UNDER SLEEPER PADS (USP) FOR CONCRETE SLEEPERS

INSTALLATION GUIDELINE

1. Transport and storage

- Always transport in original packaging.
- Damaged packaging should be immediately repaired (using plastic foil and adhesive tape).
- Storage should be in a dry environment in original packaging.
- Protection from direct sunlight is preferred.
- Once the original packaging is removed, USP must be kept dry.
- Temperatures below -20 °C and above +50 °C should be avoided.
- During storage, no more than two pallets may be stacked on top of each other.
- USP are subject to normal thermal expansion / shrinking. This physical effect is completely reversible.
- Storage conditions (and temperature) should match installation conditions. In case of big temperature differences between storage and production area, it is recommended to condition / temper USP for at least 24 h.
- Shelf life of Getzner USP is not limited. If stored correctly, the USP can stay in storage for years to be installed at any later point in time.

2. Assembly of under sleeper during production of padded sleepers

2.1 Insertion into the concrete sleeper

Sleeper manufacturing methods (e.g. instant demoulding, late demoulding, etc.) vary greatly between different sleeper producers and factories. The experts at Getzner Werkstoffe have vast experience with these different production methods. Before the first production of padded sleepers, it is recommended to coordinate with Getzner to assist in the first trials to achieve the best possible results. Getzner uses two different connection layers for its USP: flock and mesh.

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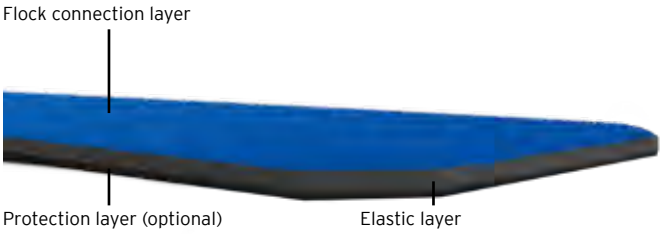
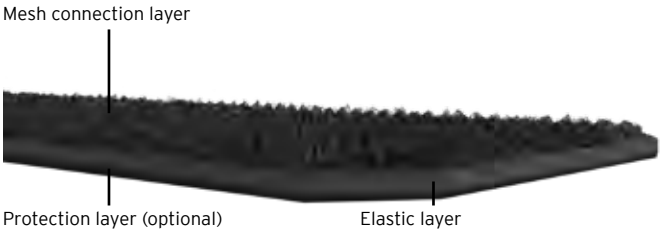
Flexible connection layers

The two connection layers are exchangeable. Nevertheless, if producing padded sleepers for the first time with any of the two connection methods, it is recommended to execute some trial productions.





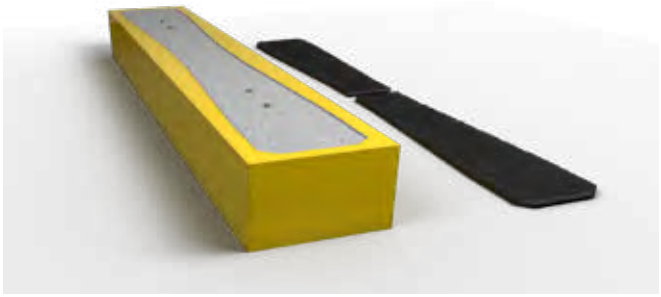
The following steps shall serve as a guideline, the list of steps is non-exhaustive and depending on actual production methods:

Filling the sleeper mould

Firstly, the sleeper mould is filled with concrete.

Compacting the concrete

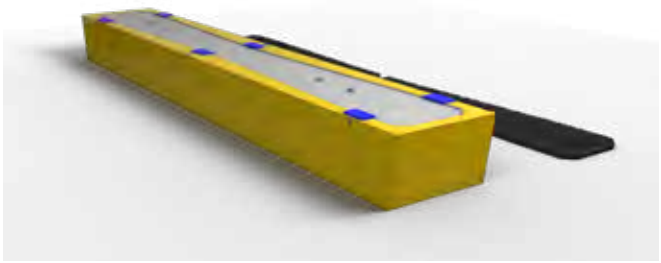
The concrete is compacted by means of electric concrete vibrators, either placed at the bottom or on top of the mould. The method depends on the actual sleeper manufacturing process.



Positioning the under sleeper pads

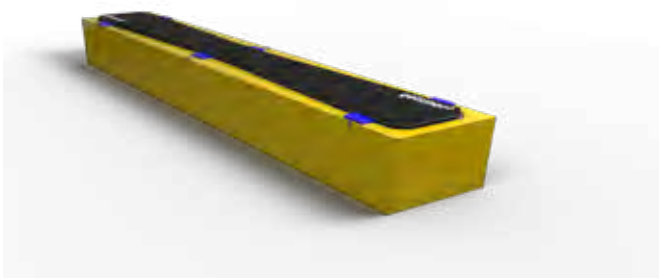
Spacers or centering pins (optional, depending on production method) are placed in order to prevent the USP from being completely embedded into the concrete and to keep the USP in correct position. It is up to the sleeper manufacturer to ensure proper placement maintaining the correct distances to the outer contour of the sleeper.

Under no circumstances shall the USP be longer / wider than the sleeper!



Placing the under sleeper pads

The USP are placed onto the flat concrete surface with the connection layer (mesh or flock) facing downwards, being in direct contact with the wet concrete.



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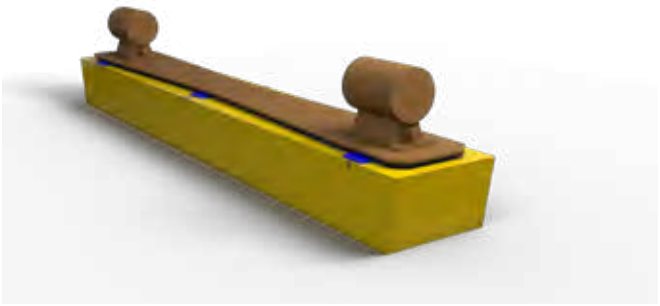
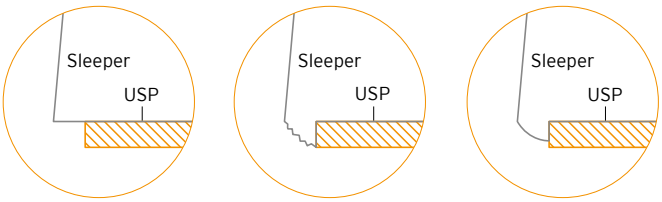
Embedding the under sleeper pads

By means of a stiff load distribution plate, covering the whole surface of the pad, the connection layer (mesh or flock) is fully embedded into the fresh concrete. It is recommended to use vibrating motors on the load distribution plate to enable the best connection between USP and sleeper.



Optimal embedding depth

Due to the different consistencies of the concrete, the USP can be embedded in slightly varying depths. We recommend to fully embed the connection layer and the elastic layer at least 2 mm in the concrete, to ensure the best connection between USP and concrete sleeper.



Execution of fillet depending on production method.

2.2 Adhesive bonding of under sleeper pads

In the case of already produced sleepers, the USP can be retrofitted by bonding them to the sleeper. For this application, the USP are exclusively delivered without mesh or flock.

Adhesive

The adhesive is provided together with the USP by Getzner Werkstoffe. Please follow the safety data sheet and instructions for use to ensure correct handling.

Sleeper

The bonding surface of the sleeper has to be dry and clean. It should be rather level and smooth (the rougher, the more adhesive is required). The surface may not have depressions.

Bonding

The sleeper is placed upside down and the surface is cleaned if necessary. Prepare the adhesive as described in the instructions for use. Please mind temperature and pot life of the adhesive. The prepared adhesive is applied to the ballast side of the sleeper. If the pad is divided in parts, the joints also have to be bonded. The required amount of adhesive is determined by the roughness of the concrete surface. Typically an amount of 0.5 – 2 kg of adhesive is used per sleeper. The USP is then placed centrically on the sleeper. During curing time the pad shall be evenly loaded on the whole surface with at least 50 kg. After bonding, there should be no cavities, which are not filled up with adhesive. The total thickness of the adhesive layer should not exceed 5 mm because the stiffness of the system could be influenced.

Attention: Please note that in case of bonding the USP with diisocyanate containing bonding agents, staff needs to be trained and certified in compliance with EU legislation 2020/1149. You can find more information via link https://safeusediisocyanates.eu/.

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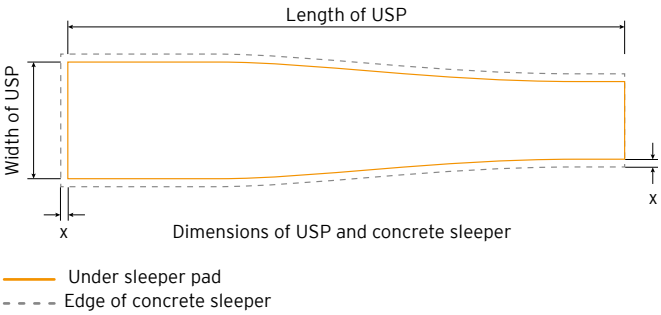
3. Quality control of the assembly

- High concrete coverage of the USP. After placing the USP on the wet concrete and vibrating once more (preferably from the top), the USP is lifted to check the concrete coverage: USP surface covered in concrete versus total USP surface. A concrete coverage of > 70 % is desirable.
- Concrete coverage shall be documented with photos during trial productions.
- The edge distance between outer contour of sleeper and outer contour of USP is jointly agreed upon with the client (refer to illustration below). This ensures that USP are not damaged during tamping.
- Testing the quality of the connection is done by pull-out testing. The test is executed according to the standard EN 16730.
- The number of sleepers to be tested shall be determined by the purchaser of the padded sleepers. Getzner recommends testing 1 % of the daily production volume.

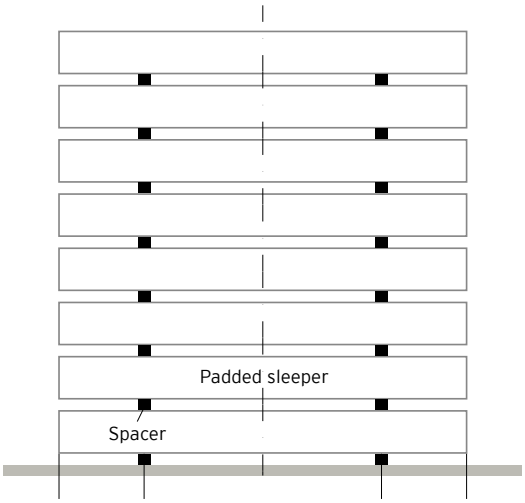


4. Storage of padded sleepers

Usually padded concrete sleepers are stacked on top of each other and stored outside.

The stacking capacity of padded sleepers is generally limited by the static load limit of the material. The maximum amount of sleepers to be stacked is determined by a laboratory test procedure (according to the standard EN 16730).

Specific values for the maximum number of stacked sleepers are dependent on the sleeper weight and the size of the spacer that is used between the sleepers because both determine the specific load on the elastic material. The wooden spacers resting on the rail seats between any two sleepers should be as wide as possible, a minimum of 80 mm is absolutely required. The exact amount of sleepers that can be stacked is defined in the data sheet.



5. Transport of padded sleepers

Attention has to be paid during transportation to avoid mechanical damage.

6. Lifetime and recycling

USP made from Sylomer® and Sylodyn® materials are long-lasting elastomers. The lifetime of the USP matches the lifetime of the sleeper, which means: no USP has to be exchanged prior to the exchange of the sleeper.

At the end of the lifetime of a padded concrete sleeper the USP can be peeled off the sleepers mechanically and be thermally recycled. Unused USP or pieces thereof can be recycled in standard plastics waste containers. All our materials are non-hazardous to the environment.

7. Disclaimer

This guideline only serves to support the customer or his authorised specialist in the installation of Getzner USP. Getzner Werkstoffe draws the attention to known demands and problems. This guideline was compiled with the utmost care based on Getzner's current knowledge.
Due to the large number of different construction designs and requirements, Getzner Werkstoffe accepts no liability for the completeness of the installation guideline. In particular, Getzner Werkstoffe is not responsible for the proper installation of Getzner USP and the resulting negative effects on the condition / quality of Getzner USP or its performance. It is recommended that the installation is carried out by a specialist.
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