Technical Report

ISOLGOMMA
insulation technology
Via Dell'Artigianato Z.I. - 36020 - Albettone(VI) - Italy
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Indications of Vibration Insulation

Client	**Acoustic Science**
Country	Athens (Greece)
Object	air conditioning unit vibrations insulation
Project	-
Note	-
Product	**Megamat ME50/500**

Index: **pag.**

Date	Writer	Rel. N.
30/06/2010	Eng. Fabio Loriggiola	ENG-I-2010-013

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Industry

Vibration theory

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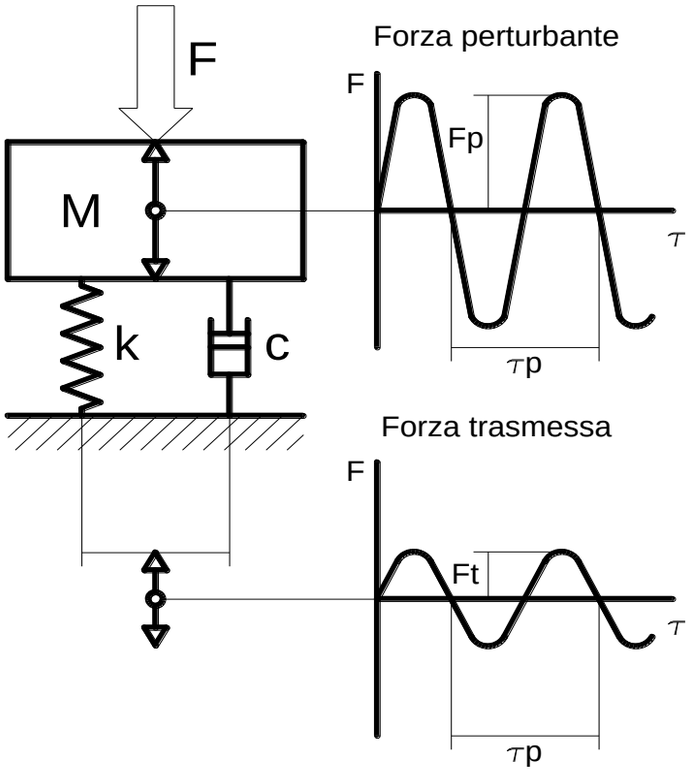
Abstract

This technical report represents the best knowledge of ISOLGOMMA Srl in the industry for vibration insulation. This report indicates our best anti-vibration technical solutions based on our market and application experience and based on our theoretical knowledge; it do not replace the competence of the deputed technical body. This report can not be used as unique reference to issue a building permit. All the results and anti-vibration indication of this report are valid considering the application procedure shown in our manual book and here synthetically mentioned. ISOLGOMMA Srl is not responsible for the result and quality of product application.

Parameter

Vibration:	it defines the vibrating motion of a body oscillation around a position of balance, resulting in a force which varies over time
Frequency:	is the number times that the motion of the system shows the same characteristics in a target range, represents the number of cycles completed in time
Natural frequency (f_0):	frequency which vibrates in the absence of external forces
Work frequency (f):	it dipend to the external action F (t), if any, acting on the system with variability dependent on time

Mass-spring system



We have this parameter

F harmonic type force
M mass of vibration system
k spring stifness
c viscous damping

τ_n oscillation period
f frequency
F_p disturbing force width
F_t transmitted force width

We consider a force vibration F, applied to the mass M, of harmonic sinusoidal type. Through the spring system, with stiffness k and damping c, is transmitted to the support structure a force with the same frequency f (tp same period) but different amplitude (Ft). The effect of damping system can be expressed through the transmission factor:

$$T = F_t / F_p$$

The spring system is efficient when T <1, when the force transmitted is less than the disturbing force

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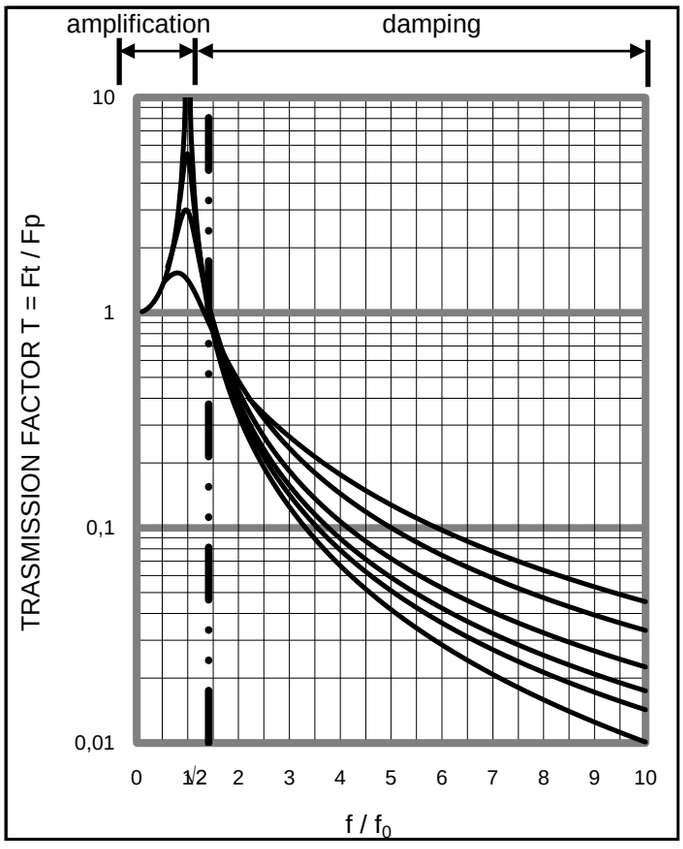
Operation of an anti-vibration system



The spring system, to be effective, must be chosen so as to give the system supported a natural oscillation frequency of at least 1.41 times less than the rate of force perturbante, f / f0> √ 2

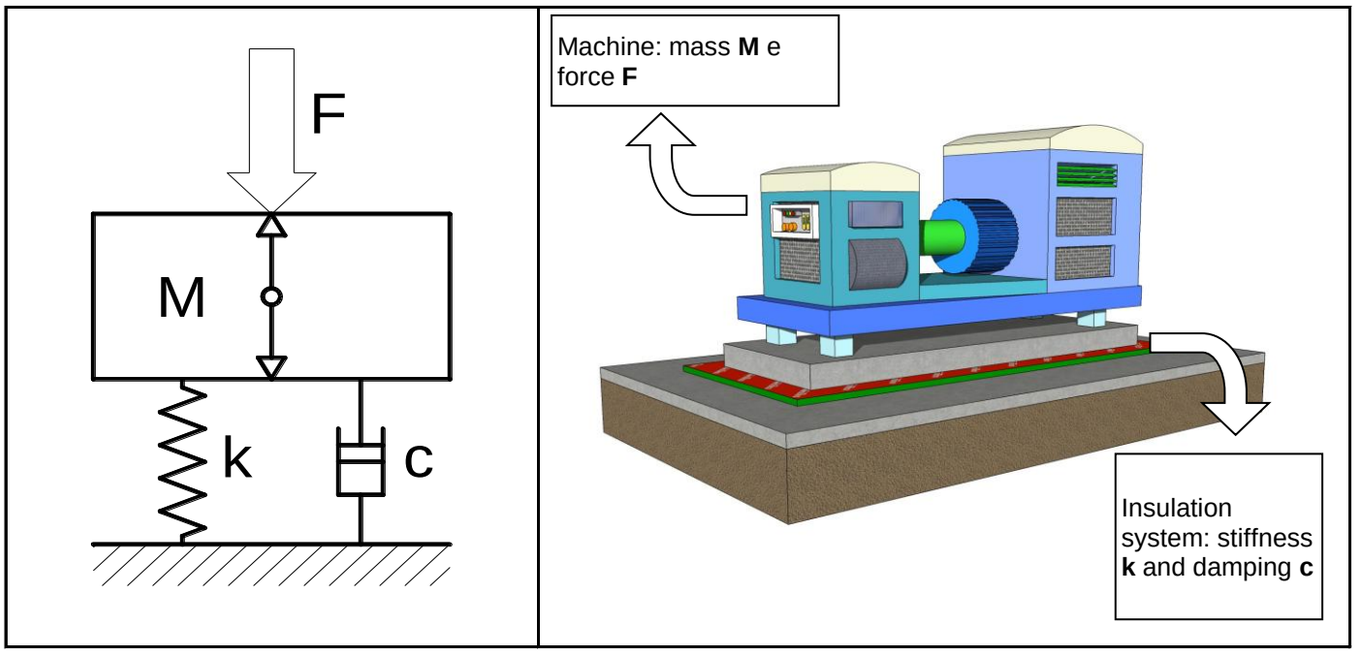
Degree of insulation (%)

$$A_{\%} = 100 (1 - T)$$

Transmission reduction (dB)

$$A_{dB} = 20 \log (T)$$

Mass-spring system in the industry



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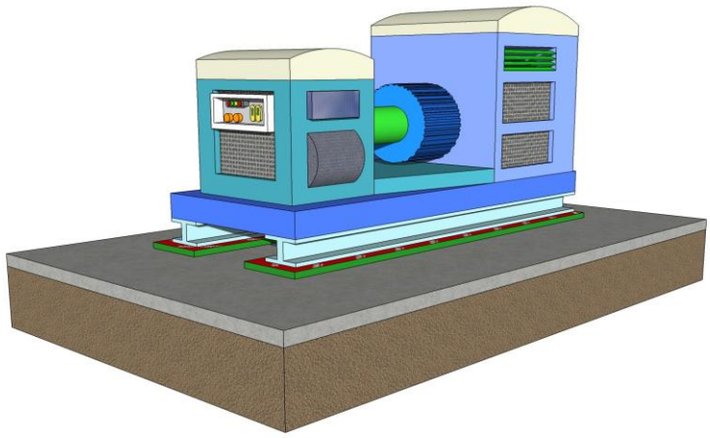
Input Data

Description

Air conditioning unit



Machine Dimensions (cm)		Support Dimensions (cm)	
Lenght	491	Lenght	491
Width	64.5	Width	5
Height	128.4	Number	2

Machine Weight (kg)		Machine pressure (N/mm²)
Static weight	680	0.01359
Dinamic weight	-	

Total Pressure (N/mm²)	0.01359

Work frequency (Hz)	Degree of insulation required (%)
50	max
Maximum displacement required (mm)	**Transmission reduction required (dB)**
-	max

Note

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Solution Output

Product Suggest

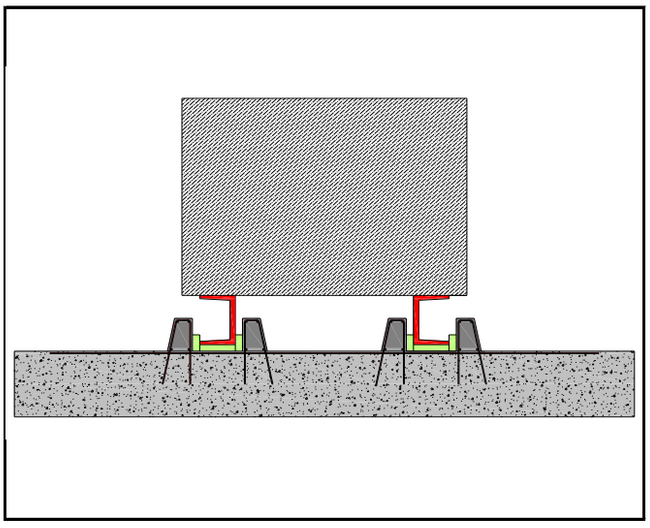
Isolgomma Linea Megamat ME 50/500

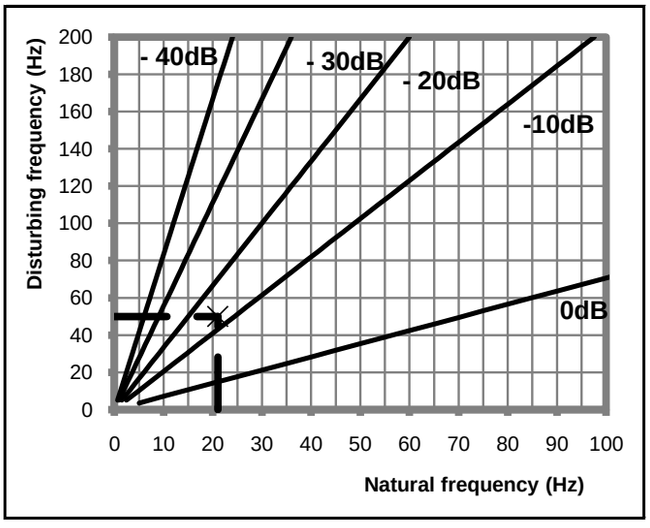
Product thickness:	50	mm
Pressure on product:	0.0136	N/mm²
Static Young Modul:	0.420	N/mm²
Dinamic Young Modul:	1.200	N/mm²
Static displacement:	1.62	mm
Dinamic displacement:	0.57	mm
Natural frequency:	21.0	Hz
Disturbing frequency:	50.0	Hz
Transmission factor T:	0.2364	< 1

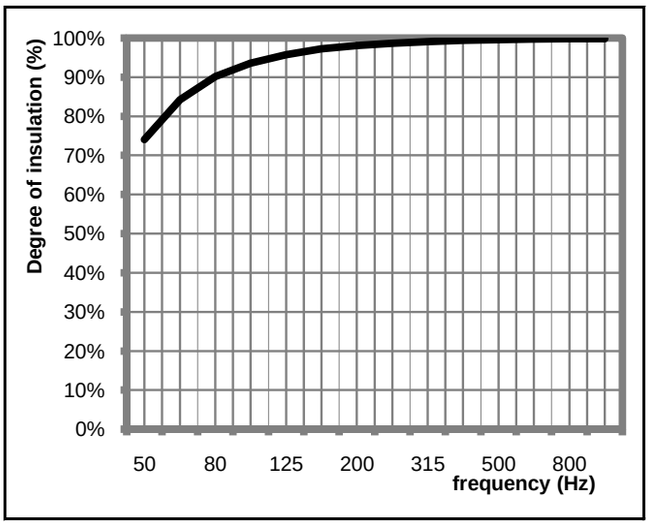
Degree of insulation	**74**	%

Transmission reduction	**-13.4**	dB

frequency Hz	Degree of insulation %
50	74.1%
63	84.2%
80	90.2%
100	93.6%
125	95.7%
160	97.2%
200	98.1%
250	98.7%
315	99.1%
400	99.4%
500	99.6%
630	99.7%
800	99.8%
1000	99.9%







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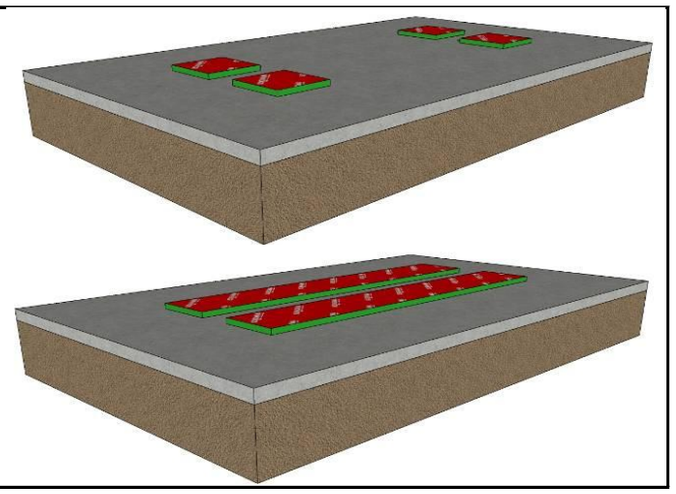
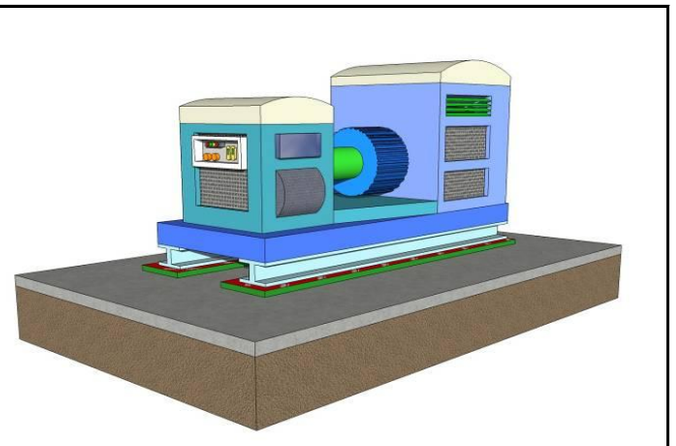
Laying instructions under legs and under steel beams

PHASE 1	
Support or paste with polyurethane glues Megamat in panels or stripes on the surface to be isolated on points or bands to support machine to be isolated.	

PHASE 2	
Place the machinery directly on the surface of Megamat slabs/blocks.	

PHASE 3	
To avoid horizontal movement of the machine, blocking laterally with the appropriate support structures of steel or CA, insulate with resilient material.