

TABLE: SELECTED DIMENSIONAL EQUIVALENTS

Length	<p>1 m = 3.280 ft 0.39,37 in 1 cm = 10^{-2} m = 0.394 in = 0.038 ft 1 mm = 10^{-3} m 1 micron (m) = 10^{-10} m 1 Angstrom (°A) 10^{-6} m</p>
Time	<p>1 hr = 3600 sec = 60 min 1 milisecc = 10^{-3} sec 1 microsec (µsec) = 10^{-6} sec 1 nanosec (nsec) = 10^{-9} sec</p>
Mass	<p>1 kg = 1000 gr = 2.2046 lbm = 6.8521×10^{-3} slugs 1 slugs = 1 lbf.sec⁻²/ft = 32.174 lbm 1 amu = 1.66×10^{-27} kg</p>
Force	<p>1 newton = 1 kg.m/sec² 1 dyne = 1 gr.cm/sec² 1 lbf = 4.448×10^5 dyne = 4.448 newtons</p>
Energy	<p>1 joule = 1 kg.m²/sec² = 0.239 cal = 0.738 ft.lb = 2.78×10^{-7} kwh 1 joule = 10^7 erg 1 Btu = 778.18 ft.lb = 1.055×10^{15} erg = 252 cal 1 cal = 4.186 joule 1 erg = 1 gr.cm²/sec² 1 eV = 1.602×10^{-19} joules = 160×10^{-12} erg</p>
Power	<p>1 Watt = 1 kg.m²/sec³ = 1 joule/sec 1 hp = 550 ft.lbf/sec 1 hp = 2545 Btu/hr = 746 Watts 1 kWatt = 1000 Watts = 3413 Btu/hr</p>
Pressure	<p>1 atm = 14.696 lbf/in² = 760 torr 1 mmHg = 0.01931 lbf/in² = 1 torr 1 dyne/cm² = 145.04×10^{-7} 1 bar = 14.504 lbf/in² = 10^6 dynes/cm² 1 micron (µ) = 10^{-6} mmHg = 10^{-3} mmHg 1 pascal (Pa) = 1 $\frac{N}{m^2}$ = 1 $\frac{kg}{(m \cdot s^2)}$ 1 hPa = 1 mb 1 hPa = 100 Pa</p>
Volume	<p>1 gal = 0.13368 ft³ 1 liter = 1000.028 cm³</p>
Temperature	<p>1 °K = 1 °C = 1.8 °F = 1.8 °R 0 °C corresponds to 32 °F, 273.16 °K, and 491.69 °R 1 eV = 11600 °K</p>
Magnetic Quantities	<p>1 Gauss = 1 g^{1/2}/cm^{1/2}.sec 1 Gauss = 10^3 coul/m.sec for M 1 Gauss = $(1/4\pi) \times 10^3$ coul/m.sec for H 1 Gauss = 10^{-4} Tesla for B 1 Tesla = 1 kg/coul.sec 1 Tesla = 1 kg/A.sec² 1 nT = 10^{-9} Tesla 1 nT = 10^{-5} Gauss 1 gamma = 1 g = 1 nT</p> <p>Magnetic Flux: $\phi_B = \int B \cdot dA$, 1 Weber = 1 kg.m²/coul.sec</p> <p>$\vec{B} = \text{kg/sec.coul}$</p>
Electrical Quantities	<p>E-potential: $\mathcal{E}, d\mathcal{E} = \vec{E} \cdot d\vec{l}$ E, 1 volt = 1 kg.m²/coul.sec²</p> <p>$\vec{E} = \text{kg.m/coul.sec}$</p> <p>Current Density: coul/m².sec Current: coul/sec Resistance (R): 1 ohm = 1 kg.m²/coul².sec</p>

PHYSICAL CONSTANTS

Avogadro's Number	$N = 6.025 \times 10^{23} / \text{g.mole}$
Bolzman's Constant	$k = 1.38 \times 10^{-23} \text{ joule /}^\circ\text{K}$
Stefan Boltzmann Constant	$\sigma = 5.7 \times 10^{-5} \text{ erg/cm}^2 \cdot \text{sec.}^\circ\text{K}^4$ $\sigma = 5.67 \times 10^{-8} \text{ joule/m}^2 \cdot \text{sec.}^\circ\text{K}^4$
Gas Constant	$R = 1545.33 \text{ ft.lbf/lb.mole.}^\circ\text{R}$ $R = 8.317 \text{ joule/g.mole.}^\circ\text{K}$ $R = 1.986 \text{ Btu/lb.mole.}^\circ\text{R}$ $R = 1.986 \text{ cal/g.mole.}^\circ\text{K}$
Planck's Constant	$h = 6.625 \times 10^{-34} \text{ joule.sec}$
Biot-Savart Constant	$1/4\pi\epsilon_0 = 8.987 \times 10^9 \text{ kg.m}^3/\text{coul}^2 \cdot \text{sec}^2$ $\mu_0/4\pi = 1.000 \times 10^{-7} \text{ kg.m/coul}^2$
Electronic Charge	$e = -1.6021 \times 10^{-19} \text{ coul}$
Proton Mass	$m_p = 1.67 \times 10^{-27} \text{ kg}$
Electron Mass	$m_e = 9.1 \times 10^{-31} \text{ kg}$
Speed of Light	$c = 2.998 \times 10^8 \text{ m/sec}$
Newton's Constant	$g_c = 32.174 \text{ ft.lbm/lbf.sec}^2$
Gravitational Constant	$k_G = 6.67 \times 10^{-14} \text{ m}^3/\text{kg.sec}^2$
Wienn's Constant	$c = 0.28 \text{ cm.}^\circ\text{K}$
Sun-Earth Distance	$1 \text{ AU} = 1.5 \times 10^8 \text{ km}$
Solar Constant for Earth	$I_o = 1.94 \text{ cal/cm}^2 \cdot \text{min}$ $I_o = 1370 \text{ Watt/m}^2$
Sun's Radius	$R_{\text{sun}} = 7 \times 10^5 \text{ km}$
Sun's Mass	$M_{\text{sun}} = 2 \times 10^{30} \text{ kg}$
Sun's Surface Temperature	$T = 6000 \text{ }^\circ\text{K}$
Sun's Luminosity	$L = 4 \times 10^{26} \text{ Watt}$
Earth's Radius	$R_{\text{Earth}} = 6378 \text{ km}$
Earth's Albedo	$A \text{ or } \alpha = \% 33 \text{ or } 0.33$
Magnetic Field at the Earth's Equator	$B_o = 0.36 \text{ Gauss (CGS)}$ $B_o = 0.3 \times 10^{-4} \text{ Tesla (MKS)}$
μ_0	$\mu_0 = 4\pi \times 10^{-7} \text{ (MKS, Henry/m, or kg.m/coul}^2 \text{, Henry = kg.m}^2/\text{coul}^2)$
<p>R : Universal Gas Constant R^* : Specific Gas Constant $R^* = (R \times 10^3) / M$, M = 29 amu for Air $R^* = (8.317 \times 10^3) / 29 = 286 \text{ (MKS)}$ $P = \rho R^* T$ or $PV = RT$</p>	

LENGTH

- 1 kilometer (km) = 1000 meters (m)
= 3281 feet (ft)
= 0.62 mile (mi)
- 1 mile (mi) = 5280 feet (ft)
= 1609 meters (m)
= 1.61 kilometers (km)
- 1 centimeter (cm) = 0.39 inch (in.)
= 0.01 meter (m)
- 1 inch (in.) = 2.54 cm
= 0.08 ft
- 1 meter (m) = 100 cm
= 3.28 ft
= 39.37 in.
- 1 micrometer (μm) = 0.0001 cm
= 0.000001 m

AREA

- 1 square centimeter (cm^2) = 0.15 in.^2
1 square inch (in.^2) = 6.45 cm^2
1 square meter (m^2) = 10.76 ft^2
1 square foot (ft^2) = 0.09 m^2

VOLUME

- 1 cubic centimeter (cm^3) = 0.06 in.^3
1 cubic inch (in.^3) = 16.39 cm^3
1 liter (l) = 1000 cm^3

SPEED

- 1 knot = 1.15 mph
= 0.51 mps
= 1.85 kph
- 1 mile per hour (mph) = 0.87 knot
= 0.45 mps
= 1.61 kph
- 1 kilometer per hour (kph) = 0.54 knot
= 0.62 mph
= 0.28 mps
- 1 meter per second (mps) = 1.9 knots
= 2.2 mph
= 3.6 kph

A

UNITS, CONVERSIONS, AND ABBREVIATIONS

MASS

- 1 gram (g) = 0.035 ounce
= 0.002 lb
- 1 kilogram (kg) = 1000 g
= 2.2 lb

ENERGY

- 1 joule (J) = 0.239 cal
1 calorie (cal) = 4.187 J

PRESSURE

- 1 millibar (mb) = 1000 dynes/ cm^2
= 0.75 millimeter of mercury
= 0.03 inch of mercury
= 0.01 pound per square
inch (psi)
= 100 pascals (Pa)
- 1 standard atmosphere = 1013.25 mb
= 760 millimeters of
mercury
= 29.92 inches of
mercury
= 14.7 psi