

Calculating Your Vibration Isolation System Parameters

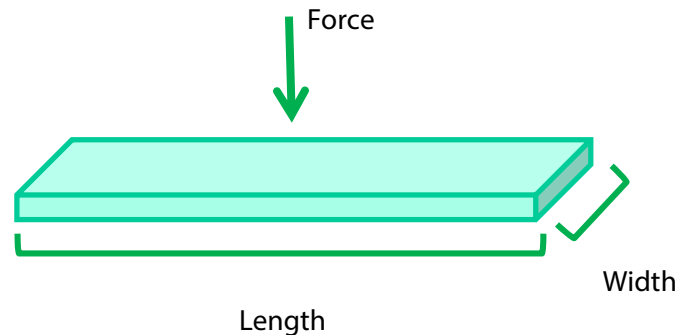
To effectively use the Rogers Corporation Vibration Isolation Efficiency Web Tool, the user must input values that describe their system. With those values, they can browse ranges of thickness to select the most effective material for their system.

SYSTEM LOAD:

The first value to enter is the system load. When working in metric units this number is in N/mm². If using Imperial units the value is in lb./in² (psi). The tool will accept both systems of measurement.

For Metric:

1. Measure dimensions in millimeters, then calculate the area by multiplying length by width.
2. Measure the mass in kilograms, then convert to newtons:
1 kg= 9.80665 N
3. Divide force [N] by area [mm²]



For Imperial:

1. Measure dimensions in inches, then calculate the area by multiplying length by width.
2. Measure the mass in pounds.
3. Divide force [lb] by area [in²].

NOTE: If the system stands on mounts, calculate the area of each mount, then divide the system mass by the total mount area.

FORCING FREQUENCY:

The next value the web tool needs is the forcing, or disturbing, frequency of the system. This can be defined as the number of oscillations per unit time. The tool calculates data in Hertz (Hz), or cycles per second. The equations below can be used to calculate the frequency of motors. The table example to the right shows frequencies of a 2-pole engine at various pump shaft rotational speeds (rpm).

$$\text{Pump shaft rotation speed [rpm]} = \frac{120 * \text{Frequency [Hz]}}{\text{Number of Poles}}$$

$$\text{Frequency [Hz]} = \frac{\text{Pump shaft rotation speed [rpm]} * \text{Number of Poles}}{120}$$

Pump Shaft Rotation Speed [rpm]	Frequency [Hz]
600	10
1200	20
1800	30
2400	40
3000	50
3600	60
4200	70
4800	80
5400	90
6000	100

*Motors outside the US are designed for 50 Hz. In the US typical designs are at 60 Hz.

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