



## **Acoustic and vibration isolation in rail traffic**

Elastic bearings made of polyurethane

Providing peace and quiet along the track.

## KRAIBURG PuraSys

Competence in  
noise and vibration  
reduction solutions  
in the rail traffic

*Project (with PURASYS MSS P 2023)  
Esfahan Metro Line, Iran*



KRAIBURG PuraSys, as part of the KRAIBURG Holding, specializes in sub-ballast mats, bearings for mass-spring-systems and other special elastic supports made of polyetherurethane in the railway superstructure.

KRAIBURG PuraSys has already successfully established itself on the international market through numerous projects with its PU products for solving noise and vibration problems caused by rail traffic.

PuraSys products have been tested in recognized external testing institutes and internally for the sometimes very demanding conditions and specifications.

KRAIBURG PuraSys is of course ISO 9001 certified and thus guarantees high quality and complete traceability of its products. PuraSys PU elements are tested according to DIN 45673-5, DIN 45673-7 and other national standards.

#### **Quality products - produced in harmony with nature**

Environmental protection is a key strategic task at KRAIBURG PuraSys. We are fully aware that sustainable growth is only possible if we live up to our commitments and responsibility for environmental protection. That is why KRAIBURG PuraSys has a consistent course here: environmental protection is our daily program!

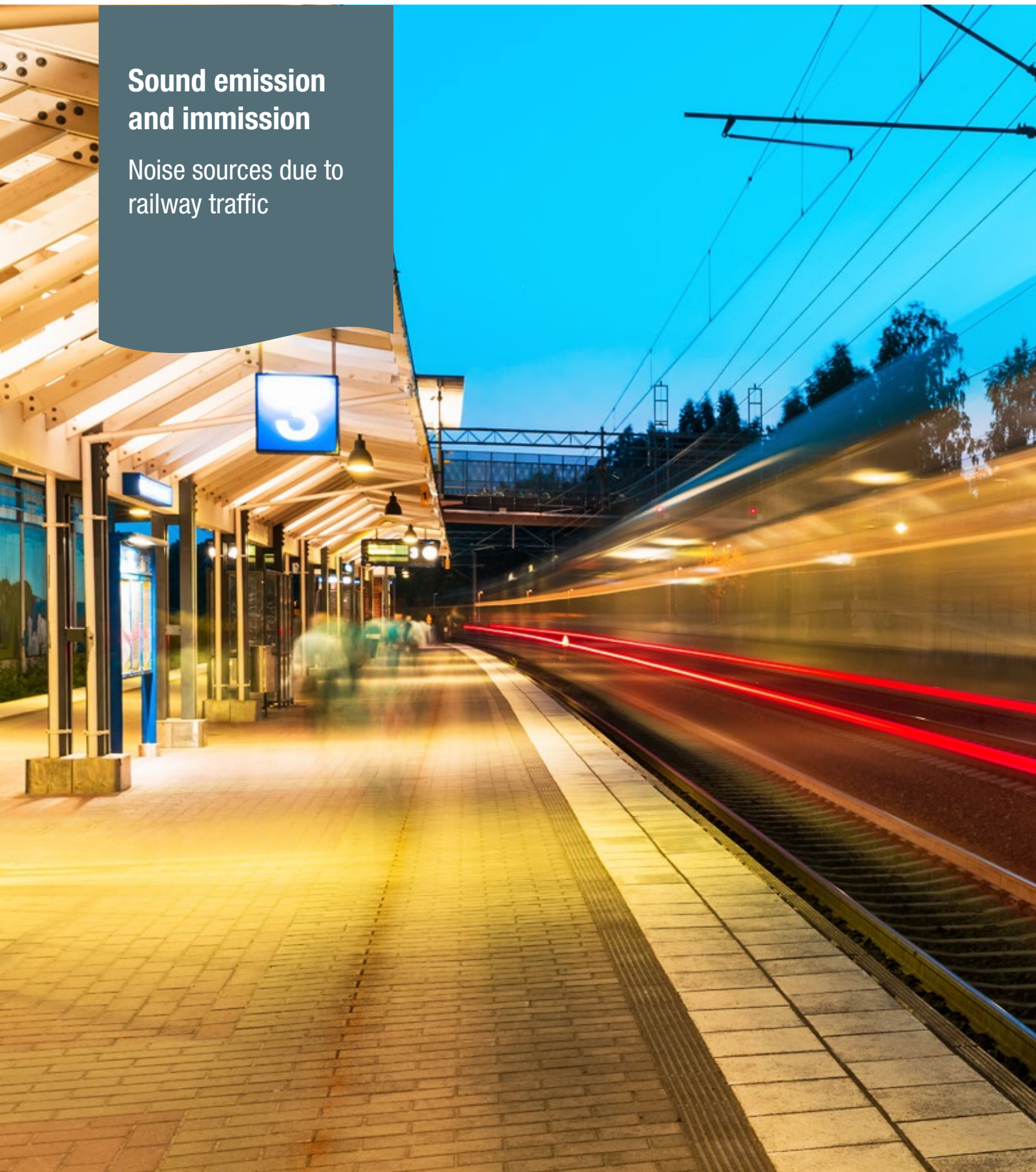
*Installation situation of elastic support in the track bed*





## Sound emission and immission

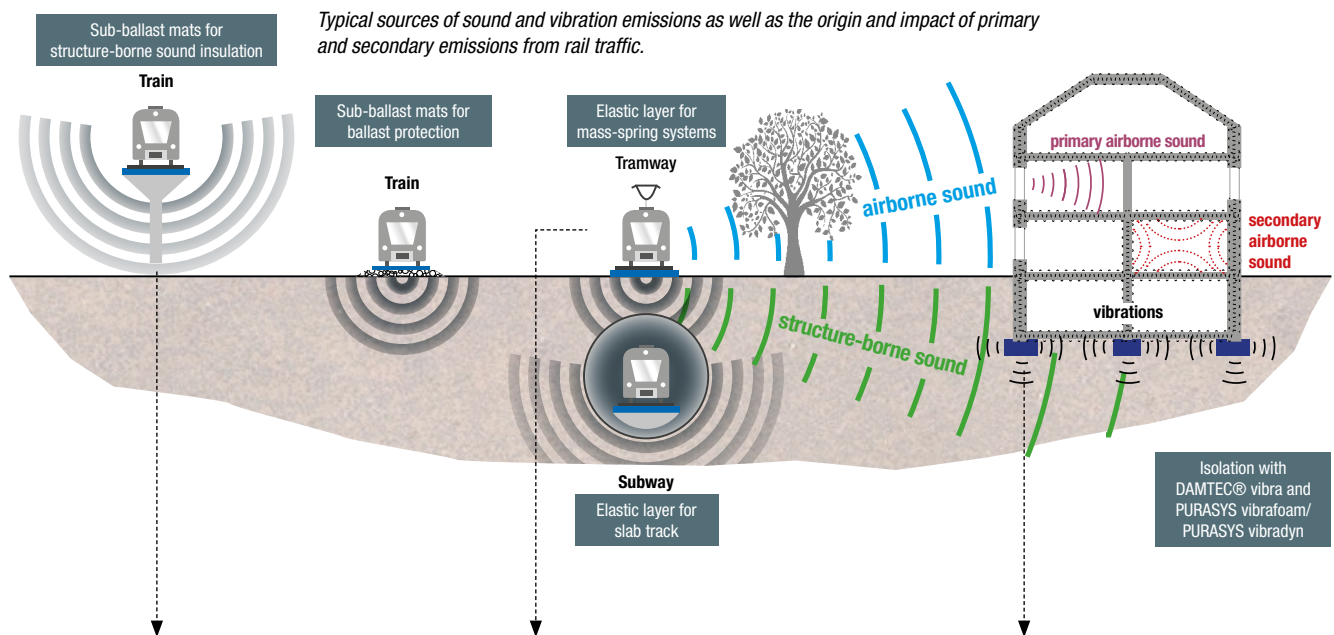
Noise sources due to  
railway traffic





Railway vehicles generate rolling noises and vibrations during operation. This is due to roughness and imbalances on both the wheels and the rail running surfaces. Surface defects such as head checks, corrugations and slip waves on the rails are known to be among the most common sources of interference.

These vibrations are transmitted to the ground via the roadway and spread as structure-borne noise. If buildings are located along or near the track, a transfer is also carried out via their foundations. The buildings begin to vibrate and, with the appropriate intensity, they are also preceived by humans as perceptible vibration or disturbing noise. Another consequence of this transmission chain is the emission of vibrations from building parts, e. g. ceilings and walls, to the environment. This takes place via the air, which begins to vibrate itself and then become audible as so-called secondary airborne sound.



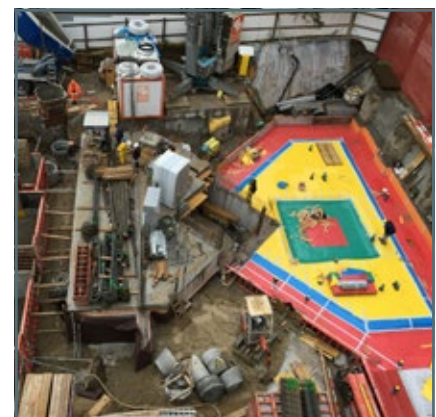
Project  
Lichterfelde, Berlin, Germany



Project  
Chaussee de Charleroi, Brussels, Belgium



Project  
Seestraße, Zurich, Switzerland



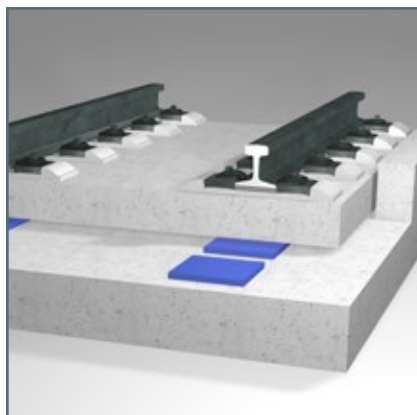
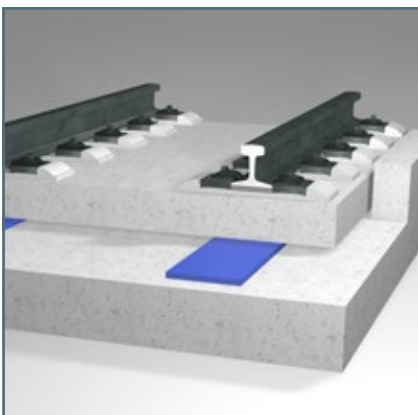
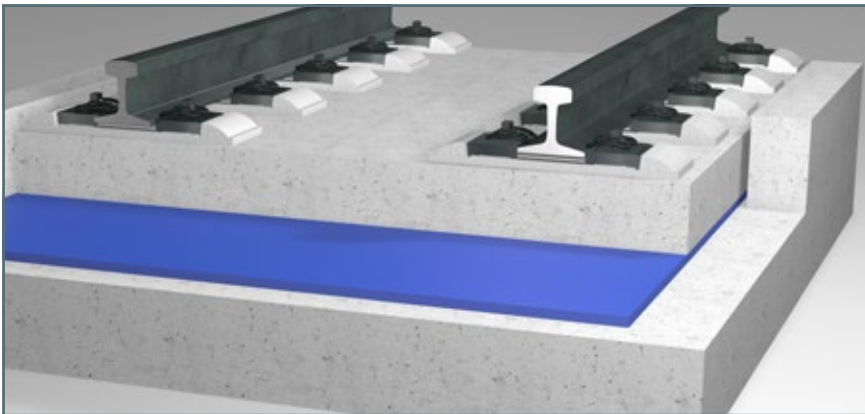
# PURASYS Products for use in railway traffic

## Product overview

Project (with PURASYS MSS P 2023)  
Esfahan Metro Line, Iran

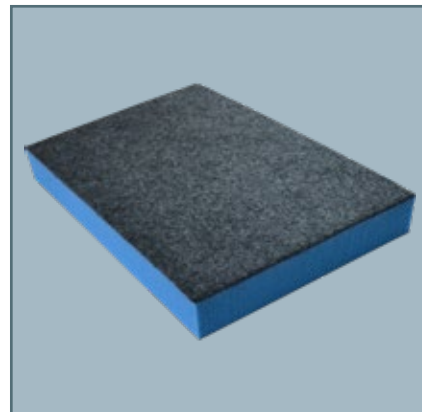
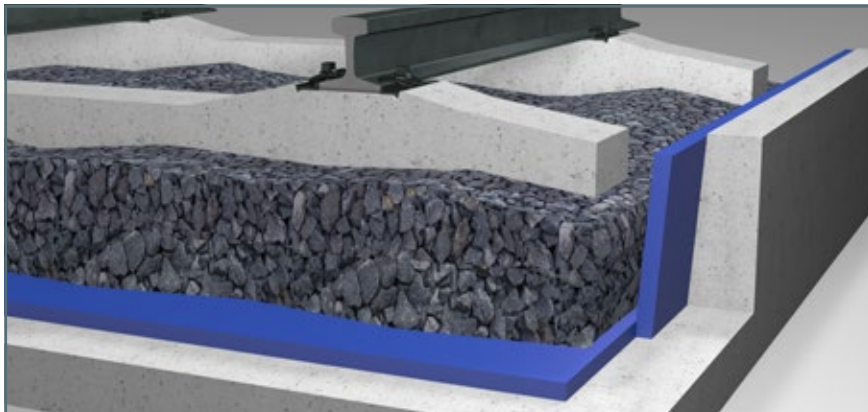


**PURASYS MSS** Full surface bearings, strip-like support and point bearings  
for mass-spring systems



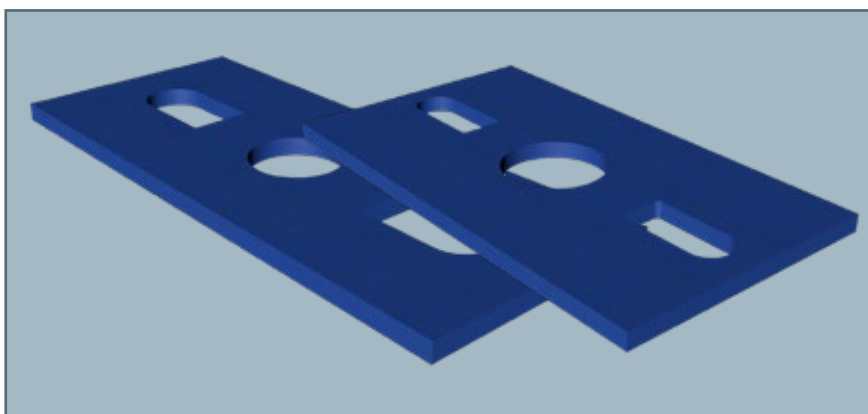
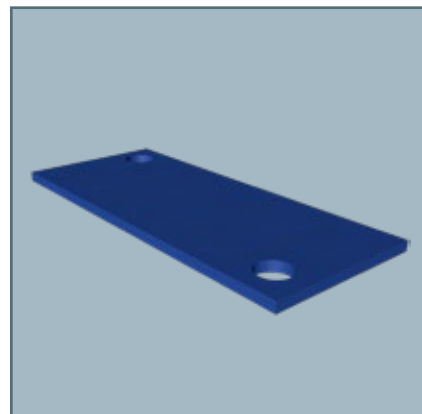
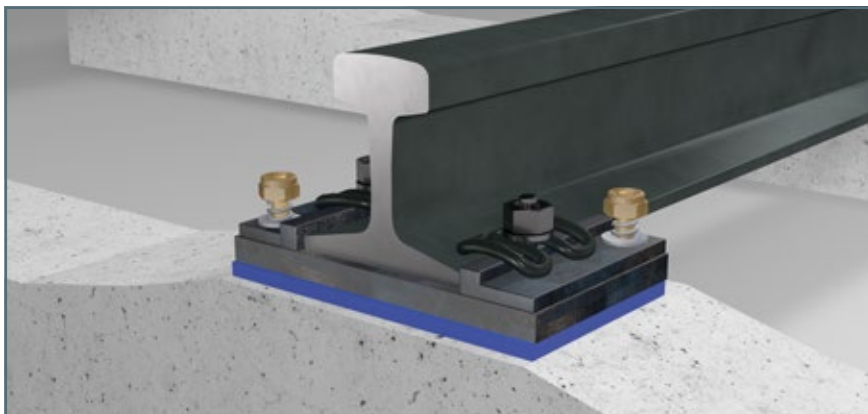
**PURASYS MSS** products are decoupling and protective mats under rail systems tested according to DIN 45673-7 (Mechanical vibration - Elastic elements of the superstructure of railway tracks). They reduce structure-borne and secondary airborne noise and vibration emissions when used in slab track (mass-spring system).

**PURASYS SBM**  
Sub-ballast mats



**PURASYS SBM** products are decoupling and protective mats under rail systems tested according to DIN 45673-5 (Mechanical vibration - Elastic elements of the superstructure of railway tracks). They reduce structure-borne noise and secondary airborne sound as well as vibration emissions. For ballasted tracks, the service life is extended by a lower and more even load. At the same time, it can protect engineering structures or sealings.

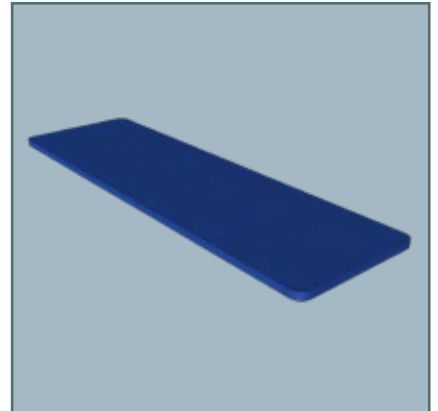
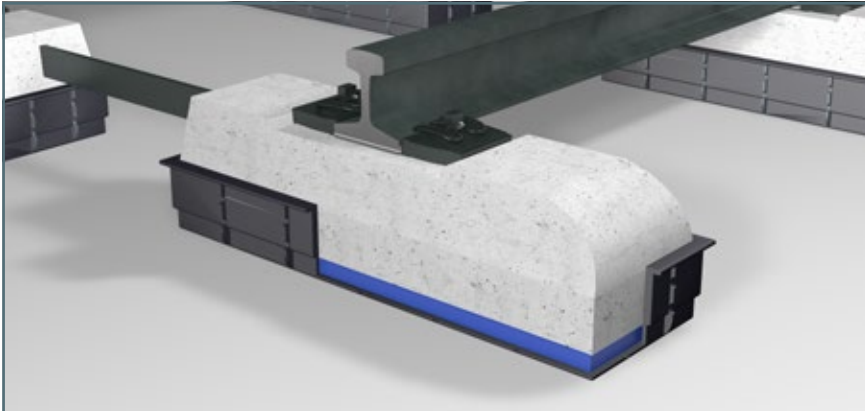
**PURASYS BPP**  
Base plate pads



**PURASYS BPP** products are intermediate plates that increase the elasticity of the rail superstructure. The rails are decoupled from the ground and the high dynamic forces acting on the rail, fastening system and pavement are reduced.

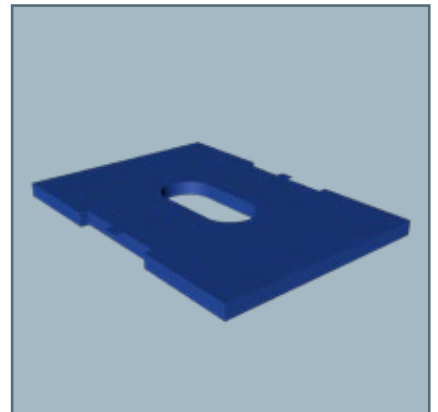
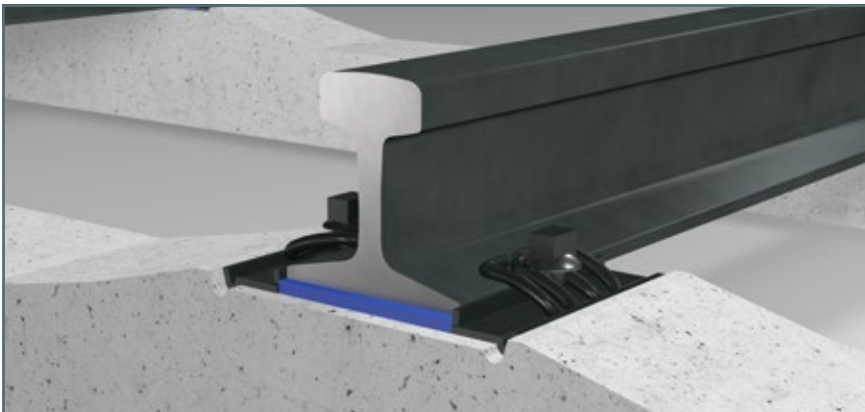


**PURASYS ESB**  
*Elastic sleeper boots*



**PURASYS ESB** products are individually prefabricated, elastic inserts for sleeper boots. This enables different sinking values to be compensated for. At the same time, they serve to optimize load distribution and reduce the forces that occur. By decoupling the track from the ground, PURASYS ESB also achieves greater drive comfort.

**PURASYS ERP**  
*Elastic rail pads*



**PURASYS ERP** products are intermediate layers to reduce vibrations and forces in the track superstructure.

PURASYS products for track construction are made of high-quality elastomer materials. With the extensively tested formulations, the products meet special requirements resulting from the loads in the track area.

PURASYS products are produced in the form of mats and stamped or water cutted parts and are therefore suitable for point bearings, strip-like support or full-surface bearings. These elastomer materials are also used in other demanding areas such as building and tunnel construction. Particularly noteworthy is the long-term behaviour, which guarantees a constant high level of effectiveness over decades. In this way, they efficiently counteract the multi-frequency vibrations and shocks that are transmitted to the environment.





*Let us convince you of the outstanding properties of our products:*

- |  |   |
|--|---|
| ■ environmentally friendly   | ■ reduce the transmission of structure-borne sound  |
| ■ reduce secondary airborne sound  | ■ long term stability for track position            |
| ■ low water absorption   | ■ extremely durable                                 |
| ■ protect the sensitive sealing layer against damage from ballast stones | ■ protect adjacent buildings by reducing vibrations |
| ■ extend the service life of the ballast                                 | ■ uncomplicated installation                        |
| ■ reduction of track maintenance costs                                   | ■ extremely economical                              |



A photograph of a construction site for a railway project. In the foreground, a worker in a yellow hard hat and orange safety vest is kneeling on a blue tarp, using a long metal level to guide the placement of a concrete slab. Another worker in a yellow hard hat and orange safety vest is also kneeling nearby, assisting with the work. In the background, a third worker in a yellow hard hat and orange safety vest is standing and observing. The ground is covered with blue tarps, and there are some construction materials and tools scattered around. The scene is set outdoors, with a concrete wall and some greenery visible in the background.

## Our comprehensive services for you

We support you with the entire railway project

*Project (with PURASYS MSS P 4025, P 3625 and PN 3225)  
Kartner Kogel, Austria*



### Solution Development & Detailed Solutions

Our many years of experience and our know-how with products for noise and vibration reduction are a guarantee for the solution of even very complex problems. Together with you, our specialists will develop effective systems to eliminate or minimize disruptive factors in the problem areas. In addition to standard solutions based on experience, we are of course also in a position to implement completely new technical and personnel solutions that are precisely adapted to your requirements.

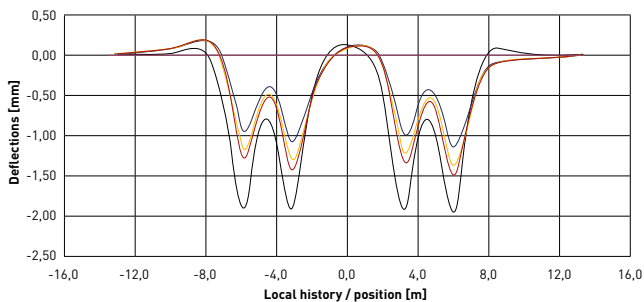
### Calculations, simulations and efficacy forecasts

To find out how effective measures can be in dealing with an emission problem, you don't have to wait until they are implemented. After a first inspection and analysis of the conditions on site, our specialists are able to create a calculation model in which all relevant factors regarding vibration and damping behaviour with different material properties are taken into account. This results in a realistic simulation that allows fine-tuning of these factors and enables our specialists to develop the optimum solution. At the end of the planning phase, you will receive proof of the expected effectiveness of the system. This efficacy prognosis gives you the assurance in advance that your expectations will be met successfully.

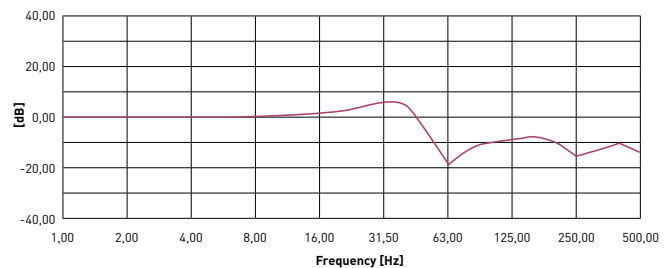
### Our services at a glance

- material testing and measurement on our own large scale test bench
- project support from the beginning
- installation advisory and site support
- preparation of installation plans
- vibration control and mech. measurements
- solution development
- calculation and simulation
- efficacy forecasts

Example of deflection



Example of insertion loss



Installation plan for mass-spring system



## References railway projects



*Watch our installation videos  
on YouTube!*

*Project (with PURASYS MSS P 4025, P 3625 and PN 3225)  
Kartner Kogel, Austria*



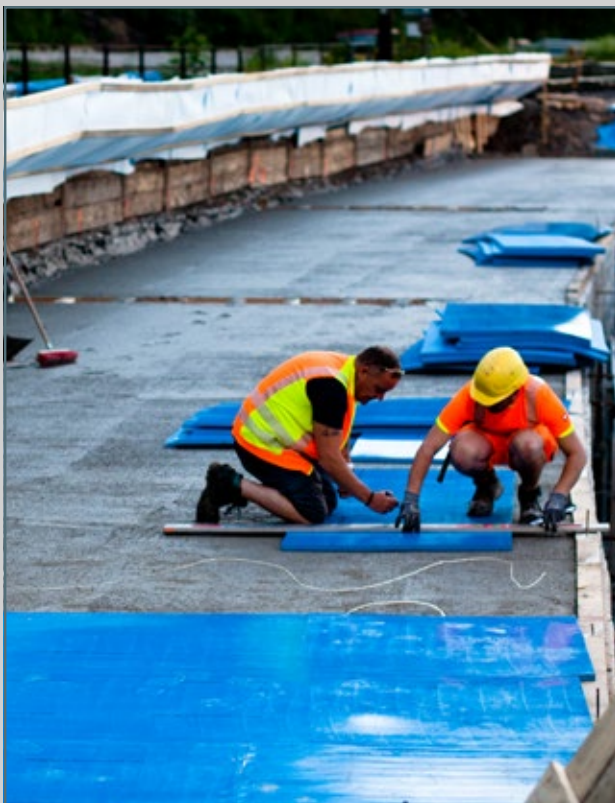
## Esfahan Metro Line, Iran, 2015

PURASYS MSS P 2023



**Kartner Kogel, Austria, 2017**

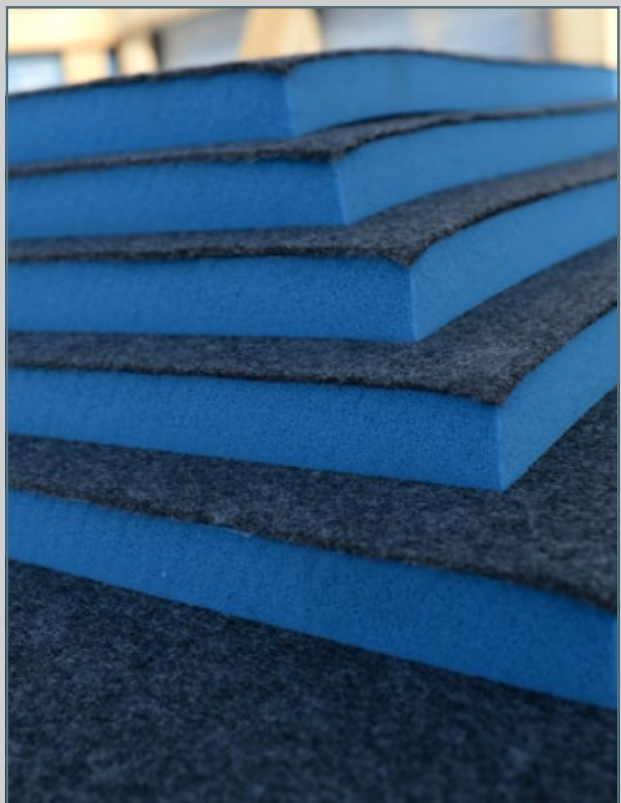
*PURASYS MSS P 4025, P 3625 and PN 3225*





## Beijing Metro Line 6 , China, 2017

*PURASYS SBM P 2025, SBM P 2032, MSS P 2025*







## Products for the railway sector made of rubber granules

Product overview

DAMTEC® Project (with DAMTEC® SBM K 10 V)  
Saalachthal, Austria

### DAMTEC®

KRAIBURG Relastec, as part of the KRAIBURG Holding, specialises in sub-ballast mats and bearings for mass-spring systems with its DAMTEC® division. KRAIBURG Relastec has already established itself through numerous international projects with its DAMTEC® products in order to provide solutions for noise and vibration problems caused by rail traffic.

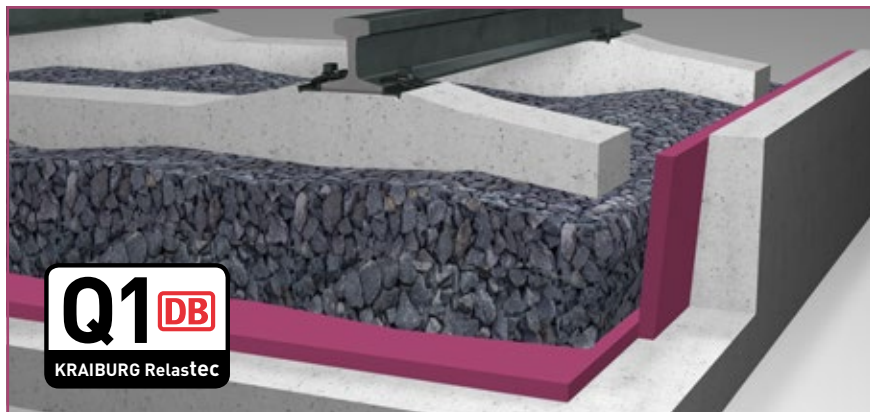
DAMTEC® products have been tested in recognized external testing institutes and internally for the sometimes very demanding conditions and specifications. They also meet the release criteria of DB Netz AG. KRAIBURG Relastec is certified in accordance with ISO 9001, thus guaranteeing consistently high quality and complete traceability of its products.

Our company has the „Manufacturer-related product qualification (HPQ)“ of Deutsche Bahn AG and the supplier's quality capability is classified as Q1 for the product range of sub-ballast mats by Deutsche Bahn AG.

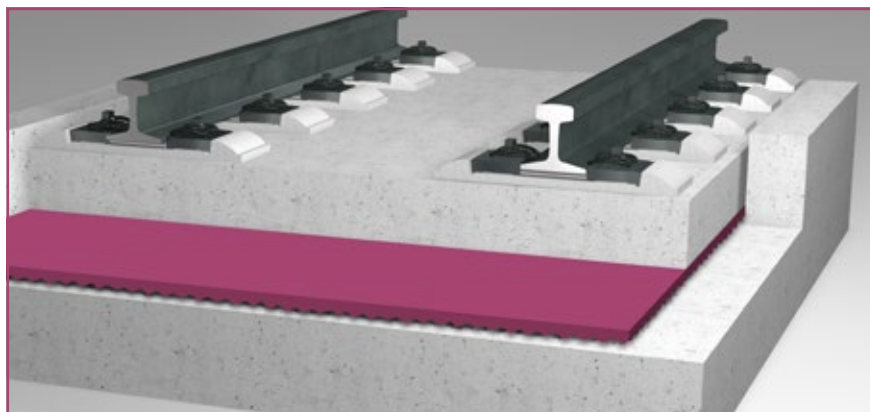
Our sub-ballast mats comply with the technical delivery conditions DBTL 918071-01 and are, for example, approved for use in the DB network with TM 4-2015-10511 I. NPF 1.



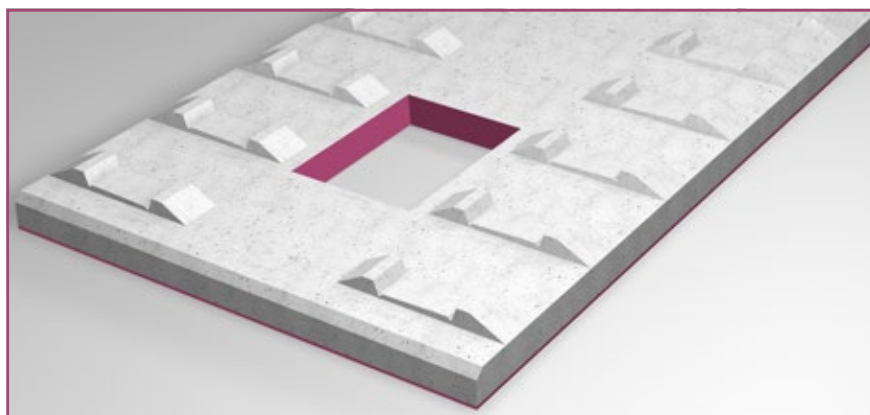
**DAMTEC® SBM**  
Sub-ballast mats



**DAMTEC® MSS**  
Full surface bearings for mass-spring systems



**DAMTEC® STM**  
Full surface bearings for slab track mats



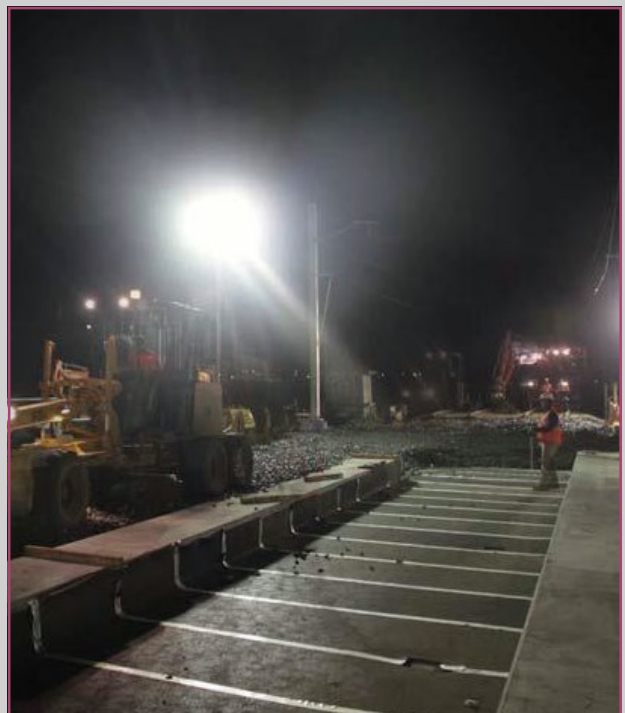
## Wiener Linien, Austria, 2016

DAMTEC® SBM K 23 V



## Officer Road, Officer, Australia, 2013

DAMTEC® SBM K 10





## Schwieberdingen, Germany, 2016

DAMTEC® SBM K 10 V



## Freilassing, Germany, 2017

DAMTEC® SBM K 10 V



## Contact



ACOUSTICS & VIBRATION ISOLATION  
made of rubber granules

Products for reducing noise and vibration  
emissions in the rail sector

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ACOUSTIC & VIBRATION ISOLATION  
made of polyetherurethane

Products for reducing noise and  
vibration emissions in the rail sector

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Quality Management  
ISO 9001  
ISO/TS 16949



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