

Carriage floor mountings

for local and intercity passenger trains



Low life-cycle costs and higher travelling comfort



© Harald Eisenberger

ÖBB (Austrian Federal Railways) Railjet

Elastic mounted carriage floors

In order to reduce the life-cycle costs of railway carriages and increase travelling comfort, Getzner Werkstoffe has developed special solutions for the mounting of carriage floors.

Getzner's carriage floor mountings efficiently isolate vibrations. They protect carriages from undesirable vibrations during the journey: structural vibrations significantly decrease, which in turn extends the service life of a carriage and its components.

The challenge

Rough running surfaces and corrugated rails cause a severe strain on the carriage components and noise pollution for passengers, especially at high speeds. The bogie absorbs a large portion of excitation frequencies from the vehicle's undercarriage. The remaining vibrations, however, exit the floor construction and sometimes lead to considerable vibrations and secondary airborne noise.

Precisely in the area over the bogies, a particularly high noise level in the higher frequency range now and then arises. Various studies have shown that it is mainly the floors and the structures attached to them that convey these vibrations.

The solution

A professionally designed floor mounting made of elastic Sylomer® and Sylodyn® materials considerably reduces the vibrations and consequently the secondary airborne noise.

» An elastic carriage floor mounting dramatically increases travelling comfort. «

The results of the Getzner solution

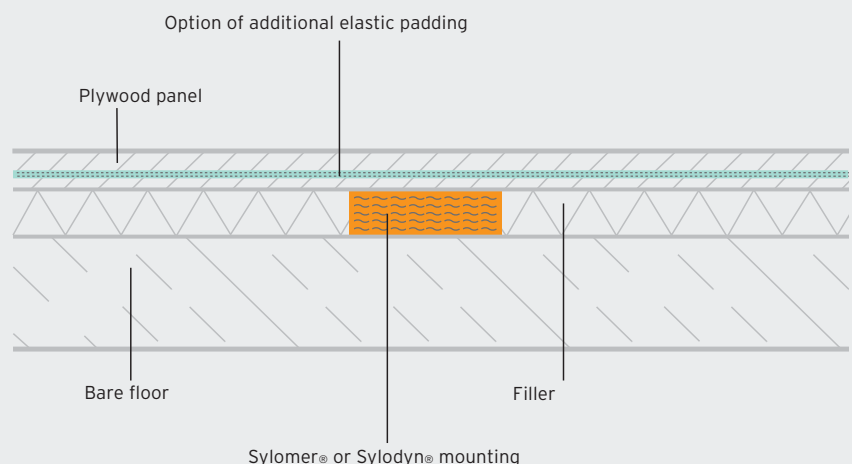
- Higher riding comfort
- Reduction of secondary airborne noise

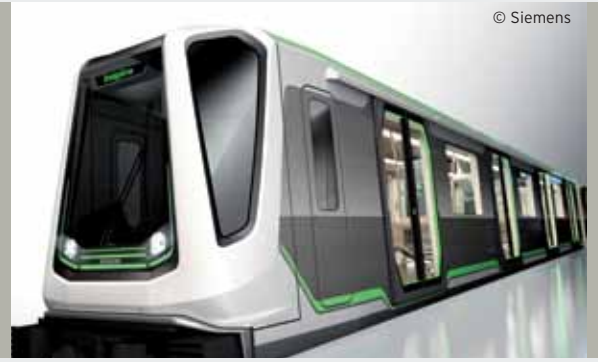
- Lower life-cycle costs
- Compensation for construction deviations during installation
- Improved working conditions for train staff
- Decoupling of sensitive components (e.g. driver's cab, toilets)

Getzner offers various product variants for the mounting of carriage floors:

- Full-surface mounting
- Strip mounting
- Point mounting
- Bond or composite mounting (combination of wood, aluminium, etc.)
- Compression-traction element mounting

Composite-bond mounting





Inspiro

Empirical values

The distributing frequencies depend on both the travelling speed and the layout and load points of a carriage. Thanks to many years of experience in the supervision of projects and the development of solutions, Getzner can recommend, depending on the field of application, the following thicknesses for an elastic floor mounting:

Trams	6 - 12 mm
Metro/underground	12 - 18 mm
Local rail	18 - 40 mm
Intercity rail	25 - 50 mm
High-speed	40 - 70 mm

The carriage floor mounting features made of Sylomer® and Sylodyn®

- Good creep resistance
- Excellent creep behaviour
- Hydrolysis-resistant
- A wide range of products for various load ranges
- Simple processing
- Low construction height
- Light weight
- Resistant against chemicals and oils
- Materials tested in accordance with the fire regulation standards CEN/TS 45545-2, DIN 5510-2, NF F 16-101 and TB 3139
- Bonding in accordance with DIN 6701-2

Sylomer® and Sylodyn®: tried and tested materials

The polyurethane materials Sylomer® and Sylodyn® made by Getzner are among the globally leading materials available on the market for vibration isolation. Their elasticity achieves a considerable, long-term reduction of undesirable vibrations.

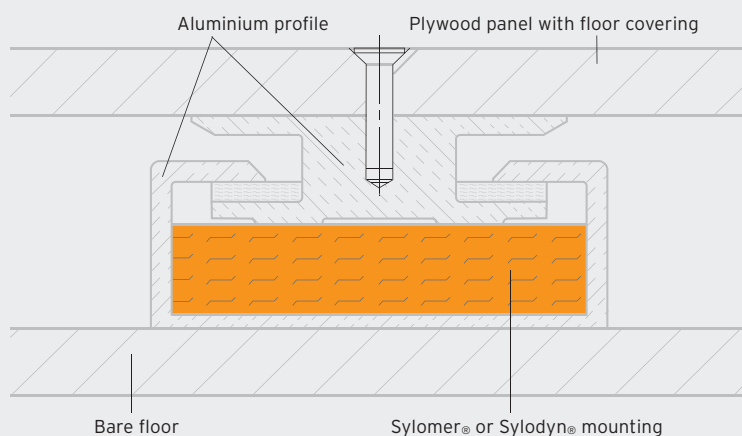
Fire performance

Both materials comply – depending on the type of material – with DIN 5510-2 or the new European standard EN 45545-2. Getzner has developed new flame-resistant materials especially for EN 45545-2, which achieve a Hazard Level (HL) rating of 2 for floor constructions (R9). Tests and classifications in accordance with the French standard NF F 16-101 and the Chinese standard TB 3139 are also available.

Creep resistance and resilience

The excellent creep resistance of Getzner's materials guarantees few deflections and have a very good resilience – even in the long term. This prevents water or cleaning agents from seeping into the floor construction causing damage, mould formation or unpleasant odours.

Compression-traction element mounting





Coradia



Zefiro 380

Performance range

Getzner's specialists work with customers to develop individually customised solutions. They also provide support with their expertise and experience during the construction of the carriage floor mounting.

- Calculation of the deflections of the elastic mounting
- Determination of the natural frequency and degree of isolation
- Support in the development-process of the floor construction and determination of the optimal and most cost-effective solution
- Representation of the time-dependent compression set
- Extensive information regarding the material's properties
- Online calculation tool FreqCalc for the initial material selection

Implementation of tests in order to determine the suitable material

- Testing of the static and dynamic creep resistance
- Testing of the coefficient of friction and attrition
- Testing of the tear resistance/ultimate elongation and tear propagation resistance
- Determination of the static and dynamic shear modulus
- Test of the creep behaviour – fatigue strength
- Bonding trials
- Fire tests
- Chemical analyses

Reference projects

MANUFACTURER	TRAIN TYPE	REGION	APPLICATION
Siemens	Railjet	Austria	Intercity/High Speed
Alstom	Coradia	Germany	Light rail
Siemens	Desiro	Europe	Light rail
Siemens	Inspiro	Russia/Poland	Metro
Bombardier	Itino	Germany	Light rail
Alstom	Coradia X61	Scandinavia	Light rail
Bombardier/Alstom	ET 422	Germany	Light rail
Bombardier	Zefiro 380	China	Intercity/High Speed
Siemens	Desiro RABe 514	Sweden	Light rail
BEML/Rotem	Movia	India	Metro
Siemens	ULF	Austria	Trams