CALENBERG

Elastic components for railways

VIBRATION AND STRUCTURE-BORNE SOUND CONTROL

A LISEGA Group Company

SECURELY AND EVENLY BEDDED

PROTECT TRACK BED STRUCTURES WITH CALENBERG

Calenberg synthetic and natural rubber products deliver enhanced elasticity in track bed structures and protect the overall track bed system thanks to their material characteristics.
Our clients benefit from a significant reduction in maintenance and repair costs.

KNOWHOW

USM track bed and sub-ballast mats

Product description and areas of use

Our track bed and sub-ballast mats are made of synthetic and natural rubber and are available in various designs and rigidities for use at all train speeds and with axle loads up to 250 kN. These mats produce an effective reduction in vibration emissions from railway traffic.
The conical stud mats are used to meet vibration engineering requirements – from ballast protection for reduced ballast bed thicknesses through to efficient isolation of structure-borne sound and vibrations in mass-spring systems.

The USM models are manufactured using high-grade rubber blends. They have a high mechanical load capacity and are permanently weather-resistant. The mats absorb virtually no water, excel thanks to their high electrical insulation resistance and provide drainage on the mat level.

The USM series is suitable for both ballasted and ballastless track systems.

ADVANTAGES

- Reduction in stress load on the ballast
- Increased long-term stability for the track position
- Reduction in the dynamic wheel forces
- Reduction in the track and vehicle stress load
- Potential for reduction in ballast height – important on bridges
- Reduction in track maintenance costs
- No replacement required thanks to high fatigue strength
- Expected service life min. 60 years

USM 1000 W

USM 2000 + 3000

USM 4000

USM G 1000 series

USM G 1000 model series mats are used for all railway system types and axle loads up to 25 t, mainly for ballasted track. Different mat rigidities provide efficient structure-borne sound and vibration protection adapted to the specific project in the area surrounding the track. Moreover, the ballast is protected effectively against wear.

The mat comprises an insulating layer made of bound rubber granulate, which is covered by a wear-resistant solid rubber top layer. This top layer protects the insulating layer from potential mechanical damage caused by elements such as ballast.

The top layer also makes the mat water-tight and weatherproof, thus contributing significantly to the product's long service life.

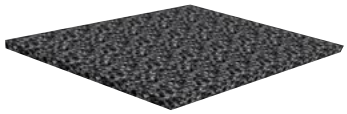
Ciprotec

Ciprotec is a PU-bound rubber granulate mat. It is primarily used on surfaces covered with ballast in railway track systems in structures such as bridges and tunnels to prevent ballast wear or protect structure layers in the interface between ballast and concrete or steel.

Ciprotec can be lined with non-woven fabric or geotextile and supplied in different thicknesses or rigidities where required.

USM G 1000

CIPROTEC



USM Ciflex

USM Ciflex is made of high-grade mixed-cell PUR foam and is manufactured in different thicknesses and densities, which have precisely determined physical characteristics. Thanks to its highly elastic behaviour, USM Ciflex is eminently suitable for reducing vibrations and structure-borne sound in track bed structures. USM Ciflex's physical properties are tested by an independent body.
The key advantages which USM Ciflex offers are permanent extreme flexibility, even under high stress loads, its excellent insulation properties and its precisely defined load ranges. USM Ciflex is versatile and can be used in both ballasted track systems and ballastless track or mass-spring systems and for all speeds and types of operation.

USM CIFLEX

Single bearings for mass-spring systems

Mass-spring systems are used to ensure protection against vibrations and structure-borne sound caused by railway traffic. The entire track bed structure is decoupled from its surroundings and the transmission or radiation of intrusive vibrations reduced in the immediate vicinity.

Mass-spring systems with very low natural frequencies provide sufficient protection in special cases. Single bearings made from a specially designed elastomer material are particularly suitable for such applications.

These reinforced elastomeric bearings comprise high-grade synthetic rubber with a chloroprene rubber (CR) content of more than 60%. They each feature a 2 mm thick plate of weathering steel vulcanised into the upper and lower sections with a form fit and non-positive connection to improve absorption of transverse splitting forces.

Diameter	Thickness [mm]	Weight [kg]	Stat. rigidity C [kN/mm]
240 mm, cambered circumference	59	ca. 4	6-14
280 mm, cambered circumference	69	ca. 8	

Other sizes and rigidities may be available on request.

MSS BEARING

ADVANTAGES

- Low natural frequency in the mass-spring system
- Adjustable rigidities
- Ageing-resistant
- Low installation height
- Easy installation and simple replacement
- Reduction in track maintenance costs

Directional Control Bearing

Special bearing for securing horizontal track alignment or absorption of horizontal forces in slab track systems. Delivered as stipulated on data sheet; differing project-specific dimensions may be available on request.

DIRECTIONAL CONTROL BEARING

- Sturdy rubber-metal moulded part
- Weather-resistant stainless steel
- Rubber bearing made of high-grade chloroprene (CR)
- Built-in part, light in weight
- Easy installation
- Secures track position

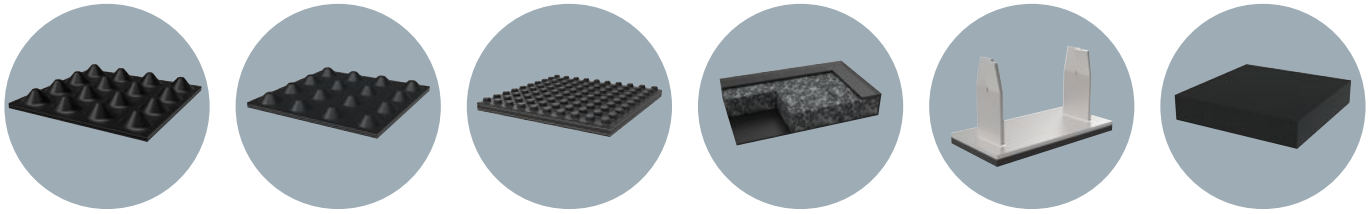
EPDM Shear Cam Pad

Special bearing for the absorption of shear- and restraint forces in slab track systems. Can be supplied in dimensions adapted to the specific project requirements and in thicknesses of 5, 10, 12.5, 15 and 20 mm. The bearing has a load capacity up to 15 N/mm^2, depending on the format.

EPDM SHEAR CAM PAD

- Premium quality rubber material
- Highly elastic and resilient
- Ageing-resistant
- Prevents damage to ballastless track
- Easy installation
- Reduction in maintenance costs for track system

Extract from our client reference projects



USM TRACK BED AND SUB-BALLAST MATS

- Cologne Cathedral/Central Station underground, Germany
- Karlsruhe triangular junction and underground station, Germany
- High-speed rail link, Taiwan
- Sao Paulo mass transit railway, Brazil
- Karlsruhe-Basel main line railway, Germany | Switzerland
- Main line railway, BAM tunnel, Russia
- Mass transit railway, MTRC Tseung Kwan O South station, Hong Kong, China
- Commuter rail system, Oberwil, Switzerland
- Mass transit railway, Los Angeles, US
- Subway, San Francisco, US
- Tram line, Basel, Switzerland
- Main line railway, Roe Highway Project, Sydney, Australia

Cologne Cathedral/Central Station underground, Germany

DIRECTIONAL CONTROL BEARING

- DB, Wendlingen-Ulm, new line, ballastless track bridges in Swabian Alb, Germany
- DB, Hanau-Nantenbach, ballastless track line extension, Germany
- DB, Ilmenau-Erfurt, ballastless track new line, Germany
- DB, Hohenthum near Halle-Peißen, ballastless track, Germany

EPDM SHEAR CAM PAD

- DB, Lahntal Bridge, Cologne-Frankfurt section, Germany
- High-speed section Taipei-Kaohsiung line, Taiwan
- KTX high-speed section, Phases 4 and 5, Korea
- Jeolla Linie BTL, Korea
- Honam high-speed railway (Honam HSR), Korea

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