POWER, WORK, ENERGY & HEAT

The work done in unit time is called the power, The unit of power in the technical system of measurement is the horse – power. In the British engineering units 1 h.p. = 550 ft. Ibs. / sec. In the metric units horse- power is called Cheval – Vapeur (CV) ans is equal to 75 kilogram – metres /sec. The fundamental metric unit of power is the watt. 1 watt = 1 joule/sec = 107 ergs/sec.
The fundamental metric units of work and energy are the erg or dyne – cm. and joule.

Units of Heat

The fundamental unit of heat in the British system is the British Thermal Unit (B.Th U) which is the quantity of heat required to raise the temperature of 1 Ib. of water by 1 deg. F. The unit of heat in the metric system is the gram-calorie or calorie, which is the quantity of heat required to raise the temperature of one gram of water 1 deg C. One B.Th. U. is equal to 252 calories, The kilogram – calorie or kilo- calorie (kh-cal. Or kilo-cal.) which is equal to 1000 gram calories is in more frequent practical use, which is the heat required to raise the temperature of one kilogram of water by 1 deg. C. 1 kilo – calorie/kg= calorie/gram=centigrade heat unit/sec. A practical unit of energy, usually applied to heat is the joule.

FORCE

The unit of force in the British system is the poundal (pdI). The dyne of dyn,Newton and sthene are the units of force in the metric system.

1 newton = 105 dynes; 1 sthene = 103 dynes

Poundal is the force required to produce an acceleration of 1 foot/sec./sec. in a mass of 1 pound. Dyne is the force required to produce an acceleration of 1 centimetre/sec/sec. in a mass of 1 gram. For practical purposes the value of g (acceleration due to gravity) is usually taken at 32.3 ft./sec./sec. or 981 cm./sec./sec/(The international recognized exact standard value of g is 32.174 ft./sec./sec. or 980.665 cm./sec./sec.)

Cm./sec./sec. = 0.0328 1 ft./sec./sec.

Ft./sec./sec. = 30.48 cm./sec./sec. or 0.305 metres/sec./sec.

CONVERSION FACTORS

1 h.p. = 1.014 metric h.p.
= 745.7 watts
=0.7457 kilowatts
= 10.70 kg – cals/min
= 76.040 kg.-m./sec.
= 42.44 B.Th.U./min.
= 550 ft.- Ibs./sec.
= 33,000 ft.-Ibs./min.

1 h.p.- hr. = 0.7457 kw.-hr.
= 611.19 kg.-cals.
= 273,745kg.-m.
= 63,705,000 ft.poundals
= 2,684.52 kilojoules
= 2.68452 megajoles
= 2,544 B.Th.U.
= 1,930,000 ft. –Ibs.

1 metric h.p. = 0.9863h.p.
or = 735.50 watts
Cheval Vapeur = 0.7355 kilowatts
= 75 kg.-m./sec.
= 542.48 ft.-Ibs./sec.

1 metric h.p.-hr.
= 270,000 kg.-m.
= 632.527 kg.-cals.
= 0.7355 kw-hr.

1 kilowatt = 1000 watts

1 B.Th.U. = 1.055 joules
= 252 calories
= 0.252 kg.-cal
= 0.293 watt hr.
= 0.000293 kw. –hr.
= 107.586 kg.-m.
= 0.000393 h.p.-hr.
= 778 ft.-Ibs

1 watt = 1 joule /sec.
= 6.1158 kg.m./min.
= 0.01434 kg.-cal./min.
= 0.2388 cal.sec.
= 3.414 B. Th.U./hr.
= 44.26 ft. – Ibs./min.

1 watt-hr = 3600 joules
= 3,415 B.Th.U.
= 367.1 kg. –m.
= 0.8605 kg.-cal.
= 0.00134 h.p.-hr.
= 2655 t.-Ibs.

1 kilowatt.-hr.
= 1.341 h.p.-hr
= 3412.14 B.Th..U.
= 859.85 kg.cals.
= 3.600 kilo joules
= 367.098 kg.-m.
= 2,654,200 ft.-Ibs.
= 85,429,000 ft.- poundals1

1 kg.-cal./min

= 10 hectowatts
= 1.341 h.p.
= 1.36 metric h.p.
= 101.97 kg.-m./sec.
= 14.34 kg.-cal./min
= 56.92 B.Th.U./min.
= 737.56 ft.-Ibs./sec.

= 0.06972 kilowatts
= 0.09351 h.p.
= 51.43 ft.- Ibs./sec.

1 B.Th.. U./min
= 17.57 watts
= 0.01757 killowatts
= 0.02358 h.p.
= 12.96 ft.Ibs/sec.

1 B.Th.U./sq.ft. = 2.71 kg.-cals./sq.metre
1 B.Th.U./cu.ft. = 8.89 kg.-cal./cu.metre
1 kg.-cal./sq. metre = 0.369 B.Th.U/sq.ft
1 gm.-cal./sq.cm. = 3.69 B.Th.U./sq.ft.
1 kg.-cal./cu.metre = 0.1125 B./Th.U./cu.ft.
1 B.Th.U./sq.ft./hr.deg.F . = 4.88 kg.-cals/sq.metre/hr./deg.C.
1 kg.-cal./sq.metre/hr./deg.C. = 0.205 B.Th.U./sq.ft./hr./deg.F.

B.Th.U./Ib. = 2.326 joules/gram
= 0.5556 kg.-cals./kg.

1 calorie = 4.19 joules
= 4.19 watt-sec.

1 kg.-cal. = 3.958 B.Th.U.
= 427 kg.-m.
= 4,190 joules
= 0.00156 h.p.-hr
= 0.00116 kw.-hr.
= 3,087 ft.-Ibs.

1 kg.-cal./kg. = 1.8 B.Th.U./Ib.
= 4.1868 joules/gram

1 joule = 107 ergs
= 0.2388 calories
= 1 watt-sec.

1ft.-poundal = 0.04214 joules
= 0.031 ft.-Ib.(force)

1 kg.-metre = 0.8145 joules
= 0.0003 B.Th. U.
= 2.342 calories
= 0.0027 watt-hr.
= 7.233 ft.-Ibs.
= 232.715 ft.- poundals

1 ft.-Ib = 1.3569 joules
= 0.1383 kg.-m.
= 32.174 ft.-poundals
= 0.3766 milliwatt – hr.
= 0.324 calories
= 1.356 x 10 7 dyne-cm.
= 0.001286 B.Thu.U

1 kg.-m./sec.= 0.0131 h.p.

= 0.0002778 watt-hr.
= 0.2778 kilowatt – hr.
= 0.1019 kg.-m.
= 0.737 ft.-Ibs
= 0.00095 B.Th.U.
= 23.73 foot poundals

1 kilo-joule = 0.9478 B.Th..U

1 mega-joule = 0.3725 hp.-hr.

1 poundal = 13,826 dynes
= 0.03108 Ib.-force
= 0.0141 kg.-force

1 Ib.-force = 444,822 dynes
= 32.174 poundals
= 0.45359 kg.- force

= 0.0133 metric h.p.
= 0.0098 kilowatts
= 7.233 ft.-Ibs/sec.

1 ft.-Ib./sec. = 1.356 watts
= 0.00184 metric h.p.
= 0.001818 h.p.
= 0.0717 B.Th.U./min.
= 0.01945 kg.-cal./min
= 0.13825 kg.-m./sec.

1 mega-dyne = 72.330 poundals
= 1.01972 kg.-force
= 2.24809 Ib.-force

1 kg.-force = 980,665 dynes
= 70.93 poundals
= 2.2046 Ib.- force

Specific Gravity is the ratio between the weight in air of any given net volume of a substance and the weight of an equal volume of pure water. The weight of any substance is its specific gravity x weight of water per unit volume.

Specific Volume is defined as the volume per unit mass of the substance.

MISCELLANEOUS CONVERSION FACTORS

To converse	into	x by	To converse	into	x by
Acre feet	cu. Feet	43.560	Feet/ Sec.	Cm/Sec.	30.48
,,	,, metres	1233.48	,,	,, Km/hour	1.0978
,,	galls imp.	271.327	,,	,, metres/min.	18.28
,,	,, US	325.851	,,	,, miles/hour	0.3048
,,	Hectare – r tre	0.1234	,,	,, ,,/ min.	0.0114
,,	kilolitres	1233.48	Foot-lbs.	kg-metres	0.1385
,,	sq. dekametre	1	Foot tons	kg-metres	309.69
,,	,, metres	100	,,	,, toones-metre	0.31
,,	,, yards	119.6	Galls. Imp.	Galls US	1.20
Atmosphere	kg. /Sq. cm.	1.034	,, / Se. ft.	Litres/Sq.metre	48.900
,,	metres of water	10.342	,, /hour	,, / min.	0.076
,,	feet of water	33.93	,, /min.	,,/hour	272.758
,,	ins. Of mercury	29.92	,, / ,,	cu.ft./sec.	0.0027
,,	Lbs. /sq. in.	14.69	galls-US)	lbs. of water	8.345
Contigrams	grains	0.154	of water		
,,	/ litre Grs./ Gall. Imp.	0.7015	,, ,,	/ min. cu. Ft./hour	8.0208
,,	,, grams/ cu. Metre	10	,, ,,	,, ,, / sec.	0.0022
Cm/sec.	ft. sec.	0.0328	,, ,,	,, Litres/sec.	0.0631
,,	,, km/ hour	0.036	,,	,, sq. yd. ,,/sq. metre	5.44
,,	,, metres/min	0.6	Gains/cu. Ft.	grains/gall	0.1605
,,	,, miles/ hour	0.0224	,, / cu. In.	Grams/ cu. Cm.	0.0035
Cu.ft/ min.	cu. Cm./sec.	472.0	,, / gall. Imp.	Parts/ million	14.286
,,	,, galls Us/ Sec.	0.1247	,, ,,	M/ Litre	1.4254
,,	,, ,, imp./ min.	6.24	,,	,, grains/ cu. Ft.	6.229
,,	,, ,, day	9000	,,	,, US parts/ Million	17.118
,,	,, liters/ sec.	0.4720	Grams/ Cm.	Lbs./Foot	0.0672
,,	/se. galls. Imp./min.	374	,, / Sq. cm. ,,	/ sq. in	0.0142
,,	,, ,, /day	538,176	,, / cu. Cm.	Grains/ Cu. In	252.01

,,	,,	,,	US/min.	448.83	,,	,,	lbs/cu. Foot	62.43	
,,	,,	,,	/day	646.315	,,	,,	,, / Cu. Inch		0.0361
Cu.m/kg. cu. Ft./lb.			16.018	,,	,, Oz/ cu. Inch		0.578		
Ft. of water lbs. sq.ft.			62.4	,, / cu. Metre			Grains/ Cu. Ft.	0.437	
,,	,,	,,/sq. in		0.4335	,, / litre		,, / gall. Imp	70.12	
,,	,,	,,kg./sq. metre		304.8	,,	,,	Lbs./ cu. Foot	0.0624	
Feet/min. feet/sec.				0.0167	,,	,,	Oz. / Gall. Imp	0.1603	
,,	,,	cm./sec.		0.5080	,,	,,	Parts/ Million	1000	
,,	,,	km/hour		0.0183	,, / Millilitre		Lbs/ gall. Imp.	10.022	
,,	,,	metres/min.		0.3048					
,,	,,	miles/hour		0.0114					

MISCELLANEOUS CONVERSION FACTORS

To Convert	Into	Xby	To Convert into	X by
Cwt./ Cu. Yd.	Quintals/ cu. M.	– 0.664	Metres of LBs/ Sq. in. water miles	1.4223
Inch.Lbs.	kg.- metres	- 0.0115	,, / hour cm./ sec.	1.609
,, ,,	kg. cm.	- 1.152	,, ,, feet/ min.	14.704
,, tons		- 25.803	,, ,, ,,/sec.	88
Inch/ sec.	metres/ min.	- 1.5240	,, ,, km. hour	1.467
kilograms	pounds (avp)	- 2.2646	,, ,, metres/ min	1.609
Kg/ Cu. Cm.	Lbs./ cu. Inch	- 35.135	,, ,, ,, / sec.	0.4470
,, / ,, metre	,, / ,, Yards	- 1.5855	,,/ min. cm/ sec.	2882
,, / ,, ,,	,, / ,,foot	- 0.062	,, ,, feet/ sec.	88
,, / Litre	,, / ,, ,,	- 62.486	milliers kilograms	1000
,, / ,,	,, /Gall. Imp.	- 10.0221	mg. litre parts/ million	1
Kg. metres	foot lbs	- 7.233	million imp cu. Ft./ sec.	1.8568
,, ,,	,, tons	- 0.0032	galls/ day	
,, ,,	inch – lbs	- 86.796	,, US ,, ,, ,,/Sec.	1.5472

,, ,, ,, tons - 0.0387 ,, ,,, ,,Litres/ ,, 52.6

Kg./ metre Lbs/ ft. - 0.6720 ,, imp. ,, ,, 03.12

,, / sq. metre ,, / sq. ft. - 0.2048 Oz. avp/ ft. Grams/ Cm. 0.930

,, / ,, ,, ,, / sq. ft. - 0.00142 ,, / sq. yd. ,, / sq. metre 33.91

,, / ,, cm . ,, / ,, in - 14.2233 Oz. liq. Imp. Cu. Inches 1.7339

,, / ,, cm ,, / ,, ,, - 2048.17 ,, / cu. In. Grams/ cu. Cm. 1.73

,, / ,, ,, ,, / ,, ft. - 0.914 ,, / gall. Imp ,, / litre 6.236

,, / ,, ,, / ,, ft. - 0.6214 ,, ,, Lbs. / cu. Ft. 0.389

,, / ,, ,, tons / ,, - 0.914 parts/ million Grains/cu. Ft. 4.37

Kilometers miles - 0.6214 ,, ,, ,,/ gall. Imp 0.0702

,, / hour cm/ sec. - 27.78 ,, ,, ,,/ gall. Us 0.0684

,, / ,, feet/ min. - 54.68 Pounds/ Foot Grams/ Cm. 14.882

,, / ,, ,, / Sec. - 0.9113 ,, ,, Kg. metre 1.488

,, / ,, metres/ sec. - 0.278 ,, / inch Grams/ Cm. 178.58

,, / ,, ,,/ min. - 16.67 ,, ,, Kg. metre 17.858

,, / ,, miles/ hour - 0.6214 ,, / yard grams/ cm. 4.961

Knots miles/ hour - 1.1516 ,, ,, kg./ metre 0.4961

,, metres/sec. - 0.5148 ,, / gall imp. Grams/ litre 99.779

,, km./ hour - 1.8532 ,, ,, kg/ ltire 0.0998

Litres/ mir. Galls/ hour -13.1985 Pounds/ Sec. tonner/hour 1.633

,, / Sq. metre ,, / sq. ft. - 0.0204 ,, / cu. Ft. grams/ cu. Cm. 0.0160

,, / sec. ,, / min. imp. - 19.00 ,, ,, ,, / litre 16.019

,, / ,, ,, / ,, us - 15.84 ,, ,,kg./ cu. metre16.019

,, / ,, cu. Ft./ min. - 2.119 ,, ,, oz./ gall. Imp 2.569

Metres feet - 3.281 ,, / 1000 ft. kg. / km. 1.4882

Metres/ min. cm. / sec. - 1.667 ,,/ cu. Inch grams/ cu. Cm. 27.68

,, ,, cm / sec. - 1.667 ,, ,, ,, kg./ cu. Cm. 0.0277

,, ,, feet/ sec. - 0.0547 ,, ,, yard ,, / cu. Metre 0.5933

,, ,, km/ hour - 0.06 ,, / sq. foot feet of water 0.0160

,, ,, miles/ hour - 0.0373 ,, ,, Grams/ Sq.cm. 0.4882

,, / sec. feet/ min. - 196.85 ,, ,, kg./ sq. metre 4.8824

,, ,, / sec. - 3.281 ,, / sq. inch feet of water 2.3068

,, ,, km/ hour - 3.6

,, ,, ,,/ min. - 0.06

,, ,, knots - 1.9435

,, ,, milles/ hour - 2.237

,, ,, ,,/ min. - 0.0373

TO CONVERT	INTE	X BY	To convert	into	x by
Pounds sq. in	Grams / Sq. Cm.	70.307	tons/sq. ft.	tones/sq. m.	10.937
,, ,,	metres of water	0.70	,, ,,	,, kg./ sq. cm.	1.0937
,, ,,	Kg./sq. cm	0.0708	,, ,,	,,/ sq. inch	15.556
,, ,,	,,/sq.metre	703.07	,, ,,	vard tones/ sq. m.	1.215
,, ,,	trons/sq. ft.	0.0643	,, US/ sq. ft.	tones/ sq. m.	9.7648
,, ,,	tones/sq. m.	0.7031	,, / cu. Yd.	Kg. / Cu. Metre	1186.5
,, /sq. yd.	k.g./ sq. metre	0.643	,, ,,	,, tones/ ,,	1.1865
,, of water	galls. Imp.	0.1000	Tonnes/ Cu. M.	Lbs/ Cu. Inch.	0.036
,, ,,	,, us	0.1198	,, ,,	,, / cu. Foot	62.43
,, ,,	cu. Feet	0.0160	,, ,,	,, / cu. Yard	1685.6
,, ,,	,, inches	27.68	,, ,,	,, gram/s cu. Cm.	1
Tons Br. F/ft.	Kg./ Metre	3333.33	,, / sq. ,,	tons/ sq. foot	0.0914
,, /cu. Yard	,,/ cu. ,,	1320	,, ,,	lbs/ ,,,, inch	1.4223
,, ,,	,, Tonnes/cu.m.	1.329	,, / hour ,,	,, ,,/ sec.	0.6124
,,/ sq. inch	kg./ sq. mm.	1.575	,,	kilometer Ton-miles br.	0.6115
,, ,,	,, / sq. cm.	157.488	,, metres	foot tons br.	3

THERMOMETRIC SCALES

Two thermometric scales are in common use, Fahrenheit and centigrade or Celsius, Temperature is measured in degrees Fahrenheit (F) or degrees Centigrade (C)

Freezing point of pure water or melting point

Of ice = 32^0 F = O C.

Boiling point of pure water – 212^0 F = 100^0 C

Human temperate = 98.4^0 F, = 37^0 C.

Cold water temperature is taken					=	45^0 F = 7^0C
Cool ,, ,,	,,	,,	,,		=	$66\ ^0$F = 19^0 C
Temperate	,,	,,	,,	,,	=	$79\ ^0$ F = $26\ ^0$C
Tepid ,,	,,	,,	,,		=	86^0 F = 30^0 C
Warm ,,	,,	,,	,,		=	99^0F = 40^0C
Hot	,,	,,	,,	,,	=	104^0F = 40^0C

O.F. is the melting point of a moisture of equal part of salt and snow

To Convert F. to C : C = 5/9 (F-32)

,, ,, C to F : 9/5 (C + 32)

For most purposes mercury in glass thermometer are used for recording the interior temperature of a dam, thermocouples are used.

Steam as compared with water occupies 1646 times as much space. It is generally assumed that one cubic inch

WEIGHTS OF BULDING MATERIALS

	Kg/ cu. Metre		kg/ cu. metre
Alum.	1700	Carborundum	1600
Aluminum cast	2580-2700	Cast iron (av)	7200
,, Wrought	2640-2800	Cast steel	7840
		Castrol oil	960

Kg/ Sq. Metre	
,, Sheets	
Asbestos cement sheets	
6 mm. thick flat	11
,, ,, corrugated	16

	Kg/ cu. Metre
Ashes and cinders,	
Loose	500-700
Asphalt, solid	2200-2300

	Kg/ sq. metre
,, mastic as laid	
10 mm thick	22

	Kg/ cu. Metre
Bajri (see shingle)	--
Ballast	
Brick	930-1260
Stone	
Dry well shaken	1600-1840
Dry well loose	1400- 1600
Dry wet fully	1920-2240
Dry consolidated	1920-2080
Basalt	2850-2960
Beeswax	960
Bitumen (av.)	1000
,, cutback	1120
Straight –run	1070
Brass	
Bricks	8550
Bricks, common	
Burnt	1600-2000
,, pressed	1760-1840
,, fire bricks	1760-2000
,, engineering	2160
Birkc ballast	930-1260
Brickwork	
Common	1800-1950
,, machine cut bricks	2400
,, Reinforced	1850-2000
,, sundried	1600-1700

Cement, common	
(grey) loose	1300-1400
lightly packed	1700
one bag	50 kg.
rapid hardhardening	1200
Mortar	1920
chalk stone (av.)	2200
charcoal wood	320-500
cinders or clinker	700-880
clay	
dry, lumps	1040
dry, compact	1440
damp. ,,	1760
Dry, rammed	1920-2080
dry, gravelly	2080
wet, compact	2080
coal	
loose	800-900
dust	960
steam (Bengal)	880
heavy quality	1200-1500
coal tar	1010
coke, coal)	1000
concrete, cement	
plain stone ballast	2300
plain reinforced	
(2% steel)	2400-2500
(5% steel)	2580-2700
acrated or cell	260
sawdust	1120
slag foamed	1280
brick aggregate	1850
cinders	1760
coke breeze	1100-1400
clinker	1500-1700
lime aggregate	1920-2250
stone aggregate	2250

Kg. sq. metre	
,, 10 cm thick	192

Kg/cu.metre	
,,cast	8700-9840
,, wrought	8840-8940
Cork	240
Crosote	1070
Diesal oil	960
Dolomine	2880
Earth	
Dry,loose	1280-1500
Moist, loose	1440-1600
Dry, rammed	1600
Moist, rammed	1760-1840
With sand mixed	2100
Fire clay	2240
,, bricks	1760-2000

Kg/sq. matre	
Glass	
Rolled,plate,	
6 mm thick	17
Sheet,	
Per 1 mm thick	2.5

Kg/cu. metre	
Grains	560-770
Granite	2640-2800
Gravel, loose	1600-1800
,, rammed	1920-2080
Gun-metal	8640
Gun powder	900

copper	
sheets	
Per mm thick	8.69

kg/cu.metre	
Lime –stone	2400-2640
,, in lumps,	
unslaked	1220-1440
,, freshly burnt	
in pieces	880-960
,, ground-quicklime	960
,, white, slaked,	
fresh	580-640
,, after 10 days	800
,, mortel	1760
Linseed oil	330
Loam	
dry, loose	1200
,, , compact-	1600

wet, compact	1920
Macadum, bitumen	
premixed	2200
rolled	2560
Marble	2560-2720
,, grit	1600
Mercury	13600
Mild steel	7850
Morter	
cement	2080
lime	1760
Mud,river,wet	1760-1920
Oil crude	880

Gutta parcha	970
Gypsum	2240-2400
Gypsum powder	1600
Hemp	320-560
Ice	900
Iron	
Ore	2400-3700
Pig	7200
Grey cast	7030-7130
White cast	7580-7720
Wrought	7500-7700
Kankar (stone)	1360-1470
,, lime unslaked	1190
,, ,, slaked	1025
Kerosene	820
Laterite	2080-2400
Lead, solid, cast	11350
,, liquid	10710

Kg/sq. metre	
,, sheets	
Per mm thick	11

Kg/cu. metre	kg/cu. metre
Plastics	1060-1600
Porcelein	2350
Pudlo	670
Pumice Stone	800-1120
Quartz rock	2650
Read lead and lytharge	
Dry	2110

fuel and	
lubricanting	900
caster	960
linseed	930
turpentine	865
Paints, ready mixed	
aluminous	1120
bituminous	1120
chocolate	2500
red lead	3200
white lead	2800
white zinc	2400
Paraffin(wax)	800-960
Peat	
dry	560-880
wet	1100
Patrol	675-690
Petroleum	1010

Pitch	1010
Plaster(see Mortar)	
Plaster of Paris	1760-2400

Steels mild	7850
,, rolled	7840
Stone	
granite	2640-2800
lime stone	2400-2640
marble	2720
pumice	800-1120

Paste	8900	sand stone	2240-2400
Red oxide, dry	1030	shale	2300-2500
Resin	1090	Stone Masonry	
Rip Rap	1280-1440	Mortar rubble	2500
Roofs(see under		dry rubble	2080
“Roofs”)	----	dry	
Rubber	940	random rubble	2100-2200
Salt, powder,		granite, ashlar	2640
Common	990	,, rubble	2400
,, , rock	1080	lime-stone ashlar	2560
Sand, dry , clean	1450-1600	marble dressed	2700
,, river	1840	sandstone dressed	2240
,, met	1760-2000	,, ashlar	2400
Sand stone	2240-2400	Sulphur	2050
Shale	2650	Surkhi	1110-1120
Shellac gum	610	Talc	2800
Shingle		Tallow	930
Aggregate,		Tar, (av.)	1080
3 to 38 mm	1460	Terra- cotta	1870-2370
Fine, dry	1600	Timber(see saction	
,, saturated	2080	,, Timber Structures”)	
Silt , wet	1760-1920	Turpentine	865
Slag, broken,		Varnishes	960
12 mm	1450-1520	Water, fresh	1000

Kg/sq. metre		,, 1 litre	1 kg
Slate,		,, sea	1026
25 mm thick	72	wheat	770-800

Kg/cu. metre		White lead dry	1380
Snow,		Wood. Fuel	350

Freshly fallen	125-190	Wood (see Timber)	
Well compacted	250-800	Wrought iron	7700
Soda Caustic	1280	kg/sq. metre	
,, silicate	880	Zinc sheets,	
		Per mm thick	7.1

Note: The values given in the above table for granular materials such as cement, earth , gravel, sand, are really the bulk densities and not the weights of the solid materials. Density of material in bulk is affected by the voids between the particles. True weight of a granular material is its specific gravity X weight of water. Density is defined as the mass per unit volume.