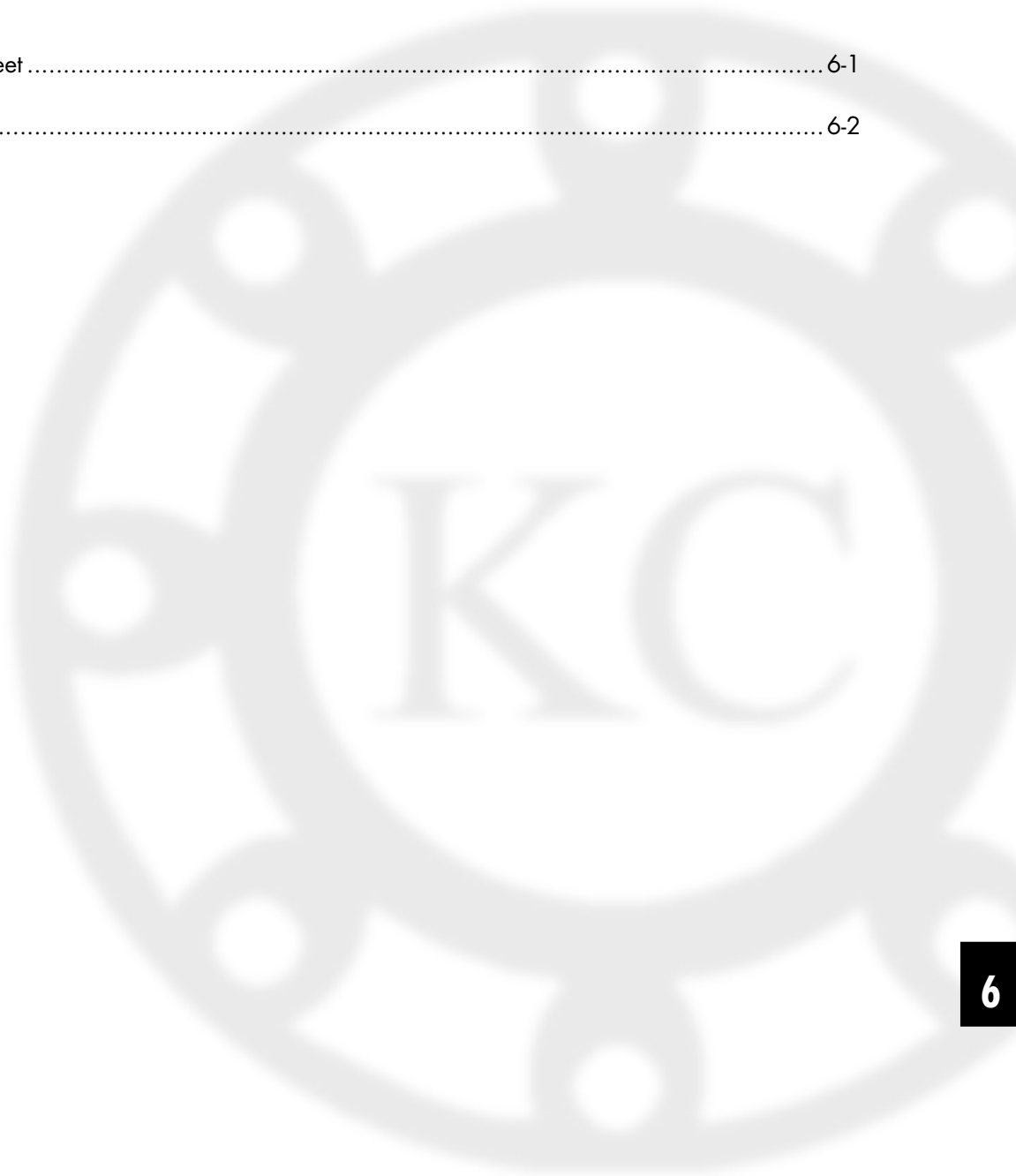




# Conversions

Sample Specification Sheet ..... 6-1

Conversions ..... 6-2





## **SAMPLE SPECIFICATION SHEET**

Flange backing rings	Patented KC Multi-Ring® thermoplastic-coated steel AC backing rings, KC Multi-Ring Products, Inc., sole source. ANSI Class 150 bolt pattern. Install with bevel facing flange adapter. <i>(Also available in stainless steel, galvanized and red oxide primered).</i>
Flange backing rings with pipe support (D-Ring)	Patented KC Multi-Ring® thermoplastic-coated steel AC "D" backing rings, KC Multi-Ring Products, Inc., sole source. ANSI Class 150 bolt pattern: Install with bevel facing flange adapter. <i>(Also available in stainless steel, galvanized and red oxide primered).</i>
Flange gaskets - UltraPure applications	Patented KC Multi-Ring® low torque design UltraPure expanded PTFE gasket, KC Multi-Ring Products, Inc., sole source. To ensure proper laminar flow, geometrically align gasket and flange faces. Install using zinc-plated fasteners, no thread lubricants. Tighten fasteners in a star pattern, using progressive 4-pass tightening, to proper torque values.
Flange gaskets - low ozone UltraPure applications	Patented KC Multi-Ring® low torque design UltraPure KRYSTLE-CLEAR (elastomeric) gasket, KC Multi-Ring Products, Inc., sole source. To ensure proper laminar flow, geometrically align gasket and flange faces. Install using zinc-plated fasteners, no thread lubricants. Tighten fasteners in a star pattern, using progressive 4-pass tightening, to proper torque values.
Flange gaskets - all other applications	Gaskets shall be manufactured in the patented KC Multi-Ring® low torque design, KC Multi-Ring Products, Inc., sole source. To ensure proper laminar flow, geometrically align gasket and flange faces. Install using zinc-plated fasteners. Tighten fasteners in a star pattern, using progressive 4-pass tightening, to proper torque values.
Fiberglass reinforced plastic ducting gaskets	Gaskets shall be manufactured from 1/8" commercial grade 40 durometer EPDM, cut to FRP ducting NBSPS 15-69, in patented KC Multi-Ring® low torque design, KC Multi-Ring Products, Inc., sole source
Flanged joint tightening	Tighten all flanges using a calibrated torque wrench. Use zinc-plated fasteners. Whenever possible, apply the torque to the nut. Tighten the fasteners in a star pattern to the proper torque values using progressive 4-pass tightening. (Note that the pipe size and tightening sequence are cast into the face of the AC Backing Flange). Following the star pattern, torque each nut to 33% of the desired torque value. Then re-torque to 66% of the desired torque value. Re-torque to 100% of the desired torque value. Wait for two minutes and re-torque to 100% value. The KC Multi-Ring® SmartBox™ may be substituted for the first 3 passes. Use a calibrated torque wrench for the final Quality Control pass.

**Specifying Engineers:** The above were compiled from the specifications written by a number of specifying engineers. Please use these specifications as required. Specific installation procedures for all KC Multi-Ring® components are available in Section 7 of our catalog and at our Web site: <http://www.kcmultiring.com>. Contact KC Multi-Ring Products, Inc for copies of installation procedures, catalogs or for any questions or comments you may have about these specifications or KC Multi-Ring® products.



**LENGTH**

from / to	cm	m	km	in.	ft	mile
cm	1	0.01	$1 \times 10^5$	0.3937	0.03281	$6.21 \times 10^{-6}$
m	100	1	0.001	39.37	3.281	$6.21 \times 10^{-4}$
km	$1 \times 10^5$	1,000	1	$3.94 \times 10^4$	3,281	0.6214
in.	2.540	0.02540	$2.54 \times 10^{-5}$	1	0.08333	$1.58 \times 10^{-5}$
ft	30.48	0.3048	$3.05 \times 10^{-4}$	12	1	$1.89 \times 10^{-4}$
mile	$1.61 \times 10^5$	1,609	1.609	$6.34 \times 10^4$	5,280	1

**AREA**

from / to	cm <sup>2</sup>	m <sup>2</sup>	km <sup>2</sup>	in. <sup>2</sup>	ft <sup>2</sup>	mile <sup>2</sup>
cm <sup>2</sup>	1	0.0001	$1 \times 10^{-10}$	0.1550	0.00108	$3.86 \times 10^{-11}$
m <sup>2</sup>	$1 \times 10^4$	1	$1 \times 10^{-6}$	1,550	10.76	$3.86 \times 10^{-7}$
km <sup>2</sup>	$1 \times 10^{10}$	$1 \times 10^6$	1	$1.55 \times 10^9$	$1.08 \times 10^7$	0.3861
in. <sup>2</sup>	6.452	$6.45 \times 10^{-4}$	$6.45 \times 10^{-10}$	1	0.00694	$2.49 \times 10^{-10}$
ft <sup>2</sup>	929.0	0.09290	$9.29 \times 10^{-8}$	144	1	$3.59 \times 10^{-8}$
mile <sup>2</sup>	$2.59 \times 10^{10}$	$2.59 \times 10^6$	2.590	$4.01 \times 10^9$	$2.79 \times 10^7$	1

1 Angstrom =  $1 \text{ \AA} = 1 \times 10^{-8} \text{ cm}$ ; 1 micron =  $1 \text{ \mu m} = 1 \times 10^{-6} \text{ m}$ ; 1 mil = 0.001 in; 1 m = 1.094 yd;  
 1 mile = 1,760 yd; 1 nautical mile = 1.852 km = 6,076 ft = 1.151 miles;  
 1 cir mil =  $7.85 \times 10^{-7} \text{ in}^2 = 5.067 \times 10^{-6} \text{ cm}^2$ ; 1 acre = 4,047 m<sup>2</sup> = 43,560 ft<sup>2</sup> = 0.00156 mile<sup>2</sup>

**FORCE,  $F = ma / g_c$**

F	m	g <sub>c</sub> conversion factor
nt.	Kg	1 kg m / newton sec <sup>2</sup>
dyne	g	1 g cm / dyne sec <sup>2</sup>
lb f	slug	1 slug ft / lb f sec <sup>2</sup>
lb f	lb m	32.17 lb m ft / lb f sec <sup>2</sup>
g f	g	980.7 g cm / g f sec <sup>2</sup>

1 slug = 32.17 lb m = 14.59 kg;  
 1 gram = 15.43 grains;  
 $a = \text{m} / \text{sec}^2, \text{cm} / \text{sec}^2 \text{ or } \text{ft} / \text{sec}^2$   
 1 lb m = 7,000 grains;  
 1 metric ton = 1,000 kg;  
 1 dyne = 1 g mass cm / sec<sup>2</sup>

**DENSITY**

$1 \text{ g} / \text{cm}^3 = 62.43 \text{ lb m} / \text{ft}^3$ ;  
 1 newton = 1 kg mass m / sec<sup>2</sup> 1 lb m / ft<sup>3</sup> = 0.1337 lb m / gal =  $1 \times 10^5 \text{ dynes} = 0.2248 \text{ lb f}$ ;  
 1 lb force = 1 slug ft / sec<sup>2</sup>



**DECIMAL EQUIVALENTS integers are 64<sup>ths</sup>**

1	.01563	17	.26563	33	.51563	49	.76563
2	.03125	18	.28125	34	.53125	50	.78125
3	.04688	19	.29688	35	.54688	51	.79688
4	.06250	20	.31250	36	.56250	52	.81250
5	.07813	21	.32813	37	.57813	53	.82813
6	.09375	22	.34375	38	.59375	54	.84375
7	.10938	23	.35938	39	.60938	55	.85938
8	.12500	24	.37500	40	.62500	56	.87500
9	.14063	25	.39063	41	.64063	57	.89063
10	.15625	26	.40625	42	.65625	58	.90625
11	.17188	27	.42188	43	.67188	59	.92188
12	.18750	28	.43750	44	.68750	60	.93750
13	.20313	29	.45313	45	.70313	61	.95313
14	.21875	30	.46875	46	.71875	62	.96875
15	.23438	31	.48438	47	.73438	63	.98438
16	.25000	32	.50000	48	.75000	64	1

**VELOCITY**

from / to	cm / sec	km / hr	in. / sec	ft / sec	ft / min	mph
cm / sec	1	0.03600	0.3937	0.03281	1.968	0.02237
km / hr	27.78	1	10.94	0.9113	54.68	0.6214
in. / sec	2.540	0.09143	1	0.08333	5	0.05682
ft / sec	30.48	1.097	12	1	60	0.6818
ft / min	0.5080	0.01829	0.2000	0.01667	1	0.01136
mph	44.70	1.609	17.60	1.467	88	1

1 knot = 1 nautical mile / hr = 1.151 mph

**FLOW RATE**

from / to	lit / sec	gal / min	ft <sup>3</sup> / sec	ft <sup>3</sup> / min	bbl / hr	bbl / day
lit / sec	1	15.85	0.03532	2.119	22.66	543.8
gal / min	0.06309	1	0.00223	0.1337	1.429	34.30
ft <sup>3</sup> / sec	28.32	448.8	1	60	641.1	1.54 x 10 <sup>4</sup>
ft <sup>3</sup> / min	0.4719	7.481	0.01667	1	10.69	256.5
bbl / hr	0.04415	0.6997	0.00156	0.09359	1	24
bbl / day	0.00184	0.02917	6.50 x 10 <sup>-5</sup>	0.00390	0.04167	1

bbl refers to bbl oil = 42 gallons



**GAS CONSTANT VALUES, R, in PV = nRT**

energy, PV	n*	T	R	energy, PV	n*	T	R
erg	g	°K	8.314 x 10 <sup>7</sup>	Btu	lb	°R	1.986
calorie	g	°K	1.987	hp hr	lb	°R	7.805 x 10 <sup>4</sup>
joule (abs)	g	°K	8.314	kw hr	lb	°R	5.819 x 10 <sup>4</sup>
atm - liter	g	°K	0.08205	atm - ft <sup>3</sup>	lb	°R	0.7302
mm Hg - liter	g	°K	62.36	mm Hg - ft <sup>3</sup>	lb	°R	555.0
kgf / cm <sup>2</sup> - liter	g	°K	0.08478	in Hg - ft <sup>3</sup>	lb	°R	21.85
mm Hg - ft <sup>3</sup>	lb	°K	998.9	lb f / in <sup>2</sup> - ft <sup>3</sup>	lb	°R	10.73
atm - ft <sup>3</sup>	lb	°K	1.314	lb f / ft <sup>2</sup> - ft <sup>3</sup>	lb	°R	1,545

\*n is the number of moles expressed in g or lb m

°K = °C + 273.2 ; °R = °F + 459.7

S.T.P. = standard temperature and pressure = 0° C and 760 mm Hg

Molar Volumes (S.T.P.): 1 g mole = 22.414 liter

1 lb m mole = 359.05 ft<sup>3</sup>

Air Density, (S.T.P.): 1.293 g / lit; 0.0808 lb m / ft<sup>3</sup>

**MASS**

from / to	g	kg	oz m	lb m	ton m
g	1	0.001	0.03527	0.00220	1.10 x 10 <sup>-6</sup>
kg	1,000	1	35.27	2.205	0.00110
oz m	28.35	0.02835	1	0.06250	3.12 x 10 <sup>-5</sup>
lb m	453.6	0.4536	16	1	0.0005
ton m	9.07 x 10 <sup>5</sup>	907.2	3.20 x 10 <sup>4</sup>	2,000	1

**ENERGY**

from / to	Btu	cal	kgf m	ft lbf	joule	hp hr	kw hr
Btu	1	252.0	107.6	778.0	1,055	3.93 x 10 <sup>-4</sup>	2.93 x 10 <sup>-4</sup>
cal	0.00397	1	0.4268	3.087	4.186	1.56 x 10 <sup>-6</sup>	1.16 x 10 <sup>-6</sup>
kgf m	0.00930	2.343	1	7.233	9.807	3.65 x 10 <sup>-6</sup>	2.72 x 10 <sup>-6</sup>
ft lbf	0.00129	0.3239	0.1383	1	1.356	5.05 x 10 <sup>-7</sup>	3.77 x 10 <sup>-7</sup>
joule	9.48 x 10 <sup>-4</sup>	0.2389	0.1020	0.7376	1	3.73 x 10 <sup>-7</sup>	2.78 x 10 <sup>-7</sup>
hp hr	2,545	6.41 x 10 <sup>5</sup>	2.74 x 10 <sup>5</sup>	1.98 x 10 <sup>6</sup>	2.68 x 10 <sup>6</sup>	1	0.7457
kw hr	3,413	8.60 x 10 <sup>5</sup>	3.67 x 10 <sup>5</sup>	2.66 x 10 <sup>6</sup>	3.60 x 10 <sup>6</sup>	1.341	1

1 erg = 1 dyne cm = 10<sup>-7</sup> joule ; 1 joule = 1 newton m

1 electron volt = 1 ev = 1.602 x 10<sup>-19</sup> joule;

Ton of refrigeration = 12,000 Btu / hr = 288,000 Btu / day



**PRESSURE**

from / to	mm Hg	in. Hg	in. H <sub>2</sub> O	ft H <sub>2</sub> O	atm	lb f / in. <sup>2</sup>	kg f / cm <sup>2</sup>
mm Hg	1	0.03937	0.5353	0.04460	0.00132	0.01934	0.00136
in. Hg	25.40	1	13.60	1.133	0.03342	0.4912	0.03453
in. H <sub>2</sub> O	1.868	0.07355	1	0.08333	0.00246	0.03613	0.00254
ft H <sub>2</sub> O	22.42	0.8826	12	1	0.02950	0.4335	0.03048
atm	760	29.92	406.8	33.90	1	14.70	1.033
lb f / in. <sup>2</sup>	51.71	2.036	27.67	2.307	0.06805	1	0.07031
kg f / cm <sup>2</sup>	735.6	28.96	393.7	32.81	0.9678	14.22	1

1 Bar = 1 x 10<sup>6</sup> dynes / cm<sup>2</sup> = 0.98692

**USEFUL CONSTANTS & DATA**

- 1 atomic mass unit = 1 amu = 1.66 x 10<sup>27</sup> kg
- 1 calendar year = 365 days = 3.154 x 10<sup>7</sup> sec
- c = 2.998 x 10<sup>10</sup> cm / sec = 186, 272 miles / sec
- Sound Velocity, air 20° C, 1 atm: 34,400 cm / sec = 1,129 ft / sec = 769.5 mph
- e = base, natural logarithms = 2.71828
- ln x = log<sub>e</sub> x = (log<sub>10</sub> 10) (log<sub>10</sub> x) = 2.3026 log<sub>10</sub> x
- F = Faraday constant = 96,500 coul / g equivalent
- G = gravitational constant = 6.670 x 10<sup>-11</sup> m<sup>3</sup> / kg sec<sup>2</sup>
- g<sub>0</sub> = grav. acc. = 9.807 m / sec<sup>2</sup> = 32.17 ft / sec<sup>2</sup>
- h = Planck's constant = 6.626 x 10<sup>-34</sup> joule sec
- N<sub>A</sub> = Avogadro's no. = 6.023 x 10<sup>23</sup> molecules / g mole
- π = 3.14159 26535 89793 23846 26433 83279 50288
- s = Stefan-Boltzmann no. = 0.171 x 10<sup>-8</sup> Btu / ft<sup>2</sup> hr<sup>0</sup> R<sup>4</sup>
- R = 1 radian = 57.3 degree; 1 degree = 0.01745 radian
- Sphere: area = 4 π r<sup>2</sup>; 1 volume = 4/3 π r<sup>3</sup>
- 1 poise = 1 g / cm sec = 0.0672 lb mass / ft sec
- 1 stoke = 1 cm<sup>2</sup> / sec = poise , density

**WATER DATA**

- weight, 20° C: 1 gal = 8.331 lb m; 1 ft<sup>3</sup> = 62.32 lb m
- heat of fus. = 79.67 cal / g = 143.4 Btu / lb m
- heat of vap. = 539.6 cal / g = 971.2 Btu / lb m
- viscosity, 20° C: 0.01002 poise



## VOLUME

from/to	cm <sup>3</sup>	liter	m <sup>3</sup>	in. <sup>3</sup>	ft <sup>3</sup>	yd <sup>3</sup>	fl oz	fl pt	fl qt	gal	gal (Br.)	bbl (oil)	bbl (liq.)
cm <sup>3</sup>	1	0.001	1 x 10 <sup>-6</sup>	0.06102	3.53 x 10 <sup>-5</sup>	1.31 x 10 <sup>-6</sup>	0.03381	0.00211	0.00106	2.64 x 10 <sup>-4</sup>	2.20 x 10 <sup>-4</sup>	6.29 x 10 <sup>-6</sup>	8.39 x 10 <sup>-6</sup>
liter	1,000	1	0.001	61.02	0.03532	0.00131	33.81	2.113	1.057	0.2642	0.22	0.00629	0.00839
m <sup>3</sup>	1 x 10 <sup>6</sup>	1,000	1	6.10 x 10 <sup>4</sup>	35.31	1.308	3.38 x 10 <sup>4</sup>	2,113	1,057	264.2	220	6.29	8.386
in. <sup>3</sup>	16.39	0.01639	1.64 x 10 <sup>-5</sup>	1	5.79 x 10 <sup>-4</sup>	2.14 x 10 <sup>-5</sup>	0.5541	0.03463	0.01732	0.00433	0.0036	1.03 x 10 <sup>-4</sup>	1.37 x 10 <sup>-4</sup>
ft <sup>3</sup>	2.83 x 10 <sup>4</sup>	28.32	0.02832	1,728	1	0.03704	957.5	59.84	29.92	7.481	6.229	0.1781	0.2375
yd <sup>3</sup>	7.65 x 10 <sup>5</sup>	764.5	0.7646	4.67 x 10 <sup>4</sup>	27	1	2.59 x 10 <sup>4</sup>	1,616	807.9	202	168.2	4.809	6.412
fl oz	29.57	0.02957	2.96 x 10 <sup>-5</sup>	1.805	0.00104	3.87 x 10 <sup>-5</sup>	1	0.0625	0.03125	0.00781	0.00651	1.86 x 10 <sup>-4</sup>	2.48 x 10 <sup>-4</sup>
fl pt	473.2	0.4732	4.73 x 10 <sup>-4</sup>	28.88	0.01671	6.19 x 10 <sup>-4</sup>	16	1	0.5	0.125	0.1041	0.00298	0.00397
fl qt	946.4	0.9463	9.46 x 10 <sup>-4</sup>	57.75	0.03342	0.00124	32	2	1	0.25	0.2082	0.00595	0.00794
gal	3,785	3.785	0.00379	231	0.1337	0.00495	128	8	4	1	0.8327	0.02381	0.03175
gal (Br.)	4,546	4.546	0.00455	277.4	0.1605	0.00595	153.7	9.608	4.804	1.201	1	0.02859	0.03813
bbl (oil)	1.59 x 10 <sup>5</sup>	159	0.159	9,702	5.615	0.2079	5,376	336	168	42	34.97	1	1.333
bbl (liq.)	1.19 x 10 <sup>5</sup>	119.2	0.1192	7,276	4.211	0.156	4,032	252	126	31.5	26.23	0.75	1

1 cord = 128 ft<sup>3</sup> = 3.625 m<sup>3</sup>



## CONVERSION FACTORS

MULTIPLY	BY	TO OBTAIN	MULTIPLY	BY	TO OBTAIN
	<b>A</b>				
abcoulomb .....	2.998 x 10 <sup>10</sup> .....	statcoulombs	Btu .....	1,054.8.....	joules
acre .....	10.0.....	sq. chain (Gunter's)	Btu .....	0.2520.....	kg. - calories
acre .....	160.0.....	rods	Btu .....	107.5.....	kg. - meters
acre .....	1 x 10 <sup>5</sup> .....	sq. links (Gunter's)	Btu .....	2.928 x 10 <sup>4</sup> .....	kilowatt-hrs.
acre .....	0.4047.....	hectare or sq. hectometer	Btu / hr.....	0.2162.....	foot - lbs. / sec.
acres .....	43,560.0.....	sq. ft.	Btu / hr.....	0.0700.....	gram - cal. / sec.
acres .....	4,047.0.....	sq. meters	Btu / hr.....	3.929 x 10 <sup>4</sup> .....	horsepower - hr.
acres .....	1.562 x 10 <sup>3</sup> .....	sq. miles	Btu / hr.....	0.2931.....	watts
acres .....	4,840.0.....	sq. yd.	Btu / min.....	12.96.....	foot - lbs. / sec.
acre-feet.....	43,560.0.....	cu. ft.	Btu / min.....	0.02356.....	horsepower
acre-feet.....	3.259 x 10 <sup>5</sup> .....	gallons	Btu / min.....	0.01757.....	kilowatts
ampere / sq. cm.....	6.452.....	ampere / sq. in.	Btu / sq. ft. / min.....	0.1221.....	watts
ampere / sq. cm.....	10 <sup>4</sup> .....	ampere / sq. meter	bucket (Br. Dry).....	1.818 x 10 <sup>4</sup> .....	watts / sq. in.
ampere / sq. in.....	0.1550.....	ampere / sq. cm.	bushels .....	1.2445.....	cubic cm.
ampere / sq. in.....	1,550.....	ampere / sq. meter	bushels .....	2,150.4.....	cu. ft.
ampere / sq. meter.....	10 <sup>4</sup> .....	ampere / sq. cm.	bushels .....	0.03524.....	cu. in.
ampere / sq. meter.....	6.452 x 10 <sup>4</sup> .....	ampere / sq. in.	bushels .....	35.24.....	cu. meters
ampere - hr.....	3,600.0.....	coulombs	bushels .....	4.0.....	liters
ampere - hr.....	0.03731.....	faradays	bushels .....	64.0.....	pecks
ampere-turns.....	1.257.....	gilberts	bushels .....	32.0.....	pints (dry)
ampere-turns / cm.....	2.54.....	ampere-turns / in.			quarts (dry)
ampere-turns / cm.....	100.....	ampere-turns / meter			
ampere-turns / cm.....	1.257.....	gilberts / cm.	calories, gram (mean)...	3.9685 x 10 <sup>-3</sup> .....	Btu (mean)
ampere-turns / in.....	0.3937.....	ampere-turns / in.	candle / sq. cm.....	3.142.....	lamberts
ampere-turns / in.....	39.37.....	ampere-turns / meter	candle / sq. in.....	0.4870.....	lamberts
ampere-turns / in.....	0.4950.....	gilberts / cm.	centares (centiares) .....	1.0.....	sq. meters
ampere-turns / meter.....	0.01.....	ampere-turns / cm.	centigrade.....	(C° x 9/5) + 32.....	Fahrenheit
ampere-turns / meter.....	0.0254.....	ampere-turns / in.	centigrams .....	0.01.....	grams
ampere-turns / meter.....	0.1257.....	gilberts / cm.	centiliter.....	0.3382.....	oz. fluid (US)
angstrom unit.....	3.937 x 10 <sup>9</sup> .....	inch	centiliter.....	0.6103.....	cu. in.
angstrom unit.....	1 x 10 <sup>-10</sup> .....	meter	centiliter.....	2.705.....	drams
angstrom unit.....	1 x 10 <sup>-4</sup> .....	micron or (Mu)	centiliter.....	0.01.....	liters
are .....	0.2471.....	acre (US)	cm.....	3.281 x 10 <sup>2</sup> .....	ft.
ares.....	119.6.....	sq. yd.	cm.....	0.3937.....	in.
ares.....	0.02471.....	acres	cm.....	1 x 10 <sup>-5</sup> .....	km.
ares.....	100.....	sq. meter	cm.....	0.01.....	meters
astronomical unit.....	1.495 x 10 <sup>8</sup> .....	kms.	cm.....	6.214 x 10 <sup>-6</sup> .....	miles
atmospheres.....	0.007348.....	ton / sq. in.	cm.....	10.0.....	millimeters
atmospheres.....	76.0.....	cms. of mercury	cm.....	393.7.....	mils
atmospheres.....	33.90.....	ft. of H <sub>2</sub> O (at 4° C)	cm.....	1.094 x 10 <sup>2</sup> .....	yd.
atmospheres.....	29.92.....	in of mercury (at 0° C)	cm. - dynes.....	1.020 x 10 <sup>3</sup> .....	cm. - grams
atmospheres.....	1.0333.....	kg. / sq. cm	cm. - dynes.....	1.020 x 10 <sup>8</sup> .....	meter - kg.
atmospheres.....	10,332.0.....	kg. / sq. meter	cm. - dynes.....	7.376 x 10 <sup>8</sup> .....	lbs. - ft.
atmospheres.....	14.70.....	lbs. / sq. in.	cm. - grams.....	980.7.....	cm. - dynes
atmospheres.....	1.058.....	tons / sq. ft.	cm. - grams.....	1 x 10 <sup>-5</sup> .....	meter - kg.
	<b>B</b>		cm. - grams.....	7.233 x 10 <sup>-5</sup> .....	lbs. - ft.
barrels (US dry) .....	7,056.0.....	cu. in.	cm. of mercury .....	0.01316.....	atmospheres
barrels (US dry) .....	105.0.....	quarts (dry)	cm. of mercury .....	0.4461.....	ft. of H <sub>2</sub> O
barrels (US liquid) .....	31.5.....	gallons	cm. of mercury .....	136.0.....	kg. / sq. meter
barrels (oil).....	42.0.....	gallons (oil)	cm. of mercury .....	27.85.....	lbs. / sq. ft.
bbl (42 gal.) / 24 hr. ....	0.029.....	gallons / min.	cm. / sec.....	0.1934.....	lbs. / sq. in.
bars .....	0.9869.....	atmospheres	cm. / sec.....	1.1969.....	ft. / min.
bars .....	1 x 10 <sup>5</sup> .....	dynes/ sq. cm.	cm. / sec.....	0.03281.....	ft. / sec.
bars .....	1.020 x 10 <sup>4</sup> .....	kg. / sq. meter	cm. / sec.....	0.036.....	km. / hr.
bars .....	2,089.0.....	lbs. / sq. ft.	cm. / sec.....	0.1943.....	knots
bars .....	14.50.....	lbs. / sq. in.	cm. / sec.....	0.6.....	meters / min.
bolt (US cloth).....	36.576.....	meters	cm. / sec. / sec.....	0.02237.....	miles / hr.
Btu .....	10.409.....	meters	cm. / sec. / sec.....	3.728 x 10 <sup>-4</sup> .....	miles / min.
Btu .....	1.055 x 10 <sup>10</sup> .....	ergs	cm. / sec. / sec.....	0.03281.....	ft. / sec. / sec.
Btu .....	778.3.....	foot - lbs.	cm. / sec. / sec.....	0.036.....	km. / hr. / sec.
Btu .....	252.0.....	gram - calories	cm. / sec. / sec.....	0.01.....	meters / sec. / sec.
Btu .....	3.931 x 10 <sup>-4</sup> .....	horsepower - hr.	chain.....	0.02237.....	miles / hr. / sec.
			chain.....	792.0.....	in.
			chain.....	20.12.....	meters
			chains (surveyors' or Gunter's).....	22.00.....	yd.





CONVERSION FACTORS

Table with columns: MULTIPLY, BY, TO OBTAIN. Contains conversion factors for various units such as circular mils, sq. in., cu. ft., gallons, and more.

Table with columns: MULTIPLY, BY, TO OBTAIN. Contains conversion factors for various units such as seconds, grams, liters, meters, and more.





## CONVERSION FACTORS

### MULTIPLY

horsepower .....  
horsepower .....  
horsepower (metric)  
(542.5 ft. lb. / sec.) .....  
horsepower  
(550 ft. lb. / sec.) .....  
horsepower .....  
horsepower .....  
horsepower .....  
horsepower (boiler) .....  
horsepower (boiler) .....  
horsepower (boiler) .....

horsepower - hr. ....  
horsepower - hr. ....  
horsepower - hr. ....  
horsepower - hr. ....  
horsepower - hr. ....  
horsepower - hr. ....  
horsepower - hr. ....  
hr. ....  
hr. ....  
hundredweights (long) ..  
hundredweights (long) ..  
hundredweights (short) ..  
hundredweights (short) ..  
hundredweights (short) ..  
hundredweights (short) ..

in. ....  
in. ....  
in. ....  
in. ....  
in. ....  
in. ....  
in. of mercury .....  
in. of mercury .....  
in. of mercury .....  
in. of mercury .....  
in. of mercury .....  
in. of mercury .....  
in. of H<sub>2</sub>O (at 4° C) .....  
in. of H<sub>2</sub>O (at 4° C) .....  
in. of H<sub>2</sub>O (at 4° C) .....  
in. of H<sub>2</sub>O (at 4° C) .....  
in. of H<sub>2</sub>O (at 4° C) .....  
in. of H<sub>2</sub>O (at 4° C) .....  
international ampere ....  
international volt .....  
international volt .....  
international volt .....

joules .....  
joules .....  
joules .....  
joules .....  
joules .....  
joules / cm .....  
joules / cm .....  
joules / cm .....

### BY

33,000.0 .....  
550.0 .....  
0.9863 .....  
1.014 .....  
10.68 .....  
0.7457 .....  
745.7 .....  
33,479.0 .....  
9.803 .....  
34.5 .....

2,547.0 .....  
2.6845 x 10<sup>13</sup> .....  
1.98 x 10<sup>6</sup> .....  
641,190.0 .....  
2.684 x 10<sup>6</sup> .....  
641.1 .....  
2.737 x 10<sup>5</sup> .....  
0.7457 .....  
4.167 x 10<sup>2</sup> .....  
5.952 x 10<sup>-3</sup> .....  
112.0 .....  
0.05 .....  
1,600.0 .....  
100.0 .....  
0.0453592 .....  
0.0446429 .....

### I

2.540 .....  
2.540 x 10<sup>2</sup> .....  
1.578 x 10<sup>-5</sup> .....  
25.40 .....  
1,000.0 .....  
2.778 x 10<sup>2</sup> .....  
0.03342 .....  
1.133 .....  
0.03453 .....  
345.3 .....  
70.73 .....  
0.4912 .....  
2.458 x 10<sup>-3</sup> .....  
0.07355 .....  
2.54 x 10<sup>-3</sup> .....  
0.5781 .....  
5.204 .....  
0.03613 .....  
0.9998 .....  
1.0003 .....  
1.593 x 10<sup>-19</sup> .....  
9.654 x 10<sup>4</sup> .....

### J

9.48 x 10<sup>4</sup> .....  
1 x 10<sup>7</sup> .....  
0.7376 .....  
2.389 x 10<sup>4</sup> .....  
0.102 .....  
2.778 x 10<sup>4</sup> .....  
1.02 x 10<sup>4</sup> .....  
1 x 10<sup>7</sup> .....  
100.0 .....

### TO OBTAIN

ft. - lbs. / min.  
ft. - lbs. / sec.  
horsepower  
(550 ft. lb. / sec.)  
horsepower (metric)  
(542.5 ft. lb. / sec.)  
kg. - calories / min.  
kilowatts  
watts  
Btu / hr.  
kilowatts  
lbs. H<sub>2</sub>O evap. / hr.  
(at 212° F)  
Btu  
ergs  
ft. - lbs.  
gram - calories  
joules  
kg. - calories  
kg. - meters  
kilowatt - hr.  
days  
weeks  
lbs.  
tons (long)  
oz. (avdp.)  
lbs.  
tons (metric)  
tons (long)

cm.  
meters  
miles  
millimeters  
mils  
yd.  
atmospheres  
ft. of H<sub>2</sub>O  
kg. / sq. cm.  
kg. / sq. meter  
lbs. / sq. ft.  
lbs. / sq. in.  
atmospheres  
in. of mercury  
kg. / sq. cm.  
oz. / sq. in.  
lbs. / sq. ft.  
lbs. / sq. in.  
ampere (absolute)  
volts (absolute)  
joules (absolute)  
joules

Btu  
ergs  
ft. - lbs.  
kg. - calories  
kg. - meters  
watt - hr.  
grams  
dynes  
joules / meter (newtons)

### MULTIPLY

joules / cm .....  
joules / cm .....

kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. ....  
kg. / cu. Meter .....  
kg. / cu. Meter .....  
kg. / cu. Meter .....  
kg. / cu. Meter .....  
kg. / meter .....  
kg. / sq. cm. ....  
kg. / sq. cm. ....  
kg. / sq. cm. ....  
kg. / sq. cm. ....  
kg. / sq. cm. ....  
kg. / sq. meter .....  
kg. / sq. meter .....  
kg. / sq. meter .....  
kg. / sq. meter .....  
kg. / sq. meter .....  
kg. / sq. meter .....  
kg. / sq. mm .....  
kg. - calories .....  
kg. - calories .....  
kg. - calories .....  
kg. - calories .....  
kg. - calories .....  
kg. - calories .....  
kg. - meters .....  
kg. - meters .....  
kg. - meters .....  
kg. - meters .....  
kg. - meters .....  
kilolines .....  
kiloliters .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers .....  
kilometers / hr. ....  
kilometers / hr. ....  
kilometers / hr. ....  
kilometers / hr. ....  
kilometers / hr. / sec. ....  
kilometers / hr. / sec. ....  
kilometers / hr. / sec. ....  
kilometers / hr. / sec. ....  
kilometers / hr. / sec. ....  
kilowatts .....  
kilowatts .....  
kilowatts .....

### BY

723.3 .....  
22.48 .....

### K

980,665.0 .....  
1,000.0 .....  
0.09807 .....  
9.807 .....  
70.93 .....  
2.205 .....  
9.842 x 10<sup>4</sup> .....  
1.102 x 10<sup>-3</sup> .....  
0.001 .....  
0.06243 .....  
3.613 x 10<sup>-5</sup> .....  
3.405 x 10<sup>-10</sup> .....  
0.672.0 .....  
980,665.0 .....  
0.9678 .....  
32.81 .....  
28.96 .....  
2,048.0 .....  
14.22 .....  
9.678 x 10<sup>-5</sup> .....  
98.07 x 10<sup>-6</sup> .....  
3.281 x 10<sup>-3</sup> .....  
2.896 x 10<sup>-3</sup> .....  
0.2048 .....  
1.422 x 10<sup>-3</sup> .....  
1 x 10<sup>6</sup> .....  
3.968 .....  
3,088.0 .....  
1.560 x 10<sup>-3</sup> .....  
4,186.0 .....  
426.9 .....  
4.186 .....  
1.163 x 10<sup>-3</sup> .....  
9.294 x 10<sup>-3</sup> .....  
9.804 x 10<sup>7</sup> .....  
7.233 .....  
9.804 .....  
2.342 x 10<sup>-3</sup> .....  
2.723 x 10<sup>-6</sup> .....  
1,000.0 .....  
1,000.0 .....  
1 x 10<sup>5</sup> .....  
3,281.0 .....  
3.937 x 10<sup>4</sup> .....  
1,000.0 .....  
0.6214 .....  
1 x 10<sup>6</sup> .....  
1,094.0 .....  
27.78 .....  
54.68 .....  
0.9113 .....  
0.5396 .....  
16.67 .....  
0.6214 .....  
27.78 .....  
0.9113 .....  
0.2778 .....  
0.6214 .....  
56.92 .....  
4.426 x 10<sup>4</sup> .....  
737.6 .....  
1.341 .....

### TO OBTAIN

poundals  
lbs.  
dynes  
grams  
joules / cm.  
joules / meter (newtons)  
poundals  
lbs.  
tons (long)  
tons (short)  
grams / cu. cm.  
lbs. / cu. in.  
lbs. / cu. in.  
lbs. / mil ft.  
lbs. / ft.  
dynes  
atmospheres  
ft. of H<sub>2</sub>O  
in. of mercury  
lbs. / sq. ft.  
lbs. / sq. in.  
atmospheres  
bars  
ft. of H<sub>2</sub>O  
in. of mercury  
lbs. / sq. ft.  
lbs. / sq. in.  
kg. / sq. meter  
Btu  
foot-pounds  
hp.-hrs.  
joules  
kg.-meters  
kilojoules  
kilowatt-hrs.  
Btu  
ergs  
foot-pounds  
joules  
kg.-calories  
kilowatt-hrs.  
maxwells  
liters  
centimeters  
feet  
inches  
meters  
miles  
millimeters  
yards  
cms. / sec.  
feet / min.  
feet / sec.  
knots  
meters / min.  
miles / hr.  
cms. / sec. / sec.  
ft. / sec. / sec.  
meters / sec. / sec.  
miles / hr. / sec.  
Btu / min.  
foot-lbs. / min.  
foot-lbs. / sec.  
horsepower



## CONVERSION FACTORS

**MULTIPLY**

kilowatts .....	14.34.....
kilowatts .....	1,000.0.....
kilowatt-hrs .....	3,413.0.....
kilowatt-hrs .....	3.600 x 10 <sup>13</sup> .....
kilowatt-hrs .....	2.655 x 10 <sup>6</sup> .....
kilowatt-hrs .....	859,850.0.....
kilowatt-hrs .....	1.341.....
kilowatt-hrs .....	3.6 x 10 <sup>6</sup> .....
kilowatt-hrs .....	860.5.....
kilowatt-hrs .....	3.671 x 10 <sup>5</sup> .....
kilowatt-hrs .....	3.53.....
kilowatt-hrs .....	22.75.....
knots .....	6,080.0.....
knots .....	1.8532.....
knots .....	1.0.....
knots .....	1.151.....
knots .....	2,027.0.....
knots .....	1.689.....

**BY**

14.34.....	.....
1,000.0.....	.....
3,413.0.....	.....
3.600 x 10 <sup>13</sup> .....	.....
2.655 x 10 <sup>6</sup> .....	.....
859,850.0.....	.....
1.341.....	.....
3.6 x 10 <sup>6</sup> .....	.....
860.5.....	.....
3.671 x 10 <sup>5</sup> .....	.....
3.53.....	.....
22.75.....	.....
6,080.0.....	.....
1.8532.....	.....
1.0.....	.....
1.151.....	.....
2,027.0.....	.....
1.689.....	.....

**L**

league .....	3.0.....
light-year .....	5.9 x 10 <sup>12</sup> .....
light-year .....	9.46891 x 10 <sup>12</sup> .....
lines / sq. cm. ....	1.0.....
lines / sq. in. ....	0.1550.....
lines / sq. in. ....	1.550 x 10 <sup>9</sup> .....
lines / sq. in. ....	1 x 10 <sup>8</sup> .....
lines / sq. in. ....	1.550 x 10 <sup>5</sup> .....
links (engineer's) ..	12.0.....
links (surveyor's) ..	7.92.....
liters .....	0.02838.....
liters .....	1,000.0.....
liters .....	0.03531.....
liters .....	61.02.....
liters .....	0.001.....
liters .....	1.308 x 10 <sup>-3</sup> .....
liters .....	0.2642.....
liters .....	2.113.....
liters .....	1.057.....
liters / min. ....	5.886 x 10 <sup>-4</sup> .....
liters / min. ....	4.403 x 10 <sup>-3</sup> .....
lumen .....	0.07958.....
lumen .....	0.001496.....
lumens / sq. ft. ....	1.0.....
lumens / sq. ft. ....	10.76.....
lux.....	0.0929.....

**M**

maxwells.....	0.001.....
maxwells.....	1 x 10 <sup>8</sup> .....
megalines.....	1 x 10 <sup>6</sup> .....
megohms.....	1 x 10 <sup>12</sup> .....
megohms.....	1 x 10 <sup>6</sup> .....
meters.....	100.0.....
meters.....	3.281.....
meters.....	39.37.....
meters.....	0.001.....
meters.....	5.396 x 10 <sup>-4</sup> .....
meters.....	6.214 x 10 <sup>-4</sup> .....
meters.....	1,000.0.....
meters.....	1.094.....
meters / min.....	1.667.....

**TO OBTAIN**

kg.-calories / min.	.....
watts	.....
Btu	.....
ergs	.....
foot-lbs.	.....
gram-calories	.....
horsepower-hrs.	.....
joules	.....
kg.-calories	.....
kg.-meters	.....
lbs. of water evaporated from and at 212°F	.....
lbs. of water raised from 62° to 212°F	.....
feet / hr.	.....
kilometers / hr.	.....
nautical miles / hr.	.....
statute miles / hr.	.....
yards / hr.	.....
feet / sec.	.....
miles (approx.)	.....
miles	.....
kilometers	.....
gausses	.....
gausses	.....
webers / sq. cm.	.....
webers / sq. in.	.....
webers / sq. meter	.....
inches	.....
inches	.....
bushels (US dry)	.....
cu. cm.	.....
cu. feet.	.....
cu. inches	.....
cu. meters	.....
cu. yards	.....
gallons (US liq.)	.....
pints (US liq.)	.....
quarts (US liq.)	.....
cu. ft. / sec.	.....
gals. / sec.	.....
spherical candle power watt	.....
foot-candles	.....
lumen / sq. meter	.....
foot-candles	.....
kilolines	.....
webers	.....
maxwells	.....
microhms	.....
ohms	.....
centimeters	.....
feet	.....
inches	.....
kilometers	.....
miles (nautical)	.....
miles (statute)	.....
millimeters	.....
yards	.....
cms. / sec.	.....

**MULTIPLY**

meters / min.....	3.281.....
meters / min.....	0.05468.....
meters / min.....	0.06.....
meters / min.....	0.03238.....
meters / min.....	0.03728.....
meters / sec.....	196.8.....
meters / sec.....	3.281.....
meters / sec.....	3.6.....
meters / sec.....	0.06.....
meters / sec.....	2.237.....
meters / sec.....	0.03728.....
meters / sec. / sec.....	100.0.....
meters / sec. / sec.....	3.281.....
meters / sec. / sec.....	3.6.....
meters / sec. / sec.....	2.237.....
meter / kilograms.....	9.807 x 10 <sup>7</sup> .....
meters / kilograms.....	1 x 10 <sup>5</sup> .....
meter / kilograms.....	7.233.....
microfarad.....	1 x 10 <sup>-6</sup> .....
micrograms.....	1 x 10 <sup>-6</sup> .....
microhms.....	1 x 10 <sup>-12</sup> .....
microhms.....	1 x 10 <sup>-6</sup> .....
microliters.....	1 x 10 <sup>-6</sup> .....
microns.....	1 x 10 <sup>-6</sup> .....
miles (nautical).....	6,080.27.....
miles (nautical).....	1.853.....
miles (nautical).....	1,853.0.....
miles (nautical).....	1.1516.....
miles (nautical).....	2,027.0.....
miles (statute).....	1.609 x 10 <sup>5</sup> .....
miles (statute).....	5,280.0.....
miles (statute).....	6.336 x 10 <sup>4</sup> .....
miles (statute).....	1.609.....
miles (statute).....	1,609.0.....
miles (statute).....	0.8684.....
miles (statute).....	1,760.0.....
miles / hr.....	44.70.....
miles / hr.....	88.0.....
miles / hr.....	1.467.....
miles / hr.....	1.609.....
miles / hr.....	0.02682.....
miles / hr.....	0.8684.....
miles / hr.....	26.82.....
miles / hr.....	0.1667.....
miles / hr. / sec.....	44.70.....
miles / hr. / sec.....	1.467.....
miles / hr. / sec.....	1.609.....
miles / hr. / sec.....	0.4470.....
miles / min.....	2,682.0.....
miles / min.....	88.0.....
miles / min.....	1.609.....
miles / min.....	0.8684.....
miles / min.....	60.0.....
mil-feet.....	9.425 x 10 <sup>-6</sup> .....
milliers.....	1,000.0.....
millimicrons.....	1 x 10 <sup>-9</sup> .....
milligrams.....	0.01543236.....
milligrams.....	0.001.....
milligrams / liter.....	1.0.....
millihenries.....	0.001.....
milliliters.....	0.001.....
millimeters.....	0.1.....
millimeters.....	3.281 x 10 <sup>-3</sup> .....
millimeters.....	0.03937.....
millimeters.....	1 x 10 <sup>-6</sup> .....
millimeters.....	0.001.....

**BY**

3.281.....	.....
0.05468.....	.....
0.06.....	.....
0.03238.....	.....
0.03728.....	.....
196.8.....	.....
3.281.....	.....
3.6.....	.....
0.06.....	.....
2.237.....	.....
0.03728.....	.....
100.0.....	.....
3.281.....	.....
3.6.....	.....
2.237.....	.....
9.807 x 10 <sup>7</sup> .....	.....
1 x 10 <sup>5</sup> .....	.....
7.233.....	.....
1 x 10 <sup>-6</sup> .....	.....
1 x 10 <sup>-6</sup> .....	.....
1 x 10 <sup>-12</sup> .....	.....
1 x 10 <sup>-6</sup> .....	.....
1 x 10 <sup>-6</sup> .....	.....
6,080.27.....	.....
1.853.....	.....
1,853.0.....	.....
1.1516.....	.....
2,027.0.....	.....
1.609 x 10 <sup>5</sup> .....	.....
5,280.0.....	.....
6.336 x 10 <sup>4</sup> .....	.....
1.609.....	.....
1,609.0.....	.....
0.8684.....	.....
1,760.0.....	.....
44.70.....	.....
88.0.....	.....
1.467.....	.....
1.609.....	.....
0.02682.....	.....
0.8684.....	.....
26.82.....	.....
0.1667.....	.....
44.70.....	.....
1.467.....	.....
1.609.....	.....
0.4470.....	.....
2,682.0.....	.....
88.0.....	.....
1.609.....	.....
0.8684.....	.....
60.0.....	.....
9.425 x 10 <sup>-6</sup> .....	.....
1,000.0.....	.....
1 x 10 <sup>-9</sup> .....	.....
0.01543236.....	.....
0.001.....	.....
1.0.....	.....
0.001.....	.....
0.001.....	.....
0.1.....	.....
3.281 x 10 <sup>-3</sup> .....	.....
0.03937.....	.....
1 x 10 <sup>-6</sup> .....	.....
0.001.....	.....

**TO OBTAIN**

feet / min.	.....
feet / sec.	.....
kms. / hr.	.....
knots	.....
miles / hr.	.....
feet / min.	.....
feet / sec.	.....
kilometers / hr.	.....
kilometers / min.	.....
miles / hr.	.....
miles / min.	.....
cms. / sec. / sec.	.....
ft. / sec. / sec.	.....
kms. / hr. / sec.	.....
miles / hr. / sec.	.....
cm.-dynes	.....
cm.-grams	.....
pound-feet	.....
farads	.....
grams	.....
megohms	.....
ohms	.....
liters	.....
meters	.....
feet	.....
kilometers	.....
meters	.....
miles (statute)	.....
yards	.....
centimeters	.....
feet	.....
inches	.....
kilometers	.....
meters	.....
miles (nautical)	.....
yards	.....
cms. / sec.	.....
feet / min.	.....
feet / sec.	.....
kms. / hr.	.....
kms. / min.	.....
knots	.....
meters / min.	.....
miles / min.	.....
cms. / sec. / sec.	.....
feet / sec. / sec.	.....
kms. / hr. / sec.	.....
meters / sec. / sec.	.....
cms. / sec.	.....
feet / sec.	.....
kms. / min.	.....
knots / min.	.....
miles / hr.	.....
cu. inches	.....
kilograms	.....
meters	.....
grams	.....
parts / million	.....
henries	.....
liters	.....
cm.	.....
ft.	.....
inch	.....
km.	.....
meters	.....





## CONVERSION FACTORS

**MULTIPLY**

quadrants (angle).....  
 quadrants (angle).....  
 quadrants (angle).....  
 quarts (dry).....  
 quarts (liquid).....  
 quarts (liquid).....  
 quarts (liquid).....  
 quarts (liquid).....  
 quarts (liquid).....  
 quarts (liquid).....

**BY**

5,400.0.....  
 1.571.....  
 $3.24 \times 10^5$ .....  
 67.2.....  
 946.4.....  
 0.03342.....  
 57.75.....  
 $9.464 \times 10^{-4}$ .....  
 $1.238 \times 10^{-3}$ .....  
 0.25.....  
 0.9463.....

**TO OBTAIN**

min.  
 radians  
 sec.  
 cu. in.  
 cu. cm.  
 cu. ft.  
 cu. in.  
 cu. meters  
 cu. yd.  
 gallons  
 liters

**R**

radians.....  
 radians.....  
 radians.....  
 radians / sec.....  
 radians / sec.....  
 radians / sec.....  
 radians / sec. / sec.....  
 radians / sec. / sec.....  
 radians / sec. / sec.....  
 revolutions.....  
 revolutions.....  
 revolutions / min.....  
 revolutions / min.....  
 revolutions / min.....  
 revolutions / min. / min.....  
 revolutions / min. / min.....  
 revolutions / min. / min.....  
 revolutions / sec.....  
 revolutions / sec.....  
 revolutions / sec.....  
 revolutions / sec. / sec.....  
 revolutions / sec. / sec.....  
 revolutions / sec. / sec.....  
 rod.....  
 rod.....  
 rods (surveyor's meas.) ..  
 rods.....

57.30.....  
 3,438.0.....  
 0.6366.....  
 $2.063 \times 10^5$ .....  
 57.3.....  
 9.549.....  
 0.1592.....  
 573.0.....  
 9.549.....  
 0.1592.....  
 360.0.....  
 4.0.....  
 6.283.....  
 6.0.....  
 0.1047.....  
 0.1667.....  
 1.745 x 10.....  
 0.01667.....  
 2.778 x 10.....  
 360.0.....  
 6.283.....  
 60.0.....  
 6.283.....  
 3,600.0.....  
 60.0.....  
 0.25.....  
 5.029.....  
 5.5.....  
 16.5.....

degrees  
 min.  
 quadrants  
 sec.  
 degrees / sec.  
 revolutions / min.  
 revolutions / sec.  
 revolutions / min. / min.  
 revolutions / min. / sec.  
 revolutions / sec. / sec.  
 degrees  
 quadrants  
 radians  
 degrees / sec.  
 radians / sec.  
 revs / sec.  
 radians / sec. / sec.  
 revs. / min. / sec.  
 revs. / sec. / sec.  
 degrees / sec.  
 radians / sec.  
 revs. / min.  
 radians / sec. / sec.  
 revs. / min. / min.  
 revs. / min. / sec.  
 chain (Gunter's)  
 meters  
 yards  
 feet

**S**

scruples.....  
 seconds (angle).....  
 seconds (angle).....  
 seconds (angle).....  
 seconds (angle).....  
 slug.....  
 slug.....  
 sphere.....  
 square centimeters.....  
 square centimeters.....  
 square centimeters.....  
 square centimeters.....  
 square centimeters.....  
 square centimeters.....  
 square centimeters.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....  
 square feet.....

20.0.....  
 $2.778 \times 10^{-4}$ .....  
 0.01667.....  
 $3.087 \times 10^{-6}$ .....  
 $4.848 \times 10^{-6}$ .....  
 14.59.....  
 32.17.....  
 12.57.....  
 $1.973 \times 10^5$ .....  
 $1.076 \times 10^{-3}$ .....  
 0.1550.....  
 0.0001.....  
 $3.861 \times 10^{-11}$ .....  
 100.0.....  
 $1.196 \times 10^{-4}$ .....  
 $2.296 \times 10^{-5}$ .....  
 $1.833 \times 10^8$ .....  
 929.0.....  
 144.0.....  
 0.09290.....  
 $3.587 \times 10^{-8}$ .....  
 $9.290 \times 10^{-4}$ .....

grains  
 degrees  
 minutes  
 quadrants  
 radians  
 kilogram  
 pounds  
 steradians  
 circular mils  
 square feet  
 square inches  
 square meters  
 square miles  
 square millimeters  
 square yards  
 acres  
 circular mils  
 sq. cms.  
 sq. inches  
 sq. meters  
 sq. miles  
 sq. millimeters

**MULTIPLY**

square feet.....  
 square inches.....  
 square inches.....  
 square inches.....  
 square inches.....  
 square inches.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square kilometers.....  
 square meters.....  
 square meters.....  
 square meters.....  
 square meters.....  
 square meters.....  
 square meters.....  
 square meters.....  
 square miles.....  
 square miles.....  
 square miles.....  
 square miles.....  
 square millimeters.....  
 square millimeters.....  
 square millimeters.....  
 square millimeters.....  
 square mils.....  
 square mils.....  
 square mils.....  
 square yards.....  
 square yards.....  
 square yards.....  
 square yards.....  
 square yards.....  
 square yards.....  
 square yards.....

**BY**

0.1111.....  
 $1.273 \times 10^6$ .....  
 6.452.....  
 $6.944 \times 10^{-3}$ .....  
 645.2.....  
 $1 \times 10^6$ .....  
 $7.716 \times 10^{-4}$ .....  
 247.1.....  
 $1 \times 10^{10}$ .....  
 $10.76 \times 10^6$ .....  
 $1.550 \times 10^9$ .....  
 $1 \times 10^6$ .....  
 0.3861.....  
 $1.196 \times 10^6$ .....  
 $2.471 \times 10^{-4}$ .....  
 $1 \times 10^4$ .....  
 10.76.....  
 1,550.0.....  
 $3.861 \times 10^{-7}$ .....  
 $1 \times 10^6$ .....  
 1.196.....  
 640.0.....  
 $27.88 \times 10^6$ .....  
 2.590.....  
 $2.590 \times 10^6$ .....  
 $3.098 \times 10^6$ .....  
 1,973.0.....  
 0.01.....  
 $1.076 \times 10^{-5}$ .....  
 $1.550 \times 10^{-3}$ .....  
 1.273.....  
 $6.452 \times 10^{-6}$ .....  
 $1 \times 10^6$ .....  
 $2.066 \times 10^{-4}$ .....  
 8,361.0.....  
 9.0.....  
 1,296.0.....  
 0.8361.....  
 $3.228 \times 10^7$ .....  
 $8.361 \times 10^5$ .....

**TO OBTAIN**

sq. yards  
 circular mils  
 sq. cms.  
 sq. feet  
 sq. millimeters  
 sq. mils  
 sq. yards  
 acres  
 sq. cms.  
 sq. ft.  
 sq. inches  
 sq. meters  
 sq. miles  
 sq. yards  
 acres  
 sq. cms.  
 sq. feet  
 sq. inches  
 sq. miles  
 sq. millimeters  
 sq. yards  
 acres  
 sq. feet  
 sq. kms.  
 sq. meters  
 sq. yards  
 circular mils  
 sq. cms.  
 sq. feet  
 sq. inches  
 circular mils  
 sq. cms.  
 sq. inches  
 acres  
 sq. cms.  
 sq. feet  
 sq. inches  
 sq. meters  
 sq. miles  
 sq. millimeters

**T**

temperature (°C) + 273  
 temperature (°C) + 17.78  
 temperature (°F) + 460  
 temperature (°F) - 32  
 tons (long)  
 tons (long)  
 tons (long)  
 tons (metric)  
 tons (metric)  
 tons (short)  
 tons (short)  
 tons (short)  
 tons (short)  
 tons (short)  
 tons (short)  
 tons (short)  
 tons (short) / sq. ft.  
 tons (short) / sq. ft.  
 tons of water / 24 hrs.  
 tons of water / 24 hrs.  
 tons of water / 24 hrs.

1.0.....  
 1.0.....  
 5/9.....  
 1,016.0.....  
 2,240.0.....  
 1.120.....  
 1,000.0.....  
 2,205.0.....  
 907.1848.....  
 32,000.0.....  
 29,166.66.....  
 2,000.0.....  
 2,430.56.....  
 0.89287.....  
 0.9078.....  
 9,765.0.....  
 2,000.0.....  
 83.333.....  
 0.16643.....  
 1.3349.....

absolute temp. (°C)  
 temperature (°F).8  
 absolute temp. (°F)  
 temperature (°C)  
 kilograms  
 pounds  
 tons (short)  
 kilograms  
 pounds  
 kilograms  
 ounces  
 ounces (troy)  
 pounds  
 pounds (troy)  
 tons (long)  
 tons (metric)  
 kgs. / sq. meter  
 pounds / sq. in.  
 pounds of water / hr.  
 gallons / min.  
 cu. ft. / hr.



## CONVERSION FACTORS

MULTIPLY	BY	TO OBTAIN
<b>V</b>		
volt inch.....	0.39370.....	volt / cm.
volt (absolute).....	0.003336.....	statvolts
<b>W</b>		
watts .....	3.4129.....	Btu / hr.
watts .....	0.05688.....	Btu / min.
watts .....	107.0.....	ergs / sec.
watts .....	44.27.....	foot-lbs. / min.
watts .....	0.7378.....	foot-lbs. / sec.
watts .....	$1.341 \times 10^3$ .....	horsepower
watts .....	$1.360 \times 10^3$ .....	horsepower (metric)
watts .....	0.01433.....	kg-calories / min.
watts .....	0.001.....	kilowatts
watts (absolute).....	0.056884.....	Btu (mean) / min.
watts (absolute).....	1.0.....	joules / sec.
watt-hours .....	3.413.....	Btu
watt-hours .....	$3.60 \times 10^{10}$ .....	ergs
watt-hours .....	2,656.0.....	foot - pounds
watt-hours .....	859.85.....	gram - calories
watt-hours .....	$1.341 \times 10^3$ .....	horsepower - hrs.
watt-hours .....	0.8605.....	kilogram - calories
watt-hours .....	367.2.....	kilogram - meters
watt-hours .....	0.001.....	kilowatt - hrs.
watt (international) .....	1.0002.....	watt (absolute)
webers .....	$1 \times 10^8$ .....	maxwells
webers .....	$1 \times 10^5$ .....	kilolines
webers / sq. in.....	$1.550 \times 10^7$ .....	gausses
webers / sq. in.....	$1 \times 10^8$ .....	lines / sq. in.
webers / sq. in.....	0.1550.....	webers / sq. cm.
webers / sq. in.....	1,550.0.....	webers / sq. meter
webers / sq. meter.....	$1 \times 10^4$ .....	gausses
webers / sq. meter.....	$6.452 \times 10^4$ .....	lines / sq. in.
webers / sq. meter.....	$1 \times 10^4$ .....	webers / sq. cm.
webers / sq. meter.....	$6.452 \times 10^4$ .....	webers / sq. in.
<b>Y</b>		
yards.....	91.44.....	centimeters
yards.....	$9.144 \times 10^4$ .....	kilometers
yards.....	0.9144.....	meters
yards.....	$4.934 \times 10^4$ .....	miles (nautical)
yards.....	$5.682 \times 10^4$ .....	miles (statute)
yards.....	914.4.....	millimeters