



SI Units

Space and Time

Quantity	Legally regulated units		Conversion	Remarks concerning non SI units
	SI units	Additional units		
Length	m (metre)			Fermi: 1 fm = 10^{-15} m
				Angstrom: 1 Å = 10^{-10} m
				Nautical mile: 1 sm = 1.852 km
				Astronomic unit: 1 AE = $1.496 \cdot 10^{11}$ m
				Parsec: 1 pc = $3.0857 \cdot 10^{16}$ m
Area	m ² (square metre)	a (are)	1 a = 100 m ²	
		ha (hectare)	1 ha = 10000 m ²	
		b (barn)	1 b = 100 fm ² = 10^{-28} m ²	
Volume	m ³ (cubic metre)	l, L (litre)	1 l = 1 dm ³	
Plane angle	rad (radian)	°	1 rad = 1 m/m	Arc minute
		° (degree) ' (minute) " (second)	1° = $(\pi/180)$ rad; 1' = 1°/60; 1" = 1'/60	Arc second
		gon (gon)	1 gon = $(\pi/200)$ rad 1 c = 1 gon/100 1 cc = 1 gon/10 000	
Space angle	sr (steradian)		1 sr = 1 m ² /m ²	
Time	s (second)	min (minute)	1 min = 60 s	
		h (hour)	1 h = 3600 s	
		d (day)	1 d = 86 400 s	
Velocity	m/s	km/h	1 km/h = 0.2778 m/s	Mach: 1 M = ca. 340 m/s
				1 knot: 1 kn = 0.514444 m/s
Acceleration	m/s ²			1 Gal = 10 ⁻² m/s ²
Frequency	Hz (Hertz)	1/s	1 Hz = 1/s	
Number of revolutions	1/s	1/min U/s U/min		Revolution: U

Mechanics and Acoustics

Mass	kg (kilogram)	g (gram)		Quintal: 1 q = 100 kg *) (* especially for Switzerland!)
		t (ton)	1 t = 1000 kg	
		u (atomic mass unit)	1 u = $1.6605402 \cdot 10^{-27}$ kg	
		ct (carats metric)	1 ct = 0.2 g	
Mass per length	kg/m	tex (for textile threads)	1 tex = 10^{-6} kg/m = 1 g/km	Denier: 1 den = $1/9 \cdot 10^{-6}$ kg/m
Density	kg/m ³			
Momentum	kg·m/s		1 kg·m/s = 1 N·s	
Moment of inertia	kg·m ²			1 kp·m·s ² = 9.80665 kg·m
Force	N (Newton)		1 N = 1 kg m/s ²	1 kp = 1 kgf = 1kg* = 9.80665 N
				1 dyn = 10 ⁻⁵ N
Angular momentum	N·m			1 kp·m = 9.80665 N·m
Mechanical tension	N/m ²			1 kp/cm ² = 9.80665 N/cm ²

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Pressure	Pa (Pascal)	bar (Bar)	1 Pa = 1 N/m ²	1 at = 1 kp/cm ² = 0.980665 bar
				1 atm = 760 Torr = 1.01325 bar
		mmHg (milli-meter mercury)	1 bar = 10 ⁵ Pa 1 mmHg = 1.33322·10 ² Pa	1 Torr = 1.33322 mbar 1 barye = 0.1 Pa
				Pièze: 1 pz = 10 ³ Pa
Energy, work, quantity of heat	J (Joule)	kW·h (kilowatt-hour)	1 J = 1 N·m = 1W·s	calorie : 1 cal = 4.1868 J
			1 kW·h = 3.6 MJ	1 kp·m = 9.80665 J
		eV (electron volt)	1 eV = 1.60217733·10 ⁻¹⁹ J	1 PS·h = 2.6478 MJ
				1 erg = 10 ⁻⁷ J
				Thermie: 1 th = 4.1855 MJ 1 SKE = 29.3076 MJ
Power, heat flux	W (Watt)		1 W = 1 J/s = 1 N·m/s = 1 V·A	1 PS = 75 kp·m/s = 0.735499 kW
				1 kcal/h = 1.163 W
Sound power	W (Watt)		Sound power level [dB] = 10·log $\frac{\text{Sound power [pW]}}{1\text{pW}}$	
Sound pressure	Pa (Pascal)	Dezibel (dB _{SPL})	Sound pressure level [dB] = 20·log $\frac{\text{Sound pressure [μPa]}}{20\text{μPa}}$	
Dynamic viscosity	Pa·s		1 Pa·s = 1 N·s/m ²	Poise : 1 P = 10 ⁻¹ Pa·s
Cinematic viscosity	m ² /s			Stokes : 1 St = 10 ⁻⁴ m ² /s

Temperature and Heat

Temperature	K (kelvin)	°C (degree Celsius)	temp.[°C] = temp.[K] -273.15	
			temp. difference 1°C = 1 K	
Heat capacity, entropy	J/K			1 kcal/°C = 4.1868 kJ/K Clausius: 1 Cl = 4.1868 J/K
Specific heat capacity	J/(kg·K)			1 kcal/(kg·°C) = 4.1868 kJ/(kg·K)
Specific energy	J/kg			1 kcal/kg = 4.1868 kJ/kg
Thermal conductivity	W/(m·K)			1 kcal/(h·m·°C) = 1.163 W/(m·K)
Thermal transmission coefficient	W/(m ² ·K)			1 kcal/(h·m ² ·°C) = 1.163 W/(m ² ·K)

Electricity, Magnetism and Light

El. current	A (Ampere)			
El. charge	C (Coulomb)		1 C = 1 A·s	
		A·h	1 A·h = 3600 C	
El. voltage	V (Volt)		1 V = 1 W/A	
El. resistance	Ω (Ohm)		1 Ω = 1 V/A	
El. conductivity	S (Siemens)		1 S = 1/Ω	
Capacitance	F (Farad)		1 F = 1 C/V	
Magnetic flux	Wb (Weber)		1 Wb = 1 V·s = 1 W·s/A	Maxwell: 1 Mx = 10 ⁻⁸ Wb
Magnetic induction	T (Tesla)		1 T = 1 Wb/m ²	Gauss: 1 G = 10 ⁻⁴ T
Inductance	H (Henry)		1 H = 1 Wb/A	
Magnetic field strength	A/m			Oersted: 1 Oe = (1000/4π) A/m
Luminous intensity	cd (Candela)			Internat. candle: 1 IK = 1.019 cd New candle: 1 NK = 1 cd
				Stilb: 1 sb = 10 ⁴ cd/m ² Apostilb: 1 asb = (1/π) cd/m ² Lambert: 1 La = (1/π)·10 ⁴ cd/m ²
Luminance	cd/m ²			

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Luminous flux	lm (Lumen)		1 lm = 1 cd·sr	
Illuminance	lx (Lux)		1 lx = 1 lm/m ²	
Quantity of light	Lm · s			Talbot: 1 Tb = 1 lms
Luminous exposure, light exposure				
Refraction power of an optical system		Dioptre	1 dioptre = 1/m	

Radiometry

Radiant power	W			
Radiant intensity	W/(sr)			
Radiance	W/(sr·m ²)			
Radiation intensity	W/m ²			
Radiant energy	W·s			
Exposure	W·s/m ²			

Radioactivity, ionising Radiation and Chemistry

Activity	Bq (Becquerel)		1 Bq=1/s	Curie: 1 Ci=37·10 ⁹ Bq
Absorbed dose	Gy (Gray)		1 Gy=1 J/kg	Rad: 1 rd=0.01 Gy
Equivalent dose	Sv (Sievert)		1 Sv=1 J/kg	Rem: 1 rem=0.01 Sv
Ion dose	C/kg			Röntgen: 1 R=0.000258 C/kg
Amount of substance	mol (mole)			
Molar mass	kg/mol			
Catalytic activity	kat		1 kat = 1 mol/s	
Molar concentration	mol/m ³			
Molar content	mol/kg			
Molar volume	m ³ /mol			
Mass content saccharose in water			1 Brix = 1 kg/100 kg	Degree Oechsle: Oe °

SI prefixes

1 000 000 000 000 000 000 000 000	= 10 ²⁴	Yotta	Y
1 000 000 000 000 000 000 000	= 10 ²¹	Zetta	Z
1 000 000 000 000 000 000	= 10 ¹⁸	Exa	E
1 000 000 000 000 000	= 10 ¹⁵	Peta	P
1 000 000 000 000	= 10 ¹²	Tera	T
1 000 000 000	= 10 ⁹	Giga	G
1 000 000	= 10 ⁶	Mega	M
1 000	= 10 ³	Kilo	k
100	= 10 ²	Hekto	h
10	= 10 ¹	Deka	da
0.1	= 10 ⁻¹	Dezi	d
0.01	= 10 ⁻²	Zenti	c
0.001	= 10 ⁻³	Milli	m
0.000 001	= 10 ⁻⁶	Mikro	μ
0.000 000 001	= 10 ⁻⁹	Nano	n
0.000 000 000 001	= 10 ⁻¹²	Piko	p
0.000 000 000 000 001	= 10 ⁻¹⁵	Femto	f
0.000 000 000 000 000 001	= 10 ⁻¹⁸	Atto	a
0.000 000 000 000 000 000 001	= 10 ⁻²¹	Zepto	z
0.000 000 000 000 000 000 000 001	= 10 ⁻²⁴	Yokto	y



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