

# METRIC SYSTEM OF MEASUREMENTS

The principal units are the meter for length, the liter for capacity and the gram for weight. The following prefixes are used for sub-divisions and multiples: milli = 1/1000; centi = 1/100; deci = 1/10; deca = 10; hecto = 100; kilo = 1000.

## Measures of Length

10 millimeters (mm.) = 1 centimeter (cm.)  
10 centimeters = 1 decimeter (dm.)  
10 decimeters = 1 meter (m.)  
1000 meters = 1 kilometer (km.)

## Measures of Weight

10 milligrams (mg.) = 1 centigram (cg.)  
10 centigrams = 1 decigram (dg.)  
10 decigrams = 1 gram (g.)  
10 grams = 1 decagram (Dg.)  
10 decagrams = 1 hectogram (Hg.)  
10 hectograms = 1 Kilogram (Kg.)  
1000 kilograms = 1 (metric) ton (T.)

## Length Conversion Constants for Metric and U.S. Units

Millimeters  $\times$  .039370 = inches.  
Meters  $\times$  39.370 = inches.  
Meters  $\times$  3.2808 = feet.  
Meters  $\times$  1.09361 = yards.  
Kilometers  $\times$  3,280.8 = feet.  
Kilometers  $\times$  .62137 = Statute Miles.  
Kilometers  $\times$  .53959 = Nautical Miles.

## Surveyor's Square Measure

100 square meters (m.<sup>2</sup>) = 1 are (ar.)  
100 ares = 1 hectare (har.)  
100 hectares = 1 sq. kilometer (Km.<sup>2</sup>)

## Square Measure

100 sq. millimeters (mm.<sup>2</sup>) = 1 sq. centimeter (cm.<sup>2</sup>)  
100 sq. centimeters = 1 sq. decimeter (dm.<sup>2</sup>)  
100 sq. decimeters = 1 sq. meter (m.<sup>2</sup>)

## Cubic Measure

1000 cu. millimeters (mm.<sup>3</sup>) = 1 cu. centimeter (cm.<sup>3</sup>)  
1000 cu. centimeters = 1 cu. decimeter (dm.<sup>3</sup>)  
1000 cu. decimeters = 1 cu. meter (m.<sup>3</sup>)

## Dry and Liquid Measure

10 milliliters (ml.) = 1 centiliter (cl.)  
10 centiliters = 1 deciliter (dl.)  
10 deciliters = 1 liter (l.)  
100 liters = 1 hectoliter (Hl.)  
1 liter = 1 cubic decimeter = the volume of 1 kilogram of pure water at a temperature of 39.2 degrees F.

Inches  $\times$  25.4001 = millimeters.  
Inches  $\times$  .0254 = meters.  
Feet  $\times$  .30480 = meters.  
Yards  $\times$  .91440 = meters.  
Feet  $\times$  .0003048 = kilometers.  
Statute Miles  $\times$  1.60935 = kilometers.  
Nautical Miles  $\times$  1.85325 = kilometers.

## Weight Conversion Constants for Metric and U.S. Units

Grams  $\times$  981 = dynes.  
Grams  $\times$  15.432 = grains.  
Grams  $\times$  .03527 = ounces (Avd.).  
Grams  $\times$  .033818 = fluid ounces (water).  
Kilograms  $\times$  35.27 = ounces (Avd.).  
Kilograms  $\times$  2.20462 = pounds (Avd.).  
Metric Tons (1000 Kg.)  $\times$  1.10231 = Net Ton (2000 lbs.).  
Metric Tons (1000 Kg.)  $\times$  .98421 = Gross Ton (2240 lbs.).

Dynes  $\times$  .0010193 = grams.  
Grains  $\times$  .0648 = grams.  
Ounces (Avd.)  $\times$  28.35 = grams.  
Fluid Ounces (Water)  $\times$  29.57 = grams.  
Ounces (Avd.)  $\times$  .02835 = kilograms.  
Pounds (Avd.)  $\times$  .45359 = kilograms.  
Net Ton (2000 lbs.)  $\times$  .90719 = Metric Tons (1000 Kg.).  
Gross Ton (2240 lbs.)  $\times$  1.01605 = Metric Tons (1000 Kg.).

## Area Conversion Constants for Metric and U.S. Units

Square Millimeters  $\times$  .00155 = square inches.  
Square Centimeters  $\times$  .155 = square inches.  
Square Meters  $\times$  10.76387 = square feet.  
Square Meters  $\times$  1.19599 = square yards.  
Hectares  $\times$  2.47104 = acres.  
Square Kilometers  $\times$  247.104 = acres.  
Square Kilometers  $\times$  .3861 = square miles.

Square Inches  $\times$  645.163 = square millimeters.  
Square Inches  $\times$  6.45163 = square centimeters.  
Square Feet  $\times$  .0929 = square meters.  
Square Yards  $\times$  .83613 = square meters.  
Acres  $\times$  .40469 = hectares.  
Acres  $\times$  .0040469 = square kilometers.  
Square Miles  $\times$  2.5899 = square kilometers.

## Volume Conversion Constants for Metric and U.S. Units

Cubic Centimeters  $\times$  .033818 = fluid ounces.  
Cubic Centimeters  $\times$  .061023 = cubic inches.  
Cubic Centimeters  $\times$  .271 = fluid drams.  
Liters  $\times$  61.023 = cubic inches.  
Liters  $\times$  1.05668 = quarts.  
Liters  $\times$  .26417 = gallons.  
Liters  $\times$  .035317 = cubic feet.  
Hectoliters  $\times$  26.417 = gallons.  
Hectoliters  $\times$  3.5317 = cubic feet.  
Hectoliters  $\times$  2.83794 = bushel (2150.42 cu. in.)  
Hectoliters  $\times$  .1308 = cubic yards.  
Cubic Meters  $\times$  264.17 = gallons.  
Cubic Meters  $\times$  35.317 = cubic feet.  
Cubic Meters  $\times$  1.308 = cubic yards.

Fluid Ounces  $\times$  29.57 = cubic centimeters.  
Cubic Inches  $\times$  16.387 = cubic centimeters.  
Fluid Drams  $\times$  3.69 = cubic centimeters.  
Cubic Inches  $\times$  .016387 = liters.  
Quarts  $\times$  .94636 = liters.  
Gallons  $\times$  3.78543 = liters.  
Cubic Feet  $\times$  28.316 = liters.  
Gallons  $\times$  .0378543 = hectoliters.  
Cubic Feet  $\times$  .28316 = hectoliters.  
Bushels (2150.42 cu. in.)  $\times$  .352379 = hectoliters.  
Cubic Yards  $\times$  7.645 = hectoliters.  
Gallons  $\times$  .00378543 = cubic meters.  
Cubic Feet  $\times$  .028316 = cubic meters.  
Cubic Yards  $\times$  .7645 = cubic meters.

## Power and Heat Conversion Constants for Metric and U.S. Units

Calorie  $\times$  0.003968 = B.T.U.  
Joules  $\times$  .7373 = foot pounds.  
Kilogram-meters  $\times$  7.233 = foot pounds.  
Cheval Vapeur  $\times$  .9863 = Horsepower.  
Kilowatts  $\times$  1.34 = Horsepower.  
Kilowatt Hours  $\times$  3415 = B.T.U.  
(Degrees Cent.  $\times$  1.8) + 32 = degrees Fahr.  
(Degrees Reamur  $\times$  2.25) + 32 = degrees Fahr.

B.T.U.  $\times$  252 = calories.  
Foot Pounds  $\times$  1.3563 = joules.  
Foot Pounds  $\times$  .13825 = kilogram-meters.  
Horsepower  $\times$  1.014 = Cheval Vapeur.  
Horsepower  $\times$  .746 = kilowatts.  
B.T.U.  $\times$  .00029282 = kilowatt hours.  
(Degrees Fahr. - 32)  $\times$  .555 = degrees Cent.  
(Degrees Fahr. - 32)  $\times$  .444 = degrees Reamur.