

# Case Study

## Elastic Bearings of Floating Floors in Hitachi High-Speed Trains (UK)



» Considerable increase in passenger comfort

» Reduction in vibrations and noise

» Greater safety due to the fire-retardant Sylomer® FR material



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# Increased Comfort that pays Dividends

## The project

The British Department for Transport has invested in new high-speed trains as part of the "InterCity Express Programme (IEP)" rail investment programme. High comfort levels were the focus of the project. Getzner's solution was elastic floating floors for rolling stock.

On long-distance lines around the world in particular, rail competes directly with air travel. The expansion of many high speed networks between important cities ensures that rail is seen as the better alternative to air travel in many cases. When choosing a suitable rail vehicle supplier, the British Department for Transport opted for manufacturer Hitachi Rail Europe, who is part of the Japanese conglomerate of the same name. This is because Hitachi trains with special floating floor solutions from Getzner offer major benefits in terms of vibration and noise reduction.

### Passenger comfort: a crucial sales argument

"Experience shows that travellers tend to opt for rail if, in addition to short journey times and punctuality, an appropriately high level of comfort is provided", confirms Tomoko Takekawa, Chief Executive Officer of Getzner Japan. 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. However, the remaining vibrations move the vehicle body and subsequently the floor construction, which can lead to considerable vibrations and secondary airborne noise.

Thus, Getzner was tasked with effectively reducing the floating floor vibrations. Getzner was the ideal choice for Hitachi owing to the company's extensive experience in this area.

### Advantages

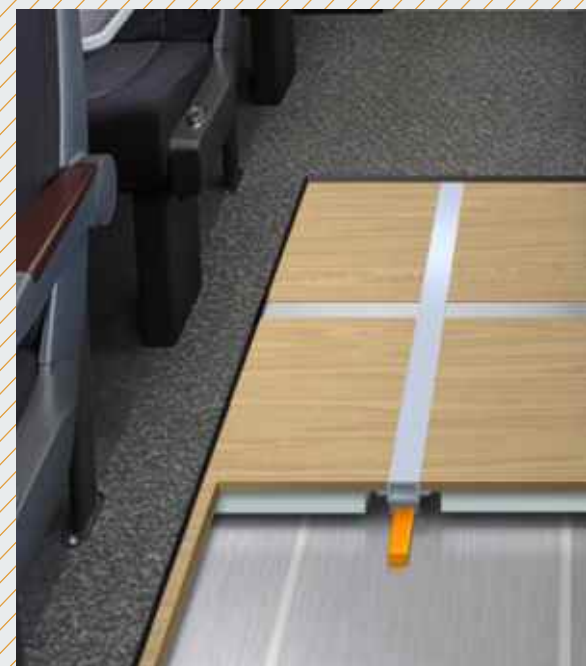
- Considerable reduction in vibrations and noise in the carriage interior
- Increased comfort for passengers
- Less wear of the carriage construction and thus reduced maintenance costs
- Minimal deflections over the entire service life
- Simple processing of the material
- Tolerance compensation during installation

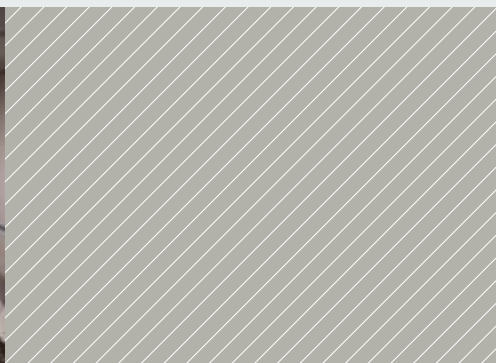
## The Getzner solution

### Reduced noise and wear

Getzner bearings for floating floors guarantee a more peaceful atmosphere in the train interior. "Our high-tech elastomers are highly effective despite their low overall height, and can therefore be relied upon to meet the required noise levels in the passenger carriages", explains Tomoko Takekawa.

"The elastomers minimise the transfer of vibrations to the interior fittings, the structure and the electronic components. Not only does this signif-





Getzner is equipping all trains manufactured for the programme between 2014 and 2018 with bearings for floating floors

Greater comfort for passengers

» *Getzner floating floors are consistent with the standards that we employ during train construction.*

ificantly reduce noise, but also wear. In summary, elastic bearings lower maintenance costs." This is a key sales argument for manufacturers of rail vehicles and rail operators.

**Elasticity with added safety**

The fact that the polyurethane materials Sylomer® and Sylodyn® from Getzner are among the leading vibration isolation materials on the international market is not only reflected in their effectiveness in reducing vibrations and noise. The elastic bearings in the floating floors of the new

Hitachi trains are made of the fire retardant material Sylomer® FR. This achieves a Hazard Level (HL) 3 rating for floor constructions (R10) and meets the European requirements of the DIN EN 45545-2 fire protection standard for rail vehicles. Tests and classifications according to German DIN 5510-2, American NFPA 130 and Japanese JRMA are also available.

**Extensive experience in the bearing of floating floors**

However, the reason for the collaboration with Getzner was not just down to the materials. Lukas Tschann, Project Manager at Getzner explains the reasoning behind the decision: "We won the contract due to the exceptional performance of our materials, our extensive experience in equipping rail vehicles and because our solution was the most cost-effective. Other significant factors were our international references in this sector and the external assessments that demonstrated the high level of effectiveness and exceptional long-term behaviour of our materials."

**The largest order in the company's history**

The four-year contract includes the supply and the design of approximately 78.000 elastic strips of the material Sylomer® FR. This means that until 2018, Getzner will be equip-

ping all trains manufactured for the "InterCity Express Programme" with vibration-isolating floating floors. It is the largest project for equipping floating floors with Sylomer® FR material since Getzner was founded.

**Feedback**

"The floor system is an important aspect of the new Hitachi 800 train series, with respect to increased passenger comfort and safety requirements. We are looking forward to continuing our partnership with Getzner and the long-term supply of materials for the floor system. Getzner is able to tailor these materials perfectly to customer requirements, and the company's high-quality products are also consistent with the standards that we employ during train construction."

Jamie Foster, Procurement Director at Hitachi Rail Europe





## Facts and figures

### Floating floors for rolling stock - "InterCity Express Programme (IEP)"

Client:	Hitachi Rail Europe
Connection:	Great Western Main Line from 2017 East Coast Main Line (Phase I and II) from 2018
Implementation:	2014-2018
Scope:	Supplying and designing of approximately 78.000 elastic strips of Sylomer® FR (conforming to the DIN EN 45545-2 fire protection standard for rail vehicles)
Getzner Project Manager:	Lukas Tschann

### Getzner Werkstoffe GmbH

Founded:	1969 (as a subsidiary of Getzner, Mutter & Cie)
Chief Executive Officer:	Jürgen Rainalter
Employees:	240 in Bürs, 100 abroad
2015 turnover:	77,9 million euros
Business areas:	Railway, construction, industry
Headquarters:	Bürs (AT)
Locations:	Munich (DE), Berlin (DE), Stuttgart (DE), Lyon (FR), Amman (JO), Tokyo (JP), Pune (IN), Beijing (CN), Kunshan (CN), Charlotte (US)
Ratio of exports:	85 percent

Photo credits: Hitachi Rail Europe Ltd.