

Dimensional Formulae of Physical Quantities

S.No	Physical Quantity	Relationship with other physical quantities	Remark	Dimensional Formula
1.	Area	Length \times breadth		$[M^0 L^2 T^0]$
2.	Volume	Length \times breadth \times height		$[M L^3 T^0]$
3.	Mass density	Mass/volume		$[M L^{-3} T^0]$
4.	Frequency	1/time period		$[M^0 L^0 T^{-1}]$
5.	Velocity, speed	Displacement/time		$[M^0 L T^{-1}]$
6.	Acceleration	Velocity/time		$[M^0 L T^{-2}]$
7.	Force	Mass \times Acceleration		$[M L T^{-2}]$
8.	Impulse	Force \times Time		$[M L T^{-1}]$
9.	Work, Energy	Force \times Distance		$[M L^2 T^{-2}]$
10	Power	Work/Time		$[M L^2 T^{-3}]$
11	Momentum	Mass \times Velocity		$[M L T^{-1}]$
12	Pressure, stress	Force/Area		$[M L^{-1} T^{-2}]$
13	Strain	$\frac{\text{change in dimension}}{\text{Original dimension}}$		$[M^0 L^0 T^0]$
14	Modulus of elasticity	Stress/Strain		$[M L^{-1} T^{-2}]$
15	Surface tension	Force/Length		$[M L^0 T^{-2}]$
16	Surface energy	Energy/Area		$[M L^0 T^{-2}]$
17	Velocity gradient	Velocity/distance		$[M^0 L^0 T^{-1}]$
18	Pressure gradient	Pressure/distance		$[M L^{-2} T^{-2}]$
19	Pressure energy	Pressure \times volume		$[M L^2 T^{-2}]$
20	Coefficient of viscosity	Force/area \times velocity gradient		$[M L^{-1} T^{-1}]$
21	Angle, Angular displacement	Arc/radius		$[M^0 L^0 T^0]$
22	Trigonometric ratio ($\sin\theta$, $\cos\theta$, $\tan\theta$, etc).	Length/length		$[M^0 L^0 T^0]$
23	Angular velocity	Angle/time		$[M^0 L^0 T^{-1}]$
24	Angular acceleration	Angular velocity/time		$[M^0 L^0 T^{-2}]$
25	Radius of gyration	Distance		$[M^0 L T^0]$
26	Moment of inertia	Mass \times (radius of gyration) ²		$[M L^2 T^0]$

1	Area	$[L^2]$	metre ²
2	Volume	$[L^3]$	metre ³
3	Velocity	$[LT^{-1}]$	ms ⁻¹
4	Acceleration	$[LT^{-2}]$	ms ⁻²
5	Force	$[MLT^{-2}]$	newton (N)
6	Work or energy	$[ML^2T^{-2}]$	joule (J)
7	Power	$[ML^2T^{-3}]$	J s ⁻¹ or watt
8	Pressure or stress	$[ML^{-1}T^{-2}]$	Nm ⁻²
9	Linear momentum or Impulse	$[MLT^{-1}]$	kg ms ⁻¹
10	Density	$[ML^{-3}]$	kg m ⁻³
11	Strain	Dimensionless	Unitless
12	Modulus of elasticity	$[ML^{-1}T^{-2}]$	Nm ⁻²
13	Surface tension	$[MT^{-2}]$	Nm ⁻¹
14	Velocity gradient	T ⁻¹	second ⁻¹
15	Coefficient of velocity	$[ML^{-1}T^{-1}]$	kg m ⁻¹ s ⁻¹
16	Gravitational constant	$[M^{-1}L^3T^{-2}]$	Nm ² /kg ²
17	Moment of inertia	$[ML^2]$	kg m ²
18	Angular velocity	$[T^{-1}]$	rad/s
19	Angular acceleration	$[T^{-2}]$	rad/S ²
20	Angular momentum	$[ML^2T^{-1}]$	kg m ² S ⁻¹
21	Specific heat	$L^2T^{-2}\theta^{-1}$	kcal kg ⁻¹ K ⁻¹
22	Latent heat	$[L^2T^{-2}]$	kcal/kg
23	Planck's constant	ML^2T^{-1}	J ^s
24	Universal gas constant	$[ML^2T^{-2}\theta^{-1}]$	J/mol-K