

# WEIGHTS AND MEASURES—U.S.A.

## ■ LIQUID MEASURE

4 gills (gi.) = 1 pint (pt.) (= 28.875 cubic inches)  
 2 pints = 1 quart (qt.) (= 57.75 cubic inches)  
 4 quarts = 1 gallon (gal.) (= 231 cubic inches) =  
 8 pints = 32 gills

## ■ AREA MEASURE

144 square inches = 1 square foot (sq. ft.)  
 9 square feet = 1 square yard (sq. yd.) = 1,296  
 square inches  
 30¼ square yards = 1 square rod (sq. rd.) = 272¼  
 square feet  
 160 square rods = 1 acre = 4,840 square yards =  
 43,560 square feet  
 640 acres = 1 square mile (sq. mi.)  
 1 mile square = 1 section (of land)  
 6 miles square = 1 township = 36 sections = 36  
 square miles

## ■ LINEAR MEASURE

12 inches (in.) = 1 foot (ft.)  
 3 feet = 1 yard (yd.)  
 5½ yards = 1 rod (rd.), pole, or perch (16½ ft.)  
 40 rods = 1 furlong (fur.) = 220 yards = 660  
 feet  
 8 furlongs = 1 statute mile (mi.) = 1,760 yards  
 = 5,280 feet  
 3 miles = 1 league = 5,280 yards = 15,840 feet  
 5,280 feet = 1 statute or land mile  
 6,076.11549 feet = 1 international nautical mile

## ■ CUBIC MEASURE

1,728 cubic inches (cu. in.) = 1 cubic foot (cu. ft.)  
 27 cubic feet = 1 cubic yard (cu. yd.)

## ■ TROY WEIGHT

24 grains = 1 pennyweight (dwt.)  
 20 pennyweights = 1 ounce troy (oz. t.) = 480 grains  
 12 ounces troy = 1 pound troy (lb. t.) = 240 penny-  
 weights = 5,760 grains

## ■ GUNTER'S OR SURVEYOR'S CHAIN MEASURE

7.92 inches (in.) = 1 link (li.)  
 100 links = 1 chain (ch.) = 4 rods = 66 ft.  
 80 chains = 1 statute mile (mi.) = 320 rods =  
 5,280 ft.

## ■ DRY MEASURE

2 pints (pt.) = 1 quart (qt.) (= 67.2006 cubic inches)  
 8 quarts = 1 peck (pk.) (= 537.605 cubic inches) =  
 16 pints  
 4 pecks = 1 bushel (bu.) (= 2,150.42 cubic inches)  
 = 32 quarts

## ■ APOTHECARIES' WEIGHT

20 grains = 1 scruple (s. ap.)  
 3 scruples = 1 dram apothecaries' (dr.  
 ap.) = 60 grains  
 8 drams apothecaries' = 1 ounce apothecaries' (oz.  
 ap.) = 24 scruples = 480  
 grains  
 12 ounces apothecaries' = 1 pound apothecaries' (lb.  
 ap.) = 96 drams apothecaries' = 288 scruples =  
 5,760 grains

## ■ APOTHECARIES' FLUID MEASURE

60 minims (min.) = 1 fluid dram (fl. dr.) (= 0.2256  
 cubic inch)  
 8 fluid drams = 1 fluid ounce (fl. oz.) (= 1.8047  
 cubic inches)  
 16 fluid ounces = 1 pint (pt.) (= 28.875 cubic  
 inches) = 128 fluid drams  
 2 pints = 1 quart (qt.) (= 57.75 cubic  
 inches) = 32 fluid ounces = 256  
 fluid drams  
 4 quarts = 1 gallon (gal.) (= 231 cubic  
 inches) = 128 fluid ounces =  
 1,024 fluid drams

## ■ AVOIRDUPOIS WEIGHT

(The "grain" is the same in avoirdupois,  
 troy, and apothecaries' weights.)

27 11/32 grains = 1 dram (dr.)  
 16 drams = 1 ounce (oz.) = 437½ grains  
 16 ounces = 1 pound (lb.) = 256 drams =  
 7,000 grains  
 100 pounds = 1 hundredweight (cwt.)\*  
 20 hundredweights = 1 ton (tn.) = 2,000 pounds\*

In "gross" or "long" measure, the following  
 values are recognized:

112 pounds = 1 gross or long  
 hundredweight\*  
 20 gross or long hundredweights = 1 gross or long ton  
 = 2,240 pounds\*

## DECIMAL EQUIVALENT TO FRACTION

¼ = .015625	⅓ = .33	1⅓ = .6875
⅓ = .03125	⅔ = .375	⅞ = .70
½ = .0625	¾ = .40	¾ = .75
⅔ = .125	⅘ = .4375	⅘ = .80
¾ = .1429	⅙ = .50	1⅙ = .8125
⅘ = .1667	⅚ = .5625	⅚ = .8333
⅙ = .1875	⅗ = .60	⅗ = .8571
⅚ = .25	⅛ = .625	⅛ = .875
⅞ = .30	⅜ = .6667	1⅜ = .9375

## PERCENT AS FRACTION

5% = 0.05 = 1/20	40% = 0.40 = 2/5
8⅓% = 0.08⅓ = 1/12	50% = 0.50 = 1/2
10% = 0.10 = 1/10	58⅓% = 0.58⅓ = 7/12
12½% = 0.125 = 1/8	60% = 0.60 = 3/5
16⅔% = 0.16⅔ = 1/6	62½% = 0.625 = 5/8
20% = 0.20 = 1/5	75% = 0.75 = 3/4
25% = 0.25 = 1/4	80% = 0.80 = 4/5
33⅓% = 0.33⅓ = 1/3	83⅓% = 0.83⅓ = 5/6
37½% = 0.375 = 3/8	87½% = 0.875 = 7/8

# WEIGHTS AND MEASURES—METRIC

## Measures of Length

10 millimeters	=	1 centimeter, cm
10 centimeters	=	1 decimeter, dm
10 decimeters	=	1 meter, m
10 meters	=	1 decameter, dam
10 decameters	=	1 hectometer, hm
10 hectometers	=	1 kilometer, km
10 kilometers	=	1 myriameter, mym

## Measures of Surface

100 square millimeters	=	1 square centimeter
100 square centimeters	=	1 square decimeter
100 square decimeters	=	1 square meter
100 square meters	=	1 square decameter = 1 are
100 square decameters	=	1 square hectometer
100 square hectometers	=	1 square kilometer
10 centiares	=	1 deciare, da
10 deciares	=	1 are, a
10 ares	=	1 decare, daa
10 decares	=	1 hectare, ha

The are and its multiples are used for measuring land; for other purposes the square meter is generally the unit.

## Measures of Capacity

10 milliliters, ml	=	1 centiliter, cl
10 centiliters	=	1 deciliter, dl
10 deciliters	=	1 liter, l
10 liters	=	1 decaliter, dal
10 decaliters	=	1 hectoliter, hl
10 hectoliters	=	1 kiloliter, kl
1 liter	=	1 cubic decimeter; 1 kiloliter = 1 cubic meter

## Measures of Weight

10 milligrams, mg	=	1 centigram, cg
10 centigrams	=	1 decigram, dg
10 decigrams	=	1 gram, g
10 grams	=	1 decagram, dag
10 decagrams	=	1 hectogram, hg
10 hectograms	=	1 kilogram, kg
10 kilograms	=	1 myriagram, myg
10 myriagrams	=	1 quintal, q
10 quintals	=	1 millier or ton, MT or t
1 gram	=	the weight of 1 cubic centimeter of water at 4° Celsius (39° Fahrenheit).
1 kilogram or cubic decimeter of water	=	measures 1 liter.

## Cubic Measure

1000 cubic millimeters	=	1 cubic centimeter, cm <sup>3</sup>
1000 cubic centimeters	=	1 cubic decimeter, dm <sup>3</sup>
1000 cubic decimeters	=	1 cubic meter, m <sup>3</sup>
10 decisteres	=	1 stere = 1 cubic meter
10 steres	=	1 decastere
The stere	=	is used for measuring timber.

## Metric Conversion Table

Millimeters	x	0.03937	=	Inches
Millimeters	=	25.400	x	Inches
Meters	x	3.2809	=	Feet
Meters	=	0.3048	x	Feet
Kilometers	x	0.621377	=	Miles
Kilometers	=	1.6093	x	Miles
Square centimeters	x	0.15500	=	Square inches
Square centimeters	=	6.4515	x	Square inches
Square meters	x	10.76410	=	Square feet
Square meters	=	0.09290	x	Square feet
Square kilometers	x	247.1098	=	Acres
Square kilometers	=	0.00405	x	Acres
Hectares	x	2.471	=	Acres
Hectares	=	0.4047	x	Acres
Cubic centimeters	x	0.061025	=	Cubic inches
Cubic centimeters	=	16.3866	x	Cubic inches
Cubic meters	x	35.3156	=	Cubic feet
Cubic meters	=	0.02832	x	Cubic feet
Cubic meters	x	1.308	=	Cubic yards
Cubic meters	=	0.765	x	Cubic yards
Liters	x	61.023	=	Cubic inches
Liters	=	0.01639	x	Cubic inches
Liters	x	0.26418	=	U. S. gallons
Liters	=	3.7854	x	U. S. gallons
Grams	x	15.4324	=	Grains
Grams	=	0.0648	x	Grains
Grams	x	0.03527	=	Ounces, avoirdupois
Grams	=	28.3495	x	Ounces, avoirdupois
Kilograms	x	2.2046	=	Pounds
Kilograms	=	0.4536	x	Pounds
Kilograms per square centimeter	x	14.2231	=	Pounds per square inch
Kilograms per square centimeter	=	0.0703	x	Pounds per square inch
Kilograms per cubic meter	x	0.06243	=	Pounds per cubic foot
Kilograms per cubic meter	=	16.01890	x	Pounds per cubic foot
Metric tons (1000 kilograms)	x	1.1023	=	Tons (2000 pounds)
Metric tons	=	0.9072	x	Tons (2000 pounds)
Kilowatts	x	1.3405	=	Horse-power
Kilowatts	=	0.746	x	Horse-power
Calories	x	3.9683	=	B. T. units
Calories	=	0.2520	x	B. T. units

## Prefix and symbol

tera, T	10 <sup>12</sup>	=	1 000 000 000 000.
giga, G	10 <sup>9</sup>	=	1 000 000 000.
mega, M	10 <sup>6</sup>	=	1 000 000.
kilo, k	10 <sup>3</sup>	=	1 000.
hecto*, h	10 <sup>2</sup>	=	100.
deca*, da	10 <sup>1</sup>	=	10.
deci*, d	10 <sup>-1</sup>	=	0.1
centi*, c	10 <sup>-2</sup>	=	0.01
milli, m	10 <sup>-3</sup>	=	0.001
micro, μ	10 <sup>-6</sup>	=	0.000 001
nano, n	10 <sup>-9</sup>	=	0.000 000 001
pico, p	10 <sup>-12</sup>	=	0.000 000 000 001
femto, f	10 <sup>-15</sup>	=	0.000 000 000 000 001
atto, a	10 <sup>-18</sup>	=	0.000 000 000 000 000 001

## Factor by which the unit is multiplied

tera, T	10 <sup>12</sup>	=	1 000 000 000 000.
giga, G	10 <sup>9</sup>	=	1 000 000 000.
mega, M	10 <sup>6</sup>	=	1 000 000.
kilo, k	10 <sup>3</sup>	=	1 000.
hecto*, h	10 <sup>2</sup>	=	100.
deca*, da	10 <sup>1</sup>	=	10.
deci*, d	10 <sup>-1</sup>	=	0.1
centi*, c	10 <sup>-2</sup>	=	0.01
milli, m	10 <sup>-3</sup>	=	0.001
micro, μ	10 <sup>-6</sup>	=	0.000 001
nano, n	10 <sup>-9</sup>	=	0.000 000 001
pico, p	10 <sup>-12</sup>	=	0.000 000 000 001
femto, f	10 <sup>-15</sup>	=	0.000 000 000 000 001
atto, a	10 <sup>-18</sup>	=	0.000 000 000 000 000 001