

Guideline for the Installation of Under Sleeper Pads for Steel Sleepers

1. Transport and Storage of Under Sleeper Pads (USP)

- Always transport in original packaging
- Damaged packaging shall 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 $-20\text{ }^{\circ}\text{C}$ and above $+50\text{ }^{\circ}\text{C}$ should be avoided
- Do not stack pallets and parcels
- 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's 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.



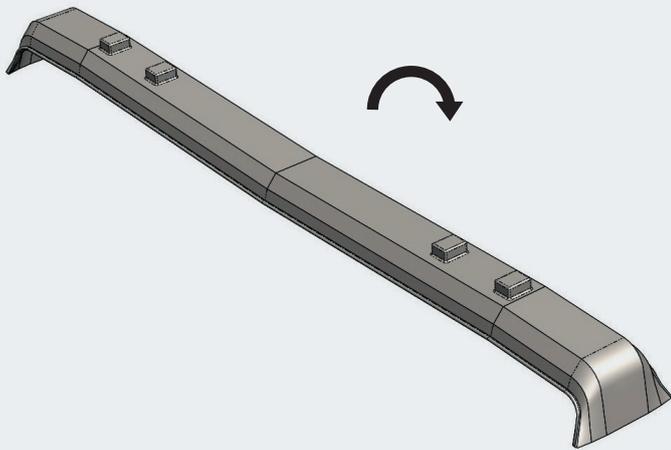
2. Adhesive Bonding of Under Sleeper Pads

For installation on steel sleepers, the under sleeper pads are delivered without a connection layer (flock or mesh), in order to enable adhesive bonding.

2.1 Adhesive

The adhesive is provided with the pads by Getzner Werkstoffe and is solvent-free. The safety data sheet and instructions for use have to be taken into account.





2.2 Steel Sleeper

The sleeper surface to be bonded has to be dry and clean, flat and smooth (the rougher the more adhesive is required). The surface should not have cavities. Please also consider the instructions for use of the adhesive.

Lay the sleeper upside down



2.3 Implementation

Lay the sleeper upside down and clean the surface if necessary. Prepare the adhesive as described in the instructions for use provided by the adhesive manufacturer. Please mind temperature and pot life.

Apply the glue on the under sleeper pads



The prepared adhesive is applied on the under sleeper pads. If the pad is divided in parts, the joints also have to be bonded. The required amount of adhesive is given by the roughness of the steel surface. Normally 1/2 to 2 kg adhesive is used per sleeper.

Place the sleeper pad on the steel sleeper



The under sleeper pad is placed centrally on the sleeper. During curing time the pad should be evenly loaded with at least 50 kg. After bonding there should not be any cavities, which are not filled with adhesive. The adhesive layer should be as even as possible (not more than 5 mm thickness difference), in order to avoid any influence on the system stiffness.

Load the surface evenly with at least 50 kg

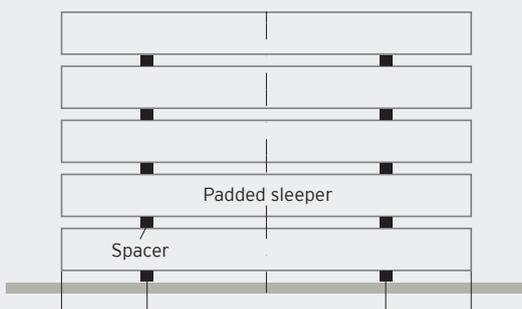


3. Storage of Padded Sleepers

Usually padded steel 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 100 mm is absolutely required. The exact amount of sleepers that can be stacked depends on the USP type and the sleeper type.



4. Transport of Padded Sleepers

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

5. 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 steel 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.

