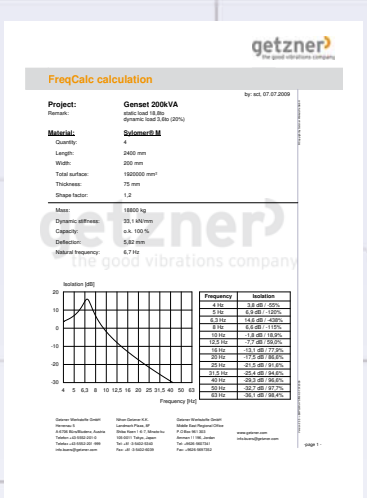
Case Study

Elastically Isolated Generator

Problem:

Generator borne vibrations that are transmitted to the surrounding areas can influence the functionality of nearby equipment, impact product quality, and machinery life cycle costs. These vibrations can affect the overall work environment of the adjacent areas and should they become structure borne cause damage to the building or structure in which they are located.


getzner
the good vibrations company

FreqCalc calculation

by: acd, 07.07.2009

Project: Genset 200kVA
Remark: static load 18,8to; dynamic load 3,6to (20%)

Material: Sylomer® M

Quantity:	4
Length:	2400 mm
Width:	200 mm
Total surface:	1920000 mm²
Thickness:	75 mm
Shape factor:	1,2

Mass:	18800 kg
Dynamic stiffness:	33,1 kN/mm
Capacity:	o.k. 100 %
Deflection:	5,82 mm
Natural frequency:	6,7 Hz

Frequency	Isolation
4 Hz	3,8 dB / 55%
5 Hz	6,9 dB / 120%
6,3 Hz	14,6 dB / 439%
8 Hz	6,6 dB / 115%
10 Hz	-1,8 dB / 18,9%
12,5 Hz	-7,7 dB / 59,0%
16 Hz	-13,1 dB / 77,9%
20 Hz	-17,5 dB / 86,6%
25 Hz	-21,5 dB / 91,8%
31,5 Hz	-25,4 dB / 94,6%
40 Hz	-29,2 dB / 96,6%
50 Hz	-32,7 dB / 97,7%
63 Hz	-36,1 dB / 98,4%

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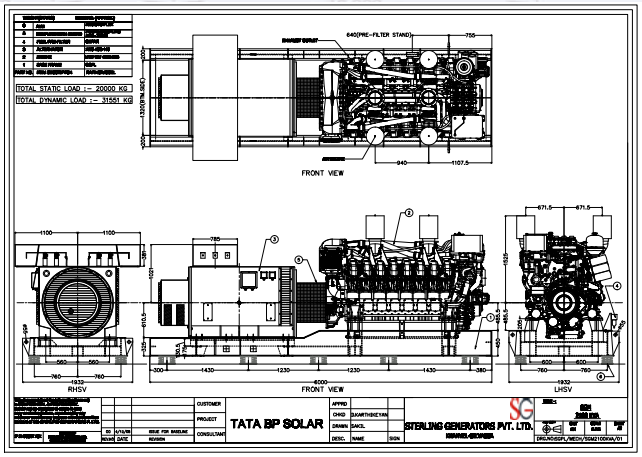
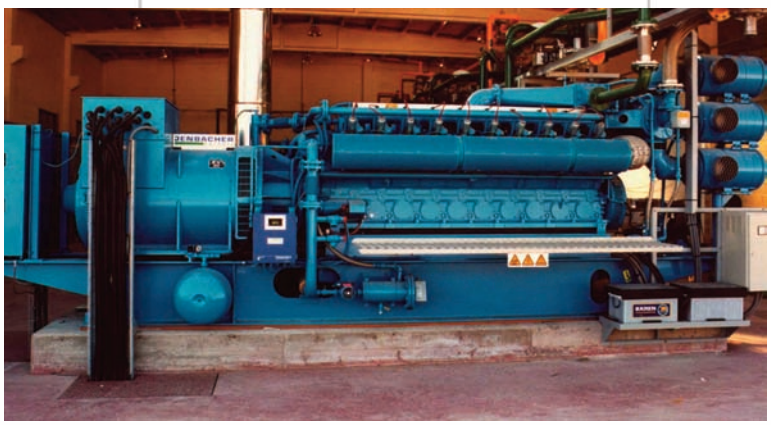
Solution:

Highly engineered cellular urethane materials manufactured by Getzner Werkstoffe called Sylomer and Sylodyn are specially designed to reduce vibration and structure borne noise for machinery applications. The wide static load capacity range (1.60 psi - 435.11 psi), thicknesses, and dimensions allow for Sylomer and Sylodyn solutions to be easily customized to the needs of your specific generator for optimal isolation.

Sylomer, Sylomer HD, and Sylodyn materials have properties that are very similar to that of a mechanical spring. Sylodyn is the material most like a mechanical spring as it has very little damping and can achieve natural frequencies as low as 4 - 5 Hz. Sylomer HD is a pure damper with little to no spring and a mechanical loss factor of 0.55 - 0.60. Standard Sylomer is a combination of both spring and damping. Since Generators require some internal damping during the startup and shutdown phases standard Sylomer is the right material for generator applications.



With special footing designs Getzner engineers are able to eliminate the loss of performance that is typical for pre-stressed solutions. The footing design would be based on the fact that pre-stress forces do not have any inertia and therefore in turn do not contribute to vibration insulation. By optimizing the build up it is possible to reach frequencies below 7 Hz with a bearing thickness of around 3". This results in highly efficient solutions that show a 91.6% or 21.5 dB reduction value at the rotation frequency of the motor as shown for the 2100kVA Sterling Wilson diesel generator



SOUNDOWN
FOR PEACE AND QUIET

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QTY REQ'D	FN	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
2	1	546-324-154-1	INSUL, FRONT & BACK PANEL

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GENERATOR INSULA

DWG BY R. Hertz | SIZE A | FSCM NO. | DWG NO. 546-324-15