APPENDIX A

RESERVED

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APPENDIX B

TORQUING OF FLARED TUBE AND PIPE CONNECTIONS

Tightening of flared and pipe connections shall be accomplished in accordance with the beat commercial practice. Torque wrenches shall be used, and the torque applied shall be within the limits specified in the following tables.

NOTE

Torque to specified minimum value and check for leakage. If additional torque is required to stop leakage, torque may be applied to specified maximum value.

Table B-1. Torque Requirements for Flared Tube Connections

Tubing O.D.	Minimum Torque	Maximum Torque
1/4 in.	50 inch-pounds	75 inch-pounds
5/16 in.	100 inch-pounds	125 inch-pounds
3/8 in.	200 inch-pounds	250 inch-pounds
1/2 in.	300 inch-pounds	400 inch-pounds
5/8 in.	400 inch-pounds	450 inch-pounds

Table B-2. Torque Requirements for Pipe Connections

Nominal Pipe Size	Minimum Torque	Maximum Torque
1/8 in.	40 inch-pounds	150 inch-pounds
1/4 in.	60 inch-pounds	200 inch-pounds
3/8 in.	100 inch-pounds	400 inch-pounds

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APPENDIX C

THE METRIC SYSTEM AND METRIC UNIT CONVERSION CHARTS

The Metric System simply and logically coordinates the measurements of length, area, volume, and mass into one decimalized system. United States currency, with its unexcelled convenience, was the first large scale national use of a decimal system. The ratio between the units of the series - dollars, dimes, cents, and mills - is ten. Additions and other numerical operations are simple. Calculations with metric units require no conversion from unit to unit, as for example between inches and feet or ounces and pounds.

In the Metric System there is one series of units for length, one for area, one for volume or capacity, and one for mass. (Refer to tables C-1, C-2 and C-5.)

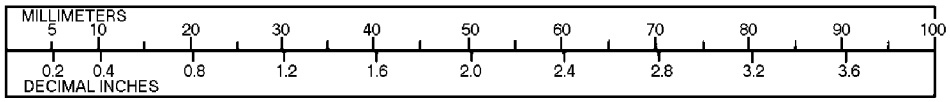
LENGTH - The common metric units of length are the millimeter (mm) for small dimensions, the centimeter (cm) for daily practical use, the meter (m) for expressing dimensions of larger objects and short distances and the kilometer (km) for longer distances. The centimeter is about four-tenths of an inch. The meter is about forty inches and the kilometer about six-tenths of a mile (figure C-1). When drawing to metric scale, engineering and product dimensions are in millimeters. Architectural drawings can be in millimeters or centimeters. On land surveys the unit is the meter. On maps the kilometer is the unit of measurement.

AREA - Small areas are usually measured in square centimeters (cm^2). In building and construction the square meter (m^2) is used and is about 20 percent larger than a square yard. The hectare (ha) is used for land surveys and is about 2.5 acres.

VOLUME - For volume the most convenient unit is the cubic decimeter (dm^3), referred to as the liter (l). The liter is slightly larger than the U.S. liquid quart but smaller than the U.S. dry quart and the British Imperial quart. The preferred unit for dispensing unit for dispensing drugs and for scientific work is the cubic centimeter (cm^3) or milliliter (ml) as it is also called. For measuring amounts of concrete and excavations the cubic meter (m^3) is used.

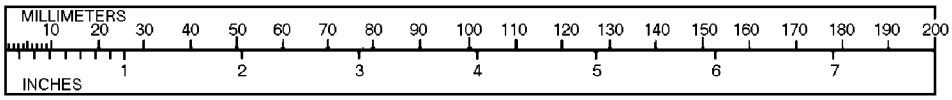
MASS - In pharmaceutical and scientific work the gram (g) is the most convenient unit. There are slightly less than 30 grams in one avoirdupois ounce. For most other uses the kilogram (kg) is convenient and is approximately 2.2 pounds. The metric ton (t), 1000 kg, is used for farm commodities, minerals, and large shipments. It is convenient that a liter of pure water at standard temperature and pressure has a mass of one kilogram (discrepancy less than one part in 10,000). This relationship makes it easy to determine the mass of any known volume of water, or of any other liquid if its specific gravity is known.

TEMPERATURE - All countries using the Metric System of weights and measures also use the Celsius (C) scale (formerly called centigrade) for ordinary measurement of temperature. On the Celsius scale pure water at standard atmospheric pressure freezes at 0 and boils at 100. Normal human body temperature is 37°, while a comfortable room temperature is about 22°. The preferred temperature scale for engineering and physics is the kelvin (K) which has the same units as the Celsius and where the freezing point of pure water is 273.15 K.



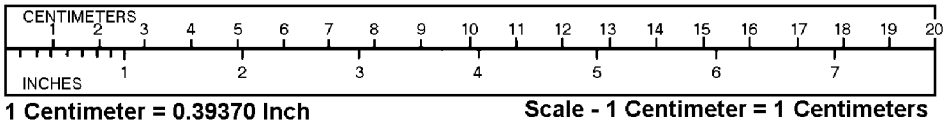
1 Millimeter = 0.03937 Inch

Scale - 1 Centimeter = 5 Millimeters



1 Inch = 25.4 Millimeters

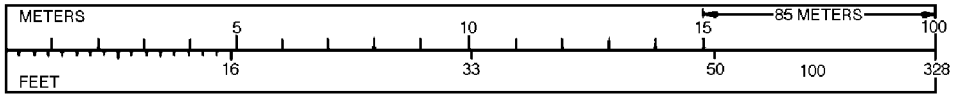
Scale - 1 Centimeter = 10 Millimeters



1 Centimeter = 0.39370 Inch

Scale - 1 Centimeter = 1 Centimeters

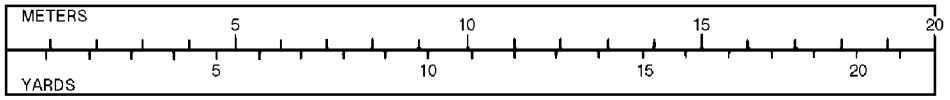
1 Inch = 2.54 Centimeters



Scale - 1 Centimeter = 1 Meter

1 Foot = 0.3048 Meter

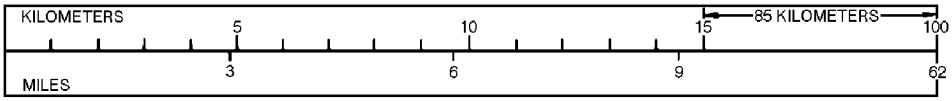
1 Meter = 3.28083 Feet (39.37 Inches - Act of Congress 1866)



1 Meter = 1.09361 Yards

1 Yard = 0.9144 Meter

Scale - 1 Centimeter = 1 Meter



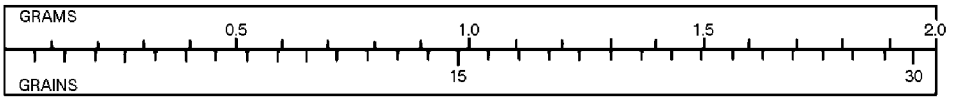
1 Kilometer = 0.62137 Mile

Scale - 1 Centimeter = 1 Kilometer

Mile = 1.6093 Kilometers

1 Cubic Centimeter = 0.061 Cubic Inch

Scale - 1 Centimeter = 1 Cubic Centimeter

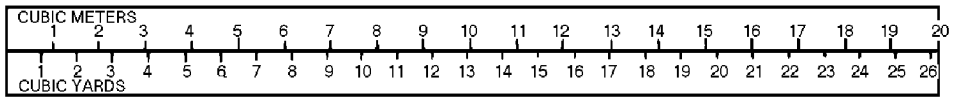


1 Gram = 15.4324 Grains

Scale - 1 Centimeter = 0.1 Gram

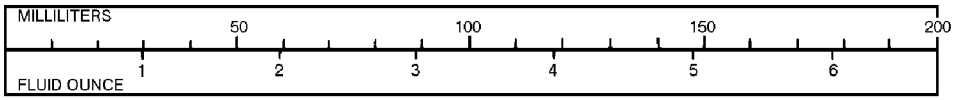
C-2

Figure C-1. Reference Conversion Charts (Sheet 1 of 2)



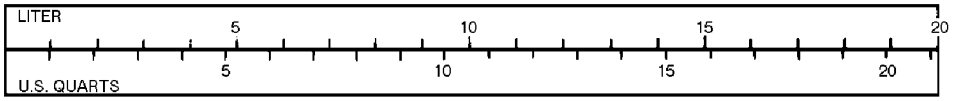
1 Cubic Meter = 1.30795 Cubic meter **Scale - 1 Centimeter = 1 Cubic Meter**

1 Cubic Yard = 0.76455 Cubic meter

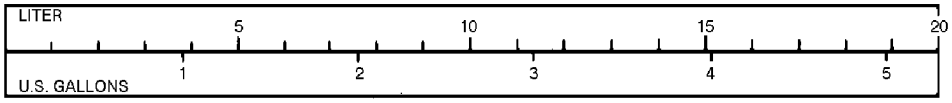


1 Milliliter = 0.03381 Fluid Ounce **Scale - 1 Centimeter = 10 Milliliter**

1 Fluid Ounce = 29.57 Milliliters



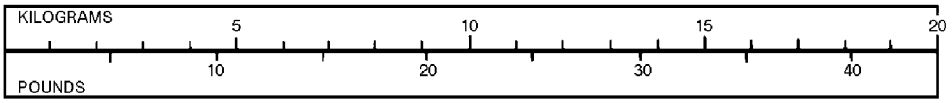
1 Liter = 1.0567 U.S. Quarts **1 U.S. Quart = 0.9463 Liter** **Scale - 1 Centimeter = 1 Liter**



1 Liter = 0.26418 U.S. Gallon **Scale - 1 Centimeter = 1 Liter**

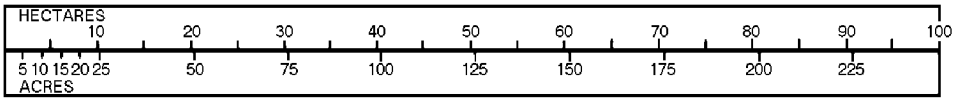
1 U.S. Gallon = 3.7853 Liters

1 Avoirdupois ounce = 28.3495 Grams **Scale - 1 Centimeter = 5 Grams**



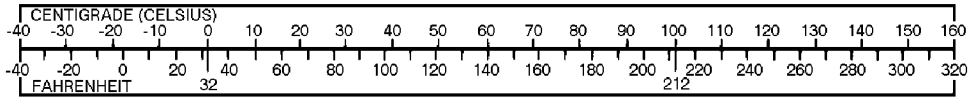
1 Kilogram = 2.2045 Pounds **Scale - 1 Centimeter = 1 Kilogram**

1 Pound = 0.45359 Kilogram



1 Hectare = 2.47105 Acres **Scale - 1 Centimeter = 5 Hectares**

1 Acres = 0.40489 Hectares **40 Acres = 16.19 Hectares**



Fahrenheit = 9/5 Centigrade plus 32 **Scale - 1 Centigrade = 10° Centigrade**

Centigrade = Fahrenheit minus 32 x 5/9

C-2A

Figure C-1. Reference Conversion Charts (Sheet 2 of 2)

Table C-1. Symbols and Relationships of Metric Units

Quantity	Unit (Note 1)	Symbol	Relationship of Units
Length	millimeter centimeter decimeter meter (Note 2) kilometer	mm cm dm m km	1 mm = 0.001 m 1 cm = 10 mm 1 dm = 10 cm 1 m = 100 cm 1 km = 1000 m
Area	square centimeter square decimeter square meter (Note 2) are hectare square kilometer	cm^2 dm^2 m^2 a ha km^2	1 cm^2 = 100 mm^2 1 dm^2 = 100 cm^2 1 m^2 = 100 dm^2 1 a = 100 m^2 1 ha = 100 a 1 km^2 = 100 ha
Volume	{cubic centimeter millimeter {cubic decimeter liter cubic meter (Note 2)	cm^3 ml dm^3 l m^3	1 cm^3 } = 0.001 l 1 ml 1 dm^3 } = 1000 ml 1 l 1 m^3 = 1000 l
Mass*	milligram gram kilogram (Note 2) metric ton	mg g kg t	1 mg = 0.001 g 1 g = 1000 mg 1 kg = 1000 g 1 t = 1000 kg

*Mass is the quantity of matter. Weight is a force Earth's attraction for a given mass. Generally the term mass is meant when we use weight.

Notes:
1. The three main units; meter liter and gram can be changed to more convenient sized units for specific purposes by means of several well known prefixes. Milli means 1/1000. Centi means 1/100. Deci means 1/10. Kilo means 1000. One merely learns the main units and the value of the most commonly used prefixes. The symbols for metric units are the same for single and plural amounts and are not followed by a period. Rates are usually shown by use of the slash as in m/s.
2. The underlined units in this table are basic or derived units of the International System of Units (SI).

Table C-2. International System of Units (SI)

Quantity	Unit	Symbol
Elemental units		
Length	meter	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Temperature	degree Kelvin	°K
Luminous intensity	candela	cd
Supplementary units		
Plane angle	radian	rad
Solid angle	steradian	sr
Derived units		
Area	square meter	m^2
Volume	cubic meter	m^3
Frequency	hertz	Hz (s^{-1})
Density	kilogram per cubic meter	kg/m^3
Velocity	meter per second	m/s
Angular velocity	radian per second	rad/s
Acceleration	meter per second squared	m/s^2
Angular acceleration	radian per second squared	rad/s^2
Force	newton	N ($kg\ m/s^2$)
Pressure	newton per square meter	N/m^2
Kinematic viscosity	square meter per second	m^2/s
Dynamic viscosity	newton-second per square meter	$N\ s/m^2$
Work, energy, quantity of heat	joule	J (N m)
Power	watt	W (J/s)
Electric charge	coulomb	C (A s)
Voltage, potential difference, electrotive force	volt	V (W/A)
Electric field strength	volt per meter	V/m
Electric resistance	ohm	Ω (V/A)
Electric capacitance	farad	F (A s/V)
Magnetic flux	weber	Wb (V s)
Inductance	henry	H (V s/A)
Magnetic flux density	tesla	T (Wb/m^2)
Magnetic field strength	ampere per meter	A/m
Magnetomotive force	ampere	A
Luminous flux	lumen	lm (cd sr)
Luminance	candela per square meter	cd/m^2
Illumination	lux	lx (lm/m^2)

USE OF TABLES

Following are step by step directions for the solution to an example conversion problem. The example is: Convert 12 3/4 inches to centimeters.

1. Convert all fractions to decimals. (Refer to table C-3.)

   12 3/4 = 12.75

2. Refer to table C-4 and find the column for the unit which you have. This would be the column labeled “INCHES” in the “Length” table.

3. Locate the numeral 1 in the column labeled “INCHES.”

4. Locate the column labeled “CENTIMETERS.”

5. Read the number in the CENTIMETERS column that is in direct line with the numeral 1 located in the INCHES column.

   Read 2.540

6. Multiply the number of inches of this example by the conversion factor to obtain the number of centimeters.

   2.540 times 12.75 equals 32.385

7. Round off the answer to not over four significant figures (four numbers counting from the first non-zero number on the left. Fewer significant figures may be used depending on the accuracy of measurement and the tolerances allowed. For most work in this manual, centimeters would be expressed as three significant figures.

   12 3/4 inches = 32.4 centimeters

Table C-3. Fraction/Decimal/Millimeter Conversion Chart

Fractions	Dec Equiv	MM Equiv	Fractions	Dec Equiv	MM Equiv
1/64	0.01562	0.397	33/64	0.515625	13.097
1/32	0.03125	0.794	17/32	0.53125	13.494
3/64	0.04688	1.191	35/64	0.546875	13.891
1/16	0.0625	1.588	9/16	0.5625	14.288
5/64	0.078125	1.984	37/64	0.578125	14.684
3/32	0.09375	2.381	19/32	0.59375	15.081
7/64	0.109375	2.778	39/64	0.609375	15.478
1/8	0.125	3.175	5/8	0.625	15.875
9/64	0.140625	3.572	41/64	0.640625	16.272
5/32	0.15625	3.969	21/32	0.65625	16.669
11/64	0.171875	4.366	43/64	0.671875	17.066
3/16	0.1875	4.762	11/16	0.6875	17.462
13/64	0.203125	5.159	45/64	0.703125	17.859
7/32	0.21875	5.556	23/32	0.71875	18.256
15/64	0.234375	5.953	47/64	0.734375	18.653
1/4	0.25	6.350	3/4	0.75	19.050
17/64	0.265625	6.747	49/64	0.765625	19.447
9/32	0.28/125	7.144	25/32	0.78125	19.844
19/64	0.296875	7.541	51/64	0.796875	20.241
5/16	0.3125	7.938	13/16	0.8125	20.638
21/64	0.328125	8.334	53/64	0.828125	21.034
11/32	0.34375	8.731	27/32	0.84375	21.431
23/64	0.359375	9.128	55/64	0.859375	21.828
3/8	0.375	9.525	7/8	0.875	22.225
25/64	0.390625	9.922	57/64	0.890625	22.622
13/32	0.40625	10.319	29/32	0.90625	23.019
27/64	0.421875	10.716	59/64	0.921875	23.416
7/16	0.4375	11.112	15/16	0.9375	23.812
29/64	0.453125	11.509	61/64	0.953125	24.209
15/32	0.46875	11.906	31/32	0.96875	24.606
31/64	0.484375	12.303	63/64	0.984375	25.003
1/2	0.5	12.700	1	1.0	25.400

Table C-4. Metric Unit Conversions

Length

Millimeters	Centimeters	Inches	Feet	Yards	Meters
1.0	0.1000	0.03937	0.003281	0.001094	0.001000
10.0	1.0	0.3937	0.03281	0.01094	0.01000
25.40	2.540	1.0	0.08333	0.02778	0.0254
304.8	30.48	12.0	1.0	0.3333	0.3048
914.4	91.44	36.0	3.000	1.0	0.9144
1000.0	100.0	39.37	3.281	1.094	1.0

Weight

Grams	Kilograms	Grains	Ounces Avoirdupois	Pounds Avoirdupois
1000.0	1.0	15,432.0	35.27	2.205
1.0	0.0010	15,432	0.03527	0.002205
0.06480	0.00006480	1.0	0.002286	0.0001429
28.35	0.02835	437.5	1.0	0.0625
453.6	0.4536	7,000.0	16.0	1.0

Velocity

Meters/Sec	Kilometers/Hr	Feet/Sec	Miles/Hr	Knots
1.0	3.600	3.281	2.237	1.944
0.2778	1.0	0.9113	0.6214	0.5400
0.3048	1.097	1.0	0.6818	0.5925
0.4470	1.609	1.467	1.0	0.8690
0.5144	1.852	1.688	1.1511	1.0

Pressure

Bars (Megabaryes)	Kilograms/ square cm	Pounds/ square inch	Atmospheres	Columns of Mercury (0°C)		Columns of Water (15°C)		
				Meters	Inches	Meters	Inches	Feet
1.0	1.0197	14.50	0.9869	0.7501	29.53	10.21	401.8	33.49
0.9807	1.0	14.22	0.9678	0.7356	28.96	10.01	394.1	32.84
0.06895	0.07031	1.0	0.06805	0.05171	2.036	0.7037	27.70	2.309
1.0133	1.0332	14.70	1.0	0.7600	29.92	10.34	407.1	33.93
1.3332	1.3595	19.34	1.316	1.0	39.37	13.61	535.7	44.64
0.03386	0.03453	0.4912	0.03342	0.02540	1.0	0.3456	13.61	1.134
0.09798	0.09991	1.421	0.09670	0.07349	2.893	1.0	39.37	3.281
0.002489	0.002538	0.03609	0.002456	0.001867	0.0739	0.02540	1.0	0.08333
0.02986	0.03045	0.4331	0.02947	0.02240	0.8819	0.3048	12.0	1.0

Area

Square Meters	Square Centimeters	Square Inches	Square Feet	Square Yards
1.0	10,000.0	1,550.0	10.76	1.196
0.0001	1.0	0.1550	0.001076	0.0001196
0.0006452	6,452.0	1.0	0.006944	0.0007716
0.9290	929.0	144.0	1.0	0.1111
0.8361	8,361.0	1,296.0	9.0000	1.0

Volume

Cubic Inches	Cubic Feet	Cubic Yards	Gallons (U.S.)	Quarts (U.S.)	Liters (Cubic Decimeters)	Cubic Meters	Milliliters (Cubic Centimeters)
1.0	0.0005787	0.00002143	0.004329	0.01732	0.01639	0.00001639	16.39
1,728.0	1.0	0.03704	7.481	29.92	28.32	0.02832	28,320
46,656.0	27.0	1.0	202.2	807.9	764.6	0.7646	764,600
231.0	0.1337	0.004951	1.0	4.000	3.785	0.003785	3,785
57.75	0.03342	0.001238	0.2500	1.0	0.9464	0.0009464	946.4
61.02	0.03531	0.001308	0.2642	1.057	1.0	0.001	1,000
61020	353.1	1.308	264.2	1057	1000.0	1	1,000,000
0.06102	0.00003531	0.000001308	0.0002642	0.001057	0.001	0.000001	1

Table C-5. Alphabetical Index of Metric Unit Conversions

TO CONVERT	INTO	MULTIPLY BY
	A	
Abcoulomb	Statcoulombs	2.998×10^{10}
Acre	Sq. chain (Gunters)	10
Acre	Rods	160
Acre	Square links (Gunters)	1×10^{5}
Acre	Hectare or sq.hectometer	0.4047
acres	sq feet	43,560.0
acres	sq meters	4,047.
acres	sq miles	1.562×10^{-3}
acres	sq yards	4,840.
acre-feet	cu feet	43,560.0
acre-feet	gallons	3.259×10^{4}
amperes/sq cm	amps/sq in.	6.452
amperes/sq cm	amps/sq meter	10^{4}
amperes/sq in.	amps/sq cm	0.1550
amperes/sq in.	amps/sq meter	1,550.0
amperes/sq meter	amps/sq cm	10^{-4}
amperes/sq meter	amps/sq in.	6.452×10^{-4}
ampere-hours	coulombs	3,600.0
ampere-hours	faradays	0.03731
ampere-turns	gilberts	1.257
ampere turns/cm	amp-turns/in.	2.540
ampere-turns/cm	amp-turns/meter	100.0
ampere-turns/cm	gilberts/cm	1.257
ampere-turns/in.	amp-turns/cm	0.3937
ampere-turns/in.	amp-turns/meter	39.37
ampere-turns/in.	gilberts/cm	0.4950
ampere-turns/meter	amp/turns/cm	0.01
ampere-turns/meter	amp-turns/in.	0.0254
ampere-turns/meter	gilberts/cm	0.01257
Angstrom unit	Inch	3937×10^{-9}
Angstrom unit	Meter	1×10^{-10}
Angstrom unit	Micron or (Mu)	1×10^{-4}
Are	Acre (US)	0.02471
Ares	sq. yards	119.60
ares	acres	0.02471
ares	sq meters	100.0
Astronomical Unit	Kilometers	1.495×10^{8}
Atmospheres	Ton/sq. inch	0.007348
atmospheres	cms of mercury	76.0
atmospheres	ft of water (at 4°C)	33.90
atmospheres	in. of mercury (at 0°C)	29.92
atmospheres	kgs/sq cm	1.0333
atmospheres	kgs/sq meter	10,332
atmospheres	pounds/sq in.	14.70
atmospheres	tons/sq ft	1.058
	B	
Barrels (U.S., dry)	cu. inches	7056.0
Barrels (U.S., dry)	quarts (dry)	105.0
Barrels (U.S., liquid)	gallons	31.5
barrels (oil)	gallons (oil)	42.0
bars	atmospheres	0.9869
bars	dynes/sq cm	10^{4}
bars	kgs/sq meter	1.020×10^{4}
bars	pounds/sq ft	2,089.0
bars	pounds/sq in.	14.50
Baryl	Dyne/sq. cm.	1.000
Bolt (US Cloth)	Meters	36.576
BTU	Liter-Atmosphere	10.409

TO CONVERT	INTO	MULTIPLY BY
	B (Cont)	
Btu	ergs	1.0550×10^{10}
Btu	foot-lbs	778.3
Btu	gram-calories	252.0
Btu	horsepower-hrs	3.931×10^{-4}
Btu	joules	1,054.8
Btu	kilogram-calories	0.2520
Btu	kilogram-meters	107.5
Btu	kilowatt-hrs	2.928×10^{-4}
Btu/hr	foot-pounds/sec	0.2162
Btu/hr	gram-cal/sec	0.0700
Btu/hr	horsepower-hrs	3.929×10^{-4}
Btu/hr	watts	0.2931
Btu/min	foot-lbs/sec	12.96
Btu/min	horsepower	0.02356
Btu/min	kilowatts	0.01757
Btu/min	watts	17.57
Btu/sq ft/min	watts/sq in.	0.1221
Bucket (Br. dry)	Cubic Cm.	1.818×10^{4}
bushels	cu ft	1.2445
bushels	cu in.	2,150.4
bushels	cu meters	0.03524
bushels	liters	35.24
bushels	pecks	4.0
bushels	pints (dry)	64.0
bushels	quarts (dry)	32.0
	C	
Calories, gram(mean)	B.T.U. (mean)	3.9685×10^{-3}
Candle/sq. cm	Lamberts	3.142
Candle/sq. inch	Lamberts	0.4870
Centares (centiares)	sq meters	1.0
Centigrade	Fahrenheit	(C° X 9/5) + 32
centigrams	grams	0.01
Centiliter	Ounce fluid (US)	0.3382
Centiliter	Cubic inch	0.6103
Centiliter	drams	2.705
centiliters	liters	0.01
centimeters	feet	3.281×10^{-2}
centimeters	inches	0.3937
centimeters	kilometers	10^{-5}
centimeters	meters	0.01
centimeters	miles	6.214×10^{-8}
centimeters	millimeters	10.0
centimeters	mils	393.7
centimeters	yards	1.024×10^{-2}
centimeter-dynes	cm-grams	1.020×10^{-3}
centimeter-dynes	meter-kgs	1.020×10^{-8}
centimeter-dynes	pound-feet	7.376×10^{-8}
centimeter-grams	cm-dynes	980.7
centimeter-grams	meter-kgs	10^{-5}
centimeter-grams	pound-feet	7.233×10^{-5}
centimeters of mercury	atmospheres	0.01316
centimeters of mercury	feet of water	0.4461
centimeters of mercury	kgs/sq meter	136.0
centimeters of mercury	pounds/sq ft	27.85
centimeters of mercury	pounds/sq in.	0.1934
centimeters/sec	feet/min	1.1969
centimeters/sec	feet/sec	0.03281
centimeters/sec	kilometers/hr	0.036
centimeters/sec	knots	0.1943
centimeters/sec	meters/min	0.6

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	C (Cont)	
centimeters/sec	miles/hr	0.02237
centimeters/sec	miles/min	3.728×10^{-4}
centimeters/sec/sec	feet/sec/sec	0.03281
centimeters/sec/sec	kms/hr/sec	0.036
centimeters/sec/sec	meters/sec/sec	0.01
centimeters/sec/sec	miles/hr/sec	0.02237
Chain	Inches	792.00
Chain	meters	20.12
Chains (surveyors' or Gunter's)	yards	22.00
circular mils	sq cms	5.067×10^{-6}
circular mils	sq mils	0.7854
Circumference	Radians	6.283
circular mils	sq inches	7.854×10^{-7}
Cords	cord feet	8
Cord feet	cu. feet	16
Coulomb	Statcoulombs	2.998×10^{9}
coulombs	faradays	1.036×10^{-5}
coulombs/sq cm	coulombs/sq in.	64.52
coulombs/sq cm	coulombs/sq meter	10^{4}
coulombs/sq in.	coulombs/sq cm	0.1550
coulombs/sq in.	coulombs/sq meter	1,550.0
coulombs/sq meter	coulombs/sq cm	10
coulombs/sq meter	coulombs/sq in.	6.452×10^{-4}
cubic centimeters	cu feet	3.531×10^{-5}
cubic centimeters	cu inches	0.06102
cubic centimeters	cu meters	10^{-6}
cubic centimeters	cu yards	1.308×10^{-6}
cubic centimeters	gallons (U.S. liq.)	2.642×10^{-4}
cubic centimeters	liters	0.001
cubic centimeters	pints (U.S. liq.)	2.113×10^{-3}
cubic centimeters	quarts (U.S. liq.)	1.057×10^{-3}
cubic feet	bushels (dry)	0.8036
cubic feet	cu cms	28,320.0
cubic feet	cu inches	1,728.0
cubic feet	cu meters	0.02832
cubic feet	cu yards	0.03704
cubic feet	gallons (U.S. liq.)	7.48052
cubic feet	liters	28.32
cubic feet	pints (U.S. liq.)	59.84
cubic feet	quarts (U.S. liq.)	29.92
cubic feet/min	cu cms/sec	472.0
cubic feet/min	gallons/sec	0.1247
cubic feet/min	liters/sec	0.4720
cubic feet/min	pounds of water/min	62.43
cubic feet/sec	million gals/day	0.646317
cubic feet/sec	gallons/min	448.831
cubic inches	cu cms	16.39
cubic inches	cu feet	5.787×10^{-4}
cubic inches	cu meters	1.639×10^{-5}
cubic inches	cu yards	2.143×10^{-5}
cubic inches	gallons	4.329×10^{-3}
cubic inches	liters	0.01639
cubic inches	mil-feet	1.061×10^{5}
cubic inches	pints(U.S. liq.)	0.03463
cubic inches	quarts(U.S. liq.)	0.01732
cubic meters	bushels (dry)	28.38
cubic meters	cu cms	10^{4}
cubic meters	cu feet	35.31
cubic meters	cu inches	61,023.0
cubic meters	cu yards	1.308
cubic meters	gallons (U.S. liq.)	264.2
cubic meters	liters	1,000.0
cubic meters	pints(U.S. liq.)	2,113.0
cubic meters	quarts (U.S. liq.)	1,057.0
cubic yards	cu cms	7.646×10^{5}
cubic yards	cu feet	27.0
cubic yards	cu inches	46,656.0
cubic yards	cu meters	0.7646
cubic yards	gallons (U.S. liq.)	202.0
cubic yards	liters	764.6
cubic yards	pints (U.S. liq.)	1,615.9
cubic yards	quarts (U.S. liq.)	807.9
cubic yards/min	cubic ft/sec	0.45
cubic yards/min	gallons/sec	3.367
cubic yards/min	liters/sec	12.74
	D	
Dalton	Gram	1.650×10^{-24}
days	seconds	86,400.0
decigrams	grams	0.1
deciliters	liters	0.1
decimeters	meters	0.1
degrees (angle)	quadrants	0.01111
degrees (angle)	radians	0.01745
degrees (angle)	seconds	3,600.0
degrees/sec	radians/sec	0.01745
degrees/sec	revolutions/min	0.1667
degrees/sec	revolutions/sec	2.778×10^{-3}
dekagrams	grams	10.0
dekaliters	liters	10.0
dekameters	meters	10.0
Drams (apothecaries' or troy)	ounces (avoirdupois)	0.1371429
Drams (apothecaries' or troy)	ounces (troy)	0.125
Drams (U.S., fluid or apoth.)	cubic cm.	3.6967
drams	grams	1.7718
drams	grains	27.3437
drams	ounces	0.0625
Dyne/cm	Erg/sq. millimeter	0.01
Dyne/sq. cm.	Atmospheres	9.869×10^{-7}
Dyne/sq. cm.	Inch of Mercury at 0°C	2.953×10^{-5}
Dyne/sq.cm.	Inch of Water at 4°C	4.015×10^{-4}
dynes	grams	1.020×10^{-3}
dynes	joules/cm	10^{-7}
dynes	joules/meter (newtons)	10^{-5}
dynes	kilograms	1.020×10^{-6}
dynes	poundals	7.233×10^{-5}
dynes	pounds	2.248×10^{-6}
dynes/sq cm	bars	10^{-6}
	E	
Ell	Cm.	114.30
Ell	Inches	45
Em, Pica	Inch	0.167
Em, Pica	Cm.	0.4233
Erg/sec	Dyne - cm/sec	1.000
ergs	Btu	9.480×10^{-11}
ergs	dyne-centimeters	1.0
ergs	foot-pounds	7.367×10^{-8}
ergs	gram-calories	0.2389×10^{-7}
ergs	gram-cms	1.020×10^{-3}
ergs	horsepower-hrs	3.7250×10^{-14}

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	E (Cont)	
ergs	joules	10^{-7}
ergs	kg-calories	2.389×10^{-11}
ergs	kg-meters	1.020×10^{-8}
ergs	kilowatt-hrs	0.2778×10^{-13}
ergs	watt-hours	0.2778×10^{-18}
ergs/sec	Btu/min	5.688×10^{-6}
ergs/sec	ft-lbs/min	4.427×10^{-6}
ergs/sec	ft-lbs/sec	7.3756×10^{-8}
ergs/sec	horsepower	1.341×10^{-10}
ergs/sec	kg-calories/min	1.433×10^{-9}
ergs/sec	kilowatts	10^{-10}
	F	
farads	microfarads	10^{6}
Faraday/sec	Ampere (absolute)	9.6500×10^{4}
faradays	ampere-hours	26.80
faradays	coulombs	9.649×10^{4}
Fathom	Meter	1.828804
fathoms	feet	6.0
feet	centimeters	30.48
feet	kilometers	3.048×10^{-4}
feet	meters	0.3048
feet	miles (naut.)	1.645×10^{-4}
feet	miles (stat.)	1.894×10^{-4}
feet	millimeters	304.8
feet	mils	1.2×10^{4}
feet of water	atmospheres	0.02950
feet of water	in. of mercury	0.8826
feet of water	kgs/sq cm	0.03048
feet of water	kgs/sq meter	304.8
feet of water	pounds/sq ft	62.43
feet of water	pounds/sq in	0.4335
feet/min	cms/sec	0.5080
feet/min	feet/sec	0.01667
feet/min	kms/hr	0.01829
feet/min	meters/min	0.3048
feet/min	miles/hr	0.01136
feet/sec	cms/sec	30.48
feet/sec	kms/hr	1.097
feet/sec	knots	0.5921
feet/sec	meters/min	18.29
feet/sec	miles/hr	0.6818
feet/sec	miles/min	0.01136
feet/sec/sec	cms/sec/sec	30.48
feet/sec/sec	kms/hr/sec	1.097
feet/sec/sec	meters/sec/sec	0.3048
feet/sec/sec	miles/hr/sec	0.6818
feet/100 feet	per cent grade	1.0
Foot - candle	Lumen/sq. meter	10.764
foot-pounds	Btu	1.286×10^{-3}
foot-pounds	ergs	1.356×10^{7}
foot-pounds	gram-calories	0.3238
foot-pounds	hp-hrs	5.050×10^{-7}
foot-pounds	joules	1.356
foot-pounds	kg-calories	3.24×10^{-4}
foot-pounds	kg-meters	0.1383
foot-pounds	kilowatt-hrs	3.766×10^{-7}
foot-pounds/min	Btu/min	1.286×10^{-3}
foot-pounds/min	foot-pounds/sec	0.01667
foot-pounds/min	horsepower	3.030×10^{-5}
foot-pounds/min	kg-calories/min	3.24×10^{-4}
foot-pounds/min	kilowatts	2.260×10^{-5}
	F (Cont)	
foot-pounds/sec	Btu/hr	4.6263
foot-pounds/sec	Btu/min	0.07717
foot-pounds/sec	horsepower	1.818×10^{-3}
foot-pounds/sec	kg-calories/min	0.01945
foot-pounds/sec	kilowatts	1.356×10^{-3}
Furlongs	miles(U.S.)	0.125
furlongs	rods	40.0
furlongs	feet	660.0
	G	
gallons	cu cms	3,785.0
gallons	cu feet	0.1337
gallons	cu inches	231.0
gallons	cu meters	3.785×10^{-3}
gallons	cu yards	4.951×10^{-3}
gallons	liters	3.785
gallons (liq Br. Imp.)	gallons (U.S. liq)	1.20095
gallons (U.S.)	gallons (Imp.)	0.83267
gallons of water	pounds of water	8.3453
gallons/min	cu ft/sec	2.228×10^{-3}
gallons/min	liters/sec	0.06308
gallons/min	cu ft/hr	8.0208
gausses	lines/sq in.	6.452
gausses	webers/sq cm	10^{-8}
gausses	webers/sq in.	6.452×10^{-8}
gausses	webers/sq meter	10^{-4}
gilberts	ampere-turns	0.7958
gilberts/cm	amp-turns/cm	0.7958
gilberts/cm	amp-turns/in	2.021
gilberts/cm	amp-turns/meter	79.58
Gills (British)	cubic cm.	142.07
gills	liters	0.1183
gills	pints (liq.)	0.25
Grade	Radian	0.01571
Grains	drams (avoirdupois)	0.03657143
grains (troy)	grains (avdp)	1.0
grains (troy)	grams	0.06480
grains (troy)	ounces (avdp)	2.0833×10^{-3}
grains (troy)	pennyweight (troy)	0.04167
grains/U.S. gal	parts/million	17.118
grains/U.S. gal	pounds/million gal	142.86
grains/Imp. gal	parts/million	14.286
grams	dynes	980.7
grams	grains	15.43
grams	joules/cm	9.807×10^{-5}
grams	joules/meter (newtons)	$9,807 \times 10^{-3}$
grams	kilograms	0.001
grams	milligrams	1.000.0
grams	ounces (avdp)	0.03527
grams	ounces (troy)	0.03215
grams	poundals	0.07093
grams	pounds	2.205×10^{-3}
grams/cm	pounds/inch	5.600×10^{-3}
grams/cu cm	pounds/cu ft	62.43
grams/cu cm	pounds/cu in	0.03613
grams/cu cm	pounds/mil-foot	3.405×10^{-7}
grams/liter	grains/gal	58.417
grams/liter	pounds/1.000 gal	8.345
grams/liter	pounds/cu ft	0.062427
grams/liter	parts/million	1,000.0
grams/sq cm	pounds/sq ft	2.0481
gram-calories	Btu	3.9683×10^{-3}
gram-calories	ergs	4.1868×10^{7}

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	G (Cont)	
gram-calories	foot-pounds	3.0880
gram-calories	horsepower-hrs	1.5596×10^{-6}
gram-calories	kilowatt-hrs	1.1630×10^{-6}
gram-calories	watt-hrs	1.1630×10^{-3}
grams-calories/sec	Btu/hr	14.286
gram-centimeters	Btu	9.297×10^{-8}
gram-centimeters	ergs	980.7
gram-centimeters	joules	9.807×10^{-5}
gram-centimeters	kg-cal	2.343×10^{-8}
gram-centimeters	kg-meters	10^{-5}
	H	
Hand	Cm.	10.16
hetacres	acres	2.471
hectares	sq feet	1.076×10^{5}
hectograms	grams	100.0
hectoliters	liters	100.0
hectometers	meters	100.0
hectowatts	watts	100.0
henries	millihenries	1,000.0
Hogsheads (British)	cubic ft.	10.114
Hogsheads (U.S.)	cubic ft.	8.42184
Hogsheads (U.S)	gallons (U.S.)	63
horsepower	Btu/min	42.44
horsepower	foot-lbs/min	33,000.0
horsepower	foot-lbs/sec	550.0
horsepower (metric) (542.5 ft lb/sec)	horsepower (550 ft lb/sec)	0.9863
horsepower (550 ft lb/sec)	horsepower (metric) (542.5 ft lb/sec)	1.014
horsepower	kg-calories/min	10.68
horsepower	kilowatts	0.7457
horsepower	watts	745.7
horsepower (boiler)	Btu/hr	33.479
horsepower (boiler)	kilowatts	9.803
horsepower-hrs	Btu	2,547.0
horsepower-hrs	ergs	2.6845×10^{13}
horsepower-hrs	foot-lbs	1.98×10^{4}
horsepower-hrs	gram-calories	641,190.0
horsepower-hrs	joules	2.684×10^{4}
horsepower-hrs	kg-calories	641.1
horsepower-hrs	kg-meters	2.737×10^{5}
horsepower-hrs	kilowatts-hrs	0.7457
hours	days	4.167×10^{-2}
hours	weeks	5.952×10^{-3}
Hundredweights (long)	pounds	112
Hundredweights (long)	tons (long)	0.05
Hundredweights (short)	ounces (avoirdupois)	1600
Hundredweights (short)	pounds	100
Hundredweights (short)	tons (metric)	0.0453592
Hundredweights (short)	tons (long)	0.0446429
	I	
inches	centimeters	2.540
inches	meters	2.540×10^{-2}
inches	miles	1.578×10^{-5}
inches	millimeters	25.40
inches	mils	1,000.0
inches	yards	2.778×10^{-2}
inches of mercury	atmospheres	0.03342
inches of mercury	feet of water	1.133
inches of mercury	kgs/sq cm	0303453
inches of mercury	kgs sq meter	345.3
inches of mercury	pounds/sq ft	70.73
inches of mercury	pounds/sq in.	0.4912
inches of water (at 4°C)	atmospheres	2.458×10^{-3}
inches of water (at 4°C)	inches of mercury	0.07355
inches of water (at 4°C)	kgs/sq cm	2.540×10^{-3}
inches of water (at 4°C)	ounces/sq in.	0.5781
inches of water (at 4°C)	pounds/sq ft	5.204
inches of water (at 4°C)	pounds/sq in.	0.03613
International Ampere	Ampere (absolute)	0.9998
International Volt	Volts (absolute)	1.0003
International volt	Joules (absolute)	$1\text{-}593 \times 10^{-19}$
International volt	Joules	9.654×10^{4}
	J	
joules	Btu	9.480×10^{-4}
joules	ergs	10^{7}
joules	foot-pounds	0.7376
joules	kg calories	2.389×10^{-4}
joules	kg-meters	0.1020
joules	watt-hrs	2.778×10^{-4}
joules/cm	grams	1.020×10^{4}
joules/cm	dynes	10^{7}
joules/cm	joules/meter (newtons)	100.0
joules/cm	poundals	723.3
joules/cm	pounds	22.48
	K	
kilograms	dynes	980,665.0
kilograms	grams	1,000.0
kilograms	joules/cm	0.09807
kilograms	joules/meter (newtons)	9.807
kilograms	poundals	70.93
kilograms	pounds	2.205
kilograms	tons (long)	9.842×10^{-4}
kilograms	tons (short)	1.102×10^{-3}
kilograms/cu meter	grams/cu cm	0.001
kilograms/cu meter	pounds/cu ft	0.06243
kilograms/cu meter	pounds/cu in.	3.613×10^{-5}
kilograms/cu meter	pounds/mil-foot	3.405×10^{-10}
kilograms/meter	pounds/ft	0.6720
Kilogram/sq. cm.	Dynes	980,665
kilograms/sq cm	atmospheres	0.9678
kilograms/sq cm	feet of water	32.81
kilograms/sq cm	inches of mercury	28.96
kilograms/sq cm	pounds/sq ft	2,048.0
kilograms/sq cm	pounds/sq in.	14.22
kilograms/sq meter	atmospheres	9.678×10^{-5}
kilograms/sq meter	bars	98.07×10^{-6}
kilograms/sq meter	feet of water	3.281×10^{-3}
kilograms/sq meter	inches of mercury	2.896×10^{-3}
kilograms/sq meter	pounds/sq ft	0.2048
kilograms/sq meter	pounds/sq in.	1.422×10^{-3}
kilograms/sq mm	kgs/sq meter	10^{6}
kilogram-calories	Btu	3.968
kilogram-calories	foot-pounds	3,088
kilogram-calories	hp-hrs	1.560×10^{-3}
kilogram-calories	joules	4,186
kilogram-calories	kg-meters	426.9
kilogram-calories	kilojoules	4.186
kilogram-calories	kilowatt-hrs	1.163×10^{-3}
kilogram meters	Btu	9.294×10^{-3}

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	K (Cont)	
kilogram meters	ergs	9.804×10^{7}
kilogram meters	foot-pounds	7.233
kilogram meters	joules	9.804
kilogram meters	kg-calories	2.342×10^{-3}
kilogram meters	kilowatt-hrs	2.723×10^{-6}
kilolines	maxwells	1,000.0
kiloliters	liters	1,000.0
kilometers	centimeters	10^{5}
kilometers	feet	3,281.0
kilometers	inches	3.937×10^{4}
kilometers	meters	1,000.0
kilometers	miles	0.6214
kilometers	millimeters	10^{6}
kilometers	yards	1,094.0
kilometers/hr	cms/sec	27.78
kilometers/hr	feet/min	54.68
kilometers/hr	feet/sec	0.9113
kilometers/hr	knots	0.5396
kilometers/hr	meters/min	16.67
kilometers/hr	miles/hr	0.6214
kilometers/hr/sec	cms/sec/sec	27.78
kilometers/hr/sec	ft/sec/sec	0.9113
kilometers/hr/sec	meters/sec/sec	0.2778
kilometers/hr/sec	miles/hr/sec	0.6214
kilowatts	Btu/min	56.92
kilowatts	foot-lbs/min	4.426×10^{4}
kilowatts	foot-lbs/sec	737.6
kilowatts	horsepower	1.341
kilowatts	kg-calories/min	14.34
kilowatts	watts	1,000.0
kilowatt-hrs	Btu	3,413.0
kilowatt-hrs	ergs	3.600×10^{13}
kilowatt-hrs	foot-lbs	2.655×10^{4}
kilowatt-hrs	gram-calories	859,850.0
kilowatt-hrs	horsepower-hrs	1.341
kilowatt-hrs	joules	3.6×10^{4}
kilowatt-hrs	kg-calories	860.5
kilowatt-hrs	kg-meters	3.671×10^{5}
kilowatt-hrs	pounds of water evaporated from and at 212°F	3.53
kilowatt-hrs	pounds of water raised from 62° to 212°F	22.75
knots	feet/hr	6,080.0
knots	kilometers/hr	1.8532
knots	nautical miles/hr	1.0
knots	statute miles/hr	1.151
knots	yards/hr	2,027.0
knots	feet/sec	1.689
	L	
league	miles(approx.)	3.0
Light year	Miles	5.9×10^{12}
Light year	Kilometers	9.46091×10^{12}
lines/sq cm	gausses	1.0
lines/sq in.	gausses	0.1550
lines/sq in.	webers/sq cm	1.550×10^{-9}
lines/sq in.	webers/sq in.	10^{-8}
lines/sq in.	webers/sq meter	1.550×10^{-5}
links (engineer's)	inches	12.0
links (surveyor's)	inches	7.92

TO CONVERT	INTO	MULTIPLY BY
	L (Cont)	
liters	bushels (U.S. dry)	0.02838
liters	cu cm	1,000.0
liters	cu inches	61.02
liters	cu meters	0.001
liters	cu yards	1.308×10^{-3}
liters	gallons (U.S. liq.)	0.2642
liters	pints (U.S. liq.)	2.113
liters	quarts (U.S. liq.)	1.057
liters/min	cu ft/sec	5.886×10^{-4}
liters/min	gals/sec	4.403×10^{-3}
lumens/sq ft	foot-candles	1.0
Lumen	Spherical candle power	0.07958
Lumen	Watt	0.001496
Lumen/sq. ft.	Lumen/sq. meter	10.76
lux	foot-candles	0.0929
	M	
maxwells	kilolines	0.001
maxwells	webers	10^{-3}
megalines	maxwells	10^{4}
megohms	microhms	10^{12}
megohms	ohms	10^{6}
meters	centimeters	100.0
meters	feet	3.281
meters	inches	39.37
meters	kilometers	0.001
meters	miles (stat.)	6.214×10^{-4}
meters	millimeters	1,000.0
meters	yards	1.094
meters	yards	1.179
meters/min	cms/sec	1.667
meters/min	feet/min	3.281
meters/min	feet/sec	0.05468
meters/min	kms/hr	0.06
meters/min	knots	0.03238
meters/min	miles/hr	0.03728
meters/sec	feet/min	196.8
meters/sec	feet/sec	3.281
meters/sec	kilometers/hr	3.6
meters/sec	kilometers/min	0.06
meters/sec	miles/hr	2.237
meters/sec	miles/min	0.03728
meters/sec/sec	cms/sec/sec	100.0
meters/sec/sec	ft/sec/sec	3.281
meters/sec/sec	kms/hr/sec	3.6
meters/sec/sec	miles/hr/sec	2.237
meter-kilograms	cm-dynes	9.807×10^{7}
meter-kilograms	cm-grams	10^{5}
meter-kilograms	pound-feet	7.233
microfarad	farads	10^{-6}
micrograms	grams	10^{-6}
microhms	megohms	10^{-12}
microhms	ohms	10^{-6}
microliters	liters	10^{-6}
Microns	meters	1×10^{-6}
miles (naut.)	feet	6,080.27
miles (naut.)	kilometers	1.853
miles (naut.)	meters	1,853.0
miles (naut.)	miles (statute)	1.1516
miles (naut.)	yards	2,027.0
miles (statute)	centimeters	1.609×10^{5}
miles (statute)	feet	5,280.0
miles (statute)	inches	6.336×10^{4}

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	M (Cont)	
miles (statute)	kilometers	1.609
miles (statute)	meters	1,609.0
miles (statute)	miles (naut)	0.8684
miles (statute)	yards	1,760.0
miles/hr	cms/sec.	44.70
miles/hr	feet/min	88.0
miles/hr	feet/sec	1.467
miles/hr	kms/hr	1.609
miles/hr	kms/min	0.02682
miles/hr	kms/min	0.02682
miles/hr	knots	0.8684
miles/hr	meters/min	26.82
miles/hr	miles/min	0.1667
miles/hr/sec	cms/sec/sec	44.70
miles/hr/sec	feet/sec/sec	1.467
miles/hr/sec	kms/hr/sec	1.609
miles/hr/sec	meters/sec/sec	0.4470
miles/min	cms/sec	2,682.0
miles/min	feet/sec	88.0
miles/min	kms/minn	1.609
miles/min	knots/min	0.8684
miles/min	miles/hr	60.0
mil-feet	cu inches	9.425×10^{-6}
milliers	kilograms	1,000.0
Millimicrons	meters	1×10^{-9}
Milligrams	grains	0.01543236
milligrams	grams	0.001
milligrams/liter	parts/million	1.0
millihenries	henries	0.001
milliliters	liters	0.001
millimeters	centimeters	0.1
millimeters	feet	3.281×10^{-3}
millimeters	inches	0.03937
millimeters	kilometers	10^{-6}
millimeters	meters	0.001
millimeters	miles	6.214×10^{-7}
millimeters	mils	39.37
millimeters	yards	1.094×10^{-3}
million gals/day	cu ft/sec	1.54723
mils	centimeters	2.540×10^{-3}
mils	feet	8.333×10^{-5}
mils	inches	0.001
mils	kilometers	2.540×10^{-8}
mils	yards	2.778×10^{-5}
miner's inches	cu ft/min	1.5
Minims (British)	cubic cm.	0.059192
Minims (U.S., fluid)	cubic cm.	0.061612
minutes (angles)	degrees	0.01667
minutes (angles)	quadrants	1.852×10^{-4}
minutes (angles)	radians	2.909×10^{-4}
minutes (angles)	seconds	60.0
myriagrams	kilograms	10.0
myriameters	kilometers	10.0
myriawatts	kilowatts	10.0
	N	
nepers	decibels	8.686
Newton	Dynes	1×10^{5}
	O	
OHM (International)	OHM (absolute)	1.0005
ohms	megohms	10^{-6}
ohms	microhms	10^{6}
ounces	drams	16.0
ounces	grains	437.5
ounces	grams	28.349527
ounces	pounds	0.0625
ounces	ounces (troy)	0.9115
ounces	tons (long)	2.790×10^{-5}
ounces	tons (metric)	2.835×10^{-5}
ounces (fluid)	cu inches	1.805
ounces (fluid)	liters	0.02957
ounces (troy)	grains	480.0
ounces (troy)	grams	31.103481
ounces (troy)	ounces (avdp)	1.09714
ounces (troy)	pennyweights (troy)	20.0
ounces (troy)	pounds (troy)	0.08333
Ounce/sq. inch	Dynes/sq cm	0.4309
ounces/sq in.	pounds/sq in.	0.0625
	P	
Parsec	Miles	19×10^{12}
Parsec	Kilometers	3.084×10^{13}
part-/million	grains/U.S. gal	0.0584
parts/million	grains/Imp. gal	0.07016
parts/million	pounds/million gal	8.345
Pecks (British)	cubic inches	554.6
Pecks (British)	liters	9.091901
Pecks (U.S.)	bushels	0.25
Pecks (U.S.)	cubic inches	37.605
Pecks (U.S.)	liters	8.809582
Pecks (U.S.)	quarts (dry)	8
pennyweights (troy)	grains	24.0
pennyweights (troy)	ounces (troy)	0.05
pennyweights (troy)	grams	1.55517
pennyweights (troy)	pounds (troy)	4.1667×10^{-3}
pints (dry)	cu inches	33.60
pints (liq.)	cu cms.	473.2
pints (liq.)	cu feet	0.01671
pints (liq.)	cu inches	28.87
pints (liq.)	cu meters	4.732×10^{-4}
pints (liq.)	cu yards	6.189×10^{-4}
pints (liq.)	gallons	0.125
pints (liq.)	liters	0.4732
pints (liq.)	quarts (liq.)	0.5
Planck's quantum	Erg second	6.624×10^{-27}
Poise	Gram/cm. sec.	1.00
Pounds (avoirdupois)	ounces (troy)	14.5833
poundals	dynes	13,826.0
poundals	grams	14.10
poundals	joules/cm	1.383×10^{-3}
poundals	joules/meter (newtons)	0.1383
poundals	kilograms	0.01410
poundals	pounds	0.03108
pounds	drams	256.0
pounds	dynes	44.4823×10^{4}
pounds	grains	7,000.0
pounds	grams	453.5924
pounds	joules/cm	0.04448
pounds	joules/meter (newtons)	4.448
pounds	kilograms	0.4536
pounds	ounces	16.0
pounds	ounces (troy)	14.5833
pounds	poundals	32.17
pounds	pounds (troy)	1.21528

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	P (Cont)	
pounds	tons (short)	0.0005
pounds (troy)	grains	5,760.0
pounds (troy)	grams	373.24177
pounds (troy)	ounces (avdp.)	13.1657
pounds (troy)	pennyweights (troy)	240.0
pounds (troy)	pounds (avdp.)	0.822857
pounds (troy)	tons (long)	3.6735×10^{-4}
pounds (troy)	tons (metric)	3.7324×10^{-4}
pounds (troy)	tons (short)	4.1143×10^{-4}
pounds of water	cu feet	0.01602
pounds of water	cu inches	27.68
pounds of water/min	cu ft/sec	2.670×10^{-4}
pound-feet	cm-dynes	1.356×10^{7}
pound-feet	cm-grams	13,825.0
pound-feet	meter-kgs	0.1383
pounds/cu ft	grams/cu cm	0.01602
pounds/cu ft	kgs/cu meter	16.02
pounds/cu ft	pounds/cu in.	5.787×10^{-4}
pounds/cu ft	pounds/mil-loot	5.456×10^{-9}
pounds/cu in.	gms/cu cm	27.68
pounds/cu in.	kgs/cu meter	2.768×10^{4}
pounds/cu in.	pounds/cu ft	1,728.0
pounds/cu in.	pounds/mil-foot	9.425×10^{-6}
pounds/ft	kgs-meter	1.488
pounds/in.	gms/cm	178.6
pounds/mil-foot	gms/cu cm	2.306×10^{6}
pounds/sq ft	atmospheres	4.725×10^{-4}
pounds/sq ft	feet of water	0.01602
pounds/sq ft	inches of mercury	0.01414
pounds/sq ft	kgs/sq meter	4.882
pounds/sq ft	pounds/sq in.	6.944×10^{-3}
pounds/sq. in.	atmospheres	0.06804
pounds/sq in.	feet of water	2.307
pounds/sq in.	inches of mercury	2.036
pounds/sq in.	kgs/sq meter	703.1
pounds/sq in.	pounds/sq ft	144.0
	Q	
quadrants (angle)	degrees	90.0
quadrants (angle)	minutes	5,400.0
quadrants (angle)	radians	1.571
quadrants (angle)	seconds	3.24×10^{5}
quarts (dry)	cu inches	67.20
quarts (liq.)	cu cms	946.4
quarts (liq)	cu feet	0.03342
quarts (liq.)	cu inches	57.75
quarts (liq.)	cu meters	$9.464 \times 10\text{-}^{4}$
quarts (liq.)	cu yards	1.238×10^{-3}
quarts (liq.)	gallons	0.25
quarts (liq.)	liters	0.9463
	R	
radians	degrees	57.30
radians	minutes	3,438.0
radians	quadrants	0.6366
radians	seconds	2.063×10^{5}
radians/sec	degrees/sec	57.30
radians/sec	revolutions/min	9.549
radians/sec	revolutions/sec	0.1592
radians/sec/sec	revs/min/min	573.0
radians/sec/sec	revs/min/sec	9.549
radians/sec/sec	revs/sec/sec	0.1592

TO CONVERT	INTO	MULTIPLY BY
	R (Cont)	
revolutions	degrees	360.0
revolutions	quadrants	4.0
revolutions	radians	6.283
revolutions/min	degrees/sec	6.0
revolutions/min	radians/sec	0.1047
revolutions/min	revs/sec	0.01667
revolutions/miri/min	radians/sec/sec	1.745×10^{-3}
revolutions/min/min	revs/min/sec	0.01667
revolutions/min/min	revs/sec/sec	2.778×10^{-4}
revolutions/sec	degrees/sec	360.0
revolutions/sec	radians/sec	6.283
revolutions/sec	revs/min	60.0
revolutions/sec/sec	radians/sec/sec	6.283
revolutions/sec/sec	revs/min/min	3,600.0
revolutions/sec/sec	revs/min/sec	60.0
Rod	Chain (Gunters)	0.25
Rod	Meters	5.029
Rods (Surveyors' meas.)	yards	5.5
rods	feet	16.5
	S	
Scruples	grains	20
seconds (angle)	degrees	2.778×10^{-4}
seconds (angle)	minutes	0.01667
seconds (angle)	quadrants	3.087×10^{-6}
seconds (angle)	radians	4.848×10^{-6}
Slug	Kilogram	14.59
Slug	Pounds	32.17
Sphere	Steradians	12.57
square centimeters	circular mils	1.973×10^{5}
square centimeters	sq feet	1.076×10^{-3}
square centimeters	sq inches	0.1550
square centimeters	sq meters	0.0001
square centimeters	sq miles	3.861×10^{-11}
square centimeters	sq millimeters	100.0
square centimeters	sq yards	1.196×10^{-4}
square feet	acres	2.296×10^{-5}
square feet	sq cms	929.0
square feet	sq inches	144.0
square feet	sq meters	0.09290
square feet	sq miles	3.587×10^{-6}
square feet	sq millimeters	9.290×10^{4}
square feet	sq yards	0.1111
square inches	circular mils	1.273×10^{6}
square inches	sq cms	6.452
square inches	sq feet	6.944×10^{-3}
square inches	sq millimeters	645.2
square inches	sq mils	10 6
square inches	sq yards	7.716×10^{-4}
square kilometers	acres	247.1
square kilometers	sq cms	10 10
square kilometers	sq ft	10.76×10^{6}
square kilometers	sq inches	1.550×10^{9}
square kilometers	sq meters	10^{6}
square kilometers	sq miles	0.3861
square kilometers	sq yards	1.196×10^{6}
square meters	acres	2.471×10^{-4}
square meters	sq cms	10^{4}
square meters	sq feet	10.76
square meters	sq inches	1,550.0
square meters	sq miles	3.861×10^{-7}
square meters	sq millimeters	10^{6}

Table C-5. Alphabetical Index of Metric Unit Conversions (Cont)

TO CONVERT	INTO	MULTIPLY BY
	S (Cont)	
square meters	sq yards	1.196
square miles	acres	640.0
square miles	sq feet	27.88×10^{6}
square miles	sq kms	2.590
square miles	sq meters	2.590×10^{6}
square miles	sq yards	3.098×10^{6}
square millimeters	circular mils	1,973.0
square millimeters	sq cms	0.01
square millimeters	sq feet	1.076×10^{-5}
square millimeters	sq inches	1.550×10^{-3}
square mils	circular mils	1.273
square mils	sq cms	6.452×10^{6}
square mils	sq inches	10^{-6}
square yards	acres	2.066×10^{-4}
square yards	sq cms	8,361.0
square yards	sq feet	9.0
square yards	sq inches	1,296.0
square yards	sq meters	0.8361
square yards	sq miles	3.228×10^{-7}
square yards	sq millimeters	$8,361 \times 10^{5}$
	T	
temperature (°C) +273	absolute temperature (°C)	1.0
temperature (°C) +17.78	temperature (°F)	1.8
temperature (°F) +460	absolute temperature (°F)	1.0
temperature (°F)32	temperature (°C)	5/9
tons (long)	kilograms	1,016.0
tons (long)	pounds	2,240.0
tons (long)	tons (short)	1.120
tons (metric)	kilograms	1,000.0
tons (metric)	pounds	2,205.0
tons (short)	kilograms	907.1848
tons (short)	ounces	32,000.0
tons (short)	ounces (troy)	29,166.66
tons (short)	pounds	2,000.0
tons (short)	pounds (troy)	2,430.56
tons (short)	tons (long)	0.89287
tons (short)	tons (metric)	0.9078
tons (short)/sq ft	kgs/sq meter	9,765.0
tons (short)/sq ft	pounds/sq in.	2,000.0
tons of water/24 hrs	pounds of water/hr	83.333
tons of water/24 hrs	gallons/min	0.16643
tons of water/24 hrs	cu ft/hr	1.3349
	V	
Volt/inch	Volt/cm.	0.39370
Volt (absolute)	Statvolts	0.003336
	W	
watts	Btu/hr	3.4129
watts	Btu/min	0.05688
Watts	ergs/sec	107.0
watts	foot-lbs/min	44.27
watts	foot-lbs/sec	0.7378
watts	horsepower	1.341×10^{-3}
watts	horsepower (metric)	1.360×10^{-3}
watts	kg-calories/min	0.01433
watts	kilowatts	0.001
Watts (Abs.)	B.T.U. (mean)/min.	0.056884
Watts (Abs.)	joules/sec.	1
watt-hours	Btu	3.413
watt-hours	ergs	3.60×10^{10}
watt-hours	foot-pounds	2,656.0
watt-hours	gram-calories	859.85
watt-hours	horsepower-hrs	1.341×10^{-3}
watt-hours	kilogram-calories	0.8605
watt-hours	kilogram-meters	367.2
watt-hours	kilowatt-hrs	0.001
Watt (International)	Watt (absolute)	1.0002
webers	maxwells	10^{8}
webers	kilolines	10^{5}
webers/sq in.	gausses	1.550×10^{7}
webers/sq in.	lines/sq in.	10^{8}
webers/sq in	webers/sq cm	0.1550
webers/sq in.	webers/sq meter	1,550.0
webers/sq meter	gausses	10^{4}
webers/sq meter	lines/sq in.	6.452×10^{4}
webers/sq meter	webers/sq cm	10^{-4}
webers/sq meter	webers/sq in.	6.452×10^{-4}
	Y	
yards	centimeters	91.44
yards	kilometers	9.144×10^{-4}
yards	meters	0.9144×10^{-4}
yards	miles (naut.)	4.934×10^{-4}
yards	miles (stat.)	5.682×10^{-4}
yards	millimeters	914.4

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GLOSSARY

ABRASION. A fuzzy spot or area on cloth, usually caused by rubbing against another object.

ACCORDION-FOLDS. Folding a piece of equipment into S-shaped layers of predetermined size. Accordion folding produces a packaged assembly in the desired finished shape.

ACID. A fundamental chemical class distinguished by having reactive hydrogen radicals (pH below 7.0). Acids can be extremely corrosive to metal and damaging to fabric.

ACTUATION LANYARD, AUTOMATIC. A wire cable connecting the survival kit reducer assembly to an aircraft structure (usually the cockpit deck), automatically providing the aircrewman with emergency oxygen at seat ejection.

ACTUATION LANYARD, BEACON. A wire cable connecting the spring-loaded actuator indicator of the radio beacon to the cockpit deck. Upon seat ejection, the lanyard pulls free from the actuator indicator, automatically actuating the radio beacon.

ACTUATION LANYARD, MANUAL. A device installed on the survival kit providing the aircrewman with a means of actuating the emergency oxygen supply, should automatic actuation fail to occur.

ACTUATOR INDICATOR. A spring-loaded device installed as part of the radio beacon that allows for automatic actuation of the radio beacon at seat ejection.

AGE LIFE. Age life is the period of time that an item may be considered acceptable for service. Age life commences with the date of manufacture and terminates with the time period limitations imposed by the appropriate shelf/service life combinations.

AID, LIFERAFT PACKING. Aid to restrain liferaft in folded position until packed.

AIRCREWMAN. An aircraft crewmember. Passengers are not considered aircrewmen.

ALKALINE. A substance which is opposite to an acid; a base. Also, any substance which has the properties of an alkali (metallic hydroxide).

AMBIENT TEMPERATURE. When performing maintenance on survival kits, ambient temperature is considered to be the temperature of the surrounding atmosphere.

ANTI-SEIZE TAPE. A tape of any of several thin plastic-film materials (such as tetrafluorethylene) characterized by a waxy, oily texture, and used to prevent binding between mating surfaces of threaded parts when applied to the male threaded portion.

APPROX. Abbreviation for approximately.

A/R. Abbreviation for as required.

ASSEMBLY. A grouping of parts fitted together to form a complete unit.

ATMOSPHERIC PRESSURE. Pressure at sea level, expressed as 14.696 pounds per square inch, absolute, or 29.92 inches mercury column (barometer).

AWL. A pointed tool for piercing small holes in cloth, leather, wood and other soft materials.

BACKSTITCH. A stitch made by inserting the needle a stitch length behind and bringing it up a stitch length ahead of the last stitch. Also, sewing back over a row of stitches.

BALL, SWAGED. A steel ball that is press-fitted to a cable to ensure maximum strength and security.

BARTACK. A concentrated series of zig-zag like stitches used to reinforce points of stress.

BEACON, EMERGENCY RADIO. An automatically actuated transmitter, mounted in the survival kit, that emits an inaudible beacon signal to attract rescue aircraft to a downed survivor.

BEESWAX. A wax that is applied cold or melted to thread to prevent raveling or cloth unknotting and to make thread easier to sew.

BIGHT. A bend or loop that is formed in a line or lanyard to facilitate neat and orderly stowage.

BINDING. A piece of tape or fabric folded over and stitched to a raw edge of cloth to prevent raveling or fraying.

BITTER END. The extreme free end of a line or rope.

BLOCK ASSEMBLY, INTERMEDIATE. A device mounted on the aft left corner of certain survival kits, providing a mounting receptacle for the upper and lower block assemblies. Emergency oxygen flows to the aircrewman through the intermediate block assembly.

BLOCK ASSEMBLY, LOWER. The lower block assembly provides a quick-disconnect for connecting breathing oxygen, communications, anti-g pressure and ventilating air between the aircraft and survival kit. Emergency oxygen is actuated at ejection by the lower block separating from the intermediate block.

BLOCK ASSEMBLY, UPPER. The upper block assembly is connected to the upper surface of the intermediate block when installed on the survival kit. It is used to connect breathing oxygen, anti-g pressure, ventilating air and communications from the intermediate block to the aircrewman.

BOOT. A flat, fabric casing incorporating channels to provide for orderly stowage and protection of a dropline or lanyard.

BOXSTITCH. A rectangular stitch used to attach and reinforce.

C. Abbreviation for Celsius.

CAGE. Commercial and Government Entity (CAGE) is a five position all numeric code. CAGE codes are assigned to organizations (entities) that are manufacturers or maintain design control of items of supply procured and cataloged by agencies of the Federal government.

℄. Symbol for centerline.

CANVAS. A heavy, closely-woven cloth of linen, cotton or synthetic fabric.

CAUTION. Indicates danger to the equipment. The caution precedes the step or item to which it refers.

CLEVIS. A U-shaped metal fitting with a hole in each end to receive a pin or bolt.

CLIP. A device which fastens, holds together or retains.

CO_2. Abbreviation for carbon dioxide.

COMBUSTIBLE MATERIAL/SUBSTANCE. Any material or substance capable of burning in the presence of oxygen.

COML. Abbreviation for commercial. Refers to parts that are commercially available.

COMPONENT. An item of equipment making up pan of an assembly or subassembly.

COMPOSITE DISCONNECT. A device which connects all personal service leads between the survival kit and aircraft. On seat ejection, all connections can be broken at a single point.

CONDUIT. A thin, hollow, metal tube that serves to protect and guide a cable or wire.

CONE, LOCKING. A small, smooth, cone-shaped metal post sewn to the flaps of a container. The cone has a horizontally drilled hole a short distance from the top to admit a temporary locking pin or ripcord pin.

CONFIGURATION. The makeup, size, shape and relative location of parts of an item of equipment and its accessories. This includes the composition of materials as well as marking details. The configuration of each equipment is specified by Government drawings, military specifications and the modification instructions contained in this volume.

CONTAINER. An assembly that encloses and protects the liferaft, oxygen system and survival equipment until deployment is desired.

CONTRASTING COLOR. A color which stands out from its background.

COTTER, HAIRPIN. A looped pin that is inserted into the actuator indicator of the radio beacon to prevent premature actuation. When the pin is with-

drawn (automatically or manually), the radio beacon is actuated.

COVER, RAFT. A fabric envelope that is tucked-in around the liferaft to prevent chafing and to facilitate closing the seat survival kit container.

CROSS BOX. A sewing pattern.

CUSHION, SEAT. A cloth-covered pad attached by snap fasteners to the upper surface of the seat survival kit to provide comfort for the aircrewman.

D-RING. A metal fitting shaped in the form of the letter "D."

DART. A stitched, tapering fold in a section of fabric. Used for shaping the fabric by gathering material to conform with a predetermined contour.

DETAIL PART. See COMPONENT.

DIA. Abbreviation for diameter.

DISC, ANTI-CHAFING. A circular piece of rubberized fabric installed between the liferaft and the metal inflation valve of the carbon dioxide cylinder to prevent damage to the liferaft.

DISCONNECT-QUICK. A method of attachment allowing separation of two components by a single, rapid motion or action.

DISPOSITION. Instructions on what is to be done with items which are obsolete, worn out or beyond repair.

DOFF. To remove or take off an item of clothing or equipment.

DON. To put on an item of clothing or equipment.

DOUBLE STITCH. Two parallel rows of stitches.

DOUBLE-W. A sewing pattern.

DROPLINE. A nylon lanyard connecting the upper and lower containers of the seat survival kit. The dropline incorporates provisions for attachment of the liferaft and survival equipment container. When deployment is desired, the aircrewman pulls the release handle. The lower container falls away, but remains attached to the upper container by the dropline. When the dropline is pulled tight, the liferaft is automatically inflated.

EGRESS. Outlet or means of getting out.

EJECTION SEAT. An emergency escape seat for propelling an occupant out and away from the aircraft by means of an explosive charge or rocket motor.

ELASTOMER. Any of various elastic substances resembling rubber.

EMERGENCY KIT, PARACHUTE. A Standard Soft Pack, High-Speed Soft Pack, Special Soft Pack or Rigid Seat Survival Kit containing a raft and survival equipment needed by an aircrewman in case of an emergency.

EQUIPMENT CONTAINER. A rectangular nylon bag used to store survival equipment within the seat survival kit. A slide fastener is provided for convenient access.

EXPLOSIVE MIXTURE. Any mixture of a combustible material or substance and oxygen capable of violent burning (detonation) either spontaneously or with the external application of heat.

EXTRUSION. A raised or grooved surface or edge.

F. Abbreviation for Fahrenheit.

FABRICATE. To make up or construct an item of equipment, accessory or material.

FAIRLEAD. Pulley, ring or hole used to guide a line, to prevent chafing or fouling, or to change its direction.

FAKE. To fold a line or lanyard in a back and forth fashion.

FASTENER, SLIDE. A type of fastener made of two lengths of tape with a series of metal or plastic scoops fastened to one side of each. A metal slide is provided which causes the scoops to mesh or lock in place as the fastener is closed, or to separate as the fastener is opened. Colloquial: ZIPPER.

FASTENER, SNAP. A metal fastener containing essentially a ball and a socket attached to opposed parts of a material and used to hold mating surfaces together.

FIBER. A natural or synthetic filament (as of wool, cotton, rayon, etc.) capable of being spun into yarn.

FID. A small, flat, hand tool of metal or wood used during the packing procedure to straighten and insert flaps into the container.

FITTING, QUICK-RELEASE. A device used to connect and release on instant response.

FITTING, SWAGE. A connection, adapter or pin which is fastened to a cable by pressure. lt is applied by means of a machine which compresses the fitting, causing it to tightly grip the cable or wire to which it is being attached.

FLAMMABLE MATERIAL. Any material capable of being easily ignited and of burning with extreme rapidity.

FLARING. The process of opening or widening, for example, the ends of oxygen tubing are often flared to ensure leak-tight connections to fittings.

FLUID. A gas, vapor or liquid.

FOLDER. A device used as an attachment to a sewing machine to guide and fold cloth.

FORM, GROUND/AIR EMERGENCY CODE. A form containing visual rescue signals. It is inserted in the equipment container of all seat survival kits.

FUNCTIONAL CHECK. A test which puts an item to use to determine if it operates properly.

GAGE. An instrument for measuring pressure.

GAUGE. A measurement of size or thickness.

GFE. Abbreviation for Government Furnished Equipment.

GROMMET. A metal eye and washer used to reinforce a hole in material.

GROMMET, HEAVING. A large hand-held rubber ring to which a nylon heaving line is tied by bowline knot. It's purpose is to carry the line a greater distance when thrown.

HARNESS. An arrangement of webbing straps used to attach a survival kit to the aircrewman.

HEATER, OXYGEN PURGING ELECTRIC. A device used in the purging process to heat the purging gas (nitrogen) before it enters the oxygen system.

HEAT EXCHANGER. An apparatus in which heat is exchanged from one fluid to another.

HEM. A border or reinforced edge formed by folding cloth back and securing it, usually by sewing.

HOOK TAPE. A strip of fabric tape with miniature hooks on one side. Hook tape is used together with pile tape as a fastener.

IN. Abbreviation for inches.

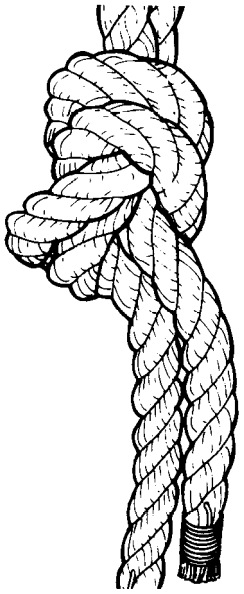
INFLATION ASSEMBLY. Inflation valve and carbon dioxide cylinder as a unit.

IN. H_2O. Abbreviation for inches of water column (27.68 IN. H_2O equals 1 PSI equals 2.036 IN. Hg).

IN. Hg. Abbreviation for inches of mercury column (0.07349 IN. Hg equals 1.0 IN. H_2O).

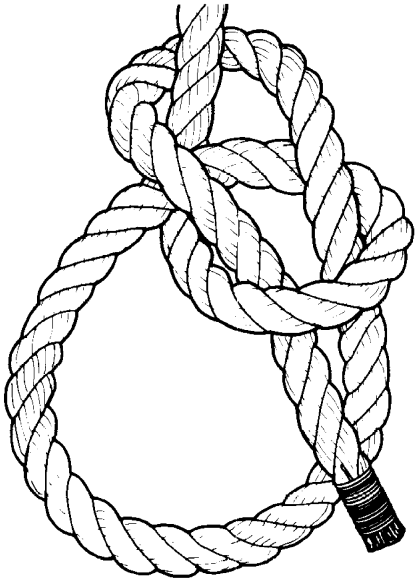
INSPECTION. A close examination for damage, wear and dirt. Also, a regularly scheduled examination of oxygen equipment and accessories.

KNOT, BINDER. The simplest method of joining two threads or lines. The two ends are placed side by side and a simple, overhand knot is then tied in both lines simultaneously. It will not slip when drawn tightly. Also called a thumb knot.



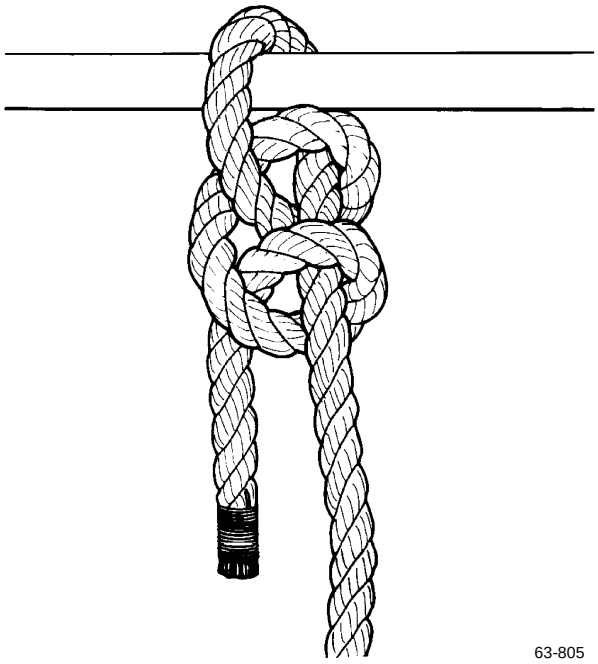
63-803

KNOT, BOWLINE. A knot formed by making a small overhand loop a desired distance from the end of the line. The end of the line is then passed through the loop from the underside of the main part of the line and back through the small part of the loop. When this knot is drawn tight, it will not slip but still can be easily untied.



63-804

KNOT, HALF-HITCH. A knot formed by passing a cord or line around an object, then passing the free end around the main part of the cord and bringing the free end up through the loop thus formed.



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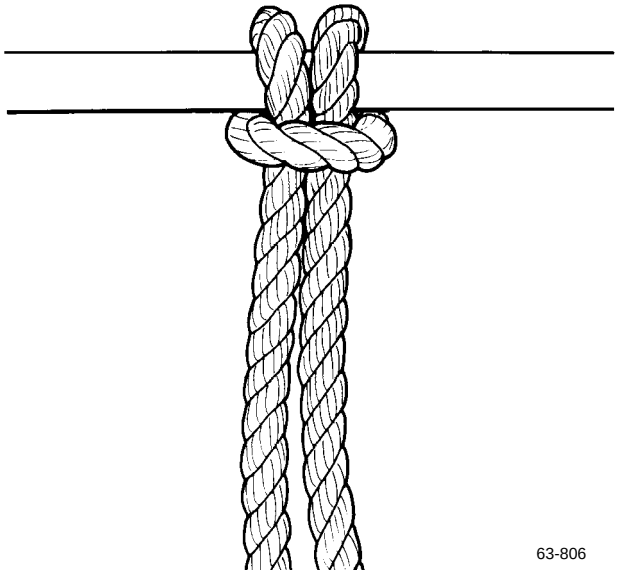
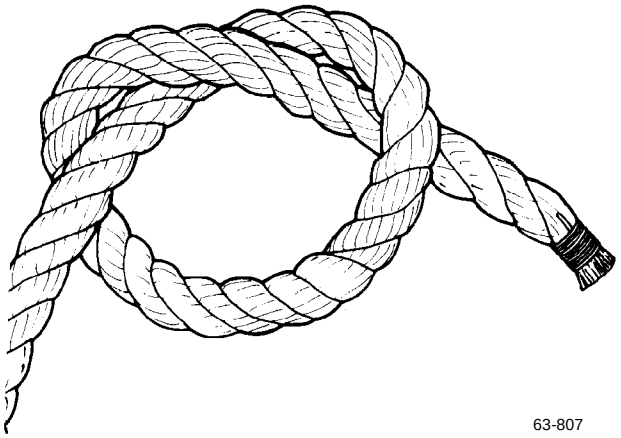
KNOT, LARK'S HEAD. A knot formed around an attachment ring or bar by passing the free ends of the line around the bar or through the ring and then through a loop or bight in the line.



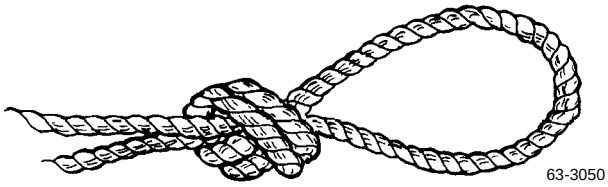
63-806

KNOT, OVERHAND. A simple knot tied in the end of a line by forming a loop and passing the end over and down through the loop.

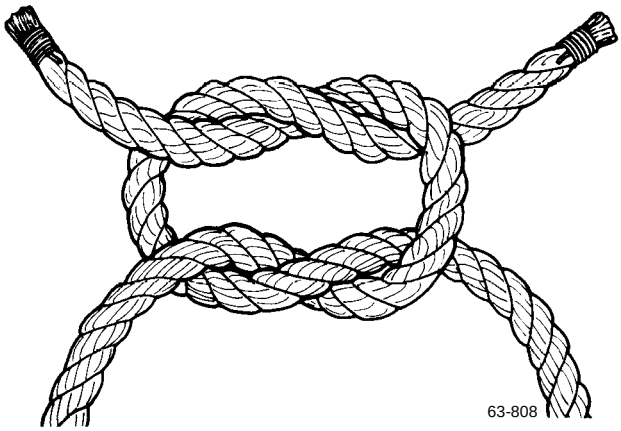


63-807

KNOT OVERHAND LOOP. Double the line forming a loop; then tie a simple overhand knot forming as large a loop as desired.


63-3050

KNOT, SQUARE. A knot formed by passing the end of the cord in the left hand over and under the end in the right hand and then reversing the process by passing the end in the right hand over and under the end in the left hand.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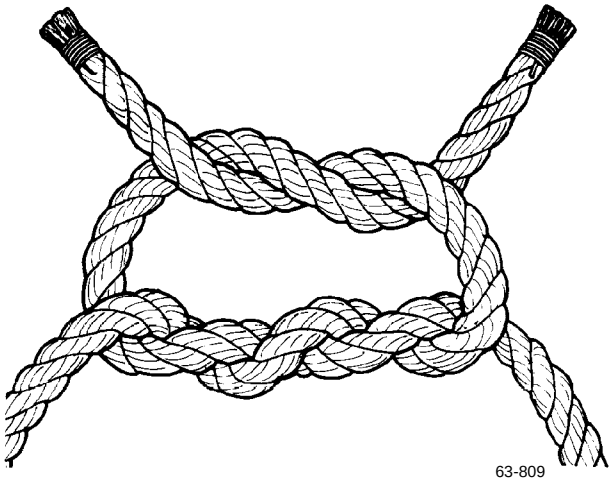
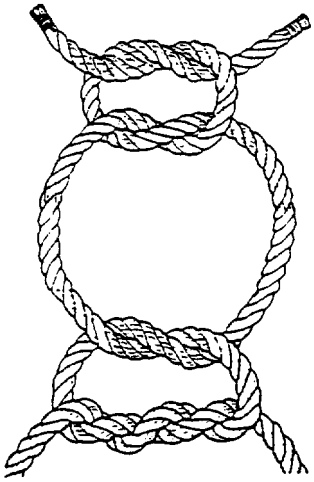
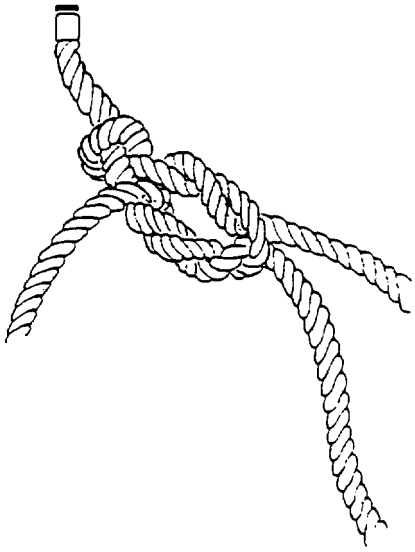
KNOT, SURGEON's. The surgeon's knot is similar to the square knot, except that the first overhand tie is wrapped twice around the cord or line.


63-809

KNOT, SURGEON's/KNOT, SQUARE. A combination of two standard knots formed exactly as the name suggests. Form the surgeon's knot first, then form a complete and separate square knot snugly against surgeon's knot.


63-3064

KNOT, SURGEON's/KNOT, OVERHAND. A combination of two standard knots formed exactly as the name suggests. Form surgeon's knot near end of line then follow with overhand knot in end of line positioned snugly against surgeon's knot to ensure no slippage.


63-3065

LAPBELT. Part of the restraint system attached to the seat survival kit. The lapbelt incorporates Koch fittings for attachment to the aircrewman's torso harness suit.

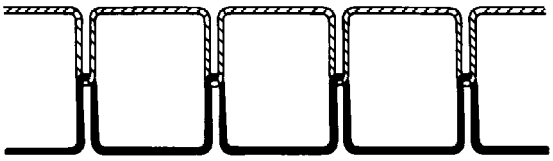
LAPBELT/BRAKE RIDER'S STRAP. A strap designed to secure the plane captain/ground servicing crewmember to the aircraft while it is being taxied.

LBS. Abbreviation for pounds.

LINE, RETAINING. A nylon lanyard connecting the liferaft to the aircrewman. The retaining line serves to prevent the aircrewman from becoming separated from, or loosing his liferaft.

LINE, VALVE ACTUATING. A nylon cord connecting the pull cable of the carbon dioxide inflation assembly to the dropline of the seat survival kit. This line is pulled tight before the dropline, thus actuating the carbon dioxide inflation assembly.

LOCKSTITCH. A common sewing-machine stitch formed when the thread in the needle goes through the material and connects with the bobbin thread. The needle and bobbin thread should lock in the center of the material thickness. (Ref. ASTM-D-6193, Type 301).



63-810

LOCKWIRE. A wire that prevents loosening of a securing device.

LOX. Abbreviation for liquid oxygen.

LPM. Abbreviation for liters per minute.

MANIFOLD. A pipe fitting with several lateral outlets for connecting one pipe with others.

MANUAL OXYGEN RELEASE. A device (usually a green ring) attached to the top of the seat survival kit which enables the aircrewman to actuate the emergency oxygen system should automatic actuation not occur.

MECHANISM, RELEASE. A device which when actuated, separates the upper and lower containers allowing the liferaft to deploy.

MILDEW. A damaging fungus or mold which forms on cloth or leather. It is caused by dampness and the absence of fresh air and sunlight.

MOUSING. A turn or lashing used across the open end of a hook to prevent the load carried from slipping off.

NAMEPLATE. A label attached to equipment, giving data as to type, model number, date of manufacture, part number, serial number, etc.

NEGATIVE G FITTING. Hardware installed on the seat survival kit to prevent movement of the kit in all flight conditions.

NEGATIVE G STRAP. Performs the same function as the negative G fitting, but incorporates nylon straps instead of hardware.

NHA. Abbreviation for next higher assembly.

NO. Abbreviation for number.

NOTE. An information item. A note may precede or follow the item or step to which it refers.

PACK. To put together compactly; to store neatly, for example, packing a survival kit consists of stowing the survival equipment in a container, folding and covering the raft, and inserting both into the kit container.

PARAFFIN. Wax generally used with 50 percent beeswax as a hot dip to prevent the fraying of cut ends of webbing, cord, thread or tape. See also BEESWAX.

PARARAFT. An emergency, one-man liferaft packed in a container, along with survival equipment. The pararaft is secured to the parachute pack or seat pan.

PILE TAPE. Strip of fabric tape with small nylon loops on one side. Used with hook tape as a fastener.

PIN, TEMPORARY LOCKING. A metal pin inserted through the eye of a locking cone to hold a flap in place until the ripcord pin is inserted.

PLD. Personnel Lowering Device. A device incorporated into some seat kits which enables an aircrew-

man to safely lower himself to the ground should his parachute become entangled in trees or heavy foliage.

PRESSURE. The force exerted by a liquid or gas per unit of area on the walls of the container. See also: PSIG, PSIA and ATMOSPHERIC PRESSURE.

PRESSURE DROP. Loss in pressure, as from one end of a LOX line to the other, due to friction and other factors.

PRESSURE REDUCER. A device that changes high pressure (1800 psi) oxygen in the emergency oxygen cylinder of a seat kit to low pressure (40 to 80 psi) oxygen, suitable for breathing.

PSI. Abbreviation for pounds per square inch. See also: PSIA and PSIG.

PSIA. Abbreviation for pounds per square inch, absolute. Absolute pressure is measured from absolute zero (100% vacuum), rather than from normal, or atmospheric pressure. It equals gage pressure plus 14.696 pounds per square inch. See also: PSI, PSIG and ATMOSPHERIC PRESSURE.

PSIG. Abbreviation for pounds per square inch, gage. Indicates pressure above ambient pressure, as indicated on a pressure gage vented to the atmosphere. See also: PSI and PSIA.

PULL-TEST, RELEASE HANDLE. A test conducted on the seat kit release handle to ensure the force required to release the handle does not exceed the maximum allowed.

PURGING. The process of eliminating undesirable particles and impurities from an oxygen system by forcing pure, heated nitrogen through the system in several stages.

PYROTECHNIC. Any device which either burns or explodes.

QUALIFIED PERSONNEL. Graduates of the Aircrew Survival Equipment School.

R. Abbreviation for radius.

RAVEL (UNRAVEL). To separate, untwist or unwind, leaving a frayed or ragged edge. RAVEL is the preferred word to describe such a condition.

REF. Abbreviation for reference.

REPAIRS, MAJOR. Repairs requiring special equipment, personnel or materials not normally available at intermediate level of maintenance.

REPAIRS, MINOR. Repairs that can be performed at organizational or intermediate levels of maintenance.

RIG. To assemble and adjust; to equip.

RSSK. Rigid Seat Survival Kit.

SAFETY TIE. Low strength thread which serves to inhibit accidental opening, discharge or separation.

SAFETY WIRE. Low strength wire which serves to inhibit premature opening, discharge or separation.

SCRAP. To discard, with proper authorization, items, parts or materials which are obsolete or no longer useable.

SEAM. A series of stitches joining two or more pieces of cloth.

SEAR. To melt or seal with heat, for example, to sear the end of nylon webbing one heats the end until the nylon melts and fuses. This prevents raveling.

SEAT PAN. A sponge rubber covered metal seat which is contoured for comfort to the user. A seat pan is used with seat-type parachutes and back-type parachutes when a packaged liferaft assembly is used. A high-speed seat pan has sections for support under the aircrewman's thighs during ejection. This reduces leg strain caused by high acceleration loads.

SECURITY. An item firmly, positively and safely attached in the authorized manner.

SHIM. A thin, often tapered slip of metal used to fill in a void space or to level a component or part.

SKID PAD. A thin, cork-like material bonded to the underside of some survival kits to prevent movement of the kit in ejection seat bucket.

SLPM. Standard Liters Per Minute.

SM&R CODES. Abbreviation for source, maintenance and recoverability codes. Comprised of three parts; a two-position source code, a three position maintenance code, and a one-position recoverability code. Refer to NAVAIRINST 44233 for further details.

STITCHES PER INCH. The number of needle penetrations where threads are interlaced, per linear inch.

STOWING. The act of putting away in a neat, orderly fashion.

STRAP, LAP RESTRAINT. A strap attached to the integrated torso harness suit to retain the rigid seat survival kit to the wearer. Prior to ejection it serves as a safety restraint for the aircrewman.

SURVEY. A formal process by which a seat survival kit or other accountable equipment is withdrawn from service or removed from records.

SWAGE. To attach a device to a cable by means of pressure. A swaging machine compresses a fitting, causing it to grip tightly to the cable to which it is being attached.

TACK. To attach temporarily prior to final sewing. Also, to tie temporarily as an aid in positioning. Also, to permanently secure portions of a seat survival kit assembly together.

TAMPER DOT. A mark applied to a screwhead or nut that will indicate if the fitting has loosened or gone out of adjustment since the last inspection.

TAPE. A narrow, woven ribbon of cotton, linen, nylon or other material.

TEMPLATE. A pattern or gage commonly in the form of a thin plate of cardboard, wood or metal. It is used as a guide in the layout or cutting of flat work.

TOGGLE RESET TOOL. A metal tool used to reset the toggle arm of the reducer assembly on most seat survival kits.

TORQUE. A force, or combination of forces, that tend to produce a rotating or twisting motion. Torque is often expressed in inch-pounds or foot-pounds. A torque wrench is used to apply a measured torque.

TORSO HARNESS SUIT. A combination of webbing and a torso suit which includes the parachute harness. lap belt, shoulder belt and life vest attachment fittings.

T-WRENCH. A special tool used for removing the threaded metal insert of a radio beacon before installation in the seat survival kit.

TYP. Abbreviation for typical.

UNRAVEL. See RAVEL.

VALVE, CHECK. A valve designed to allow the passage of a fluid in one direction only.

VALVE, FILLER. A one-way valve used to connect an external oxygen supply to the emergency oxygen cylinder of a seat survival kit for filling purposes.

VALVE, INFLATION. A valve attached to the carbon dioxide cylinder of the LR-1 liferaft. The valve directs the flow of carbon dioxide into the flotation tube of the liferaft.

VALVE, RELIEF. A valve designed to vent excess pressure to the atmosphere.

WARNING. Indicates danger to personnel. A warning precedes the item or step to which it refers.

WEBBING. A strong, narrow closely-woven tape of synthetic cotton or linen fiber designed for bearing weight.

WEBBING, TUBULAR. Strong synthetic or natural fiber webbing woven in the form of a tube.

X. Abbreviation for times or by; multiplication sign.

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