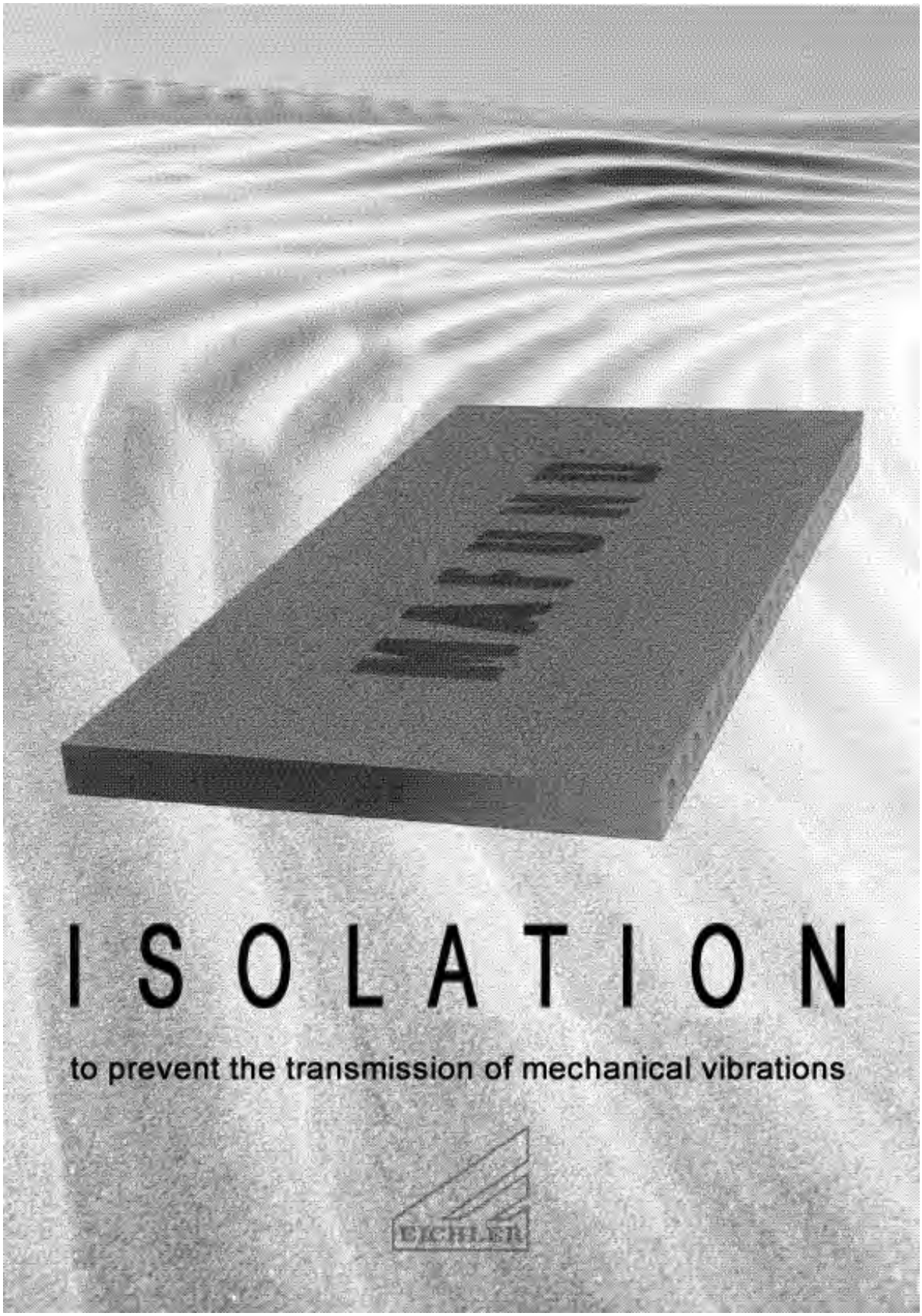
MAFUND®



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PREFACE

Machines and contrivances with moved pads cause mechanical vibrations. The effects on the installing place and its surroundings are shocks and conduction of sound. In order to prevent the transmission of vibrations to the floor and within to the building, an efficient vibration isolation must be mounted between machines respectively apparatuses or their foundations and the installing floor. In this case we speak about

ACTIVE Isolation

The Active Isolation is provided because of environment protection
protection of the building
protection of the machines and, as a consequence, longer durability.
To protect precision machines and equipment, measuring instruments and the like from shocks and vibrations coming from the environment, a corresponding Isolation must be likewise installed. Here we have to do with a

PASSIVE Isolation

The MAFUND®-Pad can be used In wide fields for the Active as well as for the passive-Isolation.

MAFUND® - Pad

GENERAL MATTERS

For many years the MAFUND®-Pad (Fig. 1) has been mounted under machines, equipments constructions and the like. or under their foundations, as a protection against shocks, vibrations and noise. Our practice and technical development on the material sector being of longstanding, the MAFUND®-Pad has been improved continually. Consequently it corresponds to the newest state of engineering. The approved form and the dimensions are unchanged.

Fig. 1
Elevator engine of Ringturm, Vienna

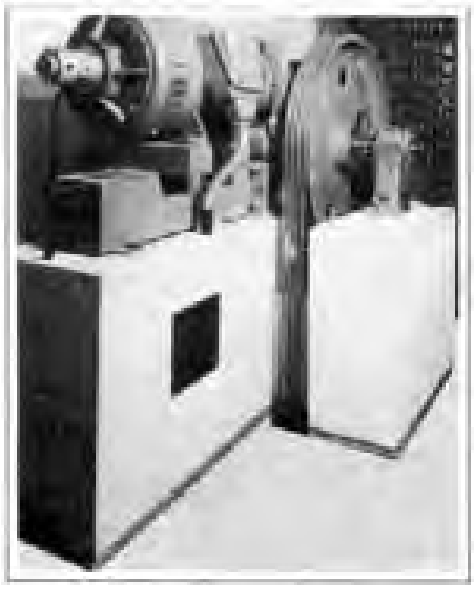

Fig. 2
MAFUND®-Pad

Dimensions: 500 x 250 x 25 mm

Beside the outstanding technical qualities such as springing, damping, a practically permanent resistance to ageing and chemical influences, insects and so on, the MAFUND®-Pad offers operating technical advantages due to the standardized dimensions and the structurally uniform shape.
Owing to the quoted qualities a maximum isolation effect accompanied by a remarkably low overall height is attained.
Modern challenges, especially in the combat against the operating noise in its various shapes, provide wide possibilities for the economic use of the MAFUND®-Pad. Several application territories are mentioned as follows.

machines of every category
contrivances
furnaces
air conditioning units
heavy structures
conveying plants
supports of pipelines
railway and undergrund rails

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TECHNICAL DATA

Dimensions:	500 x 250 x 25 mm
Load:	2-20 N/cm² ≈ 0,2-2 kp/cm² in special cases 40 N/cm² ≈ 4 kp/cm²
Static module of elasticity:	E_{st} = 324 N/cm² ≈ 33 kp/cm²
Dynamic module of elasticity:	E_d = 441 N/cm² ≈ 45 kp/cm²
Springing:	see Load deflection curve Fig.3
Resonant frequency:	see curves Fig. 4
Temperature range:	-20°C to +80°C
Standard weight:	≈ 3 kp

1 Newton (N) = 0,102 kp

TECHNICAL MATTERS

The MAFUND®-Pad consists of a permanently resistant elastic special material with correspondingly proportioned air ducts. The dimensioning of the MAFUND®-Pad depends on the excitation frequency to be isolated. The diagram in Fig. 4 gives information about the resonant frequencies of the MAFUND®-Pad in dependence on the specific loading pressure. It shows relatively low resonant frequencies under various loadings. That is the reason why the MAFUND®-Pad is useable for a wide range of excitation frequencies.

The relation between frequency ratio $L=/f_o$ - (f = excitation frequency, f_o = resonant frequency) - and the degree of isolation is shown in Fig. 5 It is evident, that an isolation effect occurs only starting from a tuning ratio $f/f_o > \sqrt{2}$. In this case we speak of an "overcritical" support.

In case of an "undercritical" support - $f/f_o < \sqrt{2}$ - there is no isolation effect for the basic frequency - number of revolutions of the machine - to be expected. As the sound frequencies are mostly much higher than the basic frequency - number of oscillatory Im pulses = excitation frequency - it is obvious. that also in case of "undercritical" support a good noise isolation can be obtained. If we consider, that forces and momentums due to the mass cause a great number of harmonic vibrations, it is explicable that even in case of an "undercritical" support a isolation effect is achieved, because thus amplitudes of the excitation frequencies, so to peak, are cut off.

Fig. 3
Load deflection curve of the MAFUND®-Pad

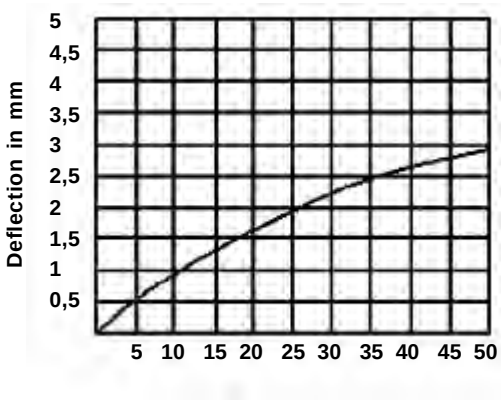


Fig. 4
Resonant frequencies of the MAFUND®-Pad

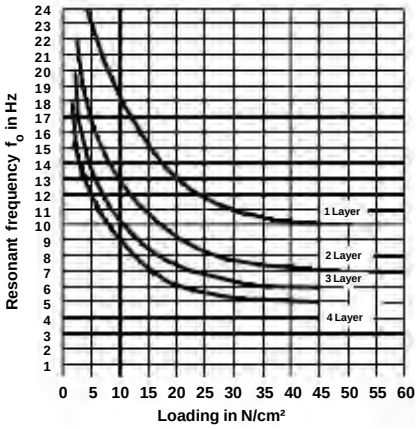
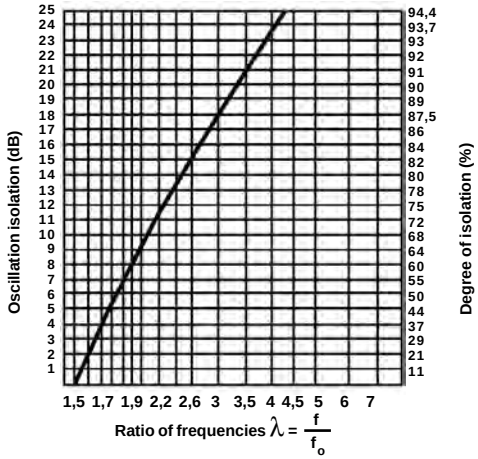


Fig. 5
Degree of isolation in dependence to the relation of frequencies



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MOUNTING

The mounting of the MAFUND®-Pads has to ensure regarding to vibration technical considerations. The MAFUND®-Pads can be laid in form of both whole pads and in form of cuttings. Smaller cuttings than 125 x 125 mm should not be used for installation. The cutting is possible with a sharp knife or a band saw and can be done on the mounting place.

If there are greater basic areas. the whole pads are arranged along the circumference and then the middle areas will be filled corespondently Fundamentally the MAFUNO®-Pads are to be installed in a manner, that there is no rigid connection between the machine and the foundation. Rigid connections are noise bridges, vibrations are transmitted via these and therefore the effect of the isolation is reduced. Pipelines, which mounted on the machines are to be isolated against transmission of vibrations.

MOUNTING EXAMPLES

MAFUND®-Isolation under a sunken foundation Fig. 6

In a correspondingly dimensioned concrete tub the MAFUND®-Pads are arranged either throughout or in area parts. In case of arrangement in area parts the intervals have to be filled up with scum in material. Then the complete area is covered by e tarboard in order to prevent the fluid concrete from getting into the slits between the MAFUND®-Pads and consequently originating a sound bridge. One has to bear In mind that the first concrete layer is responsible for an equal loading and in case of an area part arrangement, the first layer of fluid concrete has to be put in symmetrically, in order to prevent pressed down and hard fill-up layers. Along the circumference of the foundation it is possible to incorporate air slits or MAFUND®-Pads between foundation and the concrete tub. The coverings of these slits are to be elastic.

Fig. 6
Sunken foundation mounted on MAFUND®-Pads

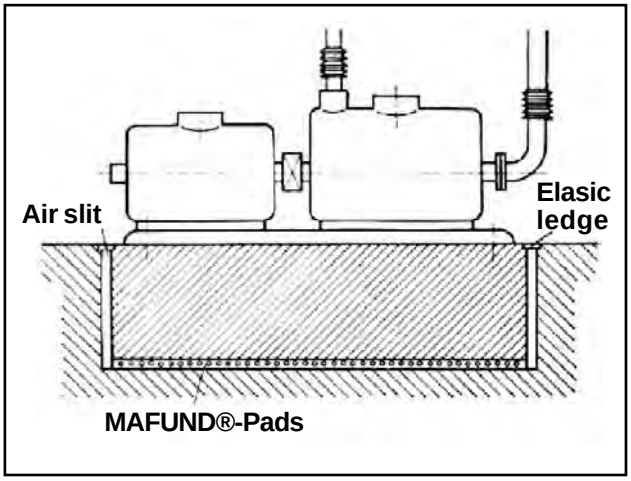

Fig. 7
Turbo generator power plant Suratthani, Thailand

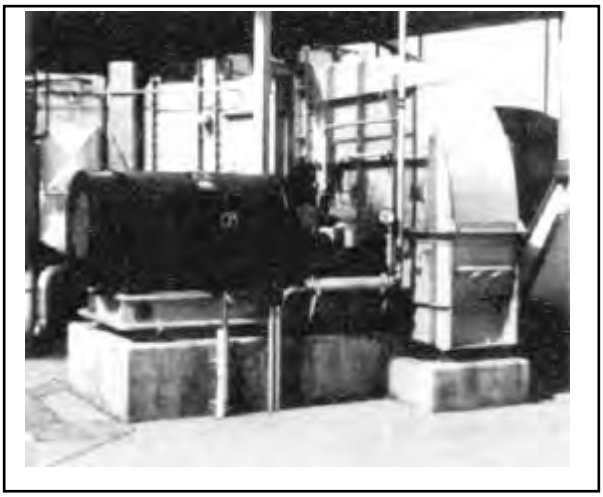

Fig. 8
Roll grindig machine machines factory J. M. Voith

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MAFUND®-Isolation
under a concrete distribution plate
Fig. 9

The MAFUND®-Pads are mounted under a foundation or a distribution plate made of concrete - steel and wood distribution plates are possible too. Only distortion resistant machines with corresponding supporting areas, without free forces and momentums due to the mass, can be installed directly on an oscillation isolation.

Fig. 9
MAFUND®-Pads under a machine with concrete distribution plate

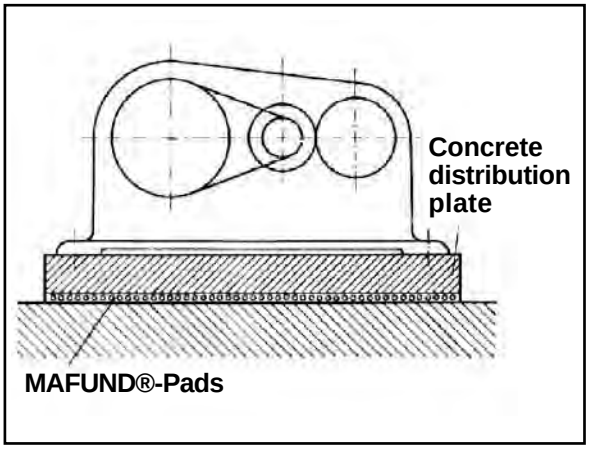

Fig. 10
Compressors "Red Cross", Bern

Fig. 11
Emergency generator

Fig. 12
Newspaper printing machine
KOEBAU "Courier 25", "Kurier" Vienna

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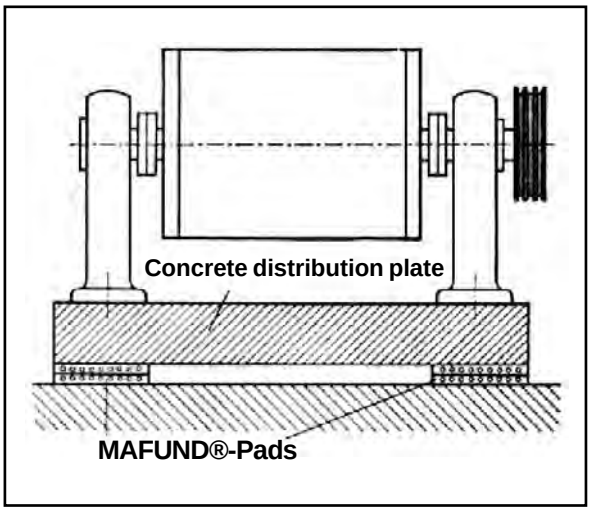
MAFUND®-Isolation
under a concrete foundation with area parts installation Fig. 13

The kind of mounting is the same as in Fig. 9 shown, but the area parts installation ensued in double layer construction of MAFUND®-Pads.

Fig. 13
Machine roundation on a double layer of MAFUND®-Pads



MAFUND®-Isolation under a concrete fundation with side fixation - Fig. 15

If there is an influence of horizontally operating forces to the machine, it is appropiated to make precautions against lateral gliding of the concrete plate. This installing type shows a possible solution.

Fig. 14
Chocolate calender

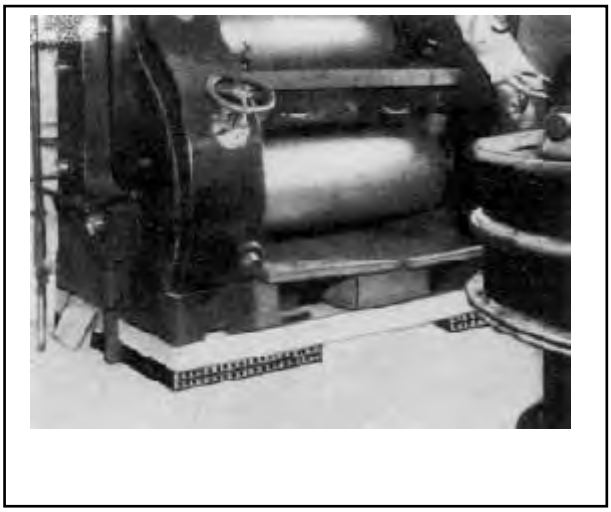
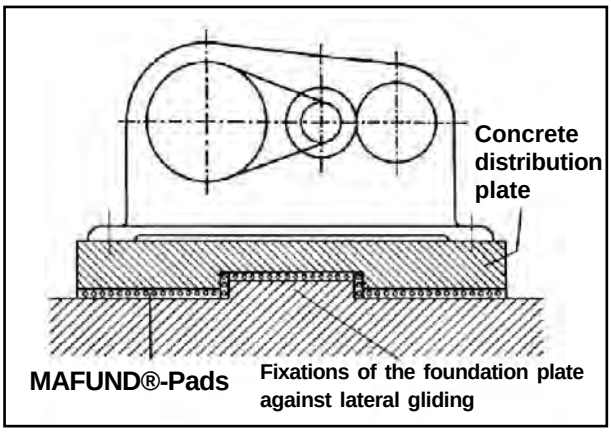


Fig. 15
Machine foundation with lateral fixation on MAFUND®-Pads



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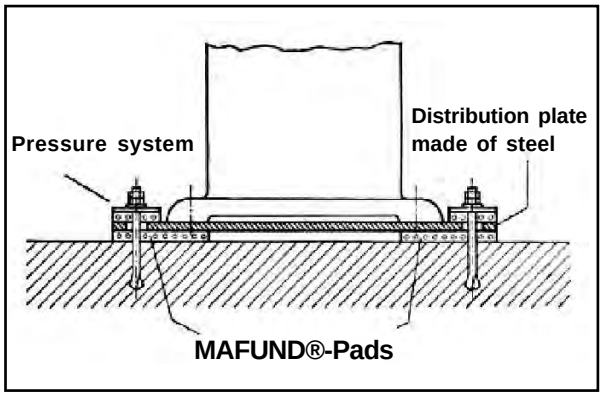
MAFUND®-Isolation
under distribution plate with pressure systems
Fig. 16

MAFUND®-Pads are laid under a steel distribution plate. This plate is anchored elastically. The screws receive MAFUND® shims and have to pass barely through the distribution plate. The machine itself is bolted on the distribution plate.

Fig. 16
Machine with distribution plate on MAFUND®-Pads

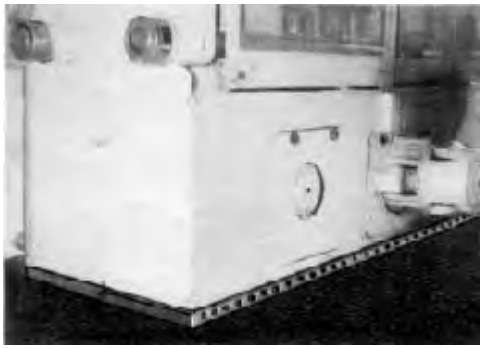


MAFUND®-Isolation directly under the machine - Fig. 18

Only in rate cases the MAFUND®-Pads are installed directly - without foundation, distribution plate and so on - under machine

Fig. 17
Eccentric press

Fig. 18
Jet moulding machine for synthetic material



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MAFUND®-Solid-Pad

There are support cases in practice, where there appear extremely specific loading pressures on the isolation to be installed. When, for example, machines are mounted on grider grillages - isolation of the machine on the griders, isolation of the griders in the masonry - or even in the industry of building. For this the MAFUND®-Solid-Pad (Fig. 19) has been created.

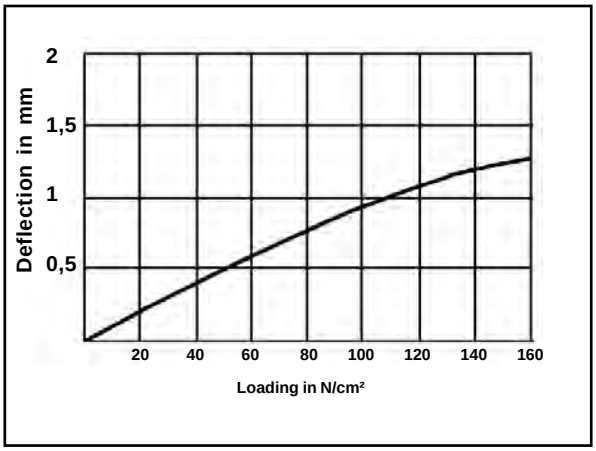
The external dimensions of the MAFUND®-Solid-Pad are 500x250x15mm. Standard weight is about 2,2kp.

Fig. 20 shows the load deflection curve of the MAFUND®-Solid-Pad.
This bearing pad can be loaded up to 200 N/cm² - 20 kp/cm²

Fig. 19
MAFUND®-Solid-Pad

Dimensions: 500 x 250 x 15 mm

Fig. 20
Load deflection curve of the MAFUND®-Solid-Pad



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