Disclaimer: This page contains conversion factors, formulae and constants. The data is believed to be correct and we use it ourselves, but we will not accept liability for problems arising from errors or inaccuracies. If your application is critical, we recommend you cross-check with other sources.

Conversion factors

Torque

1 g cm	=	9.80665×10^{-5} Nm
1 oz in	=	7.0641×10^{-3} Nm
1 lb in	=	0.1130 Nm
1 lb ft	=	1.3563 Nm

Speed

1 rad/s	=	9.5493 rpm
1 mph	=	1.6093 km/h
1 mph	=	0.44704 m/s
1 ft/s	=	0.3048 m/s

Inertia

1 g cm^2	=	1×10^{-7} kg m^2
1 oz in^2	=	0.0179 kg m^2
1 lb in^2	=	292.64 10^{-6} kg m^2
1 lb ft^2	=	42.141×10^{-3} kg m^2
1 Nms^2	=	1.0 kg m^2

Power

1 HP	=	746.0 W
1 PS	=	735.8 W
1 PS	=	0.9863 HP

Magnetic parameters

1 Maxwell	=	1.0×10^{-8} Wb
1 Gauss	=	1.0×10^{-4} T
1 Gilbert	=	0.7958 A t
1 Oersted	=	79.5775 A/m
1 MGOe	=	7.9577 kJ/m^3

Length

1 in	=	25.4 mm
1 ft	=	304.8 mm
1 yd	=	9144.0 mm
1 mile	=	1.6093 km

Mass

1 oz	=	28.35 g
1 lb	=	0.4536 kg
1 ton (UK)	=	1016.05 kg
1 ton (US)	=	907.18 kg
1 tonne	=	1000 kg

Force

1 oz f	=	0.2780 N
1 lb f	=	4.4482 N
1 kg f	=	9.81 N
1 da N	=	10 N

Pressure

1 N/ m^2	=	1.0 Pa
1 N/mm^2	=	1.0 MPa
1 lb/in^2	=	6894.75 Pa
1 kg/m^2	=	9.80665 Pa
1 mbar	=	100 Pa
1 torr	=	133.32 Pa
1 torr	=	1.3332 mbar
1 in H_20 (4°C)	=	249.082 Pa

Volume

1 litre	=	1.0×10^{-3} m^3
1 litre	=	1000.0 cm^3
1 in^3	=	16.387 cm^3
1 in^3	=	0.01639 litre
1 ft^3	=	0.02832 m^3
1 ft^3	=	28.32 litre
1 gall (imp)	=	4.546 litre
1 gall (US)	=	3.7854 litre

Area

1 in^2	=	645.16 mm^2
1 ft^2	=	92.903×10^3 mm^2
1 ft^2	=	0.0929 m^2
1 m^2	=	1.0×10^6 mm^2

Density

1 oz/in^3	=	1729.99 kg/m^3
1 lb/in^3	=	27679.9 kg/m^3
1 lb/ft^3	=	16.0185 kg/m^3

Volumetric flow

1 cfm	=	4.7195×10^{-4} m^3/s
1 cfm	=	0.47195 litre/s
1 m^3/s	=	1000.0 litre/s

Constants

Resistivity of annealed copper wire at 20°C	ρ	1.7241 x 10^{-8} Ωm
Standard acceleration due to gravity	g	9.80665 m/s^2
Speed of electromagnetic waves in vacuum	c	2.99792 x 10^{8} m/s
Electric permittivity of free space	ε_0	8.8542 x 10^{-12} F/m
Magnetic permeability of free space	μ_0	4π x 10^{-7} = 1.2566 x 10^{-6} H/m
Standard atmospheric pressure at sea level, 15°C	atm	101325 Pa

Formulae

Mechanical power (rotary)

$P = \omega \times T$ P in W; ω in rad/s; T in Nm

Mechanical power (linear)

$P = v \times F$ P in W; v in m/s; F in N

Acceleration torque (rotary)

$C = J \times \ddot{\theta}$ C in Nm; J in kgm^2; $\ddot{\theta}$ in rad/s^2

Rotary to linear conversion using screw thread of pitch a and efficiency η

$$T = \frac{F \times a \times 10^{-3}}{2 \times \pi \times \eta}$$ T in Nm; F in N; a in mm; $0 < \eta < 1$

Motor constant for DC motor with torque constant K_t and terminal resistance R

$$K_m = \frac{K_t}{\sqrt{R}}$$ K_m in Nm/√W; K_t in Nm/A; R in Ω

Mechanical time constant for DC motor with inertia J and terminal resistance R

$$t_m = \frac{J \times R}{K_t \times K_e}$$ t_m in s; J in kgm^2; R in Ω

Electrical time constant for DC motor with inductance L and terminal resistance R

$$t_e = \frac{L}{R}$$ t_e in s; L in H; R in Ω