Technical information for swivel pads and swivel feet with vibration absorption

Natural frequency:
Every sprung weight, such as a machine or piece of equipment, that is standing on swivel pads with vibration absorbers vibrates after an initial impetus at its own natural frequency (resonance frequency). In the diagram to the side (figure 1) the natural frequency of Sylomer V12 under pressure by various forces can be read. The optimum range of use is with a pressure of ≤ 0.4 N/mm^2. A maximum pressure of 0.6 N/mm^2 should not be exceeded.

Interference frequency:
The frequency emitted by a machine or a piece of equipment is known as its interference frequency. Effective vibration absorption is dependent on the interference frequency (the frequency to be absorbed) and the natural frequecy of the absorption unit. The greater the difference in frequency between the natural frequency and the interference frequency, the better the absorption. An absorbing effect will only be achieved if the interference frequency is over $\sqrt{2}$ times the natural frequency of the absorption unit.

Calculation example:
Swivel foot: M16, D1 = 30.5
Load capacity: 300 N

Figure 1

natural frequency

Pressure:

$$\frac{F}{A} = \frac{300 \text{ N}}{529{,}5 \text{ mm}^2} = 0{,}57 \text{ N/mm}^2$$

$$> 0{,}4 \text{ N/mm}^2$$

Swivel foot: M16, D1 = 40,5
Load capacity: 300 N

Pressure:

$$\frac{F}{A} = \frac{300 \text{ N}}{1087{,}2 \text{ mm}^2} = \mathbf{0{,}28 \text{ N/mm}^2}$$

$$< 0{,}4 \text{ N/mm}^2$$

The M16 swivel foot is chosen since the pressure is ≤ 0.4 N/mm^2. From Figure 1, pressure of **0.28 N/mm²** gives a natural frequency of **21 Hz** for this. With an interference frequency of **44 Hz** an absorption effect of 69% is achieved (figure 2).
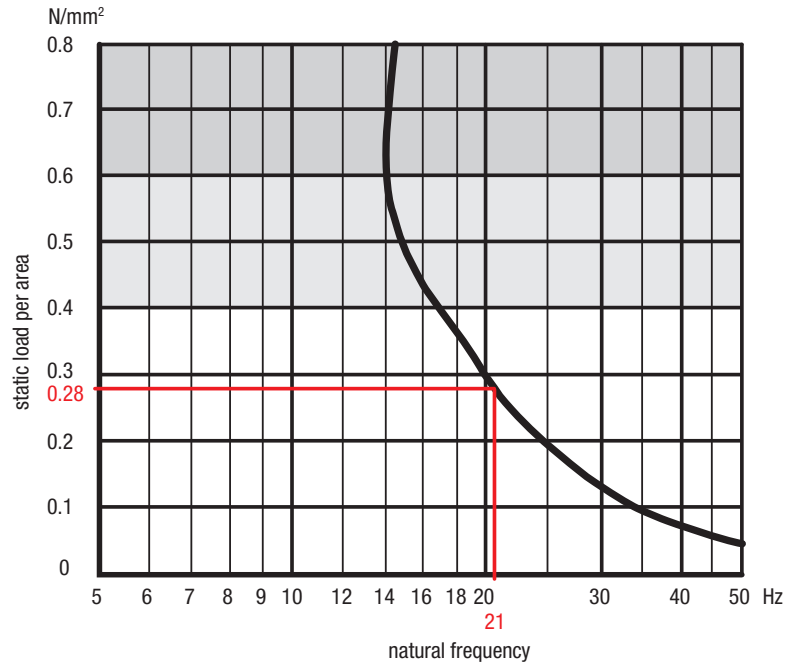
Figure 2

natural frequency