

TABLE A-1 WATER PRESSURE, FEET HEAD AND PSI

WATER PRESSURE TO FEET HEAD			
IBS./SQ. IN.	FEET HEAD	IBS./SQ. IN.	FEET HEAD
1	2.31	100	230.90
2	4.62	110	253.98
3	6.93	120	277.07
4	9.24	130	300.16
5	11.54	140	323.25
6	13.85	150	346.34
7	16.16	160	369.43
8	18.47	170	392.52
9	20.78	180	415.61
10	23.09	200	461.78
15	34.63	250	577.24
20	46.18	300	692.69
25	57.72	350	808.13
30	69.27	400	922.58
40	92.36	500	1154.48
50	115.45	600	1385.39
60	138.54	700	1616.30
70	161.63	800	1847.20
80	184.72	900	2078.10
90	207.81	1000	2309.00

NOTE:

One pound of pressure per square inch of water equals 2.309 feet of water at 62°F. Therefore, to find the feet head of water for any pressure not given in the table above, multiply the pressure pounds per square inch by 2.309.

WATER PRESSURE TO FEET HEAD			
IBS./SQ. IN.	FEET HEAD	IBS./SQ. IN.	FEET HEAD
1	0.43	100	43.31
2	0.87	110	47.64
3	1.30	120	51.97
4	1.73	130	56.30
5	2.17	140	60.63
6	2.60	150	64.96
7	3.03	160	69.29
8	3.46	170	73.63
9	3.90	180	77.96
10	4.33	200	86.62
15	6.50	250	108.27
20	8.66	300	129.93
25	10.83	350	151.58
30	12.99	400	173.24
40	17.32	500	216.55
50	21.65	600	259.85
60	25.99	700	303.16
70	30.32	800	346.47
80	34.65	900	389.78
90	38.98	1000	433.00

NOTE:

One foot of water at 62°F. equals .433 pound pressure per square inch. To find the pressure per square inch for any feet head not given in the table above, multiply the feet head by .433.

TABLE A-2 CONVERSION FACTORS

UNITS OF LENGTH	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW							
	IN.	FT.	YD.	MILE	MM.	CM.	M.	KM
1 INCH	1	0.0833	0.0278	-	25.40	2.540	0.0254	-
1 FOOT	12	1	0.3333	-	304.8	30.48	0.3048	-
1 YARD	36	3	1	-	914.4	91.44	0.9144	-
1 MILE	-	5280	1760	1	-	-	1609.3	1.609
1 MILLIMETER	0.0394	0.0033	-	-	1	0.100	0.001	-
1 CENTIMETER	0.3937	0.0328	0.0109	-	10	1	0.01	-
1 METER	39.37	3.281	1.094	-	1000	100	1	0.001
1 KILOMETER	-	3281	1094	0.6214	-	-	1000	1

(1 micron = 0.001 millimeter)

TABLE A-2 (CONTINUED). CONVERSION FACTORS

UNITS OF WEIGHT	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW						
	GRAIN	OZ.	LB.	TON	GRAM	KG.	METRIC TON
1 GRAIN	1	-	-	-	0.0648	-	-
1 OUNCE	437.5	1	0.0625	-	28.35	0.0283	-
1 POUND	7000	16	1	0.0005	453.6	0.4536	-
1 TON	-	32,000	2000	1	-	907.2	0.9072
1 GRAM	15.43	0.0353	-	-	1	0.001	-
1 KILOGRAM	-	35.27	2.205	-	1000	1	0.001
1 METRIC TON	-	35,274	2205	1.1023	-	1000	1

UNITS OF DENSITY	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW				
	LB./CU. IN.	LB./CU. FT.	LB./GAL.	G/CU. CM.	G/LITER
1 POUND/CU. IN.	1	1728	231.0	27.68	27,680
1 POUND/CU. FT.	-	1	0.1337	0.0160	16.019
1 POUND/GAL.	0.00433	7.481	1	0.1198	119.83
1 GRAM/CU. CM.	0.0361	62.43	8.345	1	1000.0
1 GRAM/LITER	-	0.0624	0.00835	0.001	1

UNITS OF AREA	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW						
	SQ. IN.	SQ. FT.	ACRE	SQ. MILE	SQ. CM.	SQ. M.	HECTARE
1 SQ. INCH	1	0.0069	-	-	6.452	-	-
1 SQ. FOOT	144	1	-	-	929.0	0.0929	-
1 ACRE	-	43,560	1	0.0016	-	4047	0.4047
1 SQ. MILE	-	-	640	1	-	-	259.0
1 SQ. CENTIMETER	0.1550	-	-	-	1	0.0001	-
1 SQ. METER	1550	10.76	-	-	10,000	1	-
1 HECTARE	-	-	2.471	-	-	10,000	1

UNITS OF VOLUME	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW							
	CU. IN.	CU. FT.	CU. YD.	CU. CM.	CU. METER	LITER	U.S. GAL.	IMP. GAL.
1 CU. INCH	1	-	-	16.387	-	0.0164	-	-
1 CU. FOOT	1728	1	0.0370	28,317	0.0283	28.32	7.481	6.229
1 CU. YARD	46,656	27	1	-	0.7646	764.5	202.0	168.2
1 CU. CENTIMETER	0.0610	-	-	1	-	0.0010	-	-
1 CU. METER	61,023	35.31	1.308	1,000,000	1	999.97	264.2	220.0
1 LITER	61.025	0.0353	-	1000.028	0.0010	1	0.2642	0.2200
1 U.S. GALLON	231	0.1337	-	3785.4	-	3.785	1	0.8327
1 IMPERIAL GALLON	277.4	0.1605	-	4546.1	-	4.546	1.201	1

TABLE A-2 (CONTINUED). CONVERSION FACTORS

UNITS OF PRESSURE	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW						
	LB./SQ. IN.	LB./SQ. FT.	INT. ETC.	KG/CM2	MM HG	IN. HG AT 32°F	FT. WATER AT 39.2°
1 POUND/SQ. IN.	1	144	-	0.0703	51.713	2.0359	2.307
1 POUND/SQ. FT.	0.00694	1	-	-	0.3591	0.01414	0.01602
1 IN./CM. ATMOSPHERE	14.696	2116.2	1	1.0333	760	29.921	33.90
1 KILOGRAM/SQ. CM.	14.223	2048.1	0.9678	1	735.56	28.958	32.81
1 MILLIMETER-MERCURY-1 TORR (TORRICELLI)	0.0193	2.785	-	-	1	0.0394	0.0446
1 INCH MERCURY	0.4912	70.73	0.0334	0.0345	25.400	1	1.133
1 FOOT WATER	0.4335	62.42	-	0.0305	22.418	0.8826	1

UNITS OF ENERGY	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW						
	FT.-IB.	BTU	G. CAL.	JOULE	KW-HR.	HP-HR.	
1 FOOT-POUND	1	0.001285	0.3240	1.3556	-	-	
1 BTU	778.2	1	252.16	1054.9	-	-	
1 GRAM CALORIE	3.0860	0.003966	1	4.1833	-	-	
1 INT. JOULE	0.7377	0.000948	0.2390	1	-	-	
1 INT. KILOWATT-HOUR	2,655,656	3412.8	860,563	-	1	1.3412	
1 HORSEPOWER-HOUR	1,980,000	2544.5	641,617	-	0.7456	1	

UNITS OF SPECIFIC ENERGY	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW					
	ABSOLUTE JOULE/G	INT. JOULE/G	CAL/G	INT. CAL/G	BTU/LB.	
1 ABSOLUTE JOULE/GRAM	1	0.99984	0.23901	0.23885	0.42993	
1 INT. JOULE/GRAM	1.000165	1	0.23904	0.23892	0.43000	
1 CALORIE/GRAM	4.1840	4.1833	1	0.99935	1.7988	
1 INT. CALORIE/GRAM	4.1867	4.1860	1.00065	1	1.8000	
1 BTU/LB.	2.3260	2.3256	0.55592	0.55556	1	

UNITS OF POWER (rates of energy use)	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW								
	HP	WATT	KW	BTU/MIN.	BTU/HR.	FT-IB/SEC.	FT-IB/MIN.	G. CAL/SEC.	METRIC HP
1 HORSEPOWER	1	745.7	0.7475	42.41	2544.5	550	33.000	178.2	1.014
1 WATT	-	1	0.001	0.0569	3.413	0.7376	44.25	0.2390	0.00136
1 KILOWATT	1.3410	1000	1	56.88	3412.8	737.6	44,254	239.0	1.360
1 BTU PER MINUTE	-	-	-	1	60	12.97	778.2	4.203	0.0239
1 METRIC HP	0.9863	735.5	0.7355	41.83	2509.6	542.5	32.550	175.7	1

UNITS OF REFRIGERATION	MULTIPLY UNITS IN LEFT COLUMN BY PROPER FACTOR BELOW						
	BTU(IT) / MIN.	BTU(IT) / HR.	KG CAL / HR.	TON (U.S.) / COMM	TON (BRIT.) / COMM	FRIGORIE / HR.	
1 TON (U.S.) COMM.	200	12,000	3025.9	1	0.8965	3025.9	
1 TON (BRIT.) COMM.	223.08	13,385	3375.2	1.1154	1	3375.2	
1 FRIGORIE/HR.	0.06609	3.9657	1	0.0003305	0.0002963	1	

1 frigorie = 1 kg cal. (IT)

Note: Btu is International Steam Table Btu (IT)

TABLE A-3. CONVERSION FACTORS

BY FACTOR TO OBTAIN →

GIVEN	LB/IN ²	IN H ₂ O AT + 39.2°F	CM H ₂ O AT + 4°C	IN HG AT + 32°F	MM HG (TORR) T(AT 0°C)	DYNE/CM ² 1X BAR	NEWTON/M ² (PASCAL)	KGM/CM ²	BAR	ATM. (AN)	LB/FT ²	FT H ₂ O (AT + 39.2°F)
LB/IN ²	1.0000	2.7680 x 10 ¹	7.0308 x 10 ¹	2.0360	5.1715 x 10 ¹	6.8948 x 10 ⁴	6.8948 x 10 ³	7.0306 x 10 ²	6.8947 x 10 ²	6.8045 x 10 ⁻²	1.4400 x 10 ²	2.3067
IN H ₂ O (AT + 39.2°F)	3.6127 x 10 ⁻²	1.0000	2.5400	7.3554 x 10 ⁻²	1.8683	2.4908 x 10 ⁵	2.4908 x 10 ²	2.5399 x 10 ⁻³	2.4908 x 10 ⁻³	2.4582 x 10 ⁻³	5.2022	8.3333 x 10 ⁻²
CM H ₂ O (AT + 4°C)	1.4223 x 10 ⁻²	0.3937	1.0000	2.8958 x 10 ⁻²	0.7355	9.8064 x 10 ²	9.8064 x 10 ¹	9.9997 x 10 ⁻⁴	9.8064 x 10 ⁻⁴	9.6781 x 10 ⁻⁴	2.0481	3.2808 x 10 ⁻²
IN HG (AT + 32°F)	4.9116 x 10 ⁻¹	1.3596 x 10 ¹	3.4532 x 10 ¹	1.0000	2.5400 x 10 ¹	3.3864 x 10 ⁴	3.3864 x 10 ³	3.4532 x 10 ⁻²	3.3864 x 10 ⁻²	3.3421 x 10 ⁻²	7.0727 x 10 ¹	1.1330
MM HG (TORR) (AT 0°C)	1.9337 x 10 ⁻²	5.3525 x 10 ⁻¹	1.3595	3.9370 x 10 ⁻²	1.0000	1.3332 x 10 ⁵	1.3332 x 10 ²	1.3595 x 10 ⁻³	1.3332 x 10 ⁻³	1.3158 x 10 ⁻³	2.7845	4.4605 x 10 ⁻²
DYNE/CM ² (1M BAR)	1.4504 x 10 ⁵	4.0147 x 10 ⁻⁴	1.0197 x 10 ³	2.9530 x 10 ⁻⁵	7.5006 x 10 ⁴	1.0000	1.0000 x 10 ¹	1.0197 x 10 ⁻⁶	1.0000 x 10 ⁻⁶	9.8692 x 10 ⁻⁷	2.0886 x 10 ³	3.3456 x 10 ⁻⁵
NEWTON/M ² (PASCAL)	1.4504 x 10 ⁻⁴	4.0147 x 10 ⁻³	1.0197 x 10 ⁻²	2.9530 x 10 ⁻⁴	7.5006 x 10 ⁻³	1.0000 x 10 ¹	1.0000	1.0197 x 10 ⁻⁵	1.0000 x 10 ⁻⁵	9.8692 x 10 ⁻⁶	2.0885 x 10 ⁻²	3.3456 x 10 ⁻⁴
KGM/CM ²	1.4224 x 10 ¹	3.9371 x 10 ²	1.0000 x 10 ³	2.8959 x 10 ¹	7.3556 x 10 ²	9.8060 x 10 ⁵	9.8060 x 10 ⁴	1.0000	9.8060 x 10 ¹	9.678 x 10 ¹	2.0482 x 10 ³	3.2809 x 10 ¹
BAR	1.4504 x 10 ¹	4.0147 x 10 ¹	1.0197 x 10 ¹	2.9530 x 10 ¹	7.5006 x 10 ¹	1.0000 x 10 ⁶	1.0000 x 10 ⁵	1.0197	1.0000	9.8692 x 10 ¹	2.0885 x 10 ³	3.3456 x 10 ¹
ATM. (AN)	1.4696 x 10 ¹	4.0679 x 10 ¹	1.0333 x 10 ¹	2.9921 x 10 ¹	7.6000 x 10 ¹	1.0133 x 10 ⁶	1.0133 x 10 ⁵	1.0332	1.0133	1.0000	2.1162 x 10 ³	3.3900 x 10 ¹
LB/FT ²	6.9445 x 10 ⁻³	1.9223 x 10 ⁻¹	4.882 x 10 ⁻¹	1.4139 x 10 ⁻²	3.591 x 10 ⁻¹	4.7880 x 10 ²	4.7880 x 10 ¹	4.8824 x 10 ⁻⁴	4.7880 x 10 ⁻⁴	4.7254 x 10 ⁻⁴	1.0000	1.6019 x 10 ⁻²
FT H ₂ O (AT + 39.2°F)	4.3352 x 10 ⁻¹	1.2000 x 10 ¹	3.0480 x 10 ¹	8.826 x 10 ⁻¹	2.2419 x 10 ¹	2.9890 x 10 ⁴	2.9890 x 10 ³	3.0479 x 10 ⁻²	2.9890 x 10 ⁻²	2.9499 x 10 ⁻²	6.2427 x 10 ¹	1.0000

↑ MULTIPLY GIVEN NUMBER OF

TABLE A-4. DECIMAL AND MILLIMETER EQUIVALENTS OF FRACTIONS

INCHES		MILLIMETERS	
FRACTIONS	DECIMALS	FRACTIONS	DECIMALS
1/64	0.015625	0.397	0.015625
1/32	0.031250	0.794	0.031250
3/64	0.046875	1.191	0.046875
1/16	0.062500	1.588	0.062500
5/64	0.078125	1.984	0.078125
3/32	0.093750	2.381	0.093750
1/8	0.109375	2.778	0.109375
9/64	0.125000	3.175	0.125000
5/32	0.140625	3.572	0.140625
11/64	0.156250	3.969	0.156250
3/16	0.171875	4.366	0.171875
13/64	0.187500	4.763	0.187500
7/32	0.203125	5.159	0.203125
15/64	0.218750	5.556	0.218750
1/4	0.234375	5.953	0.234375
	0.250000	6.350	0.250000
			0.265625
			0.281250
			0.296875
			0.312500
			0.328125
			0.343750
			0.359375
			0.375000
			0.390625
			0.406250
			0.421875
			0.437500
			0.453125
			0.468750
			0.484375
			0.500000
			0.515625
			0.531250
			0.546875
			0.562500
			0.578125
			0.593750
			0.609375
			0.625000
			0.640625
			0.656250
			0.671875
			0.687500
			0.703125
			0.718750
			0.734375
			0.750000
			0.765625
			0.781250
			0.796875
			0.812500
			0.828125
			0.843750
			0.859375
			0.875000
			0.890625
			0.906250
			0.921875
			0.937500
			0.953125
			0.968750
			0.984375
			1.000000

TABLE A-5 TEMPERATURE CONVERSION

NOTE: For convenience in making actual temperature degrees scale conversions, the center column in orange typeface refers to the known temperature in degrees, either Centigrade or Fahrenheit. If converting.

from Fahrenheit to Centigrade the equivalent temperature will be found in the left column, while if converting from degrees Centigrade to degrees Fahrenheit, the answer will be found in the column on the right.

CENTIGRADE FAHRENHEIT			CENTIGRADE FAHRENHEIT			CENTIGRADE FAHRENHEIT			CENTIGRADE FAHRENHEIT		
-273	-459		-17.8	0	32.0	12.8	55	131.0	65.6	150	302
-268	-450		-17.2	1	33.8	13.3	56	132.8	68.3	155	311
-262	-440		-16.7	2	35.6	13.9	57	134.6	71.1	160	320
-257	-430		-16.1	3	37.4	14.4	58	136.4	73.9	165	329
-251	-420		-15.6	4	39.2	15.0	59	138.2	76.7	170	338
-246	-410		-15.0	5	41.0	15.6	60	140.0	79.4	175	347
-240	-400		-14.4	6	42.8	16.1	61	141.8	82.2	180	356
-234	-390		-13.9	7	44.6	16.7	62	143.6	85.0	185	365
-229	-380		-13.3	8	46.4	17.2	63	145.4	87.8	190	374
-223	-370		-12.8	9	48.2	17.8	64	147.2	90.6	195	383
-218	-360		-12.2	10	50.0	18.3	65	149.0	93.3	200	392
-212	-350		-11.7	11	51.8	18.9	66	150.8	96.1	205	401
-207	-340		-11.1	12	53.6	19.4	67	152.6	98.9	210	410
-201	-330		-10.6	13	55.4	20.0	68	154.4	100	212	414
-196	-320		-10.0	14	57.2	20.6	69	156.2	102	215	419
-190	-310		-9.4	15	59.0	21.1	70	158.0	104	220	428
-184	-300		-8.9	16	60.8	21.7	71	159.8	107	225	437
-179	-290		-8.3	17	62.6	22.2	72	161.6	110	230	446
-173	-280		-7.8	18	64.4	22.8	73	163.4	113	235	455
-169	-273	-459	-7.2	19	66.2	23.3	74	165.2	116	240	464
-168	-270	-454	-6.7	20	68.0	23.9	75	167.0	118	245	473
-162	-260	-436	-6.1	21	69.8	24.4	76	168.8	121	250	482
-157	-250	-418	-5.6	22	71.6	25.0	77	170.6	124	255	491
-151	-240	-400	-5.0	23	73.4	25.6	78	172.4	127	260	500
-146	-230	-382	-4.4	24	75.2	26.1	79	174.2	129	265	509
-140	-220	-364	-3.9	25	77.0	26.7	80	176.0	132	270	518
-134	-210	-346	-3.3	26	78.8	27.2	81	177.8	135	275	527
-129	-200	-328	-2.8	27	80.6	27.8	82	179.6	138	280	536
-123	-190	-310	-2.2	28	82.4	28.3	83	181.4	141	285	545
-118	-180	-292	-1.7	29	84.2	28.9	84	183.2	143	290	554
-112	-170	-274	-1.1	30	86.0	29.4	85	185.0	146	295	563
-107	-160	-256	-0.6	31	87.8	30.0	86	186.8	149	300	572
-101	-150	-238	0.0	32	89.6	30.6	87	188.6	154	310	590
-96.0	-140	-220	0.6	33	91.4	31.1	88	190.4	160	320	608
-90.0	-130	-202	1.1	34	93.2	31.7	89	192.2	166	330	626
-84.0	-120	-184	1.7	35	95.0	32.2	90	194.0	171	340	644
-79.0	-110	-166	2.2	36	96.8	32.8	91	195.8	177	350	662
-73.3	-100	-148	2.8	37	98.6	33.3	92	197.6	182	360	680
-67.8	-90	-130	3.3	38	100.4	33.9	93	199.4	188	370	698
-62.2	-80	-112	3.9	39	102.2	34.4	94	201.2	193	380	716
-59.4	-75	-103	4.4	40	104.0	35.0	95	203.0	199	390	734
-56.7	-70	-94	5	41	105.8	35.6	96	204.8	204	400	752
-53.9	-65	-85	5.6	42	107.6	36.1	97	206.6	210	410	770
-51.1	-60	-76	6.1	43	109.4	36.7	98	208.4	216	420	788
-48.3	-55	-67	6.7	44	111.2	37.2	99	210.2	221	430	806
-45.6	-50	-58	7.2	45	113	37.8	100	212.0	227	440	824
-42.8	-45	-49	7.8	46	114.8	40.6	105	221.0	232	450	842
-40	-40	-40	8.3	47	116.6	43.3	110	230.0	238	460	860
-37.2	-35	-31	8.9	48	118.4	46.1	115	239.0	243	470	878
-34.4	-30	-22	9.4	49	120.2	48.9	120	248.0	249	480	896
-31.7	-25	-13	10	50	122.0	51.7	125	257.0	254	490	914
-28.9	-20	-4	10.6	51	123.8	54.4	130	266.0	260	500	932
-26.1	-15	5	11.1	52	125.6	57.2	135	275.0			
-23.3	-10	4	11.7	53	127.4	60	140	284.0			
-20.6	-5	23	12.2	54	129.2	62.8	145	293.0			

The formulas at the right may also be used for converting Centigrade or Fahrenheit degrees into the other scales.

Degrees Cent., °C = $\frac{5}{9} (°F - 32)$
 Degrees Kelvin, °T = °C + 273.2

Degrees Fahr., °F = $\frac{9}{5} °C + 32$
 Degrees Rankine, °R = °F + 459.7