



Useful Information

Conversion Factors

Volumetric Flow Capacity

Litres per second /s	Litres per minute l/min	Cubic metres per hour m ³ /hr	Cubic metres per minute m ³ /min	Cubic Feet per hour ft ³ /hr	Cubic Feet per minute ft ³ /min	Imp. gallon per minute Imp. gal/min	US gallon per minute US gal/min
1	60	3.6	0.06	127.133	2.1189	13.2	15.85
0.017	1	0.06	0.01	2.1189	0.0353	0.22	0.264
0.278	16.667	1	0.0167	35.3147	0.5886	3.666	4.403
16.67	1000	60	1	2118.882	35.3147	220	264
0.008	0.472	0.0283	0.00047	1	0.0167	0.104	0.125
0.472	23.317	1.699	0.0283	60	1	6.229	7.480
0.076	4.546	0.2728	0.0045	9.6326	0.1605	1	1.201
0.063	3.785	0.2271	0.0037	8.0209	0.1337	0.833	1

Pressure and Liquid Head

Metres of Water m H ₂ O	Feet of Water ft H ₂ O	Kilogram force per centimetre square kgf/cm ²	Pound force per square inch psi	Bar	KiloPascal kPa	Newton per square metre N/m ²	Millimetre of mercury mm Hg
1	3.28	0.1	1.42	0.098	9.789	9789	73.42
0.305	1	0.0305	0.433	0.03	2.984	2984	22.42
10	32.81	1	14.22	0.0981	98.07	98067	735.6
0.703	2.31	0.0703	1	0.069	6.895	6895	51.72
10.2	33.52	1.02	14.5	1	100	100000	750
0.102	0.335	0.0102	0.145	0.01	1	1000	7.5
0.000102	0.000335	0.0000102	0.000145	0.00001	0.001	1	0.0075
0.014	0.045	0.0014	0.019	0.0013	0.133	133.3	1 (torr)

Volume

Cubic Metre m ³	Litres l	Millilitre ml	Imperial Gallon imp. gal	US Gallon US. gal	Cubic Feet ft ³	Pound of water lbs H ₂ O	Cubic inch in ³
1	1000	1000000	220	264.2	35.3147	2200	61032
0.001	1	1000	0.22	0.2642	0.0353	2.2	61.032
0.000001	0.001	1	0.00022	0.000264	0.000035	0.0022	0.06103
0.0045	4.546	4546	1	1.201	0.1605	10	277.42
0.0038	3.785	3785	0.8327	1	0.1337	8.333	231.06
0.0283	25.317	28317	6.2288	7.4805	1	62.3	1728
0.00046	0.04546	454.6	0.1	0.12	0.0161	1	27.742

Weight

Pounds lbs	Ounce oz	Grams gm	Kilograms kg	Ton tn	Tonne t	Centum weight cwt	Stone
1	16	453.6	0.4536	0.000446	0.0004536	0.008929	0.07143
0.0625	1	28.35	0.02836	0.000027	0.000028	0.000558	0.00446
0.022	0.03527	1	0.001	-	-	0.000019	0.00015
2.205	35.274	1000	1	0.000984	0.001	0.01968	0.15748
2240	35.840	1016064	1016	1	1.016	20	160
2204.6	35.274	1000000	1000	0.9842	1	19.684	157.48
112	1792	50803	50.8	0.05	0.0508	1	8
14	224	6350	6.35	0.00625	0.0064	0.125	1

Length

Inch in	Foot ft	Yard yd	Centimetre cm	Metre m	Mile mi	Kilometre km	Chain
1	0.0833	0.02778	2.54	0.0254	0.000016	0.000025	0.00126
12	1	0.3333	30.48	0.3048	0.000189	0.000305	0.01515
36	3	1	91.44	0.9144	0.000568	0.000914	0.04545
0.3937	0.0328	0.01093	1	0.01	-	-	0.0005
39.37	3.2808	1.0936	100	1	0.00062	0.001	0.0497
63360	5280	1760	160934	1609.4	1	1.6094	80
36371	3280.9	1093.6	100000	1000	0.6214	1	49.71
792	66	22	2011.68	20.116	0.0125	0.0201	1

Temperature Equivalents

Water Boils at 100 C or 212 F (Pr = 1 at
 Water Freezes at 0 C or 32 F (Pr = 1 at
 Centigrade = (F - 32) x 5 / 9
 Fahrenheit = (C x 9 / 5) + 32

Power Equivalents

KiloWatt (kW) = Horse Power (HP) x 0.746
 Horse Power (HP) = Watt (W) / 746

Pump Affinity Laws

Power varies as RPM³ or D³
 Pressure varies as RPM² or D²
 Volume varies as RPM

Where: RPM = Speed of revolution of impeller
 D = Diameter of impell

Suction Lift

Elevation m	Max. Practical Suction m	Water Temp °C	Max. Practical Suction m
Sea Level	6.7	50	2.6
500	6.2	60	1.2
700	6	70	0
1000	5.7	80	-1.2
1500	5	90	-2.6

Pumps do not actually suck, rather pumps create a partial vacuum into which atmospheric pressure pushes water via the suction pipework.

Factors affecting suction lift:

- ◆ **Altitude:** As altitude increases atmospheric pressure decreases, thus exerting less "push" on the water entering the pump suction
- ◆ **Pump Suction Performance:** Generally, the higher the flow rate from a pump, the less the partial vacuum created by that pump
- ◆ **Water Temperature:** The higher the water temperature, the more likely it is to boil when exposed to partial vacuum, thus reducing lift
- ◆ **Friction Loss:** Friction loss in the suction pipe reduces the vertical lift possible

In practical terms, a maximum suction lift of 6.7 metres at sea level is common, but all of the items above will reduce this figure

Common Water Requirements

Fixture	Average Flow l/min	Average Pressure psi
Shower	15	20
Flushing bowl	12	15
Lawn Sprinkler	15	20
1/2" tap	15	20
3/4" hose & 1/4" nozzle	40	30
1" hose & 3/8" nozzle	75	30