vibrationdata_lv_sc_loads_a: Units and Conventions

English units

Mass entered in lbm, converted to consistent units: $m = W/386$ [lbf sec^2/in]

Stiffness k [lbf/in], length [in], force [lbf], acceleration [in/sec^2]

$1\,G = 386$ in/sec^2

Metric units

Mass m [kg], stiffness k [N/m], length [m], force [N]

$1\,G = 9.81$ m/sec^2

Equation of motion

$[M]\{\ddot{x}\} + [C]\{\dot{x}\} + [K]\{x\} = \{F(t)\}$

Natural frequency of a single DOF: $f_n = \frac{1}{2\pi}\sqrt{k/m}$ [Hz]

Load factor: $n = a/g$ [G], force $F = m\,a = m\,g\,n$