

# Installation Guideline

## Mass-Spring Systems

### Point Bearings

#### 1. Transport and Storage

The Getzner products (Getzner Point Bearings) for mass-spring systems (MSS) must always be transported in original packaging. The plastic wrapping protects the Getzner MSS Point Bearings from environmental impacts.

Attention has to be paid during transportation to avoid damages. Damaged packaging shall be immediately repaired (using for example plastic foil and adhesive tape).

Getzner MSS Point Bearings are delivered stacked on pallets.

For optimal preservation, it is advisable to store the item in its original packaging within a moisture-free environment. Additionally, to maintain its condition, shielding it from direct sunlight is recommended.

The elastic mats should not be stored at temperatures below  $-20\text{ }^{\circ}\text{C}$  and above  $+50\text{ }^{\circ}\text{C}$ .



#### 2. General Description

Getzner MSS - regardless of the variant - are high-tech polyurethane materials that can withstand extreme static and dynamic loads. They exhibit excellent resistance against all chemical substances used in railway operations. Getzner MSS passed all serviceability tests in accordance with DIN 45673-7:2010.

Although MSS from Getzner are tough and hard-wearing, some guidance for simple and efficient handling shall be taken into account in order to enable a hassle-free installation and the highest possible performance.

**Attention:** Please note that in case of bonding the bearings with Diisocyanate containing bonding agents, staff needs to be trained and certified conform EU legislation 2020/1149. More information you can find via link <https://safeusediisocyanates.eu/>.



# Installation Guideline

## Mass-Spring Systems

### Point Bearings



### 3. Installation of Getzner Point Bearings

#### 3.1 Preparation of the first stage concrete

The substructure has to be clean and dry, frost-free as well as free of depressions and sharp-edged elevations. Loose objects, e. g. stones, have to be removed with appropriate tools.

The surface of the first stage concrete has to be smooth to enable easy movement of point bearings during positioning.

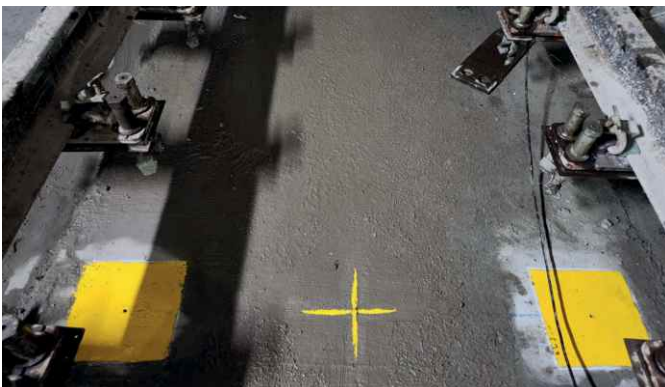
#### 3.2 Marking of distance spacers and manholes

Carefully follow the design plans and mark the positions of manholes and distance spacers on first stage concrete.

#### 3.3 Selection and preparation of shuttering elements

Prepare the shuttering elements according to the shuttering plan and materials' list.

- Wooden elements for shuttering manholes
- Distance spacer e. g. metal, wooden or rubber plates (see following chapter)
- De-bonding foils to ensure de-bonding between first concrete and concrete slab after curing process



#### 3.4 Placing of distance spacers for bearings

To create pockets on the bottom side and to enable the correct spacing for bearings within the concrete slab, distance spacers have to be placed and glued onto first stage concrete. The distance spacers create a hollow space that allows insertion of the point bearings and ensures the right positioning of the bearings. Additional blind holes reduce the lift height of the jacks when the slab is lifted and therefore avoid too high bending moments on the slab when lifted up.

Recommended dimensions for distance spacers:

- Thickness: 7.5 - 40 mm
- Contour: outer contour of spacers ~ 50 - 100 mm bigger than the contour of MSS point bearings

The exact dimensions are to be defined according to installation plans and design drawings.

# Installation Guideline

## Mass-Spring Systems

### Point Bearings



#### 3.5 Attaching of the de-bonding layer

An appropriate PE-based de-bonding layer (specs can be sent upon request) has to be laid onto the first stage concrete. This layer acts as a separation layer to ensure the concrete slab can be lifted up after curing with the purpose to integrate the point bearings afterward.

#### 3.6 Installation of the shuttering elements for the manholes

On the before clearly marked positions for manholes the wooden shuttering elements have to be placed.



Pockets for the hydraulic jacks are important for the later lifting process and are also mandatory to shutter.

#### 3.7 Installation of the reinforcement formwork and rails

The reinforcement bars have to be installed according to the reinforcement plans on top of the de-bonding layer. All areas around distance spacers and the manholes have to be worked out properly and according to reinforcement drawings. If required and in design foreseen, rail track and fastening systems have to be fixed.



During the entire working step of reinforcement and rail track fixation, the general track contractor is clearly advised for careful handling to avoid any damages and displacements of the de-bonding foil.

#### 3.8 Concreting the slab

Pouring the liquid concrete, compacting and levelling are the next steps to produce a continuous slab with a recommended length of 60 m - 80 m. The exact length is to be defined according to the final design drawings.



#### 3.9 Finishing process of concrete slab

After 28 days of concrete curing time of slab, the shuttering elements have to be removed and manholes can be cleaned up. Finalized manholes are ready to be accessible for the next working steps.

# Installation Guideline

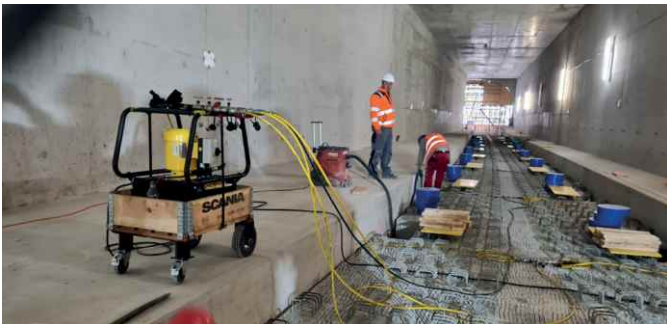
## Mass-Spring Systems

### Point Bearings



#### 3.10 Preparing devices and tools for installation of point bearings

- Hydraulic jack with the stroke of approx. 50 mm and 20 tons capacity (e. g. Enapac RCH Holl-O-cylinder); Exact specification of hydraulic jacks will be provided based on the final design and upon request
- Hydraulic power unit
- Hydraulic hoses
- Levelling shims 100 mm x 100 mm with 1, 2, 5 mm thickness, metal
- Vacuum cleaner
- Assembling jig (shaped similar to point bearing)
- Dial gauges to measure the vertical movement of the slab
- Lamps
- Endoscopes equipped with cameras
- Installation plan for point bearings
- Metal scrapers to remove the distance spacers
- Adhesive for distance spacers



#### 3.11 Preparation and placing of hydraulic cylinder

The cylinders of the hydraulic jacks have to be inserted and connected with hoses to the hydraulic power unit. Gaps between hydraulic cylinder and concrete slab due to unevenness of surface have to be filled with levelling shims. This ensures uniform load distribution and proper force distribution during lifting.

For the convenience of levelling and positioning of rails, 20 - 25 m rigid section (non-padded) on each side of the point bearing section should not be casted.



#### 3.12 Lifting up the slab

After starting the hydraulic power unit and opening the valves of hoses the hydraulic cylinders will lift up the slab slowly. Make sure the lifting speed is synchronised. As soon as the final height is reached insert levelling shims as a safety buffer.



# Installation Guideline

## Mass-Spring Systems

### Point Bearings



#### 3.13 Insertion of point bearings

Assembling jig (shaped similar to point bearing) allows proper positioning of the bearings underneath the lifted slab. Before placing point bearings, the distance spacers are to be removed with the help of a metal scrapper. Endoscopes with cameras enable the checking of the correct position of the bearings.

#### 3.14 Lowering of the slab

After the position of point bearing is adjusted, the levelling shims as safety buffers can be removed. Release the pressure from the hydraulic system to lower the slab. Repeat the before described working steps for each 60 m - 80 m slab section.



Each slab with length of 60 - 80 m may have to be connected to each other using shear connectors (dowels) depending on the final design requirements.

After lowering the slab final adjustment in height of the rail can be made by the track contractor to achieve the desired rail level.

#### 3.15 Remarks

A) In case final design requires prevention of lateral movement of a slab on point bearings, the "lateral bearings" need to be provided as per the specifications and design given by designer.

B) Utmost care to be taken during the construction and during the operations that any debris is not falling into the gap between the slab on point bearing and the tunnel invert. Suitable arrangement of sealing / closing this gap should be made wherever needed.

C) Information on project specific documents, tools, consumables, construction sequence and materials will be provided based on final design.

# Installation Guideline

## Mass-Spring Systems

### Point Bearings



#### 5. Recycling

Any waste generated during installation can be recycled in standard waste containers.

At the end of the lifetime of the superstructure the Getzner MSS can be removed from the substructure mechanically and recycled thermally. All our materials are non-hazardous to the environment.

#### 6. Disclaimer

This guideline only serves to support the customer or his authorised specialist in the installation of Getzner MSS. Getzner Werkstoffe draws the attention to known design errors and problems. This guideline was compiled with the utmost care based on Getzner's current knowledge. Getzner Werkstoffe assumes no warranty or liability for the accuracy, completeness, topicality or quality of this guideline. The customer is not entitled to any claims whatsoever arising from the use of this guideline. In particular, Getzner Werkstoffe is not responsible for the proper installation of Getzner MSS and the resulting negative effects on the condition / quality of Getzner MSS or its performance. This guideline is merely intended as a strict recommendation and it is recommended that the installation is carried out by a specialist.

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