

# Rail Pads



# 1 | Reducing Life Cycle Costs, Loads and Emissions





## Reducing railway super-structure costs

Passenger traffic and freight traffic are both enjoying worldwide growth. The more traffic there is on a given route and the greater the tonnage transported over it, the sooner wear of the superstructure components sets in.

Compared with straight sections of track, this wear manifests itself very quickly, particularly in tight curves and on routes carrying heavy traffic. Adopting the correct measures for long-term cost reductions and extending the service life of the track reduces the life cycle costs of the superstructure significantly.

### Lowering the life cycle costs of railway track

When it comes to reducing the life cycle costs of railway track, the outgoings associated with maintenance, repair and possession are always at the forefront. How long a section of track can be used depends above all on the condition of the superstructure. Special attention has to be paid to the most heavily loaded components: ballast, sleepers and elastic rail pads.

Getzner Werkstoffe has developed a range of high-performance elastic rail pads for all stiffness requirements and various application areas - from trams through standard-gauge railways to heavy haul lines - that are available in many different versions.

### Elastic rail pads - lower loads and emissions

In addition to a sustainable life cycle strategy, the requirements placed on a modern rail network also include effective protection against vibration and structure-borne noise. Specially equipped rail fastenings with outstanding dynamic damping properties reduce vibrations right at their source. Getzner elastic rail pads possess a defined stiffness and demonstrably increase the elasticity of the track superstructure. Improved load distribution results in a more comfortable ride and less wear and tear of the superstructure. The higher level of elasticity also contributes towards the quiet running of the rolling stock, helping to meet today's acoustic requirements - after all, railway lines and residential areas are moving ever closer together.

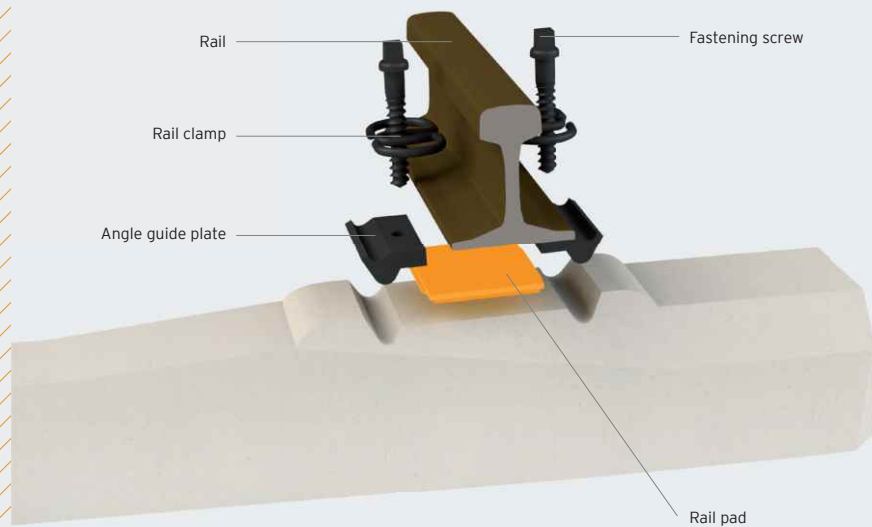
## 2 | Elastic Rail Pads from Getzner



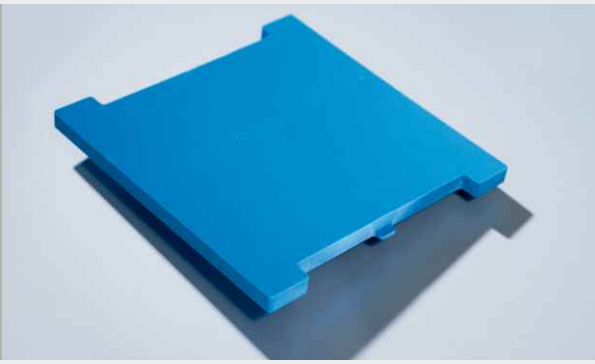
Zw 700a

### Properties of Getzner rail pads

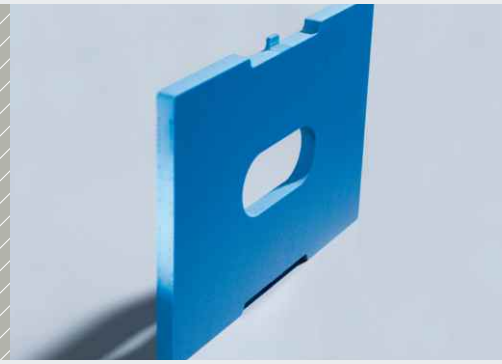
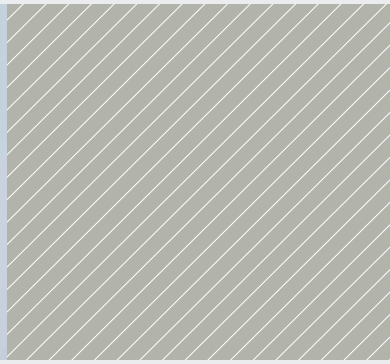
- High mechanical loading capacity and defined elasticity
- Outstanding performance over a long period
- Standard materials with a stiffness of between 30 and 200 kN/mm - depending on application and geometry
- Compatible with other supports from various manufacturers
- Satisfies all the testing criteria laid down in the relevant standards



Schematic showing a support with an elastic rail pad



Zw 900b



Zw 1000

## Arguments for Getzner rail pads

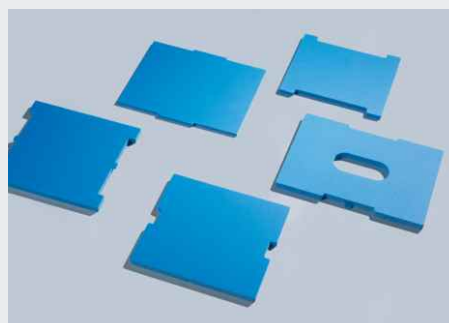
### Reducing life cycle costs

- Longer service life for rail pad and superstructure components
- Less wear of rails, sleeper and fastening (rail breakages, working of the rail into the sleeper etc.)
- Less rail corrugation on the railhead (short and long wave)
- Longer maintenance intervals
- Fewer possessions and service disruptions, hence greater track availability

### Lower loads and emissions

- Vibration damping effect
- Reduction of forces acting on superstructure
- Decrease in acoustic emission thanks to improved contact surfaces between wheel and rail (less corrugation on the railhead)

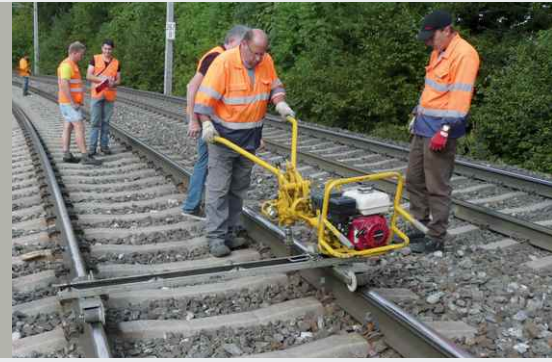
### Can be retrofitted during maintenance and repair



Types of rail pads



# 3 | Rail Pads in Tight Curves



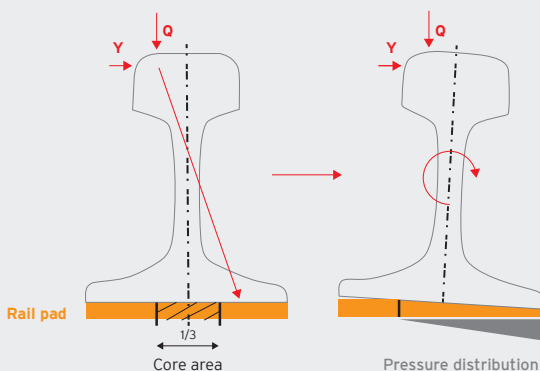
## High-end solution for tight curves

In order to be able to route a line so that it follows the terrain as closely as possible, the topography of many countries dictates that a high proportion of the track has to be laid with tight radii - a factor that places an additional load on the track structure.

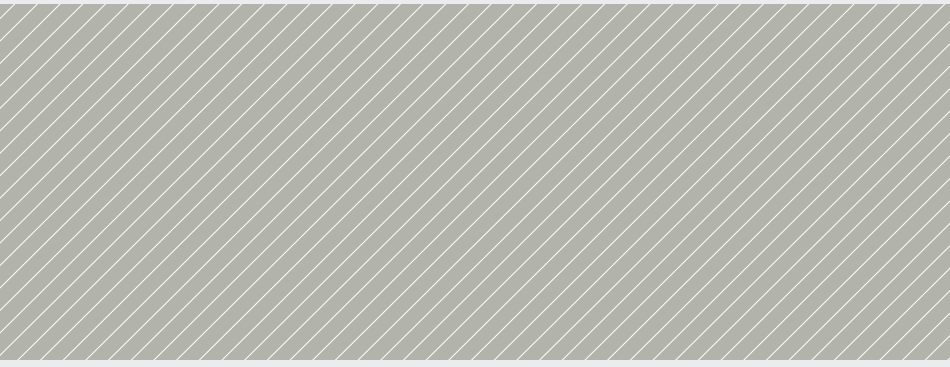
The resulting lateral forces and bending moments in the curves cause a disproportionately high increase in the load placed on track components. In tight curves with a radius of less than 600 m and traffic volumes of at least ten million tonnes a year, increased wear of the elastic rail pads is apparent on both sets of rails - on main lines and

branch lines. The quality of the track bed deteriorates significantly, particularly on the outer rail, as the wear of the rail pads averages out at around 20 percent higher. The rails on the inside of the curve frequently exhibit long wave rail corrugation. Track worn in this way can also be up to 15 dB(A) louder.

Another negative effect: worn rail pads cause the rails to work into the sleeper and result in damage to the fastening system and the rail bed areas. Damage like this reduces the service life of the superstructure significantly.



Tipping of the rails often occurs in curved track, as the resultant of the vertical (Q) and lateral forces (Y) lies outside the core area of the rail pad.



Rail corrugation (long wave)



## Counteract damage, increase service life of superstructure

Reducing the stiffness of the track structure using elastic rail pads (with a stiffness of up to 200 kN/mm) protects all fastening components, the rails, the sleepers and the substructure.

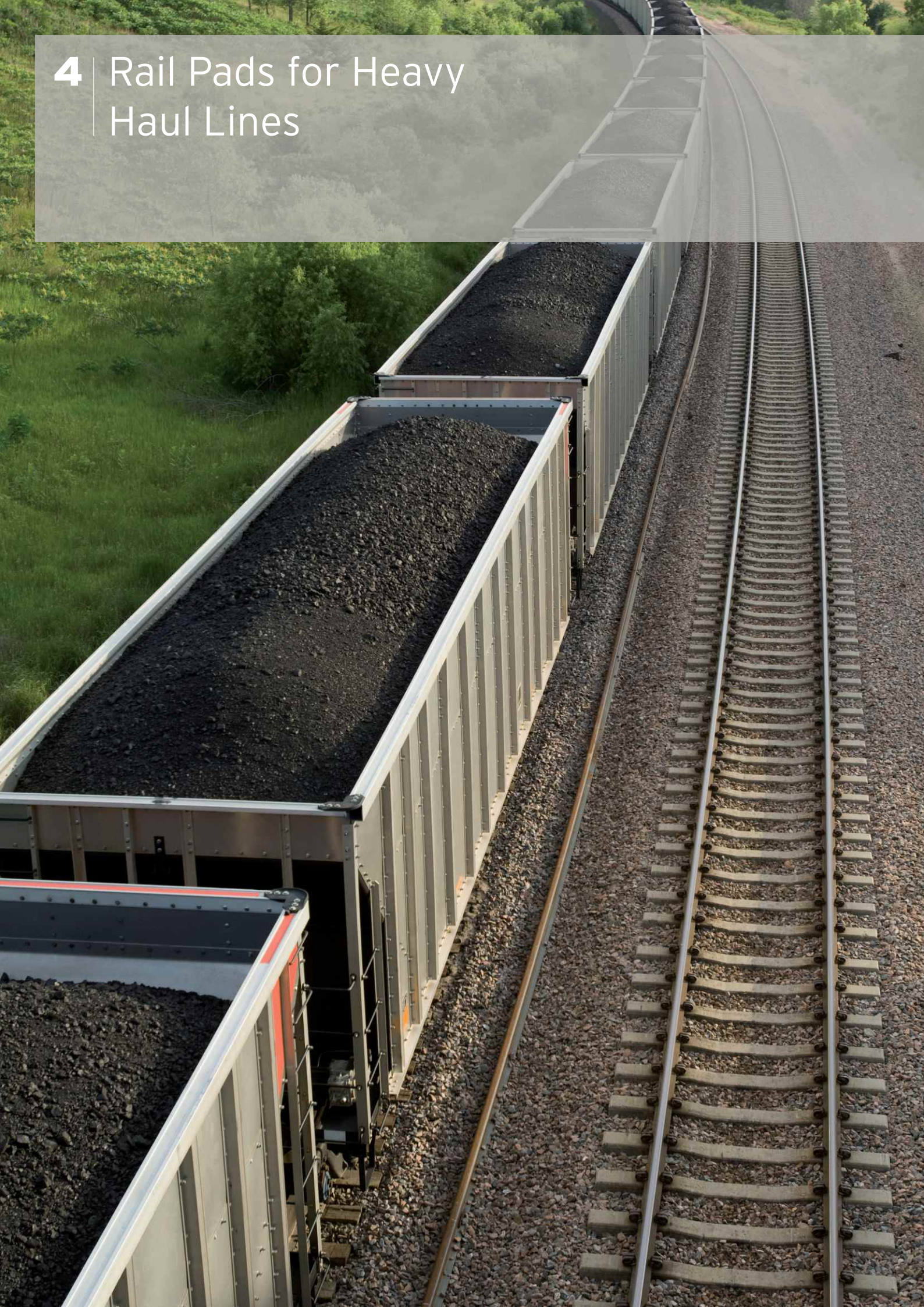
The result is less corrugation of the rails. Passengers and train personnel alike will notice a far more comfortable ride: irritating vibrations in the vehicle are reduced, as there is less interaction between the train and the superstructure.

The first results from test lines with tight radii (< 300 m) in the ÖBB rail network show that Sylodyn® HRB HS (High Strength) is ideal for use as a rail pad - especially where requirements are more stringent.



Rail pads  
in use

# 4 | Rail Pads for Heavy Haul Lines





## High-end solution for heavy haul lines

**Destroyed ballast, damaged rail fastenings and rail breakages due to lack of elasticity in the superstructure cause extremely high maintenance costs and can, under certain circumstances, result in long line closures - this is particularly true for the heavy haul sector where axle loads exceed 26 tonnes.**

**T**he train operators, frequently private companies, depend on high levels of track availability in order to run their businesses profitably, especially in the heavy haul sector.

Elastic rail pads - like sleeper pads - are an extremely suitable and economical way of counteracting the overloading of the superstructure caused by high tonnage. After just one year in use and a load of 140 million tonnes, rail pads made from the newly developed Sylodyn® HRB HS material demonstrated that they can successfully balance the combination of higher

elasticity and maximum mechanical resistance: There have been no instances of rail breakages, nor any damage to the supports, the sleepers or rail pads anywhere along the test lines.

For train operators in the heavy haul sector, elastic solutions from Getzner are therefore proving themselves to be an excellent way of optimising the life cycle costs of the superstructure.



# 5 | For Heavily used Superstructure: Sylodyn® HRB HS

## High-end material for modern superstructure

Getzner developed the new Sylodyn® HRB HS material to satisfy the steadily increasing demands placed on modern superstructure. This is a further development of the already well-established Sylodyn® material, which has been the choice of countless rail operators for more than 20 years.

Based on polyurethane - and proven for almost 50 years of use in railway superstructure - Getzner has been able to improve its properties even further in this new development. All the testing required by the standard (EN 13481-2) for the use of this newly developed high-end material as a rail pad and baseplate pad are already in place. For the Zw 700 and Zw 900 rail pads, all the approvals required for the operational trials have

been obtained from the German Federal Railway Authority.

Sylodyn® HRB HS has been developed especially for heavily loaded superstructure in the standard-gauge railway and heavy haul sectors. In the light rail sector, Getzner customers continue to put their trust in the proven Sylodyn® solutions.

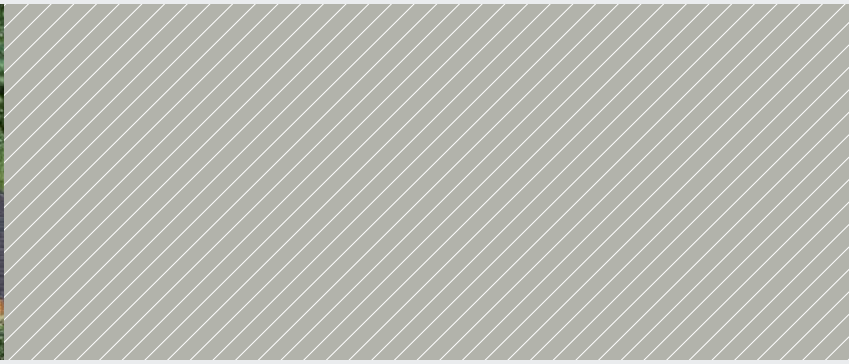
### Getzner services in detail

- Initial installation, retrofitting, modification and repair of elastic components for rail fastening systems
- Forecasts for deflection and effectiveness
- Measurements using our own large-scale testing rig (long term properties and fitness for purpose)
- Dimensioning and on-site supervision
- Special solutions (together with customer) and research

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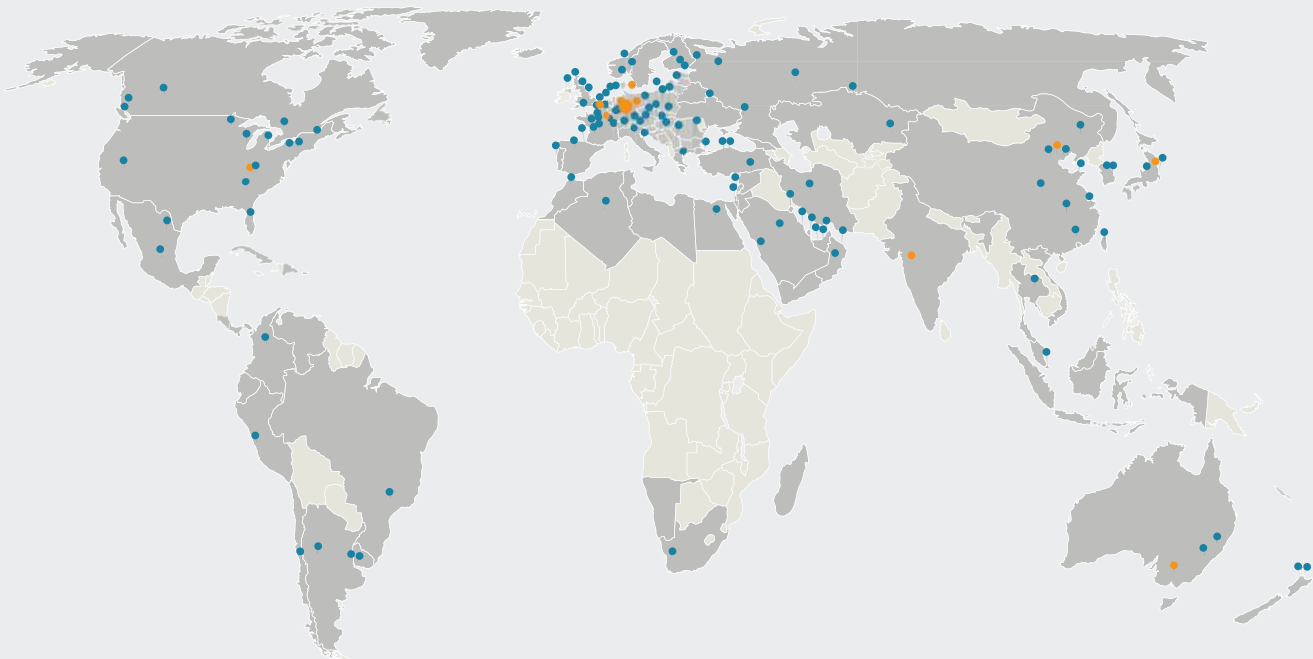


## Getzner projects speak for themselves

**E**lastic solutions from Getzner can be found in the railway, construction and industry sectors all over the world - as can the Getzner team. With numerous branches and sales partners, the company serves all the strategically important markets across the globe. Getzner is a long-standing and valued partner of leading rail operators, such as the ÖBB (Austrian Federal Railways) and Deutsche Bahn (German Railways - Q1 supplier).

### References

- Wiener Linien - Vienna, Otto-Probst-Str. (AT)
- ÖBB - Attnang-Puchheim (AT)
- ÖBB - Unzmarkt-Scheifling (AT)
- ÖBB - Brennerstrecke (AT)
- ÖBB - Ybbs-Amstetten, track 4 (AT)
- VAG - Nuremberg (DE)
- BVG - Berlin (DE)
- RNV - Heidelberg (DE)
- MVB - Magdeburg (DE)
- Rheinbahn - Dusseldorf (DE)



**Getzner Werkstoffe GmbH**

Herrenau 5  
6706 Bürs  
Austria  
T +43-5552-201-0  
F +43-5552-201-1899  
info.buers@getzner.com

**Getzner Werkstoffe GmbH**

Am Borsigturm 11  
13507 Berlin  
Germany  
T +49-30-405034-00  
F +49-30-405034-35  
info.berlin@getzner.com

**Getzner Werkstoffe GmbH**

Grünwalder Weg 32  
82041 Oberhaching  
Germany  
T +49-89-693500-0  
F +49-89-693500-11  
info.munich@getzner.com

**Getzner Spring Solutions GmbH**

Gottlob-Grotz-Str. 1  
74321 Bietigheim-Bissingen  
Germany  
T +49-7142-91753-0  
F +49-7142-91753-50  
info.stuttgart@getzner.com

**Getzner France S.A.S.**

Bâtiment Quadrille  
19 Rue Jacqueline Auriol  
69008 Lyon  
France  
T +33-4 72 62 00 16  
info.lyon@getzner.com

**Getzner France S.A.S.**

19 Rue Hans List  
78290 Croissy-sur-Seine  
France  
T +33 1 88 60 77 60

**Getzner Vibration Solutions Pty Ltd**

Unit 1 Number 2-22  
Kirkham Road West,  
Keysborough Victoria 3173  
Australia

**Getzner India Pvt. Ltd.**

1st Floor, Kaivalya  
24 Tejas Society, Kothrud  
Pune 411038, India  
T +91-20-25385195  
F +91-20-25385199  
info.pune@getzner.com

**Nihon Getzner K.K.**

6-8 Nihonbashi Odenma-cho  
Chuo-ku, Tokyo  
103-0011, Japan  
T +81-3-6842-7072  
F +81-3-6842-7062  
info.tokyo@getzner.com

**Getzner Materials (Beijing) Co., Ltd.**

No. 905, Tower D, the Vantone Center  
No. Jia 6, Chaowai Street, Chaoyang District  
10020, Beijing, the P.R.C.  
T +86-10-5907-1618  
F +86-10-5907-1628  
info.beijing@getzner.com

**Getzner USA, Inc.**

8720 Red Oak Boulevard, Suite 460  
Charlotte, NC 28217, USA  
T +1-704-966-2132  
info.charlotte@getzner.com

[www.getzner.com](http://www.getzner.com)



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