

Weight

1 U.S. Gallon of Freshwater	8.330 Pounds
1 U.S. Gallon of Seawater	8.547 Pounds
1 Imperial Gallon of Freshwater	10.005 Pounds
1 Imperial Gallon of Seawater	10.266 Pounds
1 Cubic Foot of Freshwater	62.355 Pounds

Length

Centimeter	Inch	Feet	Meter	Rod	Kilometer	Mile
1.0	0.394	0.033	0.01	0.002	1.00E-06	6.21E-07
2.54	1.0	0.083	0.025	0.005	2.54E-05	1.58E-05
30.48	12.0	1.0	0.304	0.061	3.05E-04	1.89E-04
100.0	39.37	3.28	1.0	0.199	0.001	6.21E-04
503.0	198.0	16.5	5.03	1.0	0.005	0.003
1.00E+05	3.94E+04	3279.5	1000.0	198.8	1.0	0.621
1.61E+05	6.34E+04	5280.0	1610.0	320.0	1.61	1.0

Head

PSI	Foot of Water	Inch of Mercury	Kg per Sq. Cm	Atmosphere (at sea level)	Meter of Water
1.0	2.31	2.04	--	--	--
0.433	1.0	0.855	--	--	--
--	1.132	1.0	--	--	--
14.22	--	--	1.0	--	--
14.70	33.9	--	--	1.0	10.35
--	3.28	--	--	--	1.0

Power

Watts	Horsepower	Kilowatts	Foot Pounds Per Minute	Foot Pounds Per Second
1.0	1.34E-03	1.00E-03	0.737	44.236
746.0	1.0	0.746	550.0	33,000.0
1000.0	1.341	1.0	737.33	44,236.0
1.357	1.82E-03	1.36E-03	1.0	60.0
0.023	3.03E-05	2.26E-05	0.017	1.0

Inch - Millimeter Equivalents

To convert inch to mm inches x 25.4
 To convert mm to inch mm x .03937

Inches		MM	Inches		MM	Inches		MM
Fract	Decim		Fract	Decim		Fract	Decim	
	.00004	.001		.11811	3		.55	13.97
	.00039	.01	1/8	.125	3.18		.55118	14
	.00079	.02		.1378	3.5	6/16	.5625	14.29
	.001	.025	9/64	.14063	3.57		.57087	14.5
	.00118	.03		.15	3.81	37/64	.57813	14.68
	.00157	.04	5/32	.15625	3.97		.59055	15
	.00197	.05		.15748	4	19/32	.59375	15.08
	.002	.051	11/64	.17188	4.37		.6	15.24
	.00236	.06		.175	4.45	39/64	.60938	15.48
	.00276	.07		.17717	4.5		.61024	15.5
	.003	.076	3/16	.1875	4.76	5/8	.625	15.88
	.00315	.08		.19685	5		.62992	16
	.00354	.09		.2	5.08	41/64	.64063	16.27
	.00394	.10	13/64	.20313	5.16		.64961	16.5
	.004	.102		.21654	5.5		.65	16.51
	.005	.127	7/32	.21875	5.56	21/32	.65625	16.67
	.006	.152		.225	5.72		.66929	17
	.007	.178	15/64	.23438	5.95	43/64	.67188	17.07
	.00787	.2		.23622	6	11/16	.6875	17.46
	.008	.203	1/4	.25	6.35		.68898	17.5
	.009	.229		.25591	6.5	45/64	.7	17.78
	.00984	.25		.26563	6.75		.70313	17.86
	.01	.254	17/64	.275	6.99	23/32	.70866	18
	.01181	.3		.27559	7		.71875	18.6
1/64	.01563	.397		.28125	7.14	47/64	.72835	18.5
	.01575	.4	9/32	.29528	7.5		.73438	18.65
	.01969	.5		.29688	7.54	3/4	.74803	19
	.02	.508	19/64	.3	7.62		.75	19.05
	.02362	.600		.3125	7.94	49/64	.76563	19.45
	.02500	.635	5/16	.31496	8		.76772	19.5
	.02756	.7	21/64	.32813	8.33	25/32	.778125	19.84
	.02950	.750		.33465	8.5		.7874	20
	.03000	.762		.34375	8.73	51/64	.79688	20.24
1/32	.03125	.794	11/32	.35	8.89		.8	20.32
	.031	.8		.35433	9		.80709	20.5
	.03543	.9	23/64	.35938	9.13	13/16	.8125	20.64
	.03937	1		.37402	9.5		.82677	21
	.04	1.02	3/8	.375	9.53	53/64	.82813	21.03
3/64	.04687	1.19	25/64	.39063	9.92	27/32	.84375	21.43
	.04724	1.2						

Temperature Conversion Table

Fahrenheit - Centigrade

To convert °C to °F (°C x 1.8) + 32

To convert °F to °C (°F - 32) / 1.8

-60	-51	35	1.6	100	38	220	104	350	177	480	249
-50	-46	40	4.4	110	43	230	110	360	182	490	254
-40	-40	45	7.1	120	49	240	115	370	188	500	260
-30	-34	50	9.9	130	54	250	121	380	193	700	371
-20	-29	55	12.6	140	60	260	127	390	199	710	376
-10	-23	60	15.6	150	65	270	132	400	204	720	382
0	-17.7	65	18.2	160	71	280	138	410	210	730	387
5	-15	70	21	170	76	290	143	420	215	740	393
10	-12.2	75	23.8	180	83	300	149	430	221	750	399
15	-9.4	80	26.8	190	88	310	154	440	226	760	404
20	-6.6	85	29.3	200	93	320	160	450	232	770	410
25	-3.9	90	32.1	210	99	330	165	460	238	780	415
30	-1.1	95	24.9	212	100	340	171	470	243	790	421

1/16	.05	1.27		.3937	10		.84646	21.5
	.05512	1.4		.4	10.2		.85	21.59
	.05906	1.5	13.32	.40625	10.3	55/64	.85938	21.83
	.06	1.52		.41339	10.5		.86614	22
	.0625	1.59	27.64	.42188	10.7	7/8	.875	22.23
5/64	.06299	1.6		.43307	11		.88583	22.5
	.06693	1.7	7/16	.4375	11.1	5.764	.89063	22.62
	.07	1.78		.45	11.4		.9	22.86
	.07087	1.8		.45276	11.5		.90551	23
	.075	.19	29/64	.45313	11.5	29.32	.90625	23.02
5/64	.07813	1.98	15/32	.46875	11.9	59/64	.92188	23.42
	.07874	2		.47244	12		.9252	23.5
	.08	2.03	31/64	.48438	12.3	15/16	.9375	23.81
	.08661	2.2		.49213	12.5		.94488	24
	.09	2.9	1/2	.5	12.7		.95	24.13
3/32	.09055	2.3				61/64	.95313	24.21
	.09375	2.38		.51181	13		.96457	24.5
	.09843	2.5	33/64	.51563	13.1	31/32	.96875	24.61
	.1	2.54	17/32	.53125	13.5		.98425	25
	.10236	2.6		.5315	13.5	63/64	.98438	25
7/64	.10937	2.78	35/64	.84688	13.9	1	1	25.4

Volume

US Gallons	Imperial Gallons	Cubic Inches	Cubic Foot	Cubic Meters	Liters	Acre Foot	Acre Inch	Barrel (oil)
1.0	0.8327	231.0	0.1337	0.003785	3.785	325.829	27.100	42.000
1.201	1.0	277.41	0.1605	0.004545	4.545	--	--	--
0.004329	0.003603	1.0	0.000579	1.64E-05	0.1639	--	--	--
7.481	6.229	1728.0	1.0	0.02832	28.32	43.560	3.630	--
264.2	220.0	61023.0	35.314	1.0	1000.0	--	--	--
0.2642	0.22	61.023	0.03531	0.001	1.0	--	--	--

Operating Cost

Cost per 1000 Gallons	C = $\frac{\text{Kw input} \times r}{\text{GPH}}$
Cost per acre inch	C' = $\frac{451 \times r \times x}{\text{Kw in. GPM}}$
<p>C = Cost in dollars per 1000 gallons C' = Cost in dollars per acre inch R = Power rate per kilowatt hour (dollars) Kw input = Kilowatts (measured at the meter) GPH = Gallon per hour discharged by pump GPM = Gallons per minute discharged by pump</p>	

Formulas

Pipe Velocity (ft/sec)	$= \frac{.408 \times \text{GPM}}{(\text{pipe diameter})} = \frac{.321 \times \text{GPM}}{(\text{pipe area})}$
Velocity Head (feet)	$= \frac{(\text{pipe velocity ft/sec})^2}{64.4}$
Water Horsepower	$= \frac{\text{GPM} \times \text{Head in Feet} \times \text{Specific Gravity}}{3960}$
Brake Horsepower (pump)	$= \frac{\text{GPM} \times \text{Head in Feet} \times \text{Specific Gravity}}{3960 \times \text{Pump Efficiency}}$
Brake Horsepower (motor)	$= \frac{\text{Watts Input} \times \text{Motor Efficiency}}{746}$
Efficiency (pump)	$= \frac{\text{GPM} \times \text{Head in Feet} \times \text{Specific Gravity}}{3960 \times \text{BHP}} = \frac{\text{Water Horsepower}}{\text{Brake Horsepower}}$
Efficiency (motor)	$= \frac{\text{HP Output}}{\text{Kw Input} \times 1.34}$
Pressure (lbs. per sq. in.)	$= \frac{\text{Head in Feet} \times \text{Specific Gravity}}{2.31} = \text{Head in Feet} \times \text{Specific Gravity} \times .434$
Head in Feet	$= \frac{\text{Pounds per Square Inch} \times 2.31}{\text{Specific Gravity}}$
Area of a Circle	$= (\text{diameter}) \times 0.7854$
Circumference of a circle	$= (\text{diameter}) \times 3.1416$
Volume of a cylinder	$= (\text{diameter})^2 \times .7854 \times (\text{height of cylinder})$

Electric Power	Measurement of Electric Power	
AC = Alternating Current	For DC Power use DC voltmeter and DC ammeter	
DC = Direct Current	Power W	$= E \times I$
E = Volts = Electric pressure (similar to head)	Hp input	$= \frac{W}{746} = \text{Kw} \times 1.34$
I = Amperes = Electrical current (similar to rate of flow)	AC Power - 1 Phase use single phase wattmeter	
W = Watts = Electrical power (similar to head capacity)	HP input	$= \frac{W}{746} = \text{Kw} \times 1.34$
Kw = Kilowatts = 1000 watts	AC Power - 3 Phase use A) One 3 phase wattmeter B) Two single phase watt meters C) Power Co. revolving disc watt hour meter	
Apparent Power = Volts x Amperes = Volt amperes = EI	Method for calculating power for a revolving disc watt hour meter:	
Useful Power W = EI x PF	Kilowatts input	$= \text{Kw} = \frac{K \times R \times 3.60}{t}$
Power Factor = $\frac{W}{EI}$	HP input	$= \frac{K \times R \times 3600}{746 \times t} = \frac{4.83 \times K \times R}{t}$
Kw hr = Kilowatt hour	HP output	$= \text{HP input} \times \text{Motor efficiency}$
Single phase power W = E x I x PF Where E = Average voltage between phases I = Average current in each phase	K* = Constant = Watts for one revolution of revolving disc R = Number of revolutions of disc T = Second for R revolutions * Usually found on meter nameplate or on revolving disc. Where current transformers are used, multiply meter constant by current transformer ratio.	

Metric Conversion Factors

Multiply	By	To Obtain	Multiply	By	To Obtain
Atmospheres	6	Centimeters of mercury	Horsepower-hours	2544	B.t.u.
	29.92	inches of mercury		641.1	kilogram-calories
	33.9	feet of water	0.7455	kilowatt hours	
	10.332	kilograms per sq meter	Inches	2.54	centimeters
	14.7	pounds per sq inch		0.083	feet
1.058	tons per sq foot	Kilograms	980.665	dynes	
British Thermal Units	778.2		foot-pounds	70.93	poundals
	1055	joules	2.205	pounds	
	0.252	kilogram-calories	Months	30.42	days
	107.6	kilogram-meters		730	hours
B.t.u. per minute	12.97	foot-pounds per second	43,800	minutes	
	0.02368	horsepower	Pounds	444.823	dryness
	0.01758	kilowatts		7000	grains
	17.58	watts		453.6	grams
Centimeters	0.03281	feet		16	ounces
	0.3937	inches	32.17	poundals	
	0.01	meters	Radians	57.3	degrees
	10	millimeters		3438	minutes
	393.7	mils.	0.6366	quadrants	
Foot-pounds	1.356	joules	Radians per second	57.3	degrees per second
	0.01383	kilogram-meters		9.549	rev. per minute
Foot-pounds per minute	0.01667	foot-pounds per second	0.1592	rev. per second	
			Radians per sec per sec	573	rpm per minute
9.549	rpm per second				
0.1592	rpm per second				
Horsepower	42.4	B.t.u. per minute	Revolutions	360	degrees
	33,000	foot-pounds per minute		4	quadrants
	550	foot-pounds per second		6.283	radians
	1.013	h.p. (metric)	Square foot	144	sq. inches
	10.68	kilogram-calories per minute		0.0929	sq. meters
0.7457	kilowatts				
745.7	watts				