

HANDY CONSTANTS AND FORMULAS

WEIGHT OF DISTILLED WATER :	@ 0° C.	(32° F)	-	62.4201 lbs./cu. ft.	(0.9999 kg./liter)
	@ 3.98° C.	(39.16° F)	-	62.4280 lbs./cu. ft.	(1.0000 kg./liter)
	@ 15.56° C.	(60° F)	-	62.3718 lbs./cu. ft.	(0.9991 kg./liter)
	@ 50° C.	(122° F)	-	61.6953 lbs./cu. ft.	(0.9883 kg./liter)
	@ 100° C.	(212° F)	-	59.8476 lbs./cu. ft.	(0.9587 kg./liter)

One cubic foot contains 7.4805195 gallons; thus a gallon of distilled water weighs 8.33 lbs.

For most practical purposes a liter equals a cubic decimeter; however a more exact figure is 1.000028 cubic decimeters.

One cubic foot of water @ 0° C. will make 1.11 cubic feet of ice @ 0° C.

The specific gravity of seawater in the Gulf of Mexico varies with salinity, but usually runs from 1.020 to 1.028. The generally accepted norm is a specific gravity of 1.024 (i.e. 63.87 lbs./cu. ft.).

DENSITY OF WATER

CENTIGRADE TEMPERATURE	VOLUME OF 1 KILOGRAM OF WATER IN LITERS*
0.0	1.000126
3.98	1.000000
10.0	1.000257
20.0	1.001732
30.0	1.004234
40.0	1.007627
50.0	1.011877
60.0	1.016954
70.0	1.022384
80.0	1.029003
90.0	1.035829
100.0	1.043116

* Atmospheric pressure of 14.696 lbs./sq. in. (1.0333 kilograms/square centimeter)

WEIGHTS ABOVE AND UNDER WATER

(in lbs./ cubic foot)

MATERIAL	ABOVE WATER	UNDER FRESH WATER <i>(62.37 lbs/cu.ft)</i>	UNDER SEAWATER <i>(63.87 lbs/cu.ft)</i>
Carbon Steel	489.60	427.23	425.73
Stainless Steel - 304	510.98	448.61	447.11
Concrete (Normal Density)	144.00	81.63	80.13
Aluminum (1100 or 6061)	169.32	106.95	105.45
Aluminum (5052)	167.42	105.05	103.55
Brass (Naval Cold Rolled)	528.77	466.40	464.90
Copper (Cold Rolled)	556.44	494.07	492.57
Bronze (SAE-660)	564.36	501.99	500.49
Lead	708.00	645.60	644.10
Spectra® 900 & 1000	60.49	- 1.88	- 3.38
Aramid (Kevlar®)	89.81	27.50	26.00
Nylon	71.10	8.73	7.23

LINE OF SIGHT RANGE FORMULAS

D = Range in Nautical Miles

RADAR: $D = 2.23 \left(\sqrt{hm1} + \sqrt{hm2} \right)$
 or $D = 1.23 \left(\sqrt{hf1} + \sqrt{hf2} \right)$

- Where:
- hm1 = height of radar scanner in meters
 - hm2 = height of target in meters
 - hf1 = height of radar scanner in feet
 - hf2 = height of target in feet
 - hm3 = height of eye in meters
 - hm4 = height of object in meters
 - hf3 = height of eye in feet
 - hf4 = height of object in feet

VISUAL: $D = 2.06 \left(\sqrt{hm3} + \sqrt{hm4} \right)$
 or $D = 1.14 \left(\sqrt{hf3} + \sqrt{hf4} \right)$