

EQUIVALENCIAS DE UNIDADES

Length F longueur D Länge S longitud

m	in (Inch)	ft (foot)	yd (yard)	mile	nautical mile
1	39,370	3,280 8	1,093 6	$0,621\ 37 \cdot 10^{-3}$	$0,539\ 96 \cdot 10^{-3}$
$25,4 \cdot 10^{-3}$	1	$83,333 \cdot 10^{-3}$	$27,778 \cdot 10^{-3}$	$15,783 \cdot 10^{-6}$	$13,715 \cdot 10^{-6}$
0,304 8	12	1	0,333 33	$0,189\ 39 \cdot 10^{-3}$	$0,164\ 58 \cdot 10^{-3}$
0,914 4	36	3	1	$0,568\ 18 \cdot 10^{-3}$	$0,493\ 74 \cdot 10^{-3}$
$1,609\ 3 \cdot 10^3$	$63,36 \cdot 10^3$	$5,28 \cdot 10^3$	$1,76 \cdot 10^3$	1	0,868 98
$1,852 \cdot 10^3$	$72,913 \cdot 10^3$	$6,076\ 1 \cdot 10^3$	$2,025\ 4 \cdot 10^3$	1,150 8	1

1Å (1 ångström) = 10^{-10} m

Area F aire surface D Fläche S superficie, área

m ²	in ²	ft ²	yd ²	acre	square mile
1	$1,550\ 0 \cdot 10^3$	10,764	1,196 0	$0,247\ 10 \cdot 10^{-3}$	$0,386\ 10 \cdot 10^{-6}$
$0,645\ 16 \cdot 10^{-3}$	1	$6,944\ 4 \cdot 10^{-3}$	$0,771\ 61 \cdot 10^{-3}$	$0,159\ 42 \cdot 10^{-6}$	$0,249\ 10 \cdot 10^{-9}$
$92,903 \cdot 10^{-3}$	144	1	0,111 11	$22,957 \cdot 10^{-6}$	$35,870 \cdot 10^{-9}$
0,836 13	$1,296 \cdot 10^3$	9	1	$0,206\ 61 \cdot 10^{-3}$	$0,322\ 83 \cdot 10^{-6}$
$4,046\ 9 \cdot 10^3$	$6,272\ 6 \cdot 10^6$	$43,56 \cdot 10^3$	$4,84 \cdot 10^3$	1	$1,562\ 5 \cdot 10^{-3}$
$2,590\ 0 \cdot 10^6$	$4,014\ 5 \cdot 10^9$	$27,878 \cdot 10^6$	$3,097\ 6 \cdot 10^6$	640	1

1 ha (1 hectare) = 10 000 m²

Volume F volume D Volumen S volumen

m ³	in ³	ft ³	yd ³	UK gallon	US gallon
1	$61,024 \cdot 10^3$	35,315	1,308 0	219,97	264,17
$16,387 \cdot 10^{-6}$	1	$0,578\ 70 \cdot 10^{-3}$	$21,434 \cdot 10^{-6}$	$3,604\ 6 \cdot 10^{-3}$	$4,329\ 0 \cdot 10^{-3}$
$28,317 \cdot 10^{-3}$	$1,728 \cdot 10^3$	1	$37,037 \cdot 10^{-3}$	6,228 8	7,480 5
0,764 56	$46,656 \cdot 10^3$	27	1	168,18	201,97
$4,546\ 1 \cdot 10^{-3}$	277,42	0,160 54	$5,946\ 1 \cdot 10^{-3}$	1	1,201 0
$3,785\ 4 \cdot 10^{-3}$	231	0,133 68	$4,951\ 1 \cdot 10^{-3}$	0,832 68	1

1 l (1 litre) = 1 dm³ = 10^{-3} m³

Velocity F vitesse D Geschwindigkeit S velocidad

m/s	km/h	ft/s	mile/h	kn (knot)
1	3,6	3,280 8	2,236 9	1,943 8
0,277 78	1	0,911 34	0,621 37	0,539 96
0,304 8	1,097 3	1	0,681 82	0,592 48
0,447 04	1,609 3	1,466 7	1	0,868 98
0,514 44	1,852	1,687 8	1,150 8	1

1 kn = 1 nautical mile per hour

Density F masse volumique D Dichte S densidad

kg/m ³	g/cm ³	lb/in ³	lb/ft ³
1	10^{-3}	$36,127 \cdot 10^{-6}$	$62,428 \cdot 10^{-3}$
10^3	1	$36,127 \cdot 10^{-3}$	62,428
$27,680 \cdot 10^3$	27,680	1	$1,728 \cdot 10^3$
16,019	$16,019 \cdot 10^{-3}$	$0,578\ 70 \cdot 10^{-3}$	1

Mass F masse D Masse S masa

kg	lb (pound)	slug	oz (ounce)	(long) cwt (hundredweight)	(long) ton (UK)	sh cwt (short hundredweight) (US)	sh tn (short ton) (US)
1	2,204 6	$68,522 \cdot 10^{-3}$	35,274	$19,684 \cdot 10^{-3}$	$0,984 21 \cdot 10^{-3}$	$22,046 \cdot 10^{-3}$	$1,102 3 \cdot 10^{-3}$
0,453 59	1	$31,081 \cdot 10^{-3}$	16	$8,928 6 \cdot 10^{-3}$	$0,446 43 \cdot 10^{-3}$	$10 \cdot 10^{-3}$	$0,5 \cdot 10^{-3}$
14,594	32,174	1	514,79	0,287 27	$14,363 \cdot 10^{-3}$	0,321 74	$16,087 \cdot 10^{-3}$
$28,350 \cdot 10^{-3}$	$62,5 \cdot 10^{-3}$	$1,942 6 \cdot 10^{-3}$	1	$0,558 04 \cdot 10^{-3}$	$27,902 \cdot 10^{-6}$	$0,625 \cdot 10^{-3}$	$31,25 \cdot 10^{-6}$
50,802	112	3,481 1	$1,792 \cdot 10^3$	1	$50 \cdot 10^{-3}$	1,12	$56 \cdot 10^{-3}$
$1,016 1 \cdot 10^3$	$2,24 \cdot 10^3$	69,621	$35,84 \cdot 10^3$	20	1	22,4	1,12
45,359	100	3,108 1	$1,6 \cdot 10^3$	0,892 86	$44,643 \cdot 10^{-3}$	1	$50 \cdot 10^{-3}$
907,19	$2 \cdot 10^3$	62,162	$32 \cdot 10^3$	17,857	0,892 86	20	1

In the USA 1 ounce is also called 1 avoirdupois ounce to distinguish it from 1 troy ounce (oz t).
 $7 680 \text{ oz avdp} = 7 000 \text{ oz t}$

1 hundredweight (UK) is called 1 long hundredweight in the USA
 1 ton (UK) is called 1 long ton in the USA

1 tonne ("metric ton") = 1 000 kg

Force F force D Kraft S fuerza

N	dyn	kgf (kp) (kilogram-force)	lbf (pound-force)
1	$0,1 \cdot 10^6$	0,101 97	0,224 81
$10 \cdot 10^{-6}$	1	$1,019 7 \cdot 10^{-6}$	$2,248 1 \cdot 10^{-6}$
9,806 6	$0,980 66 \cdot 10^6$	1	2,204 6
4,448 2	$0,444 82 \cdot 10^6$	0,453 59	1

Moment of force F moment d'une force

D Moment S momento de una fuerza

Nm	kgf · m	lbf · in	lbf · ft
1	0,101 97	8,850 8	0,737 56
9,806 6	1	86,796	7,233 0
0,112 99	$11,521 \cdot 10^{-3}$	1	$83,333 \cdot 10^{-3}$
1,355 8	0,138 26	12	1

Energy F énergie D Energie S energia

J Nm, Ws	kWh	kgf · m	kcal	metric horsepower-hour	ft · lbf (foot pound-force)	Btu (British thermal unit)
1	$0,277 78 \cdot 10^{-6}$	0,101 97	$0,238 85 \cdot 10^{-3}$	$0,377 67 \cdot 10^{-6}$	0,737 56	$0,947 82 \cdot 10^{-3}$
$3,6 \cdot 10^6$	1	$0,367 10 \cdot 10^6$	859,85	1,359 6	$2,655 2 \cdot 10^6$	$3,412 1 \cdot 10^3$
9,806 6	$2,724 1 \cdot 10^{-6}$	1	$2,342 3 \cdot 10^{-3}$	$3,703 7 \cdot 10^{-6}$	7,233 0	$9,294 9 \cdot 10^{-3}$
$4,186 8 \cdot 10^3$	$1,163 \cdot 10^{-3}$	426,94	1	$1,581 2 \cdot 10^{-3}$	$3,088 0 \cdot 10^3$	3,968 3
$2,647 8 \cdot 10^6$	0,735 50	$0,27 \cdot 10^6$	632,42	1	$1,952 9 \cdot 10^6$	$2,509 6 \cdot 10^3$
1,355 8	$0,376 62 \cdot 10^{-6}$	0,138 26	$0,323 83 \cdot 10^{-3}$	$0,512 06 \cdot 10^{-6}$	1	$1,285 1 \cdot 10^{-3}$
$1,055 1 \cdot 10^3$	$0,293 07 \cdot 10^{-3}$	107,59	0,252 00	$0,398 47 \cdot 10^{-3}$	778,17	1

1 erg = $0,1 \cdot 10^{-6}$ J

Power F puissance D Leistung S potencia

W Nm/s, J/s	kgf · m/s	kcal/s	kcal/h	metric horsepower	horsepower (foot-pound system)	ft · lbf/s	Btu/h
1	0,101 97	$0,238 85 \cdot 10^{-3}$	0,859 85	$1,359 6 \cdot 10^{-3}$	$1,341 0 \cdot 10^{-3}$	0,737 56	3,412 1
9,806 6	1	$2,342 3 \cdot 10^{-3}$	8,432 2	$13,333 \cdot 10^{-3}$	$13,151 \cdot 10^{-3}$	7,233 0	33,462
$4,186 8 \cdot 10^3$	426,94	1	$3,6 \cdot 10^3$	5,692 5	5,614 6	$3,088 0 \cdot 10^3$	$14,286 \cdot 10^3$
1,163	0,118 59	$0,277 78 \cdot 10^{-3}$	1	$1,581 2 \cdot 10^{-3}$	$1,559 6 \cdot 10^{-3}$	0,857 79	3,968 3
735,50	75	0,175 67	632,42	1	0,986 32	542,48	$2,509 6 \cdot 10^3$
745,70	76,040	0,178 11	641,19	1,013 9	1	550	$2,544 4 \cdot 10^3$
1,355 8	0,138 26	$0,323 83 \cdot 10^{-3}$	1,165 8	$1,843 4 \cdot 10^{-3}$	$1,818 2 \cdot 10^{-3}$	1	4,626 2
0,293 07	$29,885 \cdot 10^{-3}$	$69,999 \cdot 10^{-6}$	0,252 00	$0,398 47 \cdot 10^{-3}$	$0,393 02 \cdot 10^{-3}$	0,216 16	1

Pressure, stress F pression, contrainte D Druck, Spannung S presión, tensión

Pa	bar	kgf/cm ² at	kgf/mm ²	torr (≈ mm Hg)	atm	lbf/in ² (psi)
1	10 · 10 ⁻⁶	10,197 · 10 ⁻⁶	0,101 97 · 10 ⁶	7,500 6 · 10 ⁻³	9,869 2 · 10 ⁻⁶	0,145 04 · 10 ⁻³
100 · 10 ³	1	1,019 7	10,197 · 10 ⁻³	750,06	0,986 92	14,504
98,066 · 10 ³	0,980 66	1	10 · 10 ⁻³	735,56	0,967 84	14,223
9,806 6 · 10 ⁶	98,066	100	1	73,556 · 10 ³	96,784	1,422 3 · 10 ³
133,32	1,333 2 · 10 ⁻³	1,359 5 · 10 ⁻³	13,595 · 10 ⁻⁶	1	1,315 8 · 10 ⁻³	19,337 · 10 ⁻³
101,32 · 10 ³	1,013 2	1,033 2	10,332 · 10 ⁻³	760	1	14,696
6,894 8 · 10 ³	68,948 · 10 ⁻³	70,307 · 10 ⁻³	0,703 07 · 10 ⁻³	51,715	68,046 · 10 ⁻³	1

1 mm water column ≈ 9,81 Pa 1 inch water column ≈ 249,09 Pa; 1 inch Hg ≈ 3 386,4 Pa

Temperature F température D Temperatur S temperatura

Quantity	Kelvin scale	Celsius scale	Rankine scale	Fahrenheit scale	Physical characteristics
Temperatures associated together	0 K	-273,15 °C	0 °R	-459,67 °F	Absolute zero
	255,37 K	-17,778 °C	459,67 °R	0 °F	Melting point of ice
	273,15 K	0 °C	491,67 °R	32 °F	
	273,16 K	0,01 °C	491,69 °R	32,018 °F	Triple point of water
Equal temperature differences	1 K	1 °C	1,8 °R	1,8 °F	
	0,555 56 K	0,555 56 °C	1 °R	1 °F	

$$\text{Value in } ^\circ\text{C} = \frac{1}{1,8} \cdot (\text{value in } ^\circ\text{F} - 32)$$

EQUIVALENCIAS DEL kWh y del HPh

$$1 \text{ kW} = 1000 \text{ [W]} = 1000 \text{ [J/s]} = 1000 \text{ [Nm/s]}$$

$$1 \text{ kWh} = 3600 \text{ [kJ]} = 3.600.000 \text{ [Nm]}$$

$$1 \text{ N} = 1 / 9,80665 = 0,101972 \text{ [kp]} \quad 1 \text{ kW} = 101,972 \text{ [kpm/s]}$$

$$1 \text{ kwh} = 3.600 \text{ [s]} * 101,972 = 367.098 \text{ [kpm]}$$

Equivalencia mecánica del calor: $A = 1 / 426,94 \text{ [kcal/kpm]}$

$$1 \text{ kWh} = 367.098 / 426,94 = 859,85 \text{ [kcal]}$$

$$1 \text{ kWh} = 860 \text{ kcal}$$

$$1 \text{ kWh} = 1,3596 \text{ HPh}$$

$$1 \text{ HP} = 75 \text{ [kpm/s]} ; 1 \text{ HPh} = 75 * 3600 / 426,94 = 632,4 \text{ kcal}$$

$$1 \text{ HPh} = 632 \text{ kcal}$$

Equivalencia entre kJ y kcal:

$$A/g = 1 / (426,94 * 9,80665) = 1 / 4.186,8 \text{ [kcal/J]}$$

$$1 \text{ kcal} = 4,1868 \text{ kJ}$$

$$3600 / 859,85 = 4,1868$$