

$$k^2 * \sqrt{\frac{E * I}{m * L^4}} \quad \text{in radians/second}$$

E = Young's Modulus

I = Moment of inertia

m = distributed mass = distributed weight divided by g

L = member length

k = 1.875 for 1st mode,

4.694 for 2nd mode,

7.855 for 3rd mode, etc.

E = 30000 ksi = 30E6 psi

I = 1.333 inch⁴

Distributed weight W = 1.124 pound-weight/inch

Distributed mass = m = W/g = (1.124/386.4) pound-mass/inch

L = 80 inches

Thus,

Frequency in rad/sec	Frequency in cycles/sec
64.4151421	10.25198827
403.711941	64.25275104
1130.51884	179.9276614