

Case Study

Elastic bearing of the Ankara - Sivas high-speed line



» Lower maintenance costs
thanks to reduced wear

» Increased safety and availability by
protection of the superstructure

» Higher acceptance due to
efficient vibration protection

Increased route availability for the 'Middle Corridor'

The project

Turning a twelve-hour journey into two

The 'Middle Corridor' along the New Silk Road connects Türkiye with Georgia and Azerbaijan. Between the capital Ankara and the city of Sivas in the Central Anatolia region, the Turkish railway company TCDD has built a new, double-track high-speed line for passenger and freight services as part of this corridor. It is scheduled to open in 2023.

The new construction will not only reduce the journey time from Ankara to Sivas from twelve hours to around two, but the route length will also be shortened by around 200 kilometres to 406 kilometres. Trains will travel along the line at speeds of up to 250 km/h.

Various Getzner solutions were installed in two construction phases from 2018 to 2022 in order to reduce maintenance costs in the long term and increase track availability.

The quick and easy to install under ballast mats and side mats sustainably reduce the need for maintenance on the new high-speed line.

The Getzner solution

Low wear in heavily loaded areas

The Ankara - Sivas line passes over numerous bridges and viaducts, and more than 10 per cent of it leads through tunnels. In addition to the many high-speed turnouts, the transitions from open track into a tunnel or onto a bridge represent a particular challenge in terms of the level of required maintenance. The different stiffnesses of the substructure and the uneven settlement behaviour lead to high dynamic loads at these points. This generates increased ballast wear, which can result in cavities between the sleeper and ballast, and even to cracks or fractures in the sleepers.

Lower maintenance costs and increased safety

In order to reduce wear on these heavily used sections, the customer opted

for durable polyurethane solutions from the market leader - not least because of the fast delivery time that Getzner was able to ensure for the large quantities of products required. Furthermore, the Getzner solutions are also tested according to current European DIN and EN standards.

Around 350,000 m² of under ballast mats and about 150,000 under sleeper pads were used to protect the superstructure. "Our products protect the ballast, helping to minimise wear in superstructure components. This will reduce the need for maintenance, in particular at turnouts and transitions, and therefore significantly increase line availability," explains Ismail Bayrak, Project Manager for Getzner. Mass-spring systems provide optimum vibration protection on 20,000 m² of slab track. The fulfilment





Under sleeper pads protect the ballast, improve the track stability and extend the service life of the superstructure.

Thanks to the full-surface mass-spring systems, vibrations on the high-speed line are noticeably and audibly reduced.

of the specifications required by the customer was confirmed for all materials by the technical universities of Munich and Innsbruck.

Comprehensive support

"For decades, it has been really important to us that our partners get the best possible support when installing our solutions. That's why, in addition to tools such as mat welding equipment, we also offer other services like online training. And, if needed, we can also visit the site in person to provide assistance," explains Ismail Bayrak.

The experts from Getzner Werkstoffe supported the project from the initial detailed planning and model and forecast calculations using the finite element method through to the preparation of installation plans, on-site supervision and acceptance.

All aboard for sustainability

Particular attention has been paid to environmental compatibility: Almost all Getzner materials were transported using intermodal transport by rail from Austria to Türkiye. "We are always looking for ways to reduce our carbon footprint. In addition to organising alternative transport routes, this also includes our sophisticated recycling concepts and self-generated electricity," explains Ismail Bayrak, adding: "The durability of our products and the extended life of the superstructure are two other important aspects that contribute to sustainability."

Feedback

What does the customer have to say about the project?



"An innovative approach was taken to this high-speed project. On various sections of the track - including the transition areas - we used under ballast mats, mass-spring systems and under sleeper pads. The elasticity of the Getzner products brought the stiffness of the tracks to the desired level. Our goal is to significantly reduce maintenance costs. Throughout the entire construction phase, Getzner worked closely with the project team to overcome the challenges posed by things like the harsh weather conditions along the line. In doing so, Getzner used the expertise of its experienced employees."

Onur Agin

Railway Systems Engineer,
Railway Construction Department, TCDD





Facts and figures

Route:	Ankara - Sivas railway line, Türkiye
Length:	406 km
Vibration isolation:	Getzner Werkstoffe GmbH
Solution:	Approx. 150,000 track and turnout sleeper pads, approx. 350,000 m ² of under ballast mats, approx. 20,000 m ² of mass-spring systems
Project support:	Detailed planning, model and forecast calculations using FEM, on-site supervision, quality assurance, acceptance
Implemented:	2018-2022
Customer:	1 st construction phase Yapı Merkezi İnşaat ve Sanayi A.Ş. 2 nd construction phase Doğu İnşaat ve Ticaret A.Ş.
Operating company:	TCDD, Türkiye Cumhuriyeti Devlet Demiryolları

Getzner Werkstoffe GmbH

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

High-speed line references (extract)

- Çerkezköy - Kapıkule, Turkey
- Yerköy - Sivas, Turkey
- Kayaş - Yerköy, Turkey
- LGV Est, France
- HONAM HSR, South Korea
- Bologna - Firenze, Italy
- Rome - Naples (Roma - Napoli), Italy
- Vilagarcía del Padrón, Spain
- JR West and JR East, Japan
- Hannover - Würzburg, Germany