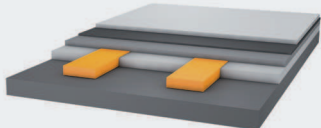


Floating Floors

for Local and Intercity
Passenger Trains



Low Life Cycle Costs and Greater Passenger Comfort



ÖBB (Austrian Federal Railways) Railjet

Elastic bearing of floating floors

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

Getzner's floating floors for rolling stock efficiently isolate vibrations. They protect carriages from undesirable vibrations during the journey: structural vibrations significantly decrease, which in turn extends the service life of the carriage and its components.

The challenge

Uneven running surfaces, corrugated rails and the drive motors place considerable stress on the carriage components and cause noise pollution for passengers and staff alike. The bogie absorbs a large portion of excitation frequencies from the vehicle's undercarriage. The remaining vibrations, however, move the floor construction and sometimes lead to considerable vibrations and secondary airborne noise.

» The elastic bearing of floating floors significantly improves passenger comfort. «

The solution

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

Fewer vibrations inside the vehicle not only improve conditions for passengers and staff, but an elastic bearing of floating floors also protects joints, electronic components and sanitary facilities. Isolating vibrations, and thereby reducing them, lowers life-cycle costs.

Calculated deflection

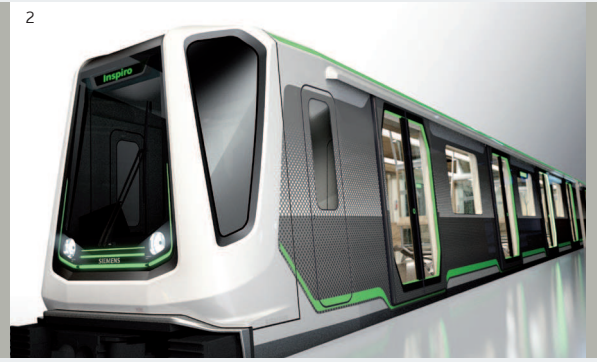
With Sylomer® and Sylodyn®, the majority of the deflection takes place right at the start of the installation process, which is in complete contrast to other materials, such as rubber. The materials are individually adapted for each load situation, thus ensuring that the deflection remains low and calculable over the entire service life of the carriage.



Empirical values

The disturbing frequencies depend on both the travelling speed and the layout and load points of a carriage. Depending on the application, Getzner recommends thicknesses of between 6 and 50 mm for an elastic floor bearing.

The greater efficiency of elastic floor bearings reduces the height of the floor construction. During installation the materials compensate for both longitudinal and lateral tolerances in the bare floor, without affecting the vibration isolation properties in any way.



Inspiro

The results of the Getzner solution

- Greater passenger comfort
- Less noise in the vehicle
- Minimal deflections over the entire service life
- Lower life-cycle costs
- Reduced floor construction height
- Lower energy consumption
- Tolerance compensation during installation

Features of floating floors made of Sylomer® and Sylodyn®

- Good creep resistance
- Excellent creep behaviour
- Resistant to hydrolysis
- A wide range of products for various load ranges
- Simple processing
- Low construction height and weight
- Resistant to chemicals and oils
- Materials tested in accordance with fire regulations DIN EN 45545-2, DIN 5510-2, NF F 16-101, NFPA 130 and JRMA

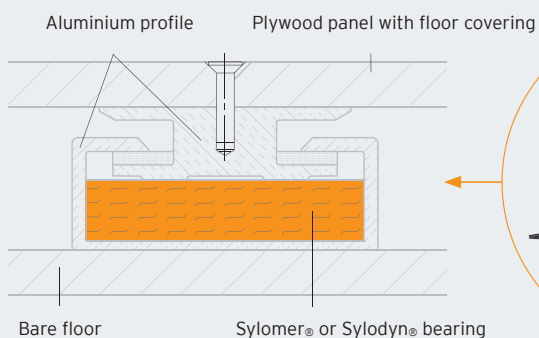
Sylomer® and Sylodyn®: tried and tested materials

The polyurethane materials Sylomer® and Sylodyn® from Getzner are among the leading vibration isolation materials on the international market. Their elasticity delivers a significant and long-term reduction in unwanted vibrations.

Flammability

Depending on the type of material, both materials comply with the new European standard DIN EN 45545-2. Getzner has developed new flame-retardant materials specifically for this standard that achieve a Hazard Level (HL) 3 rating for floor constructions (R10). Tests and classifications according to German DIN 5510-2, American NFPA 130 and Japanese JRMA are also available. Tests in line with French NF F 16-101 and British BS 6853 are currently being prepared.

Compression-traction element mounting



Creep behaviour and resilience

The exceptional creep behaviour and resilience of Getzner materials guarantee low deflections - even in the long term. They prevent water or cleaning agents from seeping into the floor construction and causing damage, mould or unpleasant odours. Maintenance intervals can be extended as a result.



Coradia



Zefiro 380

Pictures: 1 Harald Eisenberger,
2 Siemens, 3 Alstom
Transport TOMA - C.Sasso,
4 Bombardier

Performance range

Getzner's specialists work with customers to develop individually customised solutions. They also provide support with their expertise and experience in the design of floating floors for rolling stock.

- Calculation of the deflections of the elastic bearing from the time of installation to the end of the predicted service life of the train
- Calculation of the insulation rate and deflection when empty, under normal operating load and under maximum load
- Determination of the natural frequency and insulation rate
- Support in developing the floor construction and determining the optimal and most cost-effective solution
- Representation of the time-dependent compression set
- Support and guidance for bonding
- Online calculation tool/app FreqCalc for the initial material selection

Reference projects

MANUFACTURER	TRAIN TYPE	REGION	APPLICATION
Siemens	Desiro RUS	Russia	Intercity
Alstom	Coradia	Germany	Commuter services
Siemens	Desiro	Europe	Commuter services
Siemens	Inspiro	Russia/Poland	Underground
Bombardier	Itino	Germany	Commuter services
Alstom	Coradia X61	Scandinavia	Commuter services
Alstom/Bombardier	ET 430	Germany	Commuter services
Bombardier	Zefiro 380	China	Intercity/High Speed
CAF	RENFE - Type HT 65000	Turkey	Intercity/High Speed
BEML/Rotem		India	Underground
Siemens	ULF	Austria	Tram

International references

Due to the unique material properties of Sylomer® and Sylodyn®, together with the experience amassed over many years, Getzner Werkstoffe has already implemented countless projects all over the world. This applies to trams, underground systems, commuter service and intercity trains as well as high speed rail applications.

Implementation of tests in order to determine the suitable material

- Testing of the static and dynamic creep behaviour
- 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
- Testing of the creep resistance
 - fatigue strength
- Bonding trials
- Fire tests
- Chemical analyses