

GROUND MATS

Silenzia drV / MN

APPLICATION

High Speed lines, conventional rail ways, subway and tramway

VIBRATION REDUCTION SOLUTIONS

silenzia[®]
grupo acustel

ICT
Innovative Construction Technologies



1/ SERVICE DESCRIPTION

1.1. Analysis of the project needs.

Verification of the project specifications, validation of the constructive system, analysis of the vibration transmission in the ground.

1.2. Development of a guaranteed supply plan.

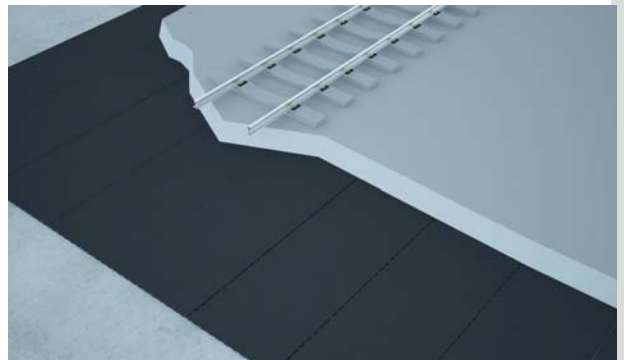
·Guarantee

1.3. Work control

- Validation of the installation system.
- Periodic analysis of the system behaviour.
- In situ vibration control. (optional)
- Verification of results. (optional)

VISITS IN SITU

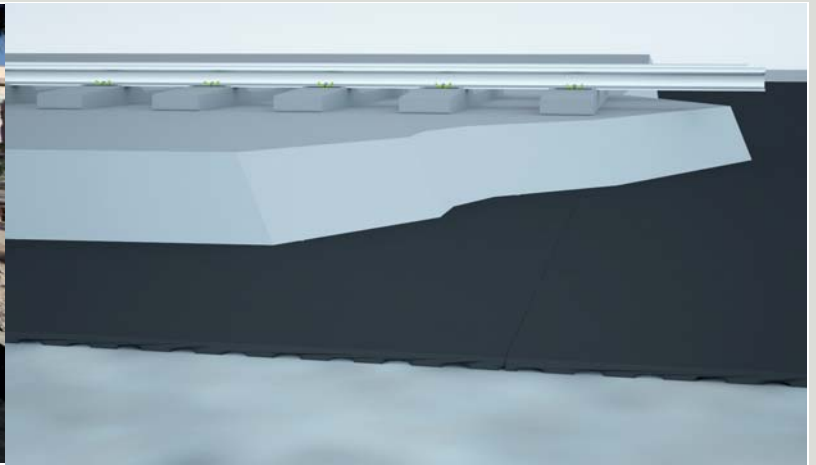
- Realisation of a planning of programmed visits to control the installation in situ
- Continuous attention to solve doubts and requests from the project manager
- Visits to work place out of program on request of the leadership of the work



RESULT ANALYSIS AND VERIFICATION

- Preliminary study: background vibration and vibration transmission through the ground and the structures
- Realisation of periodic inspections according to the work program to check the results during and after the installation of the supplied materials
- Final result verification and final tests after the service is launched





2. PRODUCT SPECIFICATIONS

GENERAL CHARACTERISTIC

The SILENZIA drV MN products are elastic mats made of recycled rubber elements specially designed for the reduction of vibrations caused by the railway traffic.

The SILENZIA drV MN mats make the different track superstructure elements totally independent each one from each other and from the ground, so that the vibrations caused by the rolling stock are attenuated.

SILENZIA drV MN created a high performance mass-spring-mass system through the displacement of the resonance towards very low frequencies.

SILENZIA drV/ MN uses recycled rubber from airplane tires. It can be highlighted as fundamental characteristic that because of quality requirements, this kind of tire has been much less stressed and thus, contains a higher proportion of natural rubber, around 60% more than the recycled rubbers from other typologies of tires. This characteristic provides better performances, with the same thickness and geometry, than our concurrence.



In our mat manufacturing process, a low aggression system is used during the polymerization of the polyurethane used as a resin to bind the rubber granules and fibers.

Unlike other processes which apply high temperatures to accelerate the fusion process, we reach that the polymerization is done in a more natural way and maintains the elastic properties of the raw products.

Our supply proposal includes not only the technical assistance of specialized engineers to solve any issues or concerns during the installation of the product. We enclose our specifications with actual test of the vibratory transmission before and after application of the product as warranty.

With all that we exceed the expectations of our customers both from the point of view of product and service delivery.

More the high reduction of vibrations, SILENZIA drV MN also provides the following properties:

- Acoustic transmission reduction,
- Resistance to oils and lubricants,
- Electric insulation,
- No putrefaction nor dust, etc.



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Cat alog of proposed products

Concret slab way

Mat Silenzia drV / MN / 25 / 10

Mat Silenzia drV / MN / 20 / 8

Mat Silenzia drV / MN / 15 / 7

Under ballasted way

Mat Silenzia drV / MN / 25 / 10

Mat Silenzia drV / MN / 20 / 8

MAIN TECHNICAL SPECIFICATIONS

	SILENZIA drV / MN 25 / 10	SILENZIA drV / MN 20 / 8	SILENZIA drV / MN 15 / 7
Composition	Recycled rubber elements bound with a PU resin. Black colour		
Presentation	Rolls (13000 x 1250) mm ² Plate (1700 x 600) mm ²		
Temperature of use (°C)	from -40 to +110 °C		
Thickness (mm)	25 ± 5 %	20 ± 5 %	15 ± 5 %
Density according to ASTM-F104 (kg/m ³)	650	650	650-700
Static load domain (MPa)	< 0.3		
Max. total load (MPa)	0.7	0.6	0.5
Max. occasional load (MPa)	3.5	3.0	2.5
Permanent Deformation (DIN and ISO 1856)	< 10 %		
Strength resistance accord. to ISO 37 (MPa)	> 0.5		
Elongation at break accord. to ISO 37 (MPa)	> 45%		
Hardness according to ASTM D2240	35 - 45 Shore A		
Creep at 0.3 MPa according to ISO 8013	< 1 % / dec. min.		
Creep at a 0.02 MPa 168 h	Recovering > 95 % in 30 min.		
Resistance to displacement DIN 45673-7	< 20%		
Internal damping factor	> 0.15		
Static stiffness (MN/m ³)*	4-25	5-30	6-40
Dynamic stiffness (MN/m ³)*	6-35	15-45	20-60
*Depending on loads, thickness and frequencies. Please consult the specifics values of each project.			

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OTHER TECHNICAL SPECIFICATIONS

Fire resistance according to ISO 11925-2

Fire resistance according to EN13501-1:2007

Water resistance according to DBS 918 071-1

Frozen resistance according to DBS 918 071-1

Resistance to thermal ageing
according to DBS 918 071-1 and DIN 53508

Fatigue resistance according to DIN 45673-7

Volumetric resistivity according to IEC 60093

$F_s < 150 \text{ mm in } 60 \text{ s}$

Cfl-s1

Variations $< 10\%$

Variations $< 10\%$

Strength resistance reduction $< 10\%$

Mass reduction $< 1\%$

Hardness increase $< 8 \text{ ShoreA}$

Reduction in elongation at break $< 20\%$

Variations $< 15\%$

$> 800 \text{ MW.m}$

PREPARATION

The SILENZIA drV mats are manufactured into standard rolls (only for standard widths and thickness lower than 10 mm to avoid high weights difficult to handle on site) or panels (usually $1,7 \times 0,6 \text{ m}^2$), but they can also be produced according to specific formats and sizes according to each need and to the track geometry, or pre cut in the plant, in order to facilitate transversal or longitudinal installations. The mats can also be easily cut in situ for any required adjustment.



For the lateral treatment, if any, SILENZIA drV must rely on the background horizontal mats and be fixed using an adhesive band or glue without dissolvent. A plastic film must be further extended above the mats to avoid the penetration of concrete or any other harmful element.

It is recommended to seal the top of the joint caused by the lateral side of the mat between the concrete slabs with an elastic cementitious mortar. In the case of ballasted track a 350 g/m^2 geotextile spread for the mats protection is indispensable.

SILENZIA drV is delivered in pallets and must be stocked in dry conditions.

The mat should be placed on a clean concrete slab or at least a ground compacted according to the project specification. In any case, all the surfaces should be clean and dry and in case of undulated mats, the undulations should be oriented downwards.