

METRIC - IMPERIAL CONVERSION TABLES



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MULTIPLYING FACTORS

NAME	SYMBOL	FACTOR
exa	E	10 ¹⁸
peta	P	10 ¹⁵
tera	T	10 ¹²
giga	G	10 ⁹
mega	M	10 ⁶
kilo	k	10 ³
hecto	h	10 ²
deca	da	10 ¹
deci	d	10 ⁻¹
centi	c	10 ⁻²
milli	m	10 ⁻³
micro	mu	10 ⁻⁶
nano	n	10 ⁻⁹
pico	p	10 ⁻¹²
femto	f	10 ⁻¹⁵
atto	a	10 ⁻¹⁸



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AREA

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
acre	4046.86	0.0002471	m ²
acre	0.405	2.469	Hectares
centares	1	1	m ²
circular mill	506.707	1.9735x10 ⁻⁶	mm ²
cm ²	0.155	6.4516	in ²
ft ²	0.0929	10.7643	m ²
ft ²	144	0.00694	in ²
ft ²	929.03	1.0764x10 ⁻³	cm ³
Hectares	10000	0.0001	m ²
Hectares	1076.4	0.000929	ft ²
in ²	645.16	0.00155	mm ²
in ²	6.4516	0.155	cm ²
in ²	6.452x10 ⁻⁴	1550	m ²
Km ²	247.105	4.047x10 ⁻³	acres
Km ²	0.386	2.591	mile ²
m ²	1.19599	0.83613	yd ²
rood	1011.71	0.0009884	m ²
sq. chain	404.686	2.471x10 ⁻³	m ²
sq.mile	2.58999	0.3861	km ²
sq.mile	258.999	0.003861	Hectare
yd ²	0.836	1.1962	m ²



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VOLUME – CAPACITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Barrels (US)	0.15899	6.2897	m ³
Barrels	42	0.0238	US Gal
Barrels	159	6.29x10 ⁻³	Litres
Board foot	2.35974	0.4238	dm ³
Bushels	1.244	0.804	ft ³
Bushels	36.3687	0.0275	litre (dm3)
Chaldron	1.30927	0.76378	m ³
Cord	3.62456	0.2759	m ³
cm ³	0.000035315	28316.6	ft ³
cm ³	0.061024	16.387	in ³
cm ³	0.000001308	764526	yd ³
cm ³	0.000002642	378501	US gall
cm ³	0.00022	4545.45	imp.gall
cm ³	0.001	1000	litres
Drachm (Fl)	3.55163	0.2812	cm ³
Ft ³	0.02832	35.311	m ³
ft ³	2832	0.0003531	cm ³
ft ³	1728	0.0005612	in ³
ft ³	0.03704	26.998	yd ³
ft ³	7.481	0.1337	US gall.
ft ³	6.229	0.161	imp.gall.
ft ³	28.32	0.03531	litres
Gill	0.142065	7.039	litres
imp gall	4546	0.00022	cm ³
imp gall	4.546	0.22	litre (dm ³)
imp gall	0.004546	220	m ³
imp gall	0.16054	6.229	ft ³
imp gall	0.005946	168.18	yd ³
imp gall	1.20094	0.8327	US gall
imp gall	10	0.1	lb H ₂ O@82°F
in ³	0.000016387	61024	m ³
in ³	16.387	0.061	cm ³
in ³	0.016387	61.024	litres
in ³	0.0005787	1728	ft ³
in ³	0.002143	466.64	yd ³
in ³	0.004329	231	US gall.
in ³	0.003605	277.393	imp.gall.



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VOLUME - CAPACITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
lbH ₂ O@60°F	453.98	0.002203	cm ³
lbH ₂ O@60°F	0.45398	2.203	litre
lbH ₂ O@60°F	0.01603	62.383	ft ³
lbH ₂ O@60°F	27.7	0.0361	in ³
lbH ₂ O@60°F	0.1199	8.3403	US gall
litre (1901)	1.000028	0.999972	dm ³
litre (1964)	1	1	dm ³
litre	100	0.01	cm ³
litre	0.035315	28.317	ft ³
litre	61.024	0.0164	in ³
litre	0.001308	764.53	yd ³
litre	0.2642	3.785	US gall
litre	0.22	4.545	imp gall
litre	1.76	0.5682	pints
litre	7.039	0.142065	Gill
m ³	1000	0.001	litre
m ³	35.315	0.02832	ft ³
m ³	61024	0.0000164	in ³
m ³	1.308	0.76453	yd ³
m ³	264.2	0.003785	US gall
m ³	220	0.004545	UK gall
Minim	59.1939	0.0169	mm ³
Peck	9.0922	0.10998	litre (dm ³)
Petrograd Std.	4.67228	0.21403	m ³
Pint	0.568261	1.75975	litre
quarts (dry)	1101	0.0009083	cm ³
quarts (dry)	67.2	0.0149	in ³
quarts (liq)	946.4	0.00106	cm ³
quarts (liq)	57.75	0.01732	in ³
quarts (liq)	1.13652	0.87988	litre (dm ³)
UK fld oz	28.4131	0.0352	cm ³
US brls.liq.	0.11924	8.3752	m ³
US brls.liq.	31.5	0.03175	US galls.liq.
US brls.petr.	0.15899	6.2897	m ³
US brls.petr.	42	0.0238	US galls.oil
US fld oz	0.02957	33.8181	litres
US fld oz	1.8046	0.55414	in ³



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VOLUME - CAPACITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
US gall	3785.4	0.0002642	cm ³
US gall	3.7854	0.2642	litre (dm ³)
US gall	0.0037854	264.2	m ³
US gall	231	4.329	in ³
US gall	0.13368	7.481	ft ³
US gall	0.004951	201.98	yd ³
US gall	8	0.125	pint(US)liq
US gall	4	0.25	quart(US)liq
US gall	0.8327	1.20091	imp gall
US gall	8.328	0.12008	lbH ₂ O@60of(air)
US gall	8.337	0.11995	lbH ₂ O@60of(vac)
yd ³	0.7646	1.3079	m ³
yd ³	764.6	0.0013079	litres
yd ³	764600	0.0000013	cm ³
yd ³	27	0.03704	ft ³
yd ³	46.656	0.0214	in ³
yd ³	210.97	0.00495	US gal
yd ³	168.17	0.00595	imp gall

SPECIFIC VOLUME

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
ft ³ /ton	0.0278696	35.8814	l/kg
ft ³ /lb	62.428	0.016	l/kg
ft ³ /lb	0.06243	16.0179	m ³ /kg
gal/lb (IMP)	10.0224	0.099777	l/kg
gal/lb (US)	8.3454	0.11983	l/kg
in ³ /lb	36.1273	0.02768	cm ³ /kg



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DENSITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
@ 60°F			
grains/US gall	17.12	0.0584	g/m ³
grains/US gall	17.15	0.05831	ppm (by wtH ₂ O)
grains/US gall	142.9	6.998x10 ⁻³	lbs/106 galls
@ 62°F			
grains/imp.gal	14.25	0.0702	g/m ³
grains/imp.gal	14.29	0.06998	ppm (by wtH ₂ O)
grains/100ft ³	0.022884	43.6986	g/m ³
grams/cm ³	62.43	0.016	lb/ft ³
grams/cm ³	0.03613	27.6778	lb/in ³
grams/litre	58.42	0.01712	grains/USgal
grams/litre	8.345	0.11983	lb/100 USgal
grams/litre	0.06243	16.0179	lb/ft ³
grams/litre	1002	9.98x10 ⁻⁴	PPM (mass in H ₂ O @ 60°F)
kg/m ³	0.06243	16.018	lb/ft ³
lb/ft ³	16.018	0.06243	kg/m ³
lb/ft ³	0.016018	62.4298	g/cm ³
lb/ft ³	5.787x10 ⁻⁴	1728	lb/in ³
lb/in ³	2.768x10 ⁴	3.61272	kg/m ³
lb/in ³	27.68	0.03613	g/cm ³
lb/in ³	1728	5.787x10 ⁻⁴	lb/ft ³
lb/in ³	27.68	0.03613	Mg/m ³
lb/gal (IMP)	0.0997763	10.0224	kg/l
lb/gal (US)	0.11983	8.3454	kg/l
oz/gal	6.236	0.1604	g/l
PPM by mass	0.9991	1.0009	gram/m ³ @15°C
PPM by mass	0.0583	17.153	gr/USgal@60°F
PPM by mass	0.07	14.2857	gr/impgal@62°F
PPM by mass	8.328	0.1201	lbs/10 ⁶ USgal
ton/yd ³	1328.94	7.5248x10 ⁻⁴	kg/m ³
ton/yd ³	1.32894	0.75248	t/m ³
slug/ft ³	515.379	1.9403x10 ⁻³	kg/m ³



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LENGTH

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
chain	20.1168	0.0497	m
chain(eng.)	30.48	0.03281	m
cm	0.393701	2.54	in
fathoms	1.8288	0.5468	m
fathoms	6.0	0.1667	ft
feet	0.3048	3.2808	m
feet	30.48	0.0328	cm
feet	12	0.0833	in
feet	0.3333	3.0	yds
furlong	0.201168	4.971	km
inches	25.4	0.03937	mm
inches	2.54	0.3937	cm
iron	0.53	1.8868	mm
km	0.6214	1.60927	mile
link	0.201168	4.97097	m
metre	3.281	0.3048	ft
metre	39.37	0.0254	in
metre	1.0936	0.9144	yds
micrometres	1x10 ⁻⁴	1000	m
micrometres	39.3701	0.0254	microinches
miles	1609	6.215x10 ⁻⁴	m
miles	1.60934	0.62147	km
miles(Naut)	1.85318	0.5396	km
mm	0.03937	25.4	in
Pole	5.0292	0.19884	m
Perch	5.0292	0.19884	m
Rod	5.0292	0.19884	m
thou	25.4	0.03937	micrometres
yards	0.9144	1.0936	m



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PRESSURE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Atmosphere	101.325	0.00987	kPa
Atmosphere	14.696	0.068	psia
Atmosphere	76	0.0132	cm Hg
Atmosphere	29.92	0.0334	in Hg
Atmosphere	33.96	0.02945	ft H ₂ O
Atmosphere	1.01325	0.987	Bar a.
Atmosphere	1.0332	0.9679	kg/cm ² a.
Atmosphere	1.0581	0.945	tonf/ft ² a.
Atmosphere	760	0.00132	torr=mmHg
Bar	100	0.01	kPa
Bar	14.504	0.069	psi
Bar	33.52	0.0298	ft H ₂ O
Bar	29.53	0.0339	in Hg
Bar	1.0197	0.9807	kg/cm ²
Bar	0.98692	1.0133	Atmosphere
Bar	1.0443	0.9576	tonf/ft ²
Bar	750.06	0.001333	torr=mm Hg
FtH ₂ O@68°F	2.984	0.3351	kPa
FtH ₂ O ---	2989.07	3.345x10 ⁻⁴	N/m ²
FtH ₂ O ---	0.2984	3.3512	Bar
FtH ₂ O ---	0.8811	1.135	in Hg
FtH ₂ O ---	0.03042	32.873	kg/cm ²
FtH ₂ O ---	62.32	0.016	lbf/ft ²
FtH ₂ O ---	0.4328	2.311	psi
FtH ₂ O ---	0.02945	33.956	Atmosphere
FtH ₂ O ---	0.305	3.279	mH ₂ O
In Hg@0°C	3.3864	0.2953	kPa
In Hg --	3386.39	2.953x10 ⁻⁴	N/m ²
In Hg --	33.864	0.02953	mbar
In Hg --	0.03386	29.533	Bar
In Hg --	1.135	0.8811	ftH ₂ O
In Hg --	13.62	0.07342	inH ₂ O
In Hg --	0.03453	28.96	kg/cm ²
In Hg --	70.73	0.01412	lbf/ft ²
In Hg --	0.4912	2.0358	psi
In Hg --	0.03342	29.922	Atmosphere



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PRESSURE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Inch w.g.	0.2487	4.02	kPa
Inch w.g.	249.089	4.015×10^{-3}	N/m ²
Inch w.g.	0.002487	402.09	Bar
Inch w.g.	0.07342	13.62	Inch Hg.
Inch w.g.	0.002535	394.48	kg/cm ²
Inch w.g.	0.577	1.733	Ozf/in ²
Inch w.g.	5.193	0.1926	Lbf/ft ²
Inch w.g.	0.03606	27.732	psi
Inch w.g.	0.002454	407.5	Atmos.
Inch w.g.	2.491	0.4014	mBar
kg/cm ²	98.07	0.0102	kPa
kg/cm ²	0.9807	1.02	Bar
kg/cm ²	32.87	0.0304	ftH ₂ O@68°F
kg/cm ²	28.96	0.0345	in Hg@0°C
kg/cm ²	2048	0.004883	lbf/ft ²
kg/cm ²	14.223	0.07031	psi
kg/cm ²	0.9678	1.0333	Atmosphere
kgf/mm ²	9.807	0.10197	MPa
kgf/mm ²	10000	0.0001	kgf/m ²
kPa	1000	0.001	Pa=N/m ²
kPa	0.145	6.897	psi
kPa	0.010197	98.068	kg/cm ²
kPa	0.2953	3.3864	in Hg@32°F
kPa	0.3351	2.9842	ftH ₂ O@68°F
kPa	4.021	0.2487	inH ₂ O@68°F



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PRESSURE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Lb/ft ²	4.8828	0.2048	kg/m ²
Lbf/ft ²	47.88	0.02089	Pa (N/m ²)
Lbf/ft ²	0.01605	62.3053	ftH ₂ O
Lbf/ft ²	0.0004882	2048.34	kg/cm ²
Lbf/ft ²	0.006944	144.01	psi
Lbf/in ²	6894.76	0.000145	N/m ²
Lbf/in ²	68.9476	0.0145	mbar
MPa	1x10 ⁶	1x10 ⁻⁶	Pa=N/m ²
MPa	1x10 ³	1x10 ⁻³	kPa
MPa	145	0.0069	psi
MPa	0.102	9.804	kgf/mm ²
N/m ²	0.14504x10 ⁻²	6894.65	lb/in ²
KN/m ²	20.8854	0.04788	lb/in ²
KN/m ²	0.2953	3.3864	in Hg
Ozf/in ²	43.1	0.0232	Pa
Ozf/in ²	0.0625	16	psi
Ozf/in ²	4.395	0.22753	gf/cm ²
Pa	1	1	N/m ²
Pa	0.000145	6896.55	psi
Pa	0.000010197	98068	kg/cm ²
Pa	0.001	1000	kPa
Pa	0.004015	249	inH ₂ O
pdl/ft ²	1.4882	0.672	N/m ²
Psi	6894.76	1.45x10 ⁻⁴	Pa
Psi	6.895	0.145	kPa
Psi	0.06805	14.6951	Atmosphere
Psi	2.311	0.4327	ftH ₂ O@68°F
Psi	27.73	0.0361	inH ₂ O@68°F
Psi	2.036	0.4912	in Hg@0°C
Psi	0.07031	14.223	kg/cm ²
Psi	0.0689	14.514	Bar
Psi	68.95	0.0145	mBar
Tonf/ft ²	107.252	0.009324	kN/m ²
Tonf/in ²	15.4443	0.06475	MN/m ²



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WEIGHTS - MASS

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Cwt	50.8023	0.01968	kg
Drachm	3.88793	0.2572	grams
Drams	1.7718	0.5644	grams
Drams	27.344	0.03657	grains
Drams	0.0625	16	oz.
Grains Av/troy	0.0648	15.432	grams
Grains Av/troy	64.7989	0.015432	mg
Grains Av/troy	0.323995	3.08647	carat (Metric)
Grams	0.035274	28.3495	oz (Av)
Grams	0.032151	31.1032	oz (troy)
Grams	0.0022046	453.597	lb
Grams	0.257206	3.88793	Drachm
Grams	0.771617	1.29598	Scruple
Grams	5	0.2	Carat (Met)
Grams	15.4324	0.0648	Grain
kg	35.274	0.02834	oz.
kg	2.2046	0.4536	lb
kg	0.1575	6.35029	Stone
kg	0.068522	14.5939	Slug
kg	0.022046	45.3592	Ctl
kg	0.019684	50.8023	Cwt
kg	0.001102	907.441	ton (short)
lbs H ₂ O	0.01602	62.422	ft ³
lbs H ₂ O	27.68	0.03613	in ³



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WEIGHTS - MASS

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
oz (Apoth)	1	1	oz (troy)
oz (Av)	28.35	0.0353	grams
oz (Av)	0.00002835	35269.84	tonnes
oz (Av)	16	0.0625	drams (Av)
oz (Av)	437.5	0.002286	grains
oz (Av)	0.0625	16	lb
oz (Av)	0.9115	1.0971	oz (troy)
oz (Av)	0.0000279	35842.294	ton (long)
oz (troy)	31.103	0.03215	grams
oz (troy)	480	0.002083	grains
oz (troy)	20	0.05	pennywts(troy)
oz (troy)	0.08333	12	lb (troy)
oz (troy)	0.06857	14.584	lb (Av)
oz (troy)	1.0971	0.9115	oz (Av)
Pennyweights (Troy)	1.5552 24	0.643 0.04167	Grams Grains
Pounds (Av.)	453.6	0.002205	Grams
Pounds (Av.)	0.4536	2.20459	kg
Pounds (Av.)	16	0.0625	Ounces av.
Pounds (Av.)	256	0.00391	Drams av.
Pounds (Av.)	7000	0.00014286	Grains
Pounds (Av.)	0.0005	2000	Tons (Short)
Pounds (Av.)	1.2153	0.82284	Pounds troy
Pounds (Troy)	373.2	0.00268	Grams
Pounds (Troy)	12	0.08333	Ounces (Troy)
Pounds (Troy)	240	0.004167	Pennyweights
Pounds (Troy)	5760	0.000174	Grains
Pounds (Troy)	0.8229	1.2152	Pounds Av.
Pounds (Troy)	13.166	0.07595	Ounces Av.
Pounds (Troy)	0.0003674	2721.83	Tons (Long)
Pounds (Troy)	0.0004114	2430.72	Tons (Short)
Pounds (Troy)	0.0003732	2679.53	Tonnes (metric)



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WEIGHTS - MASS

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Quintals	100	0.01	kg
Quintals	220.46	0.004536	lbs USav
Quintals	101.28	0.009874	lbs Argentina
Quintals	129.54	0.00772	lbs Brazil
Quintals	101.41	0.009861	lbs Chile
Quintals	101.47	0.009855	lbs Mexico
Quintals	101.43	0.009859	lbs Peru
Scruple	1.29598	0.771617	grain
Slug	14.5939	0.06852	kg
Stone	6.3503	0.07874	kg
Ton (assay)	32.6667	0.03061	g
Tons (Long)	1016	0.0009843	kg
Tons (Long)	2240	0.0004464	lbs av.
Tons (Long)	1.12	0.89286	Tons (Short)
Tonnes (Met)	1000	0.001	kg
Tonnes (Met)	2204.6	0.0004536	lbs
Tonnes (Met)	1.102	0.9074	Tons (Short)
Tonnes (Met)	0.984	1.0163	Tons (Long)
Tons (Short)	907.2	0.0011023	kg
Tons (Short)	0.9072	1.1023	Tonnes (Met)
Tons (Short)	2000	0.0005	lbs av.
Tons (Short)	32000	0.0000313	Ounnces Av.
Tons (Short)	2430.6	0.0004114	lbs troy
Tons (Short)	0.8929	1.11995	Tons (Long)



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HEAT OUTPUT / POWER / FORCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
BTU	1055	0.00094787	Joules
BTU	778	0.00128535	ft-lbf
BTU	0.252	3.96825	kcal
BTU	107.6	0.00929368	kgf-m
BTU	0.000293	3412.9693	kw-h
BTU	0.000393	2544.5293	hp-h
BTU/hr	0.293	3.41297	Watts
BTU/hr	0.21617	4.6261	ft-lbf/s
BTU/hr	0.000393	2544.5293	hp
BTU/hr	0.00007	14287	kcal/hr
BTU/hr	0.000399	2506.3	hk/PS
Cal	4.187	0.2388	Joules
Ft-lb	1.35582	0.73756	Joules
Ft-lbf/s	1.35582	0.73756	Watts
hk/PS	0.7355	1.3596	KW
hk/PS	632	1.5823×10^{-3}	kcal/h
hk/PS	2510	3.9841×10^{-4}	BTU/h
Hp	745.7	0.001341	Watts
Hp	0.7457	1.341	kw
Hp	33000	3.03×10^{-5}	Ft-lbf/min
Hp	550	0.00182	Ft-lbf/s
Hp	42.43	0.02357	BTU/min
Hp	0.7072	1.4141	BTU/hr
Hp	10.69	0.09355	kcal/min
Hp	0.1782	5.61272	kcal/hr
Hp	1.0139	0.98629	hk/PS
Hp boiler	33520	2.983×10^{-5}	BTU/hr
Hp boiler	9.809	0.10195	kw



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TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Hp-h	0.7457	1.34102	kw-h
Hp-h	19760	0.000051	Ft-lbf
Hp-h	2545	0.000393	BTU
HP-h	641.5	0.001559	kcal
Hp-h	2732	0.000366	kgf-m
Hp-h	2.68452	0.3725	MJ
Joules	0.0009484	1054.41	BTU
Joules	0.239	4.1841	Cal
Joules	0.7376	1.35575	Ft-lbf
Joules	2.778×10^{-4}	3600	W-h
Joules	10^7	10^{-7}	Ergs
kg-cal	3.968	0.252	BTU
kgf	9.807	0.102	N
kgf	2.205	0.4535	lbf
kgf/m	9.807	0.102	N/m
kgf/m	0.6721	1.4879	lbf/ft
KJ	0.2778	3.6	w.h
KJ	0.948	1.0549	BTU
KJ	0.239	4.1841	kcal
Kw	44250	0.0000226	Ft-lbf/min
Kw	737.6	0.0013557	Ft-lbf/s
Kw	56.9	0.017575	BTU/min
Kw	3414	2.929×10^{-4}	BTU/hr
Kw	14.33	0.069784	kcal/min
Kw	860	1.1628×10^{-3}	kcal/hr
Kw	1.341	0.7457	Hp
Kw	1.36	0.7353	hk/PS
Kw	0.284	3.521	Tons Refr.



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TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Kw-h	3.6×10^6	2.778×10^{-7}	Joules
Kw-h	2.655×10^6	3.766×10^{-7}	ft-lbf
Kw-h	3413	2.930×10^{-4}	BTU
Kw-h	860	1.163×10^{-3}	Kcal
Kw-h	3.671×10^5	2.724×10^{-6}	kgf-m
Kw-h	1.341	0.7457	hp-h
lbf (Av)	4.448	0.2248	N
lbf (Av)	0.4536	2.2046	kgf
lbf/in	0.175127	5.71	N/mm
lbf/ft	14.59	0.06854	N/m
lbf/ft	1.488	0.67204	kgf/m
lbf/ft	14.88	0.0672	gf/cm
N	1	1	kg m/s ²
N	0.10197	9.807	kgf
N	0.2248	4.4484	lbf
N	7.233	0.1383	Poundals
N	10^5	10^{-5}	Dynes
ozf	0.278014	3.59694	N
pdl	0.138255	7.233	N
Ton-f	9.96402	0.10036	KN
Ton-f/ft	32.6903	0.03059	KN/m
Tonnes-f	980.7	1.0197×10^{-3}	N
Ton. Ref	12000	8.333×10^{-5}	BTU/hr
Ton. Ref.	3.517	0.2843	kw
Ton. Ref.	3024.62	3.306×10^{-4}	Kcal/hr
Therm	105.506	9.478×10^{-3}	MJ



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TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Watts	0.0569	17.575	BTU/min
Watts	3.414	0.2929	BTU/Hr
Watts	44.25	0.0226	ft-lbf/min
Watts	0.7376	1.35575	ft-lbf/s
Watts	1.341×10^{-3}	745.7	hp
Watts	0.01433	69.784	Kcal/min
Watt-h	3600	2.778×10^{-4}	Joules
Watt-h	3.413	0.293	BTU
Watt-h	2655	3.7665×10^{-4}	ft-lbf
Watt-h	1.341×10^{-3}	745.7	hp-h
Watt-h	0.86	1.1628	Kcal
Watt-h	367.1	2.724×10^{-3}	kgf-m



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THERMAL CONDUCTIVITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu.ft/ft ² h°F	1.73073	0.57779	W/m°C
Btu.ft/ft ² h°F	0.01731	57.779	W/cm.°C
Btu.ft/ft ² h°F	1.4882	0.67195	kg.cal/m.h.°C
Btu.ft/ft ² h°F	12	0.08333	Btu.in/ft ² h°F
Btu.ft/ft ² h°F	4.134x10 ⁻³	241.896	Cal.m/m ² .s.°C
Btu.in/ft ² h°F	0.14423	6.93337	W/m°C
Btu.in/ft ² h°F	3.445x10 ⁻⁴	2902.76	Cal.cm/cm ² .s.°C
Btu.in/ft ² h°F	0.124	8.06452	kg.cal/m.h.°C
Btu.in/ft ² h°F	1.442x10 ⁻³	693.4	W.cm/cm ² .°C
Btu.in/ft ² s°F	519.22	1.926x10 ⁻³	W/m°C
Cal/cm.s.°C	4.187	0.2388	W/cm.°C
kg.cal/m.h.°C	2.778x10 ⁻³	360	Cal.cm/cm ² .s.°C
kg.cal/m.h.°C	0.01163	86	W/cm.°C
kcal/m.h.°C	1.163	0.85984	W/m°C

THERMAL CONDUCTANCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ² .h°F	5.67826	0.17611	W/m ² °C
Btu/ft ² .h°F	4.882	0.2048	kcal/m ² .h.°C
kcal/m ² .h.°C	1.163	0.86	W/m ² °C

THERMAL RESISTANCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Ft ² .h°F/Btu.ft	57.7789	0.01731	cm°C/W
Ft ² .h°F/Btu.ft	0.577789	1.731	m°C/W
Ft ² .h°F/Btu-in	6.933	0.14424	m°K/W



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THERMAL CAPACITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ³ °F	67.066	0.0149	KJ/m ³ °K

LATENT HEAT

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/lb	2.326	0.4299	J/g
Btu/lb	2.326	0.4299	KJ/kg
Btu/lb	0.55556	1.79998	kcal/kg
Ft.lbf/lb	2.98907	0.33455	J/kg
kcal/kg	4187	2.388x10 ⁻⁴	KJ/kg

SPECIFIC HEAT

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/lb°F	4.187	0.2388	KJ/kg°C
Btu/lb°F	4.187	0.2388	J/g°C
Btu/lb°F	1	1	kcal/kg°C
KJ/kg°C	0.2388	4.187	kcal/kg°C
Ft.lbf/lb°F	5.38032	0.18586	J/kg°C

CALORIFIC VALUE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ³	0.0372589	26.839	J/cm ³
Btu/ft ³	37.259	0.02684	KJ/m ³
MJ/kg	238.8	4.187x10 ⁻³	kcal/kg
MJ/kg	430	2.326x10 ⁻³	BTU/lb
MJ/m ³	26.84	0.0373	BTU/ft ³
Therm/gal	23.208	0.04309	MJ/l



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HEAT RELEASE RATE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ³ .h	10.35	0.09662	W/m ³

HEAT FLUX DENSITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ² .h	3.1546	0.316997	W/m ²
Btu/ft ² .h	2.7125	0.36867	Kcal/m ² .h

TORQUE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Ft-lbf	1.356	0.7375	Nm
Ft-lbf	1.285x10 ⁻³	778.21	BTU
Ft-lbf	3.239x10 ⁻⁴	3087.373	kcal
Ft-lbf	0.13825	7.2333	kgf-m
Ft-lbf	5.05x10 ⁻⁷	1980198	hp-h
Ft-lbf	3.77x10 ⁻⁷	2652520	kw-h
lb.f.in	0.112985	8.8507	Nm
oz.f.in	7.06158x10 ⁻³	141.611	Nm
pdl.ft	0.04214	23.73	Nm
ton.f.ft	3.03703	0.32926	KNm

MOMENT OF INERTIA

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
lb.ft ²	0.04214	23.73	kg.m ²
lb.in ²	2.9264	0.3417	kg.cm ²
oz.in ²	0.1829	5.4675	kg.cm ²
slug.ft ²	1.35582	0.73756	kg.m ²



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MOMENTUM

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
lb.ft/s	0.138253	7.23311	kg.m/s
lb.ft ² /s	0.0421401	23.73	kg.m ² /s
ft ⁴	0.008631	115.86	m ⁴
in ⁴	41.6231	0.024	cm ⁴

FUEL CONSUMPTION

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
gal/mile	2.825	0.354	l/km
Usgal/mile	2.352	0.4252	l/km



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VELOCITY / ACCELERATION / ANGLES

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
cm/s	1.9685	0.508	ft/min
cm/s	0.0281	35.587	ft/s
cm/s	0.36	2.778	km/h
cm/s	0.6	1.667	m/min
cm/s	0.02237	44.703	mph
Degrees	0.017453	57.297	Radians
Degrees	60	0.016667	Minutes
Degrees	3600	2.7778x10 ⁻⁴	Seconds
Degrees	1.111	0.9001	Grade (gon)
Degrees/s	0.017453	57.297	Rad/s
Degrees/s	0.16667	6	r/min
Degrees/s	2.7778x10 ⁻³	360	r/s
ft/min	0.00508	196.8503	m/s
ft/min	0.508	1.9685	cm/s
ft/min	0.01829	54.675	km/h
ft/min	0.3048	3.2808	m/min
ft/min	0.016667	60	ft/s
ft/min	0.01136	88.028	mph
ft/s	0.3048	3.28084	m/s
ft/s ²	0.3048	3.28084	m/s ²
ft/s ²	30.48	0.03281	cm/s ²
in/s	2.54	0.3937	cm/s
in/min	0.042333	23.622	cm/s
in/min	2.54	0.3937	cm/min
km/hr	27.78	0.036	cm/s
km/hr	0.9113	1.0973	ft/s
km/hr	54.68	0.0183	ft/min
km/hr	16.667	0.06	m/min
km/hr	0.53996	1.8512	knots
km/hr	0.6214	1.6093	mph



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VELOCITY / ACCELERATION / ANGLES

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
km/hr/s	0.2778	3.6	m/s ²
km/hr/s	27.78	0.036	cm/s ²
km/hr/s	0.9113	1.0973	ft/s ²
km/s	37.28	0.02682	miles/min
knots	1.8532	0.5396	Km/h
knots	0.5144	1.944	m/s
knots	1.151	0.86881	mph
m/min	1.6667	0.6	cm/s
m/min	0.06	16.6667	km/h
m/min	3.281	0.3048	ft/min
m/min	0.05468	18.2882	ft/s
m/min	0.03728	26.824	mph
m/s	3.6	0.27778	km/h
m/s	0.06	16.6667	km/min
m/s	196.8	5.081x10 ⁻³	ft/min
m/s	3.281	0.3048	ft/s
m/s	2.237	0.447	mph
m/s	0.03728	26.824	miles/min
m/s ²	3.281	0.3048	ft/s ²
miles/min	1.6093	0.6214	km/min
miles/min	2682	3.7286x10 ⁻⁴	cm/s
miles/min	88	0.011364	ft/s
miles/min	60	0.016667	mph
miles/hr	1.6093	0.6214	Km/hr
minutes	2.909x10 ⁻⁴	3437.61	Radians
radians	57.3	0.01745	degrees
radians/s	57.3	0.01745	degrees/s



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TEMPERATURE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
° Rankine	0.5556	1.8	° Kelvin

FLOW

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
cfm	472	2.1186×10^{-3}	cm ³ /s
cfm	1.699	0.5886	m ³ /h
cfm	0.472	2.1186	l/s
cfm	0.1247	8.01925	US gall/s
cfm	62.3	0.01605	lbH ₂ O/min@68°F
cfs	0.02832	35.311	m ³ /s
cfs	1.699	0.5886	m ³ /min
cfs	448.8	2.2282×10^{-3}	US gpm
cfs	0.6463	1.5473	US gpd
igps	4.54609	0.21997	l/s
igpm	7.577×10^{-5}	13197.8	m ³ /s
igpm	0.07577	13.1978	l/s
igph	1.26×10^{-6}	793650.8	m ³ /s
igph	0.00126	793.65	l/s
l/s	3.6	0.27778	m ³ /h
l/s	15.85	0.06309	US gpm
l/s	13.2	0.07576	igpm
lb/h.ft ²	1.3562×10^{-3}	737.354	kg/m ² .s
lb/hr	1.26×10^{-4}	7936.5	kg/s
lb/hr	0.453592	2.2046	kg/h
lb/min	7.56×10^{-3}	132.28	kg/s
lb/s	0.453592	2.2046	kg/s
lbH ₂ O/min @ 60°F	7.576	0.132	cm ³ /s
lbH ₂ O/min @ 60°F	2.675×10^{-4}	3738.32	cfs



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FLOW

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
m ³ /h	0.2778	3.6	l/s
m ³ /h	2.778x10 ⁻⁴	3600	m ³ /s
m ³ /h	4.403	0.22712	US gpm
m ³ /h	3.6661	0.27277	UK gpm
@ 14.696 psia & 60°F			@ 760mmHg & 0°C
scfm	0.4474	2.235	sl/s
scfm	1.608	0.6219	sm ³ /h
tonsH ₂ O/day @ 60°F	0.03789	26.392	m ³ /h
tonsH ₂ O/day @ 60°F	83.33	0.012	lb/h H ₂ O
tonsH ₂ O/day @ 60°F	0.1668	6	US gpm
tonsH ₂ O/day @ 60°F	1.338	0.7474	cfh
ton/hr	1016.05	9.842x10 ⁻⁴	kg/hr
US gpm	0.22715	4.4024	m ³ /h
US gpm	0.06309	15.8504	l/s
US gpm	8.021	0.1247	cfh
US gpm	2.228x10 ⁻³	448.833	cfs



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VISCOSITY (DYNAMIC)

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
centipoise	2.42	0.413223	lb/ft.h
centipoise	1.02×10^{-4}	9810	kg.s/m ²
lbf.h/ft ²	0.172369	5.8015	MN.s/m ²
lbf.s/ft ²	47.8803	0.02089	N.s/m ²
lb.s/ft ²	4.8828	0.2048	kg.s/m ²
lb.s/ft ²	47900	2.0877×10^{-5}	Centipoise
lb/ft.h	2.777×10^{-4}	3600	lb/ft.s
lb/ft.h	8.621×10^{-6}	116000	lb.s/ft ²
lb/ft.h	4.214×10^{-5}	23730	kg.s/m ²
lb/ft.h	0.413	2.42	Centipoise
lb/ft.s	1.48816	0.67197	kg/m.s
lb/ft.s	0.15175	6.59	kg.s/m ²
lb/ft.s	0.0311	32.2	lb.s/ft ²
lb/ft.s	1488.16	6.72×10^{-4}	Centipoise
pdl.s/ft ²	1.48816	0.67197	N.s/m ²
pdl.s/ft ²	1488.16	6.72×10^{-4}	centipoise
pdl.s/ft ²	1	1	lb/ft.s
poise	1	1	gm/cm ²
poise	0.1	10	N.s/m ²
poise	100	0.01	centipoise
poise	2.0886×10^{-3}	478.7896	lbf.s/ft ²
poise	0.06721	14.87874	lb/ft.s
poise	242.13	4.13×10^{-3}	lb/ft.h
poise	0.010194	98.1	kg.s/m ²
slug/ft.s	47.8803	0.020885	kg/m.s
Centistrokes =	$\frac{\text{poise}}{\text{S.G.}}$ (poise = 100cp)	=	$\frac{\mu\text{Pa.s} \times 100}{0.1 \times 0.413}$



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VISCOSITY (KINEMATIC)

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
ft ² /h	0.092903	10.7639	m ² /h
ft ² /h	25.8064	0.03875	centistokes
ft ² /s	0.092903	10.7639	m ² /s
ft ² /s	92903.04	1.07639	centistokes
in ² /h	6.4516	0.155	cm ² /h
in ² /s	645.16	1.55x10 ⁻³	centistokes
stokes	1x10 ⁻⁴	1000	m ² /s
stokes	1.076x10 ⁻³	929.368	ft ² /s

VISCOSITY FORMULAE

K = kinematic viscosity - centistokes

t = time of efflux - seconds

E = Engler degrees

Saybolt universal:-

$$K \times A = t$$

When K > 70, then A = 4.620 @ 100°F

A = 4.629 @ 130°F

A = 4.652 @ 210°F

Redwood No. 1:- $K = 0.264t - \frac{190}{t}$, when t = 40 to 85sec.

Redwood No. 1:- $K = 0.247t - \frac{65}{t}$, when t = 85 to 2000sec.

Redwood No. 2:- t = 0.1 x Redwood No. 1 time

Engler time:- $K = 100 (0.00147t - \frac{3.74}{t})$ OR t = 53E

Engler degrees:- $K = E \times 7.6^{(1 - \frac{1}{t^3})}$



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FOULING FACTOR

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Btu/ft ² .h.°F	5.672	0.1763	W/m ² .°C
Btu/ft ² .h.°F	4.878	0.2098	Kcal/m ² .h.°C
ft ² .h.°F/btu	176	5.678x10 ⁻³	m ² °C/KW
ft ² .h.°F/btu	0.2048	4.878	m ² .h.°C/Kcal

VAPOUR PERMEANCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Gr/h.ft ² .inHg	0.0572	17.4825	kg/GN.s

VAPOUR RESISTANCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
InHg.ft ² .h/gr	17.4825	0.0572	GN.s/kg

VAPOUR PERMEABILITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Gr.in/hft ² .inHg	0.001454	687.758	kg.m/GN.s

VAPOUR RESISTIVITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
InHgft ² h/gr.in	687.758	0.001454	GN.s/kg.m



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LUMINANCE

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
cd.sr	1	1	lumen
Candle	0.981	1.019368	cd
cd/ft ²	10.7639	0.0929	cd/m ²
cd/in ²	1550	6.452x10 ⁻⁴	cd/m ²
Foot.lambert	3.426	0.2919	cd/m ²

ILLUMINATION

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
lm/ft ²	10.76	0.092937	lux (lm/m ²)
lm/m ²	1	1	lux (lm/m ²)
Foot.candle	10.76	0.092937	lux (lm/m ²)

ELECTRIC STRESS

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
kV/in	0.03937	25.4	kV/mm
kV/in	39.3701	0.0254	kV/m
kV/in	1	1	V/mil



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PUMP FORMULAE

$$\text{Power (KW)} = \frac{\text{m}^3/\text{hr} \times \text{Head (m)} \times \text{S.G.}}{367.87 \times \text{Pump Efficiency}}$$

$$\text{B.H.P.} = \frac{\text{I.G.P.M.} \times \text{Head (m)} \times \text{S.G.}}{33,000 \times \text{Pump Efficiency}}$$

$$\text{Elect. H.P} = \frac{\text{B.H.P.}}{\text{Motor Eff.}} \quad \frac{\text{E.H.P}}{1.341} = \text{KW}$$

PUMP-FLOW CHARACTERISTICS

$$\left(\frac{\text{GPM}_2}{\text{GPM}_1} \right)^2 \times \text{HEAD}_1 = \text{HEAD}_2$$

$$\left(\frac{\text{HEAD}_2}{\text{HEAD}_1} \right)^{1/2} \times \text{GPM}_1 = \text{GPM}_2$$

PUMP HEAD - SPECIFIC GRAVITY

TO CONVERT	MULTIPLY BY	DIVIDE BY	EQUALS
Atmospheres	$\frac{10.35}{\text{S.G.}}$	$\frac{\text{S.G.}}{10.35}$	Metres
Bar	$\frac{10.2}{\text{S.G.}}$	$\frac{\text{S.G.}}{10.2}$	Metres
Cm.Hg.	$\frac{0.1362}{\text{S.G.}}$	$\frac{\text{S.G.}}{0.1362}$	Metres
Feet	0.305	3.2808	Metres
In.Hg	$\frac{0.345}{\text{S.G.}}$	$\frac{\text{S.G.}}{0.345}$	Metres
Kg/cm ²	$\frac{10}{\text{S.G.}}$	$\frac{\text{S.G.}}{10}$	Metres
KN/m ²	$\frac{10.2}{\text{S.G.}}$	$\frac{\text{S.G.}}{10.2}$	Metres



Exit

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