**Helpful Quantity Chart for Mechanical Physics**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Quantity | Form | Equation Representation | Metric Unit | Natural Unit Equivalent |
|
| position | scalar | x | m | m |
| displacement | vector | ∆x | m | m |
| length, height, depth, width | scalar | depends | m | m |
| radius | depends | r | m | m |
| area | depends | A | m2 | m2 |
| volume | depends | V | m3 | m3 |
| time | scalar | t | s | s |
| velocity | vector | v | m/s | m/s |
| acceleration | vector | a | m/s2 | m/s2 |
| mass | scalar | m | kg | kg |
| weight | vector | Fg | N | kg m/s2 |
| normal force | vector | FN | N | kg m/s2 |
| static friction | vector | fs | N | kg m/s2 |
| kinetic friction | vector | fk | N | kg m/s2 |
| period | scalar | T | s | s |
| centripetal acceleration | vector | ac | m/s2 | m/s2 |
| centripetal force | vector | Fc | N | kg m/s2 |
| kinetic energy | scalar | KE | J | kg m2/s2 |
| gravitational potential energy | scalar | PEg | J | kg m2/s2 |
| work | scalar | W | J | kg m2/s2 |
| power | scalar | P | W | kg m2/s3 |
| momentum | vector | p | kg m/s | kg m/s |
| Impulse | vector | J | Ns | kg m/s |
| angular displacement | vector | ∆θ | rad | dimensionless |
| angular velocity | vector | ω | rad/s | s-1 |
| angular acceleration | vector | α | rad/s2 | s-2 |
| inertia | scalar | I | kg m2 | kg m2 |
| torque | vector | τ | Nm | kg m2/s2 |
| rotational kinetic energy | scalar | KER | J | kg m2/s2 |
| elastic potential energy | scalar | PEk | J | kg m2/s2 |
| pressure | scalar | P | Pa | kg/m s2 |
| buoyancy | vector | FB | N | kg m/s2 |
| viscosity | scalar | 𝜂 | Pa s | kg m/s |
| moles | scalar | n | mol | dimensionless |
| temperature | scalar | T | K | K |
| heat | scalar | Q | J | kg m2/s2 |
| specific heat capacity | scalar | c | J/kgK | m2/s2K |
| latency of vaporization | scalar | Lv | J/kg | m2/s2 |
| latency of fusion | scalar | Lf | J/kg | m2/s2 |
| root mean squared velocity | vector | vrms | m/s | m/s |
| amplitude | depends | A | m | m |
| frequency | scalar | f | Hz | s-1 |
| wavelength | scalar | λ | m | m |
| beat | scalar | fb | Hz | s-1 |
| angular frequency | scalar | ω | rad/s1 | s-1 |