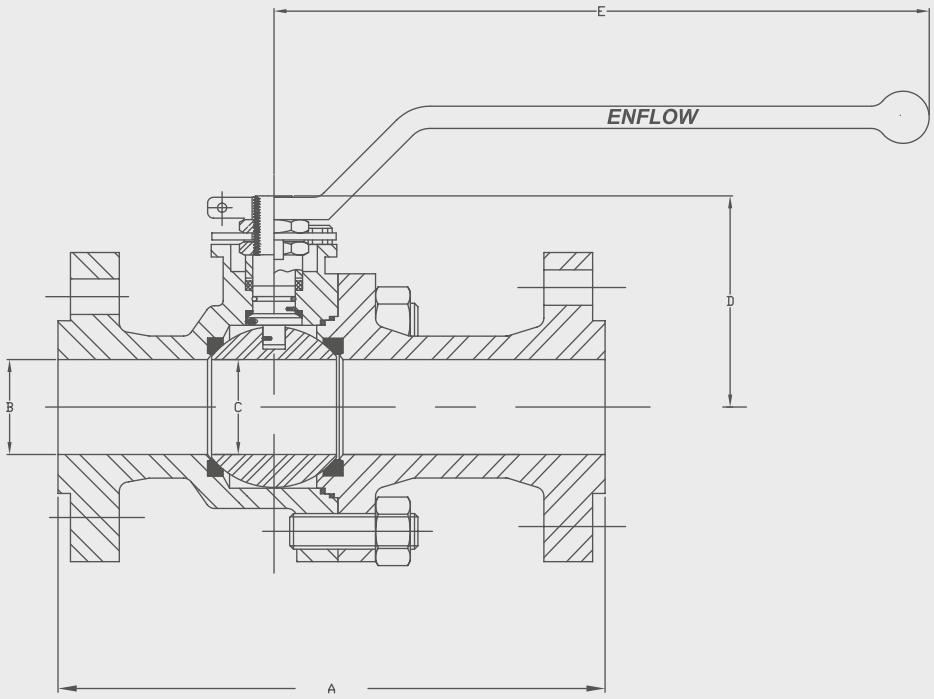
* Only if specified by customer at time of order



PRESSURE / TEMPERATURE CURVE



This graph is to be used as a guide only.
For special materials consult Enflow engineering department.



FULL PORT ANSI 150

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
½"	15	4.25	108	.5	15	.5	15	2.3	59	7.0	180	10	4.5
¾"	20	4.62	117	.7	20	.7	20	2.5	63	7.0	180	11	5.0
1"	25	5.00	127	1	25	1	25	3.0	75	7.0	180	12	5.5
1 ½"	40	6.50	165	1.5	40	1.5	40	3.7	95	13.0	330	14	6.5
2"	50	7.00	178	2	50	2	50	5.0	127	13.0	330	22	10
3"	80	8.00	203	3	80	3	80	6.5	294	13.7	350	42	19
4"	100	9.00	229	4	100	4	100	8.0	203	20.0	510	70	32
6"	150	15.50	395	6	150	6	150	10.7	272	29.9	760	148	67
8"	200	18.00	457	8	200	8	200	13.5	342	n/a*	n/a*	245	111
10"	250	21.00	533	10	250	10	250	19.5	495	n/a*	n/a*	452	205

FULL PORT ANSI 300

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
½"	15	5.50	140	.5	15	.5	15	2.3	59	7.0	180	11	5.0
¾"	20	6.00	152	.7	20	.7	20	2.5	63	7.0	180	12	5.5
1"	25	6.50	127	1	25	1	25	3.0	75	7.0	180	13	6.0
1 ½"	40	7.50	191	1.5	40	1.5	40	4.0	103	13.0	330	24	11
2"	50	8.50	216	2	50	2	50	5.0	127	13.0	330	20	9.0
3"	80	11.12	283	3	80	3	80	6.5	294	13.7	350	66	30
4"	100	12.00	305	4	100	4	100	9.0	228	20.0	510	70	32
6"	150	15.87	403	6	150	6	150	12.0	304	29.9	760	275	126
8"	200	19.75	502	8	200	8	200	15.0	381	n/a*	n/a*	443	200

FULL PORT ANSI 600

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
2"	50	11.50	292	2	50	2	50	5.0	127	13.5	345	56	25
3"	80	14.00	356	3	80	3	80	6.5	294	15.2	385	113	51
4"	100	17.00	432	4	100	4	100	9.0	228	24.0	610	203	92

REGULAR PORT ANSI 150

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
2”	50	7.00	178	2	50	1.5	40	3.7	95	13.0	330	17	7.5
3”	80	8.00	203	3	80	2	50	5.0	127	13.0	330	28	13
4”	100	9.00	229	4	100	3	80	6.5	294	13.7	350	55	25
6”	150	15.50	394	6	150	4	100	8.0	203	20.0	510	79	36
6”SP	150SP	10.50	267	6	150	4	100	8.0	203	20.0	510	79	36
8”	200	18.00	457	8	200	6	150	10.7	272	29.9	760	165	75
8”SP	200SP	11.50	292	8	200	6	150	10.7	272	29.9	760	165	75
10”	250	21.00	533	10	250	8	200	13.5	342	n/a*	n/a*	269	122
10”SP	250SP	13.00	330	10	250	8	200	13.5	342	n/a*	n/a*	269	122

SP= Short Pattern- Short or Long pattern to be specified at time of order.

REGULAR PORT ANSI 300

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
2”	**50**	8.50	216	2	50	1.5	40	3.7	95	13.0	330	27	12
3”	**80**	11.12	283	3	80	2	50	5.0	127	13.0	330	60	27
4”	**100**	12.00	305	4	100	3	80	6.5	294	13.7	350	77	35
6”	**150**	15.87	403	6	150	4	100	8.0	203	20.0	510	110	50
8”	**200**	19.75	502	8	200	6	150	10.7	272	29.9	760	276	125
8”SP	**200SP**	16.50	419	8	200	6	150	10.7	272	29.9	760	276	125

SP= Short Pattern- Short or Long pattern to be specified at time of order.

REGULAR PORT ANSI 600

SIZE		A		B		C		D		E		WEIGHT	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Lbs	Kg
2”	**50**	11.50	292	2	50	1.5	40	3.7	95	13.5	345	48	22
3”	**80**	14.00	356	3	80	2	50	5.0	127	15.2	385	71	32.5
4”	**100**	17.00	432	4	100	3	80	6.5	294	24.0	610	159	72
6”	**150**	22.00	559	6	150	4	100	8.0	203	24.0	610	231	105

FLOW COEFFICENT (Cv)

The Flow Coefficient of a valve is the flow rate of water (gallons/minute) through a fully open valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through the valve from the Cv use the following formulas;

Liquid Flow

QL = Flow rate of liquid (gal./min.)
ΔP = Differential pressure across the valve (psi)
G = Specific gravity of liquid (for water, G=1)

$$QL = C_v \sqrt{\frac{\Delta P}{G}}$$

Gas Flow

Qg = Flow rate of gas (CFH at STP)
P2 = Outlet pressure (psia)
g = Specific gravity of gas (for air, g = 1.000)

$$Qg = 61C_v \sqrt{\frac{P_2 \Delta P}{g}}$$

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TRUNNION MOUNTED BALL VALVES

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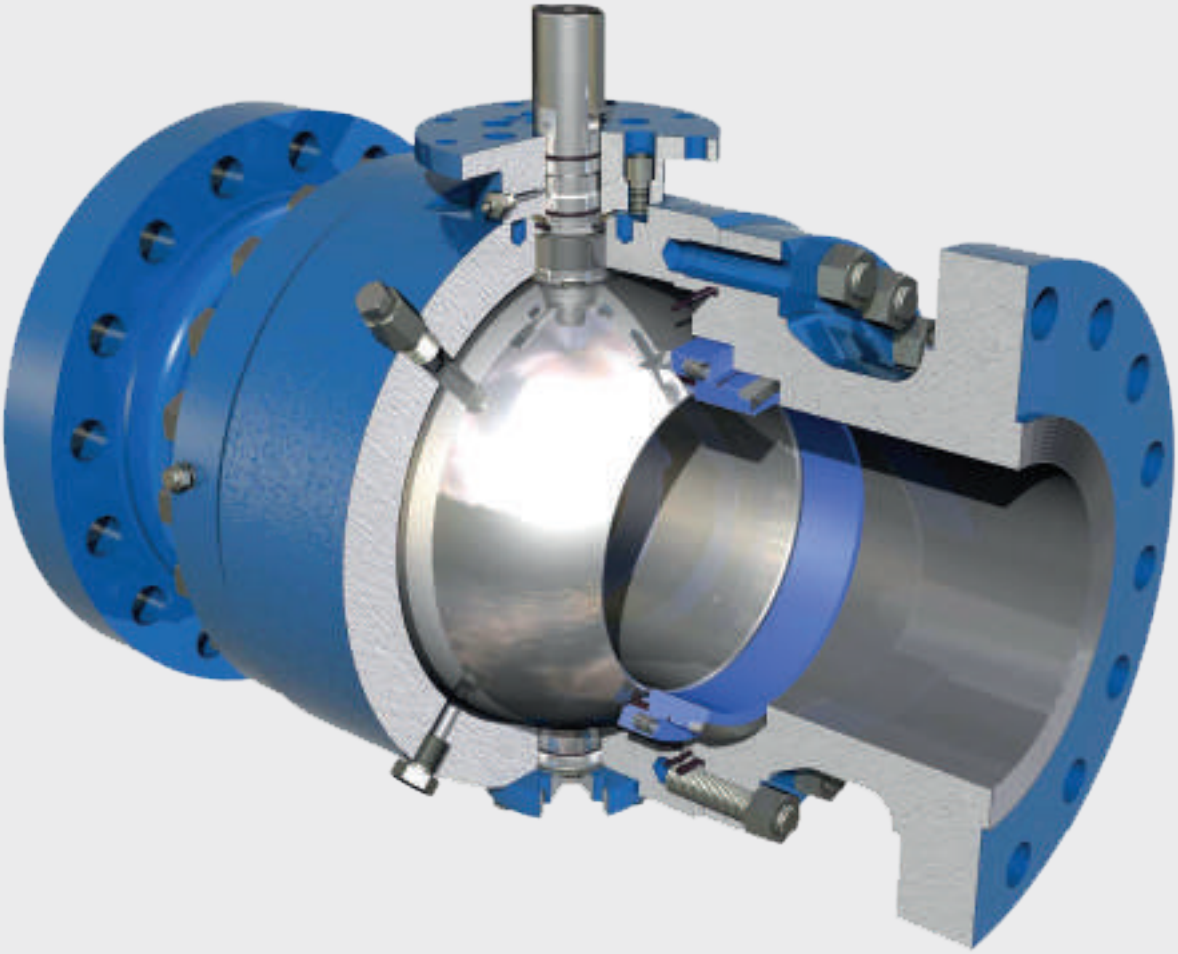


CAST STEEL
FORGED STEEL
STAINLESS STEEL

TRUNNION MOUNTED
BALL VALVES

Design Features

Body Construction
We manufacturer 2 pc. and 3 pc. bolted body Trunnion Mounted Ball Valves in both superior quality cast and forged steel material to assure a uniform and solid valve product at the full rated working pressure. Our wide choices of quality trim material make the valve durable even under the most severe conditions.

Tight Shut-off
Upstream sealing is accomplished regardless of flow or pressure direction as a result of unique floating spring loaded seat design which provides a bubble tight seal at both high & low differential pressure.

Double Block and Bleed
Independent spring loaded upstream and downstream seats and body bleed ensure suitability for use in double block & bleed service.

Low Operating Torque
Our Advanced Trunnion Mounted Ball design provides even axial upstream loading, eliminating high seat loading and torque associated with the transfer of high upstream pressure on the ball to the downstream seat, thereby ensuring consistent torque.

Automatic Body Cavity & Relief
Trunnion Mounted Ball Valves are protected from thermal expansion and body cavity over pressurization due to spring loaded seats which automatically relieve pressure to the down stream side of the body cavity. In addition, all valves come with a manual safe relieving bleed valve.

Secondary or Emergency Sealing
All valves are equipped with a secondary emergency stem sealant Injection System and secondary emergency seat / body Injection Systems (as a standard). Valves do not require lubrication under normal operating conditions.

Fire Tested
Valves have been fire safe tested in accordance with API 607 latest edition.

Anti-Static
Electrical continuity between stem, ball and body, ensured through anti-static features in all Trunnion Mounted Ball Valves, is standard.

NACE (2002) Compliance
All materials supplied for Trunnion Ball Valves meet the requirements of NACE MR-01-75 (2002). Compliance is ensured during the manufacturing process by strict inspection and material control.

Corrosion Resistance
Electro-less nickel plating is standard on all carbon steel stems, balls and seats. A wide range of alloys are also available for corrosive service.

Operating Devices
Lever operators will be supplied to valves sizes 2" to 4" Class 150, 300 & 600, 2" & 3" Class 900 as well as 2" Class 1500. All other large sizes will be supplied with a gear operator as a standard. Pneumatic, electric and hydraulic actuators for automatic operation can also be supplied and adapted.

Buried Service
Stem, body vents and sealant injection fitting extensions and actuator mounting pads are available for below ground level installation.

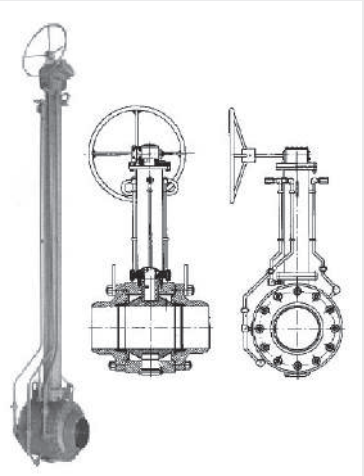


Figure 1: Actuator Extensions

GENERAL DIMENSIONAL DATA

ANSI 150

SIZE		FULL PORT BORE		REGULAR PORT BORE		RAISED FACE LENGTH		WELD END LENGTH		RTJ LENGTH	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
2″	50	2″	49			7″	178	8.5″	216	7.5″	191
3″	80	3″	74	2″	49	8″	203	11.12″	283	8.5″	216
4″	100	4″	100	3″	74	9″	229	12″	305	9.5″	241
6″	150	6″	150	4″	100	15.5″	394	18″	457	16″	406
8″	200	8″	201	6″	150	18″	457	20.5″	521	18.5″	470
10″	250	10″	252	8″	201	21″	533	22″	559	21.5″	546
12″	300	12″	303	10″	252	24″	610	25″	635	24.5″	622
14″	350	14″	334	12″	303	27″	686	30″	762	27.5″	699
16″	400	16″	385	12″	303	30″	762	33″	838	30.5″	775
18″	450	18″	436			34″	864	36.37″	914	34.5″	876
20″	500	20″	487			36″	914	39″	991	36.5″	927
24″	600	24″	589			42″	1067	45″	1143	42.5″	1080
26″	650	26″	633			45″′	1143	49″	1245		
28″	700	28″	684			49″	1245	53″	1346		
30″	750	30″	735			51″	1295	55″	1397		

ANSI 300

SIZE		FULL PORT BORE		REGULAR PORT BORE		RAISED FACE LENGTH		WELD END LENGTH		RTJ LENGTH	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
2″	50	2″	50			8.5″	216	8.5″	216	9.12″	232
3″	80	3″	80	2″	49	11.12″	283	11.12″	283	11.75″	298
4″	100	4″	100	3″	74	12″	305	12″	305	12.62″	321
6″	150	6″	150	4″	100	15.86″	403	18″	457	16.5″	419
8″	200	8″	201	6″	150	19.75″	502	20.5″	521	20.37″	518
10″	250	10″	252	8″	201	22.37″	568	22″	559	23″	584
12″	300	12″	303	10″	252	25.5″	648	25″	635	26.12″	664
14″	350	14″	334	12″	303	30″	762	30″	762	30.62″	778
16″	400	16″	385	12″	303	33″	838	33″	838	33.62″	854
18″	450	18″	436			36″	914	36.37″	914	36.62″	930
20″	500	20″	487			39″	991	39″	991	39.75″	1010
24″	600	24″	589			45″	1143	45″	1143	45.87″	1165
26″	650	26″	633			49″	1245	49″	1245	50″	1270
28″	700	28″	684			53″	1346	53″	1346	54″	1372
30″	750	30″	735			55″	1397	55″	1397	56″	1422

ANSI 600

SIZE		FULL PORT BORE		REGULAR PORT BORE		RAISED FACE LENGTH		WELD END LENGTH		RTJ LENGTH	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
2″	50	2″	49			11.5″	292	11.5″	292	11.62″	295
3″	80	3″	74	2″	49	14″	356	14″	356	14.12″	359
4″	100	4″	100	3″	74	17″	432	17″	432	17.12″	435
6″	150	6″	150	4″	100	22″	559	22″	559	22.12″	562
8″	200	8″	201	6″	150	26″	660	26″	660	26.12″	664
10″	250	10″	252	8″	201	31″	787	31″	787	31.12′	791
12″	300	12″	303	10″	252	33″	838	33″	838	33.12″	841
14″	350	14″	334	12″	303	35″	889	35″	889	35.12′	892
16″	400	16″	385	12″	303	39″	991	39″	991	39.12″	994
18″	450	18″	436			43″	1092	43″	1092	43.12″	1095
20″	500	20″	487			47″	1194	47″	1194	47.25″	1200
24″	600	24″	589			51″	1295	51″	1295	51.37″	1305
26″	650	26″	633			55′	1397	55′	1397	55.37″	1407
28″	700	28″	684			57″	1448	57″	1448	57.5″	1461
30″	750	30″	735			61″	1549	61″	1549	61.5″	1562

GENERAL DIMENSIONAL DATA

ANSI 900

SIZE		FULL PORT BORE		REGULAR PORT BORE		RAISED FACE LENGTH		WELD END LENGTH		RTJ LENGTH	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
2″	50	2″	49			14.5″	368	14.5″	368	14.62″	371
3″	80	3″	74	2″	49	15″	381	15″	381	15.12″	384
4″	100	4″	100	3″	74	18″	457	18″	457	18.12″	460
6″	150	6″	150	4″	100	24″	610	24″	610	24.12″	613
8″	200	8″	201	6″	150	29″	737	29″	737	29.12″	740
10″	250	10″	252	8″	201	33″	838	33″	838	33.12″	841
12″	300	12″	303	10″	252	38″	965	38″	965	38.12″	968
16″	400	14.67″	373	12″	303	44.5″	1130	44.5″	1130	44.87″	1140
18″	450	16.67″	423			48″	1219	48″	1219	48.5″	1232
20″	500	18.5″	471			52″	1321	52″	1321	52.5″	1334
24″	600	22.5″	570			61″	1549	61″	1549	61.75″	1568

ANSI 1500

SIZE		FULL PORT BORE		REGULAR PORT BORE		RAISED FACE LENGTH		WELD END LENGTH		RTJ LENGTH	
Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM
2″	50	2″	49			14.5″	368	14.5″	368	14.61″	371
3″	80	3″	74	2″	49	18.5″	470	18.5″	470	18.62″	473
4″	100	4″	100	3″	74	21.5″	546	21.5″	546	21.62″	549
6″	150	5.67″	144	4″	100	27.75″	705	27.75″	705	28″	711
8″	200	7.56″	192	6″	150	32.75″	832	32.75″	832	33.12″	841
10″	250	9.41″	239	8″	201	39″	991	39″	991	39.37″	1000
12″	300	11.30″	287	10″	252	44.5″	1130	44.5″	1130	45.12″	1146
16″	400	14.17″	360	12″	303	54.5″	1384	54.5″	1384	55.39″	1407

ENGINEERING DATA

PRESSURE TESTING OF TRUNNION VALVES TO API 6D

TEST	MEDIUM	PRESSURE
SHELL TEST	WATER	1.5 TIMES NOMINAL PRESSURE
HIGH PRESSRUE CLOSURE TEST	WATER	1.1 TIMES NOMINAL PRESSURE
LOW PRESSURE CLOSURE TEST*	AIR	80 PSI (.6 MPA)

* Only if specified by customer at time of order.

FLOW COEFFICENT (Cv)

The Flow Coefficient of a valve is the flow rate of water (gallons/minute) through a fully open valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through the valve from the Cv use the following formulas;

Liquid Flow
QL = Flow rate of liquid (gal./min.)
ΔP = Differential pressure across the valve (psi)
G = Specific gravity of liquid (for water, G=1)

$$QL = C_v \sqrt{\frac{\Delta P}{G}}$$

Gas Flow
Qg = Flow rate of gas (CFH at STP)
P2 = Outlet pressure (psia)
g = Specific gravity of gas (for air, g = 1.000)

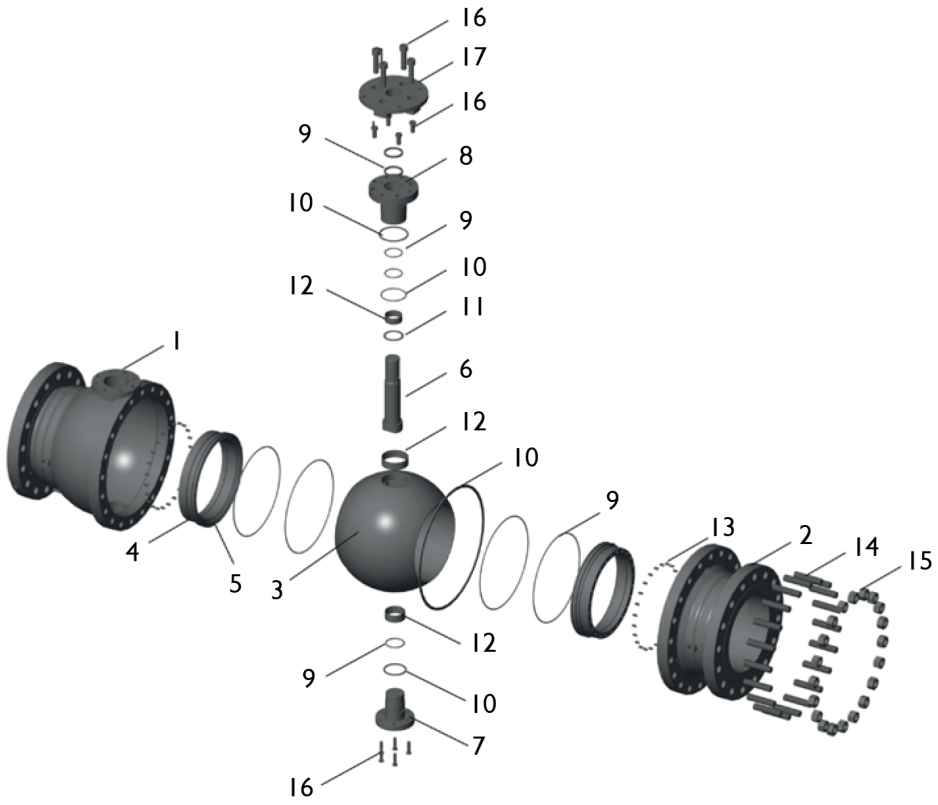
$$Qg = 61C_v \sqrt{\frac{P_2 \Delta P}{g}}$$

AVAILABLE MATERIALS OF CONSTRUCTION

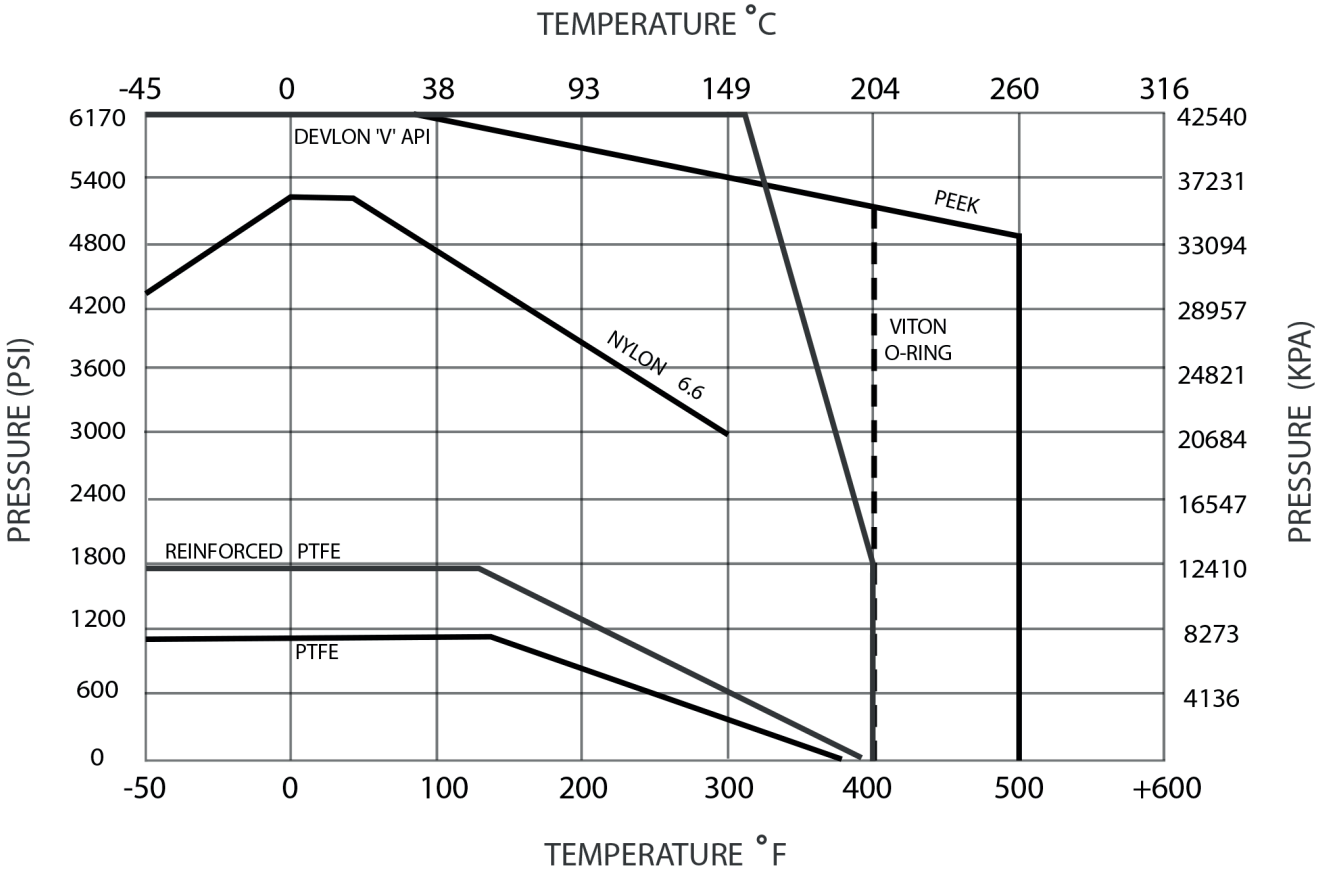
ITEM	PART NAME	STANDARD NACE (2002)	LOW TEMPERATURE NACE (2002)	STAINLESS STEEL NACE (2002)	DUPLEX	SUPER DUPLEX
1	BODY	A216 WCB	A352 LCC	A182 CF8M	A182 F51	A182 F55
		A105N	A350 LF2	A182 F316		
2	CAP/ ADAPTER	A216 WCB	A352 LCC	A182 CF8M	A182 F51	A182 F55
		A105N	A350 LF2	A182 F316		
3	BALL	A216 WCB / ENP	A216 WCB / ENP	A182 CF8M	A182 F51	A182 F55
		A182 CF8M / 316 SS	A182 CF8M / 316 SS			
4	SEAT HOLDER	A105N / ENP	A350 LF2 / ENP	A182 F316 SS	A182 F51	A182 F55
		A182 F316 SS	A182 F316 SS			
5	SEAT INSERT	RTFE	RTFE	RTFE	RTFE	RTFE
		DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API
		PEEK	PEEK	PEEK	PEEK	PEEK
		NYLON	NYLON	NYLON	NYLON	NYLON
6	STEM	A105N / ENP	A350 LF2 / ENP	A182 F316 SS	A182 F51	A182 F55
		A4130/A4140 / ENP	A4130/A4140 / ENP	ASTM A479 TYPE 316SS		
		A182 F316 SS	A182 F316 SS			
7	TRUNNION	A105N / ENP	A350 LF2 / ENP	A182 F316 SS	A182 F51	A182 F55
		A4130/A4140 / ENP	A4130/A4140 / ENP	ASTM A479 TYPE 316SS		
		A182 F316 SS	A182 F316 SS			
8	BONNET	A216 WCB	A352 LCC	A182 CF8M	A182 F51	A182 F55
		A105N	A350 LF2	A182 F316		
9	O-RING	VITON	VITON	VITON	VITON	VITON
10	GASKET	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE	GRAPHITE
11	THRUST WASHER	RTFE	RTFE	RTFE	RTFE	RTFE
		DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API	DEVLON V API
		PEEK	PEEK	PEEK	PEEK	PEEK
12	BEARING	CARBON STEEL-DU	CARBON STEEL-DU	CARBON STEEL-DU	CARBON STEEL-DU	CARBON STEEL-DU
13	SPRINGS	INCONEL X750	INCONEL X750	INCONEL X750	INCONEL X750	INCONEL X750
14	SUDS	A193 B7M	A320 L7M	A193 B8M	A193 B8M	A193 B8M
15	NUTS	A194 2HM	A194 7M	A194 GR 8	A194 GR 8	A194 GR 8
16	BOLTING	A193 B7M	A320 L7M	A193 B8M	A193 B8M	A193 B8M
17	MOUNTING PLATE	CARBON STEEL	CARBON STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL

Other materials available upon request
Materials shown are general materials of construction for 2 piece cast and 3 piece forged Trunnion Ball Valves.

■ **INDICATES PARTS INCLUDED IN MINOR REPAIR KIT**



PRESSURE / TEMPERATURE CURVE



This graph is to be used as a guide only.

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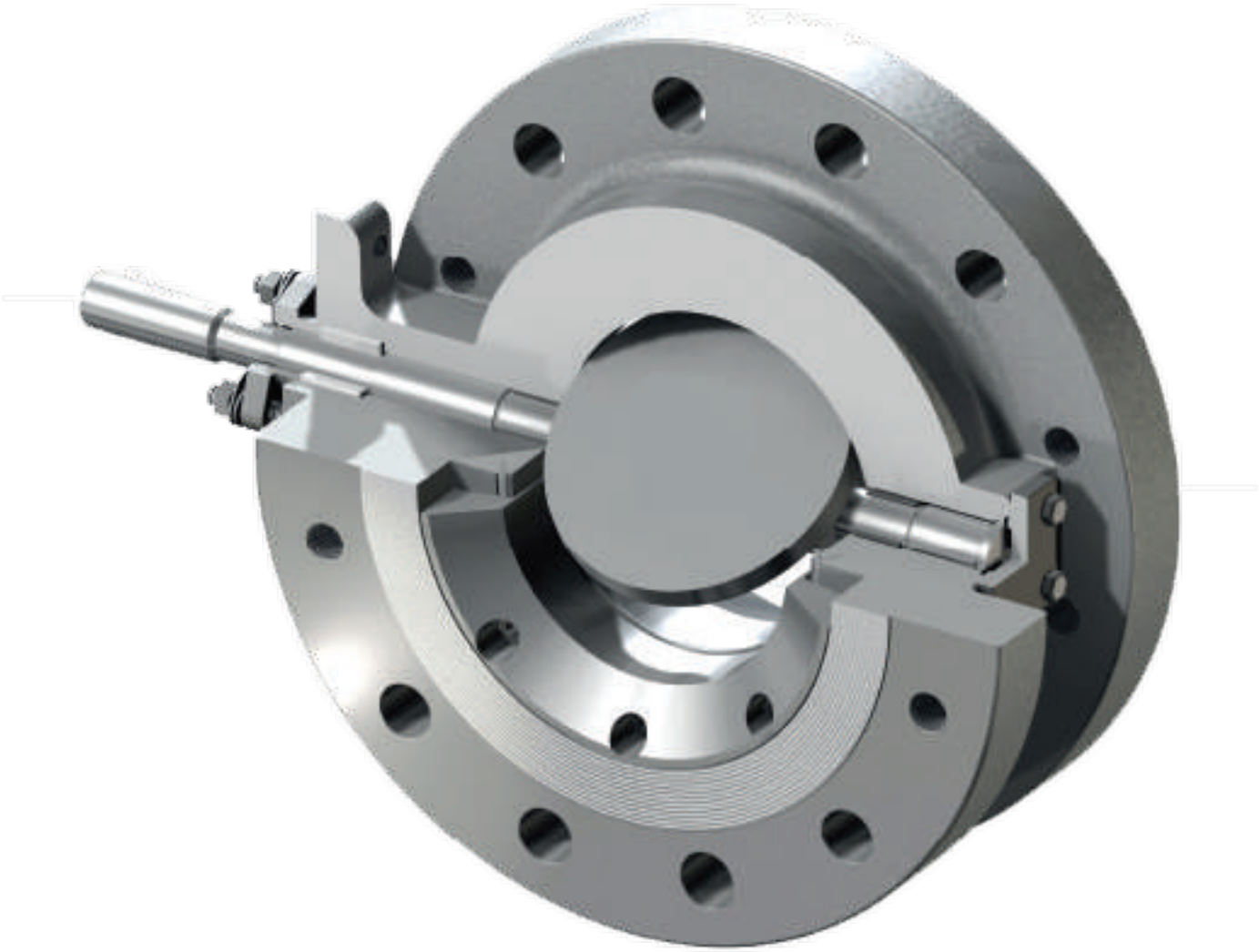
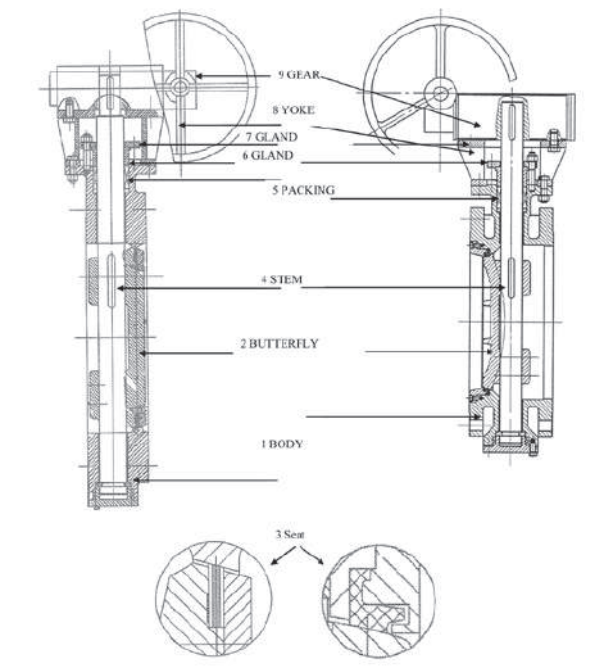


CAST STEEL
STAINLESS STEEL

BUTTERFLY VALVES

BUTTERFLY VALVES



STANDARD MATERIAL SPECIFICATIONS

ITEM	PART NAME	CARBON STEEL		STAINLESS STEEL	
		WCB	LCC	CF8	CF8M
1	BODY	A216 WCB	A352 LCC	A351 CF8	A351 CF8M
2	BUTTERFLY PLATE	A216 WCB	A352 LCC	A351 CF8	A351 CF8M
3	SEAT RING	PTFE, VITON, BUNA, HARD FACE			
4	STEM	A182 F6 / 304 SS	A182 F6 / 304 SS	A182 F6 / 304 SS	A182 F316
5	PACKING	FLEXIBLE GRAPHITE			
6	GLAND	A182 F304	A182 F304	A182 F304	A182 F316
7	GLAND FLANGE	AISI 1025	AISI 1025	A182 F304	A182 F316
8	YOKE	A216 WCB	A352 LCC	A351 CF8	A351 CF8M
9	GEAR	CAST IRON			

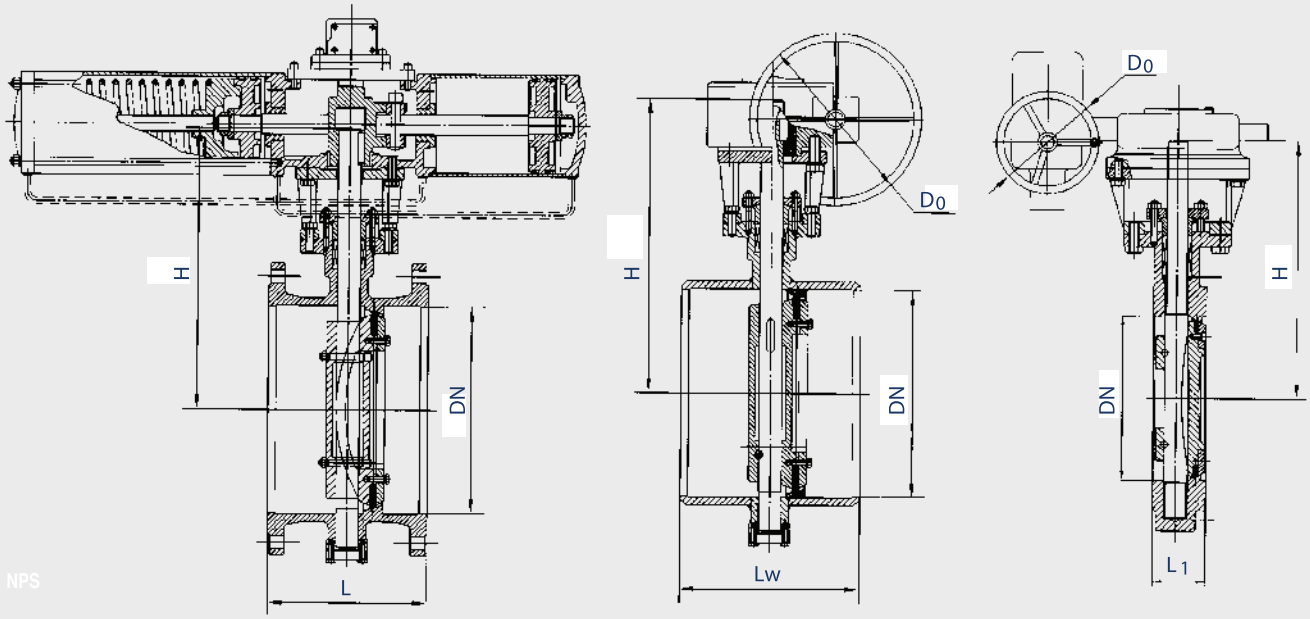
DIMENSIONS AND WEIGHTS (mm)

	CLASS 150									
DN (IN)	3	4	5	6	8	10	12	14	16	18
L	114	127	140	140	152	165	178	190	216	222
L_W	180	190	200	210	230	250	270	290	310	330
L_1	48	54	56	57	64	71	81	92	102	114
Do	160	160	160	160	240	240	240	240	320	320
H	229	240	255	290	310	340	395	440	485	525

	CLASS 150										
DN (IN)	28	32	36	40	44	48	56	60	64	72	80
L	292	318	330	410	444	470	530	565	216	670	760
L_W	430	470	510	550	–	630	710	–	310	870	950
L_1	229	241	241	300	–	350	390	–	102	490	540
Do	500	500	500	500	500	500	600	600	320	600	600
H	905	970	1038	1100	1150	1180	1525	1600	451	1893	2130

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L_1 - FACE TO FACE DIMENSIONS OF THE WAFER TYPE SOFT AND METAL SEATED FLANGED END
L_W - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

BUTTERFLY VALVES



DIMENSIONS AND WEIGHTS (mm)

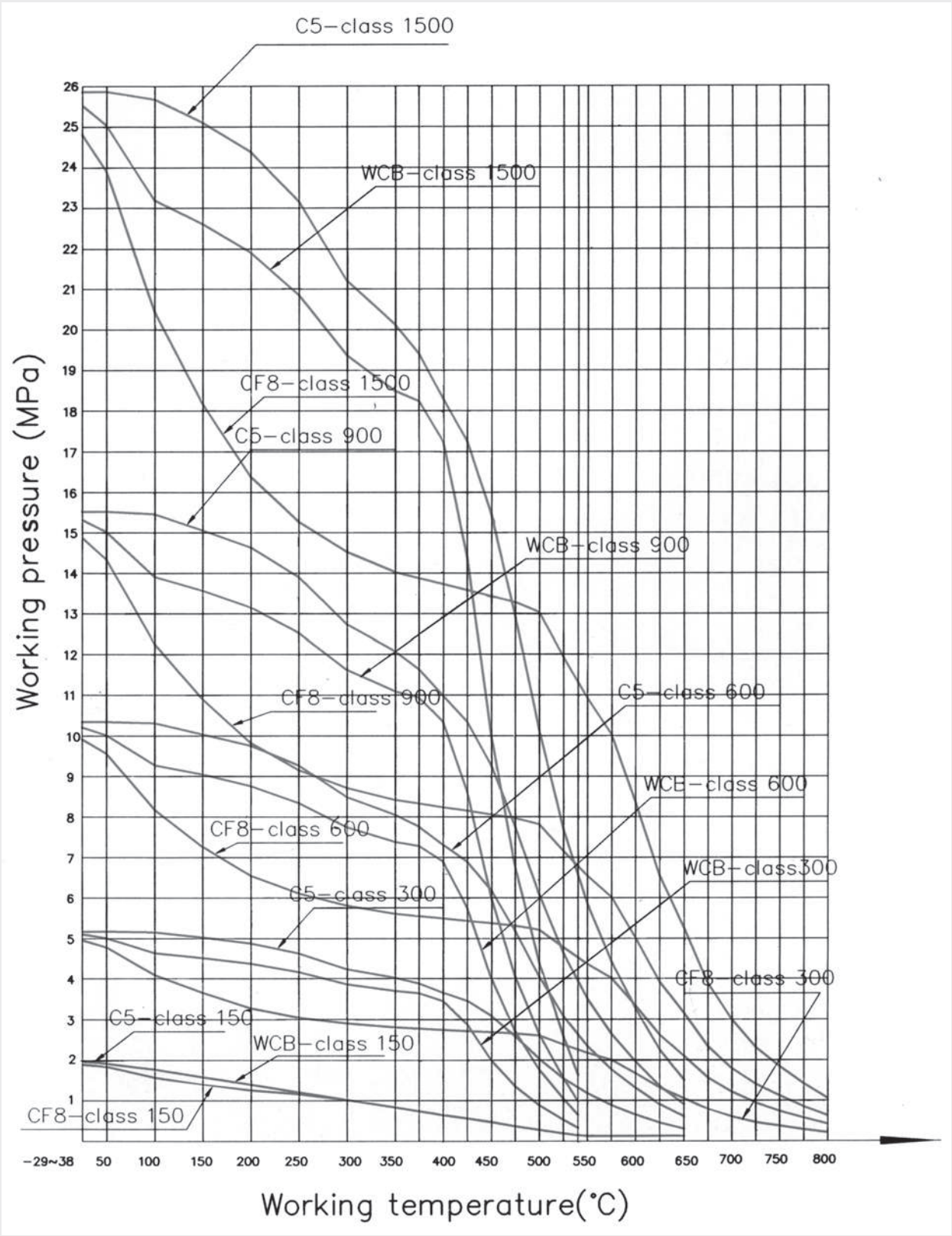
	CLASS 300									
DN (IN)	3	4	5	6	8	10	12	14	16	18
L	180	190	200	210	230	250	270	290	310	330
L_w	180	190	200	210	230	250	270	290	310	330
L_1	48	54	56	59	73	83	92	117	133	149
Do	160	160	160	240	240	240	240	240	320	350
H	229	240	255	290	310	340	395	440	485	525

	CLASS 300								
DN (IN)	28	32	36	40	48	56	64	72	80
L	430	470	510	550	630	710	790	870	950
L_w	430	470	510	550	630	710	790	870	950
L_1	229	241	241	300	350	390	440	490	540
Do	500	500	500	500	600	600	600	600	600
H	905	970	1038	1100	1180	1525	1640	1893	2130

	CLASS 600									
DN (IN)	4	5	6	8	10	12	14	16	18	20
L	190	200	210	230	250	270	290	310	330	350
L_1	64	64	78	102	117	140	155	178	200	216
Do	240	240	320	320	320	350	500	500	500	500
H	260	310	320	350	420	470	500	550	640	850

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L_1 - FACE TO FACE DIMENSIONS OF THE WAFER TYPE SOFT AND METAL SEATED FLANGED END
L_w - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

PRESSURE - TEMPERATURE RATINGS TO ASME B16.34



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CAST STEEL
STAINLESS STEEL

GLOBE VALVES

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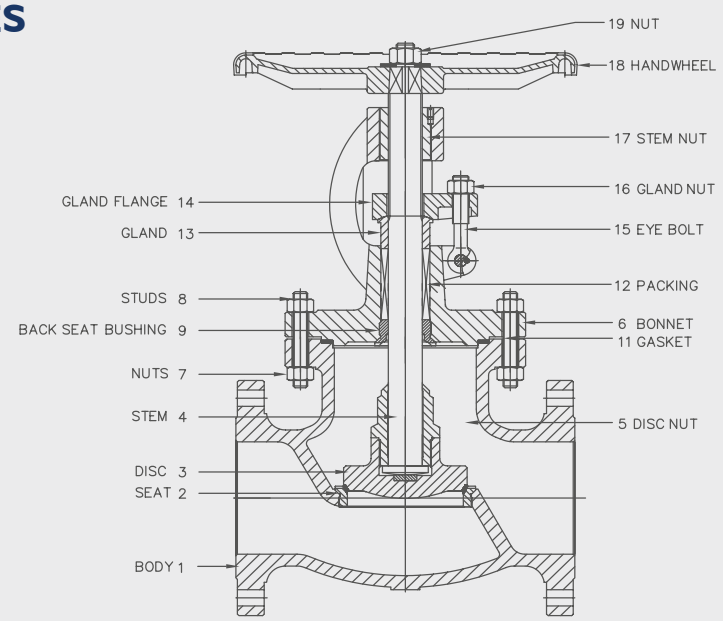
GLOBE VALVES

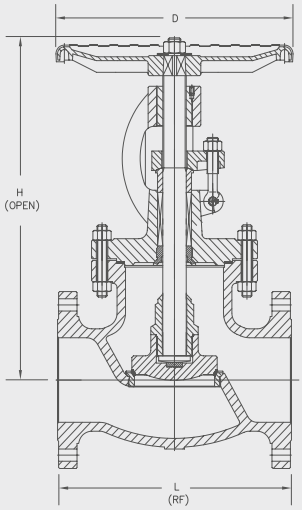


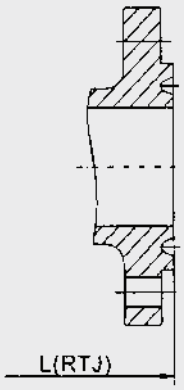
AVAILABLE MATERIALS OF CONSTRUCTION

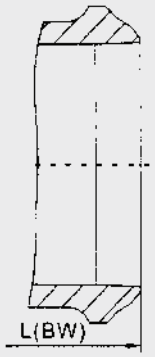
ITEM	PART NAME	STANDARD	LOW TEMPERATURE	STAINLESS STEEL
1	BODY	A216 WCB	A352 LCC	A182 CF8M
2	SEAT	A105	A350 LF2	A182 F316
3	DISC	A105	A350 LF2	A182 F316
4	STEM	A182 F6	A182 F304	A182 F316
5	DISC NUT	A182 F6	A182 F6	A182 F316
6	BONNET	A216 WCB	A352 LCC	A182 CF8M
7	NUTS	A194 2H / 2HM	A194 7M	A194 GR 8
8	STUDS	A193 B7 / B7M	A320 L7 / L7M	A193 B8M
9	BACKSEAT BUSHING	A182 F6	A182 F6	A182 F316
10*	LANTERN RING	A182 F6	A182 F6	A182 F316
11	GASKET	304 SS / 316 SS SPIRAL WOUND / SOLID 304 SS / 316 SS METAL RING		
12	STEM PACKING	GRAPHITE		
13	GLAND	A182 F6	A182 F6	A182 F316
14	GLAND FLANGE	A216 WCB	A352 LCC	A351 CF8
15	EYEBOLT	A193 B7 / B7M	A32P L7 / L7M	A182 B8
16	GLAND NUT	A194 B7 / B7M	A194 7M	A182 GR 8
17	STEM NUT	CU - ALLOY		
18	HANDWHEEL	CARBON STEEL / STAINLESS STEEL		
19	RETAINING NUT	CARBON STEEL / STAINLESS STEEL		
	SEALING FACE OVERLAY	AVAILABLE API TRIMS		

* ON REQUEST ONLY
• OTHER MATERIALS AVAILABLE UPON REQUEST

GLOBE VALVES







DIMENSIONS AND WEIGHTS (mm and inches)

CLASS 150												
DN NPS	15 1/2	25 1	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4	125 5	150 6	200 8	250 10	300 12
L - L_1 (RF = BW)	108 4.3	127 5	165 6.5	203 8	216 8.5	241 9.5	292 11.5	356 14	406 16	495 19.5	622 24.5	699 27.5
L2 (RTJ)	119 4.7	140 5.5	178 7	216 8.5	229 9	254 10	305 12	369 14.5	419 16.5	508 20	635 25	711 28
H	320 12.6	335 13.2	345 13.5	380 15	435 17.1	465 18.3	430 20.9	580 22.9	650 25.6	760 30	860 33.9	1000 39.4
Do	150 6	200 8	200 8	200 8	250 10	250 10	300 12	300 12	350 14	400 16	500 20	600 24
RF (Kg)	14	15	16	21	30	41	64	90	113	190	238	410
BW (Kg)	12	13	14	19	27	38	54	75	93	170	215	370

CLASS 300											
DN NPS	15 1/2	25 1	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4	125 5	150 6	200 8	250 10
L - L_1 (RF = BW)	152 6	203 8	229 9	267 10.5	292 11.5	318 12.5	356 14	400 15.8	445 17.5	559 22	622 24.5
L2 (RTJ)	163 6.4	216 8.5	241 9.5	283 11.1	308 12.1	333 13.1	371 14.6	416 16.4	460 18.1	575 22.6	638 25.1
H	370 14.6	385 15.2	405 16	425 16.8	465 18.3	530 20.6	610 24	695 27.7	790 31.1	870 34.2	1040 41
Do	200 8	200 8	200 8	200 8	250 10	250 10	300 12	300 12	400 16	500 20	500 20
RF (Kg)	20	23	26	37	50	61	115	130	176	333	340
BW (Kg)	18	20	20	31	43	52	100	110	150	320	280

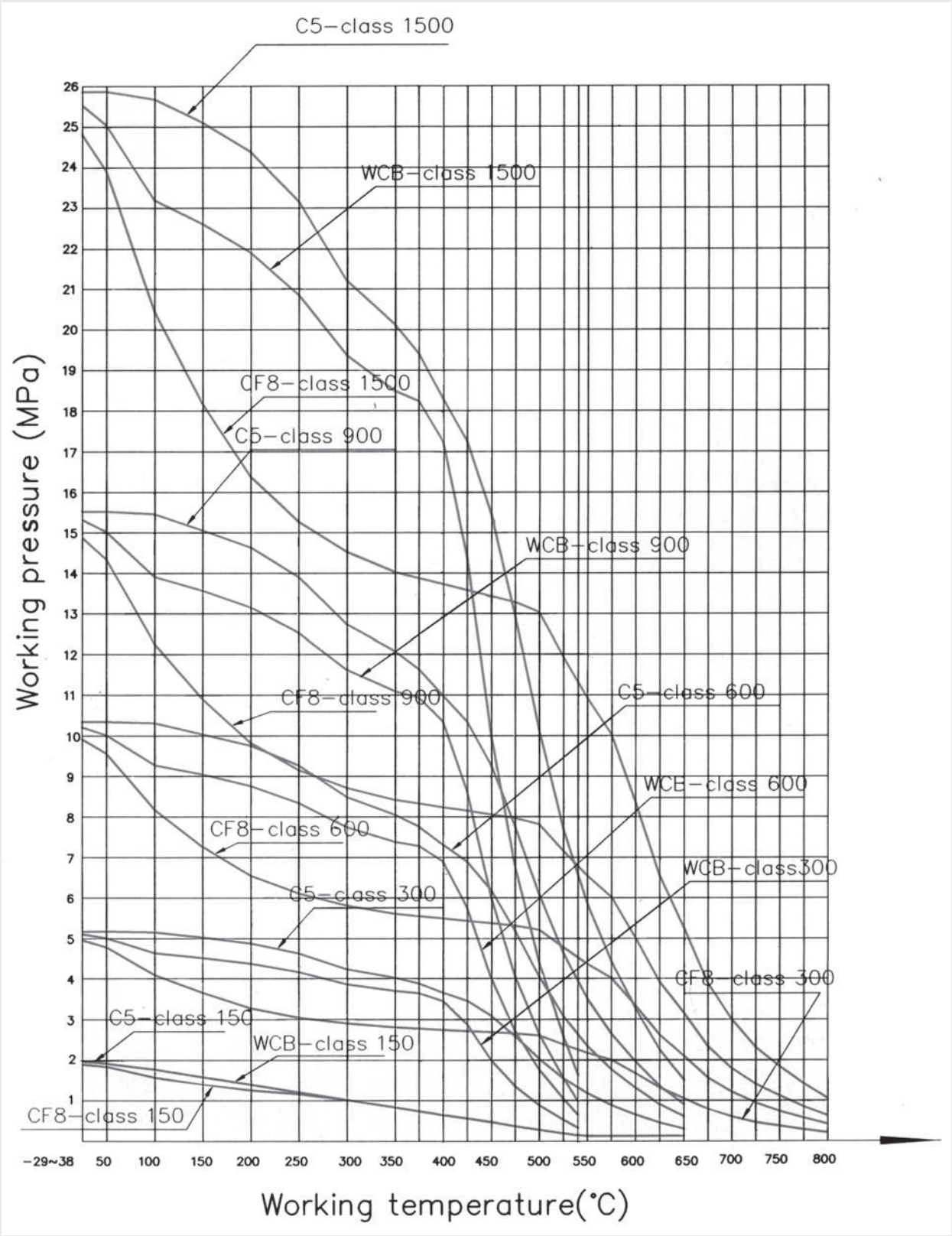
CLASS 600							
DN NPS	15 1/2	25 1	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4
L - L_1 (RF = BW)	165 6.5	216 8.5	241 9.5	292 11.5	330 13	356 14	432 17
L2 (RTJ)	163.4 6.4	216 8.5	241 9.5	295 11.6	333 13.1	359 14.1	435 17.1
H	385 15.2	398 15.7	415 16.3	475 18.8	515 20.3	585 23	675 26.5
Do	200 8	200 8	200 8	250 10	250 10	300 12	350 14
RF (Kg)	22	25	28	39	56	68	121
BW (Kg)	20	22	24	35	44	59	97

CLASS 900							
DN NPS	20 3/4	25 1	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4
L - L_1 (RF = BW)	229 9	254 10	305 12	368 14.5	419 16.5	381 15	457 18
L2 (RTJ)	229 9	254 10	305 12	371 14.6	422 16.6	384 15.1	460 18.1
H	398 15.7	415 16.3	430 17	600 23.6	660 26	665 28.1	800 31.5
Do	200 8	200 8	200 8	300 12	350 14	350 14	500 20
RF (Kg)	25	28	32	87	130	122	182
BW (Kg)	22	24	28	80	115	102	167

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L2 - FACE TO FACE DIMENSIONS OF THE TRJ FLANGED END

L_1 - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

PRESSURE - TEMPERATURE RATINGS TO ASME B16.34



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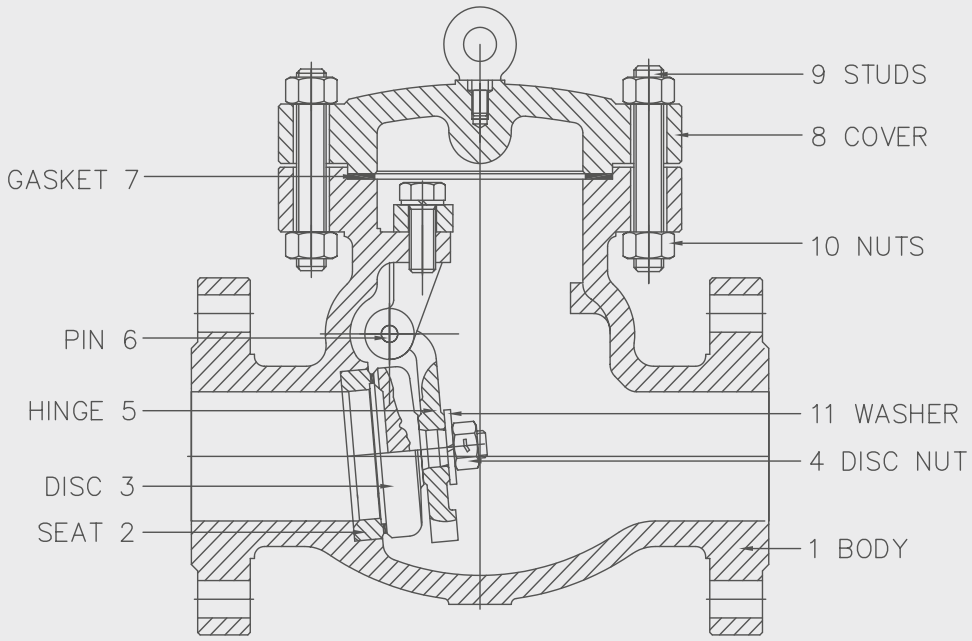
CAST STEEL
STAINLESS STEEL

SWING CHECK VALVES

SWING CHECK VALVES



AVAILABLE MATERIALS OF CONSTRUCTION

ITEM	PART NAME	STANDARD	LOW TEMPERATURE	STAINLESS STEEL
1	BODY	A216 WCB	A352 LCC	A182 CF8M
2	SEAT	A105	A350 LF2	A182 F316
3	DISC	A216 WCB	A350 LF2	A182 F316
4	DISC NUT	A182 F6	A182 F6	A182 F316
5	HINGE	A216 WCB	A352 LCC	A182 CF8M
6	PIN	A182 F6	A182 F6	A182 F316
7	GASKET	304 SS / 316 SS SPIRAL WOUND / SOLID 304 SS / 316 SS METAL RING		
8	COVER	A216 WCB	A352 LCC	A182 CF8M
9	STUDS	A193 B7 / B7M	A320 L7M / 7M	A193 B8M
10	NUT	A194 2H / 2HM	A194 7M	A182 GR8
11	WASHER	CARBON STEEL / STAINLESS STEEL		
	SEALING FACE OVERLAY	AVAILABLE API TRIMS		

- **OTHER MATERIALS AVAILABLE UPON REQUEST**

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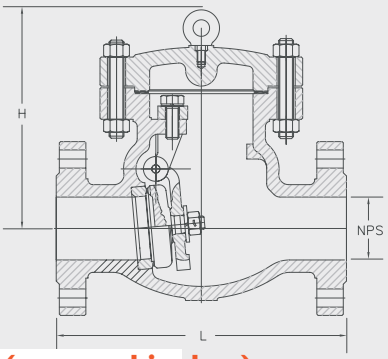
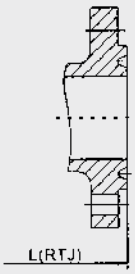
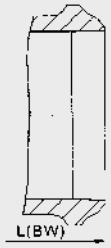
SWING CHECK VALVES







DIMENSIONS AND WEIGHTS (mm and inches)

CLASS 150

DN	15	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
NPS	1/2	1	1 - 1/2	2	2 - 1/2	3	4	5	6	8	10	12	14	16	18	20	24	28	30
L - L1 (RF = BW)	108 4.3	127 5	165 6.5	203 8	216 8.5	241 9.5	292 11.5	330 13	356 14	495 19.5	622 24.5	699 27.5	787 31	864 34	978 38.5	978 38.5	1295 51	1448 57	1524 60
L2(RTJ)	119	140	178	216	229	254	305	343	368	508	635	711	800	876	991	991	1308	1461	1537
	4.7	5.5	7	8.5	9	10	12	13.5	14.5	20	25	28	31.5	34.5	35	39	51.5	57.5	60.5
H	130 5.1	140 5.5	150 6	170 6.8	180 7.1	185 7.4	215 8.5	240 9.5	260 10.3	300 11.9	350 13.9	400 15.8	450 17.8	480 19	540 21.3	600 25.6	680 26.8	710 28	790 31.1
RF (Kg)	8	10	11	17	23	33	44	69	78	137	207	279	428	555	775	835	1300	1450	1620
BW (Kg)	7	8	8.5	14	16	24	34	57	63	122	175	229	368	483	685	720	1150	1300	1450

CLASS 300

DN	25	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	750
NPS	1	1 - 1/2	2	2 - 1/2	3	4	5	6	8	10	12	14	16	18	20	24	28	30
L - L1 (RF = BW)	216 8.5	241 9.5	267 10.5	292 11.5	318 12.5	356 14	400 15.8	445 17.5	533 21	622 24.5	711 28	838 33	864 34	978 38.5	1016 40	1346 53.9	1499 59	1595 63
L2(RTJ)	229	254	283	308	333	371	416	460	549	638	727	854	879	994	1035	1368	1524	1620
	9	10	11	12.1	13	15	16	18.1	21.6	25	29	34	34.6	39.1	41	54	60	63.8
H	150 5.9	160 6.3	170 6.8	185 7.4	215 8.5	235 9.3	270 10.6	300 11.9	340 13.4	350 13.9	420 16.6	480 18.9	520 20.5	600 23.6	670 26.4	750 29.6	780 30.7	810 32
RF (Kg)	14	15	21	24	39	51	80	90	175	210	286	700	774	1000	1273	1650	1725	1819
BW (Kg)	12	11	15	17	30	40	60	68	145	180	260	490	640	850	1100	1400	1570	1700

CLASS 600

DN	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24
L - L1 (RF = BW)	292 11.5	330 13	356 14	432 17	559 22	660 26	787 31	838 33	889 35	991 39	1092 43	1194 47	1397 55
L2(RTJ)	295	333	359	435	562	664	791	841	892	994	1095	1200	1407
	12	13	14	17.1	22.1	26.1	31.1	33.1	35.1	39.1	43.1	47.3	55.4
H	175 6.9	200 7.9	230 9.1	295 11.6	360 14.3	400 15.8	460 18.1	520 20.5	560 22.1	650 25.6	730 28.8	800 31.5	900 35.5
RF (Kg)	34	45	63	114	207	387	580	790	892	1200	1600	2420	3150
BW (Kg)	26	37	50	98	145	310	490	670	752	1020	1350	2050	2720

CLASS 900

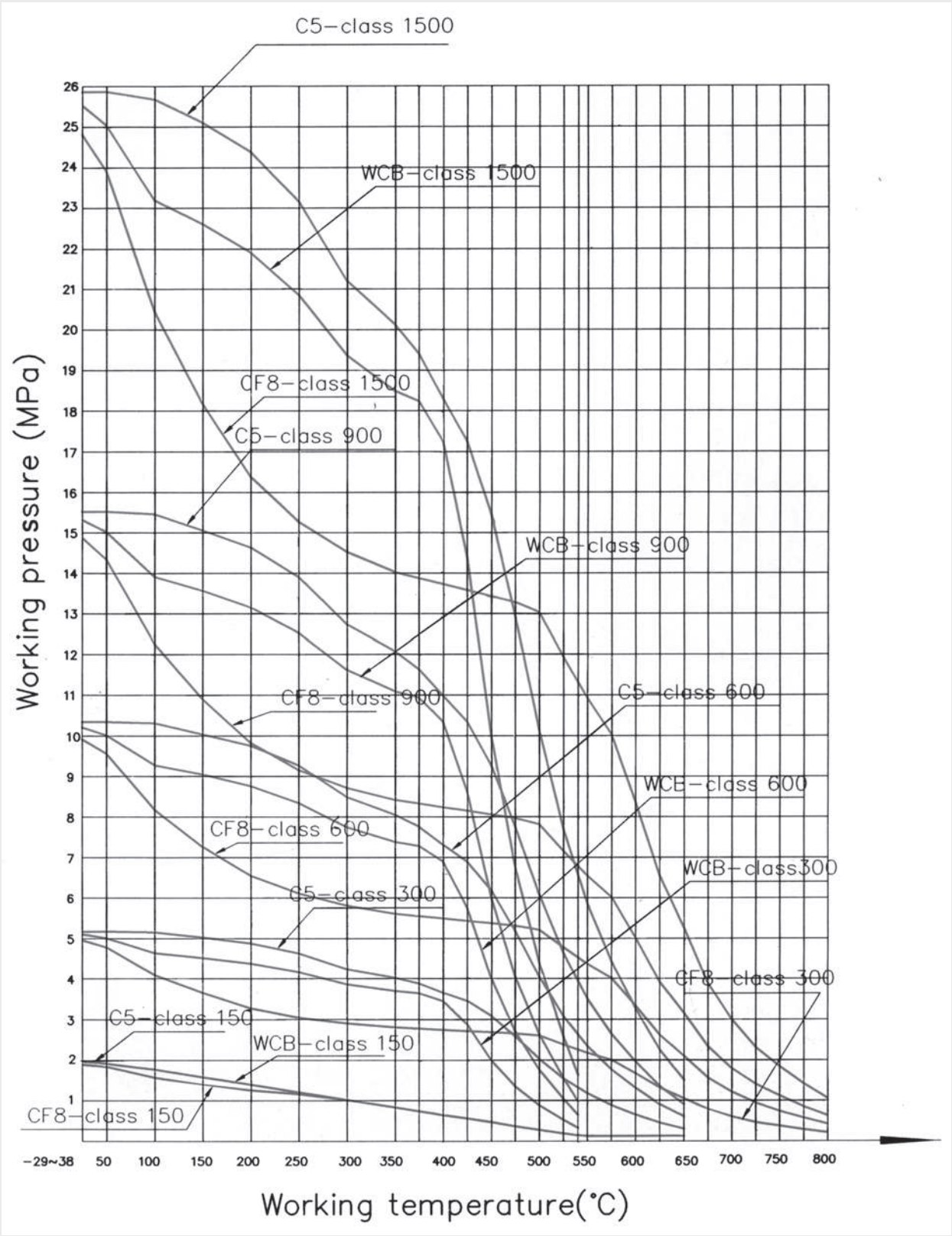
DN	50	65	80	100	150	200	250	300	350	400	450	500
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20
L - L1 (RF = BW)	368 14.5	419 16.5	381 15	457 18	610 24	737 29	838 33	965 38	1029 40.5	1130 44.5	1219 58	1321 52
L2(RTJ)	371	422	384	460	613	740	841	968	1038	1140	1232	1334
	15	17	15	18.1	24.1	29.1	33.1	33.1	40.9	44.9	48.5	52.5
H	250 9.9	270 10.6	280 11	310 12.3	380 15	430 17	480 18.9	560 22	630 24.9	700 27.6	750 29.6	850 33.5
RF (Kg)	69	93	85	145	310	500	772	1080	1380	1810	2400	3500
BW (Kg)	60	78	70	120	265	385	600	860	1140	1510	2050	3100

CLASS 1500

DN	50	65	80	100	150	200	250	300	350	400	450	500
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20
L - L1 (RF = BW)	368 14.5	419 16.5	470 18.5	546 21.5	705 27.8	832 32.8	991 39	-- --	-- --	-- --	-- --	-- --
L2(RTJ)	371	422	473	549	711	841	1000	--	--	--	--	--
	14.6	16.6	18.6	21.6	28	33.1	39.4	--	--	--	--	--
H	250 9.9	270 10.6	300 11.9	330 13	450 17.8	500 19.8	560 22.1	-- --	-- --	-- --	-- --	-- --
RF (Kg)	69	93	120	235	540	949	1275	--	--	--	--	--
BW (Kg)	60	78	90	185	450	785	1065	--	--	--	--	--

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L2 - FACE TO FACE DIMENSIONS OF THE RTJ FLANGED END
L1 - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

PRESSURE - TEMPERATURE RATINGS TO ASME B16.34



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CAST STEEL
STAINLESS STEEL

WAFER & FLANGE
CHECK VALVES

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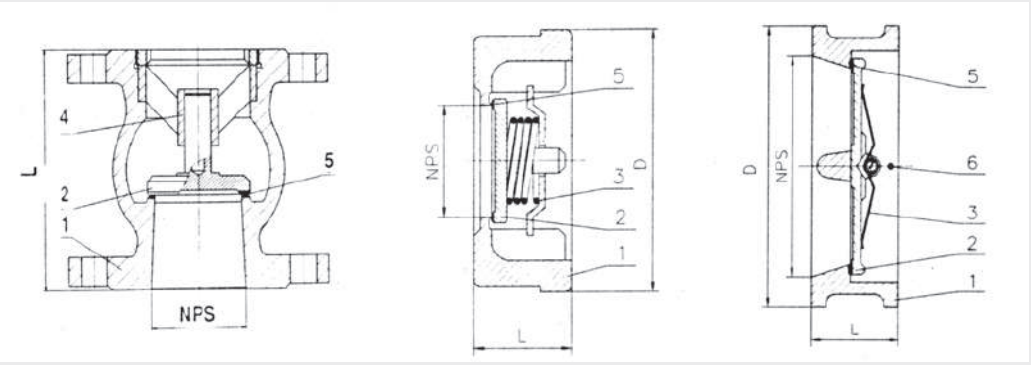
WAFER AND FLANGE CHECK VALVES



Vertical lift check valves

Wafer lift check valves NPS2~6

Wafer double disc check valves NPS2~48

STANDARD MATERIAL SPECIFICATIONS

ITEM	PART NAME	CARBON STEEL		STAINLESS STEEL	
		WCB	LCC	CF8	CF8M
1	BODY	A216 WCB	A352 LCC	A351 CF8	A351 CF8M
2	DISC	A216 WCB	A352 LCC	A351 CF8	A351 CF8M
3	SPRING	AISI 6150		17-7PH STAINLESS STEEL (inconel for NACE standard) Ni - CrAlloy	
4	BUSH	A216 WCB	A352 LCC	A182 F6	
5	SEALING FACE OVERLAY	PTFE, 13 Cr and 18 Cr-8Ni or HF (Co-CrA)			
6	PIN	A182 F6	A182 F6	A182 F304	A182 F316

• **OTHER MATERIALS AVAILABLE UPON REQUEST**

DIMENSIONS AND WEIGHTS (mm and inches)

VERTICAL LIFT CHECK VALVE

CLASS 150														
DN NPS	50 2	65 2 - 1/2	80 3	100 4	125 5	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24
L (RF)	158.8 6.3	177.8 7	190.5 7.5	216 8.5	241 9.5	254 10	304.8 12	355.6 14	457.2 18	533.4 21	571.5 22.5	609.6 24	609.6 24	711.2 28
BW (Kg)	20	35	39	55	80	89	182	258	422	514	630	753	980	1340

CLASS 300														
DN NPS	50 2	65 2 - 1/2	80 3	100 4	125 5	150 6	200 8	250 10	300 12	350 14	400 16	450 --	500 --	600 --
L (RF)	165.1 6.5	184.2 7.3	200 7.9	231.8 9.1	263.5 10.4	279.4 11	330.2 13	390.5 15.4	495.3 19.5	571.5 22.5	609.6 24	-- --	-- --	-- --
BW (Kg)	25	35	47	60	89	147	230	335	552	701	898	--	--	--

DIMENSIONS AND WEIGHTS (mm and inches)

WAFER CHECK VALVE

CLASS 150

DN	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
L (RF)	60 2.38	67 2.62	73 2.88	73 2.88	98 3.88	127 5	146 5.75	181 7.12	184 7.25	191 7.5	203 8	219 8.62	222 8.75	305 12	368 14.5	432 17	524 20.62
D	92	105	127	157	216	270	324	381	413	470	533	584	692	857	1022	1194	1359
	36.2	4.13	5	6.18	8.5	10.63	12.76	15	16.26	18.5	20.98	22.99	27.24	33.74	40.24	44.5	50.75
BW (Kg)	1.2	2.3	3	7	15	23	30	37	49	62	78	97	125	300	395	470	595

CLASS 300

DN	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
L (RF)	60 2.38	67 2.62	73 2.88	73 2.88	98 3.88	127 5	146 5.75	181 7.12	222 8.75	232 9.12	264 10.38	292 11.5	318 12.5	368 14.5	483 19	568 22.37	629 24.75
D	92	105	127	157	216	270	324	381	413	470	533	584	692	857	1022	1136	1302
	36.2	4.13	5	6.18	8.5	10.63	12.76	15	16.26	18.5	20.98	22.99	27.24	33.74	40.24	46	52.24
BW (Kg)	2	2.9	5.5	9.2	20	25	32	39	52	67	82	102	135	321	400	515	611

CLASS 600

DN	50	65	80	100	150	200	250	300	350	400	450	500	600	750	900	1000	1200
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
L (RF)	60 2.38	67 2.62	73 2.88	79 3.12	136 5.38	165 6.5	213 8.38	229 9	273 10.75	305 12	362 14.25	368 14.5	438 17.25	505 19.88	635 25	701 27.61	-- --
D	92	105	127	157	216	270	324	381	413	470	533	584	692	857	1022	1168	--
	36.2	4.13	5	6.18	8.5	10.63	12.76	15	16.26	18.5	20.98	22.99	27.24	33.74	40.24	46	--
BW (Kg)	2.5	3.4	6.3	10.2	22	35	41	57	72	83	100	140	350	410	589	698	--

CLASS 900

DN	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24
L (RF)	70 2.75	83 3.25	83 3.25	102 4	159 6.25	206 8.12	241 9.5	292 11.5	356 14	384 15.12	451 17.75	451 17.75	495 19.5
D	92	105	127	157	216	270	324	381	413	470	533	584	692
	3.62	4.13	5	6.18	8.5	10.63	12.76	15	16.26	18.5	20.98	22.99	27.24
BW (Kg)	2.8	4	8.2	13	25	41	59	82	105	198	225	255	398

CLASS 1500

DN	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24
L (RF)	70 2.75	83 3.25	83 3.25	102 4	159 6.25	206 8.12	248 9.75	305 12	356 14	384 15.12	468 18.44	533 21	559 22
D	92	105	127	157	216	270	324	381	413	470	533	584	692
	3.62	4.13	5	6.18	8.5	10.63	12.76	15	16.26	18.5	20.98	22.99	27.24
BW (Kg)	3.8	7	10.5	27.5	48.5	62	89	125	154	275	300	458	525

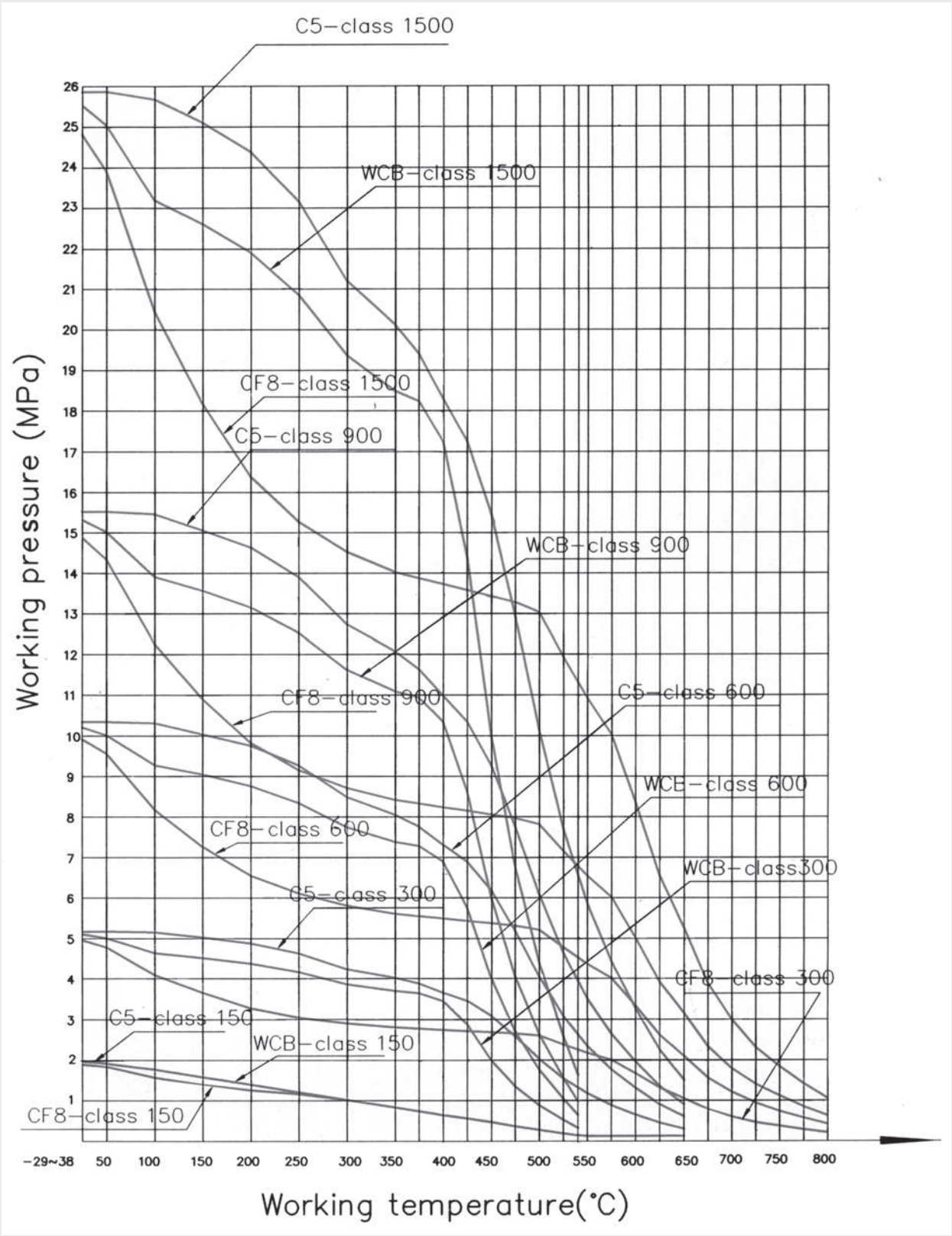
CLASS 2500

DN	50	65	80	100	150	200	250	300	350	400	450	500	600
NPS	2	2 - 1/2	3	4	6	8	10	12	14	16	18	20	24
L (RF)	70 2.75	83 3.25	86 3.38	105 4.12	159 6.25	206 8.12	254 10	305 12	-- --	-- --	-- --	-- --	-- --
D	92	105	127	157	216	270	324	381	--	--	--	--	--
	3.62	4.13	5	6.18	8.5	10.63	12.76	15	--	--	--	--	--
BW (Kg)	7	11	20.5	45.5	63.5	97	155	325	--	--	--	--	--

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L2 - FACE TO FACE DIMENSIONS OF THE TRJ FLANGED END

L_1 - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

PRESSURE - TEMPERATURE RATINGS TO ASME B16.34



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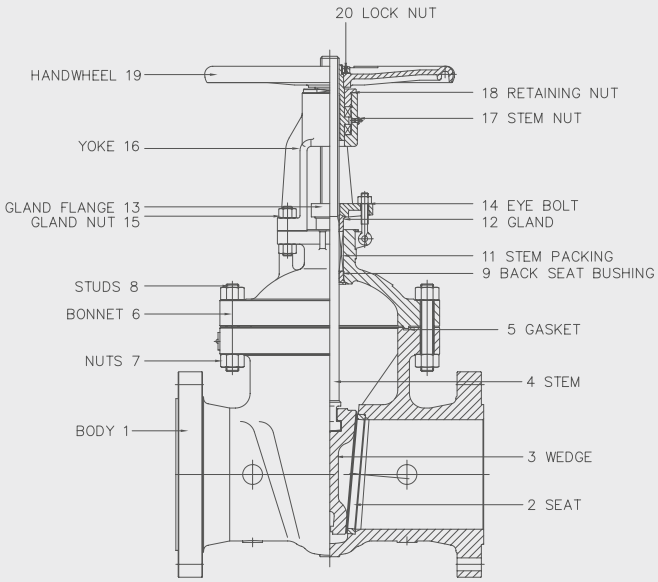
CAST STEEL
STAINLESS STEEL

WEDGE GATE VALVES

WEDGE GATE VALVES

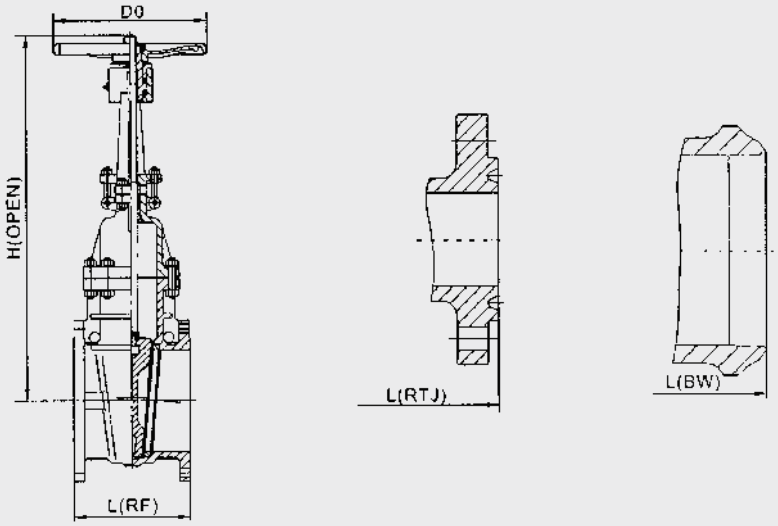


AVAILABLE MATERIALS OF CONSTRUCTION

ITEM	PART NAME	STANDARD	LOW TEMPERATURE	STAINLESS STEEL
1	BODY	A216 WCB	A352 LCC	A182 CF8M
2	SEAT	A105	A350 LF2	A182 F316
3	WEDGE	A216 WCB	A352 LCC	A182 CF8M
4	STEM	A182 F6	A182 F304	A182 F316
5	GASKET	304 SS / 316 SS SPIRAL WOUND / SOLID 304 SS / 316 SS METAL RING		
6	BONNET	A216 WCB	A352 LCC	A182 CF8M
7	NUTS	A194 2H / 2HM	A194 7M	A194 GR 8
8	STUDS	A193 B7 / B7M	A320 L7 / L7M	A320 B8 / A193 B8M
9	BACKSEAT BUSHING	A182 F6	A182 F6	A182 F316
10*	LANTERN RING	A182 F6	A182 F6	A182 F316
11	STEM PACKING	GRAPHITE		
12	GLAND	A182 F6	A182 F6	A182 F316
13	GLAND FLANGE	A216 WCB	A352 LCC	A351 CF8
14	EYEBOLT	A193 B7 / B7M	A320 L7 / L7M	A182 B8
15	GLAND NUT	A194 B7 / B7M	A194 7M	A182 GR 8
16	YOKE	A216 WCB	A352 LCC	A182 CF8M
17	STEM NUT	CU - ALLOY		
18	RETAINING NUT	CARBON STEEL / STAINLESS STEEL		
19	HANDWHEEL	STEEL / DUCTILE IRON		
20	LOCK NUT	CARBON STEEL / STAINLESS STEEL		
	SEALING FACE OVERLAY	AVAILABLE API TRIMS		

*** ON REQUEST ONLY**
• OTHER MATERIALS AVAILABLE UPON REQUEST

WEDGE GATE VALVES



DIMENSIONS AND WEIGHTS (mm and inches)

CLASS 150																		
DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	800
NPS	1 - 1/2	2	2 - 1/2	3	4	5	6	8	10	12	14	16	18	20	24	26	28	32
L(RF)	165	178	191	203	229	254	267	292	330	356	381	406	432	457	508	559	610	660
	6.5	7	7.5	8	9	10	10.5	11.5	13	14	15	16	17	18	20			
L(RTJ)	178	191	203	216	241	267	279	305	343	368	394	419	445	470	521	--	--	--
	7	7.5	8	8.5	9.5	10.5	11	12	13.5	14.5	15.5	16.5	17.5	18.5	20.5	--	--	--
L(BW)	165	216	241	283	305	381	403	419	457	502	572	610	660	711	813	902	991	965
	6.5	8.5	9.5	11.5	12	15	15.9	16.5	18	19.8	22.5	24	26	28	32			
H MANUAL	342	397	438	504	591	682	756	975	1170	1375	1566	1770	1924	2144	2522	2728	2941	3320
	15.4	15.8	19.3	20	23	29.13	30.4	37.63	45.8	54.13	61.8	69.5	77.9	87.4	102.4			
H GEAR	--	--	--	--	--	--	--	1015	1210	1415	1610	1825	1980	2210	2610	2800	3022	3400
Do	180	200	200	250	250	300	300	350	400	450	500	600	600	680	760	800	915	915
	8	8	8	10	12	12	14	14	16	18	20	24	24	27	28.4			
RF (Kg)	15	17	27	31	47	58	71	122	185	225	355	495	688	900	1135	1700	1950	2900
BW (Kg)	14	15	24	28	42	54	69	113	170	214	340	475	635	770	965	1425	1820	2600

CLASS 300																		
DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	800
NPS	1 - 1/2	2	2 - 1/2	3	4	5	6	8	10	12	14	16	18	20	24	26	28	32
L(RF)	191	216	241	283	305	381	403	419	457	502	762	838	914	991	1143	1245	1346	1524
	7.5	8.5	9.5	11.3	12	15	15.9	16.5	18	19.8	30	33	36	39	45			
L(RTJ)	203	232	257	298	321	397	419	435	473	518	778	854	930	1010	1165	1270	1372	1552
	8	9.13	10.13	11.8	12.63	15.63	16.5	17.13	18.63	20.4	30.63	33.63	36.61	39.8	45.9			
L(BW)	191	216	241	283	305	381	403	419	457	502	762	838	914	991	1143	1245	1346	1524
	7.5	8.5	9.5	11.3	12	15	15.9	16.5	18	19.8	30	33	36	39	45			
H MANUAL	300	430	510	540	650	760	840	1040	1280	1440	1590	1755	1997	2192	2587	2890	3280	--
	15.4	15.8	19.3	20	23	29.13	30.4	37.63	45.8	54.13	61.8	69.5	77.9	87.4	10.4			--
H GEAR	--	--	--	--	--	--	--	1080	1320	1484	1646	1810	2150	2320	2730	2940	3350	3630
	--	--	--	--	--	--	--											
Do	160	200	200	250	250	300	350	400	450	500	600	600	680	760	915	915	915	--
	8	8	8	12	12	14	14	16	18	20	24	24	27	28.4	31.5			
RF (Kg)	22	26	39	48	73	110	144	204	320	465	715	970	1190	1655	2320	2900	3510	5250
BW (Kg)	16	20	35	40	59	95	124	176	278	405	643	876	1076	1515	2114	2640	3210	4864

WEDGE GATE VALVES

DIMENSIONS AND WEIGHTS (mm and inches)

CLASS 600

DN NPS	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	650 26	700 28	800 32
L(RF)	241 9.5	292 11.5	330 13	356 14	432 17	559 22	660 26	787 31	838 33	889 35	991 39	1092 43	1194 47	1397	1448	1549	1778
L(RTJ)	241 9.5	295 11.6	333 13.1	359 14.1	435 17.1	562 22.1	663 26.1	790 31.1	841 33.1	892 35.1	994 39.1	1095 43.1	1200 47.3	1407	1461	1562	1794
L(BW)	241 9.5	292 11.5	330 13	356 14	432 17	559 22	660 26	787 31	838 33	889 35	991 39	1092 43	1194 47	1397	1448	1549	1778
H MANUAL	 18.5	438 18.8	512 20.9	549 21.5	668 27.8	890 36	1109 42.4	1268 50.1	1458 58.8	1640 65.3	1825 73.4	1992 89	-- 89	-- --	-- --	-- --	-- --
H GEAR		-- --	-- --	-- --	-- --	-- --	1159	1318	1508	1735	1895	2155	2304	2700	3020	3120	3560
Do	200 8	250 10	250 10	250 12	350 12	450 18	500 20	600 24	680 27	760 30	800 34	915 38	-- --	-- --	-- --	-- --	-- --
RF (Kg)	32	47	55	75	123	260	400	700	854	1112	1317	1862	2200	4560	5120	7450	9150
BW (Kg)	28	39	47	66	102	208	373	630	766	1059	1243	1768	2090	4228	4682	6850	8450

CLASS 900

DN NPS	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	650 26	700 28	800 32
L(RF)	305 12	368 14.5	419 16.5	381 15	457 18	610 24	737 29	838 33	965 38	1029 40.5	1130 44.5	1219	1321	1579			
L(RTJ)	305 12	371 14.6	422 16.6	384 15.1	460 18.1	613 24.1	740 29.1	841 33.1	968 38.1	1038 40.9	1140 44.9	1232	1334	1568			
L(BW)	305 12	368 14.5	419 16.5	381 15	457 18	610 24	737 29	838 33	965 38	1029 40.5	1130 44.5	1219	1321	1549			
H MANUAL	490 19.3	508 24.5	580 27.8	606 27.8	796 32.5	957 42	1172 52	1300 60.6	1655 72.5	-- --	-- --	-- --	-- --	-- --			
H GEAR		-- --	-- --	-- --	-- --	1060	1202	1334	1960	2090	2390	2580	2780	3130			
Do	250 9.8	300 12	300 14	350 14	450 16	500 20	600 24	600 30	680 34	-- --	-- --	-- --	-- --	-- --			
RF (Kg)	34	55	75	95	135	280	495	725	1341	1900	2550	3275	3900	5985			
BW (Kg)	30	43	59	79	111	258	421	684	1217	1750	2364	3009	3574	5325			

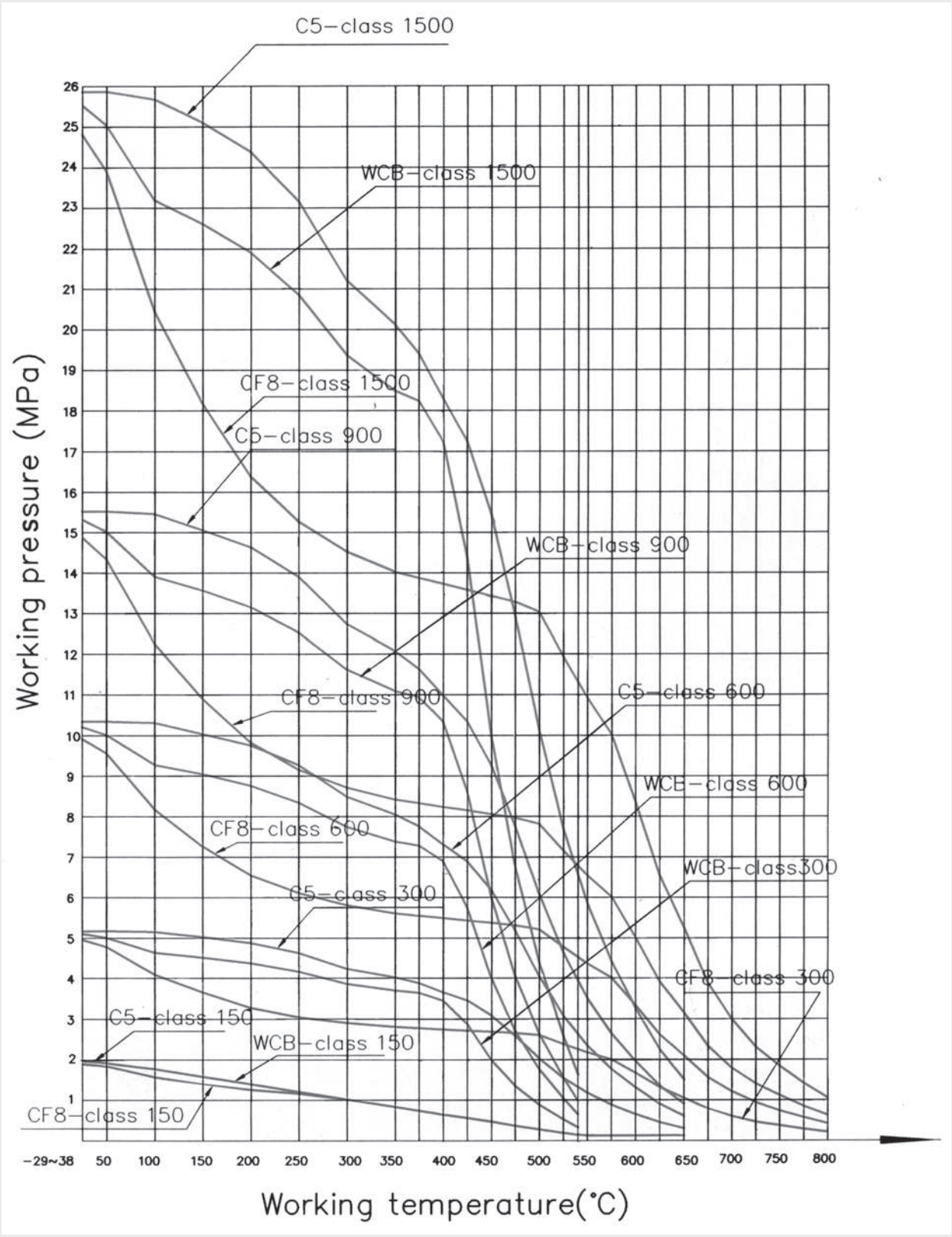
CLASS 1500

DN	40 1 - 1/2	50 2	65 2 - 1/2	80 3	100 4	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	650 26	700 28	800 32
L(RF)	305 12	368 14.5	419 16.5	470 18.5	546 21.5	705 27.8	832 32.8	991 39	1130	1257	1384	1537	1664	1943			
L(RTJ)	305 12	371 14.6	422 16.6	473 18.6	549 21.6	711 28	841 33.1	1000 39.4	1146	1276	1407	1559	1686	1972			
L(BW)	305 12	368 14.5	419 16.5	470 18.5	546 21.5	705 27.8	832 32.8	991 39	1130	1257	1384	1537	1664	1943			
H MANUAL	490 19.3	475 27.4	526 27.8	735 30.3	838 34.8	1042 43	1385 55.1	1645 63	1750	-- --	-- --	-- --	-- --	-- --			
H GEAR	--	--	--	--	900	1221	1555	1800	2010	2159	2330	2540	2862	3135			
Do	250 9.8	300 16	330 16	400 16	450 20	600 24	700 30	800 34	915	-- --	-- --	-- --	-- --	-- --			
RF (Kg)	34	95	128	181	275	627	1050	2200	3300	4200	6300	7350	9800	17800			
BW (Kg)	30	80	110	145	220	560	922	1950	2850	3550	5500	6400	8500	15600			

L - FACE TO FACE DIMENSIONS OF THE RF FLANGED END
L2 - FACE TO FACE DIMENSIONS OF THE TRJ FLANGED END
• OTHER CLASSES AND DIMENSIONS AVAILABLE UPON REQUEST

L1 - FACE TO FACE DIMENSIONS OF THE BW FLANGED END
H - THE DIMENSIONS WHEN THE VALVE IS CLOSED

PRESSURE - TEMPERATURE RATINGS TO ASME B16.34

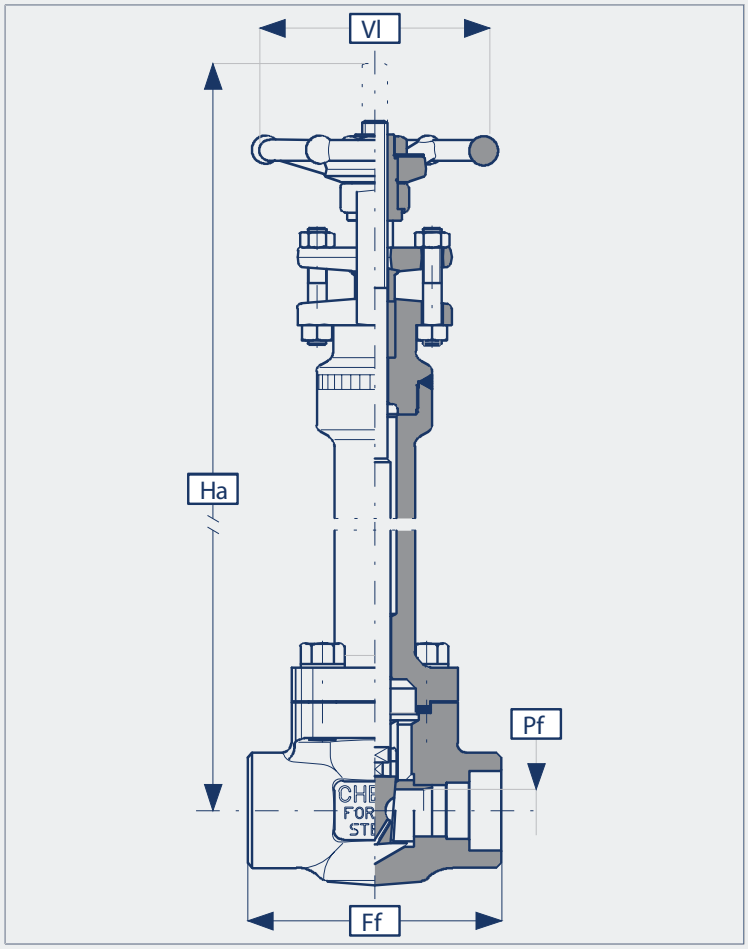


MidTech
Engineering Solutions

FORGED STEEL & STAINLESS STEEL

VALVES

"Cryogenic" GATE VALVES - 800 - Welded bonnet - Sw/Npt



Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	*founded on* API 602, BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	*founded on* API 598-BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw(e)/NPT		
SU	Sw(u)/NPT		
B4	Butt weld 40		

CONVENTIONAL BORE

			1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)		80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12
Ha	(mm/in)		333 13,11	367 14,45	406 15,98	463 18,23	508 20,00	534 21,02
Vl	(mm/in)		90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf	(mm/in)		10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44
Wt.	(kg/lb)		3,1 6,8	3,6 7,9	5,7 12,5	8,8 19,4	11,7 25,7	14,4 31,7

FULL BORE

		1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12	150 5,91
Ha	(mm/in)	330 12,99	333 13,11	367 14,45	406 15,98	463 18,23	508 20,00	534 21,02	658 25,91
Vl	(mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf	(mm/in)	9 0,35	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44	48 1,89
Wt.	(kg/lb)	3,1 6,8	3,1 6,8	3,6 7,9	5,7 12,5	8,8 19,4	11,7 25,7	14,4 31,7	22,2 48,8

"Cryogenic" GATE VALVES - 800 - Bolted bonnet - Sw/Npt

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

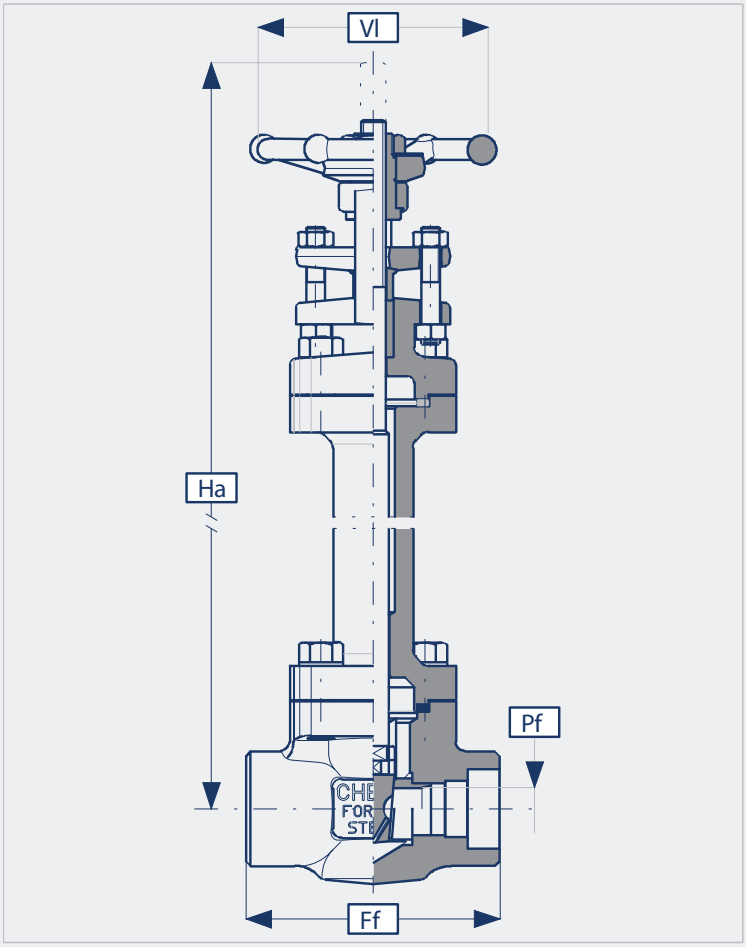
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	*founded on* API 602, BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	*founded on* API 598-BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld
TH	Threaded NPT
TS	Sw/NPT
SE	Sw(e)/NPT
SU	Sw(u)/NPT
B4	Butt weld 40
B8	Butt weld 80



CONVENTIONAL BORE

	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff (mm/in)	80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12
Ha (mm/in)	333 13,11	367 14,45	406 15,98	463 18,23	508 20,00	534 21,02
Vl (mm/in)	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf (mm/in)	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44
Wt. (kg/lb)	3,1 6,8	3,6 7,9	5,7 12,5	8,8 19,4	11,7 25,7	14,4 31,7

FULL BORE

	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff (mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12	150 5,91
Ha (mm/in)	333 13,11	333 13,11	367 14,45	406 15,98	463 18,23	508 20,00	534 21,02	658 25,91
Vl (mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf (mm/in)	9 0,35	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44	48 1,89
Wt. (kg/lb)	3,1 6,8	3,1 6,8	3,6 7,9	5,7 12,5	8,8 19,4	11,7 25,7	14,4 31,7	22,2 49,0

"Ext. Weld." GATE VALVES - 800 - Bolted bonnet - Sw/Npt-Weld

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

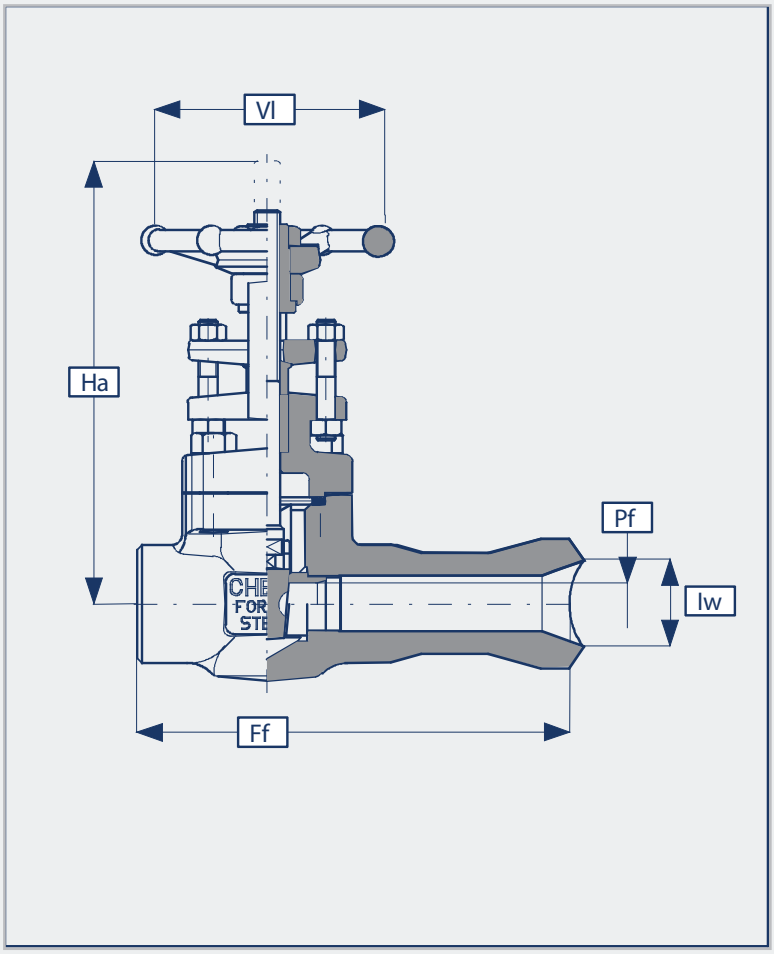
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	API 602, API 606
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	API 598-BS 6755 (Pt.1)

Connections (xx)

SNW Sw/ext. Weld
TNW Sw/ext. Weld



CONVENTIONAL BORE														
			1/2"		3/4"		1"		1.1/4"		1.1/2"		2" (4)	
Ff (mm/in)			208	8,19	218	8,58	244	9,60			263	10,35	268	10,55
Ha (mm/in)			208	5,90	156	6,14	186	7,32			255	10,04	273	10,75
Vl (mm/in)			90	3,54	90	3,54	100	3,94			140	5,51	140	5,51
Pf (mm/in)			10	0,39	14	0,55	18	0,71			31	1,22	36,5	
1,44														
Iw (mm/in)			22	0,87	30	1,18	36	1,42			50	1,97	65	2,56
Wt. (kg/lb)			2,5	5,5	2,8	6,2	5	11			9,8	21,56	13,5	
29,7														

"Ext. Weld." GATE VALVES- 800 - Welded bonnet -Sw/Npt-Weld

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

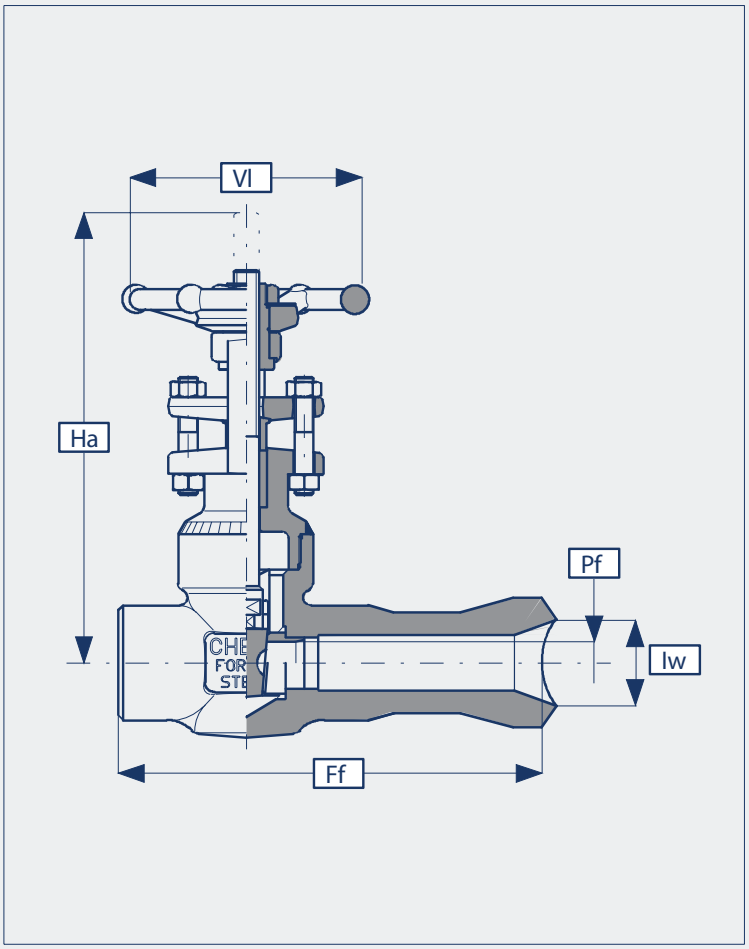
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	API 602, API 606
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	API 598-BS 6755 (Pt.1)

Connections (xx)

SNW Sw/ext. Weld
TNW Sw/ext. Weld



CONVENTIONAL BORE												
					3/4"		1"			1.1/2"		2"
Ff (mm/in)			208	8,19	218	8,58	244	9,60		263	10,35	268	10,55
Ha (mm/in)			150	5,90	157	6,18	188	7,40		248	9,76	274	10,79
Vl (mm/in)			90	3,54	90	3,54	100	3,94		140	5,51	140	5,51
Pf (mm/in)			10	0,39	14	0,55	18	0,71		31	1,22	36,5	1,44
lw (mm/in)			22	0,87	30	1,18	36	1,42		50	1,97	65	2,56
Wt. (kg /lb)			2,2	4,84	2,5	5,5	4,7	10,3		9	19,8	12,7	27,94

"Ext. body" GATE VALVES - 800 - Welded bonnet - Sw/Npt/BW

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

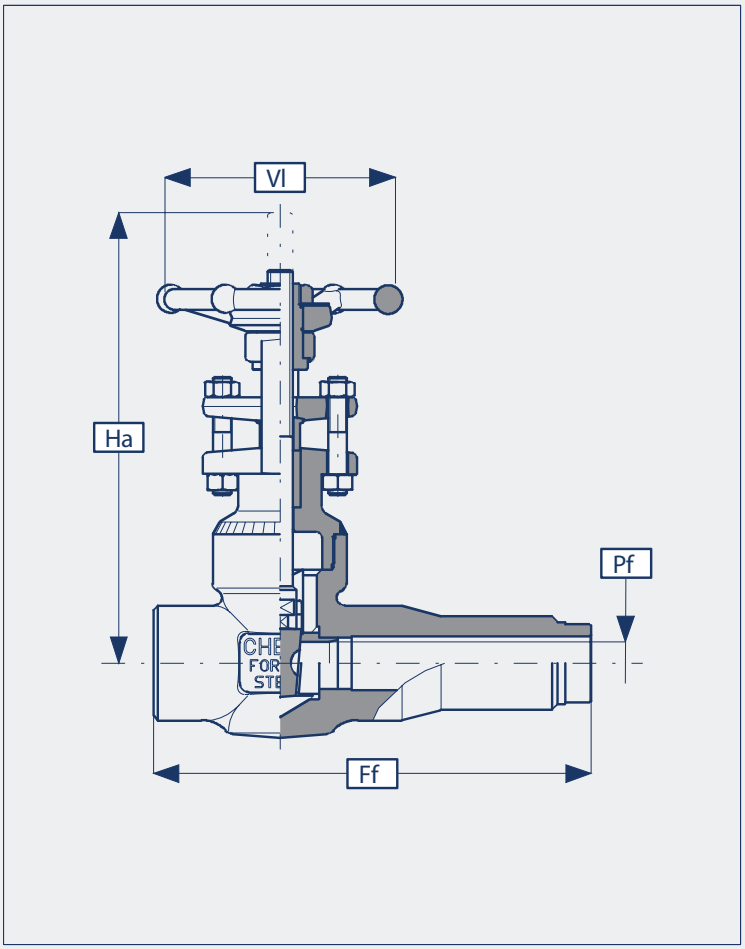
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	API 602, API 606
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-BS 6755 (Pt.1)

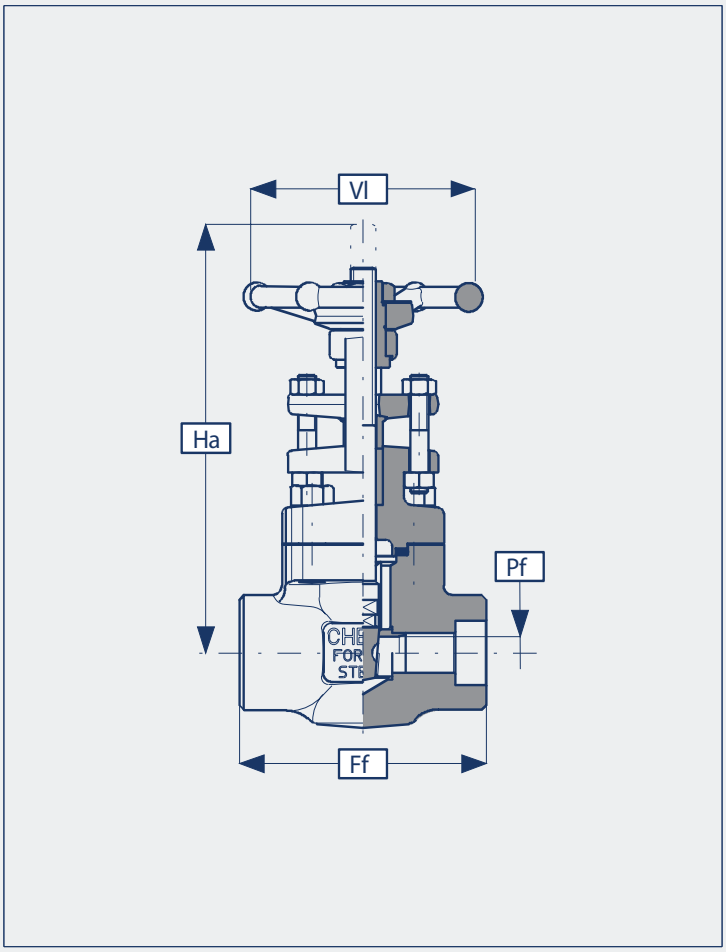
Connections (xx)

SNS	Sw/ext. Sw	BNS	BW80/ext. Sw
SNT	Sw/ext. NPT	BNT	BW80/ext. NPT
SNB	Sw/ext. BW80	BNB	BW80/ext. BW80
TNS	NPT/ext. Sw		
TNT	NPT/ext. NPT		
TNB	NPT/ext. BW80		



CONVENTIONAL BORE																
			1/2"		3/4"		1"				1.1/2"		2"	
Ff (mm/in)			145	5,71	160	6,30	190	7,48			224	8,82	240	9,45
Ha (mm/in)			150	5,91	157	6,18	188	7,40			248	9,76	273	10,75
Vl (mm/in)			90	3,54	90	3,54	100	3,94			140	5,51	140	5,51
Pf (mm/in)			10	0,39	14	0,55	18	0,71			31	1,22	36,5	1,44
Wt. (kg/lb)			1,6	3,5	2,0	4,4	3,2	7,0			6,2	13,6	8,3	18,5

"Compact" GATE VALVES - 1500 - Bolted bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

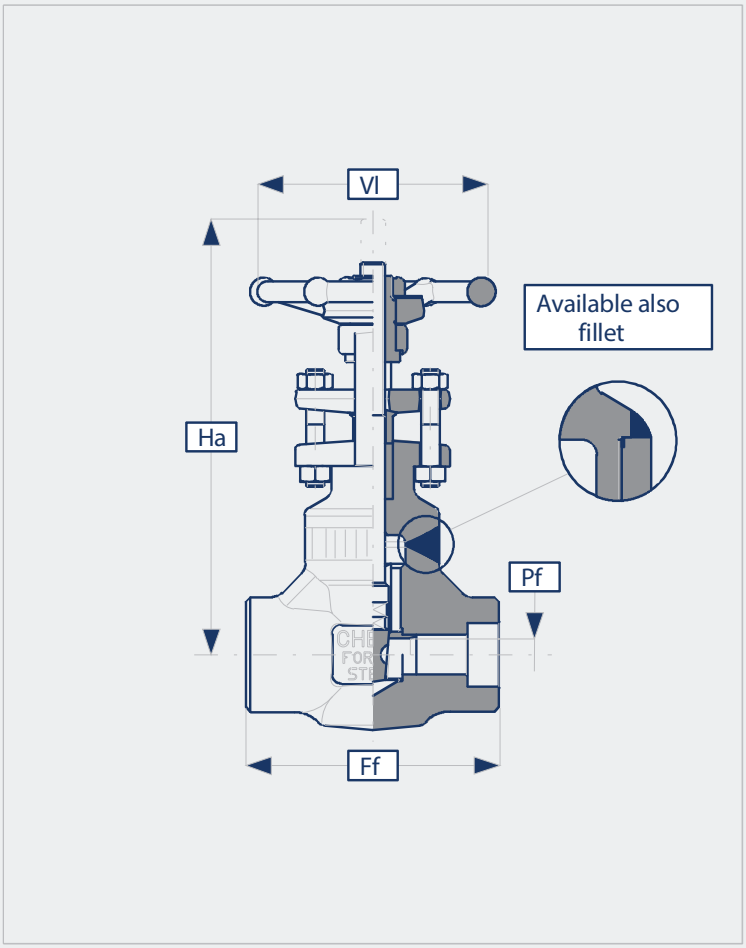
Construction	API 602
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw(e)/NPT		
SU	Sw(u)/NPT		
B6	Butt weld 160		

CONVENTIONAL BORE														
	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff (mm/in)	90	3,54	90	3,54	90	3,54	110	4,33	127	5,00	127	5,00	130	5,12	150	5,91
Ha (mm/in)	163	6,42	163	6,42	163	6,42	180	7,09	212	8,35	245	9,65	266	10,47	318	12,52
Vl (mm/in)	90	3,54	90	3,54	90	3,54	100	3,94	120	4,72	140	5,51	140	5,51	200	7,87
Pf (mm/in)	8,5	0,33	8,5	0,33	10	0,39	14	0,55	18	0,71	24	0,94	31	1,22	36,5	1,44
Wt. (kg/lb)	2,3	5,1	2,3	5,1	2,3	5,1	3,7	8,1	5,4	11,9	7,4	16,3	9,6	21,1	15,1	33,2

"Compact" GATE VALVES - 1500 - Welded bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	API 602
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598

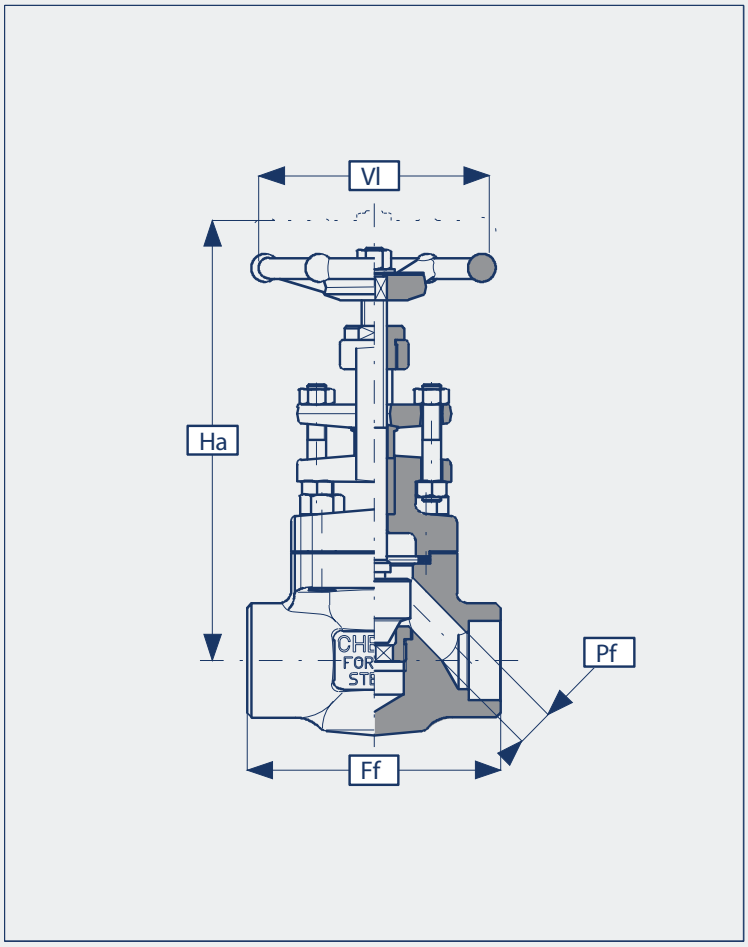
Connections (xx)

SW	Socket weld
TH	Threaded NPT
TS	Sw/NPT
SE	Sw(e)/NPT
SU	Sw(u)/NPT
B6	Butt weld 160
B8	Butt weld 80

CONVENTIONAL BORE

	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff (mm/in)	90 3,54	90 3,54	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12	150 5,91
Ha (mm/in)	170 6,69	170 6,69	170 6,69	183 7,20	219 8,62	247 9,72	274 10,79	331 13,03
Vl (mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf (mm/in)	8,5 0,33	8,5 0,33	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44
Wt. (kg/lb)	2,2 4,8	2,2 4,8	2,2 4,8	3,3 7,3	5,0 11,0	6,4 14,1	8,7 19,1	13,6 29,9

GLOBE VALVES - 800 - Bolted bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TS	SW/NPT		
TH	Threaded NPT		
SE	SW (in)/NPT		
SU	SW (out)/NPT		
B4	Butt weld 40		

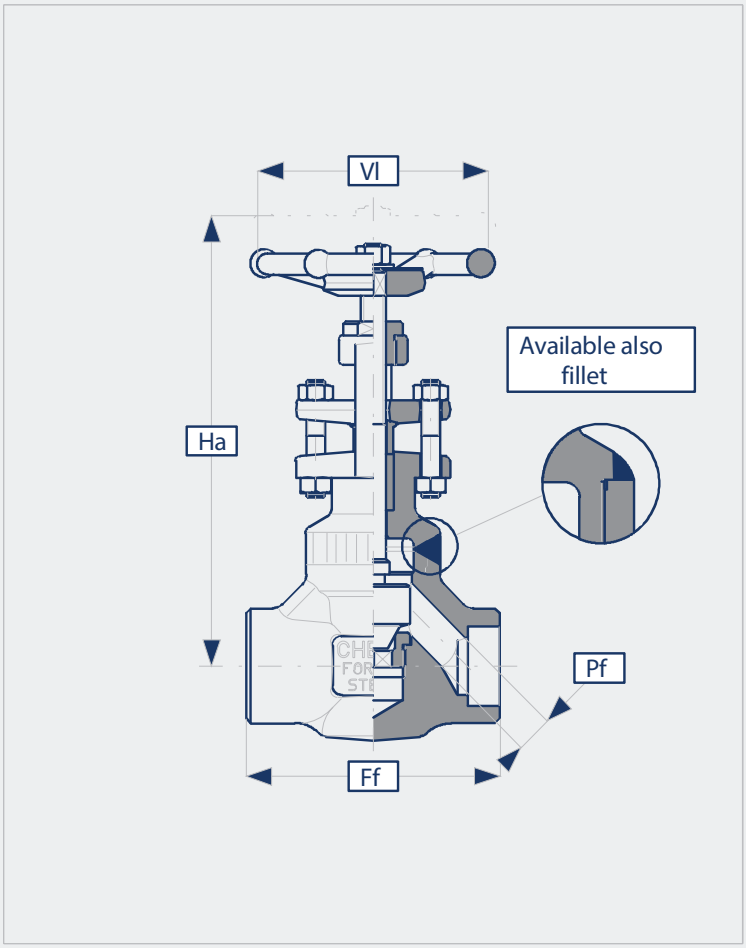
REDUCED BORE

	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff (mm/in)	80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69
Ha (mm/in)	152 5,98	159 6,26	182 7,17	214 8,43	283 11,14	306 12,05
Vl (mm/in)	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf (mm/in)	9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 (4) 1,10	32 (5) 1,26
Wt. (kg/lb)	1,7 3,7	2 4,4	3,2 7,0	5,3 11,7	7,8 17,2	10,6 23,3

FULL BORE

	1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff (mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69	210 8,27
Ha (mm/in)	150 5,91	152 5,98	159 6,26	182 7,17	214 8,43	283 11,14	306 12,05	327 12,87
Vl (mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf (mm/in)	6 0,24	9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 (4) 1,10	32 (5) 1,26	40 (6) 1,57
Wt. (kg/lb)	1,8 4,0	1,8 4,0	2,1 4,6	3,3 7,3	5,4 11,9	7,9 17,4	10,7 23,5	16 35,2

GLOBE VALVES - 800 - Welded bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TS	Sw/NPT		
TH	Threaded NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B4	Butt weld 40		

REDUCED BORE

			1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff	(mm/in)		80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69
Ha	(mm/in)		153	6,02	158	6,22	179	7,05	220	8,66	250	9,84	274	10,79
Vl	(mm/in)		90	3,54	90	3,54	100	3,94	120	4,72	140	5,51	140	5,51
Pf	(mm/in)		9	0,35	12,5	0,49	17,5	0,69	22,5	0,89	28 (4)	1,10	32 (5)	1,26
Wt.	(kg/lb)		1,4	3,1	1,6	3,5	3	6,6	4,8	10,6	6,8	15,0	9,4	20,7

FULL BORE

		1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff	(mm/in)	80	3,15	80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69	210	8,27
Ha	(mm/in)	150	5,91	153	6,02	158	6,22	179	7,05	220	8,66	250	9,84	274	10,79	327	12,87
Vl	(mm/in)	90	3,54	90	3,54	90	3,54	100	3,94	120	4,72	140	5,51	140	5,51	200	7,87
Pf	(mm/in)	6,5	0,26	9	0,35	12,5	0,49	17,5	0,69	22,5	0,89	28 (4)	1,10	32 (5)	1,26	38 (6)	1,50
Wt.	(kg/lb)	1,4	3,1	1,4	3,1	1,6	3,5	3,0	6,6	4,8	10,7	6,8	15,0	9,4	20,7	14,6	32,1

GLOBE VALVES - 4500 - Welded bonnet - Sw/Npt/Bw

Ratings (ASTM A105)

4010 p.s.i. @ 850°F
11110 p.s.i. @ 100°F

Test pressure (ASTM A105)

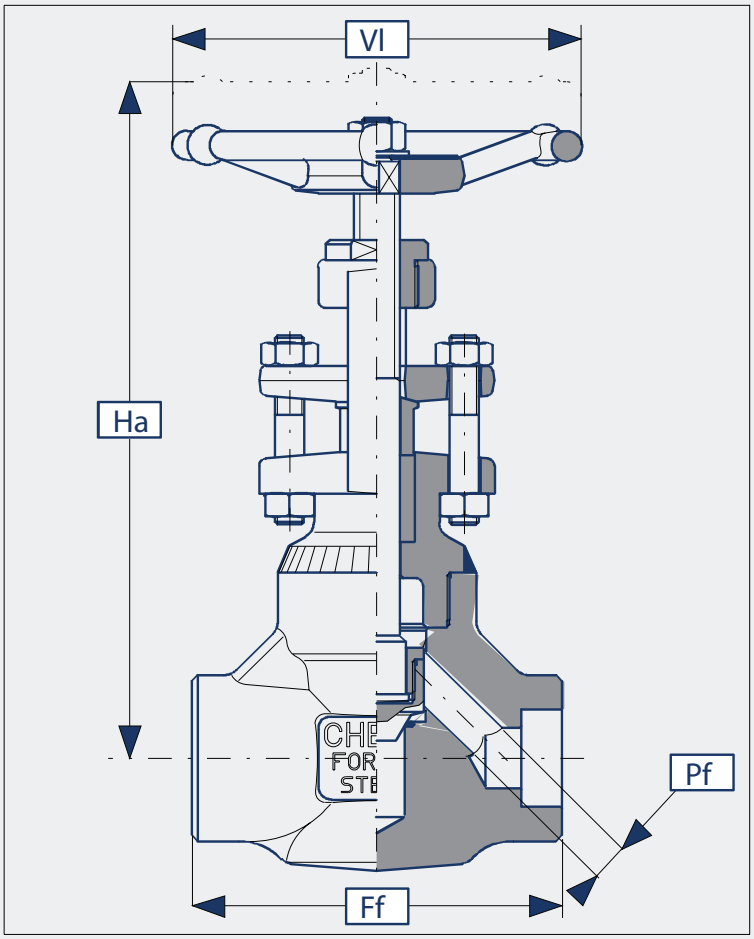
Hydraulic: *(minimum)*
Body - 16650 p.s.i.
Seat - 12210 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598 -ASME B16.34

Connections (xx)

SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		



STANDARD BORE									
			1/2"	3/4"	1"		1.1/2"	2"
Ff (mm/in)			127 5,00	155 6,10	170 6,69		240 9,45	240 9,45
Ha (mm/in)			230 9,06	277 10,90	335 13,18		431 16,97	450 17,72
Vl (mm/in)			175 6,89	200 7,87	260 10,24		350 13,78	350 13,78
Pf (mm/in)			7 0,28	11 0,43	14 0,55		25 0,98	30 1,18
Wt. (kg/lb)			4,1 9,0	6,2 13,6	11,8 26,0		28,0 61,6	42 92,4

GLOBE VALVES - 2500 - Bolted bonnet - Sw/Npt/Bw

Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

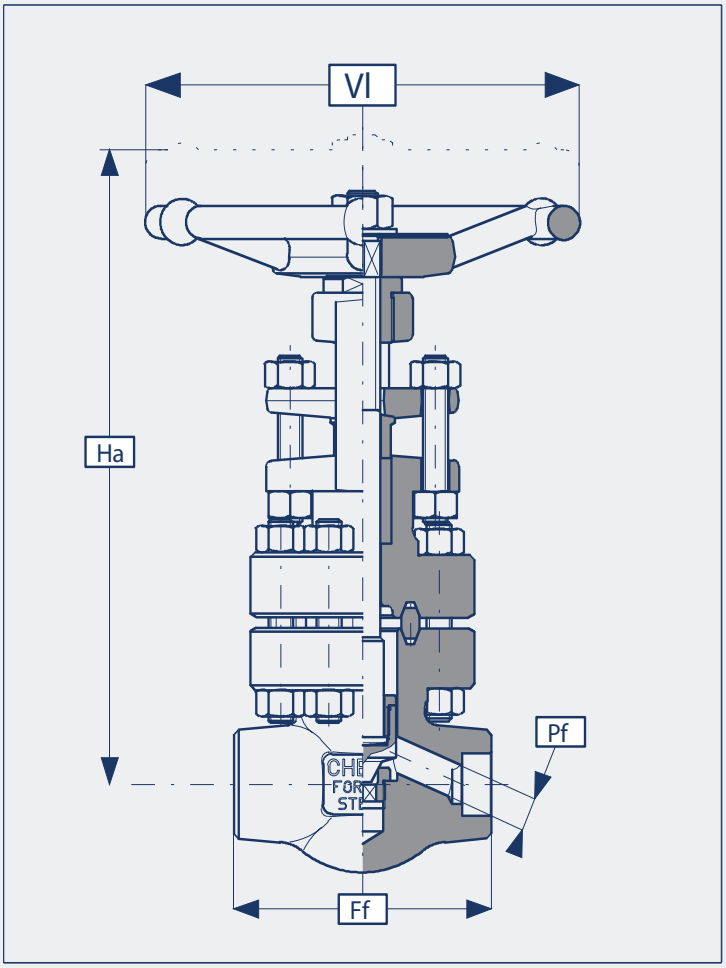
Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	*founded on* ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-ASME B16.34

Connections (xx)

SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		



STANDARD BORE

			1/2"		3/4"		1"			1.1/2"		2"	
Ff	(mm/in)		110	4,33	115	4,52	130	5,12		210	8,27	240	9,45
Ha	(mm/in)		218	8,58	260	10,24	268	10,55		427	16,81	433	17,05
Vl	(mm/in)		140	5,51	200	7,87	200	7,87		260	10,24	350	13,77
Pf	(mm/in)		10	0,39	13	0,51	18	0,71		25	0,98	34	1,33
Wt.	(kg/lb)		5,8	13,0	8,3	18,3	9,7	21,3		26,8	59,0	35,3	77,7

GLOBE VALVES - 2500 - Welded bonnet - Sw/Npt/Bw

Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

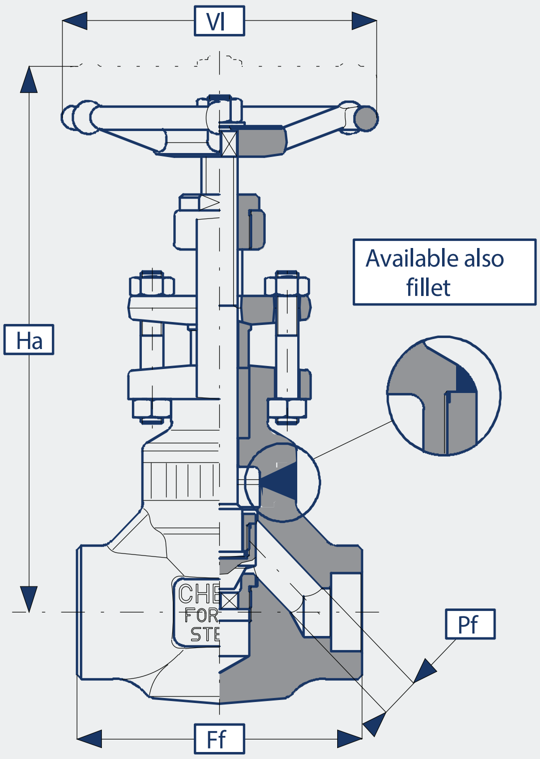
Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	*founded on* ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	*API 598-* ASME B16.34

Connections (xx)

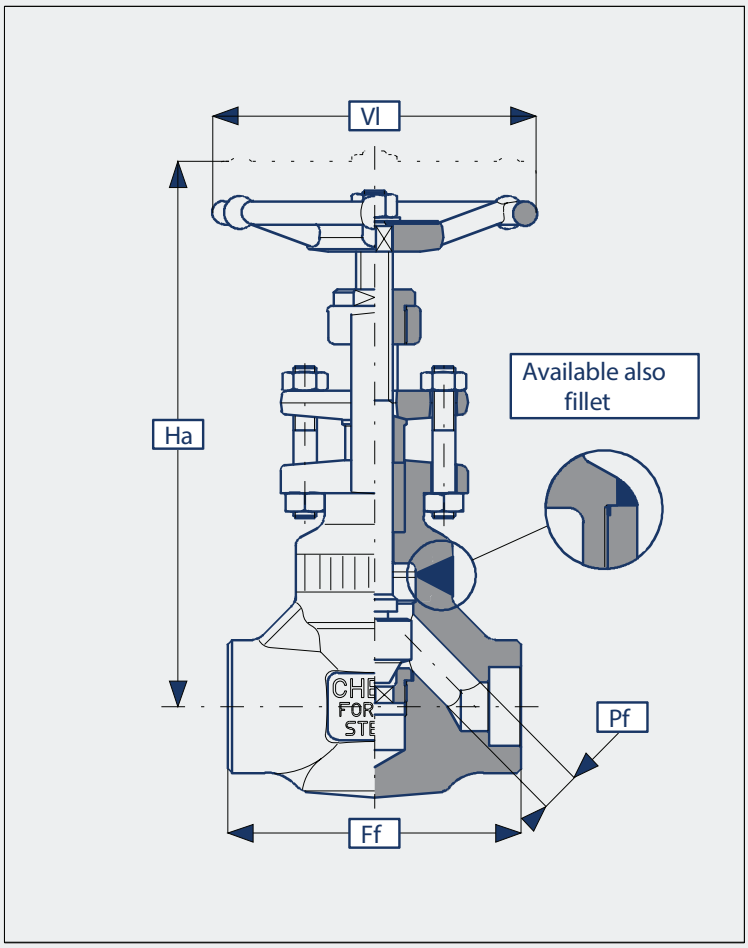
SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		



STANDARD BORE

			1/2"	3/4"	1"		1.1/2"	2"
Ff (mm/in)			110 4,33	127 4,33	155 6,10		210 8,27	240 9,45
Ha (mm/in)			209 8,22	238 9,37	257 10,11		386 15,20	407 16,02
Vl (mm/in)			140 5,51	200 7,87	200 7,87		260 10,24	350 13,78
Pf (mm/in)			10 0,39	13 0,51	18 0,71		25 0,98	34 1,33
Wt. (kg/lb)			2,5 5,5	4,1 9,0	6,2 13,6		11,8 26,0	28 61,6

GLOBE VALVES - 1500 - Welded bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

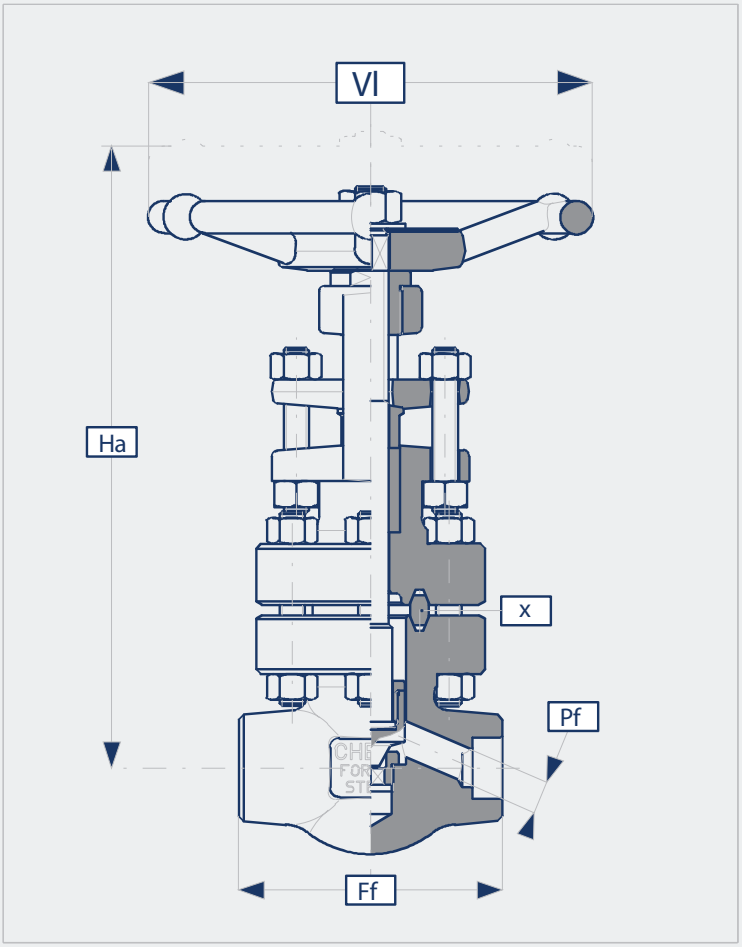
Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		

STANDARD BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	90 3,54	110 4,33	127 5,00	170 6,69	210 8,26
Ha (mm/in)	203 7,99	227 8,94	233 9,17	310 12,20	402 15,83
Vl (mm/in)	120 4,72	175 6,89	175 6,89	200 7,87	260 10,24
Pf (mm/in)	11 0,43	14,5 0,57	19 0,75	31 1,22	37,5 1,48
Wt. (kg /lb)	1,9 4,2	3,3 7,4	5,2 11,4	10,3 22,7	17,8 39,16

GLOBE VALVES - 1500 - Bolted bonnet - Sw/Npt/Bw



Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

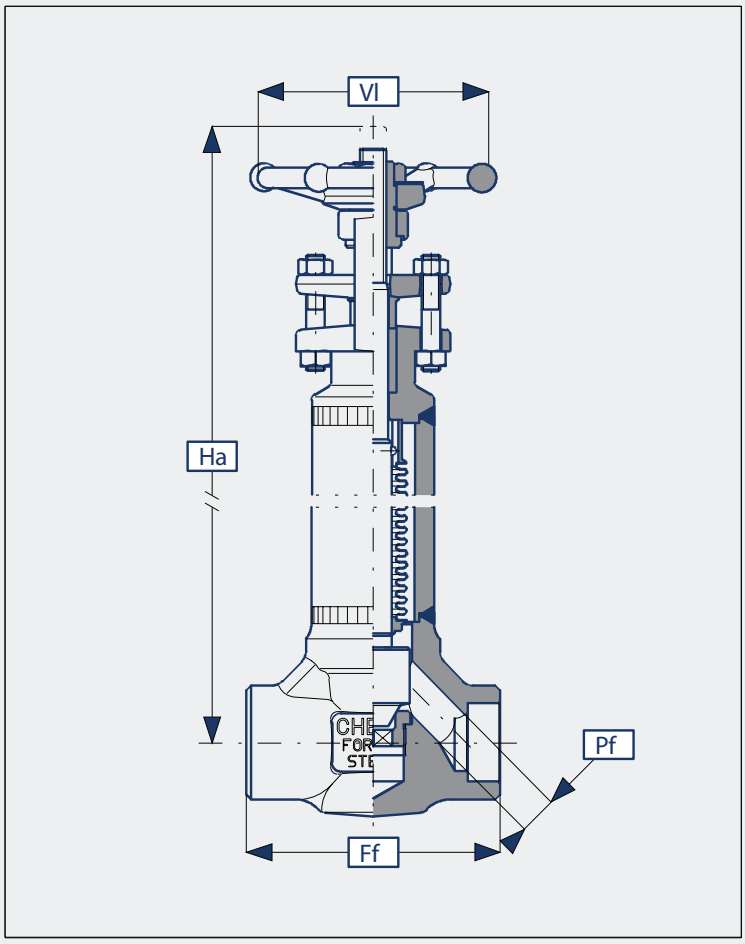
Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		

X) Gasket=Spiral wound.RJ gasket available on request.

STANDARD BORE																
			1/2"		3/4"		1"				1.1/2"		2"	
Ff (mm/in)			110	4,33	115	4,53	130	5,12			210	8,27	240	9,45
Ha (mm/in)			218	8,58	274	10,79	286	11,26			427	16,8	433	17,05
Vl (mm/in)			120	4,72	175	6,89	175	6,89			260	10,24	260	10,24
Pf (mm/in)			11	0,43	14,5	0,57	19	0,75			31	1,22	37,5	1,48
Wt. (kg /lb)			5,6	12,3	8,0	17,6	9,3	20,5			26,2	57,6	34,5	75,9

"Bellows sealed" GLOBE VALVES-800- Welded bonnet -Sw/Npt



Ratings (ASTM A105)

800 p.s.i. @ 850°F
1440 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 2180 p.s.i.
Seat - 1495 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B4	Butt weld 40		

REDUCED BORE

			1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff	(mm/in)		80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69
Ha	(mm/in)		235	9,25	259	10,20	302	11,89	329	12,95	354	13,94	390	15,35
Vl	(mm/in)		90	3,54	90	3,54	100	3,94	120	4,72	140	5,51	140	5,51
Pf	(mm/in)		9	0,35	12,5	0,49	17,5	0,69	22,5	0,89	28 (4)	1,10	32 (5)	1,26
Wt.	(kg /lb)		2,3	5,1	2,6	5,7	4,3	9,5	6,8	15,0	9,6	21,1	13,8	30,4

FULL BORE

		1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff	(mm/in)	80	3,15	80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69	210	8,27
Ha	(mm/in)	235	9,25	235	9,25	259	10,20	302	11,89	329	12,95	354	13,94	390	15,35	442	17,40
Vl	(mm/in)	90	3,54	90	3,54	90	3,54	100	3,94	120	4,72	140	5,51	140	5,51	200	7,87
Pf	(mm/in)	6	0,24	9	0,35	12,5	0,4	17,5	0,69	22,5	0,89	28 (4)	1,10	32 (5)	1,26	40 (6)	1,57
Wt.	(kg /lb)	2,4	5,4	2,4	5,4	2,7	6,1	4,6	10,5	7,3	16,5	10,2	23,1	14,5	32,9	23,4	51,1

"Bellows sealed" GLOBE VALVES - 800 - Bolted bonnet - Sw/Npt

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1440 p.s.i. @ 100°F

Test pressure (ASTM A105)

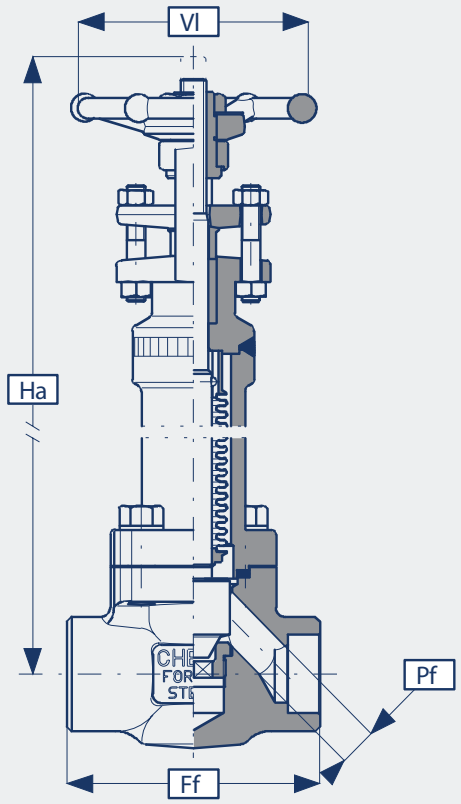
Hydraulic: *(minimum)*
Body - 2180 p.s.i.
Seat - 1495 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5253
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	BS 6755 (Pt.1)

Connections

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B4	Butt weld 40		



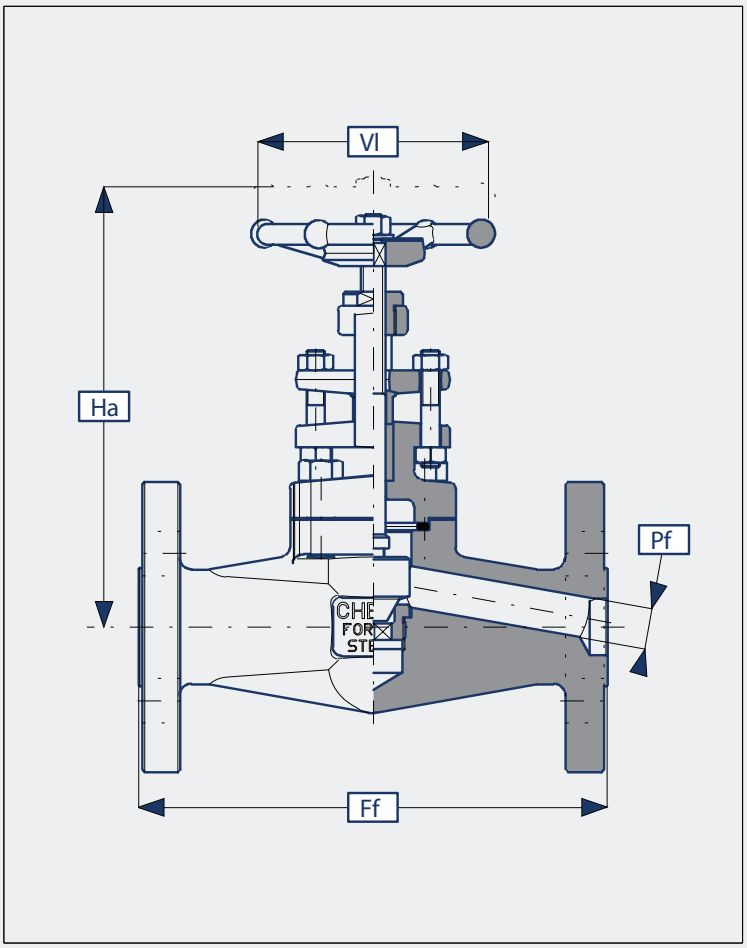
REDUCED BORE

			1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)		80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69
Ha	(mm/in)		234 9,21	243 9,56	290 11,41	320 12,59	363 14,29	389 15,31
Vl	(mm/in)		90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf	(mm/in)		9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 [4] 1,10	32 [5] 1,26
Wt.	(kg /lb)		2,5 5,5	2,8 6,2	5,2 11,4	7,5 16,5	11,4 25,1	15,4 33,9

FULL BORE

		1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69	210 8,27
Ha	(mm/in)	234 9,21	234 9,21	243 9,56	290 11,41	320 13,04	363 14,29	389 15,31	442 17,40
Vl	(mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf	(mm/in)	6 0,24	9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 [4] 1,10	32 [5] 1,26	40 [6] 1,57
Wt.	(kg /lb)	2,6 5,7	2,6 5,7	2,9 6,4	5,3 11,7	7,6 16,7	11,5 25,3	15,5 34,1	23,4 51,5

GLOBE VALVES - 300 - Bolted bonnet - Flanged Rf/Rj



Ratings (ASTM A105)

300 p.s.i. @ 850°F
740 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 1125 p.s.i.
Seat - 825 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Flanged	ASME B16.5, ASME B16.10
Test	BS 6755 (Pt.1)

Connections (xx)

RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		

REDUCED BORE

	1/2"		3/4"		1"		1.1/2"		2"	
Ff (mm/in)	152,4	5,98	177,8	7,00	203,2	8,00	228,6	9,00	266,7	10,50
Ha (mm/in)	152	5,98	159	6,26	182	7,17	283	11,14	306	12,05
Vl (mm/in)	90	3,54	90	3,54	100	3,94	140	5,51	140	5,51
Pf (mm/in)	9	0,35	12,5	0,49	17,5	0,69	28 (4)	1,10	32 (5)	1,26
Wt. (kg/lb)	3,4	7,5	4,8	10,6	7,0	15,4	14,2	31,2	17,4	38,3

FULL BORE

	1/2"		3/4"		1"		1.1/2"		2"	
Ff (mm/in)	152,4	5,98	177,8	7,00	203,2	8,00	228,6	9,00	266,7	10,50
Ha (mm/in)	152	5,98	159	6,26	182	7,17	283	11,14	306	12,05
Vl (mm/in)	90	3,54	100	3,94	120	4,72	140	5,51	200	7,87
Pf (mm/in)	13	0,51	17,5	0,69	22,5	0,89	34	1,34	45	1,77
Wt. (kg/lb)	3,4	7,5	4,8	10,6	7,0	15,4	14,2	31,2	17,4	38,3

GLOBE VALVES - 600 - Bolted bonnet - Flanged Rf/Rj

Ratings (ASTM A105)

600 p.s.i. @ 850°F
1480 p.s.i. @ 100°F

Test pressure (ASTM A105)

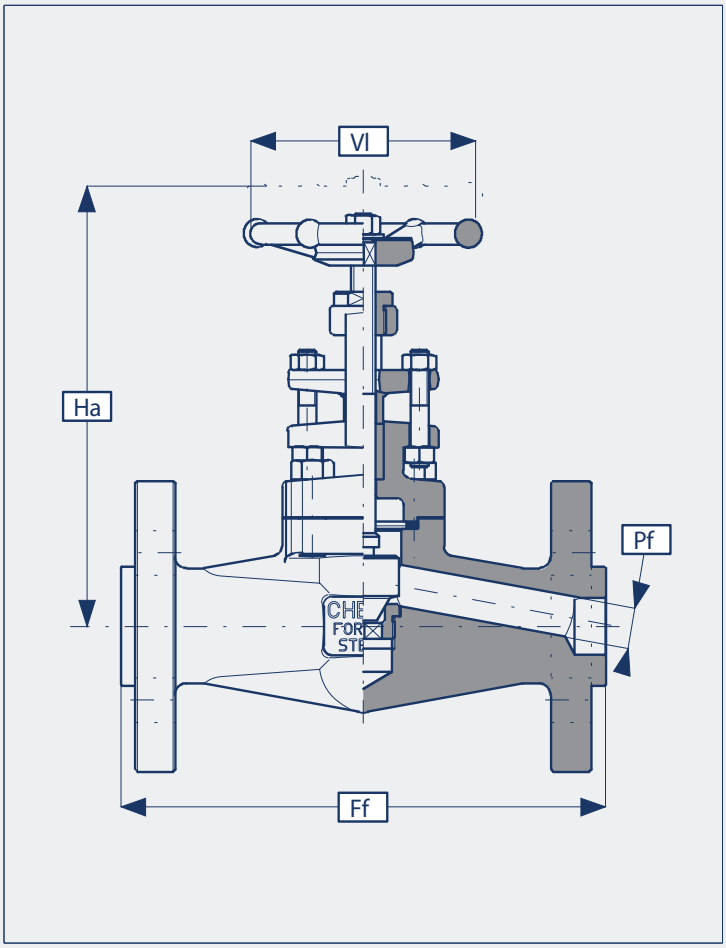
Hydraulic: *(minimum)*
Body - 2225 p.s.i.
Seat - 1650 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Flanged	ASME B16.5, ASME B16.10
Test	BS 6755 (Pt.1)

Connections (xx)

RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		



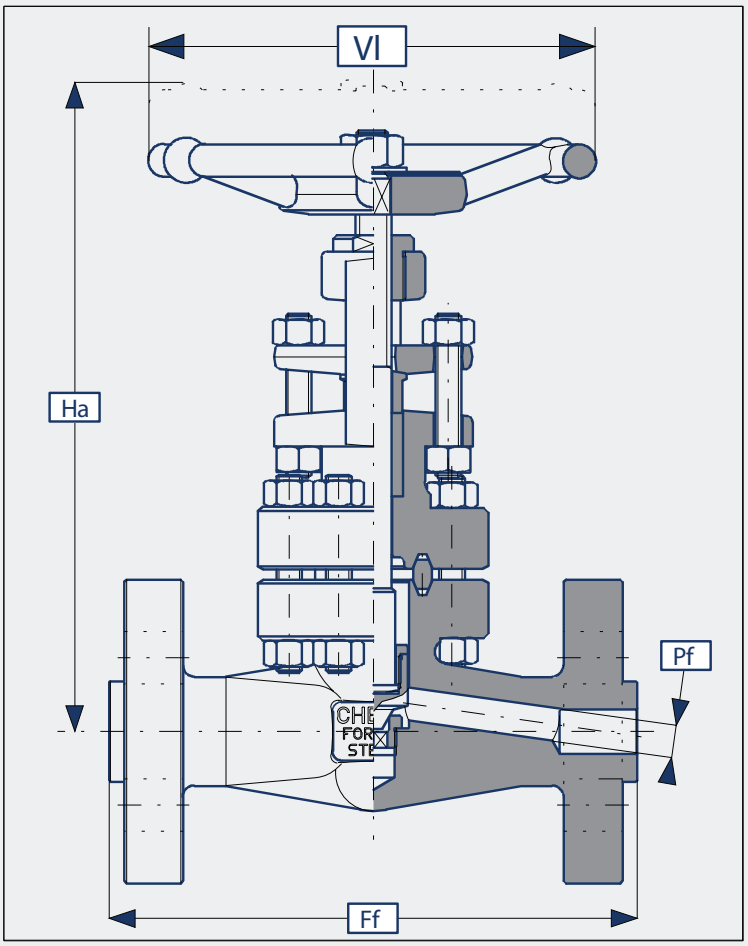
REDUCED BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	165,1 6,50	190,5 7,50	215,9 8,50	241,3 9,50	292,1 11,50
Ha (mm/in)	152 5,98	159 6,26	182 7,17	283 11,14	306 12,05
Vl (mm/in)	90 3,54	90 3,54	100 3,94	140 5,51	140 5,51
Pf (mm/in)	9 0,35	12,5 0,49	17,5 0,69	28 (4) 1,10	32 (5) 1,26
Wt. (kg/lb)	3,6 7,9	5,1 11,2	7,8 17,2	14,2 31,2	19,4 42,7

FULL BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	165,1 6,50	190,5 7,50	215,9 8,50	241,3 9,50	292,1 11,50
Ha (mm/in)	159 6,26	182 7,17	214 8,43	306 12,05	327 12,87
Vl (mm/in)	90 3,54	100 3,94	120 4,72	140 5,51	200 7,87
Pf (mm/in)	12 0,47	17,5 0,69	22,5 0,89	34 1,34	45 1,77
Wt. (kg/lb)	3,8 8,4	6,8 15,0	10,3 22,7	17,8 39,2	26,8 59,0

GLOBE VALVES - 2500 - Bolted bonnet - Flanged Rf/Rj



Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	*founded on* ASME B16.34
Flanged	ASME B16.5, ASME B16.10
Test	API 598-ASME B16.34

Connections (xx)

RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		

STANDARD BORE														
			1/2"		3/4"		1"			1.1/2"		2"	
Ff (mm/in)			263,5	10,37	273,0	10,75	308,0	12,13		384,2	15,13	450,8	17,15
Ha (mm/in)			218	8,58	274	10,79	286	11,26		427	16,81	433	17,05
Vl (mm/in)			140	5,51	200	7,87	200	7,87		260	10,24	350	13,77
Pf (mm/in)			10	0,39	13	0,51	18	0,71		25	0,98	34	1,33
Wt. (kg/lb)			9,6	21,1	15,4	33,9	17,4	38,3		38,5	84,7	55,9	123,0

"Bellows sealed" GATE VALVES - 800 - Bolted bonnet - Sw/Npt

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1440 p.s.i. @ 100°F

Test pressure (ASTM A105)

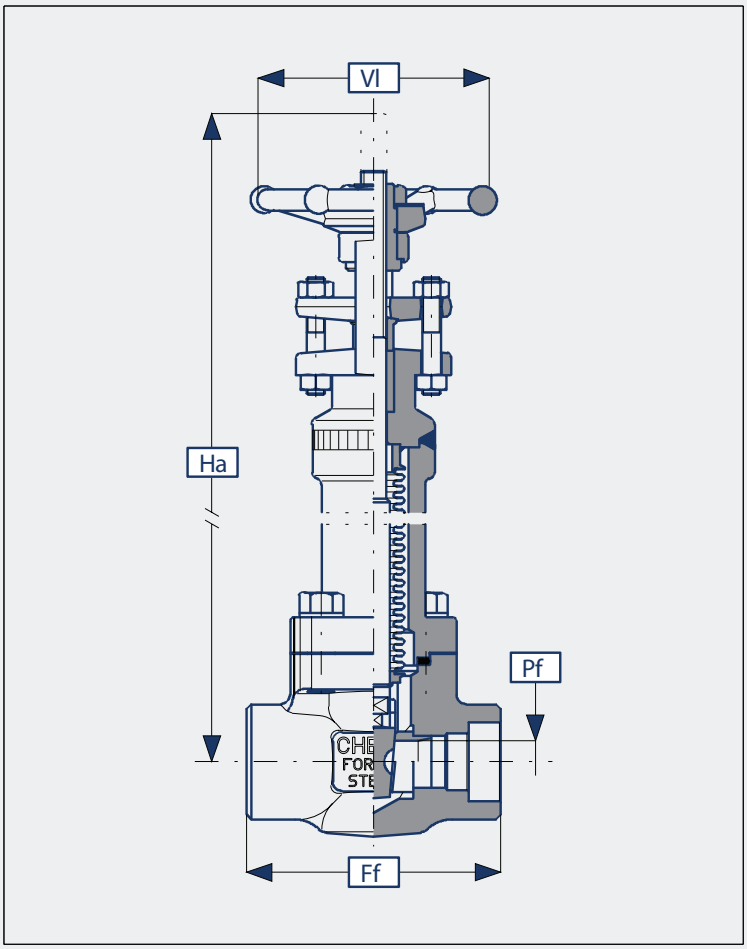
Hydraulic: *(minimum)*
Body - 2180 p.s.i.
Seat - 1495 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw(e)/NPT		
SU	Sw(u)/NPT		
B4	Butt weld 40		



REDUCED BORE

			1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)		80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12
Ha	(mm/in)		256 10,08	267 10,51	300 11,81	344 13,54	421 16,57	433 17,05
Vl	(mm/in)		90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf	(mm/in)		10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44
Wt.	(kg /lb)		3,0 6,6	3,4 7,5	5,3 11,7	7,7 16,9	11,0 24,2	14,2 31,2

FULL BORE

		1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12	150 5,91
Ha	(mm/in)	256 10,08	256 10,08	267 10,51	300 11,81	344 13,54	421 16,57	433 17,05	560 22,05
Vl	(mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf	(mm/in)	8,5 0,33	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44	48 1,89
Wt.	(kg /lb)	3,0 6,6	3,0 6,6	3,4 7,5	5,3 11,7	7,7 17,1	11,0 24,4	14,2 31,2	25,0 55,0

"Ext. body" GATE VALVES - 800 - Bolted bonnet - Sw/Npt/BW

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

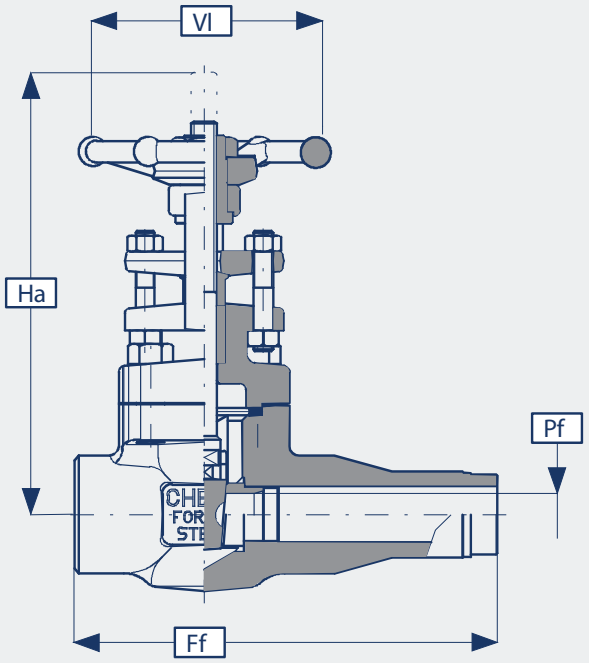
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	API 602, API 606
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-BS 6755 (Pt.1)

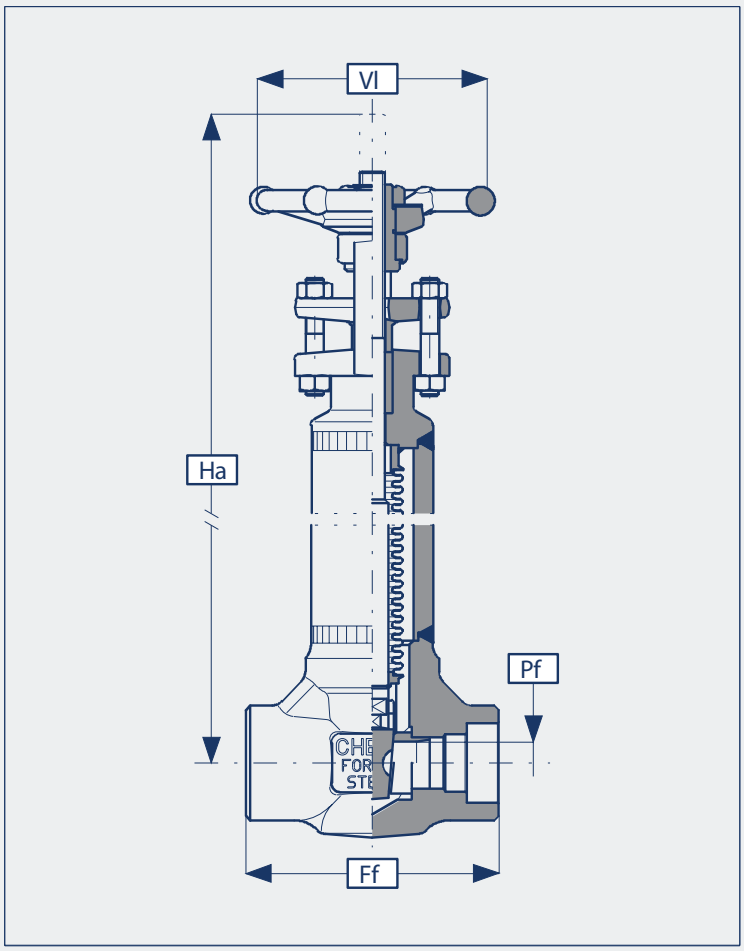
Connections (xx)

SNS	Sw/ext. Sw	BNS	BW80/ext. Sw
SNT	Sw/ext. NPT	BNT	BW80/ext. NPT
SNB	Sw/ext. BW80	BNB	BW80/ext. BW80
TNS	NPT/ext. Sw		
TNT	NPT/ext. NPT		
TNB	NPT/ext. BW80		



	CONVENTIONAL BORE											
			1/2"		3/4"		1"		1.1/2"		2"	
Ff (mm/in)			145	5,71	160	6,30	190	7,48	224	8,82	240	9,45
Ha (mm/in)			145	5,70	156	6,14	186	7,32	255	10,04	273	10,75
Vl (mm/in)			90	3,54	90	3,54	100	3,94	140	5,51	140	5,51
Pf (mm/in)			10	0,39	14	0,55	18	0,71	31	1,22	36,5	1,44
Wt. (kg/lb)			1,9	4,2	2,4	5,3	3,8	8,4	7,7	16,9	7,7	16,9

"Bellows sealed" GATE VALVES - 800 - Welded bonnet - Sw/Npt



Ratings (ASTM A105)

800 p.s.i. @ 850°F
1440 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 2180 p.s.i.
Seat - 1495 p.s.i.
Air under water:
Seat - 85 p.s.i.

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw(e)/NPT		
SU	Sw(u)/NPT		
B4	Butt weld 40		

REDUCED BORE

			1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)		80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12
Ha	(mm/in)		256 10,08	267 10,51	300 11,81	344 13,54	421 16,57	433 17,05
Vl	(mm/in)		90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51
Pf	(mm/in)		10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44
Wt.	(kg/lb)		2,7 5,9	3,1 6,8	4,7 10,3	6,9 15,2	9,5 20,9	12,6 27,7

FULL BORE

		1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	127 5,00	130 5,12	150 5,91
Ha	(mm/in)	256 10,08	256 10,08	267 10,51	300 11,81	344 13,54	421 16,57	433 17,05	560 22,05
Vl	(mm/in)	90 3,54	90 3,54	90 3,54	100 3,94	120 4,72	140 5,51	140 5,51	200 7,87
Pf	(mm/in)	8,5 0,33	10 0,39	14 0,55	18 0,71	24 0,94	31 1,22	36,5 1,44	48 1,89
Wt.	(kg/lb)	2,7 5,9	2,7 5,9	3,1 6,8	4,7 10,3	6,9 15,2	9,5 20,9	12,6 27,7	25,0 55,0

CHECK VALVES - 800 - Welded cover - Sw/Npt/Bw

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

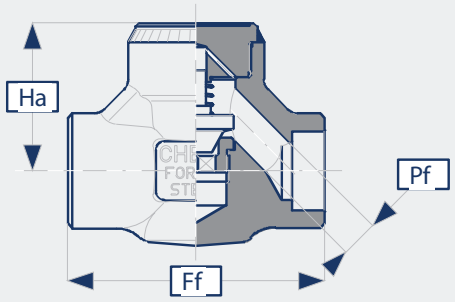
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
not applicable

Standards

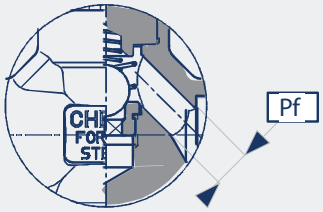
Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

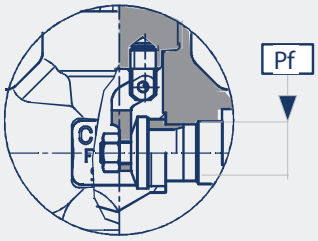
SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B4	Butt weld 40		



Piston (.P4../)



Ball (.B4../)



Swing (.S5../)

REDUCED BORE

			1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)		80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69
Ha	(mm/in)		48 1,89	51 2,01	63 2,48	71 2,80	86 3,39	99 3,90
Pf	(mm/in)		9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 (4) 1,10	32 (5) 1,26
Wt.	(kg/lb)		0,8 1,8	1,1 2,4	2,0 4,4	3,3 7,3	4,9 10,8	7,3 16,1

FULL BORE

		1/4"	3/8"	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"
Ff	(mm/in)	80 3,15	80 3,15	90 3,54	110 4,33	127 5,00	155 6,10	170 6,69	210 8,27
Ha	(mm/in)	48 1,89	48 1,89	51 2,01	63 2,48	71 2,80	86 3,39	99 3,90	121 4,76
Pf	(mm/in)	6,5 0,26	9 0,35	12,5 0,49	17,5 0,69	22,5 0,89	28 (4) 1,10	32 (5) 1,26	38 (6) 1,50
Wt.	(kg/lb)	0,8 1,8	0,8 1,8	1,1 2,4	2,0 4,4	3,3 7,3	4,9 10,8	7,3 16,1	11,9 26,2

CHECK VALVES - 800 - Bolted cover - Sw/Npt/Bw

Ratings (ASTM A105)

800 p.s.i. @ 850°F
1975 p.s.i. @ 100°F

Test pressure (ASTM A105)

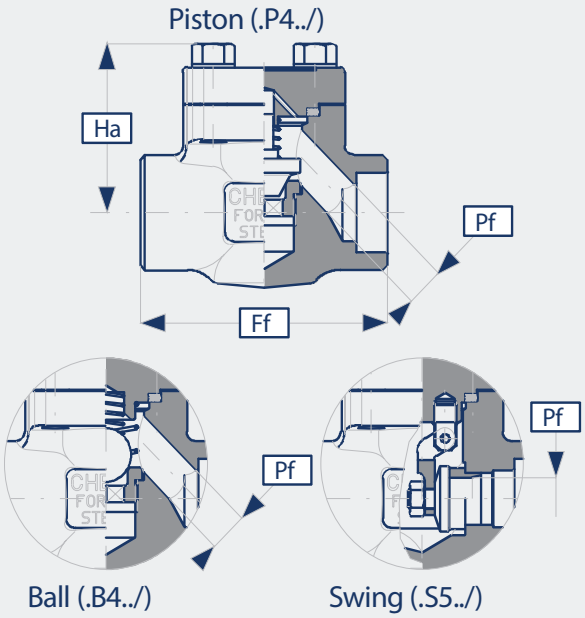
Hydraulic: *(minimum)*
Body - 3000 p.s.i.
Seat - 2175 p.s.i.
Air under water:
not applicable

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B4	Butt weld 40		



REDUCED BORE												
			1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff (mm/in)			80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69
Ha (mm/in)			50	1,97	56	2,20	74	2,91	79	3,11	100	3,94	109	4,29
Pf [7] (mm/in)			9	0,35	12,5	0,49	17,5	0,69	22,5	0,89	28 [4]	1,10	32 [5]	1,26
Wt. (kg/lb)			1,1	2,4	1,8	4,0	2,6	5,7	3,6	7,9	5,5	12,1	8,4	18,5

FULL BORE																
	1/4"		3/8"		1/2"		3/4"		1"		1.1/4"		1.1/2"		2"	
Ff (mm/in)	80	3,15	80	3,15	90	3,54	110	4,33	127	5,00	155	6,10	170	6,69	210	8,27
Ha (mm/in)	50	1,97	50	1,97	56	2,20	74	2,91	79	3,11	100	3,94	109	4,29	135	5,31
Pf [7] (mm/in)	6,5	0,26	9	0,35	12,5	0,49	17,5	0,69	22,5	0,89	28 [4]	1,10	32 [5]	1,26	38 [6]	1,50
Wt. (kg/lb)	1,1	2,4	1,1	2,4	1,8	4,0	2,6	5,7	3,6	7,9	5,5	12,1	8,4	18,5	11,8	26,0

CHECK VALVES - 300 - Bolted cover - Flanged Rf/Rj

Ratings (ASTM A105)

300 p.s.i. @ 850°F
740 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 1125 p.s.i.
Seat - 825 p.s.i.
Air under water:
not applicable

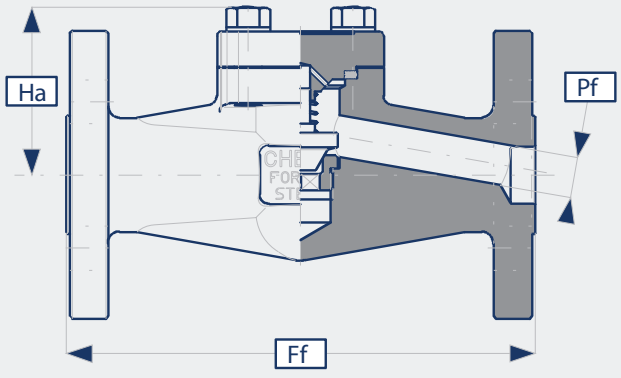
Standards

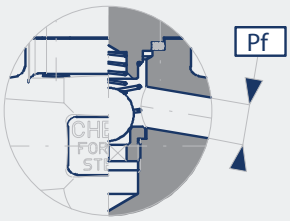
Construction	BS 5352
Flanged	ASME B16.5, ASME B16.10
Test	BS 6755 (Pt.1)

Connections (xx)

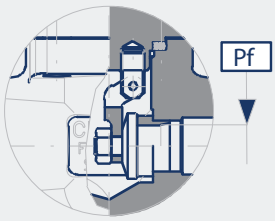
RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		

Piston (.P4../30)





Ball (.B4../30)



Swing (.S5../30)

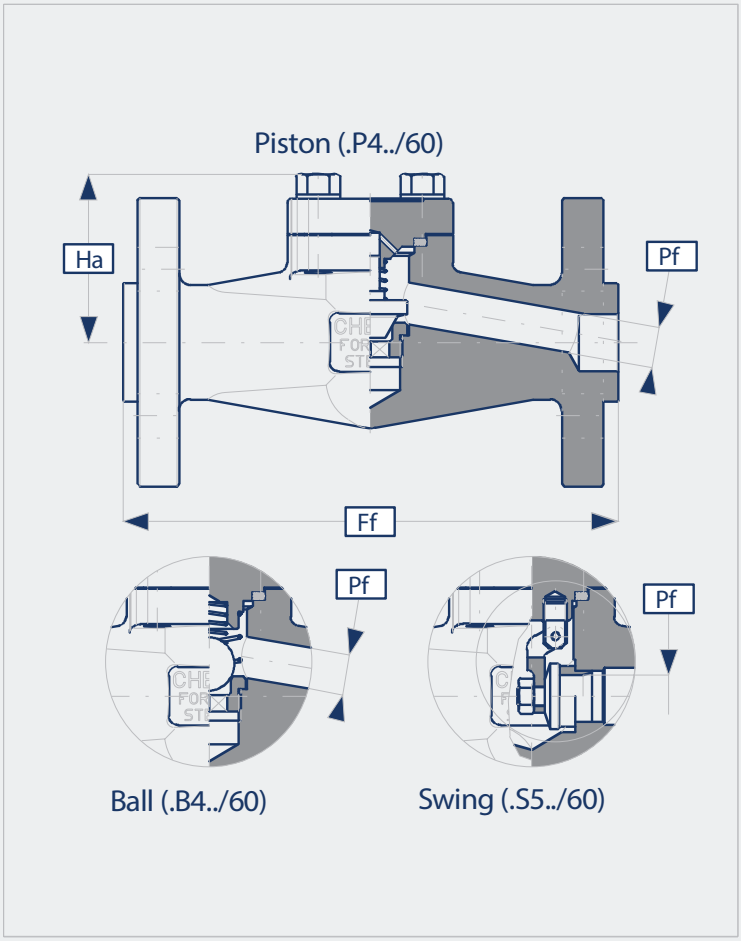
REDUCED BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	152,4 6,00	177,8 7,00	203,2 [6] 8,00	228,6 [6] 9,00	266,7 10,50
Ha (mm/in)	50 1,97	56 2,20	74 2,91	100 3,94	109 4,29
Pf [7] (mm/in)	9 0,35	12,5 0,49	17,5 0,69	28 [4] 1,10	32 [5] 1,26
Wt. (kg/lb)	2,5 5,5	4,2 9,2	5,7 12,5	11,2 24,6	14,4 31,7

FULL BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	152,4 6,00	177,8 7,00	203,2 [6] 8,00	228,6 [6] 9,00	266,7 10,50
Ha (mm/in)	50 1,97	56 2,20	92 3,62	110 4,33	140 5,51
Pf [7] (mm/in)	12,5 0,49	17,5 0,69	22,5 0,89	35 1,38	45 1,77
Wt. (kg/lb)	2,5 5,5	4,2 9,2	5,7 12,5	11,2 24,6	14,4 31,7

CHECK VALVES - 600 - Bolted cover - Flanged Rf/Rj



Ratings (ASTM A105)

600 p.s.i. @ 850°F
1480 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 2225 p.s.i.
Seat - 1650 p.s.i.
Air under water:
not applicable

Standards

Construction	BS 5352
Flanged	ASME B16.5, ASME B16.10
Test	BS 6755 (Pt.1)

Connections (xx)

RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		

REDUCED BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	165,1 6,50	190,5 7,50	215,9 8,50	241,3 9,50	292,1 11,50
Ha (mm/in)	50 1,97	56 2,20	74 2,91	100 3,94	109 4,29
Pf [6] (mm/in)	9 0,35	12,5 0,49	17,5 0,69	28 [4] 1,10	32 [5] 1,26
Wt. (kg /lb)	3,1 6,8	5 11,0	7,3 16,1	12 26,4	16,6 36,5

FULL BORE

	1/2"	3/4"	1"	1.1/2"	2"
Ff (mm/in)	165,1 6,50	190,5 7,50	215,9 8,50	241,3 9,50	292,1 11,50
Ha (mm/in)	50 1,97	56 2,20	92 3,62	110 4,33	140 5,51
Pf [6] (mm/in)	12,5 0,49	17,5 0,69	22,5 0,89	35 1,38	45 1,77
Wt. (kg /lb)	3,1 6,8	5 11,0	7,3 16,1	12 26,4	16,6 36,5

CHECK VALVES - 1500 - Welded cover - Sw/Npt/Bw

Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

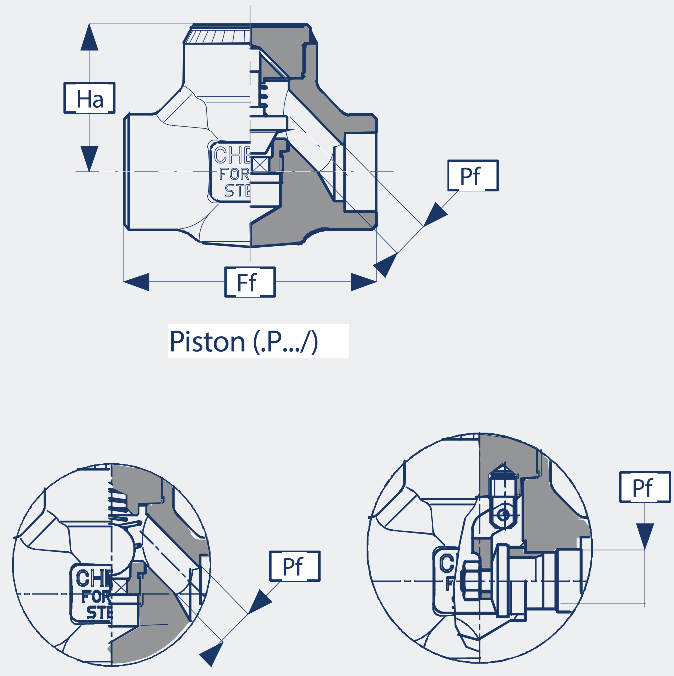
Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
not applicable

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

SW	Socket weld
TH	Threaded NPT
TS	Sw/NPT
SE	Sw (in)/NPT
SU	Sw (out)/NPT
B6	Butt weld 160
B8	Butt weld 80



Piston (.P.../)

Ball (.B.../)

Swing (.S.../)

STANDARD BORE								
			1/2"	3/4"	1"		1.1/2"	2"
Ff (mm/in)			90 3,54	110 4,33	127 5,00		170 6,69	210 8,26
Ha (mm/in)			51 2,01	57 2,24	62 2,44		90 3,54	117 4,61
Pf (mm/in)			11 0,43	14,5 0,57	19 0,75		31 1,22	37,5 1,48
Wt. (kg/lb)			1,4 3,1	2,4 5,3	3,8 8,4		8,0 17,6	14,5 31,9

CHECK VALVES - 1500 - Bolted cover - Sw/Npt/Bw

Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

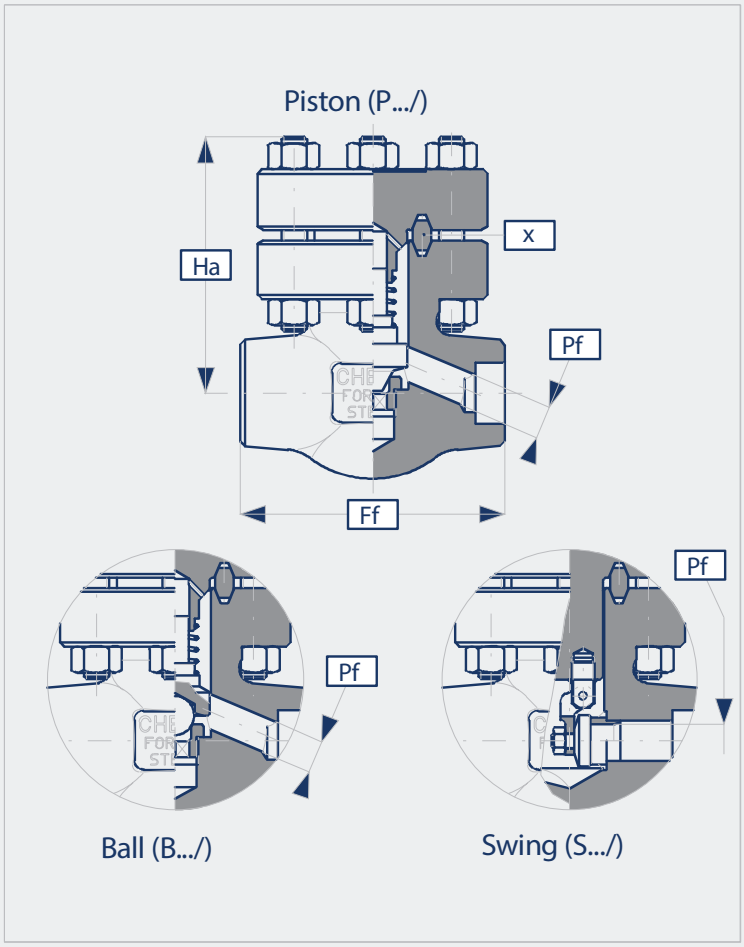
Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
not applicable

Standards

Construction	BS 5352
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	BS 6755 (Pt.1)

Connections (xx)

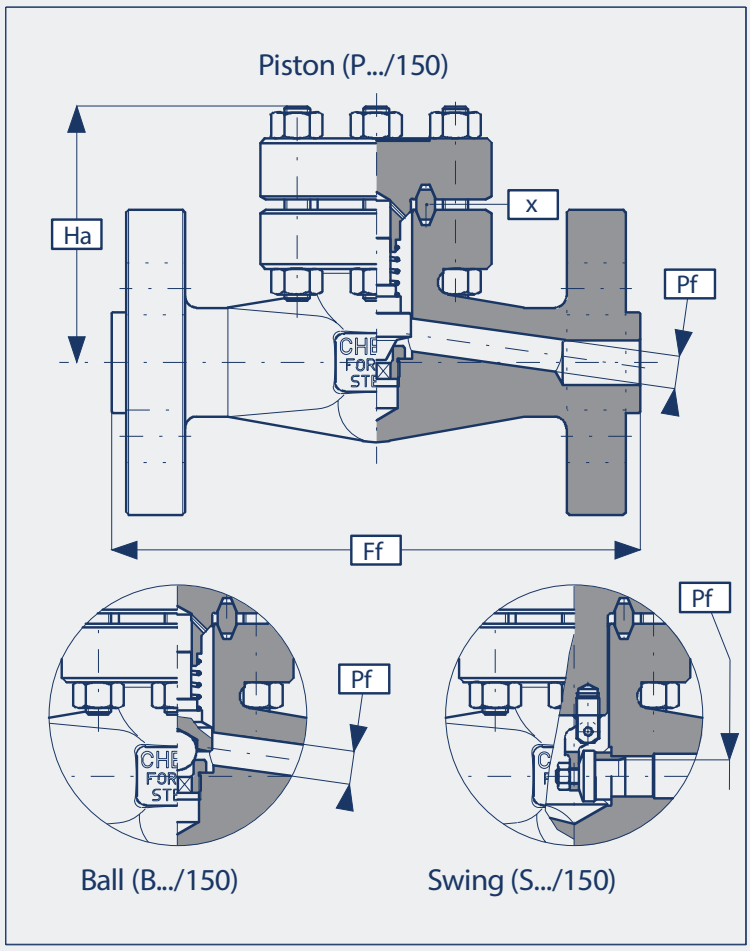
SW	Socket weld	B8	Butt weld 80
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		



X) Gasket=Spiral wound. RJ gasket available on request.

STANDARD BORE																
			1/2"		3/4"		1"				1.1/2"		2"	
Ff (mm/in)			110	4,33	115	4,53	130	5,12			210	8,27	240	9,45
Ha (mm/in)			93	3,66	109	4,29	122	4,80			158	6,22	171	6,73
Pf [4] (mm/in)			11	0,43	14,5	0,57	19	0,75			31	1,22	37,5	1,48
Wt. (kg/lb)			3,8	8,4	5,9	13,0	6,8	15,0			18,8	41,4	23,7	52,1

CHECK VALVES - 1500 - Bolted cover - Flanged Rf/Rj



Ratings (ASTM A105)

1500 p.s.i. @ 850°F
3705 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 5575 p.s.i.
Seat - 4100 p.s.i.
Air under water:
not applicable

Standards

Construction	BS 5352
Flanged	ASME B16.5, ASME B16.10
Test	BS 6755 (Pt.1)

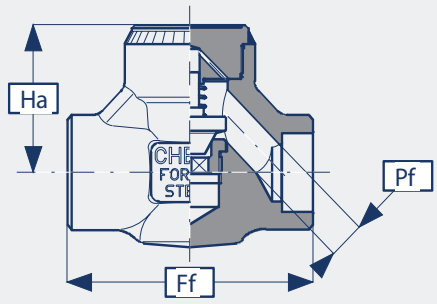
Connections (xx)

RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		

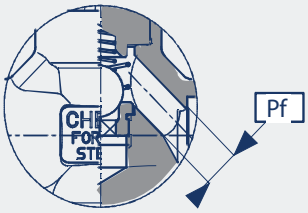
X)Gasket=Spiral wound. RJ gasket available on request.

	STANDARD BORE													
			1/2"		3/4"		1"			1.1/2"		2"		
Ff (mm/in)			215,9	8,50	228,6	9,00	254,0	10,00		304,8	12,00	368,3	14,50	
Ha (mm/in)			93	3,66	109	4,29	122	4,80		158	6,22	171	6,73	
Pf [4] (mm/in)			11	0,43	14,5	0,57	19	0,75		31	1,22	37,5	1,48	
Wt. (kg/lb)			7,5	16,5	10,9	24,0	14,4	31,7		30,3	67,0	44,0	96,8	

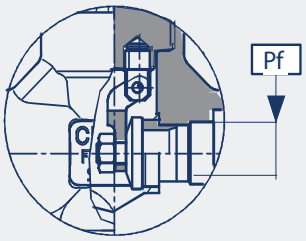
CHECK VALVES - 2500 - Welded cover - Sw/Npt/Bw



Piston (.P.../)



Ball (.B.../)



Swing (.S.../)

Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
not applicable

Standards

Construction	*founded on* ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-ASME B16.34

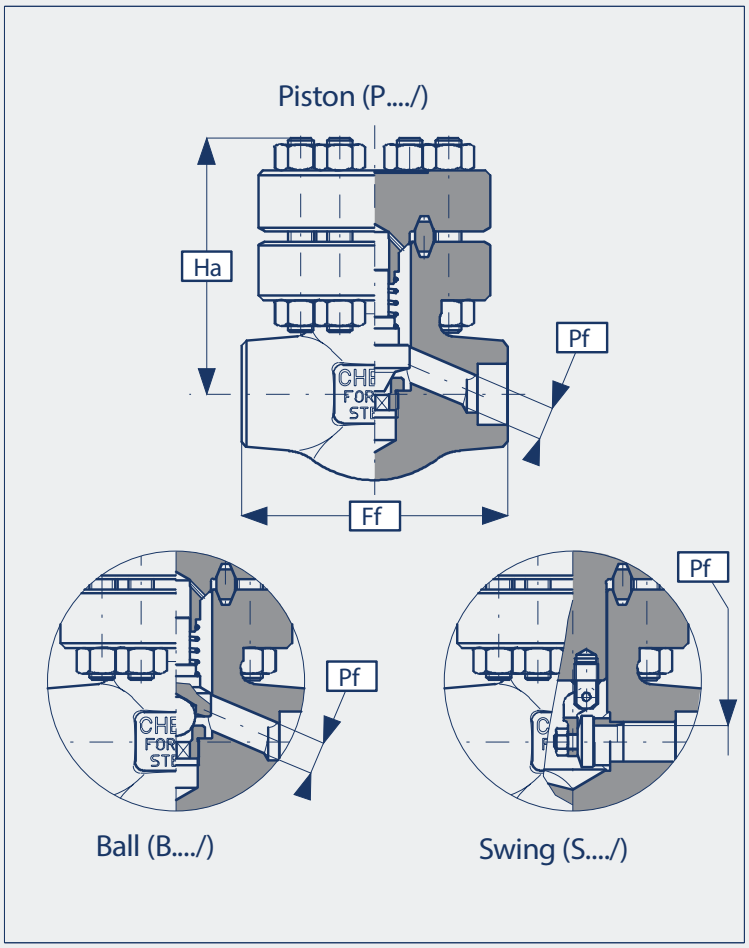
Connections (xx)

SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		

STANDARD BORE

			1/2"		3/4"		1"			1.1/2"		2"	
Ff (mm/in)			110	4,33	127	5,00	155	6,10		210	8,27	240	9,45
Ha (mm/in)			60	2,36	71	2,80	85	3,35		120	4,72	130	5,12
Pf (mm/in)			10	0,39	13	0,51	18	0,71		25	0,98	34	1,33
Wt. (kg/lb)			2,0	4,4	3,2	7,0	4,8	10,6		9,6	21,1	16	35,2

CHECK VALVES - 2500 - Bolted cover - Sw/Npt/Bw



Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
not applicable

Standards

Construction	*founded on* ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-ASME B16.34

Connections (xx)

SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		

STANDARD BORE																
			1/2"		3/4"		1"				1.1/2"		2"	
Ff (mm/in)			110	4,33	115	4,53	130	5,12			210	8,27	240	9,45
Ha (mm/in)			93	3,66	109	4,29	122	4,80			158	6,22	171	6,73
Pf [4] (mm/in)			10	0,39	13	0,51	18	0,71			25	0,98	34	1,33
Wt. (kg /lb)			4,0	8,8	6,2	13,6	7,2	15,8			19,4	42,7	24,5	53,9

CHECK VALVES - 2500 - Bolted cover - Flanged Rf/Rj

Ratings (ASTM A105)

2500 p.s.i. @ 850°F
6170 p.s.i. @ 100°F

Test pressure (ASTM A105)

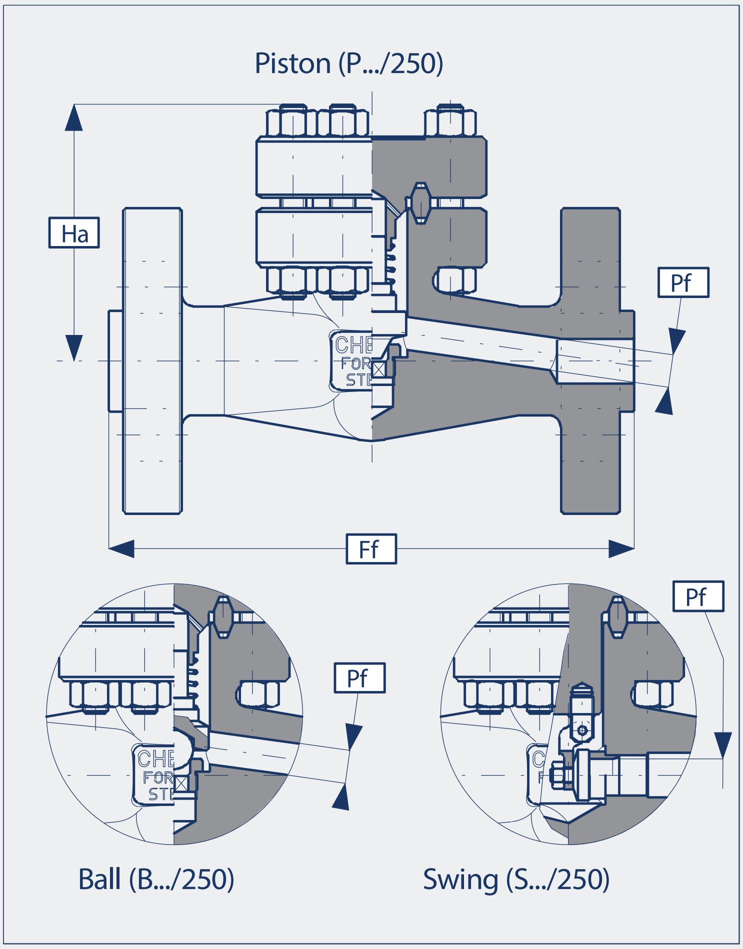
Hydraulic: *(minimum)*
Body - 9275 p.s.i.
Seat - 6800 p.s.i.
Air under water:
not applicable

Standards

Construction	*founded on* ASME B16.34
Flanged	ASME B16.5, ASME B16.10
Test	API 598-ASME B16.34

Connections (xx)

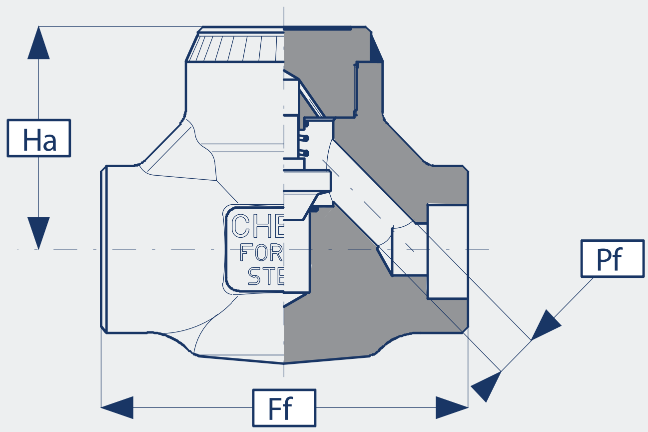
RF	Raised face (std.)	LF	Large female
RJ	Ring joint	LG	Large groove
SF	Small female	LM	Large male
SG	Small groove	LT	Large tongue
SM	Small male		
ST	Small tongue		



STANDARD BORE

			1/2"	3/4"	1"		1.1/2"	2"
Ff (mm/in)			263,5 10,37	273,0 10,75	308,0 12,13		384,2 15,13	450,8 17,75
Ha (mm/in)			93 3,66	109 4,29	122 4,80		158 6,22	171 6,73
Pf (4) (mm/in)			10 0,39	13 0,51	18 0,71		25 0,98	34 1,33
Wt. (kg/lb)			8,5 18,7	12,5 27,5	19,2 42,2		40,8 89,8	59,0 129,8

CHECK VALVES - 4500 - Welded cover - Sw/Npt/Bw



Ratings (ASTM A105)

4010 p.s.i. @ 850°F
11110 p.s.i. @ 100°F

Test pressure (ASTM A105)

Hydraulic: *(minimum)*
Body - 16650 p.s.i.
Seat - 12210 p.s.i.
Air under water:
not applicable

Standards

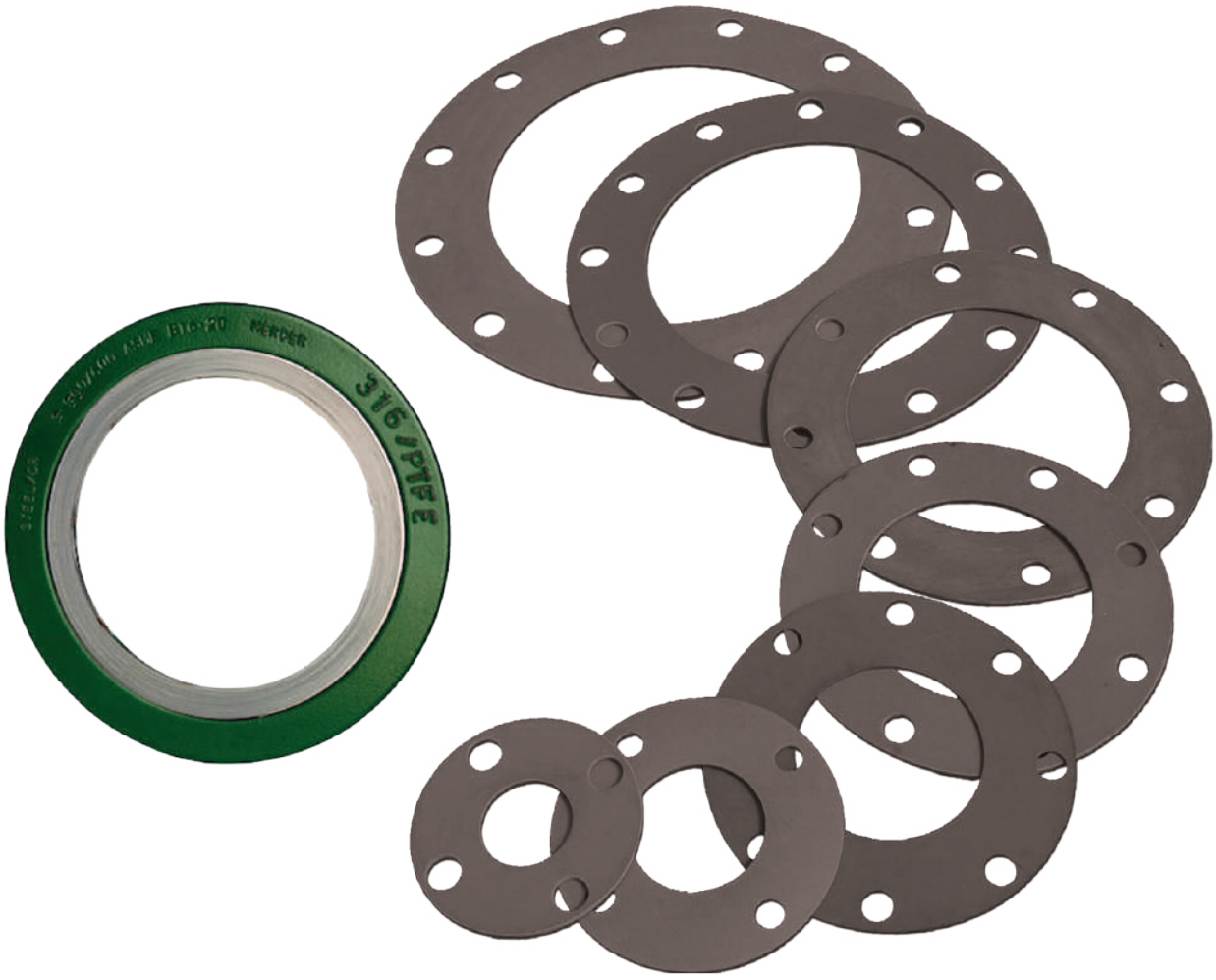
Construction	ASME B16.34
Socket weld	ASME B16.11
Threaded	ASME B1.20.1
Butt weld	ASME B16.25
Test	API 598-ASME B16.34

Connections (xx)

SW	Socket weld	BX	Butt weld XXS
TH	Threaded NPT		
TS	Sw/NPT		
SE	Sw (in)/NPT		
SU	Sw (out)/NPT		
B6	Butt weld 160		

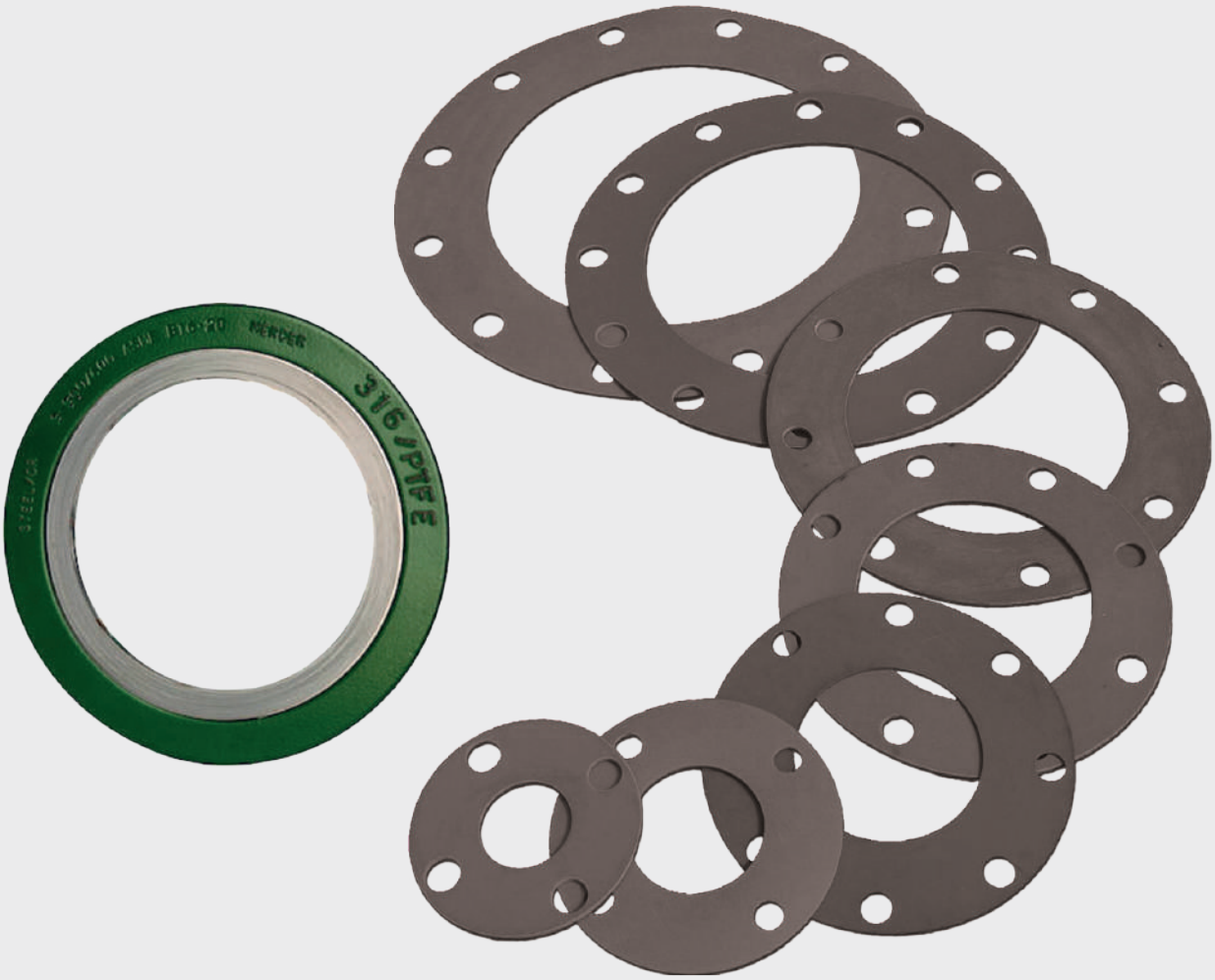
STANDARD BORE								
			1/2"	3/4"	1"		1.1/2"	2"
Ff (mm/in)			127 5,00	155 6,10	170 6,69		240 9,45	240 9,45
Ha (mm/in)			75 2,95	90 3,54	125 4,92		145 5,71	140 5,51
Pf (mm/in)			7 0,28	11 0,43	15 0,59		25 0,98	30 1,33
Wt. (kg/lb)			3,2 7,0	4,8 10,6	8 17,6		16 35,2	26 57,2

MidTech
Engineering Solutions



SPIRAL WOUND GASKETS

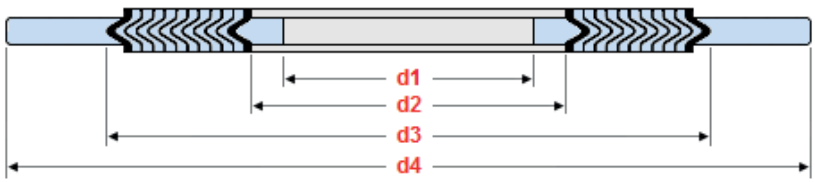
MidTech
Engineering Solutions



SPIRAL WOUND
GASKETS

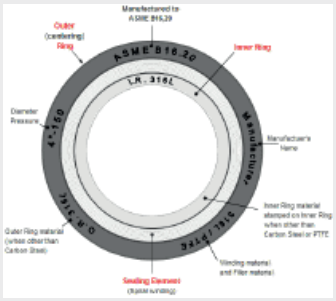
Dimensions of Spiral Wound Gaskets ASME B16.20

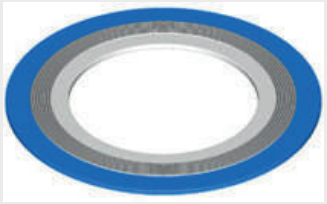
used with Raised Face flanges ASME B16.5



Pressure Class 150 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	47.8
3/4	20.6	25.4	39.6	57.2
1	26.9	31.8	47.8	66.8
1¼	38.1	47.8	60.5	76.2
1½	44.5	54.1	69.9	85.9
2	55.6	69.9	85.9	104.9
2½	66.5	82.6	98.6	124
3	81	101.6	120.7	136.7
4	106.4	127	149.4	174.8
5	131.8	155.7	177.8	196.9
6	157.2	182.6	209.6	222.3
8	215.9	233.4	263.7	279.4
10	268.2	287.3	317.5	339.9
12	317.5	339.9	374.7	409.7
14	349.3	371.6	406.4	450.9
16	400.1	422.4	463.6	514.4
18	449.3	474.7	527.1	549.4
20	500.1	525.5	577.9	606.6
24	603.3	628.7	685.8	717.6





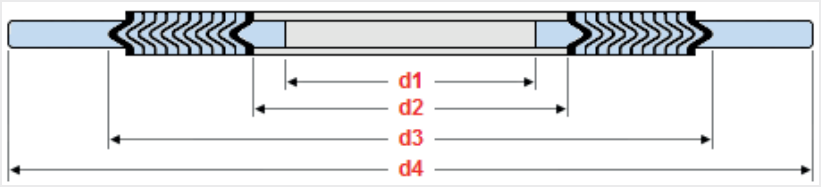
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

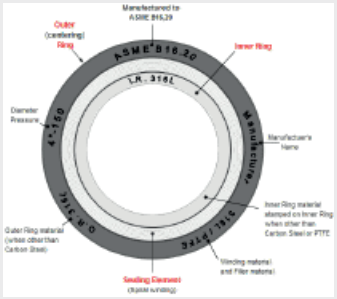
Dimensions of Spiral Wound Gaskets ASME B16.20

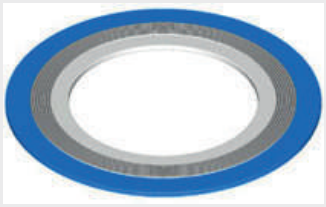
used with Raised Face flanges ASME B16.5



Pressure Class 300 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	54.1
3/4	20.6	25.4	39.6	66.8
1	26.9	31.8	47.8	73.2
1¼	38.1	47.8	60.5	82.6
1½	44.5	54.1	69.9	95.3
2	55.6	69.9	85.9	111.3
2½	66.5	82.6	98.6	130.3
3	81	101.6	120.7	149.4
4	106.4	127	149.4	181.1
5	131.8	155.7	177.8	215.9
6	157.2	182.6	209.6	251
8	215.9	233.4	263.7	308.1
10	268.2	287.3	317.5	362
12	317.5	339.9	374.7	422.4
14	349.3	371.6	406.4	485.9
16	400.1	422.4	463.6	539.8
18	449.3	474.7	527.1	596.9
20	500.1	525.6	577.9	654.1
24	603.3	628.7	685.8	774.7





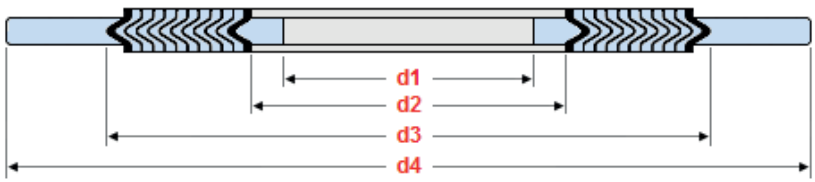
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

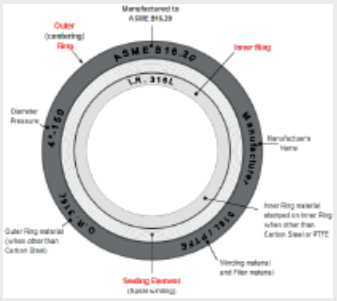
Dimensions of Spiral Wound Gaskets ASME B16.20

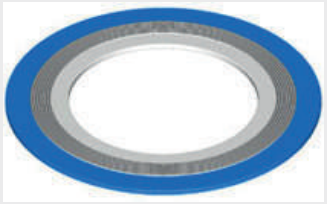
used with Raised Face flanges ASME B16.5



Pressure Class 400 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	54.1
3/4	20.6	25.4	39.6	66.8
1	26.9	31.8	47.8	73.2
1¼	38.1	47.8	60.5	82.6
1½	44.5	54.1	69.9	95.3
2	55.6	69.9	85.9	111.3
2½	66.5	82.6	98.6	130.3
3	81	101.6	120.7	149.4
4	102.6	120.7	149.4	177.8
5	128.3	147.6	177.8	212.9
6	154.9	174.8	209.6	247.7
8	205.7	225.6	263.7	304.8
10	255.3	274.6	317.5	358.9
12	307.3	327.2	374.7	419.1
14	342.9	362	406.4	482.6
16	389.9	412.8	463.6	536.7
18	438.2	469.9	527.1	593.9
20	489	520.7	577.9	647.7
24	590.6	628.7	685.8	768.4





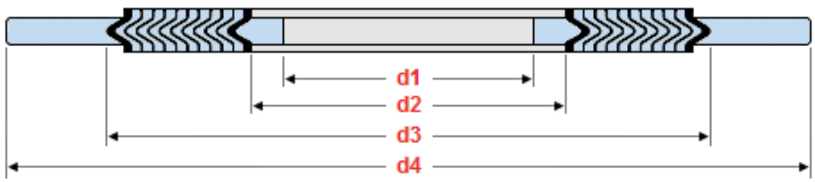
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

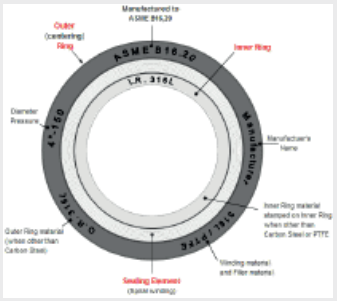
Dimensions of Spiral Wound Gaskets ASME B16.20

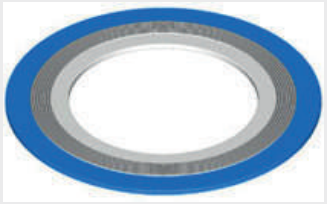
used with Raised Face flanges ASME B16.5



Pressure Class 600 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	54.1
3/4	20.6	25.4	39.6	66.8
1	26.9	31.8	47.8	73.2
1¼	38.1	47.8	60.5	82.6
1½	44.5	54.1	69.9	95.3
2	55.6	69.9	85.9	111.3
2½	66.5	82.6	98.6	130.3
3	78.7	101.6	120.7	149.4
4	102.6	120.7	149.4	193.8
5	128.3	147.6	177.8	241.3
6	154.9	174.8	209.6	266.7
8	205.7	225.6	263.7	320.8
10	255.3	274.6	317.5	400.1
12	307.3	327.2	374.7	457.2
14	342.9	362	406.4	492.3
16	389.9	412.8	463.6	565.2
18	438.2	469.9	527.1	612.9
20	489	520.7	577.9	682.8
24	590.6	628.7	685.8	790.7





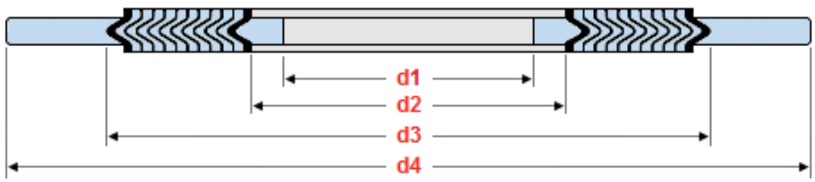
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

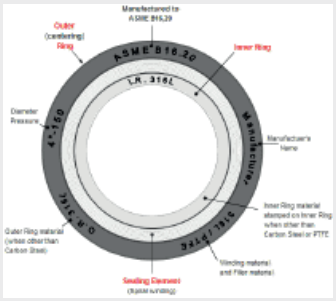
Dimensions of Spiral Wound Gaskets ASME B16.20

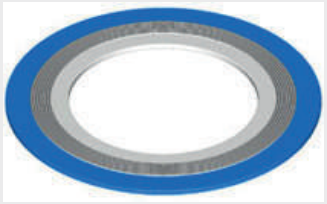
used with Raised Face flanges ASME B16.5



Pressure Class 900 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	63.5
3/4	20.6	25.4	39.6	69.9
1	26.9	31.8	47.8	79.5
1¼	33.3	39.6	60.5	88.9
1½	41.4	47.8	69.9	98.6
2	52.3	58.7	85.9	143
2½	63.5	69.9	98.6	165.1
3	78.7	95.3	120.7	168.4
4	102.6	120.7	149.4	206.5
5	128.3	147.6	177.8	247.7
6	154.9	174.8	209.6	289.1
8	196.9	222.3	257.3	358.9
10	246.1	276.4	311.2	435.1
12	292.1	323.9	368.3	498.6
14	320.8	355.6	400.1	520.7
16	374.7	412.8	457.2	574.8
18	425.5	463.6	520.7	638.3
20	482.6	520.7	571.5	698.5
24	590.6	628.7	679.5	838.2





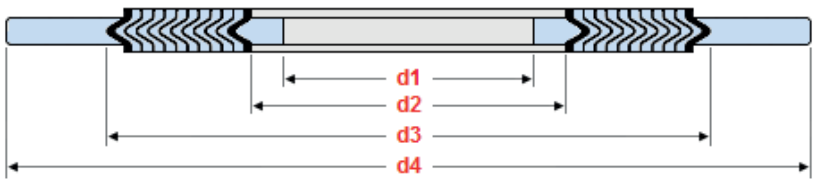
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

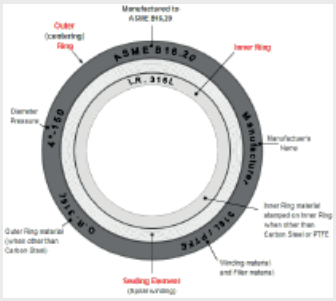
Dimensions of Spiral Wound Gaskets ASME B16.20

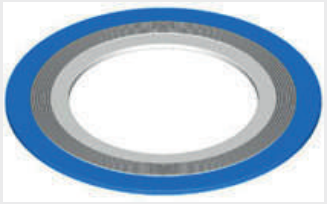
used with Raised Face flanges ASME B16.5



Pressure Class 1500 - NPS 1/2 - NPS 24

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	63.5
3/4	20.6	25.4	39.6	69.9
1	26.9	31.8	47.8	79.5
1¼	33.3	39.6	60.5	88.9
1½	41.4	47.8	69.9	98.6
2	52.3	58.7	85.9	143
2½	63.5	69.9	98.6	165.1
3	78.7	92.2	120.7	174.8
4	97.8	117.6	149.4	209.6
5	124.5	143	177.8	254
6	147.3	171.5	209.6	282.7
8	196.9	215.9	257.3	352.6
10	246.1	266.7	311.2	435.1
12	292.1	323.9	368.3	520.7
14	320.8	362	400.1	577.9
16	374.7	406.4	457.2	641.4
18	425.5	463.6	520.7	704.9
20	476.3	514.4	571.5	755.7
24	577.9	616	679.5	901.7





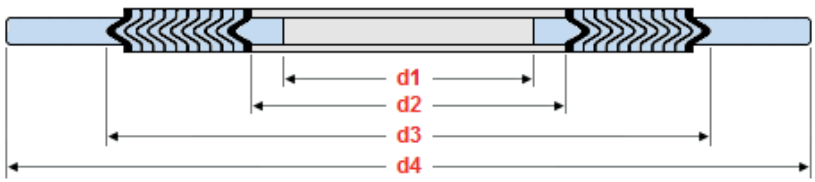
Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

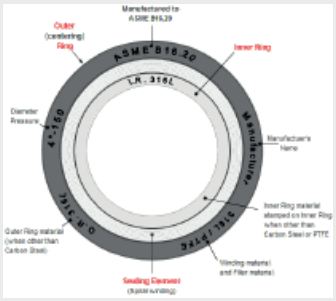
Dimensions of Spiral Wound Gaskets ASME B16.20

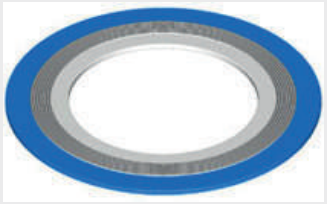
used with Raised Face flanges ASME B16.5



Pressure Class 2500 - NPS 1/2 - NPS 12

NPS	Inner Ring	Sealing Element		Outer Ring
	Inside (d1) Diameter	Inside (d2) Diameter	Outside (d3) Diameter	Outside (d4) Diameter
1/2	14.2	19.1	31.8	69.9
3/4	20.6	25.4	39.6	76.2
1	26.9	31.8	47.8	85.9
1¼	33.3	39.6	60.5	104.9
1½	41.4	47.8	69.9	117.6
2	52.3	58.7	85.9	146
2½	63.5	69.9	98.6	168.4
3	78.7	92.2	120.7	196.9
4	97.8	117.6	149.4	235
5	124.5	143	177.8	279.4
6	147.3	171.5	209.6	317.5
8	196.9	215.9	257.3	387.4
10	246.1	270	311.2	476.3
12	292.1	317.5	368.3	549.4





Typical Spiral Wound Gasket

General notes:

Dimensions are in millimeters unless otherwise indicated.
Image shows a Spiral Wound gasket with Inner - and Outer ring.
d1 = Inside diameter when Inner ring is used.
d2 = Inside diameter sealing element when no Inner ring is used.
d3 = Outside diameter of sealing element.
d4 = Outside diameter of Outer ring.
Thickness of inner and outer ring: 2.97 mm - 3.33 mm.
Thickness sealing element: 4.45 mm.
Tolerance Outside diameter for NPS ½ through NPS 8 is ± 0.8 mm; for NPS 10 trough NPS 24 tolerance is + 1.5 mm - 0.8 mm.
ASME B16.20 does not covers class 400 flanges up to NPS 3 and class 900 flanges up to NPS 2½.
There are no class 400 flanges NPS 2/1 thru NPS 3 (use Class 600), class 900 flanges NPS 2/1 thru NPS 2½ (use Class 1500), or class 2500 flanges NPS 14 or larger.
The inner ring inside diameters shown for NPS 1¼ thru 2½ in class 1500 and 2500 will produce inner ring widths of 0.12 inches, a practical minimum for production purposes.
ASME B16.20 which covers spiral wound gaskets requires the use of solid metal inner rings in: Pressure Class 900, nominal pipe sizes 24 and larger, Pressure Class 1500 from nominal pipe sizes 12 and larger, Pressure Class 2500 from nominal pipe sizes 4 and larger and all PTFE filled gaskets.

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CARBON STEEL
STAINLESS STEEL
ALLOY STEEL

STUD BOLTS

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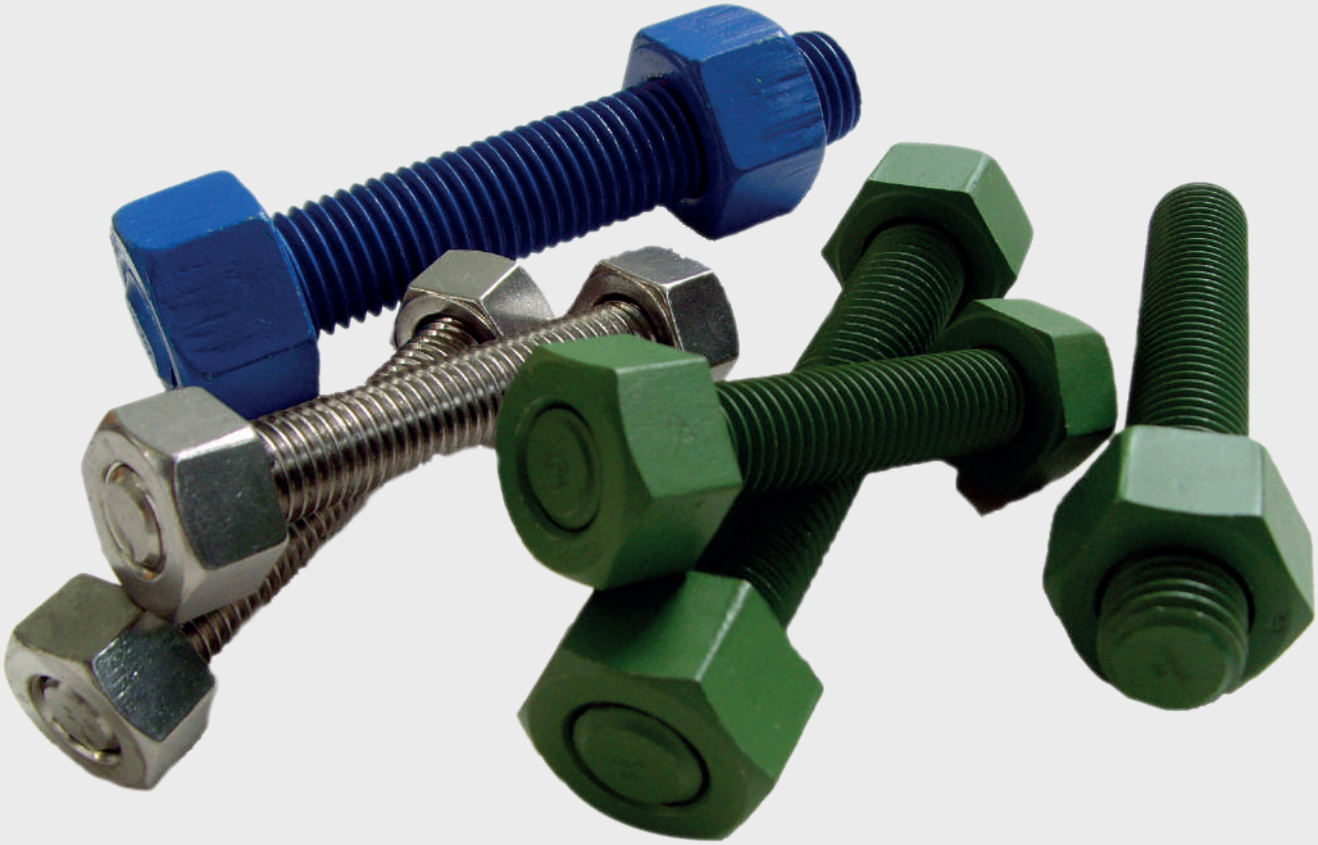

CARBON STEEL
STAINLESS STEEL
ALLOY STEEL

STUD BOLTS

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MATERIALS FOR STUDBOLTS - BOLTS - SPECIAL PIECES

MATERIALS SPECIFICATIONS				CHARACTERISTICS		
NAME	NR	GRADE	SERVICE	SIZE STANDARD LIMITS	HB (INDICATIVE)	REMARKS
ASTM	A 182	F51	S	ALL	≥ 180	
		F44	S	ALL	≥ 200	
		F53	S	ALL	≥ 240	
ASTM	A 193	B5	H	≤ 4"	–	
		B6	H	≤ 4"	–	
		B7	H	≤ 7"	≤ 321	
		B7M	S	≤ 7"	≤ 235	SOUR SERVICE
		B16	H	≤ 8"	≤ 321	
		B8 CL 1	H	ALL	≤ 223	
		B8 CL 2	H	≤ 1.1/2"	≤ 321	STRAIN HARDENED
		B8M CL 1	H	ALL	≤ 223	
		B8M CL 2	H	≤ 1.1/2"	≤ 321	STRAIN HARDENED
		B8T CL 1	H	ALL	≤ 223	
		B8C CL 1	H	ALL	≤ 223	
ASTM	A 320	L7	L	≤ 21/2"	–	
		L7M	S	≤ 21/2"	≤ 235	SOUR SERVICE
		L43	L	≤ 4"	–	
		B8 CL 1	L	ALL	≤ 223	
		B8 CL 2	L	≤ 1.1/2"	≤ 321	STRAIN HARDENED
		B8M CL 1	L	ALL	≤ 223	
		B8M CL 2	L	≤ 1.1/2"	≤ 321	STRAIN HARDENED
		B8T CL 1	L	ALL	≤ 223	
		B8C CL 1	L	ALL	≤ 223	
	A 453	651 A	S	ALL	217/277	
		651 B	S	ALL	212/269	
		660 A	S	ALL	248/341	
		660 B	S	ALL	248/341	
	A 540	B23	S	≤ 6"	248/429	ALL CLASSES
		B24	S	≤ 6"	248/415	ALL CLASSES
	A 564	630	S	≤ 8"	≥ 302	SOLUTION THREATED 1100°F
DIN	17240	C35	H	≤ 100 mm	≥ 150	
		CK35	H	≤ 100 mm	≥ 150	
		24CrMo5	H	≤ 100 mm	≥ 180	
		21CrMoV5 7	H	≤ 250 mm	≥ 210	
		40CrMoV4 7	H	≤ 100 mm	≥ 270	
		X22CrMoV12 1	H - S	≤ 250 mm	≥ 240	
		X19CrMoVNbN11 1	H - S	≤ 250 mm	≥ 270	
		X8CrNiMoBNb1616	H - S	≤ 100 mm	≥ 200	
		NiCr20TiAl	H - S	≤ 160 mm	≥ 300	
DIN	17440	X5CrNi18 10	S	≤ 160 mm	≥ 150	
REGISTERED TRADE MARKS	–	MONEL	S	ALL	–	ALL IDENTIFICATION NUMBERS
	–	INCONEL	S	ALL	–	
	–	HASTELLOY	S	ALL	–	
	–	NIMONIC	S	ALL	–	

H = High temperature service L = Low temperature service S = Special service

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MATERIALS FOR NUTS

MATERIALS SPECIFICATIONS				CHARACTERISTICS		
NAME	NR	GRADE	SERVICE	SIZE STANDARD LIMITS	HB (INDICATIVE)	REMARKS
ASTM	A 182	F51	S	ALL	≥ 180	
		F44	S	ALL	≥ 200	
		F53	S	ALL	≥ 240	
ASTM	A 194	2H	H	ALL	212/352	
		2HM	S	ALL	159/237	SOUR SERVICE
		3	H	ALL	248/352	
		4	H - L	ALL	248/352	
		6	H	ALL	228/271	
		6F	H	ALL	228/271	
		7	H - L	ALL	248/352	
		7M	S	ALL	159/237	SOUR SERVICE
		8	H	ALL	126/300	
		8T	H	ALL	126/300	
		8M	H	ALL	126/300	
		8F	H	ALL	126/300	
		8C	H	ALL	126/300	
ASTM	A 453	651 A - B	S	ALL	212/277	
		660A	S	ALL	248/341	
		660B	S	ALL	248/341	
	A 540	B23	S	≤ 6"	248/429	ALL CLASSES
		B24	S	≤ 6"	248/418	ALL CLASSES
	A 564	630	S	≤ 8"	≥ 302	SOLUTION THREATED 1100°F
DIN	17240	C35	H	≤ 100 mm	≥ 150	
		CK35	H	≤ 100 mm	≥ 180	
		24CrMo5	H	≤ 100 mm	≥ 180	
		21CrMoV5 7	H	≤ 250 mm	≥ 210	
		40CrMoV4 7	H	≤ 100 mm	≥ 270	
		X22CrMoV12 1	H - S	≤ 250 mm	≥ 240	
		X19CrMoVNbN11 1	H - S	≤ 250 mm	≥ 270	
		X8CrNiMoBNb16 16	H - S	≤ 100 mm	≥ 200	
		NiCr20TiA1	H - S	≤ 160 mm	≥ 300	
DIN	17440	X5CrNi18 10	S	≤ 160 mm	≥ 150	
REGISTERED TRADE MARKS		MONEL	S	ALL	–	ALL IDENTIFICATION NUMBERS
		INCONEL	S	ALL	–	
		HASTELLOY	S	ALL	–	
		NIMONIC	S	ALL	–	

H = High temperature service L = Low temperature service S = Special service

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FULLY THREADED STUDBOLTS

ANSI B16.5

l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)												
	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"	1.3/8"	1.1/2"	1.5/8"	1.3/4"
50 2"	0.024	0.032	0.044	0.055	0.070	0.103	0.141	0.185	0.238	0.299	0.366	0.441	0.521	0.611
55 2.1/4"	0.026	0.035	0.048	0.060	0.076	0.112	0.154	0.202	0.260	0.326	0.399	0.481	0.569	0.666
60 2.3/8"	0.028	0.038	0.052	0.065	0.083	0.122	0.166	0.218	0.281	0.353	0.432	0.521	0.616	0.722
65 2.1/2"	0.030	0.041	0.056	0.070	0.089	0.131	0.179	0.235	0.303	0.380	0.466	0.561	0.664	0.777
70 2.3/4"	0.032	0.044	0.060	0.075	0.095	0.140	0.192	0.252	0.325	0.407	0.499	0.601	0.711	0.833
75 3"	0.034	0.047	0.064	0.080	0.102	0.150	0.205	0.269	0.346	0.434	0.532	0.641	0.758	0.888
80 3.1/8"	0.037	0.050	0.068	0.085	0.108	0.159	0.218	0.286	0.368	0.462	0.565	0.681	0.806	0.944
85 3.1/4"	0.039	0.053	0.072	0.090	0.114	0.168	0.230	0.302	0.390	0.489	0.599	0.721	0.853	0.999
90 3.1/2"	0.041	0.056	0.076	0.095	0.121	0.178	0.243	0.319	0.411	0.516	0.632	0.761	0.901	1.055
95 3.3/4"	0.043	0.059	0.081	0.100	0.127	0.187	0.256	0.336	0.433	0.543	0.665	0.801	0.948	1.110
100 4"	0.045	0.061	0.085	0.105	0.133	0.196	0.269	0.353	0.455	0.570	0.698	0.841	0.995	1.166
105 4.1/8"	0.047	0.064	0.089	0.110	0.140	0.206	0.282	0.370	0.476	0.597	0.732	0.881	1.043	1.221
110 4.1/4"	0.050	0.067	0.093	0.115	0.146	0.215	0.294	0.386	0.498	0.624	0.765	0.921	1.090	1.277
115 4.1/2"	0.052	0.070	0.097	0.120	0.152	0.224	0.307	0.403	0.520	0.652	0.798	0.961	1.138	1.332
120 4.3/4"	0.054	0.073	0.101	0.125	0.159	0.234	0.320	0.420	0.541	0.679	0.831	1.001	1.185	1.388
125 5"	0.056	0.076	0.105	0.130	0.165	0.243	0.333	0.437	0.563	0.706	0.865	1.041	1.232	1.443
130 5.1/8"	0.058	0.079	0.109	0.135	0.171	0.252	0.346	0.454	0.585	0.733	0.898	1.081	1.280	1.499
135 5.1/4"	0.060	0.082	0.113	0.140	0.178	0.262	0.358	0.470	0.606	0.760	0.931	1.121	1.327	1.554
140 5.1/2"	0.062	0.085	0.117	0.145	0.184	0.271	0.371	0.487	0.628	0.787	0.964	1.161	1.375	1.610
145 5.3/4"	0.065	0.088	0.121	0.150	0.191	0.281	0.384	0.504	0.650	0.815	0.998	1.202	1.422	1.665
150 6"	0.067	0.091	0.125	0.155	0.197	0.290	0.397	0.521	0.671	0.842	1.031	1.242	1.469	1.721
155 6.1/8"	0.069	0.094	0.129	0.159	0.203	0.299	0.410	0.538	0.693	0.869	1.064	1.282	1.517	1.776
160 6.1/4"	0.071	0.097	0.133	0.164	0.210	0.309	0.422	0.554	0.714	0.896	1.097	1.322	1.564	1.832
165 6.1/2"	0.073	0.100	0.137	0.169	0.216	0.318	0.435	0.571	0.736	0.923	1.131	1.362	1.612	1.887
170 6.3/4"	0.075	0.102	0.141	0.174	0.222	0.327	0.448	0.588	0.758	0.950	1.164	1.402	1.659	1.943
175 6.7/8"	0.078	0.105	0.145	0.179	0.229	0.337	0.461	0.605	0.779	0.977	1.197	1.442	1.706	1.998
180 7"	0.080	0.108	0.149	0.184	0.235	0.346	0.474	0.622	0.801	1.005	1.230	1.482	1.754	2.054
185 7.1/4"	0.082	0.111	0.153	0.189	0.241	0.355	0.486	0.638	0.823	1.032	1.264	1.522	1.801	2.109
190 7.1/2"	0.084	0.114	0.157	0.194	0.248	0.365	0.499	0.655	0.844	1.059	1.297	1.562	1.849	2.165
195 7.3/4"	0.086	0.117	0.161	0.199	0.254	0.374	0.512	0.672	0.866	1.086	1.330	1.602	1.896	2.220
200 7.7/8"	0.088	0.120	0.165	0.204	0.260	0.383	0.525	0.689	0.888	1.113	1.363	1.642	1.943	2.276
205 8"	0.091	0.123	0.169	0.209	0.267	0.393	0.538	0.706	0.909	1.140	1.397	1.682	1.991	2.331
210 8.1/4"	0.093	0.126	0.173	0.214	0.273	0.402	0.550	0.722	0.931	1.167	1.430	1.722	2.038	2.387
215 8.1/2"	0.095	0.129	0.177	0.219	0.279	0.411	0.563	0.739	0.953	1.195	1.463	1.762	2.086	2.442
220 8.3/4"	0.097	0.132	0.181	0.224	0.286	0.421	0.576	0.756	0.974	1.222	1.496	1.802	2.133	2.498
225 8.7/8"	0.099	0.135	0.185	0.229	0.292	0.430	0.589	0.773	0.996	1.249	1.530	1.842	2.180	2.553
230 9"	0.101	0.138	0.189	0.234	0.298	0.439	0.602	0.790	1.018	1.276	1.563	1.882	2.228	2.609
235 9.1/4"	0.103	0.141	0.193	0.239	0.305	0.449	0.614	0.806	1.039	1.303	1.596	1.922	2.275	2.664
240 9.1/2"	0.106	0.143	0.197	0.244	0.311	0.458	0.627	0.823	1.061	1.330	1.629	1.962	2.323	2.720
245 9.5/8"	0.108	0.146	0.201	0.249	0.318	0.468	0.640	0.840	1.083	1.358	1.663	2.003	2.370	2.775
250 9.3/4"	0.110	0.149	0.205	0.254	0.324	0.477	0.653	0.857	1.104	1.385	1.696	2.043	2.417	2.831
255 10"	0.112	0.152	0.209	0.259	0.330	0.486	0.666	0.874	1.126	1.412	1.729	2.083	2.465	2.886
260 10.1/4"	0.114	0.155	0.213	0.264	0.337	0.496	0.678	0.890	1.147	1.439	1.762	2.123	2.512	2.942
265 10.1/2"	0.116	0.158	0.217	0.269	0.343	0.505	0.691	0.907	1.169	1.466	1.796	2.163	2.560	2.997
270 10.5/8"	0.119	0.161	0.221	0.274	0.349	0.514	0.704	0.924	1.191	1.493	1.829	2.203	2.607	3.053
275 10.3/4"	0.121	0.164	0.225	0.279	0.356	0.524	0.717	0.941	1.212	1.520	1.862	2.243	2.654	3.108

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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FULLY THREADED STUDBOLTS

ANSI B16.5

l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"	1.3/8"	1.1/2"	1.5/8"	1.3/4"
280 11"	0.123	0.167	0.229	0.284	0.362	0.533	0.730	0.958	1.234	1.548	1.895	2.283	2.702	3.164
285 11.1/4"	0.125	0.170	0.233	0.289	0.368	0.542	0.742	0.974	1.256	1.575	1.929	2.323	2.749	3.219
290 11.1/2"	0.127	0.173	0.237	0.294	0.375	0.552	0.755	0.991	1.277	1.602	1.962	2.363	2.797	3.275
295 11.5/8"	0.129	0.176	0.242	0.299	0.381	0.561	0.768	1.008	1.299	1.629	1.995	2.403	2.844	3.330
300 11.3/4"	0.131	0.179	0.246	0.304	0.387	0.570	0.781	1.025	1.321	1.656	2.028	2.443	2.891	3.386
305 12"	0.134	0.182	0.250	0.309	0.394	0.580	0.794	1.042	1.342	1.683	2.062	2.483	2.939	3.441
310 12.1/4"	0.136	0.184	0.254	0.314	0.400	0.589	0.806	1.058	1.364	1.710	2.095	2.523	2.986	3.497
315 12.1/2"	0.138	0.187	0.258	0.319	0.406	0.598	0.819	1.075	1.386	1.738	2.128	2.563	3.034	3.552
320 12.5/8"	0.140	0.190	0.262	0.324	0.413	0.608	0.832	1.092	1.407	1.765	2.161	2.603	3.081	3.608
325 12.3/4"	0.142	0.193	0.266	0.329	0.419	0.617	0.845	1.109	1.429	1.792	2.195	2.643	3.128	3.663
330 13"	0.144	0.196	0.270	0.334	0.425	0.626	0.858	1.126	1.451	1.819	2.228	2.683	3.176	3.719
335 13.1/4"	0.147	0.199	0.274	0.339	0.432	0.636	0.870	1.142	1.472	1.846	2.261	2.723	3.223	3.774
340 13.3/8"	0.149	0.202	0.278	0.344	0.438	0.645	0.883	1.159	1.494	1.873	2.294	2.763	3.271	3.830
345 13.1/2"	0.151	0.205	0.282	0.349	0.445	0.655	0.896	1.176	1.516	1.901	2.328	2.804	3.318	3.885
350 13.3/4"	0.153	0.208	0.286	0.354	0.451	0.664	0.909	1.193	1.537	1.928	2.361	2.844	3.365	3.941
355 14"	0.155	0.211	0.290	0.359	0.457	0.673	0.922	1.210	1.559	1.955	2.394	2.884	3.413	3.996
360 14.1/4"	0.157	0.214	0.294	0.364	0.464	0.683	0.934	1.226	1.580	1.982	2.427	2.924	3.460	4.052
365 14.3/8"	0.159	0.217	0.298	0.369	0.470	0.692	0.947	1.243	1.602	2.009	2.461	2.964	3.508	4.107
370 14.1/2"	0.162	0.220	0.302	0.374	0.476	0.701	0.960	1.260	1.624	2.036	2.494	3.004	3.555	4.163
375 14.3/4"	0.164	0.223	0.306	0.379	0.483	0.711	0.973	1.277	1.645	2.063	2.527	3.044	3.602	4.218
380 15"	0.166	0.225	0.310	0.384	0.489	0.720	0.986	1.294	1.667	2.091	2.560	3.084	3.650	4.274
385 15.1/4"	0.168	0.228	0.314	0.389	0.495	0.729	0.998	1.310	1.689	2.118	2.594	3.124	3.697	4.329
390 15.3/8"	0.170	0.231	0.318	0.394	0.502	0.739	1.011	1.327	1.710	2.145	2.627	3.164	3.745	4.385
395 15.1/2"	0.172	0.234	0.322	0.399	0.508	0.748	1.024	1.344	1.732	2.172	2.660	3.204	3.792	4.440
400 15.3/4"	0.175	0.237	0.326	0.404	0.514	0.757	1.037	1.361	1.754	2.199	2.693	3.244	3.839	4.496
405 16"	0.177	0.240	0.330	0.409	0.521	0.767	1.050	1.378	1.775	2.226	2.727	3.284	3.887	4.551
410 16.1/4"	0.179	0.243	0.334	0.414	0.527	0.776	1.062	1.394	1.797	2.253	2.760	3.324	3.934	4.607
415 16.3/8"	0.181	0.246	0.338	0.419	0.533	0.785	1.075	1.411	1.819	2.281	2.793	3.364	3.982	4.662
420 16.1/2"	0.183	0.249	0.342	0.424	0.540	0.795	1.088	1.428	1.840	2.308	2.826	3.404	4.029	4.718
425 16.3/4"	0.185	0.252	0.346	0.429	0.546	0.804	1.101	1.445	1.862	2.335	2.860	3.444	4.076	4.773
430 17"	0.187	0.255	0.350	0.434	0.552	0.813	1.114	1.462	1.884	2.362	2.893	3.484	4.124	4.829
435 17.1/8"	0.190	0.258	0.354	0.439	0.559	0.823	1.126	1.478	1.905	2.389	2.926	3.524	4.171	4.884
440 17.1/4"	0.192	0.261	0.358	0.444	0.565	0.832	1.139	1.495	1.927	2.416	2.959	3.564	4.219	4.940
445 17.1/2"	0.194	0.264	0.362	0.449	0.572	0.842	1.152	1.512	1.949	2.444	2.993	3.605	4.266	4.995
450 17.3/4"	0.196	0.266	0.366	0.454	0.578	0.851	1.165	1.529	1.970	2.471	3.026	3.645	4.313	5.051
455 18"	0.198	0.269	0.370	0.459	0.584	0.860	1.178	1.546	1.992	2.498	3.059	3.685	4.361	5.106
460 18.1/8"	0.200	0.272	0.374	0.464	0.591	0.870	1.190	1.562	2.013	2.525	3.092	3.725	4.408	5.162
465 18.1/4"	0.203	0.275	0.378	0.468	0.597	0.879	1.203	1.579	2.035	2.552	3.126	3.765	4.456	5.217
470 18.1/2"	0.205	0.278	0.382	0.473	0.603	0.888	1.216	1.596	2.057	2.579	3.159	3.805	4.503	5.273
475 18.3/4"	0.207	0.281	0.386	0.478	0.610	0.898	1.229	1.613	2.078	2.606	3.192	3.845	4.550	5.328
480 18.7/8"	0.209	0.284	0.390	0.483	0.616	0.907	1.242	1.630	2.100	2.634	3.225	3.885	4.598	5.384
485 19"	0.211	0.287	0.394	0.488	0.622	0.916	1.254	1.646	2.122	2.661	3.259	3.925	4.645	5.439
490 19.1/4"	0.213	0.290	0.398	0.493	0.629	0.926	1.267	1.663	2.143	2.688	3.292	3.965	4.693	5.495
495 19.1/2"	0.216	0.293	0.403	0.498	0.635	0.935	1.280	1.680	2.165	2.715	3.325	4.005	4.740	5.550
500 19.3/4"	0.218	0.296	0.407	0.503	0.641	0.944	1.293	1.697	2.187	2.742	3.358	4.045	4.787	5.606

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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FULLY THREADED STUDBOLTS

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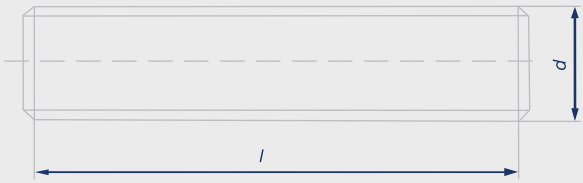

l \ d	1.7/8"	2"	2.1/4"	2.1/2"	2.3/4"	3"	3.1/4"	3.1/2"	3.3/4"	4"				
	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
50 2"	0.704	0.803	1.029	1.282	1.557	1.865	2.228	2.596	2.915	3.348				
55 2.1/4"	0.768	0.876	1.122	1.398	1.698	2.034	2.430	2.832	3.180	3.653				
60 2.3/8"	0.832	0.949	1.216	1.515	1.840	2.204	2.633	3.068	3.445	3.957				
65 2.1/2"	0.896	1.022	1.309	1.631	1.981	2.373	2.835	3.304	3.710	4.262				
70 2.3/4"	0.960	1.095	1.403	1.748	2.123	2.543	3.038	3.540	3.975	4.566				
75 3"	1.024	1.168	1.496	1.864	2.264	2.712	3.240	3.776	4.240	4.870				
80 3.1/8"	1.088	1.241	1.590	1.981	2.406	2.882	3.443	4.012	4.505	5.175				
85 3.1/4"	1.152	1.314	1.683	2.097	2.547	3.051	3.645	4.248	4.770	5.479				
90 3.1/2"	1.216	1.387	1.777	2.214	2.689	3.221	3.848	4.484	5.035	5.784				
95 3.3/4"	1.280	1.460	1.870	2.330	2.830	3.390	4.050	4.720	5.300	6.088				
100 4"	1.344	1.533	1.964	2.447	2.972	3.560	4.253	4.956	5.565	6.392				
105 4.1/8"	1.408	1.606	2.057	2.563	3.113	3.729	4.455	5.192	5.830	6.697				
110 4.1/4"	1.472	1.679	2.151	2.680	3.255	3.899	4.658	5.428	6.095	7.001				
115 4.1/2"	1.536	1.752	2.244	2.796	3.396	4.068	4.860	5.664	6.360	7.306				
120 4.3/4"	1.600	1.825	2.338	2.913	3.538	4.238	5.063	5.900	6.625	7.610				
125 5"	1.664	1.898	2.431	3.029	3.679	4.407	5.265	6.136	6.890	7.914				
130 5.1/8"	1.728	1.971	2.525	3.146	3.821	4.577	5.468	6.372	7.155	8.219				
135 5.1/4"	1.792	2.044	2.618	3.262	3.962	4.746	5.670	6.608	7.420	8.523				
140 5.1/2"	1.856	2.117	2.712	3.379	4.104	4.916	5.873	6.844	7.685	8.828				
145 5.3/4"	1.920	2.190	2.805	3.495	4.245	5.085	6.075	7.080	7.950	9.132				
150 6"	1.984	2.263	2.899	3.612	4.387	5.255	6.278	7.316	8.215	9.436				
155 6.1/8"	2.048	2.336	2.992	3.728	4.528	5.424	6.480	7.552	8.480	9.741				
160 6.1/4"	2.112	2.409	3.086	3.845	4.670	5.594	6.683	7.788	8.745	10.045				
165 6.1/2"	2.176	2.482	3.179	3.961	4.811	5.763	6.885	8.024	9.010	10.350				
170 6.3/4"	2.240	2.555	3.273	4.078	4.953	5.933	7.088	8.260	9.275	10.654				
175 6.7/8"	2.304	2.628	3.366	4.194	5.094	6.102	7.290	8.496	9.540	10.958				
180 7"	2.368	2.701	3.460	4.311	5.236	6.272	7.493	8.732	9.805	11.263				
185 7.1/4"	2.432	2.774	3.553	4.427	5.377	6.441	7.695	8.968	10.070	11.567				
190 7.1/2"	2.496	2.847	3.647	4.544	5.519	6.611	7.898	9.204	10.335	11.872				
195 7.3/4"	2.560	2.920	3.740	4.660	5.660	6.780	8.100	9.440	10.600	12.176				
200 7.7/8"	2.624	2.993	3.834	4.777	5.802	6.950	8.303	9.676	10.865	12.480				
205 8"	2.688	3.066	3.927	4.893	5.943	7.119	8.505	9.912	11.130	12.785				
210 8.1/4"	2.752	3.139	4.021	5.010	6.085	7.289	8.708	10.148	11.395	13.089				
215 8.1/2	2.816	3.212	4.114	5.126	6.226	7.458	8.910	10.384	11.660	13.394				
8.3/4"														
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MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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FULLY THREADED STUDBOLTS

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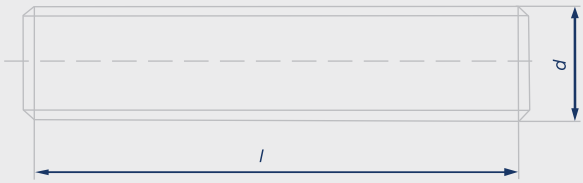

l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	1.7/8"	2"	2.1/4"	2.1/2"	2.3/4"	3"	3.1/4"	3.1/2"	3.3/4"	4"				
280 11"	3.648	4.161	5.330	6.641	8.066	9.662	11.543	13.452	15.105	17.351				
285 11.1/4"	3.712	4.234	5.423	6.757	8.207	9.831	11.745	13.688	15.370	17.655				
290 11.1/2"	3.776	4.307	5.517	6.874	8.349	10.001	11.948	13.924	15.635	17.960				
295 11.5/8	3.840	4.380	5.610	6.990	8.490	10.170	12.150	14.160	15.900	18.264				
300 11.3/4"	3.904	4.453	5.704	7.107	8.632	10.340	12.353	14.396	16.165	18.568				
30 12"	3.968	4.526	5.797	7.223	8.773	10.509	12.555	14.632	16.430	18.873				
310 12.1/4"	4.032	4.599	5.891	7.340	8.915	10.679	12.758	14.868	16.695	19.177				
315 12.1/2"	4.096	4.672	5.984	7.456	9.056	10.848	12.960	15.104	16.960	19.482				
320 12.5/8"	4.160	4.745	6.078	7.573	9.198	11.018	13.163	15.340	17.225	19.786				
325 12.3/4"	4.224	4.818	6.171	7.689	9.339	11.187	13.365	15.576	17.490	20.090				
330 13"	4.288	4.891	6.265	7.806	9.481	11.357	13.568	15.812	17.755	20.395				
335 13.1/4"	4.352	4.964	6.358	7.922	9.622	11.526	13.770	16.048	18.020	20.699				
340 13.3/8"	4.416	5.037	6.452	8.039	9.764	11.696	13.973	16.284	18.285	21.004				
345 13.1/2"	4.480	5.110	6.545	8.155	9.905	11.865	14.175	16.520	18.550	21.308				
350 13.3/4"	4.544	5.183	6.639	8.272	10.047	12.035	14.378	16.756	18.815	21.612				
355 14"	4.608	5.256	6.732	8.388	10.188	12.204	14.580	16.992	19.080	21.917				
36 14.1/4"	4.672	5.329	6.826	8.505	10.330	12.374	14.783	17.228	19.345	22.221				
365 14.3/8	4.736	5.402	6.919	8.621	10.471	12.543	14.985	17.464	19.610	22.526				
370 14.1/2"	4.800	5.475	7.013	8.738	10.613	12.713	15.188	17.700	19.875	22.830				
375 14.3/4"	4.864	5.548	7.106	8.854	10.754	12.882	15.390	17.936	20.140	23.134				
380 15"	4.928	5.621	7.200	8.971	10.896	13.052	15.593	18.172	20.405	23.439				
385 15.1/4"	4.992	5.694	7.293	9.087	11.037	13.221	15.795	18.408	20.670	23.743				
390 15.3/8"	5.056	5.767	7.387	9.204	11.179	13.391	15.998	18.644	20.935	24.048				
395 15.1/2"	5.120	5.840	7.480	9.320	11.320	13.560	16.200	18.880	21.200	24.352				
400 15.3/4"	5.184	5.913	7.574	9.437	11.462	13.730	16.403	19.116	21.465	24.656				
405 16"	5.248	5.986	7.667	9.553	11.603	13.899	16.605	19.352	21.730	24.961				
410 16.1/4"	5.312	6.059	7.761	9.670	11.745	14.069	16.808	19.588	21.995	25.265				
415 16.3/8"	5.376	6.132	7.854	9.786	11.886	14.238	17.010	19.824	22.260	25.570				
420 16.1/2"	5.440	6.205	7.948	9.903	12.028	14.408	17.213	20.060	22.525	25.874				
425 16.3/4"	5.504	6.278	8.041	10.019	12.169	14.577	17.415	20.296	22.790	26.178				
430 17"	5.568	6.351	8.135	10.136	12.311	14.747	17.618	20.532	23.055	26.483				
435 17.1/8"	5.632	6.424	8.228	10.252	12.452	14.916	17.820	20.768	23.320	26.787				
440 17.1/4"	5.696	6.497	8.322	10.369	12.594	15.086	18.023	21.004	23.585	27.092				
445 17.1/2"	5.760	6.570	8.415	10.485	12.735	15.255	18.225	21.240	23.850	27.396				
450 17.3/4"	5.824	6.643	8.509	10.602	12.877	15.425	18.428	21.476	24.115	27.700				
455 18"	5.888	6.716	8.602	10.718	13.018	15.594	18.630	21.712	24.380	28.005				
460 18.1/8"	5.952	6.789	8.696	10.835	13.160	15.764	18.833	21.948	24.645	28.309				
465 18.1/4"	6.016	6.862	8.789	10.951	13.301	15.933	19.035	22.184	24.910	28.614				
470 18.1/2"	6.080	6.935	8.883	11.068	13.443	16.103	19.238	22.420	25.175	28.918				
475 18.3/4"	6.144	7.008	8.976	11.184	13.584	16.272	19.440	22.656	25.440	29.222				
480 18.7/8"	6.208	7.081	9.070	11.301	13.726	16.442	19.643	22.892	25.705	29.527				
485 19"	6.272	7.154	9.163	11.417	13.867	16.611	19.845	23.128	25.970	29.831				
490 19.1/4"	6.336	7.227	9.257	11.534	14.009	16.781	20.048	23.364	26.235	30.136				
495 19.1/2"	6.400	7.300	9.350	11.650	14.150	16.950	20.250	23.600	26.500	30.440				
500 19.3/4"	6.464	7.373	9.444	11.767	14.292	17.120	20.453	23.836	26.765	30.744				

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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FULLY THREADED STUDBOLTS
ISO 1891

d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33	M36	M39
50	0.015	0.024	0.035	0.049	0.066	0.082	0.103	0.128	0.149	0.193	0.233	0.287	0.353	0.419
55	0.017	0.027	0.039	0.054	0.072	0.090	0.113	0.141	0.164	0.212	0.256	0.315	0.388	0.460
60	0.019	0.029	0.042	0.059	0.079	0.098	0.124	0.154	0.179	0.231	0.280	0.344	0.424	0.502
65	0.020	0.032	0.046	0.064	0.085	0.106	0.134	0.166	0.194	0.250	0.303	0.373	0.459	0.544
70	0.022	0.034	0.049	0.068	0.092	0.115	0.144	0.179	0.209	0.270	0.326	0.401	0.494	0.586
75	0.023	0.037	0.053	0.073	0.099	0.123	0.155	0.192	0.224	0.289	0.350	0.430	0.530	0.628
80	0.025	0.039	0.056	0.078	0.105	0.131	0.165	0.205	0.238	0.308	0.373	0.459	0.565	0.670
85	0.026	0.042	0.060	0.083	0.112	0.139	0.175	0.218	0.253	0.327	0.396	0.487	0.600	0.711
90	0.028	0.044	0.063	0.088	0.118	0.147	0.185	0.230	0.268	0.347	0.420	0.516	0.635	0.753
95	0.029	0.046	0.067	0.093	0.125	0.156	0.196	0.243	0.283	0.366	0.443	0.545	0.671	0.795
100	0.031	0.049	0.071	0.098	0.131	0.164	0.206	0.256	0.298	0.385	0.466	0.573	0.706	0.837
105	0.032	0.051	0.074	0.103	0.138	0.172	0.216	0.269	0.313	0.404	0.490	0.602	0.741	0.879
110	0.034	0.054	0.078	0.108	0.145	0.180	0.227	0.282	0.328	0.424	0.513	0.631	0.777	0.921
115	0.035	0.056	0.081	0.112	0.151	0.188	0.237	0.294	0.343	0.443	0.536	0.659	0.812	0.963
120	0.037	0.059	0.085	0.117	0.158	0.196	0.247	0.307	0.358	0.462	0.559	0.688	0.847	1.004
125	0.039	0.061	0.088	0.122	0.164	0.205	0.258	0.320	0.373	0.481	0.583	0.717	0.883	1.046
130	0.040	0.064	0.092	0.127	0.171	0.213	0.268	0.333	0.387	0.501	0.606	0.745	0.918	1.088
135	0.042	0.066	0.095	0.132	0.177	0.221	0.278	0.346	0.402	0.520	0.629	0.774	0.953	1.130
140	0.043	0.068	0.099	0.137	0.184	0.229	0.288	0.358	0.417	0.539	0.653	0.803	0.988	1.172
145	0.045	0.071	0.102	0.142	0.191	0.237	0.299	0.371	0.432	0.558	0.676	0.831	1.024	1.214
150	0.046	0.073	0.106	0.147	0.197	0.246	0.309	0.384	0.447	0.578	0.699	0.860	1.059	1.256
155	0.048	0.076	0.109	0.152	0.204	0.254	0.319	0.397	0.462	0.597	0.723	0.889	1.094	1.297
160	0.049	0.078	0.113	0.156	0.210	0.262	0.330	0.410	0.477	0.616	0.746	0.917	1.130	1.339
165	0.051	0.081	0.116	0.161	0.217	0.270	0.340	0.422	0.492	0.635	0.769	0.946	1.165	1.381
170	0.052	0.083	0.120	0.166	0.223	0.278	0.350	0.435	0.507	0.655	0.793	0.975	1.200	1.423
175	0.054	0.086	0.123	0.171	0.230	0.286	0.361	0.448	0.522	0.674	0.816	1.003	1.236	1.465
180	0.056	0.088	0.127	0.176	0.237	0.295	0.371	0.461	0.536	0.693	0.839	1.032	1.271	1.507
185	0.057	0.090	0.130	0.181	0.243	0.303	0.381	0.474	0.551	0.712	0.862	1.061	1.306	1.548
190	0.059	0.093	0.134	0.186	0.250	0.311	0.391	0.486	0.566	0.732	0.886	1.089	1.341	1.590
195	0.060	0.095	0.137	0.191	0.256	0.319	0.402	0.499	0.581	0.751	0.909	1.118	1.377	1.632
200	0.062	0.098	0.141	0.196	0.263	0.327	0.412	0.512	0.596	0.770	0.932	1.147	1.412	1.674
205	0.063	0.100	0.145	0.200	0.269	0.336	0.422	0.525	0.611	0.789	0.956	1.175	1.447	1.716
210	0.065	0.103	0.148	0.205	0.276	0.344	0.433	0.538	0.626	0.809	0.979	1.204	1.483	1.758
215	0.066	0.105	0.152	0.210	0.283	0.352	0.443	0.550	0.641	0.828	1.002	1.233	1.518	1.800
220	0.068	0.108	0.155	0.215	0.289	0.360	0.453	0.563	0.656	0.847	1.026	1.261	1.553	1.841
225	0.069	0.110	0.159	0.220	0.296	0.368	0.464	0.576	0.671	0.866	1.049	1.290	1.589	1.883
230	0.071	0.112	0.162	0.225	0.302	0.377	0.474	0.589	0.685	0.886	1.072	1.319	1.624	1.925
235	0.073	0.115	0.166	0.230	0.309	0.385	0.484	0.602	0.700	0.905	1.096	1.347	1.659	1.967
240	0.074	0.117	0.169	0.235	0.315	0.393	0.494	0.614	0.715	0.924	1.119	1.376	1.694	2.009
245	0.076	0.120	0.173	0.240	0.322	0.401	0.505	0.627	0.730	0.943	1.142	1.405	1.730	2.051
250	0.077	0.122	0.176	0.245	0.329	0.409	0.515	0.640	0.745	0.963	1.166	1.434	1.765	2.093
255	0.079	0.125	0.180	0.249	0.335	0.417	0.525	0.653	0.760	0.982	1.189	1.462	1.800	2.134
260	0.080	0.127	0.183	0.254	0.342	0.426	0.536	0.666	0.775	1.001	1.212	1.491	1.836	2.176
265	0.082	0.130	0.187	0.259	0.348	0.434	0.546	0.678	0.790	1.020	1.235	1.520	1.871	2.218
270	0.083	0.132	0.190	0.264	0.355	0.442	0.556	0.691	0.805	1.040	1.259	1.548	1.906	2.260
275	0.085	0.134	0.194	0.269	0.361	0.450	0.567	0.704	0.820	1.059	1.282	1.577	1.942	2.302

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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FULLY THREADED STUDBOLTS

ISO 1891

d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33	M36	M39
280	0.086	0.137	0.197	0.274	0.368	0.458	0.577	0.717	0.834	1.078	1.305	1.606	1.977	2.344
285	0.088	0.139	0.201	0.279	0.374	0.467	0.587	0.730	0.849	1.097	1.329	1.634	2.012	2.385
290	0.089	0.142	0.204	0.284	0.381	0.475	0.597	0.742	0.864	1.117	1.352	1.663	2.047	2.427
295	0.091	0.144	0.208	0.289	0.388	0.483	0.608	0.755	0.879	1.136	1.375	1.692	2.083	2.469
300	0.093	0.147	0.212	0.293	0.394	0.491	0.618	0.768	0.894	1.155	1.399	1.720	2.118	2.511
305	0.094	0.149	0.215	0.298	0.401	0.499	0.628	0.781	0.909	1.174	1.422	1.749	2.153	2.553
310	0.096	0.152	0.219	0.303	0.407	0.507	0.639	0.794	0.924	1.194	1.445	1.778	2.189	2.595
315	0.097	0.154	0.222	0.308	0.414	0.516	0.649	0.806	0.939	1.213	1.469	1.806	2.224	2.637
320	0.099	0.156	0.226	0.313	0.420	0.524	0.659	0.819	0.954	1.232	1.492	1.835	2.259	2.678
325	0.100	0.159	0.229	0.318	0.427	0.532	0.670	0.832	0.969	1.251	1.515	1.864	2.295	2.720
330	0.102	0.161	0.233	0.323	0.434	0.540	0.680	0.845	0.983	1.271	1.538	1.892	2.330	2.762
335	0.103	0.164	0.236	0.328	0.440	0.548	0.690	0.858	0.998	1.290	1.562	1.921	2.365	2.804
340	0.105	0.166	0.240	0.333	0.447	0.557	0.700	0.870	1.013	1.309	1.585	1.950	2.400	2.846
345	0.106	0.169	0.243	0.337	0.453	0.565	0.711	0.883	1.028	1.328	1.608	1.978	2.436	2.888
350	0.108	0.171	0.247	0.342	0.460	0.573	0.721	0.896	1.043	1.348	1.632	2.007	2.471	2.930
355	0.110	0.174	0.250	0.347	0.466	0.581	0.731	0.909	1.058	1.367	1.655	2.036	2.506	2.971
360	0.111	0.176	0.254	0.352	0.473	0.589	0.742	0.922	1.073	1.386	1.678	2.064	2.542	3.013
365	0.113	0.178	0.257	0.357	0.480	0.598	0.752	0.934	1.088	1.405	1.702	2.093	2.577	3.055
370	0.114	0.181	0.261	0.362	0.486	0.606	0.762	0.947	1.103	1.425	1.725	2.122	2.612	3.097
375	0.116	0.183	0.264	0.367	0.493	0.614	0.773	0.960	1.118	1.444	1.748	2.150	2.648	3.139
380	0.117	0.186	0.268	0.372	0.499	0.622	0.783	0.973	1.132	1.463	1.772	2.179	2.683	3.181
385	0.119	0.188	0.271	0.377	0.506	0.630	0.793	0.986	1.147	1.482	1.795	2.208	2.718	3.222
390	0.120	0.191	0.275	0.381	0.512	0.638	0.803	0.998	1.162	1.502	1.818	2.236	2.753	3.264
395	0.122	0.193	0.278	0.386	0.519	0.647	0.814	1.011	1.177	1.521	1.841	2.265	2.789	3.306
400	0.123	0.196	0.282	0.391	0.526	0.655	0.824	1.024	1.192	1.540	1.865	2.294	2.824	3.348
405	0.125	0.198	0.286	0.396	0.532	0.663	0.834	1.037	1.207	1.559	1.888	2.322	2.859	3.390
410	0.127	0.200	0.289	0.401	0.539	0.671	0.845	1.050	1.222	1.579	1.911	2.351	2.895	3.432
415	0.128	0.203	0.293	0.406	0.545	0.679	0.855	1.062	1.237	1.598	1.935	2.380	2.930	3.474
420	0.130	0.205	0.296	0.411	0.552	0.688	0.865	1.075	1.252	1.617	1.958	2.408	2.965	3.515
425	0.131	0.208	0.300	0.416	0.558	0.696	0.876	1.088	1.267	1.636	1.981	2.437	3.001	3.557
430	0.133	0.210	0.303	0.421	0.565	0.704	0.886	1.101	1.281	1.656	2.005	2.466	3.036	3.599
435	0.134	0.213	0.307	0.425	0.572	0.712	0.896	1.114	1.296	1.675	2.028	2.494	3.071	3.641
440	0.136	0.215	0.310	0.430	0.578	0.720	0.906	1.126	1.311	1.694	2.051	2.523	3.106	3.683
445	0.137	0.218	0.314	0.435	0.585	0.728	0.917	1.139	1.326	1.713	2.075	2.552	3.142	3.725
450	0.139	0.220	0.317	0.440	0.591	0.737	0.927	1.152	1.341	1.733	2.098	2.580	3.177	3.767
455	0.140	0.222	0.321	0.445	0.598	0.745	0.937	1.165	1.356	1.752	2.121	2.609	3.212	3.808
460	0.142	0.225	0.324	0.450	0.604	0.753	0.948	1.178	1.371	1.771	2.145	2.638	3.248	3.850
465	0.144	0.227	0.328	0.455	0.611	0.761	0.958	1.190	1.386	1.790	2.168	2.666	3.283	3.892
470	0.145	0.230	0.331	0.460	0.618	0.769	0.968	1.203	1.401	1.810	2.191	2.695	3.318	3.934
475	0.147	0.232	0.335	0.465	0.624	0.778	0.979	1.216	1.416	1.829	2.214	2.724	3.354	3.976
480	0.148	0.235	0.338	0.469	0.631	0.786	0.989	1.229	1.430	1.848	2.238	2.752	3.389	4.018
485	0.150	0.237	0.342	0.474	0.637	0.794	0.999	1.242	1.445	1.867	2.261	2.781	3.424	4.059
490	0.151	0.240	0.345	0.479	0.644	0.802	1.009	1.254	1.460	1.887	2.284	2.810	3.459	4.101
495	0.153	0.242	0.349	0.484	0.650	0.810	1.020	1.267	1.475	1.906	2.308	2.838	3.495	4.143
500	0.154	0.244	0.353	0.489	0.657	0.819	1.030	1.280	1.490	1.925	2.331	2.867	3.530	4.185

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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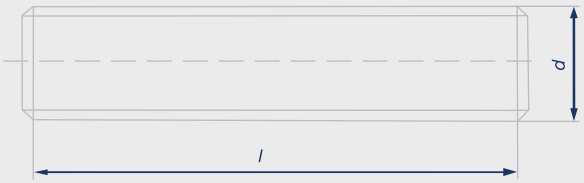
FULLY THREADED STUDBOLTS
ISO 1891

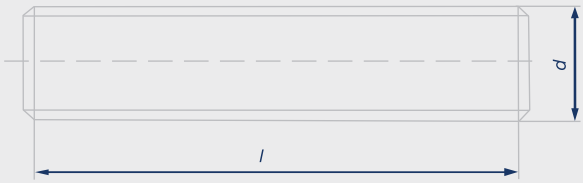


d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76	M80	M85	M90	M95
50	0.493	0.570	0.647	0.770	0.874	1.001	1.156	1.318	1.475	1.674	1.804	2.044	2.300	2.571
55	0.542	0.626	0.711	0.847	0.961	1.101	1.272	1.449	1.623	1.841	1.984	2.249	2.530	2.829
60	0.592	0.683	0.776	0.924	1.049	1.201	1.387	1.581	1.770	2.008	2.164	2.453	2.760	3.086
65	0.641	0.740	0.840	1.001	1.136	1.301	1.503	1.713	1.918	2.176	2.345	2.658	2.990	3.343
70	0.690	0.797	0.905	1.078	1.224	1.401	1.618	1.845	2.065	2.343	2.525	2.862	3.220	3.600
75	0.740	0.854	0.970	1.155	1.311	1.502	1.734	1.976	2.213	2.510	2.705	3.067	3.451	3.857
80	0.789	0.911	1.034	1.232	1.398	1.602	1.850	2.108	2.360	2.678	2.886	3.271	3.681	4.114
85	0.838	0.968	1.099	1.309	1.486	1.702	1.965	2.240	2.508	2.845	3.066	3.475	3.911	4.371
90	0.887	1.025	1.164	1.386	1.573	1.802	2.081	2.372	2.655	3.012	3.246	3.680	4.141	4.629
95	0.937	1.082	1.228	1.463	1.661	1.902	2.196	2.503	2.803	3.180	3.427	3.884	4.371	4.886
100	0.986	1.139	1.293	1.540	1.748	2.002	2.312	2.635	2.950	3.347	3.607	4.089	4.601	5.143
105	1.035	1.196	1.358	1.617	1.835	2.102	2.428	2.767	3.098	3.514	3.787	4.293	4.831	5.400
110	1.085	1.253	1.422	1.694	1.923	2.202	2.543	2.899	3.245	3.682	3.968	4.498	5.061	5.657
115	1.134	1.310	1.487	1.771	2.010	2.302	2.659	3.030	3.393	3.849	4.148	4.702	5.291	5.914
120	1.183	1.367	1.552	1.848	2.098	2.402	2.774	3.162	3.540	4.016	4.328	4.907	5.521	6.171
125	1.233	1.424	1.616	1.925	2.185	2.503	2.890	3.294	3.688	4.184	4.509	5.111	5.751	6.428
130	1.282	1.481	1.681	2.002	2.272	2.603	3.006	3.426	3.835	4.351	4.689	5.315	5.981	6.686
135	1.331	1.538	1.746	2.079	2.360	2.703	3.121	3.557	3.983	4.518	4.870	5.520	6.211	6.943
140	1.380	1.595	1.810	2.156	2.447	2.803	3.237	3.689	4.130	4.686	5.050	5.724	6.441	7.200
145	1.430	1.652	1.875	2.233	2.535	2.903	3.352	3.821	4.278	4.853	5.230	5.929	6.671	7.457
150	1.479	1.709	1.940	2.310	2.622	3.003	3.468	3.953	4.425	5.021	5.411	6.133	6.901	7.714
155	1.528	1.765	2.004	2.387	2.709	3.103	3.584	4.084	4.573	5.188	5.591	6.338	7.131	7.971
160	1.578	1.822	2.069	2.464	2.797	3.203	3.699	4.216	4.720	5.355	5.771	6.542	7.361	8.228
165	1.627	1.879	2.133	2.541	2.884	3.303	3.815	4.348	4.868	5.523	5.952	6.747	7.591	8.486
170	1.676	1.936	2.198	2.618	2.972	3.403	3.930	4.480	5.015	5.690	6.132	6.951	7.821	8.743
175	1.726	1.993	2.263	2.695	3.059	3.504	4.046	4.611	5.163	5.857	6.312	7.155	8.051	9.000
180	1.775	2.050	2.327	2.772	3.146	3.604	4.162	4.743	5.310	6.025	6.493	7.360	8.281	9.257
185	1.824	2.107	2.392	2.849	3.234	3.704	4.277	4.875	5.458	6.192	6.673	7.564	8.511	9.514
190	1.873	2.164	2.457	2.926	3.321	3.804	4.393	5.007	5.605	6.359	6.853	7.769	8.741	9.771
195	1.923	2.221	2.521	3.003	3.409	3.904	4.508	5.138	5.753	6.527	7.034	7.973	8.971	10.028
200	1.972	2.278	2.586	3.080	3.496	4.004	4.624	5.270	5.900	6.694	7.214	8.178	9.201	10.286
205	2.021	2.335	2.651	3.157	3.583	4.104	4.740	5.402	6.048	6.861	7.395	8.382	9.431	10.543
210	2.071	2.392	2.715	3.234	3.671	4.204	4.855	5.534	6.195	7.029	7.575	8.586	9.661	10.800
215	2.120	2.449	2.780	3.311	3.758	4.304	4.971	5.665	6.343	7.196	7.755	8.791	9.892	11.057
220	2.169	2.506	2.845	3.388	3.846	4.404	5.086	5.797	6.490	7.363	7.936	8.995	10.122	11.314
225	2.219	2.563	2.909	3.465	3.933	4.505	5.202	5.929	6.638	7.531	8.116	9.200	10.352	11.571
230	2.268	2.620	2.974	3.542	4.020	4.605	5.318	6.061	6.785	7.698	8.296	9.404	10.582	11.828
235	2.317	2.677	3.039	3.619	4.108	4.705	5.433	6.192	6.933	7.865	8.477	9.609	10.812	12.086
240	2.366	2.734	3.103	3.696	4.195	4.805	5.549	6.324	7.080	8.033	8.657	9.813	11.042	12.343
245	2.416	2.791	3.168	3.773	4.283	4.905	5.664	6.456	7.228	8.200	8.837	10.018	11.272	12.600
250	2.465	2.848	3.233	3.850	4.370	5.005	5.780	6.588	7.375	8.368	9.018	10.222	11.502	12.857
255	2.514	2.904	3.297	3.927	4.457	5.105	5.896	6.719	7.523	8.535	9.198	10.426	11.732	13.114
260	2.564	2.961	3.362	4.004	4.545	5.205	6.011	6.851	7.670	8.702	9.378	10.631	11.962	13.371
265	2.613	3.018	3.426	4.081	4.632	5.305	6.127	6.983	7.818	8.870	9.559	10.835	12.192	13.628
270	2.662	3.075	3.491	4.158	4.720	5.405	6.242	7.115	7.965	9.037	9.739	11.040	12.422	13.886
275	2.712	3.132	3.556	4.235	4.807	5.506	6.358	7.246	8.113	9.204	9.919	11.244	12.652	14.143

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS
ISO 1891



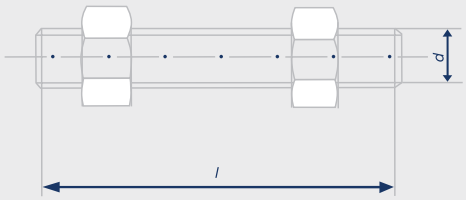
d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76	M80	M85	M90	M95
280	27.61	31.89	36.20	43.12	48.94	56.06	64.74	73.78	82.60	93.72	101.00	114.49	128.82	144.00
285	28.10	32.46	36.85	43.89	49.82	57.06	65.89	75.10	84.08	95.39	102.80	116.53	131.12	146.57
290	28.59	33.03	37.50	44.66	50.69	58.06	67.05	76.42	85.55	97.06	104.61	118.58	133.42	149.14
295	29.09	33.60	38.14	45.43	51.57	59.06	68.20	77.73	87.03	98.74	106.41	120.62	135.72	151.71
300	29.58	34.17	38.79	46.20	52.44	60.06	69.36	79.05	88.50	100.41	108.21	122.66	138.02	154.28
305	30.07	34.74	39.44	46.97	53.31	61.06	70.52	80.37	89.98	102.08	110.02	124.71	140.32	156.86
310	30.57	35.31	40.08	47.74	54.19	62.06	71.67	81.69	91.45	103.76	111.82	126.75	142.62	159.43
315	31.06	35.88	40.73	48.51	55.06	63.06	72.83	83.00	92.93	105.43	113.62	128.80	144.92	162.00
320	31.55	36.45	41.38	49.28	55.94	64.06	73.98	84.32	94.40	107.10	115.43	130.84	147.22	164.57
325	32.05	37.02	42.02	50.05	56.81	65.07	75.14	85.64	95.88	108.78	117.23	132.89	149.52	167.14
330	32.54	37.59	42.67	50.82	57.68	66.07	76.30	86.96	97.35	110.45	119.03	134.93	151.82	169.71
335	33.03	38.16	43.32	51.59	58.56	67.07	77.45	88.27	98.83	112.12	120.84	136.97	154.12	172.28
340	33.52	38.73	43.96	52.36	59.43	68.07	78.61	89.59	100.30	113.80	122.64	139.02	156.42	174.86
345	34.02	39.30	44.61	53.13	60.31	69.07	79.76	90.91	101.78	115.47	124.44	141.06	158.72	177.43
350	34.51	39.87	45.26	53.90	61.18	70.07	80.92	92.23	103.25	117.15	126.25	143.11	161.02	180.00
355	35.00	40.43	45.90	54.67	62.05	71.07	82.08	93.54	104.73	118.82	128.05	145.15	163.33	182.57
360	35.50	41.00	46.55	55.44	62.93	72.07	83.23	94.86	106.20	120.49	129.85	147.20	165.63	185.14
365	35.99	41.57	47.19	56.21	63.80	73.07	84.39	96.18	107.68	122.17	131.66	149.24	167.93	187.71
370	36.48	42.14	47.84	56.98	64.68	74.07	85.54	97.50	109.15	123.84	133.46	151.29	170.23	190.28
375	36.98	42.71	48.49	57.75	65.55	75.08	86.70	98.81	110.63	125.51	135.27	153.33	172.53	192.85
380	37.47	43.28	49.13	58.52	66.42	76.08	87.86	100.13	112.10	127.19	137.07	155.37	174.83	195.43
385	37.96	43.85	49.78	59.29	67.30	77.08	89.01	101.45	113.58	128.86	138.87	157.42	177.13	198.00
390	38.45	44.42	50.43	60.06	68.17	78.08	90.17	102.77	115.05	130.53	140.68	159.46	179.43	200.57
395	38.95	44.99	51.07	60.83	69.05	79.08	91.32	104.08	116.53	132.21	142.48	161.51	181.73	203.14
400	39.44	45.56	51.72	61.60	69.92	80.08	92.48	105.40	118.00	133.88	144.28	163.55	184.03	205.71
405	39.93	46.13	52.37	62.37	70.79	81.08	93.64	106.72	119.48	135.55	146.09	165.60	186.33	208.28
410	40.43	46.70	53.01	63.14	71.67	82.08	94.79	108.04	120.95	137.23	147.89	167.64	188.63	210.85
415	40.92	47.27	53.66	63.91	72.54	83.08	95.95	109.35	122.43	138.90	149.69	169.69	190.93	213.43
420	41.41	47.84	54.31	64.68	73.42	84.08	97.10	110.67	123.90	140.57	151.50	171.73	193.23	216.00
425	41.91	48.41	54.95	65.45	74.29	85.09	98.26	111.99	125.38	142.25	153.30	173.77	195.53	218.57
430	42.40	48.98	55.60	66.22	75.16	86.09	99.42	113.31	126.85	143.92	155.10	175.82	197.83	221.14
435	42.89	49.55	56.25	66.99	76.04	87.09	100.57	114.62	128.33	145.59	156.91	177.86	200.13	223.71
440	43.38	50.12	56.89	67.76	76.91	88.09	101.73	115.94	129.80	147.27	158.71	179.91	202.43	226.28
445	43.88	50.69	57.54	68.53	77.79	89.09	102.88	117.26	131.28	148.94	160.51	181.95	204.73	228.85
450	44.37	51.26	58.19	69.30	78.66	90.09	104.04	118.58	132.75	150.62	162.32	184.00	207.03	231.43
455	44.86	51.82	58.83	70.07	79.53	91.09	105.20	119.89	134.23	152.29	164.12	186.04	209.33	234.00
460	45.36	52.39	59.48	70.84	80.41	92.09	106.35	121.21	135.70	153.96	165.93	188.08	211.63	236.57
465	45.85	52.96	60.12	71.61	81.28	93.09	107.51	122.53	137.18	155.64	167.73	190.13	213.93	239.14
470	46.34	53.53	60.77	72.38	82.16	94.09	108.66	123.85	138.65	157.31	169.53	192.17	216.23	241.71
475	46.84	54.10	61.42	73.15	83.03	95.10	109.82	125.16	140.13	158.98	171.34	194.22	218.53	244.28
480	47.33	54.67	62.06	73.92	83.90	96.10	110.98	126.48	141.60	160.66	173.14	196.26	220.83	246.85
485	47.82	55.24	62.71	74.69	84.78	97.10	112.13	127.80	143.08	162.33	174.94	198.31	223.13	249.43
490	48.31	55.81	63.36	75.46	85.65	98.10	113.29	129.12	144.55	164.00	176.75	200.35	225.43	252.00
495	48.81	56.38	64.00	76.23	86.53	99.10	114.44	130.43	146.03	165.68	178.55	202.40	227.73	254.57
500	49.30	56.95	64.65	77.00	87.40	100.10	115.60	131.75	147.50	167.35	180.35	204.44	230.04	257.14

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ANSI B16.5/ANSI B18.2.2 TABLE 9



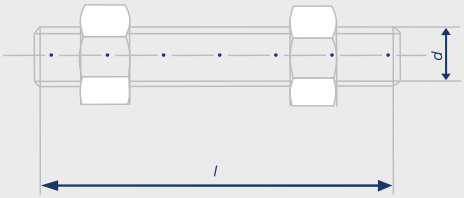
l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"	1.3/8"	1.1/2"	1.5/8"	1.3/4"
50 2"	0.054	0.073	0.108	0.135	0.172	0.279	0.400	0.554	0.747	0.960	1.229	1.543	1.950	2.333
55 2.1/4"	0.056	0.076	0.113	0.140	0.178	0.289	0.413	0.571	0.768	0.988	1.263	1.583	1.997	2.389
60 2.3/8"	0.058	0.079	0.117	0.145	0.184	0.298	0.425	0.587	0.790	1.015	1.296	1.623	2.045	2.444
65 2.1/2"	0.061	0.082	0.121	0.150	0.191	0.307	0.438	0.604	0.812	1.042	1.329	1.663	2.092	2.500
70 2.3/4"	0.063	0.085	0.125	0.155	0.197	0.317	0.451	0.621	0.833	1.069	1.362	1.703	2.139	2.555
75 3"	0.065	0.087	0.129	0.160	0.203	0.326	0.464	0.638	0.855	1.096	1.396	1.743	2.187	2.611
80 3.1/8"	0.067	0.090	0.133	0.165	0.210	0.335	0.477	0.655	0.876	1.123	1.429	1.783	2.234	2.666
85 3.1/4"	0.069	0.093	0.137	0.170	0.216	0.345	0.489	0.671	0.898	1.151	1.462	1.823	2.282	2.722
90 3.1/2"	0.071	0.096	0.141	0.174	0.222	0.354	0.502	0.688	0.920	1.178	1.495	1.863	2.329	2.777
95 3.3/4"	0.074	0.099	0.145	0.179	0.229	0.363	0.515	0.705	0.941	1.205	1.529	1.903	2.376	2.833
100 4"	0.076	0.102	0.149	0.184	0.235	0.373	0.528	0.722	0.963	1.232	1.562	1.943	2.424	2.888
105 4.1/8"	0.078	0.105	0.153	0.189	0.242	0.382	0.541	0.739	0.985	1.259	1.595	1.983	2.471	2.944
110 4.1/4"	0.080	0.108	0.157	0.194	0.248	0.391	0.553	0.755	1.006	1.286	1.628	2.023	2.519	2.999
115 4.1/2"	0.082	0.111	0.161	0.199	0.254	0.401	0.566	0.772	1.028	1.313	1.662	2.063	2.566	3.055
120 4.3/4"	0.084	0.114	0.165	0.204	0.261	0.410	0.579	0.789	1.050	1.341	1.695	2.103	2.613	3.110
125 5"	0.086	0.117	0.169	0.209	0.267	0.420	0.592	0.806	1.071	1.368	1.728	2.143	2.661	3.166
130 5.1/8"	0.089	0.120	0.173	0.214	0.273	0.429	0.605	0.823	1.093	1.395	1.761	2.183	2.708	3.221
135 5.1/4"	0.091	0.123	0.177	0.219	0.280	0.438	0.617	0.839	1.115	1.422	1.795	2.223	2.756	3.277
140 5.1/2"	0.093	0.126	0.181	0.224	0.286	0.448	0.630	0.856	1.136	1.449	1.828	2.263	2.803	3.33
145 5.3/4"	0.095	0.128	0.185	0.229	0.292	0.457	0.643	0.873	1.158	1.476	1.861	2.304	2.850	3.388
150 6"	0.097	0.131	0.189	0.234	0.299	0.466	0.656	0.890	1.180	1.503	1.894	2.344	2.898	3.443
155 6.1/8"	0.099	0.134	0.193	0.239	0.305	0.476	0.669	0.907	1.201	1.531	1.928	2.384	2.945	3.499
160 6.1/4"	0.102	0.137	0.197	0.244	0.311	0.485	0.681	0.923	1.223	1.558	1.961	2.424	2.993	3.554
165 6.1/2"	0.104	0.140	0.201	0.249	0.318	0.494	0.694	0.940	1.245	1.585	1.994	2.464	3.040	3.610
170 6.3/4"	0.106	0.143	0.205	0.254	0.324	0.504	0.707	0.957	1.266	1.612	2.027	2.504	3.087	3.665
175 6.7/8"	0.108	0.146	0.209	0.259	0.330	0.513	0.720	0.974	1.288	1.639	2.061	2.544	3.135	3.721
180 7"	0.110	0.149	0.213	0.264	0.337	0.522	0.733	0.991	1.309	1.666	2.094	2.584	3.182	3.776
185 7.1/4"	0.112	0.152	0.217	0.269	0.343	0.532	0.745	1.007	1.331	1.694	2.127	2.624	3.230	3.832
190 7.1/2"	0.114	0.155	0.221	0.274	0.349	0.541	0.758	1.024	1.353	1.721	2.160	2.664	3.277	3.887
195 7.3/4"	0.117	0.158	0.225	0.279	0.356	0.550	0.771	1.041	1.374	1.748	2.194	2.704	3.324	3.943
200 7.7/8"	0.119	0.161	0.229	0.284	0.362	0.560	0.784	1.058	1.396	1.775	2.227	2.744	3.372	3.998
205 8"	0.121	0.164	0.233	0.289	0.369	0.569	0.797	1.075	1.418	1.802	2.260	2.784	3.419	4.054
210 8.1/4"	0.123	0.167	0.237	0.294	0.375	0.578	0.809	1.091	1.439	1.829	2.293	2.824	3.467	4.109
215 8.1/2"	0.125	0.169	0.241	0.299	0.381	0.588	0.822	1.108	1.461	1.856	2.327	2.864	3.514	4.165
220 8.3/4"	0.127	0.172	0.245	0.304	0.388	0.597	0.835	1.125	1.483	1.884	2.360	2.904	3.561	4.220
225 8.7/8"	0.130	0.175	0.249	0.309	0.394	0.607	0.848	1.142	1.504	1.911	2.393	2.944	3.609	4.276
230 9"	0.132	0.178	0.253	0.314	0.400	0.616	0.861	1.159	1.526	1.938	2.426	2.984	3.656	4.331
235 9.1/4"	0.134	0.181	0.257	0.319	0.407	0.625	0.873	1.175	1.548	1.965	2.460	3.024	3.704	4.387
240 9.1/2"	0.136	0.184	0.261	0.324	0.413	0.635	0.886	1.192	1.569	1.992	2.493	3.064	3.751	4.442
245 9.5/8"	0.138	0.187	0.265	0.329	0.419	0.644	0.899	1.209	1.591	2.019	2.526	3.105	3.798	4.498
250 9.3/4"	0.140	0.190	0.269	0.334	0.426	0.653	0.912	1.226	1.613	2.046	2.559	3.145	3.846	4.553
255 10"	0.142	0.193	0.274	0.339	0.432	0.663	0.925	1.243	1.634	2.074	2.593	3.185	3.893	4.609
260 10.1/4"	0.145	0.196	0.278	0.344	0.438	0.672	0.937	1.259	1.656	2.101	2.626	3.225	3.941	4.664
265 10.1/2"	0.147	0.199	0.282	0.349	0.445	0.681	0.950	1.276	1.678	2.128	2.659	3.265	3.988	4.720
270 10.5/8"	0.149	0.202	0.286	0.354	0.451	0.691	0.963	1.293	1.699	2.155	2.692	3.305	4.035	4.775
275 10.3/4"	0.151	0.205	0.290	0.359	0.457	0.700	0.976	1.310	1.721	2.182	2.726	3.345	4.083	4.831

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ANSI B16.5/ANSI B18.2.2 TABLE 9



d / l	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1"	1.1/8"	1.1/4"	1.3/8"	1.1/2"	1.5/8"	1.3/4"
280 11"	0.153	0.208	0.294	0.364	0.464	0.709	0.989	1.327	1.742	2.209	2.759	3.385	4.130	4.886
285 11.1/4"	0.155	0.210	0.298	0.369	0.470	0.719	1.001	1.343	1.764	2.237	2.792	3.425	4.178	4.942
290 11.1/2"	0.158	0.213	0.302	0.374	0.476	0.728	1.014	1.360	1.786	2.264	2.825	3.465	4.225	4.997
295 11.5/8"	0.160	0.216	0.306	0.379	0.483	0.737	1.027	1.377	1.807	2.291	2.859	3.505	4.272	5.053
300 11.3/4"	0.162	0.219	0.310	0.384	0.489	0.747	1.040	1.394	1.829	2.318	2.892	3.545	4.320	5.108
305 12"	0.164	0.222	0.314	0.389	0.496	0.756	1.053	1.411	1.851	2.345	2.925	3.585	4.367	5.164
310 12.1/4"	0.166	0.225	0.318	0.394	0.502	0.765	1.065	1.427	1.872	2.372	2.958	3.625	4.415	5.219
315 12.1/2"	0.168	0.228	0.322	0.399	0.508	0.775	1.078	1.444	1.894	2.399	2.992	3.665	4.462	5.275
320 12.5/8"	0.170	0.231	0.326	0.404	0.515	0.784	1.091	1.461	1.916	2.427	3.025	3.705	4.509	5.330
325 12.3/4"	0.173	0.234	0.330	0.409	0.521	0.794	1.104	1.478	1.937	2.454	3.058	3.745	4.557	5.386
330 13"	0.175	0.237	0.334	0.414	0.527	0.803	1.117	1.495	1.959	2.481	3.091	3.785	4.604	5.441
335 13.1/4"	0.177	0.240	0.338	0.419	0.534	0.812	1.129	1.511	1.981	2.508	3.125	3.825	4.652	5.497
340 13.3/8"	0.179	0.243	0.342	0.424	0.540	0.822	1.142	1.528	2.002	2.535	3.158	3.865	4.699	5.552
345 13.1/2"	0.181	0.246	0.346	0.429	0.546	0.831	1.155	1.545	2.024	2.562	3.191	3.906	4.746	5.608
350 13.3/4"	0.183	0.249	0.350	0.434	0.553	0.840	1.168	1.562	2.046	2.589	3.224	3.946	4.794	5.663
355 14"	0.186	0.251	0.354	0.439	0.559	0.850	1.181	1.579	2.067	2.617	3.258	3.986	4.841	5.719
360 14.1/4"	0.188	0.254	0.358	0.444	0.565	0.859	1.193	1.595	2.089	2.644	3.291	4.026	4.889	5.774
365 14.3/8"	0.190	0.257	0.362	0.449	0.572	0.868	1.206	1.612	2.111	2.671	3.324	4.066	4.936	5.830
370 14.1/2"	0.192	0.260	0.366	0.454	0.578	0.878	1.219	1.629	2.132	2.698	3.357	4.106	4.983	5.885
375 14.3/4"	0.194	0.263	0.370	0.459	0.584	0.887	1.232	1.646	2.154	2.725	3.391	4.146	5.031	5.941
380 15"	0.196	0.266	0.374	0.464	0.591	0.896	1.245	1.663	2.175	2.752	3.424	4.186	5.078	5.996
385 15.1/4"	0.199	0.269	0.378	0.469	0.597	0.906	1.257	1.679	2.197	2.780	3.457	4.226	5.126	6.052
390 15.3/8"	0.201	0.272	0.382	0.474	0.603	0.915	1.270	1.696	2.219	2.807	3.490	4.266	5.173	6.107
395 15.1/2"	0.203	0.275	0.386	0.479	0.610	0.924	1.283	1.713	2.240	2.834	3.524	4.306	5.220	6.163
400 15.3/4"	0.205	0.278	0.390	0.483	0.616	0.934	1.296	1.730	2.262	2.861	3.557	4.346	5.268	6.218
405 16"	0.207	0.281	0.394	0.488	0.623	0.943	1.309	1.747	2.284	2.888	3.590	4.386	5.315	6.274
410 16.1/4"	0.209	0.284	0.398	0.493	0.629	0.952	1.321	1.763	2.305	2.915	3.623	4.426	5.363	6.329
415 16.3/8"	0.211	0.287	0.402	0.498	0.635	0.962	1.334	1.780	2.327	2.942	3.657	4.466	5.410	6.385
420 16.1/2"	0.214	0.290	0.406	0.503	0.642	0.971	1.347	1.797	2.349	2.970	3.690	4.506	5.457	6.440
425 16.3/4"	0.216	0.292	0.410	0.508	0.648	0.981	1.360	1.814	2.370	2.997	3.723	4.546	5.505	6.496
430 17"	0.218	0.295	0.414	0.513	0.654	0.990	1.373	1.831	2.392	3.024	3.756	4.586	5.552	6.551
435 17.1/8"	0.220	0.298	0.418	0.518	0.661	0.999	1.385	1.847	2.414	3.051	3.790	4.626	5.600	6.607
440 17.1/4"	0.222	0.301	0.422	0.523	0.667	1.009	1.398	1.864	2.435	3.078	3.823	4.666	5.647	6.662
445 17.1/2"	0.224	0.304	0.426	0.528	0.673	1.018	1.411	1.881	2.457	3.105	3.856	4.707	5.694	6.718
450 17.3/4"	0.227	0.307	0.430	0.533	0.680	1.027	1.424	1.898	2.479	3.132	3.889	4.747	5.742	6.773
455 18"	0.229	0.310	0.435	0.538	0.686	1.037	1.437	1.915	2.500	3.160	3.923	4.787	5.789	6.829
460 18.1/8"	0.231	0.313	0.439	0.543	0.692	1.046	1.449	1.931	2.522	3.187	3.956	4.827	5.837	6.884
465 18.1/4"	0.233	0.316	0.443	0.548	0.699	1.055	1.462	1.948	2.544	3.214	3.989	4.867	5.884	6.940
470 18.1/2"	0.235	0.319	0.447	0.553	0.705	1.065	1.475	1.965	2.565	3.241	4.022	4.907	5.931	6.995
475 18.3/4"	0.237	0.322	0.451	0.558	0.711	1.074	1.488	1.982	2.587	3.268	4.056	4.947	5.979	7.051
480 18.7/8"	0.239	0.325	0.455	0.563	0.718	1.083	1.501	1.999	2.608	3.295	4.089	4.987	6.026	7.106
485 19"	0.242	0.328	0.459	0.568	0.724	1.093	1.513	2.015	2.630	3.323	4.122	5.027	6.074	7.162
490 19.1/4"	0.244	0.331	0.463	0.573	0.730	1.102	1.526	2.032	2.652	3.350	4.155	5.067	6.121	7.217
495 19.1/2"	0.246	0.333	0.467	0.578	0.737	1.111	1.539	2.049	2.673	3.377	4.189	5.107	6.168	7.273
500 19.3/4"	0.248	0.336	0.471	0.583	0.743	1.121	1.552	2.066	2.695	3.404	4.222	5.147	6.216	7.328

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
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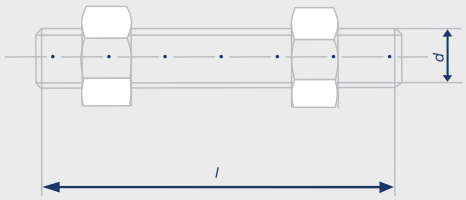
FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ANSI B16.5/ANSI B18.2.2 TABLE 9



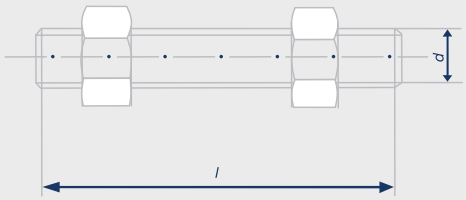
l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	1.7/8"	2"	2.1/4"	2.1/2"	2.3/4"	3"	3.1/4"	3.1/2"	3.3/4"	4"				
50 2"	2.830	3.394	4.667	6.282	7.953	9.769	11.970	15.499	18.579	22.948				
55 2.1/4"	2.894	3.467	4.761	6.398	8.094	9.938	12.173	15.735	18.844	23.253				
60 2.3/8"	2.958	3.540	4.854	6.515	8.236	10.108	12.375	15.971	19.109	23.557				
65 2.1/2"	3.022	3.613	4.948	6.631	8.377	10.277	12.578	16.207	19.374	23.862				
70 2.3/4"	3.086	3.686	5.041	6.748	8.519	10.447	12.780	16.443	19.639	24.166				
75 3"	3.150	3.759	5.135	6.864	8.660	10.616	12.983	16.679	19.904	24.470				
80 3.1/8"	3.214	3.832	5.228	6.981	8.802	10.786	13.185	16.915	20.169	24.775				
85 3.1/4"	3.278	3.905	5.322	7.097	8.943	10.955	13.388	17.151	20.434	25.079				
90 3.1/2"	3.342	3.978	5.415	7.214	9.085	11.125	13.590	17.387	20.699	25.384				
95 3.3/4"	3.406	4.051	5.509	7.330	9.226	11.294	13.793	17.623	20.964	25.688				
100 4"	3.470	4.124	5.602	7.447	9.368	11.464	13.995	17.859	21.229	25.992				
105 4.1/8"	3.534	4.197	5.696	7.563	9.509	11.633	14.198	18.095	21.494	26.297				
110 4.1/4"	3.598	4.270	5.789	7.680	9.651	11.803	14.400	18.331	21.759	26.601				
115 4.1/2"	3.662	4.343	5.883	7.796	9.792	11.972	14.603	18.567	22.024	26.906				
120 4.3/4"	3.726	4.416	5.976	7.913	9.934	12.142	14.805	18.803	22.289	27.210				
125 5"	3.790	4.489	6.070	8.029	10.075	12.311	15.008	19.039	22.554	27.514				
130 5.1/8"	3.854	4.562	6.163	8.146	10.217	12.481	15.210	19.275	22.819	27.819				
135 5.1/4"	3.918	4.635	6.257	8.262	10.358	12.650	15.413	19.511	23.084	28.123				
140 5.1/2"	3.982	4.708	6.350	8.379	10.500	12.820	15.615	19.747	23.349	28.428				
145 5.3/4"	4.046	4.781	6.444	8.495	10.641	12.989	15.818	19.983	23.614	28.732				
150 6"	4.110	4.854	6.537	8.612	10.783	13.159	16.020	20.219	23.879	29.036				
155 6.1/8"	4.174	4.927	6.631	8.728	10.924	13.328	16.223	20.455	24.144	29.341				
160 6.1/4"	4.238	5.000	6.724	8.845	11.066	13.498	16.425	20.691	24.409	29.645				
165 6.1/2"	4.302	5.073	6.818	8.961	11.207	13.667	16.628	20.927	24.674	29.950				
170 6.3/4"	4.366	5.146	6.911	9.078	11.349	13.837	16.830	21.163	24.939	30.254				
175 6.7/8"	4.430	5.219	7.005	9.194	11.490	14.006	17.033	21.399	25.204	30.558				
180 7"	4.494	5.292	7.098	9.311	11.632	14.176	17.235	21.635	25.469	30.863				
185 7.1/4"	4.558	5.365	7.192	9.427	11.773	14.345	17.438	21.871	25.734	31.167				
190 7.1/2"	4.622	5.438	7.285	9.544	11.915	14.515	17.640	22.107	25.999	31.472				
195 7.3/4"	4.686	5.511	7.379	9.660	12.056	14.684	17.843	22.343	26.264	31.776				
200 7.7/8"	4.750	5.584	7.472	9.777	12.198	14.854	18.045	22.579	26.529	32.080				
205 8"	4.814	5.657	7.566	9.893	12.339	15.023	18.248	22.815	26.794	32.385				
210 8.1/4"	4.878	5.730	7.659	10.010	12.481	15.193	18.450	23.051	27.059	32.689				
215 8.1/2"	4.942	5.803	7.753	10.126	12.622	15.362	18.653	23.287	27.324	32.994				
220 8.3/4"	5.006	5.876	7.846	10.243	12.764	15.532	18.855	23.523	27.589	33.298				
225 8.7/8"	5.070	5.949	7.940	10.359	12.905	15.701	19.058	23.759	27.854	33.602				
230 9"	5.134	6.022	8.033	10.476	13.047	15.871	19.260	23.995	28.119	33.907				
235 9.1/4"	5.198	6.095	8.127	10.592	13.188	16.040	19.463	24.231	28.384	34.211				
240 9.1/2"	5.262	6.168	8.220	10.709	13.330	16.210	19.665	24.467	28.649	34.516				
245 9.5/8"	5.326	6.241	8.314	10.825	13.471	16.379	19.868	24.703	28.914	34.820				
250 9.3/4"	5.390	6.314	8.407	10.942	13.613	16.549	20.070	24.939	29.179	35.124				
255 10"	5.454	6.387	8.501	11.058	13.754	16.718	20.273	25.175	29.444	35.429				
260 10.1/4"	5.518	6.460	8.594	11.175	13.896	16.888	20.475	25.411	29.709	35.733				
265 10.1/2"	5.582	6.533	8.688	11.291	14.037	17.057	20.678	25.647	29.974	36.038				
270 10.5/8"	5.646	6.606	8.781	11.408	14.179	17.227	20.880	25.883	30.239	36.342				
275 10.3/4"	5.710	6.679	8.875	11.524	14.320	17.396	21.083	26.119	30.504	36.646				

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ANSI B16.5/ANSI B18.2.2 TABLE 9



l \ d	WEIGHT (Kg) PER 1 PIECE (IMPERIAL SIZE)													
	1.7/8"	2"	2.1/4"	2.1/2"	2.3/4"	3"	3.1/4"	3.1/2"	3.3/4"	4"				
280 11"	5.774	6.752	8.968	11.641	14.462	17.566	21.285	26.355	30.769	36.951				
285 11.1/4"	5.838	6.825	9.062	11.757	14.603	17.735	21.488	26.591	31.034	37.255				
290 11.1/2"	5.902	6.898	9.155	11.874	14.745	17.905	21.690	26.827	31.299	37.560				
295 11.5/8"	5.966	6.971	9.249	11.990	14.886	18.074	21.893	27.063	31.564	37.864				
300 11.3/4"	6.030	7.044	9.342	12.107	15.028	18.244	22.095	27.299	31.829	38.168				
305 12"	6.094	7.117	9.436	12.223	15.169	18.413	22.298	27.535	32.094	38.473				
310 12.1/4"	6.158	7.190	9.529	12.340	15.311	18.583	22.500	27.771	32.359	38.777				
315 12.1/2"	6.222	7.263	9.623	12.456	15.452	18.752	22.703	28.007	32.624	39.082				
320 12.5/8"	6.286	7.336	9.716	12.573	15.594	18.922	22.905	28.243	32.889	39.386				
325 12.3/4"	6.350	7.409	9.810	12.689	15.735	19.091	23.108	28.479	33.154	39.690				
330 13"	6.414	7.482	9.903	12.806	15.877	19.261	23.310	28.715	33.419	39.995				
335 13.1/4"	6.478	7.555	9.997	12.922	16.018	19.430	23.513	28.951	33.684	40.299				
340 13.3/8"	6.542	7.628	10.090	13.039	16.160	19.600	23.715	29.187	33.949	40.604				
345 13.1/2"	6.606	7.701	10.184	13.155	16.301	19.769	23.918	29.423	34.214	40.908				
350 13.3/4"	6.670	7.774	10.277	13.272	16.443	19.939	24.120	29.659	34.479	41.212				
355 14"	6.734	7.847	10.371	13.388	16.584	20.108	24.323	29.895	34.744	41.517				
360 14.1/4"	6.798	7.920	10.464	13.505	16.726	20.278	24.525	30.131	35.009	41.821				
365 14.3/8"	6.862	7.993	10.558	13.621	16.867	20.447	24.728	30.367	35.274	42.126				
370 14.1/2"	6.926	8.066	10.651	13.738	17.009	20.617	24.930	30.603	35.539	42.430				
375 14.3/4"	6.990	8.139	10.745	13.854	17.150	20.786	25.133	30.839	35.804	42.734				
380 15"	7.054	8.212	10.838	13.971	17.292	20.956	25.335	31.075	36.069	43.039				
385 15.1/4"	7.118	8.285	10.932	14.087	17.433	21.125	25.538	31.311	36.334	43.343				
390 15.3/8"	7.182	8.358	11.025	14.204	17.575	21.295	25.740	31.547	36.599	43.648				
395 15.1/2"	7.246	8.431	11.119	14.320	17.716	21.464	25.943	31.783	36.864	43.952				
400 15.3/4"	7.310	8.504	11.212	14.437	17.858	21.634	26.145	32.019	37.129	44.256				
405 16"	7.374	8.577	11.306	14.553	17.999	21.803	26.348	32.255	37.394	44.561				
410 16.1/4"	7.438	8.650	11.399	14.670	18.141	21.973	26.550	32.491	37.659	44.865				
415 16.3/8"	7.502	8.723	11.493	14.786	18.282	22.142	26.753	32.727	37.924	45.170				
420 16.1/2"	7.566	8.796	11.586	14.903	18.424	22.312	26.955	32.963	38.189	45.474				
425 16.3/4"	7.630	8.869	11.680	15.019	18.565	22.481	27.158	33.199	38.454	45.778				
430 17"	7.694	8.942	11.773	15.136	18.707	22.651	27.360	33.435	38.719	46.083				
435 17.1/8"	7.758	9.015	11.867	15.252	18.848	22.820	27.563	33.671	38.984	46.387				
440 17.1/4"	7.822	9.088	11.960	15.369	18.990	22.990	27.765	33.907	39.249	46.692				
445 17.1/2"	7.886	9.161	12.054	15.485	19.131	23.159	27.968	34.143	39.514	46.996				
450 17.3/4"	7.950	9.234	12.147	15.602	19.273	23.329	28.170	34.379	39.779	47.300				
455 18"	8.014	9.307	12.241	15.718	19.414	23.498	28.373	34.615	40.044	47.605				
460 18.1/8"	8.078	9.380	12.334	15.835	19.556	23.668	28.575	34.851	40.309	47.909				
465 18.1/4"	8.142	9.453	12.428	15.951	19.697	23.837	28.778	35.087	40.574	48.214				
470 18.1/2"	8.206	9.526	12.521	16.068	19.839	24.007	28.980	35.323	40.839	48.518				
475 18.3/4"	8.270	9.599	12.615	16.184	19.980	24.176	29.183	35.559	41.104	48.822				
480 18.7/8"	8.334	9.672	12.708	16.301	20.122	24.346	29.385	35.795	41.369	49.127				
485 19"	8.398	9.745	12.802	16.417	20.263	24.515	29.588	36.031	41.634	49.431				
490 19.1/4"	8.462	9.818	12.895	16.534	20.405	24.685	29.790	36.267	41.899	49.736				
495 19.1/2"	8.526	9.891	12.989	16.650	20.546	24.854	29.993	36.503	42.164	50.040				
500 19.3/4"	8.590	9.964	13.082	16.767	20.688	25.024	30.195	36.739	42.429	50.344				

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
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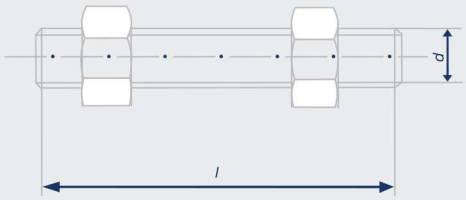
FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ISO 1891/ISO 4033



WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)

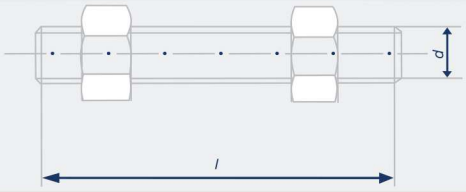
	M3	M4	M5	M6	M8	M10	M12	M14	M16	M20	M24	M30	M36	M42
60	0.032	0.058	0.083	0.121	0.160	0.215	0.282	0.343	0.453	0.631	0.848	1.066	1.390	1.748
65	0.033	0.060	0.086	0.126	0.166	0.223	0.292	0.356	0.468	0.650	0.871	1.095	1.425	1.790
70	0.035	0.063	0.090	0.131	0.173	0.231	0.302	0.369	0.483	0.670	0.894	1.123	1.460	1.832
75	0.036	0.065	0.093	0.136	0.180	0.239	0.313	0.382	0.498	0.689	0.918	1.152	1.496	1.874
80	0.038	0.068	0.097	0.141	0.186	0.247	0.323	0.395	0.512	0.708	0.941	1.181	1.531	1.916
85	0.039	0.070	0.101	0.146	0.193	0.256	0.333	0.407	0.527	0.727	0.964	1.209	1.566	1.957
90	0.041	0.073	0.104	0.151	0.199	0.264	0.344	0.420	0.542	0.747	0.988	1.238	1.601	1.999
95	0.042	0.075	0.108	0.156	0.206	0.272	0.354	0.433	0.557	0.766	1.011	1.267	1.637	2.041
100	0.044	0.077	0.111	0.161	0.212	0.280	0.364	0.446	0.572	0.785	1.034	1.295	1.672	2.083
105	0.045	0.080	0.115	0.165	0.219	0.288	0.375	0.459	0.587	0.804	1.058	1.324	1.707	2.125
110	0.047	0.082	0.118	0.170	0.226	0.296	0.385	0.471	0.602	0.824	1.081	1.353	1.743	2.167
115	0.048	0.085	0.122	0.175	0.232	0.305	0.395	0.484	0.617	0.843	1.104	1.381	1.778	2.209
120	0.050	0.087	0.125	0.180	0.239	0.313	0.405	0.497	0.632	0.862	1.127	1.410	1.813	2.250
125	0.052	0.090	0.129	0.185	0.245	0.321	0.416	0.510	0.647	0.881	1.151	1.439	1.849	2.292
130	0.053	0.092	0.132	0.190	0.252	0.329	0.426	0.523	0.661	0.901	1.174	1.467	1.884	2.334
135	0.055	0.095	0.136	0.195	0.258	0.337	0.436	0.535	0.676	0.920	1.197	1.496	1.919	2.376
140	0.056	0.097	0.139	0.200	0.265	0.346	0.447	0.548	0.691	0.939	1.221	1.525	1.954	2.418
145	0.058	0.100	0.143	0.205	0.272	0.354	0.457	0.561	0.706	0.958	1.244	1.553	1.990	2.460
150	0.059	0.102	0.146	0.210	0.278	0.362	0.467	0.574	0.721	0.978	1.267	1.582	2.025	2.502
155	0.061	0.104	0.150	0.214	0.285	0.370	0.478	0.587	0.736	0.997	1.291	1.611	2.060	2.543
160	0.062	0.107	0.153	0.219	0.291	0.378	0.488	0.599	0.751	1.016	1.314	1.639	2.096	2.585
165	0.064	0.109	0.157	0.224	0.298	0.387	0.498	0.612	0.766	1.035	1.337	1.668	2.131	2.627
170	0.065	0.112	0.160	0.229	0.304	0.395	0.508	0.625	0.781	1.055	1.361	1.697	2.166	2.669
175	0.067	0.114	0.164	0.234	0.311	0.403	0.519	0.638	0.796	1.074	1.384	1.725	2.202	2.711
180	0.069	0.117	0.168	0.239	0.318	0.411	0.529	0.651	0.810	1.093	1.407	1.754	2.237	2.753
185	0.070	0.119	0.171	0.244	0.324	0.419	0.539	0.663	0.825	1.112	1.430	1.783	2.272	2.794
190	0.072	0.122	0.175	0.249	0.331	0.427	0.550	0.676	0.840	1.132	1.454	1.811	2.307	2.836
195	0.073	0.124	0.178	0.254	0.337	0.436	0.560	0.689	0.855	1.151	1.477	1.840	2.343	2.878
200	0.075	0.126	0.182	0.258	0.344	0.444	0.570	0.702	0.870	1.170	1.500	1.869	2.378	2.920
205	0.076	0.129	0.185	0.263	0.350	0.452	0.581	0.715	0.885	1.189	1.524	1.897	2.413	2.962
210	0.078	0.131	0.189	0.268	0.357	0.460	0.591	0.727	0.900	1.209	1.547	1.926	2.449	3.004
215	0.079	0.134	0.192	0.273	0.364	0.468	0.601	0.740	0.915	1.228	1.570	1.955	2.484	3.046
220	0.081	0.136	0.196	0.278	0.370	0.477	0.611	0.753	0.930	1.247	1.594	1.983	2.519	3.087
225	0.082	0.139	0.199	0.283	0.377	0.485	0.622	0.766	0.945	1.266	1.617	2.012	2.555	3.129
230	0.084	0.141	0.203	0.288	0.383	0.493	0.632	0.779	0.959	1.286	1.640	2.041	2.590	3.171
235	0.086	0.144	0.206	0.293	0.390	0.501	0.642	0.791	0.974	1.305	1.664	2.069	2.625	3.213
240	0.087	0.146	0.210	0.298	0.396	0.509	0.653	0.804	0.989	1.324	1.687	2.098	2.660	3.255
245	0.089	0.148	0.213	0.302	0.403	0.517	0.663	0.817	1.004	1.343	1.710	2.127	2.696	3.297
	0.090	0.151	0.217	0.307	0.410	0.526	0.673	0.830	1.019	1.363	1.734	2.156	2.731	3.339
	0.092	0.153	0.220	0.312	0.416	0.534	0.684	0.843	1.034	1.382	1.757	2.184	2.766	3.380
	0.093	0.156	0.224	0.317	0.423	0.542	0.694	0.855	1.049	1.401	1.780	2.213	2.802	3.422
	0.095	0.158	0.227	0.322	0.429	0.550	0.704	0.868	1.064	1.420	1.803	2.242	2.837	3.464
	0.096	0.161	0.231	0.327	0.436	0.558	0.714	0.881	1.079	1.440	1.827	2.270	2.872	3.506
	0.098	0.163	0.234	0.332	0.442	0.567	0.725	0.894	1.094	1.459	1.850	2.299	2.908	3.548

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ISO 1891/ISO 4033



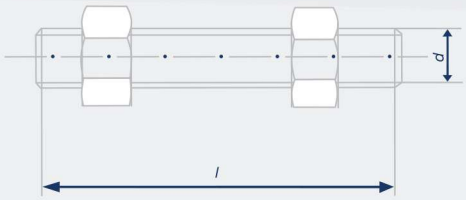
d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27	M30	M33	M36	M39
280	0.099	0.166	0.238	0.337	0.449	0.575	0.735	0.907	1.108	1.478	1.873	2.328	2.943	3.590
285	0.101	0.168	0.242	0.342	0.455	0.583	0.745	0.919	1.123	1.497	1.897	2.356	2.978	3.631
290	0.102	0.170	0.245	0.346	0.462	0.591	0.756	0.932	1.138	1.517	1.920	2.385	3.013	3.673
295	0.104	0.173	0.249	0.351	0.469	0.599	0.766	0.945	1.153	1.536	1.943	2.414	3.049	3.715
300	0.106	0.175	0.252	0.356	0.475	0.608	0.776	0.958	1.168	1.555	1.967	2.442	3.084	3.757
305	0.107	0.178	0.256	0.361	0.482	0.616	0.787	0.971	1.183	1.574	1.990	2.471	3.119	3.799
310	0.109	0.180	0.259	0.366	0.488	0.624	0.797	0.983	1.198	1.594	2.013	2.500	3.155	3.841
315	0.110	0.183	0.263	0.371	0.495	0.632	0.807	0.996	1.213	1.613	2.037	2.528	3.190	3.883
320	0.112	0.185	0.266	0.376	0.501	0.640	0.817	1.009	1.228	1.632	2.060	2.557	3.225	3.924
325	0.113	0.188	0.270	0.381	0.508	0.648	0.828	1.022	1.243	1.651	2.083	2.586	3.261	3.966
330	0.115	0.190	0.273	0.386	0.515	0.657	0.838	1.035	1.257	1.671	2.106	2.614	3.296	4.008
335	0.116	0.192	0.277	0.390	0.521	0.665	0.848	1.047	1.272	1.690	2.130	2.643	3.331	4.050
340	0.118	0.195	0.280	0.395	0.528	0.673	0.859	1.060	1.287	1.709	2.153	2.672	3.366	4.092
345	0.119	0.197	0.284	0.400	0.534	0.681	0.869	1.073	1.302	1.728	2.176	2.700	3.402	4.134
350	0.121	0.200	0.287	0.405	0.541	0.689	0.879	1.086	1.317	1.748	2.200	2.729	3.437	4.176
355	0.123	0.202	0.291	0.410	0.547	0.698	0.890	1.099	1.332	1.767	2.223	2.758	3.472	4.217
360	0.124	0.205	0.294	0.415	0.554	0.706	0.900	1.111	1.347	1.786	2.246	2.786	3.508	4.259
365	0.126	0.207	0.298	0.420	0.561	0.714	0.910	1.124	1.362	1.805	2.270	2.815	3.543	4.301
370	0.127	0.210	0.301	0.425	0.567	0.722	0.920	1.137	1.377	1.825	2.293	2.844	3.578	4.343
375	0.129	0.212	0.305	0.430	0.574	0.730	0.931	1.150	1.392	1.844	2.316	2.872	3.614	4.385
380	0.130	0.214	0.309	0.434	0.580	0.738	0.941	1.163	1.406	1.863	2.340	2.901	3.649	4.427
385	0.132	0.217	0.312	0.439	0.587	0.747	0.951	1.175	1.421	1.882	2.363	2.930	3.684	4.468
390	0.133	0.219	0.316	0.444	0.593	0.755	0.962	1.188	1.436	1.902	2.386	2.958	3.719	4.510
395	0.135	0.222	0.319	0.449	0.600	0.763	0.972	1.201	1.451	1.921	2.409	2.987	3.755	4.552
400	0.136	0.224	0.323	0.454	0.607	0.771	0.982	1.214	1.466	1.940	2.433	3.016	3.790	4.594
405	0.138	0.227	0.326	0.459	0.613	0.779	0.993	1.227	1.481	1.959	2.456	3.044	3.825	4.636
410	0.140	0.229	0.330	0.464	0.620	0.788	1.003	1.239	1.496	1.979	2.479	3.073	3.861	4.678
415	0.141	0.232	0.333	0.469	0.626	0.796	1.013	1.252	1.511	1.998	2.503	3.102	3.896	4.720
420	0.143	0.234	0.337	0.474	0.633	0.804	1.023	1.265	1.526	2.017	2.526	3.130	3.931	4.761
425	0.144	0.236	0.340	0.478	0.639	0.812	1.034	1.278	1.541	2.036	2.549	3.159	3.967	4.803
430	0.146	0.239	0.344	0.483	0.646	0.820	1.044	1.291	1.555	2.056	2.573	3.188	4.002	4.845
435	0.147	0.241	0.347	0.488	0.653	0.828	1.054	1.303	1.570	2.075	2.596	3.216	4.037	4.887
440	0.149	0.244	0.351	0.493	0.659	0.837	1.065	1.316	1.585	2.094	2.619	3.245	4.072	4.929
445	0.150	0.246	0.354	0.498	0.666	0.845	1.075	1.329	1.600	2.113	2.643	3.274	4.108	4.971
450	0.152	0.249	0.358	0.503	0.672	0.853	1.085	1.342	1.615	2.133	2.666	3.302	4.143	5.013
455	0.153	0.251	0.361	0.508	0.679	0.861	1.096	1.355	1.630	2.152	2.689	3.331	4.178	5.054
460	0.155	0.254	0.365	0.513	0.685	0.869	1.106	1.367	1.645	2.171	2.713	3.360	4.214	5.096
465	0.157	0.256	0.368	0.518	0.692	0.878	1.116	1.380	1.660	2.190	2.736	3.388	4.249	5.138
470	0.158	0.258	0.372	0.522	0.699	0.886	1.126	1.393	1.675	2.210	2.759	3.417	4.284	5.180
475	0.160	0.261	0.375	0.527	0.705	0.894	1.137	1.406	1.690	2.229	2.782	3.446	4.320	5.222
480	0.161	0.263	0.379	0.532	0.712	0.902	1.147	1.419	1.704	2.248	2.806	3.474	4.355	5.264
485	0.163	0.266	0.383	0.537	0.718	0.910	1.157	1.431	1.719	2.267	2.829	3.503	4.390	5.305
490	0.164	0.268	0.386	0.542	0.725	0.919	1.168	1.444	1.734	2.287	2.852	3.532	4.425	5.347
495	0.166	0.271	0.390	0.547	0.731	0.927	1.178	1.457	1.749	2.306	2.876	3.560	4.461	5.389
500	0.167	0.273	0.393	0.552	0.738	0.935	1.188	1.470	1.764	2.325	2.899	3.589	4.496	5.431

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

FULLY THREADED STUDBOLTS WITH TWO HEAVY HEX NUTS

ISO 1891/ISO 4033



d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76	M80	M85	M90	M95
50	2.083	2.546	3.087	3.710	4.414	5.161	6.056	6.998	8.015	9.154	10.304	11.704	14.420	16.171
55	2.132	2.602	3.151	3.787	4.501	5.261	6.172	7.129	8.163	9.321	10.484	11.909	14.650	16.429
60	2.182	2.659	3.216	3.864	4.589	5.361	6.287	7.261	8.310	9.488	10.664	12.113	14.880	16.686
65	2.231	2.716	3.280	3.941	4.676	5.461	6.403	7.393	8.458	9.656	10.845	12.318	15.110	16.943
70	2.280	2.773	3.345	4.018	4.764	5.561	6.518	7.525	8.605	9.823	11.025	12.522	15.340	17.200
75	2.330	2.830	3.410	4.095	4.851	5.662	6.634	7.656	8.753	9.990	11.205	12.727	15.571	17.457
80	2.379	2.887	3.474	4.172	4.938	5.762	6.750	7.788	8.900	10.158	11.386	12.931	15.801	17.714
85	2.428	2.944	3.539	4.249	5.026	5.862	6.865	7.920	9.048	10.325	11.566	13.135	16.031	17.971
90	2.477	3.001	3.604	4.326	5.113	5.962	6.981	8.052	9.195	10.492	11.746	13.340	16.261	18.229
95	2.527	3.058	3.668	4.403	5.201	6.062	7.096	8.183	9.343	10.660	11.927	13.544	16.491	18.486
100	2.576	3.115	3.733	4.480	5.288	6.162	7.212	8.315	9.490	10.827	12.107	13.749	16.721	18.743
105	2.625	3.172	3.798	4.557	5.375	6.262	7.328	8.447	9.638	10.994	12.287	13.953	16.951	19.000
110	2.675	3.229	3.862	4.634	5.463	6.362	7.443	8.579	9.785	11.162	12.468	14.158	17.181	19.257
115	2.724	3.286	3.927	4.711	5.550	6.462	7.559	8.710	9.933	11.329	12.648	14.362	17.411	19.514
120	2.773	3.343	3.992	4.788	5.638	6.562	7.674	8.842	10.080	11.496	12.828	14.567	17.641	19.771
125	2.823	3.400	4.056	4.865	5.725	6.663	7.790	8.974	10.228	11.664	13.009	14.771	17.871	20.028
130	2.872	3.457	4.121	4.942	5.812	6.763	7.906	9.106	10.375	11.831	13.189	14.975	18.101	20.286
135	2.921	3.514	4.186	5.019	5.900	6.863	8.021	9.237	10.523	11.998	13.370	15.180	18.331	20.543
140	2.970	3.571	4.250	5.096	5.987	6.963	8.137	9.369	10.670	12.166	13.550	15.384	18.561	20.800
145	3.020	3.628	4.315	5.173	6.075	7.063	8.252	9.501	10.818	12.333	13.730	15.589	18.791	21.057
150	3.069	3.685	4.380	5.250	6.162	7.163	8.368	9.633	10.965	12.501	13.911	15.793	19.021	21.314
155	3.118	3.741	4.444	5.327	6.249	7.263	8.484	9.764	11.113	12.668	14.091	15.998	19.251	21.571
160	3.168	3.798	4.509	5.404	6.337	7.363	8.599	9.896	11.260	12.835	14.271	16.202	19.481	21.828
165	3.217	3.855	4.573	5.481	6.424	7.463	8.715	10.028	11.408	13.003	14.452	16.407	19.711	22.086
170	3.266	3.912	4.638	5.558	6.512	7.563	8.830	10.160	11.555	13.170	14.632	16.611	19.941	22.343
175	3.316	3.969	4.703	5.635	6.599	7.664	8.946	10.291	11.703	13.337	14.812	16.815	20.171	22.600
180	3.365	4.026	4.767	5.712	6.686	7.764	9.062	10.423	11.850	13.505	14.993	17.020	20.401	22.857
185	3.414	4.083	4.832	5.789	6.774	7.864	9.177	10.555	11.998	13.672	15.173	17.224	20.631	23.114
190	3.463	4.140	4.897	5.866	6.861	7.964	9.293	10.687	12.145	13.839	15.353	17.429	20.861	23.371
195	3.513	4.197	4.961	5.943	6.949	8.064	9.408	10.818	12.293	14.007	15.534	17.633	21.091	23.628
200	3.562	4.254	5.026	6.020	7.036	8.164	9.524	10.950	12.440	14.174	15.714	17.838	21.321	23.886
205	3.611	4.311	5.091	6.097	7.123	8.264	9.640	11.082	12.588	14.341	15.895	18.042	21.551	24.143
210	3.661	4.368	5.155	6.174	7.211	8.364	9.755	11.214	12.735	14.509	16.075	18.246	21.781	24.400
215	3.710	4.425	5.220	6.251	7.298	8.464	9.871	11.345	12.883	14.676	16.255	18.451	22.012	24.657
220	3.759	4.482	5.285	6.328	7.386	8.564	9.986	11.477	13.030	14.843	16.436	18.655	22.242	24.914
225	3.809	4.539	5.349	6.405	7.473	8.665	10.102	11.609	13.178	15.011	16.616	18.860	22.472	25.171
230	3.858	4.596	5.414	6.482	7.560	8.765	10.218	11.741	13.325	15.178	16.796	19.064	22.702	25.428
235	3.907	4.653	5.479	6.559	7.648	8.865	10.333	11.872	13.473	15.345	16.977	19.269	22.932	25.686
240	3.956	4.710	5.543	6.636	7.735	8.965	10.449	12.004	13.620	15.513	17.157	19.473	23.162	25.943
245	4.006	4.767	5.608	6.713	7.823	9.065	10.564	12.136	13.768	15.680	17.337	19.678	23.392	26.200
250	4.055	4.824	5.673	6.790	7.910	9.165	10.680	12.268	13.915	15.848	17.518	19.882	23.622	26.457
255	4.104	4.880	5.737	6.867	7.997	9.265	10.796	12.399	14.063	16.015	17.698	20.086	23.852	26.714
260	4.154	4.937	5.802	6.944	8.085	9.365	10.911	12.531	14.210	16.182	17.878	20.291	24.082	26.971
265	4.203	4.994	5.866	7.021	8.172	9.465	11.027	12.663	14.358	16.350	18.059	20.495	24.312	27.228
270	4.252	5.051	5.931	7.098	8.260	9.565	11.142	12.795	14.505	16.517	18.239	20.700	24.542	27.486
275	4.302	5.108	5.996	7.175	8.347	9.666	11.258	12.926	14.653	16.684	18.419	20.904	24.772	27.743

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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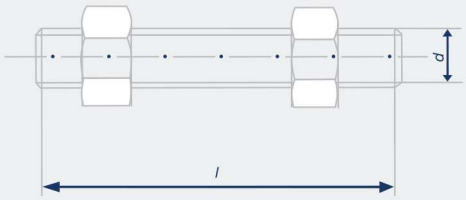
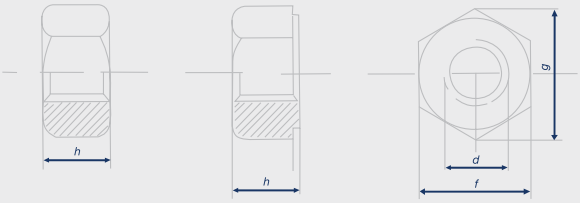


d / l	WEIGHT (Kg) PER 1 PIECE (METRIC SIZE)													
	M42	M45	M48	M52	M56	M60	M64	M68	M72	M76	M80	M85	M90	M95
280	4.351	5.165	6.080	7.252	8.434	9.766	11.374	13.058	14.800	16.852	18.600	21.109	25.002	28.000
285	4.400	5.222	6.125	7.329	8.522	9.866	11.489	13.190	14.948	17.019	18.780	21.313	25.232	28.257
290	4.449	5.279	6.190	7.406	8.609	9.966	11.605	13.322	15.095	17.186	18.961	21.518	25.462	28.514
295	4.499	5.336	6.254	7.483	8.697	10.066	11.720	13.453	15.243	17.354	19.141	21.722	25.692	28.771
300	4.548	5.393	6.319	7.560	8.784	10.166	11.836	13.585	15.390	17.521	19.321	21.926	25.922	29.028
305	4.597	5.450	6.384	7.637	8.871	10.266	11.952	13.717	15.538	17.688	19.502	22.131	26.152	29.286
310	4.647	5.507	6.448	7.714	8.959	10.366	12.067	13.849	15.685	17.856	19.682	22.335	26.382	29.543
315	4.696	5.564	6.513	7.791	9.046	10.466	12.183	13.980	15.833	18.023	19.862	22.540	26.612	29.800
320	4.745	5.621	6.578	7.868	9.134	10.566	12.298	14.112	15.980	18.190	20.043	22.744	26.842	30.057
325	4.795	5.678	6.642	7.945	9.221	10.667	12.414	14.244	16.128	18.358	20.223	22.949	27.072	30.314
330	4.844	5.735	6.707	8.022	9.308	10.767	12.530	14.376	16.275	18.525	20.403	23.153	27.302	30.571
335	4.893	5.792	6.772	8.099	9.396	10.867	12.645	14.507	16.423	18.692	20.584	23.357	27.532	30.828
340	4.942	5.849	6.836	8.176	9.483	10.967	12.761	14.639	16.570	18.860	20.764	23.562	27.762	31.086
345	4.992	5.906	6.901	8.253	9.571	11.067	12.876	14.771	16.718	19.027	20.944	23.766	27.992	31.343
350	5.041	5.963	6.966	8.330	9.658	11.167	12.992	14.903	16.865	19.195	21.125	23.971	28.222	31.600
355	5.090	6.019	7.030	8.407	9.745	11.267	13.108	15.034	17.013	19.362	21.305	24.175	28.453	31.857
360	5.140	6.076	7.095	8.484	9.833	11.367	13.223	15.166	17.160	19.529	21.485	24.380	28.683	32.114
365	5.189	6.133	7.159	8.561	9.920	11.467	13.339	15.298	17.308	19.697	21.666	24.584	28.913	32.371
370	5.238	6.190	7.224	8.638	10.008	11.567	13.454	15.430	17.455	19.864	21.846	24.789	29.143	32.628
375	5.288	6.247	7.289	8.715	10.095	11.668	13.570	15.561	17.603	20.031	22.027	24.993	29.373	32.885
380	5.337	6.304	7.353	8.792	10.182	11.768	13.686	15.693	17.750	20.199	22.207	25.197	29.603	33.143
385	5.386	6.361	7.418	8.869	10.270	11.868	13.801	15.825	17.898	20.366	22.387	25.402	29.833	33.400
390	5.435	6.418	7.483	8.946	10.357	11.968	13.917	15.957	18.045	20.533	22.568	25.606	30.063	33.657
395	5.485	6.475	7.547	9.023	10.445	12.068	14.032	16.088	18.193	20.701	22.748	25.811	30.293	33.914
400	5.534	6.532	7.612	9.100	10.532	12.168	14.148	16.220	18.340	20.868	22.928	26.015	30.523	34.171
405	5.583	6.589	7.677	9.177	10.619	12.268	14.264	16.352	18.488	21.035	23.109	26.220	30.753	34.428
410	5.633	6.646	7.741	9.254	10.707	12.368	14.379	16.484	18.635	21.203	23.289	26.424	30.983	34.685
415	5.682	6.703	7.806	9.331	10.794	12.468	14.495	16.615	18.783	21.370	23.469	26.629	31.213	34.943
420	5.731	6.760	7.871	9.408	10.882	12.568	14.610	16.747	18.930	21.537	23.650	26.833	31.443	35.200
425	5.781	6.817	7.935	9.485	10.969	12.669	14.726	16.879	19.078	21.705	23.830	27.037	31.673	35.457
430	5.830	6.874	8.000	9.562	11.056	12.769	14.842	17.011	19.225	21.872	24.010	27.242	31.903	35.714
435	5.879	6.931	8.065	9.639	11.144	12.869	14.957	17.142	19.373	22.039	24.191	27.446	32.133	35.971
440	5.928	6.988	8.129	9.716	11.231	12.969	15.073	17.274	19.520	22.207	24.371	27.651	32.363	36.228
445	5.978	7.045	8.194	9.793	11.319	13.069	15.188	17.406	19.668	22.374	24.551	27.855	32.593	36.485
450	6.027	7.102	8.259	9.870	11.406	13.169	15.304	17.538	19.815	22.542	24.732	28.060	32.823	36.743
455	6.076	7.158	8.323	9.947	11.493	13.269	15.420	17.669	19.963	22.709	24.912	28.264	33.053	37.000
460	6.126	7.215	8.388	10.024	11.581	13.369	15.535	17.801	20.110	22.876	25.093	28.468	33.283	37.257
465	6.175	7.272	8.452	10.101	11.668	13.469	15.651	17.933	20.258	23.044	25.273	28.673	33.513	37.514
470	6.224	7.329	8.517	10.178	11.756	13.569	15.766	18.065	20.405	23.211	25.453	28.877	33.743	37.771
475	6.274	7.386	8.582	10.255	11.843	13.670	15.882	18.196	20.553	23.378	25.634	29.082	33.973	38.028
480	6.323	7.443	8.646	10.332	11.930	13.770	15.998	18.328	20.700	23.546	25.814	29.286	34.203	38.285
485	6.372	7.500	8.711	10.409	12.018	13.870	16.113	18.460	20.848	23.713	25.994	29.491	34.433	38.543
490	6.421	7.557	8.776	10.486	12.105	13.970	16.229	18.592	20.995	23.880	26.175	29.695	34.663	38.800
495	6.471	7.614	8.840	10.563	12.193	14.070	16.344	18.723	21.143	24.048	26.355	29.900	34.893	39.057
500	6.520	7.671	8.905	10.640	12.280	14.170	16.460	18.855	21.290	24.215	26.535	30.104	35.124	39.314

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

HEAVY HEX NUTS
ANSI B18.2.2 - TABLE 9



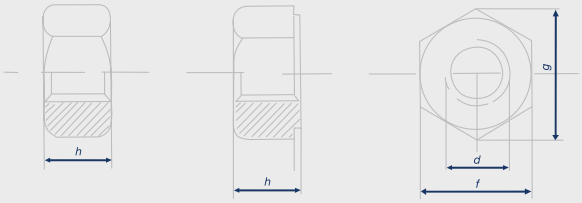
DIMENSION (mm) AND WEIGHT (Kg) PER 100 PIECES (IMPERIAL SIZE)

d	f (inches)	f		g		h			WEIGHT
		Max	Min	Max	Min	Nom.	Max	Min	
3/8"	1.1/16"	17.5	17.0	20.2	19.4	9.1	9.6	8.7	1.52
7/16"	3/4"	19.1	18.5	22.0	21.1	10.7	11.2	10.2	2.03
1/2"	7/8"	22.2	21.6	25.7	24.8	12.3	12.8	11.8	3.21
9/16"	15/16"	23.8	23.0	27.5	26.3	13.9	14.4	13.3	3.99
5/8"	1.1/16"	27.0	26.2	31.2	29.8	15.5	16.0	14.9	5.09
3/4"	1.1/4"	31.8	30.8	36.7	35.1	18.7	19.3	18.0	8.82
7/8"	1.7/16"	36.5	35.4	42.2	40.4	21.8	22.5	21.2	12.95
1"	1.5/8"	41.3	40.0	47.7	45.6	25.0	25.7	24.3	18.45
1.1/8"	1.13/16"	46.0	44.6	53.2	50.9	28.2	28.9	27.4	25.42
1.1/4"	2"	50.8	49.2	58.6	56.1	31.0	31.8	30.1	33.09
1.3/8"	2.3/16"	55.6	53.8	64.2	61.4	34.1	35.0	33.3	43.18
1.1/2"	2.3/8"	60.3	58.4	69.6	66.6	37.3	38.2	36.4	55.10
1.5/8"	2.9/16"	65.1	63.0	75.2	71.8	40.5	41.5	39.5	71.42
1.3/4"	2.3/4"	69.9	67.6	80.6	77.1	43.7	44.7	42.6	86.13
1.7/8"	2.15/16"	74.6	72.2	86.2	82.3	46.8	47.9	45.8	106.29
2"	3.1/8"	79.4	76.8	91.6	87.6	50.0	51.1	48.9	129.54
2.1/4"	3.1/2"	88.9	86.0	102.6	98.1	56.0	57.2	54.7	181.93
2.1/2"	3.7/8"	98.4	95.3	113.6	108.6	62.3	63.6	61.0	250.00
2.3/4"	4.1/4"	108.0	104.4	124.6	119.1	68.7	70.1	67.2	319.82
3"	4.5/8"	117.5	113.7	135.6	129.6	75.0	76.5	73.5	395.20
3.1/4"	5"	127.0	122.9	146.7	140.1	81.0	82.6	79.3	487.13
3.1/2"	5.3/8"	136.5	132.1	157.7	150.6	87.3	89.1	85.6	645.13
3.3/4"	5.3/4"	146.1	141.3	168.7	161.1	93.7	95.5	91.8	783.20
4"	6.1/8"	155.6	150.5	179.7	171.6	100.0	102.0	98.1	980.00

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

MidTech
Engineering Solutions

HEX NUTS
ISO 4033



METRIC RANGE - DIMENSION (mm) AND WEIGHT (Kg) PER 100 PIECES

d	s		e		m		WEIGHT
	Max	Min	Max	Min	Max	Min	
M8	13.00	12.73	15.00	14.38	8.00	7.64	0.65
M10	17.00	16.73	19.60	18.90	10.00	9.64	1.43
M12	19.00	18.67	21.90	21.10	12.00	11.57	2.03
M14	22.00	21.67	25.40	24.49	14.00	13.57	3.14
M16	24.00	23.67	27.70	26.75	16.00	15.57	4.05
M18	27.00	26.67	31.10	30.14	18.00	17.57	5.82
M20	30.00	29.67	34.60	33.53	20.00	19.48	7.91
M22	32.00	31.61	36.90	35.72	22.00	21.48	9.49
M24	36.00	35.38	41.50	39.98	24.00	23.48	13.70
M27	41.00	40.38	47.30	45.63	27.00	26.48	20.00
M30	46.00	45.38	53.10	51.28	30.00	29.48	28.40
M33	50.00	49.26	57.70	55.80	33.00	32.38	36.10
M36	55.00	54.26	63.50	61.31	36.00	35.38	48.30
M39	60.00	59.26	69.30	66.95	39.00	38.38	62.30
M42	65.00	64.26	75.00	72.61	42.00	41.38	79.50
M45	70.00	69.26	80.80	78.26	45.00	44.38	98.80
M48	75.00	74.26	86.50	83.91	48.00	47.38	122.00
M52	80.00	79.26	92.40	89.56	52.00	51.38	147.00
M56	85.00	84.15	98.10	95.07	56.00	55.26	177.00
M60	90.00	89.13	103.90	100.72	60.00	59.26	208.00
M64	95.00	94.13	109.70	106.37	64.00	63.26	245.00
M68	100.00	99.13	115.50	112.02	68.00	67.26	284.00
M72	105.00	104.13	121.25	117.67	72.00	71.26	327.00
M76	110.00	109.13	127.00	123.32	76.00	75.26	374.00
M80	115.00	114.13	132.80	128.97	80.00	79.26	425.00
M85	120.00	119.13	138.60	134.62	85.00	84.13	483.00
M90	130.00	129.00	150.10	145.77	90.00	89.13	606.00
M95	135.00	134.00	155.90	151.42	95.00	94.13	680.00

MATERIALS	SEE TECHNICAL ENCLOSURE	COATINGS	SEE TECHNICAL ENCLOSURE

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