UNITS and SYMBOLS

Quantity	Symbol	Unit	Identical Symbol	Value
amount of substance	n	mole	mol	
angular frequency	ϖ	radian per second	rad/s	
area	A	hectare	ha	
capacitance	C	farad	F	C/V
Celsius temperature	t	degree Celsius	°C	
charge	Q	coulomb	C	As
conductance	G	siemens	S	A/V
conductivity	σ	siemens per meter	S/m	
current	I	ampere	A	
electric field strength	E	volt per meter	V/m	
electric flux density	D	coulomb/square meter	C/m^2	
energy, work	W	joule	J	Nm
force	F	newton	N	kgm/s^2
frequency	f	hertz	Hz	1/s
inductance	L	henry	H	Wb/A
Kelvin temperature	T_K	degree kelvin	K	
length	l	meter	m	
luminous intensity	I	candela	cd	
magnetic field strength	H	ampere per meter	A/m	
magnetic flux density	B	tesla	T	Wb/m^2
magnetic flux	Φ	weber	Wb	Vs
magnetomotive force	$\mathcal{F}$	ampere	A	
mass	m	kilogram	kg	
permeability	μ	henry per meter	H/m	
permittivity	ε	farad per meter	F/m	
plane angle	θ	radian	rad	
power	P	watt	W	J/s
pressure	p	pascal	Pa	N/m^2
Rankine temperature	T_R	degree Rankine	°R	
relative permeability	μ_r	(pure number)		
relative permittivity	ε_r	(pure number)		
reluctance	$\mathcal{R}$	ampere per weber	A/Wb	
resistance	R	ohm	Ω	V/A
resistivity	ρ	ohm-meter	Ωm	
solid angle	Ω	steradian	sr	
specific impulse	Isp	seconds	s	
voltage, potential	V	volt	V	W/A

NASA
National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, Florida 32899

SI Metric Units for Engineering Use

Length

1 in = 25.4 mm*	1mm = 0.039 in
1 ft = 0.3048 m*	1 cm = 0.39 in
1 yd = 0.9144 m*	1 m = 3.28 ft
1 stmi = 1.609 km	1 km = 0.62 stmi
1 nmi = 1.852 km	1 km = 0.54 nmi

Area

$1\ in^2 = 6.452\ cm^2$	$mm^2 = 0.0016\ in^2$
$1\ ft^2 = 0.0929\ m^2$	$cm^2 = 0.16\ in^2$
$1\ yd^2 = 0.836\ m^2$	$m^2 = 10.76\ ft^2$
$1\ mi^2 = 2.59\ km^2$	$km^2 = 0.39\ mi^2$
acre = 0.4047 ha	km^2 = 247 acres
1 ha = 2.47 acres	

Volume

1 barrell (42 US gal) = 0.159 m^3
1 fluid oz = 29.57 cm^3
1 gal = 3.785 L
1 qt = 0.946 L

Electrical Units

1 Ah = 3 600 C

Pressure

1 psi = 6.89 kPa
1 torr = 0.133 kPa
1 mbar = 0.100 kPa*
1 klp/in2 = 6 894 kPa
1 lbf/ft2 = 0.0479 kPa

Temperature

100°C = 212°F	9/5x °C +32 = °F
37°C = 98.6°F	5/9x (°F-32) = °C
21°C = 70°F	K = °Ra/1.8
0 °C = 32°F	K = °C +273.16
-40°C = -40°F	

Mass

1 lb = 0.454 kg
1 lb/ft^3 = 16.02 kg/m^3
1 lb/in^3 = 27.68 g/cm^3

Force

1 pdl = 0.138 N
1 N = 0.225 lbf
1 lbf/ft = 14.6 N/m
1 lbf/in = 175 N/m

Thermal

1 Btu/h = 0.293 W
1 Btu/hft °F = 1.731 W/m K
1 Btu/ft^2 = 11 350 J/m^2
1 Btu/lb = 2 326 J/kg
1 cal = 4.186 J
1 cal/s = 4.186 W
1 cal/g = 4186 J/kg

Speed/Velocity

1 ft/s = 0.3048 m/s
1 knot = 0.514 m/s
1 mi/h = 1.609 km/h
1 km/h = 0.28 m/s

*Exact

KSC FORM 21-603 (3/92)