Swivel foot and swivel pad with vibration dampening

Technical Information

natural frequency
Every sprung mass, such as a machine, which sits on swivel feet with vibration dampening vibrates to a natural frequency (resonance frequency) after receiving an impact. The natural frequency of an inert mass resting on Sylomer V12 can be read from the diagram (Fig. 1). The optimal application is achieved by a pressure of ≤ 0,4 N/mm², a maximum pressure of 0,6 N/mm² should not be exceeded.

interference frequency
The frequency caused by a running machine or plant is called an interferance frequency. This is caused by such things as unbalanced rotating masses or linear movements. A functional vibration dampening is dependent on the interference frequency (the vibration to be dampened) and the natural frequency of the machine resting on the dampening elements. The greater the frequency difference between the natural frequency and the interference frequency, the better is the dampening effect. A dampening effect is first achieved when the interference frequency is more than $\sqrt{2}$x the natural frequency of the supported machine.

Calculation example:
Swivel pad: M12, D1 = 30.5
Loading: 300 N
Pressure:

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

>0,4 N/mm²

Swivel pad: M16, Di = 40.5
Loading: 300 N
Pressure:

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

<0,4 N/mm²

An M16 swivel pad is chosen because the pressure is ≤ 0.4 N/mm².
From Fig. 1 it can be read that by a pressure of **0.28 N/mm²** there is natural frequency of **21 Hz**.
By an interference frequency of **44 Hz** there is a dampening effect of 69 % (Fig. 2).

Fig. 1

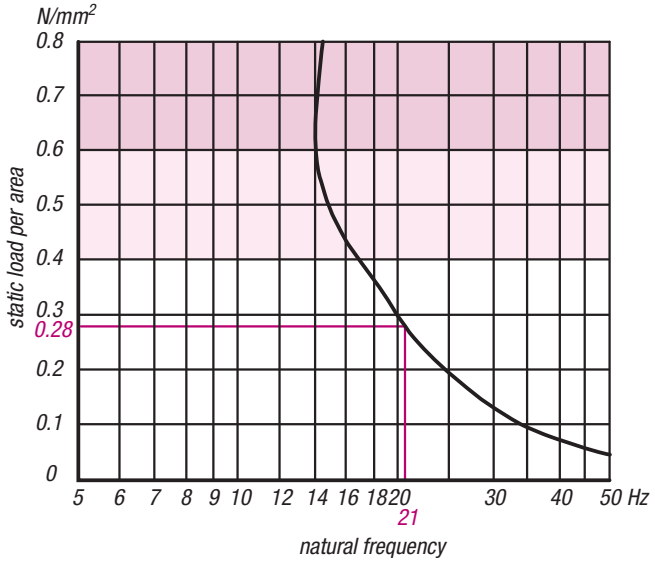

Fig. 2