

# Physical Values & SI-Units

## Mechanics

Value	Formula	SI-Unit
① Velocity	$v = \frac{\text{Length}}{\text{Time}}$	$\frac{\text{m}}{\text{s}}$
② Acceleration	$a = \frac{\text{Velocity}}{\text{Time}} = \frac{v}{t} = \frac{s}{t \cdot t} = \frac{m}{s^2}$	$\frac{\text{m}}{\text{s}^2}$
③ Momentum	$J = \text{Mass} \times \text{Velocity} = m \cdot v = \frac{m \cdot s}{t} = \frac{\text{kg} \cdot \text{m}}{\text{s}} = \text{N} \cdot \text{s}$	$\text{N} \cdot \text{s}$
④ Force	$F = \text{Mass} \times \text{Acceleration} = m \cdot a = \frac{m \cdot v}{t} = \frac{m \cdot s}{t^2} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2} = \text{N}$	$\text{N}$
⑤ Pressure	$p = \frac{\text{Force}}{\text{Area}} = \frac{\text{Momentum}}{\text{Time} \times \text{Area}} = \frac{F}{s^2} = \frac{J}{t \cdot s^2} = \frac{m \cdot v}{t \cdot s^2} = \frac{m \cdot s}{t^2 \cdot s^2} = \frac{\text{kg} \cdot \text{m}}{\text{s}^2 \cdot \text{m}^2} = \frac{\text{N}}{\text{m}^2} = \text{Pa}$	$\text{Pa}$
⑥ Work	$W = \text{Force} \times \text{Length} = F \cdot s = m \cdot a \cdot s = \frac{m \cdot v \cdot s}{t} = \frac{m \cdot s^2}{t^2} = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2} = \text{Nm} = \text{J} = \text{V} \cdot \text{C}$	$\text{Nm} = \text{J} = \text{V} \cdot \text{C}$
⑦ Power	$P = \frac{\text{Work}}{\text{Time}} = \frac{\text{Force} \times \text{Length}}{\text{Time}} = \frac{F \cdot s}{t} = \frac{m \cdot a \cdot s}{t} = \frac{m \cdot v \cdot s}{t^2} = \frac{m \cdot s^2}{t^3} = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^3} = \frac{\text{J}}{\text{s}} = \text{W}$	$\frac{\text{J}}{\text{s}} = \text{W}$

## Electric Units

Watt	$W = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^3}$	$= \frac{\text{Nm}}{\text{s}}$	$= \frac{\text{V} \cdot \text{C}}{\text{s}}$	$= \Omega \cdot \text{A}^2$	$= \frac{\text{J}}{\text{s}}$
Joule	$J = \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2}$	$= \text{Nm}$	$= \text{V} \cdot \text{C}$	$= \text{V} \cdot \text{A} \cdot \text{s}$	$= \text{W} \cdot \text{s}$
Electronvolt	$\text{eV} = \frac{\text{kg} \cdot \text{m}^2 \cdot e}{\text{A} \cdot \text{s}^3}$	$= \frac{\text{J} \cdot e}{\text{C}}$	$= \text{V} \cdot e$	$= 1,6 \cdot 10^{-19} \text{ J}$	$= \frac{\text{W} \cdot e}{\text{A}}$
Volt	$V = \frac{\text{kg} \cdot \text{m}^2}{\text{A} \cdot \text{s}^3}$	$= \frac{\text{Nm}}{\text{A} \cdot \text{s}}$	$= \frac{\text{J}}{\text{C}}$	$= \Omega \cdot \text{A}$	$= \frac{\text{W}}{\text{A}}$
Coulomb	$C = \frac{\text{kg} \cdot \text{m}^2}{\text{V} \cdot \text{s}^2}$	$= \frac{\text{Nm}}{\text{V}}$	$= \frac{\text{J}}{\text{V}}$	$= \frac{\text{J}}{\Omega \cdot \text{A}}$	$= \frac{\text{J} \cdot \text{A}}{\text{W}}$
Farad	$F = \frac{\text{A}^2 \cdot \text{s}^4}{\text{kg} \cdot \text{m}^2}$	$= \frac{\text{A} \cdot \text{s}}{\text{V}}$	$= \frac{\text{C}}{\text{V}}$	$= \frac{\text{J}}{\Omega \cdot \text{A} \cdot \text{V}}$	$= \frac{\text{J}}{\text{V}^2}$
Ampere	$A = \frac{\text{kg} \cdot \text{m}^2}{\text{V} \cdot \text{s}^3}$	$= \frac{\text{Nm}}{\text{V} \cdot \text{s}}$	$= \frac{\text{J}}{\text{V} \cdot \text{s}}$	$= \frac{\text{V}}{\Omega}$	$= \frac{\text{W}}{\text{V}}$
Ohm	$\Omega = \frac{\text{kg} \cdot \text{m}^2}{\text{A}^2 \cdot \text{s}^3}$	$= \frac{\text{Nm}}{\text{A}^2 \cdot \text{s}}$	$= \frac{\text{J}}{\text{A} \cdot \text{C}}$	$= \frac{\text{V}}{\text{A}}$	$= \frac{\text{W}}{\text{A}^2}$

## Greek Alphabet

Alpha	Beta	Gamma	Delta	Epsilon	Zeta	Eta	Theta	Iota	Kappa	Lambda	Mu
A α	B β	Γ γ	Δ δ	E ε ε	Z ζ	H η	Θ θ ϑ	I ι	K κ κ	Λ λ	M μ
N ν	Ξ ξ	O ο	Π π π	P ρ ρ	Σ σ σ	T τ	Υ υ	Φ φ φ	X χ	Ψ ψ	Ω ω
Nu	Xi	Omikron	Pi	Rho	Sigma	Tau	Ypsilon	Phi	Chi	Psi	Omega

## Physical Constants

Elementary charge	$e$	1.602177	$10^{-19}$	C
Faraday constant	$F = N_A \cdot e$	9.6485	$10^4$	$\frac{\text{C}}{\text{mol}}$

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