Complete List of Units with Derivation Equations

Acceleration
SI: m/s^2
ST Derivation:
$m/s^2 = m * s^{-2}$
Result: L / T^2

Ampere
SI: A
ST Derivation:
$A = T * L^{-1}$ (given as base unit scaling)
Result: $T^1 * L^{-1}$

Angular Acceleration
SI: s^{-2}
ST Derivation:
$s^{-2} = T^{-2}$
Result: T^{-2}

Angular Momentum
SI: $kg \cdot m^2/s$
ST Derivation:
$kg \cdot m^2/s = (kg) * (m^2) * (s^{-1}) = (T^2 * L^{-1}) * L^2 * T^{-1} = T * L$
Result: $T^1 * L^1$

Angular Velocity
SI: s^{-1}
ST Derivation:
$s^{-1} = T^{-1}$
Result: T^{-1}

Area
SI: m^2
ST Derivation:
$m^2 = L^2$
Result: L^2

Attenuation Coefficient
SI: m^{-1}
ST Derivation:

$m^{-1} = L^{-1}$

Result: L^{-1}

Compressibility

SI: $Pa^{-1} = m^2/N$

ST Derivation:

$Pa = N/m^2 = 1 / L^2 = L^{-2}$

$Pa^{-1} = L^2 / 1 = L^2$

Result: L^2

Conductivity

SI: $S/m = (\Omega \cdot m)^{-1}$

ST Derivation:

$\Omega = V/A = (L^2 * T^{-2}) / (T * L^{-1}) = L^3 * T^{-3}$

$S = \Omega^{-1} = L^{-3} * T^3$

$S/m = (L^{-3} * T^3) / L = L^{-4} * T^3$

Result: $L^{-4} * T^3$

Cosmological Constant

SI: m^{-2}

ST Derivation:

$m^{-2} = L^{-2}$

Result: L^{-2}

Coulomb

SI: $C = A \cdot s$

ST Derivation:

$C = (T * L^{-1}) * T = T^2 * L^{-1}$

Result: $T^2 * L^{-1}$

Coulomb Constant

SI: $N \cdot m^2/C^2$

ST Derivation:

$N = 1$, $m^2 = L^2$

$C = T^2 * L^{-1}$

$C^2 = (T^2 * L^{-1})^2 = T^4 * L^{-2}$

$N \cdot m^2/C^2 = L^2 / (T^4 * L^{-2}) = L^4 / T^4$

Result: L^4 / T^4

Current Density

SI: A/m^2

ST Derivation:
$A/m^2 = (T * L^{-1}) / L^2 = T * L^{-3}$
Result: $T^1 * L^{-3}$

Density
SI: kg/m^3
ST Derivation:
$kg/m^3 = (T^2 * L^{-1}) / L^3 = T^2 * L^{-4}$
Result: $T^2 * L^{-4}$

Dynamic Viscosity
SI: $Pa \cdot s = (N/m^2) \cdot s$
ST Derivation:
$Pa = N/m^2 = 1 / L^2 = L^{-2}$
$Pa \cdot s = L^{-2} * T$
Result: T^1 / L^2

Electric Charge Density
SI: C/m^3
ST Derivation:
$C/m^3 = (T^2 * L^{-1}) / L^3 = T^2 * L^{-4}$
Result: $T^2 * L^{-4}$

Electric Field Strength
SI: V/m
ST Derivation:
$V = W/A = (L * T^{-1}) / (T * L^{-1}) = L^2 * T^{-2}$
$V/m = (L^2 * T^{-2}) / L = L * T^{-2}$
Result: $L^1 * T^{-2}$

Electric Flux
SI: $V \cdot m$
ST Derivation:
$V \cdot m = (L^2 * T^{-2}) * L = L^3 * T^{-2}$
Result: $L^3 * T^{-2}$

Electric Flux Density
SI: C/m^2
ST Derivation:
$C/m^2 = (T^2 * L^{-1}) / L^2 = T^2 * L^{-3}$
Result: $T^2 * L^{-3}$

Electric Mobility
SI: $m^2/(V \cdot s)$
ST Derivation:
$m^2 = L^2$, $V \cdot s = (L^2 * T^{-2}) * T = L^2 * T^{-1}$
$m^2/(V \cdot s) = L^2 / (L^2 * T^{-1}) = T$
Result: T^1

Energy Density
SI: J/m^3
ST Derivation:
$J = N \cdot m = 1 * L = L$
$J/m^3 = L / L^3 = L^{-2}$
Result: L^{-2}

Farad
SI: $F = C/V$
ST Derivation:
$C = T^2 * L^{-1}$, $V = L^2 * T^{-2}$
$F = (T^2 * L^{-1}) / (L^2 * T^{-2}) = T^4 * L^{-3}$
Result: $T^4 * L^{-3}$

Fine Structure Constant
SI: Dimensionless
ST Derivation:
Dimensionless = 1
Result: 1

Galilei (assumed as acceleration, e.g., cm/s^2, but treated as m/s^2 for consistency)
SI: m/s^2
ST Derivation:
Same as acceleration: L / T^2
Result: $L^1 * T^{-2}$

Gravitational Constant
SI: $m^3/(kg \cdot s^2)$
ST Derivation:
$m^3 = L^3$, $kg = T^2 * L^{-1}$, $s^2 = T^2$
$kg \cdot s^2 = (T^2 * L^{-1}) * T^2 = T^4 * L^{-1}$
$m^3/(kg \cdot s^2) = L^3 / (T^4 * L^{-1}) = L^4 / T^4$
Result: L^4 / T^4

Gravitational Field Strength

SI: N/kg

ST Derivation:

$N = 1, kg = T^2 * L^{-1}$

$N/kg = 1 / (T^2 * L^{-1}) = T^{-2} * L$

Result: $T^{-2} * L^1$

Geomagnetic Ratio (assumed as gyromagnetic ratio, C/kg)

SI: C/kg

ST Derivation:

$C = T^2 * L^{-1}, kg = T^2 * L^{-1}$

$C/kg = (T^2 * L^{-1}) / (T^2 * L^{-1}) = 1$

Result: 1

Heat Flux

SI: W/m^2

ST Derivation:

$W = J/s = L / T = L * T^{-1}$

$W/m^2 = (L * T^{-1}) / L^2 = T^{-1} / L$

Result: T^{-1} / L^1

Henry

SI: H = Wb/A

ST Derivation:

$Wb = V \cdot s = (L^2 * T^{-2}) * T = L^2 * T^{-1}$

$A = T * L^{-1}$

$H = (L^2 * T^{-1}) / (T * L^{-1}) = L^3 * T^{-2}$

Result: $L^3 * T^{-2}$

Hertz

SI: $Hz = s^{-1}$

ST Derivation:

$s^{-1} = T^{-1}$

Result: T^{-1}

Hubble Constant

SI: s^{-1}

ST Derivation:

$s^{-1} = T^{-1}$

Result: T^{-1}

Impulse
SI: N·s
ST Derivation:
N = 1, s = T
N·s = 1 * T
Result: T

Irradiance
SI: W/m^2
ST Derivation:
Same as heat flux: T^{-1} / L
Result: T^{-1} / L^1

Jerk/Jolt
SI: m/s^3
ST Derivation:
$m/s^3 = L / T^3$
Result: $L^1 * T^{-3}$

Joule
SI: J = N·m
ST Derivation:
N = 1, m = L
J = 1 * L = L
Result: L

Kilogram
SI: kg
ST Derivation:
kg = $T^2 * L^{-1}$ (base unit scaling)
Result: $T^2 * L^{-1}$

Kinematic Viscosity
SI: m^2/s
ST Derivation:
$m^2/s = L^2 / T$
Result: $L^2 * T^{-1}$

Knudson Number
SI: Dimensionless
ST Derivation:

Dimensionless = 1
Result: 1

Length
SI: m
ST Derivation:
m = L (base unit scaling)
Result: L

Linear Charge Density
SI: C/m
ST Derivation:
C/m = $(T^2 * L^{-1}) / L = T^2 * L^{-2}$
Result: $T^2 * L^{-2}$

Magnetic Dipole Moment
SI: $A \cdot m^2$
ST Derivation:
$A \cdot m^2 = (T * L^{-1}) * L^2 = T * L$
Result: $T^1 * L^1$

Magnetic Field Strength
SI: A/m
ST Derivation:
A/m = $(T * L^{-1}) / L = T * L^{-2}$
Result: $T^1 * L^{-2}$

Magnetic Flux
SI: Wb = V·s
ST Derivation:
Wb = $(L^2 * T^{-2}) * T = L^2 * T^{-1}$
Result: $L^2 * T^{-1}$

Magnetic Moment (same as Magnetic Dipole Moment)
SI: $A \cdot m^2$
ST Derivation:
Same as magnetic dipole moment: $T^1 * L^1$
Result: $T^1 * L^1$

Magnetic Reluctance
SI: H^{-1}
ST Derivation:

$H = Wb/A = L^3 * T^{-2}$

$H^{-1} = L^{-3} * T^2$

Result: $L^{-3} * T^2$

Magnetic Rigidity

SI: T·m

ST Derivation:

$T = Wb/m^2 = (L^2 * T^{-1}) / L^2 = T^{-1}$

$T·m = T^{-1} * L$

Result: $T^{-1} * L$

Magnetic Vector Potential

SI: Wb/m

ST Derivation:

$Wb/m = (L^2 * T^{-1}) / L = L * T^{-1}$

Result: $L^1 * T^{-1}$

Magnetomotive Force

SI: A

ST Derivation:

Same as ampere: $T^1 * L^{-1}$

Result: $T^1 * L^{-1}$

Moment of Force (Torque)

SI: N·m

ST Derivation:

$N·m = 1 * L = L$

Result: L

Moment of Inertia

SI: $kg·m^2$

ST Derivation:

$kg·m^2 = (T^2 * L^{-1}) * L^2 = T^2 * L$

Result: $T^2 * L^1$

Momentum

SI: kg·m/s

ST Derivation:

$kg·m/s = (T^2 * L^{-1}) * L / T = T$

Result: T

Newton

SI: $N = kg \cdot m/s^2$

ST Derivation:

$N = (T^2 * L^{-1}) * L * T^{-2} = 1$

Result: 1

Ohm

SI: $\Omega = V/A$

ST Derivation:

$\Omega = (L^2 * T^{-2}) / (T * L^{-1}) = L^3 * T^{-3}$

Result: $L^3 * T^{-3}$

Pascal

SI: $Pa = N/m^2$

ST Derivation:

$Pa = 1 / L^2 = L^{-2}$

Result: L^{-2}

Permeability

SI: H/m

ST Derivation:

$H = L^3 * T^{-2}$

$H/m = (L^3 * T^{-2}) / L = L^2 * T^{-2}$

Result: $L^2 * T^{-2}$

Permittivity

SI: F/m

ST Derivation:

$F = T^4 * L^{-3}$

$F/m = (T^4 * L^{-3}) / L = T^4 * L^{-4}$

Result: $T^4 * L^{-4}$

Planck's Constant

SI: J·s

ST Derivation:

$J \cdot s = L * T$

Result: $L^1 * T^1$

Planck Energy

SI: J

ST Derivation:

Same as joule: L
Result: L

Planck Length
SI: m
ST Derivation:
Same as length: L
Result: L

Planck Mass
SI: kg
ST Derivation:
Same as kilogram: $T^2 * L^{-1}$
Result: $T^2 * L^{-1}$

Planck Time
SI: s
ST Derivation:
s = T (base unit scaling)
Result: T

Negative Pressure
SI: Pa
ST Derivation:
Same as pascal: L^{-2}
Result: L^{-2}

Polarizability
SI: $C \cdot m^2/V$
ST Derivation:
$C \cdot m^2/V = (T^2 * L^{-1}) * L^2 / (L^2 * T^{-2}) = T^4 / L$
Result: T^4 / L^1

Radian
SI: rad
ST Derivation:
Dimensionless = 1
Result: 1

Radiant Energy
SI: J
ST Derivation:

Same as joule: L
Result: L

Radiant Energy Density
SI: J/m^3
ST Derivation:
Same as energy density: L^{-2}
Result: L^{-2}

Radiant Exitance
SI: W/m^2
ST Derivation:
Same as heat flux: T^{-1} / L
Result: T^{-1} / L^1

Radiant Exposure
SI: J/m^2
ST Derivation:
$J/m^2 = L / L^2 = L^{-1}$
Result: L^{-1}

Radiant Flux
SI: $W = J/s$
ST Derivation:
$W = L / T = L * T^{-1}$
Result: $L * T^{-1}$

Radiant Intensity
SI: W/sr (sr is-dimensionless)
ST Derivation:
$W/sr = W = L * T^{-1}$
Result: $L * T^{-1}$

Radiosity
SI: W/m^2
ST Derivation:
Same as heat flux: T^{-1} / L
Result: T^{-1} / L^1

Resistivity
SI: Ω·m
ST Derivation:

$\Omega \cdot m = (L^3 * T^{-3}) * L = L^4 * T^{-3}$
Result: $L^4 * T^{-3}$

Reynolds Number
SI: Dimensionless
ST Derivation:
Dimensionless = 1
Result: 1

Second
SI: s
ST Derivation:
s = T (base unit scaling)
Result: T

Siemens
SI: $S = \Omega^{-1}$
ST Derivation:
$S = L^{-3} * T^3$
Result: $L^{-3} * T^3$

Specific Energy
SI: J/kg
ST Derivation:
$J/kg = L / (T^2 * L^{-1}) = L^2 / T^2$
Result: L^2 / T^2

Specific Volume
SI: m^3/kg
ST Derivation:
$m^3/kg = L^3 / (T^2 * L^{-1}) = L^4 / T^2$
Result: L^4 / T^2

Speed of Light in a Vacuum
SI: m/s
ST Derivation:
m/s = L / T
Result: L / T

Steradian
SI: sr
ST Derivation:

Dimensionless = 1
Result: 1

Surface Density
SI: kg/m^2
ST Derivation:
$kg/m^2 = (T^2 * L^{-1}) / L^2 = T^2 * L^{-3}$
Result: $T^2 * L^{-3}$

Surface Tension
SI: N/m
ST Derivation:
$N/m = 1 / L = L^{-1}$
Result: L^{-1}

Tesla
SI: $T = Wb/m^2$
ST Derivation:
$T = (L^2 * T^{-1}) / L^2 = T^{-1}$
Result: T^{-1}

Velocity
SI: m/s
ST Derivation:
Same as speed of light: L / T
Result: L / T

Volt
SI: V = W/A
ST Derivation:
$V = (L * T^{-1}) / (T * L^{-1}) = L^2 * T^{-2}$
Result: $L^2 * T^{-2}$

Volume
SI: m^3
ST Derivation:
$m^3 = L^3$
Result: L^3

Volumetric Flow
SI: m^3/s
ST Derivation:

$m^3/s = L^3 / T$
Result: $L^3 * T^{-1}$

Watt
SI: W = J/s
ST Derivation:
$W = L / T = L * T^{-1}$
Result: $L * T^{-1}$

Wave Number
SI: m^{-1}
ST Derivation:
$m^{-1} = L^{-1}$
Result: L^{-1}

Weber
SI: Wb = V·s
ST Derivation:
$Wb = (L^2 * T^{-2}) * T = L^2 * T^{-1}$
Result: $L^2 * T^{-1}$

Weber Number
SI: Dimensionless
ST Derivation:
Dimensionless = 1
Result: 1