

**Conversion Charts & Formulas**

**LENGTH** — Basic unit is meter (m)

Metric Unit	Meters	Inches	Feet	Yards	Miles
Millimeter (mm)	.001	—	—	—	—
Centimeter (cm)	.01	.3937	—	—	—
Decimeter (dm)	.1	3.937	.3281	.1094	—
Meter (m)	1	39.37	3.281	1.094	—
Decameter (dkm)	10	393.7	32.81	10.94	—
Hectometer (hm)	100	3937	328.1	109.4	—
Kilometer (km)	1000	—	3281	1094	.6214

**To Convert**

**Inch to mm**  
Multiply by 25.4

**mm to Inch**  
Multiply by .03937

**Feet to Inch**  
Multiply by 3048

**Meters to Feet**  
Multiply by 3.281

**Yards to Meters**  
Multiply by .9144

**Meters to Yards**  
Multiply by 1.094

**Miles to Km**  
Multiply by 1.609

**Km to Miles**  
Multiply by .6214

**VOLUME** — Basic unit is stere (s) which is 1 cubic meter

Metric Unit	Steres	Cubic Inch	Cubic Feet	Cubic Yards
Cu. Millimeter (cu mm)	.000000001	—	—	—
Cu. Centimeter (cu cm)	.000001	.3937	—	—
Cu. Decimeter (cu dm)	.001	3.937	.3281	.1094
Decistere (ds)	.1	39.37	3.281	1.094
Stere/Cu Meter (sicu m)	1	393.7	32.81	10.94
Decastere (dks)	10	3937	328.1	109.4

**To Convert**

**Cu.In. to Cu.mm**  
multiply by 1639

**Cu.mm to Cu.In.**  
multiply by .00061

**Cu.In. to Cu.cm**  
multiply by 16.39

**Cu.cm to Cu.In.**  
multiply by .06102

**Cu.Ft. to Cu.m**  
multiply by .0283

**Cu.m to Cu.Ft.**  
multiply by 35.31

**Cu.Yds. to Cu.m**  
multiply by .7646

**Cu.m to Cu.yds.**  
multiply by 1.308

**AREA** — Basic unit is Centare (CA) which is 1 square meter

Metric Unit	Centares	Square Inches	Square Feet	Square Yards	Acres
Sq. Millimeter (sq.cm.)	.00001	—	—	—	—
Sq. Centimeter (sq.cm.)	.0001	.1550	—	—	—
Sq. Decimeter (sq.dm.)	.01	15.50	.1076	—	—
Centare/Sq meter (ca/sq m)	1	1550	10.76	1.196	—
Area (a)	100	—	1076	119.6	—
Hectare (ha)	10,000	—	—	—	2.471
Sq. Kilometer (sq.km)	1,000,000	—	—	—	247.1

**To Convert**

**Sq. in. to sq. cm**  
multiply by 6.452

**Sq. cm to sq. in.**  
multiply by .1550

**Sq. Ft. to sq. m.**  
multiply by .0929

**Sq. m. to sq. ft.**  
multiply by 10.76

**Sq. yds to sq. m.**  
multiply by .8361

**Sq. m. to sq. yds.**  
multiply by 1.196

**Acres to Hectares**  
multiply by .4047

**Hectares to Acres**  
multiply by 2.471

**Acres to sq. km.**  
multiply by .004047

**Sq. km to Acres**  
multiply by 247.1

**Sq. miles to sq. km**  
multiply by 2.590

**Sq. km to sq. miles**  
multiply by .3861

**WEIGHT** — Basic unit is gram (g)

Metric Unit	Grams	Grains	Ounces	Pounds
Milligram (mg)	.001	.01543	—	—
Centigram (cg)	.01	1.543	—	—
Decigram (dg)	.1	15.43	—	—
Gram	1	15.43	.03527	—
Decagram (dkg)	10	154.3	.3527	—
Hectogram (hg)	100	1543	3.527	.22046
Kilogram (kg)	1000	—	35.27	2.2046
Quintal (q)	100,000	—	3527	220.46
Metric Ton (MT)	1,000,000	—	—	2204.6

**To Convert**

**G to CG**  
multiply by 6.48

**CG to G**  
multiply by .1543

**Ounces to G**  
multiply by 31.103

**G to Ounces**  
multiply by .03527

**Pounds to KG**  
multiply by .4536

**KG to Pounds**  
multiply by 2.2046

**Tons (2000#) to Metric Tons** - multiply by .9078  
**Metric Tons to Tons (2000#)** - multiply by 1.1023

**Specific Gravity of Liquids**

LIQUID	TEMP °F	SPECIFIC GRAVITY
Water (1 cu. ft. weighs 62.41 lb)	50	1.00
Brine (Sodium Chloride 25%)	32	1.20
Pennsylvania Crude Oil	80	0.85
Fuel Oil No. 1 and 2	85	0.95
Gasoline	80	0.74
Kerosene	85	0.82
Lubricating Oil SAE 10-20-30	115	0.94

LIQUID	TEMP °F	SPECIFIC GRAVITY
30% Acetic Acid	68	1.04
50% Acetic Acid	68	1.05
20% Chromic Acid	68	1.16
20% Hydrogen Peroxide	68	1.07
25% Methyl Alcohol	68	0.96
10% Nitric Acid	68	1.05
20% Nitric Acid	68	1.11

LIQUID	TEMP °F	SPECIFIC GRAVITY
20% Phosphoric Acid	68	1.11
20% Sodium Hydroxide	68	1.21
50% Sodium Hydroxide	68	1.52
20% Sulphuric Acid	68	1.14
50% Sulphuric Acid	68	1.40
98% Sulphuric Acid	68	1.83

**Conversion Constants**

To Change	To	Multiply By
Inches	Feet	0.0833
Inches	Millimeters	25.4
Feet	Inches	12
Feet	Yards	0.3333
Yards	Feet	3
Square Inches	Square feet	0.00694
Square feet	Square Inches	144
Square feet	Square yards	0.11111
Square yards	Square feet	9
Cubic Inches	Cubic feet	0.00058
Cubic feet	Cubic Inches	1728
Cubic feet	Cubic yards	0.03703
Cubic yards	Cubic feet	27
Cubic Inches	Gallons	0.00433
Cubic feet	Gallons	7.48
Gallons	Cubic Inches	231
Gallons	Cubic feet	0.1337
Gallons	Pounds of water	8.33
Pounds of water	Gallons	0.12004
Ounces	Pounds	0.0625
Pounds	Ounces	16
Inches of water	Pounds per sq. inch	0.0361

To Change	To	Multiply By
Inches of water	Inches of mercury	0.0
Inches of water	Ounces per sq. inch	0.5
Inches of water	Pounds per sq. foot	5.2
Inches of mercury	Inches of water	13.
Inches of mercury	Feet of water	1.1
Inches of mercury	Pounds per sq. inch	0.4
Ounces per sq. inch	Inches of mercury	0.1
Ounces per sq. inch	Inches of water	1.7
Pounds per sq. inch	Inches of water	27.
Pounds per sq. inch	Feet of water	2.3
Pounds per sq. inch	Inches of mercury	2.0
Pounds per sq. inch	Atmospheres	0.0
Feet of water	Pounds per sq. inch	0.4
Feet of water	Pounds per sq. foot	62.
Feet of water	Inches of mercury	0.8
Atmospheres	Pounds per sq. inch	14.
Atmospheres	Inches of mercury	29.
Atmospheres	Feet of water	34
Long Tons	Pounds	224
Short Tons	Pounds	200
Short Tons	Long Tons	0.89

Volume	
1 gal. (U.S.)	= 128 fl. oz. (U.S.)
1 cu. ft.	= 231 cu. in.
	= 0.833 gal. (Brit.)
	= 7.48 gal. (U.S.)

Temperature	
°C	= (°F - 32) X .556
°F	= C(1.8) + 32

Pressure	
1 lb. per sq. in.	= 2.31 ft. water at 60°F.
	= 2.04 in. hg at 60°F.
1 ft. water at 60°F	= 0.4333 lb. per sq. in.
	= 0.884 in. hg at 60°F.
1 in. Hg at 60°F	= 0.49 lb. per sq. in.
	= 1.13 ft. water at 60°F.
1 lb. per sq. in.	= lb. per sq. in. gauge (psig) + 14.7 Absolute (psia)

Mass	
1 lb. (avoir)	= 16 oz. (avoir.)
1 ton (short)	= 7000 grain
1 ton (long)	= 2000 lb.
	= 2240 lb.

Flow	
1 gpm	= 0.134 cu. ft. per min.
	= 500 lb. per hr. x sp. gr.
500 lb. per hr.	= 1 gpm x sp. gr.
1 cu. ft. per min. (cfm)	= 448.8 gal. per hr. (gph)

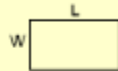
**Formulas**

**Where**

A = Area ; A1 = Surface area of solids;  
V = Volume; C = Circumference

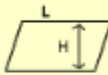
**Rectangle**

$A = W \times L$



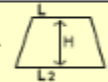
**Parallelogram**

$A = H \times L$



**Trapezoid**

$A = H \times \frac{L1 + L2}{2}$



**Triangle**

$A = \frac{W \times H}{2}$



**Circle**

$A = 3.142 \times R \times R$   
 $C = 3.142 \times D$   
 $R = \frac{D}{2}$   
 $R = 2 \times R$



**Sector of Circle**

$A = 3.142 \times R \times R \times \frac{\alpha}{360}$   
 $\alpha = \frac{L}{.01745 \times R}$     $R = \frac{L}{.01745 \times \alpha}$   
 $L = .01745 \times R \times \alpha$



**Ellipse**

$A = 3.142 \times A \times B$

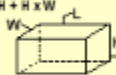
$C = 6.283 \times \frac{\sqrt{A^2 + B^2}}{2}$



**Rectangular Solid**

$A1 = 2W \times L + L \times H + H \times W$

$V = W \times L \times H$



**Cone**

$A1 = 3.142 \times R \times S + 3.142 \times R \times R$

$V = 1.047 \times R \times R \times H$



**Cylinder**

$A1 = 6.283 \times R \times H + 6.283 \times R \times R$

$V = 3.142 \times R \times R \times H$



**Elliptical Tanks**

$V = 3.142 \times A \times B \times H$

$A1 = 6.283 \times \frac{\sqrt{A^2 + B^2}}{2} \times H + 6.283 \times A \times B$



**Sphere**

$V = 4.188 \times R \times R \times R$

$A = 12.56 \times R \times R$

For Above Containers

Capacity in Gallons =  $\frac{V}{231}$

when V is cu. inches

Capacity in Gallons =  $7.48 \times V$

when V is in cu.feet.

