

SINGLE DEGREE OF FREEDOM SYSTEMS (SDOF)

- VIBRATION CALCULATOR

The Single Degree of Freedom (SDOF) Vibration Calculator to calculate mass-spring-damper natural frequency, circular frequency, damping factor, Q factor, critical damping, damped natural frequency and transmissibility for a harmonic input. Mechanical vibrations are fluctuations of a mechanical or a structural system about an equilibrium position. Mechanical vibrations are initiated when an inertia element is displaced from its equilibrium position due to energy input to the system through an external source. When work is done on SDOF system and mass is displaced from its equilibrium position, potential energy is developed in the spring. A restoring force or moment pulls the element back toward equilibrium and this cause conversion of potential energy to kinetic energy. In the absence of nonconservative forces, this conversion of energy is continuous, causing the mass to oscillate about its equilibrium position. All structures have many degrees of freedom, which means they have more than one independent direction in which to vibrate and many masses that can vibrate. Single degree of freedom systems are the simplest systems to study basics of mechanical vibrations. SDOF systems are often used as a very crude approximation for a generally much more complex system. The other use of SDOF system is to describe complex systems motion with collections of several SDOF systems.

Operation:

Free Vibration-> 

Mass [m] (in kg) :..... Unit: kg 

k (in N/m) :..... Unit: N/m 

Damping ratio (coefficient) [ζ] :.....

Harmonic input frequency [Ω] (in Hz) :... Unit: Hz 

(Enter 0 if it is free vibration)

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