Anti-Vibration Mount Performance and Selection Guide

The WDS range of anti-vibration mounts offers a number of different types and designs to suit a variety of industrial applications. Some mounts have specific features which make them more suited to a particular situation; for example the 721 fully encapsulated Turret Mount is well suited to HVAC applications where electrical insulation could be important, or the 719 Captive Transit mount with its overload fail safe feature assisting in mobile plant applications and the protective metal cap shielding the mount from contamination by oil to the 710-715 cylindrical bobbin mounts and stops for more general purpose applications.

To assist with the selection of the best mount for the desired vibration isolation, please consider the following 6 point guide.

1. Number of Mounts - Establish the total weight (kg) to be supported and the number of mountings required.
2. Weight per Mount - Determine the load distribution and hence the weight (kg) supported by each mount.
3. Forcing Frequency - Establish the vibration frequency, aka the Forcing Frequency. For rotating plant this will be the revolutions per minute – RPM.
4. Vertical Isolation - Select the desired vibration absorption rate, aka the Vertical Isolation, for the RPM determined at point 3 – 70%/80%/90%

Static Deflection (SD)	% Vertical Isolation Required		
Forcing Frequency (RPM)	70%	80%	90%
1000	4.0mm	5.4mm	10.0mm
1500	1.8mm	2.5mm	4.5mm
3000	0.5mm	0.7mm	1.2mm

5. Static Deflection - From point 2 and the table above, select the mounting SD for the required percentage Vertical Isolation – eg 1000RPM, 80% = 5.4mm SD
6. Free movement - To allow free movement of the equipment ensure all other service connections are flexible and protected from chafing.

Worked example:

- Rotating plant weighing 240kg to be supported over 4 mounts at 60kg per mount (Points 1&2).
- Normal speed of rotation = 1000RPM = Forcing Frequency (Point 3).
- 80% Vertical Isolation required to adequately protect the equipment (Point 4).
- The Static Deflection for 80% Vertical Isolation @ 1000RPM = 5.4mm, therefore each mount must deflect 5.4mm when the plant is at rest or zero RPM
- Mounts are normally quoted with maximum deflection (mm) and maximum load (kg). Maximum load / Maximum deflection = kg/mm. Select the mount with a value closest to 60/5.4 = 11.1kg/mm. A mount with a value higher than 11.1kg/mm will increase the vertical isolation and a lower value will reduce it.

Other design considerations:

- Will the mount be exposed to contamination by oil or fuel or to extremes of temperature or load?
- Will the mount be exposed to high humidity or corrosive chemicals or environments?
- Will the mount experience occasional shock loads such as those on off-road and military vehicles or construction plant?
- Is the equipment fragile requiring shock protection from dropping or impacts?
- Consider human exposure to vibration, refer to ISO2631.
- Consider equipment exposure to vibration, refer to ISO7919 and ISO10816.

General notes and definitions:

- Forcing Frequency is the frequency of an oscillating force applied to a system expressed in Cycles Per Minute (CPM) or cycles per second expressed as Hertz (Hz). For rotating plant this will be the same value as Revolutions Per Minute (RPM). For example 1500RPM = 1500CPM or 25Hz.
- Natural Frequency is the frequency at which a system oscillates when not exposed to a repeated or continuous external force. It is affected by the mounting stiffness and deflection under load. As a general rule, the greater the deflection the better the vertical isolation and the lower the natural frequency.

Natural Frequency (fn) = 300 / √(Mounting Deflection(mm)/10

- Frequency Ratio is the Forcing Frequency / Natural Frequency. The larger the ratio the better the isolation. A ratio of 1 must be avoided as this will lead to Resonance where energy becomes stored in the system leading to potentially catastrophic harmonic movement and damage to the system.