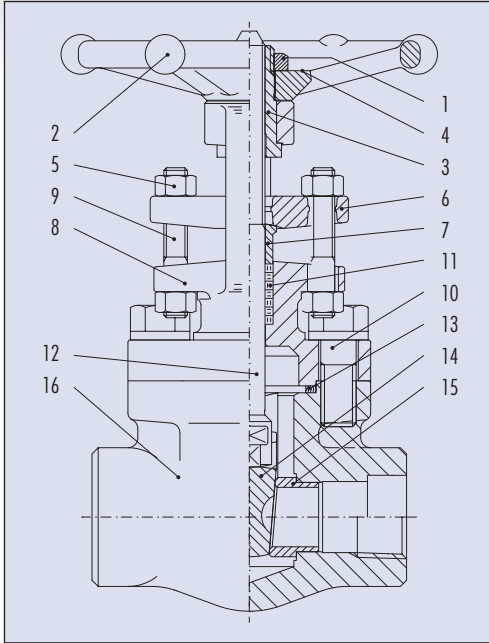
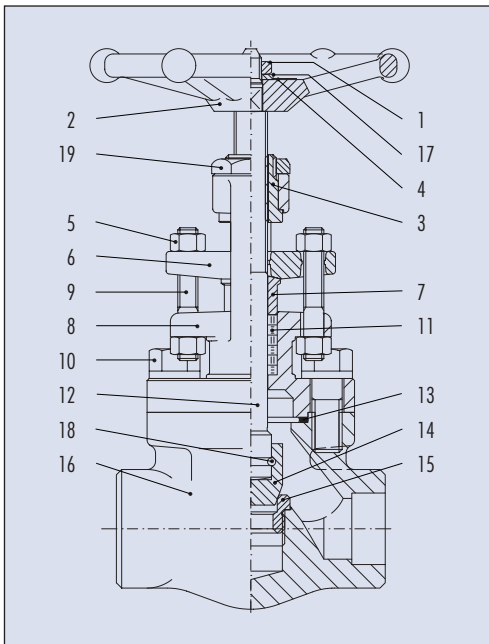


STANDARD MATERIALS SPECIFICATION (FORGED)



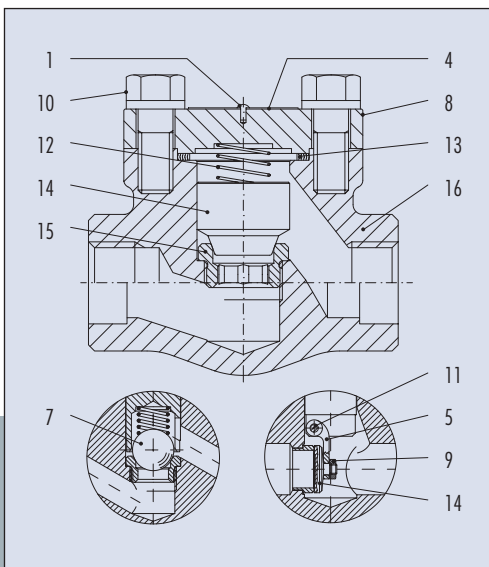
TYPICAL GATE

PART	NAME	MATERIALS
1	Handwheel nut	CARBON STEEL
2	Handwheel	CARBON STEEL
3	Yoke sleeve	AISI 416
4	Name plate	ALUMINUM
5	Gland nuts	ASTM A194 - 2H
6	Gland flange	ASTM A105
7	Packing gland	AISI 316
8	Bonnet	ASTM A105 N
9	Gland studs	ASTM A193 B6
10	B/B bolts	ASTM A193 B7
11	Packing	GRAPHITE
12	Stem	ASTM A479 410
13	B/B gasket	F316L + GRAPHITE
14	Wedge	ASTM A182 F6a
15	Seat rings	ASTM A479 410
16	Body	ASTM A105 N



TYPICAL GLOBE

PART	NAME	MATERIALS
1	Handwheel nut	CARBON STEEL
2	Handwheel	CARBON STEEL
3	Yoke sleeve	AISI 416
4	Name plate	ALUMINUM
5	Gland nuts	ASTM A194 - 2H
6	Gland flange	ASTM A105
7	Packing gland	AISI 316
8	Bonnet	ASTM A105 N
9	Gland studs	ASTM A193 B6
10	B/B bolts	ASTM A193 B7
11	Packing	GRAPHITE
12	Stem	ASTM A479 410
13	B/B gasket	F316L + GRAPHITE
14	Disc	ASTM A479 410
15	Seat rings	ASTM A479 410
16	Body	ASTM A105 N
17	Washer	CARBON STEEL
18	Connection wire	ASTM A479 316
19	Yoke nut	CARBON STEEL



TYPICAL CHECK

PART	NAME	MATERIALS
1	Rivet	CARBON STEEL
4	Name plate	ALUMINUM
5	Hinge	AISI 410
7	Ball	AISI 420
8	Bonnet	ASTM A105 N
9	Disc nut	ASTM A194 - 8
10	B/B bolts	ASTM A193 B7
11	Hinge pin	ASTM A479 316
12	Spring	ASTM A479 316
13	B/B gasket	F316L + GRAPHITE
14	Disc	ASTM A479 410
15	Seat rings	ASTM A479 410
16	Body	ASTM A105 N

Stellite # 6 hardfacing on seat and disc on request. All carbon steel valves are phosphatized to prevent the atmospheric corrosion.

TEST PRESSURES

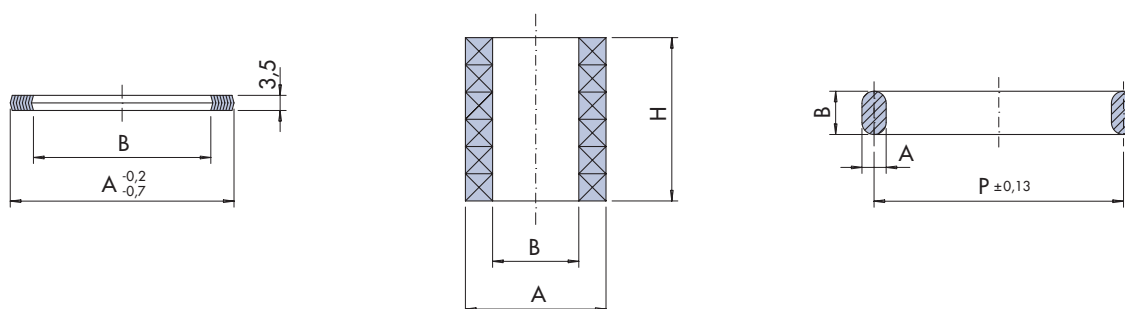
In accordance with API 598 - ANSI B16.34 - MSS SP 61 - BS 6755

MATERIALS	GROUP	
	STD CLASS 150 TO 4500	CLASS 800 ONLY
ASTM A350 LF1 - LF1N	0	0
ASTM A105 - A105N - A105NGS8 - A350 LF2 - LF2N - A216 WCB - F42 - C22.8 (1.0460) - ALLOY 20 - UNS N080020	1	1
ASTM A350 LF3 - LF3N - A352 LCC - LC3 - ASTM A182 F5 - F5a - F6a - F9 - F11 - F12 - F22 - F44 - F51 - F53* - F55* - F91 - WC9 - 1.4462 - ASTM A217 C5 - WC6 - WC9 - C12 - A351 CK3MCuN - ASTM B564 N10276 - N10001 - N06600 - N06625 - N08028* - N08825 - ASTM B464 N08020 - ASTM A182 F44 - INCONEL 600 - UNS N06600 - N7M - INCONEL 625 - UNS N06625 - CW6MC - INCOLOY 825 - HASTELLOY B - UNS N10001 - HASTELLOY B-2 - UNS N10665 - HASTELLOY C276 - UNS N10276 - ZERON 100* - UNS S32760* - F53* - SAF2507* - UNS S32750*	2	2
ASTM A182 F304-L - F304H - F316-L - F316H - F316 U.G. - F316 TI - F317-L - F321-H - F347-H - AVESTA 904L - 1.4539 - INCOLOY 800 - UNS N08800 - ASTM B381 F2* - UNS R50400* - MONEL K500* - UNS N05500*	3	1
ASTM A182 F1 - A217 WC1 - A352 LCB - A352 LC1	3	3
MONEL 400 - UNS N04400 - CW12MW - N12MW - SANICRO 28* - UNS N080028*	4	3
ASTM A182 F304 - F316 - A351 CF8 - CF8M - CF3A - B564 N08800 - N05500* - B381 F2*	4	4
ASTM A182 F1	5	1
ASTM A182 F304L - F316L - A351 CN7M - ASTM B564 N04400	5	5
C95400	6	/

* Not included on ANSI B16.34

GROUP		CLASS 150		CLASS 300		CLASS 600		CLASS 800		CLASS 1500		CLASS 1690		CLASS 2500		CLASS 2680		CLASS 3000		CLASS 4000		CLASS 4500	
		psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar
0	SEAT	260	18	685	48	1360	94	1815	125	3395	235	-	-	5660	395	-	-	6795	470	9055	625	20190	705
	BODY	375	26	950	66	1875	130	2475	175	4650	325	-	-	7725	535	-	-	9275	640	12350	855	13900	960
1	SEAT	315	22	815	57	1630	115	2175	150	4080	285	4650	325	6790	470	7370	510	8150	565	10865	750	12225	845
	BODY	450	32	1125	78	2225	155	2975	210	5575	385	6350	440	9275	640	10050	695	11125	770	14825	1025	16675	1150
2	SEAT	320	22	825	57	1650	115	2200	155	4125	285	4650	325	6875	475	7370	510	11250	570	11000	760	12375	1165
	BODY	450	32	1125	78	2250	160	3000	210	5625	390	6350	440	9375	650	10050	695	8250	780	15000	1035	16875	855
3	SEAT	305	21	795	55	1585	110	2115	150	3960	275	4650	325	6600	460	7370	510	7920	550	10560	730	11880	820
	BODY	425	30	1100	76	2175	150	2900	200	5400	375	6350	440	9000	625	10050	695	10800	745	14400	995	16200	1120
4	SEAT	255	18	660	46	1320	92	1760	125	3300	230	-	-	5500	380	-	-	6600	460	8800	610	9900	685
	BODY	350	25	900	63	1800	125	2400	170	4500	315	-	-	7500	520	-	-	9000	625	12000	830	13500	935
5	SEAT	295	21	765	53	1530	110	2040	145	3820	265	-	-	6365	440	-	-	7640	530	10190	705	11460	790
	BODY	400	28	1050	73	2100	145	2800	195	5225	365	-	-	8700	600	-	-	10425	720	13900	960	15625	1080
6	SEAT	250	18	550	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	BODY	350	25	750	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SPARE PARTS FOR FORGED VALVES

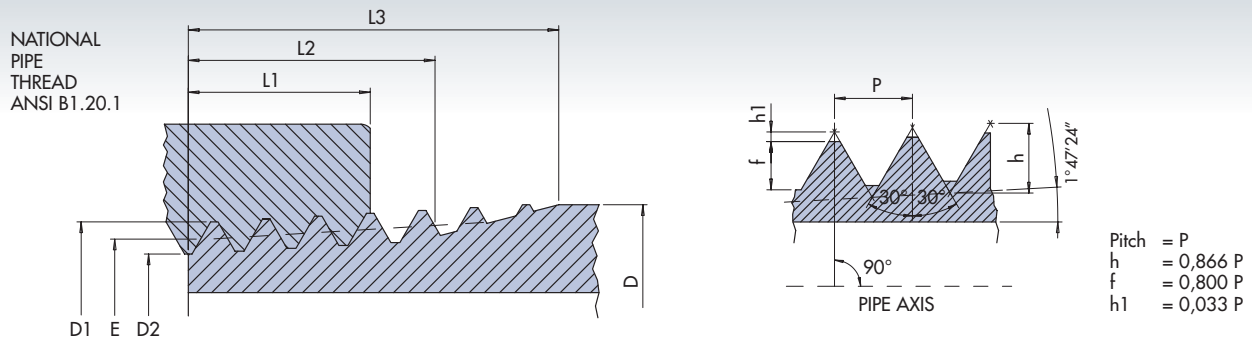


GASKET		
Type	A	B
G1	36	27
G2	40	31
G3	48	39
G4	54	44
G5	62	52
G6	66	54
G7	74	60
G8	85	73
G9	95	78
G10	87	76
G11	70	60

PACKING			
Type	A	B	H
BH2	15,7	9,5	22
BH3	17,2	11,1	22
BH4	17,2	11,1	26
BH5	19,2	12,7	26
BH6/A	24,5	14,5	30
BH8	32,2	19	36
BY5/A	26	16	30
BY7	28,2	19	30
2B3	19,2	12,7	35
2B4/A	26	16	35
2B5	28,2	19	40
2B8	35,7	22,2	52
25B8	38,5	25,4	52
4B8	40,5	28,5	54
9B8/A	35,7	22,2	42
9BE5	40,5	19	32

RING JOINT			
RTJ	P	A	B
R11	34,1	6,35	11,1
R12	39,6	7,94	14,3
R13	42,8	7,94	14,3
R14	44,4	7,94	14,3
R15	47,6	7,94	14,3
R16	50,8	7,94	14,3
R17	57,1	7,94	14,3
R18	60,3	7,94	14,3
R19	65,0	7,94	14,3
R20	68,2	7,94	14,3
R21	72,2	11,1	17,4
R22	82,5	7,94	14,3
R23	82,5	11,1	17,4
R24	95,2	11,1	17,4
R25	101,6	7,94	14,3
R26	101,6	11,1	17,4

THREAD STANDARDS ANSI B2.1

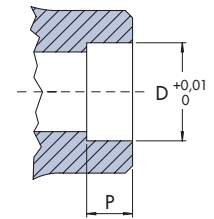


Dimensions in mm

NOMINAL PIPE SIZE	O.D. OF PIPE	THREADS PER INCH.	PITCH OF THREAD	O.D. AT BEGINNING OF THREAD	PITCH DIA. AT BEGINNING OF EXT. THRD.	ROOT DIA. AT BEGINNING OF EXT. THRD.	HANDTIGHT ENGAGEMENT	EFFECTIVE THREAD EXT. LENGTH	OVERALL LENGTH EXT. THREAD
	D								
1/8	10.29	27	0.940	9.982	9.233	6.484	4.572	6.703	9.967
1/4	13.72	18	1.412	13.259	12.126	10.998	5.080	10.206	15.103
3/8	17.14	18	1.412	16.662	15.545	14.427	6.096	10.358	15.255
1/2	21.34	14	1.814	20.726	19.263	17.805	8.128	13.556	19.850
3/4	26.67	14	1.814	26.035	24.580	23.139	8.611	13.861	20.155
1	33.40	11.1/2	2.210	32.588	30.825	29.058	10.160	17.343	25.006
1.1/4	42.16	11.1/2	2.210	41.326	39.550	37.795	10.668	17.953	25.616
1.1/2	48.26	11.1/2	2.210	47.396	45.621	43.866	10.668	18.377	26.040
2	60.32	11.1/2	2.210	59.411	57.633	55.855	11.074	19.215	26.878

SOCKET WELD - ANSI B16.11

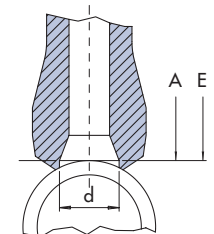
SIZE	inch	1/4	3/8	1/2	3/4	1	1.1/4	1.1/2	2
	mm	6	10	15	20	25	32	40	50
D		14,10	17,53	21,72	27,05	33,78	42,54	48,64	61,11
P min.		9,6	9,6	9,6	12,7	12,7	12,7	12,7	15,8



VALV-O-LET

RUN PIPE CONSOLIDATION

The "Lip" extension end shown on Part 7-Extended Body represents an economical solution to stocking problems. In fact, the lip is inserted on the corresponding hole in the run and therefore a valve can be welded on different run size, independently. On the contrary, this solution creates some problems in welding, especially when small run sizes are involved. In these cases, more amount of weld is required to compensate for lack of material in the transverse section. Where a certain number of valves is required and their location is known, B.F.E. suggests the use of the Weld-o-let end type for which all the well known advantages of the Weld-o-let fitting are met.



CLASS 800

	1/2	3/4	1	1.1/2	2
Run pipe consolidation	1.1/4 ÷ 3/4 36 ÷ 1.1/2 -	1.1/4 ÷ 1 3.1/2 ÷ 1.1/2 36 ÷ 4	1.1/2 ÷ 1.1/4 5 ÷ 2 36 ÷ 6	2.1/2 ÷ 2 3 ÷ 5 36 ÷ 6	4 ÷ 3 8 ÷ 5 36 ÷ 10
d - Weldolet bore	22	30	36.5	50.5	65
Fig. N. - Bolted Bonnet	VL 103	VL 104	VL 105	VL 107	VL 108
Fig. N. - Welded Bonnet	VOL 103	VOL 104	VOL 105	VOL 107	VOL 108

CLASS 1500

	1/2	3/4	1	1.1/2	2
Run pipe consolidation	1.1/4 ÷ 1 3.1/2 ÷ 1.1/2 36 ÷ 6	1.1/2 ÷ 1.1/4 5 ÷ 2 36 ÷ 6	2.1/2 ÷ 2 5 ÷ 3 36 ÷ 6	4 ÷ 3 8 ÷ 5 36 ÷ 10	- - -
d - Weldolet bore	30	36.5	50.5	65	-
Fig. N. - Bolted Bonnet	9VL 103	9VL 104	9VL 105	9VL 107	-
Fig. N. - Welded Bonnet	9VOL 103	9VOL 104	9VOL 105	9VOL 107	-

A - E and other valve dimensions same as Part 7 - Extended Body

B.F.E. VALVES FLOW COEFFICIENT

"CV" factor is the most common data used to determine valve flow characteristics. "CV" indicates the number of U.S. Gallons per minute of water at 70°F which flows through the valve at a pressure drops of one p.s.i.. It can be determined by computing, but usually is obtained by flow tests. This data allows computing of pressure drop starting from a known flow rate or reverse and it is applicable both to fluid and gaseous media.

Formulas hereinafter represent a single example. For gaseous fluids, the engineering will use proper formulas on which factors resulting from fluid type (vapour, saturated or superheated steam, etc.), differential pressure, temperature, flow velocity, etc., must be included.

FLOW RATE

water:

$$Q = C_v \sqrt{\Delta P}$$

fluids other than water:

$$Q = C_v \sqrt{\frac{\Delta P \cdot 62.4}{S}}$$

PRESSURE DROP

$$\Delta P = \left(\frac{Q}{C_v}\right)^2$$

$$\Delta P = \frac{S}{62.4} \left(\frac{Q}{C_v}\right)^2$$

WHERE

- Q = flow rate, gallon/minute
- Δ P = pressure drop, p.s.i.
- S = weight density of fluid handled, pound/cu.ft.
- 62.4 = weight density of water, pound/cu.ft.

FLOW COEFFICIENT "CV" FOR FORGED STEEL VALVES								
VALVE TYPE			SIZE	1/2	3/4	1	1.1/2	2
			inch mm	15	20	25	40	50
GATE	H 100	FULL BORE		12	23	43	98	197
	HL 100	REDUCED BORE		5,6	11	25,5	77	97
GLOBE	H 300	FULL BORE		3,5	5,2	9,3	21	35
	HL 300	REDUCED BORE		1,5	3,9	6,5	16,5	23,5
	Y 300	FULL BORE		5,5	10	18	48	78
CHECK	H 400	FULL BORE		3	4,9	9,8	16	28
	HL 400	REDUCED BORE		1,2	2,8	5	12,5	17,5
	Y 400	FULL BORE		4,8	8,2	13	39	73

PROPER SIZING OF CHECK VALVES

It is the velocity of fluid that open the disc in a check valve. The minimum velocity required to lift the disc to the full open and stable position has been determined by the following formula:

$$v = 50 \beta^2 \sqrt{\bar{V}}$$

WHERE

- v = flow velocity in feet per second
- β = $\frac{\text{seat diameter}}{\text{pipe int. diameter}}$
- \bar{V} = specific volume of fluid in cu.ft. per pound

CONVERSION CHART

kg/sq. centimetre - Pound. sq. inch

1 kg/sq. cm = 14,2233 p.s.i.
 1 p.s.i. = 0,070307 kg/sq. cm

kg/sq.cm	0	1	2	3	4	5	6	7	8	9
0	0,00	14,22	28,44	42,66	56,88	71,11	85,32	99,54	113,8	128,0
10	142,2	156,4	170,6	184,9	199,1	213,3	227,5	241,8	256,0	270,2
20	284,5	298,6	312,9	327,1	341,3	355,6	369,8	384,0	398,3	412,5
30	426,7	440,9	455,1	469,4	483,6	497,8	511,0	526,2	540,5	554,7
40	568,9	583,1	597,3	611,5	625,8	640,0	654,2	668,4	682,8	697,0
50	711,2	725,4	739,6	753,6	768,1	782,3	796,5	810,7	824,9	839,2
60	853,4	867,6	881,8	896,1	910,3	924,5	938,7	952,9	967,2	981,4
70	995,6	1010	1024	1038	1052	1067	1081	1095	1109	1123
80	1138	1152	1166	1180	1195	1209	1224	1238	1253	1267
90	1280	1294	1308	1323	1337	1351	1366	1381	1395	1408
100	1422	1436	1451	1465	1479	1493	1508	1522	1536	1550
110	1565	1579	1593	1607	1621	1636	1650	1664	1678	1693
120	1707	1721	1735	1749	1764	1778	1792	1806	1821	1835
130	1849	1863	1877	1892	1906	1920	1934	1949	1963	1977
140	1991	2005	2020	2034	2048	2062	2077	2091	2105	2119
150	2133	2148	2162	2176	2190	2205	2219	2233	2247	2261
160	2276	2290	2304	2318	2333	2347	2361	2375	2389	2404
170	2418	2432	2446	2461	2475	2489	2503	2517	2532	2546
180	2560	2574	2589	2603	2617	2631	2645	2660	2674	2688
190	2702	2717	2731	2745	2759	2773	2788	2802	2816	2830
200	2845	2859	2873	2887	2902	2916	2930	2944	2958	2973
210	2987	3001	3015	3029	3044	3058	3072	3086	3101	3115
220	3129	3143	3158	3172	3186	3200	3214	3229	3243	3257
230	3271	3286	3300	3314	3328	3342	3357	3371	3385	3399
240	3414	3428	3442	3456	3470	3485	3499	3513	3527	3542
250	3556	3570	3584	3598	3613	3627	3641	3655	3670	3684
260	3698	3712	3726	3741	3755	3769	3783	3798	3812	3826
270	3840	3854	3869	3883	3897	3911	3926	3940	3954	3968
280	3983	3997	4011	4025	4039	4054	4068	4082	4096	4110
290	4125	4139	4153	4167	4182	4196	4210	4224	4239	4253
300	4267	4281	4295	4310	4324	4338	4352	4366	4381	4395
310	4409	4423	4438	4452	4466	4480	4495	4509	4523	4537
320	4551	4566	4580	4514	4608	4622	4637	4651	4665	4679
330	4694	4708	4722	4736	4750	4765	4779	4793	4807	4822
340	4836	4850	4864	4879	4893	4907	4921	4935	4950	4964
350	4978	4992	5007	5021	5035	5049	5063	5078	5092	5106
360	5120	5135	5149	5163	5177	5191	5206	5220	5234	5248
370	5263	5277	5291	5305	5319	5334	5348	5362	5376	5391
380	5405	5419	5433	5447	5462	5476	5490	5504	5519	5533
390	5547	5561	5576	5590	5604	5618	5632	5647	5661	5675
400	5689	5703	5718	5732	5746	5760	5775	5789	5803	5817
410	5831	5846	5860	5874	5888	5903	5917	5931	5945	5959
420	5974	5988	6002	6016	6031	6045	6059	6073	6088	6102
430	6116	6130	6144	6159	6173	6187	6201	6216	6230	6244
440	6258	6272	6287	6301	6315	6329	6344	6358	6372	6386
450	6400	6415	6429	6443	6457	6472	6486	6500	6514	6528
460	6543	6557	6571	6585	6600	6614	6628	6642	6656	6671
470	6685	6699	6713	6728	6742	6756	6770	6784	6799	6813
480	6827	6841	6856	6870	6884	6898	6912	6927	6941	6955
490	6969	6983	6998	7012	7026	7040	7055	7069	7083	7097

CONVERSION CHART

Degrees Fahrenheit - Centigrade

General Formula $^{\circ}\text{F} = (^{\circ}\text{C} \times 9/5) + 32$
 $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 5/9$

$^{\circ}\text{C}$	\leftrightarrow	$^{\circ}\text{F}$	$^{\circ}\text{C}$	\leftrightarrow	$^{\circ}\text{F}$	$^{\circ}\text{C}$	\leftrightarrow	$^{\circ}\text{F}$	$^{\circ}\text{C}$	\leftrightarrow	$^{\circ}\text{F}$	$^{\circ}\text{C}$	\leftrightarrow	$^{\circ}\text{F}$
-169	-273	-459,4	7,2	45	113	185	365	689	363	685	1265	541	1005	1841
-168	-270	-454	10,0	50	122	188	370	698	366	690	1274	543	1010	1850
-165	-265	-445	12,8	55	131	191	375	707	368	695	1283	546	1015	1859
-162	-260	-436	15,6	60	140	193	380	716	371	700	1292	549	1020	1868
-159	-255	-427	18,3	65	149	196	385	725	374	705	1301	552	1025	1877
-157	-250	-418	21,1	70	158	199	390	734	377	710	1310	554	1030	1886
-154	-245	-409	23,9	75	167	202	395	743	379	715	1319	557	1035	1895
-151	-240	-400	26,7	80	176	204	400	752	382	720	1328	560	1040	1904
-148	-235	-391	29,4	85	185	207	405	761	385	725	1337	563	1045	1913
-146	-230	-382	32,2	90	194	210	410	770	388	730	1346	566	1050	1922
-143	-225	-373	35,0	95	203	213	415	779	391	735	1355	568	1055	1931
-140	-220	-364	37,8	100	212	216	420	788	393	740	1364	571	1060	1940
-137	-215	-355	40,6	105	221	218	425	797	396	745	1373	574	1065	1949
-134	-210	-346	43,3	110	230	221	430	806	399	750	1382	577	1070	1958
-132	-205	-337	46,1	115	239	224	435	815	402	755	1391	579	1075	1967
-129	-200	-328	48,9	120	248	227	440	824	404	760	1400	582	1080	1976
-126	-195	-319	51,7	125	257	229	445	833	407	765	1409	585	1085	1985
-123	-190	-310	54,4	130	266	232	450	842	410	770	1418	588	1090	1994
-121	-185	-301	57,2	135	275	235	455	851	413	775	1427	590	1095	2003
-118	-180	-292	60,0	140	284	238	460	860	416	780	1436	593	1100	2012
-115	-175	-283	62,8	145	293	241	465	869	418	785	1445	596	1105	2021
-112	-170	-274	65,6	150	302	243	470	878	421	790	1454	599	1110	2030
-109	-165	-265	68,3	155	311	246	475	887	424	795	1463	602	1115	2039
-107	-160	-256	71,1	160	320	249	480	896	427	800	1472	604	1120	2048
-104	-155	-247	73,9	165	329	252	485	905	429	805	1481	607	1125	2057
-101	-150	-238	76,7	170	338	254	490	914	432	810	1490	610	1130	2066
-98,3	-145	-229	79,4	175	347	257	495	923	435	815	1499	613	1135	2075
-95,6	-140	-220	82,2	180	356	260	500	932	438	820	1508	616	1140	2084
-92,8	-135	-211	85,0	185	365	263	505	941	441	825	1517	618	1145	2093
-90,0	-130	-202	87,8	190	374	266	510	950	443	830	1526	621	1150	2102
-87,2	-125	-193	90,6	195	383	268	515	959	446	835	1535	624	1155	2111
-84,4	-120	-184	93,3	200	392	271	520	968	449	840	1544	627	1160	2120
-81,6	-115	-175	96,1	205	401	274	525	977	452	845	1553	629	1165	2129
-78,9	-110	-166	98,9	210	410	277	530	986	454	850	1562	632	1170	2138
-76,1	-105	-157	102	215	419	279	535	995	457	855	1571	635	1175	2147
-73,3	-100	-148	104	220	428	282	540	1004	460	860	1580	638	1180	2156
-70,6	-95	-139	107	225	437	285	545	1013	463	865	1589	641	1185	2165
-67,8	-90	-130	110	230	446	288	550	1022	466	870	1598	643	1190	2174
-65,0	-85	-121	113	235	455	291	555	1031	468	875	1607	646	1195	2183
-62,2	-80	-112	115	240	464	293	560	1040	471	880	1616	649	1200	2192
-59,4	-75	-103	118	245	473	296	565	1049	474	885	1625	652	1205	2201
-56,7	-70	-94	121	250	482	299	570	1058	477	890	1634	654	1210	2210
-53,9	-65	-85	124	255	491	302	575	1067	479	895	1643	657	1215	2219
-51,1	-60	-76	127	260	500	304	580	1076	482	900	1652	660	1220	2228
-48,3	-55	-67	129	265	509	307	585	1085	485	905	1661	663	1225	2237
-45,6	-50	-58	132	270	518	310	590	1094	488	910	1670	666	1230	2246
-42,8	-45	-49	135	275	527	313	595	1103	491	915	1679	668	1235	2255
-40,0	-40	-40	138	280	536	316	600	1112	493	920	1688	671	1240	2264
-37,2	-35	-31	141	285	545	318	605	1121	496	925	1697	674	1245	2273
-34,4	-30	-22	143	290	554	321	610	1130	499	930	1706	677	1250	2282
-31,7	-25	-13	146	295	563	324	615	1139	502	935	1715	679	1255	2291
-28,9	-20	-4	149	300	572	327	620	1148	504	940	1724	682	1260	2300
-26,1	-15	5	152	305	581	329	625	1157	507	945	1733	685	1265	2309
-23,3	-10	14	154	310	590	332	630	1166	510	950	1742	688	1270	2318
-20,6	-5	23	157	315	599	335	635	1175	513	955	1751	691	1275	2327
-17,8	0	32	160	320	608	338	640	1184	516	960	1760	693	1280	2336
-15,0	5	41	163	325	617	341	645	1193	518	965	1769	696	1285	2345
-12,2	10	50	166	330	626	343	650	1202	521	970	1778	699	1290	2354
-9,4	15	59	168	335	635	346	655	1211	524	975	1787	702	1295	2363
-6,7	20	68	171	340	644	349	660	1220	527	980	1796	704	1300	2372
-3,9	25	77	174	345	653	352	665	1229	529	985	1805			
-1,1	30	86	177	350	662	354	670	1238	532	990	1814			
1,7	35	95	179	355	671	357	675	1247	535	995	1823			
4,4	40	104	182	360	680	360	680	1256	538	1000	1832			

The central column represents the know temperature in $^{\circ}\text{C}$ or $^{\circ}\text{F}$.
 The equivalent temperature in $^{\circ}\text{F}$ or $^{\circ}\text{C}$ is then read from the column to the right or the left.

WEIGHTS AND MEASURES

Metric conversion factors

Multiply by to obtain

LENGTH		
centimetre	0,03281	foot (ft)
centimetre	0,39370	inch
foot	0,3048	metre (m)
foot	304,8	millimetre (mm)
inch	25,4	millimetre
microinch	0,0254	micron (µm)
micron (micrometre)	39,37008	microinch
millimetre	0,039370	inch

AREA		
centimetre ²	0,15500	inch ²
centimetre ²	0,00108	foot ²
foot ²	0,09290	metre ² (m ²)
foot ²	929,0304	centimetre ² (cm ²)
inch ²	645,16	millimetre ² (mm ²)
metre ²	1550,003	inch ²
metre ²	10,76391	foot ²
millimetre ²	0,00155	inch ²

VOLUME		
centimetre ³	0,06102	inch ³
foot ³	0,02832	metre ³ (m ³)
foot ³	28,31685	litre
gallon (U.K. liquid)	4,54609	litre
gallon (U.S. liquid)	3,78541	litre
inch ³	16,38706	centimetre ³ (cm ³)
litre	0,21997	gallon (U.K. liquid)
litre	0,26417	gallon (U.S. liquid)

VELOCITY and FLOW		
centimetre/minute	0,39307	inch/minute
foot/minute	18,288	metre/hour
foot/minute	0,3048	metre/minute
foot ³ /minute	28,31685	litre/minute
gallon (U.S. liquid)/minute	3,78541	litre/minute
litre/minute	0,035315	foot ³ /minute
litre/minute	0,26417	gallon (U.S. liquid)/minute

MASS and DENSITY		
gram (=0,001 kg)	0,035274	ounce (avoirdupois)
kilogram	2,20462	pound
kilogram/metre ³	0,06243	pound/foot ³
kilogram/metre ³	0,00835	pound/gallon (U.S.)
ounce (avoirdupois)	28,34952	gram
pound (avoirdupois)	0,45359	kilogram (kg)
ton (long = 2240 Lb)	1016,047	kilogram
ton (short = 2000 Lb)	907,1847	kilogram

FORCE and FORCE/LENGTH		
dyne	0,00001	newton (N)
kilogram · force	9,80665	newton
newton	0,10197	kilogram-force
newton	0,22481	pound-force
newton/metre	0,00571	pound/inch
pound/force	4,44822	newton
pound/inch	175,1268	newton/metre (N/m)
pound/foot	14,59390	newton/metre

Multiply by to obtain

BENDING MOMENT or TORQUE		
kilogram · metre	9,80665	newton · metre (N·m)
kilogram · metre	7,23299	pound · foot
newton · metre	0,73756	pound · foot
newton · metre	0,10197	kilogram · metre
pound · foot	1,35582	newton · metre

PRESSURE and STRESS		
atmosphere (atm)	101325	Pascal (Pa)
atmosphere	1,01325	bar
atmosphere	1,0333	kilogram/centimetre ²
bar	0,98692	atmosphere
bar	1,02668	kilogram/centimetre ²
bar	100000	Pascal (or N/m ²)
bar	14,50377	pound/inch ²
kilogram/centimetre ²	0,968	atmosphere
kilogram/centimetre ²	0,98066	bar
kilogram/centimetre ²	98066	Pascal (and N/m ²)
kilogram/centimetre ²	14,22334	pound/inch ²
kilogram/metre ²	9,80665	Pascal
newton/metre ² (N/m ²)	0,000145	pound/inch ²
newton/metre ² (or Pa)	0,10197	kilogram/metre ²
newton/metre ²	0,000010197	kilogram/centimetre ²
Pascal (and N/m ²)	0,00000987	atmosphere
Pascal	0,00001	bar
kPa	0,01	bar
MPa	10	bar
pound/inch ²	0,06895	bar
pound/inch ²	6895	Pa
pound/inch ²	0,07031	kilogram/metre ²
pound/inch ²	0,06805	atmosphere

ENERGY-WORK and POWER		
Btu (internat.)	1055,056	joule (J)
calorie	4,19002	joule
foot · pound	1,35582	joule
kilogram · metre	9,80665	joule
joule	0,73756	foot · pound
joule	0,101972	kilogram · metre
foot · pound/hour	0,0003766	watt (W)
horsepower (550 ft·lb/s)	0,7457	kilowatt (kW)
horsepower (electric)	746	watt
kilowatt	1,34102	horsepower (550 ft·lb/s)

MISCELLANEOUS		
atmosphere (atm)	760	mm Hg at 32°F
atmosphere	29,92	inch Hg at 32°F
atmosphere	10330	mm H ₂ O at 60°F
bar	14,70	pound/inch ²
bar	750	torr
bar	29,53	inch Hg at 32°F
feet of water (at 60°F)	0,8843	inch Hg at 60°F
feet of water	0,4331	pound/inch ²
inch of Hg (at 60°F)	0,03342	atmosphere
inch of Hg	1,131	feet of water
inch of Hg	0,4898	pound/inch ²
torr (and mm Hg)	0,0013116	atmosphere
torr	0,001333	bar (or 133,6 Pa)
torr	0,00136	kilogram/centimetre ²
torr	0,03937	inch of Hg (at 32°F)
torr	13,59	mm H ₂ O
torr	0,01934	pound/inch ²
torr l/sec	1,316	atm.cc/sec (or Std. cc/sec)
atm. cc/sec	0,76	torr l/sec
torr l/sec	1000	Lusec
Lusec	0,001	torr l/sec
drop of water or bubble	16	centimetre ³