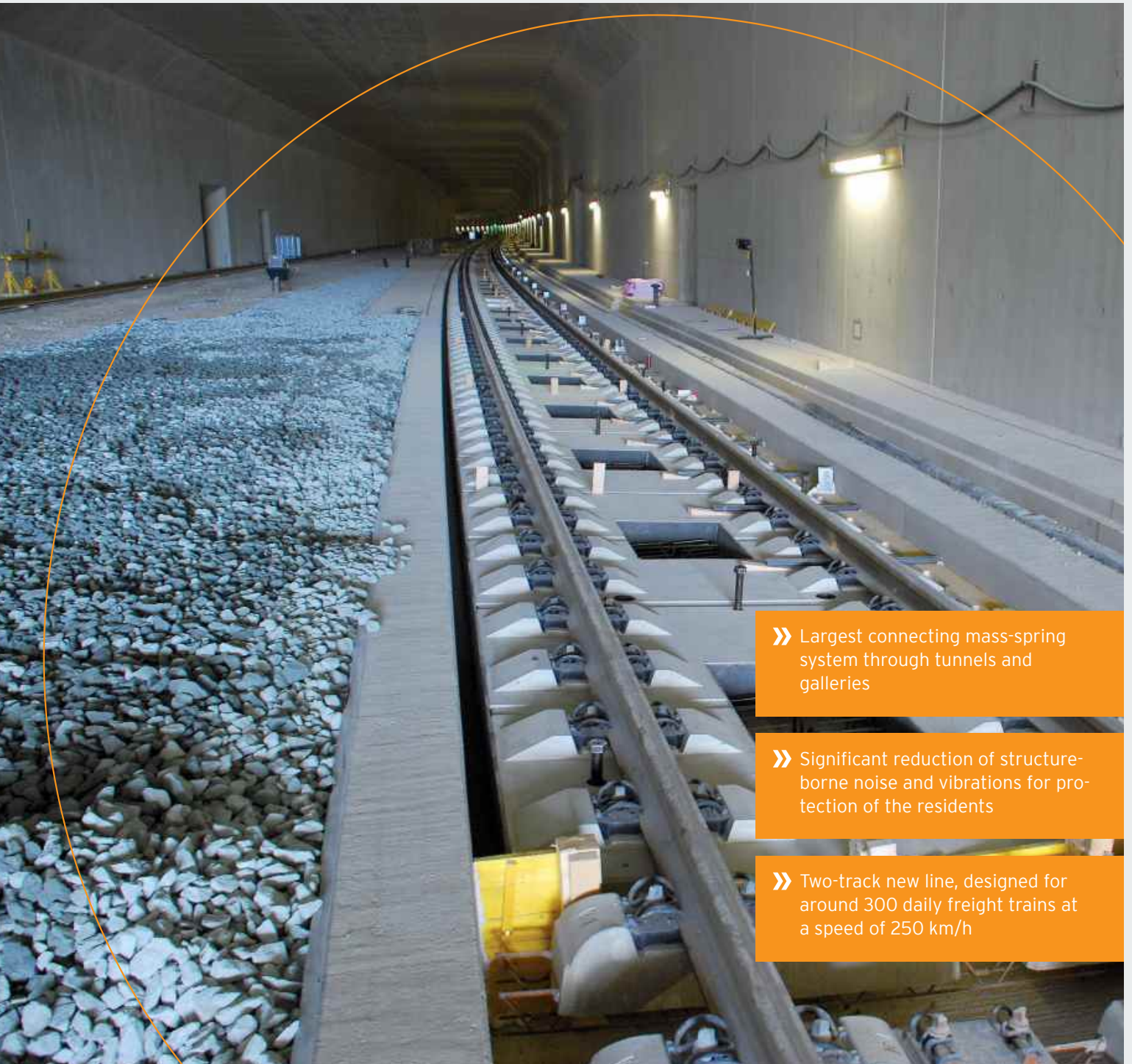


# Case Study

## Northern Approach Line to the Brenner Base Tunnel



» Largest connecting mass-spring system through tunnels and galleries

» Significant reduction of structure-borne noise and vibrations for protection of the residents

» Two-track new line, designed for around 300 daily freight trains at a speed of 250 km/h

# Largest continuous Mass-Spring System for Structure-Borne Noise and Vibration Mitigation

## Project description

### Expansion of the Brenner rail axis - Easing of traffic in the region

The Brenner Base Tunnel (BBT) is a joint Austrian-Italian project aimed at the construction of a railway tunnel for passenger and freight transport through the Brenner Pass. It passes under the Tyrolean Alps along the axis from Innsbruck (A) to Bolzano (I) and is part of the high-speed railway line from Berlin to Palermo, which covers a total distance of 2,200 kilometers. At a length of 55 kilometers, it is the second longest railway tunnel in the world after the Gotthard Base Tunnel.

An invitation to tender was issued for a high-efficiency solution for vibration and sound mitigation for the northern approach line to the BBT running through the Unterinntal valley. The primary objective of the project was an easing of traffic for the section between Kundl/Radfeld and Baumkirchen. The newly constructed double-track rail line is designed for

speeds of up to 250 kilometers per hour. Accordingly, the requirements for vibration and noise mitigation are highly demanding. Between 260 and 300 trains - primarily freight trains - are expected to travel on the approach line each day once it goes into service in 2012.

Thanks to its high level of expertise and over 40 years of experience in the development of high-performance, high-efficiency mass-spring systems, Getzner Werkstoffe was commissioned to deliver elastomer bearings for the mitigation of vibrations and structure-borne noise. The noise and vibration mitigation measures that have been implemented protect local residents and businesses from the adverse effects of vibrations and audible structure-borne noise. This will make a long-term contribution to protecting the environment in these regions, which are impacted by heavy transport, and help to preserve it for future generations.

## Getzner's solution

### Unterinntal railway receives high-efficiency vibration mitigation

The northern approach line to the future Brenner Base Tunnel was fitted with the largest continuous mass-spring system for structure-borne noise and vibration mitigation which has ever been installed on a rail transport route. Roughly 80,000 square meters of high-efficiency mass-spring systems with Sylomer® and Sylodyn® elastomer bearings were installed in the sections of the approach line that runs through tunnels and avalanche screens, which account for around 32 of the total 40 kilometers. The precise calibration of the static and dynamic properties of the various bearing types ensured optimal efficiency (damping efficiency) that meets the specific requirements at each point along the line. This resulted in a significant reduction of structure-borne noise and vibrations.





### Getzner Werkstoffe: Developer, manufacturer and application consultant

**G**etzner Werkstoffe is more than just a developer and manufacturer of highly elastic materials for vibration mitigation. The company is also a competent, experienced consultant in application-related issues in the field of vibration engineering.

Getzner's experts are from the very beginning, actively involved in materials and system development and the realization of projects. Collaboration begins with the definition of specific framework conditions and generally continues all the way through to the joint development of innovative solutions. Getzner's technical expertise

in the field of vibration mitigation allows the company to engineer intelligent system solutions using elastic polyurethane materials. The mutual goal of the project partners is always to find the optimal mix of cost efficiency, feasibility, noise and vibration mitigation, and a comfortable environment for working and living.

### Feedback

#### What does the client have to say about the project?

"The engineers from Getzner Werkstoffe were extremely competent and motivated during the realization of the approach line to the Brenner Base Tunnel. We were highly impressed by their specialized knowledge in the field and the fact that they know their product inside and out. A key requirement for the consortium was to have a partner who we could collaborate with to solve problems and who expertly implements its high-tech product. Getzner fully lived up to these expectations."



EMBA-HSG,  
project manager  
Robert Kumpusch  
for ARGE Alptransit Brenner



## Key data for the Brenner northern approach line



Client:	ARGE Alptransit Brenner: Rhomberg Bahntechnik and Alpine Bau
Completion of railway equipment installation:	by 2012
Length:	40 km, 32 km of which run through tunnels, troughs or snow sheds
Maximum speed upon completion:	250 km/h
Track superstructure dimensions:	load class E5
Solution:	full-surface and discrete mass-spring systems
Materials used:	around 80,000 m <sup>2</sup> of high-efficiency mass-spring systems from Getzner (approximately 73,000 m <sup>2</sup> of which employ full-surface bearings, approximately 6,000 discrete bearings)
Capacity:	around 260-300 trains a day assuming the maintenance concept is adhered to

### Getzner Werkstoffe GmbH

Foundation:	1969 (as a subsidiary of Getzner, Mutter & Cie)
Managing Director:	Ing. Jürgen Rainalter
Employees:	212 in Bürs, 87 abroad
2011 turnover:	EUR 56.2 Mio.
Business areas:	Rail, construction, industry
2011 output:	7,209 tonnes of technical PU materials
2011 recycling:	51 tonnes of residual PU materials
Locations:	Bürs (AT), Munich (DE), Berlin (DE), Amman (JO), Tokyo (JP), Pune (IN), Beijing (CN), Kunshan (CN)
Ratio of exports:	80 percent

### References in railway construction (excerpt):

- Austrian Railways, Vienna-St. Pölten: Lainzer Tunnel
- Austrian Railways, Linz-Salzburg: Römerberg Tunnel
- Austrian Railways, Innsbruck-Bregenz: Zammer Tunnel
- Deutsche Bahn AG, Berlin: North-South Tunnel
- Deutsche Bahn AG, Cologne-Chorweiler
- Deutsche Bahn AG, Leipzig City Tunnel
- Swiss Federal Railways, Zurich-Thalwil: Zimmerberg Tunnel