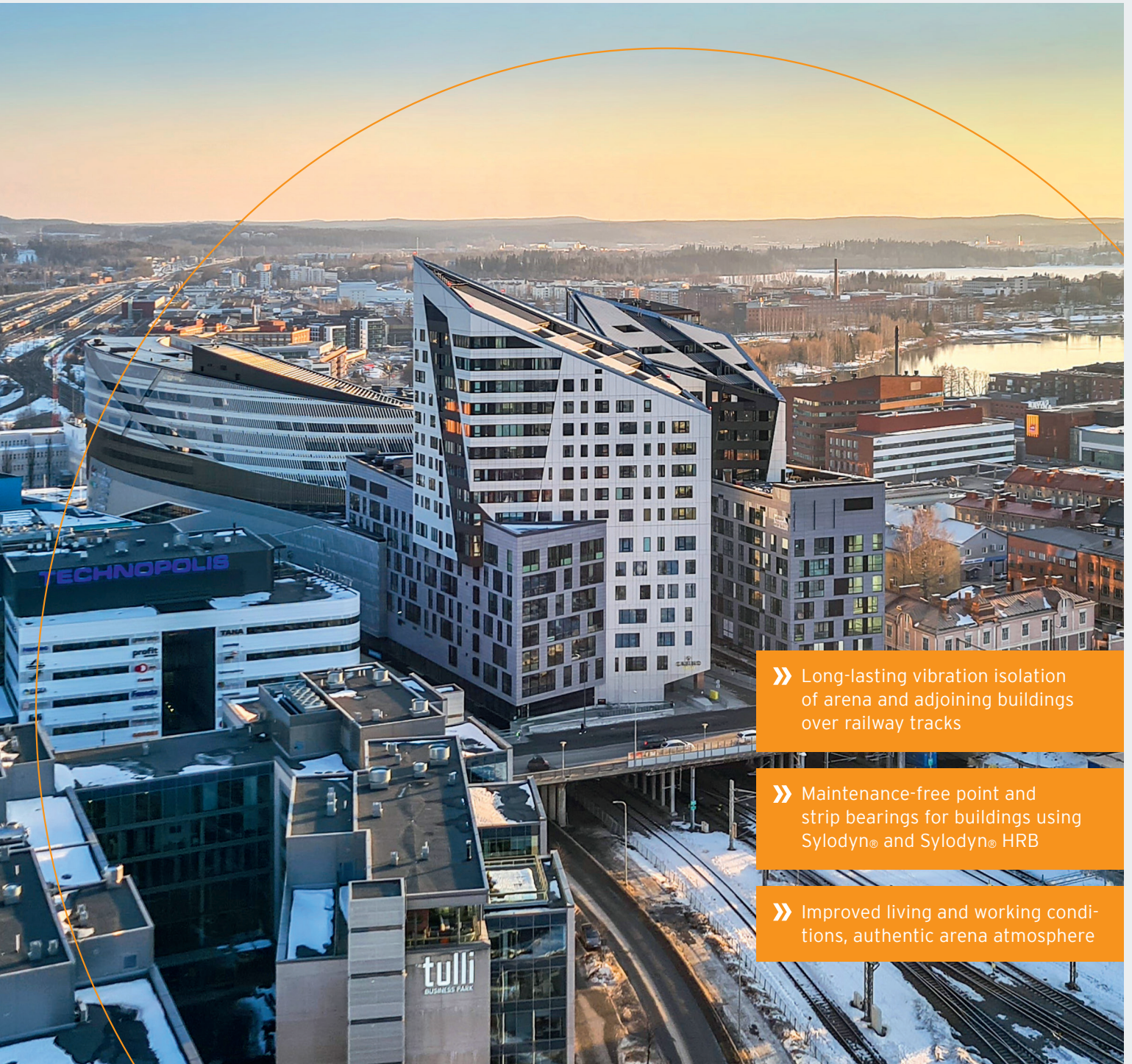


Case Study

Resilient bedding of the NOKIA Arena in Tampere (FI)



» Long-lasting vibration isolation of arena and adjoining buildings over railway tracks

» Maintenance-free point and strip bearings for buildings using Sylodyn® and Sylodyn® HRB

» Improved living and working conditions, authentic arena atmosphere

Continuous, maintenance-free vibration isolation

The project

The NOKIA Arena building complex – located directly above railway tracks

The arena in the city of Tampere in the south-west of Finland was designed by Daniel Libeskind. It serves as a venue for ice hockey matches and concerts and can accommodate up to 15,000 spectators. A concrete slab forms the foundations of the entire complex, which consists of the arena, a hotel and two adjoining residential tower blocks. Four railway tunnels run under the slab. Part of the hotel is located on top of the arena.

To protect the arena from the vibrations caused by trains passing underneath and to offer high-quality living and working conditions in the hotel and the towers, all the buildings had

to be acoustically decoupled from the concrete slab. Part of the hotel is attached to the arena via pairs of pillars, which means it also needed to be isolated from the arena.

This poses a particular challenge: the extremely high point loads of up to 7,000 kN exerted on the pillars. In addition, the climate in Tampere is very harsh and it can be bitterly cold in the winter. One of the reasons that a decision was taken early in the project to opt for the decoupling expertise and solutions offered by Getzner were the company's excellent references in building isolation projects. After all, the elastic bearing has to function reliably for decades, as swapping it out at a later date is not an option.

The Getzner solution

Point and strip bearings for extreme loads in confined spaces

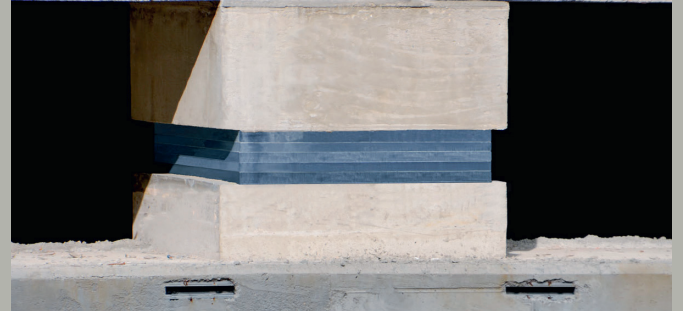
Point loads of up to 7,000 kN, temperatures as low as -30 °C and top performance over the long term: the HRB HS series from Getzner was the only solution on the market capable of meeting these stringent requirements. The highly resilient Sylodyn® bearings provide the necessary mechanical rigidity and a good degree of elasticity. Over an extended period they can reliably decouple structures subjected to loads as high as 12 N/mm².

Customised solution for a special situation

The pillars of the building are completely decoupled from the concrete



Challenging vibration isolation design: the hotel is attached to the arena using separate, decoupled pairs of pillars – as seen on the left of this photo. The hotel rests on the left side of each pillar, the arena on the right.



The railway lines underneath the complex are very busy. A prerequisite for ensuring that the complex could be used as envisaged was the complete decoupling of all parts of the building.

The 'High Resilient Bearing' (HRB) series from Getzner takes up very little space yet provides load transmission figures of up to 12 N/mm² to provide effective vibration protection.

slab by point bearings, while the walls are equipped with strip bearings. Stairwells and lift shafts penetrate the concrete slab right down to track level. The differing levels over which the structures had to be decoupled demanded a lot of the Getzner specialists during the planning of the vibration isolation, explained Andreas Wenz, a project engineer at Getzner Werkstoffe: "The unusual foundation configuration of the NOKIA Arena complex posed numerous challenges for us when designing the isolation solution. At some locations on the tower walls we had to provide three separate bearing points for multi-axis loading conditions." To compensate the tensile loading of the pillars, customised bearing designs occasionally had to be planned.

While installing the bearings, pre-stressed elements were used to take account of the enormous weight that would be placed on the pillars when the structure is complete.

Decoupled as planned

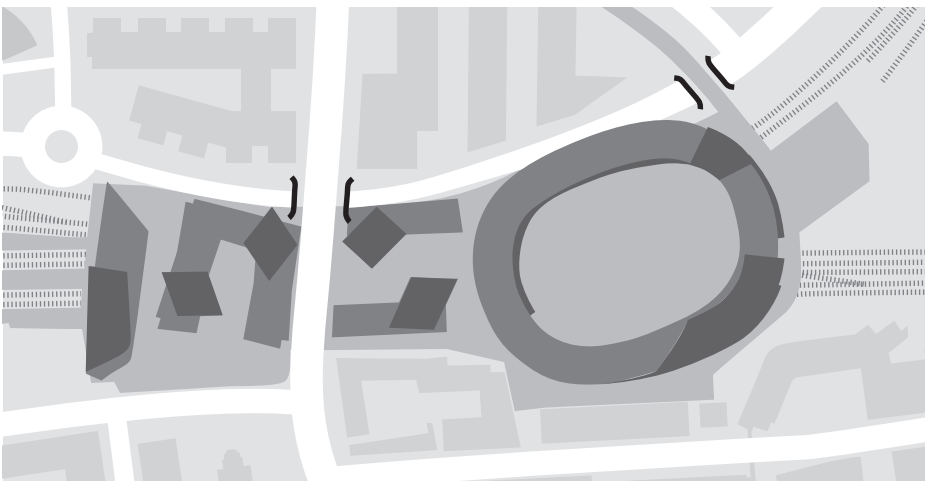
The elastic bearings were installed by the SRV Group. Two of the partners in the project, Christian Berner and Akukon, oversaw the installation of the critical decoupling components. All the hard work paid off: measurements taken retrospectively confirmed that the stringent requirements of the client were fulfilled as expected.

Feedback

What does the acoustic consultant have to say about the project?

„The solution that Getzner provides for the elastic shielding of buildings is as unique as the construction project itself. I'm proud that we were able to make such a significant contribution to this prestige project.“

Tuomas Laitinen
Christian Berner



In its final configuration, the complex will have three further towers added – as shown on the left of the diagram.

Facts and figures at a glance

Building complex:	Arena with space for up to 15,000 spectators, hotel on top, two residential/office blocks
Location:	Centre of Tampere, Finland
Vibration isolation:	Getzner Werkstoffe GmbH
Solution:	Point and strip bearings of type Sylodyn® and Sylodyn® HRB HS in various dimensions and with natural frequencies of 10 to 14 Hz
Implemented:	2016-2021
Client:	SRV Group
Investors:	City of Tampere, SRV, Lähi Tapiola, OP, Ilmarinen
Implementation of building bedding:	SRV Group
Acoustic consultants:	Akukon Finland
Implementation planning:	Ramboll Finland

Getzner Werkstoffe GmbH

Founded:	1969 (as a subsidiary of Getzner, Mutter & Cie.)
Chief Executive Officer:	Ing. Jürgen Rainalter
Business areas:	Railway, construction, industry
Headquarters:	Bürs (AT)
Locations:	Beijing (CN), Munich (DE), Berlin (DE), Stuttgart (DE), Lyon (FR), Paris (FR), Pune (IN), Tokyo (JP), Charlotte (US), Melbourne (AU)

Referenzen (Auszug)

- Southbank Place, London (UK)
- The Rushmore Building, New York (US)
- “Four Suns” luxury residential complex, Moscow (RU)
- Central & Park Panorama Towers in Arnulfpark, Munich (DE)
- New 5-storey apartment block, Munich (DE)
- Drachen-Center, Basel (CH)
- National Training Centre, Tokyo (JP)
- Hotel am Potsdamer Platz, Berlin (DE)
- Music Hall, Helsinki (FI)
- Oslo Opera, Oslo (NO)
- BMW-Welt, Munich (DE)
- Welfenhöfe, Munich (DE)