

VIBRATION ISOLATION FOR LONDON UNDERGROUND

CASE STUDY

London Underground
(UK)

EFFECTIVE VIBRATION ISOLATION.



IMPROVED QUALITY OF LIFE FOR RESIDENTS

THE PROJECT

The track of the London Underground District Line was completely renewed between Paddington and High Street Kensington stations in the city centre. Around 173 million passengers use this line every year. Starting in July 2011, this very busy section of track, which is also part of the Circle Line, was upgraded with new ballast, rails and brand new sleepers with pads supplied by Getzner Werkstoffe.

The sleeper pads protect the track superstructure and reduce the level of vibrations caused by the underground trains. They also have a beneficial effect on the numerous dwellings alongside the track, as the reduction in vibrations noticeably improves the residents' quality of life.



THE GETZNER SOLUTION

Sleeper pads as vibration protection

Providing elastic bearings for this stretch of the District Line was the first major sleeper pad project for London Underground: the vibration protection requirements called for the use of full-surface Syldyn® Sleeper Pads, which are ideal for effectively minimising vibrations. Deliveries were made both to the CEMEX sleeper plants and directly to London Underground.

This renovated section of the District Line runs through very narrow tunnels, meaning that there is little to no gap between the sleepers and the drainage channels adjacent to the tunnel wall. A particular challenge in this case was preventing an increase in the level of sound transmission through the tunnel walls. For the first time, the elastic Syldyn® Bearings were placed not only on the bottom of the sleepers, but also on the ends, thus reducing the transmission of noise and vibrations through the tunnel wall.

Comprehensive project support

Around 7,000 pads for concrete sleepers and roughly 1,000 pads for timber sleepers were used on a stretch of track extending over approximately 2.5 kilometres. CEMEX fitted the elastic bearings to the concrete sleepers directly in its sleeper plants.

London Underground itself fitted the pads to the timber sleepers. Getzner was involved in all phases of the project - from finding the solution and performing calculations to providing support to the sleeper plants and London Underground.

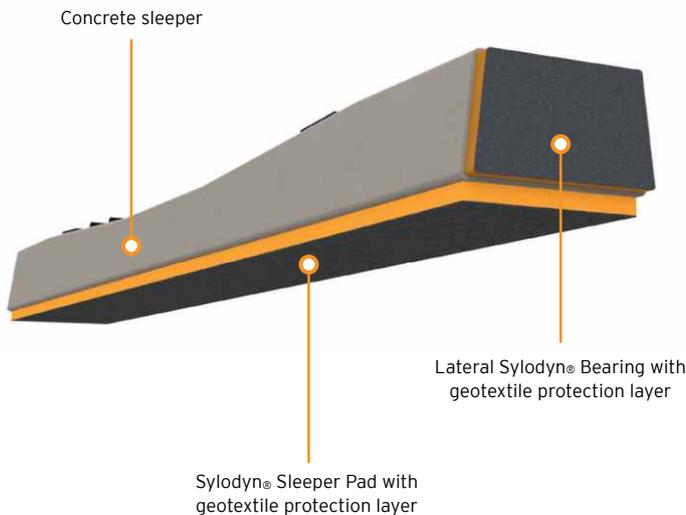
Successful and long-term collaboration

The CEMEX sleeper plants is already an experienced partner of Getzner in the pre-assembly of sleeper pads. "We have worked together with Getzner on a number of projects - both for Network Rail and for London Underground. During the implementation of these projects, we were able to gain valuable experience in the installation of sleeper pads. Getzner supported us with excellent customer service and was also present on-site during installation, when required", explains Andrew Carey, Sales Manager of the sleeper manufacturer CEMEX Rail Products.

Testing confirms effectiveness

Structure-borne noise measurements taken after the installation verify the effectiveness of the vibration protection solution from Getzner. "A significant reduction in ground-borne vibration has been achieved in a number of neighbouring properties. Some long-term residents living next to the track have even written and thanked us for providing them with greater peace and quiet. Additionally, the sleeper pads supplied by Getzner required no changes to the installation programme, methodology or equipment for the track renewal. Overall, the use of Getzner Sleeper Pads on this project has been a great success", stated Mike Barlow, Principal Project Engineer from London Underground.

ILLUSTRATION OF THE INSTALLED SLEEPER WITH PAD



Pre-assembly of the sleeper pads in the plants



Sylodyn® Bearings on the ends of the sleepers



Installation in the tunnel



ADVANTAGES

The vibration isolation solution implemented on the London Underground District and Circle Lines delivers effective and long-lasting reduction of structure-borne noise in a highly sensitive inner-city environment.

Full-surface Sylodyn® Sleeper Pads, combined with additional elastic bearings on the sleeper ends, ensure uniform load distribution and significantly reduce the transmission of vibrations into tunnel walls and neighbouring buildings. This improves living conditions for residents along the line while protecting the track superstructure from dynamic loads. The solution was seamlessly integrated into the existing installation process without changes to equipment or methodology, supporting efficient project execution, high operational reliability and sustainable, low-maintenance rail infrastructure on one of London's busiest underground routes.

Operator	London Underground/Transport for London
Track length	Approx. 2.5 km
Solution	Padding of 8,000 sleepers 7,000 full-surface sleeper pads for concrete sleepers, 1,000 for timber sleepers
Services	Model and forecast calculations using finite element methods, installation plans, quality assurance

**Additional references can
be found on our website:**



[getzner.com/
references](https://www.getzner.com/references)

[getzner.com](https://www.getzner.com)

Getzner Werkstoffe GmbH

Herrenau 5
6706 Bürs, Austria
T +43-5552-201-0
info.buers@getzner.com