Case Study

Vibration Protection for London Underground (UK)

- Proven reduction of vibrations
- Elastic pads on bottom and ends of the sleepers
- Verified long-term quality

getzner
engineering a quiet future

Improved quality of Life for Residents

Description of the project

Track renewal for London Underground

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 decrease in vibrations noticeably improves the residents' quality of life.

The 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 Sylodyn® sleeper pads, which are ideal for effectively minimising vibrations. Deliveries were made both to the CEMEX sleeper works 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. The elastic Sylodyn® bearings were for the first time 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 works. London Underground itself fitted the pads to the timber sleepers. Getzner was involved in all phases of

1 Pre-assembly of the sleeper pads in the works
2 Sylodyn® bearings on the ends of the sleepers
3 Installation in the tunnel

the project – from finding the solution and performing calculations to providing support to the sleeper works and London Underground.

Successful and long-term collaboration

The CEMEX sleeper works 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.

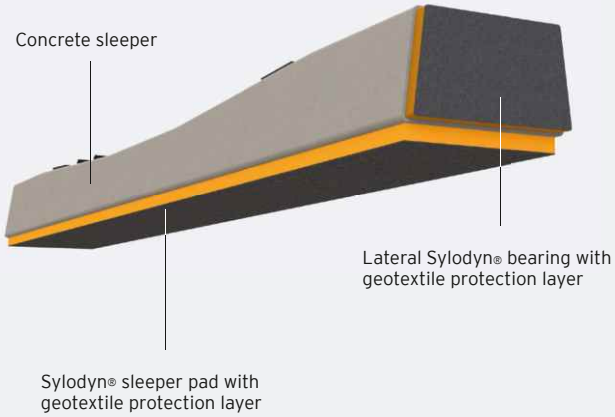
Testing confirms effectiveness

Structure-borne noise measurements taken following 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



Facts and figures at a glance

District Line/Circle Line track renovation between High Street Kensington and Paddington

Track length:	approx. 2.5 km

Order details

Scope of the order:	Padding of 8,000 sleepers 7,000 full-surface sleeper pads for concrete sleepers, 1,000 for timber sleepers
Innovation:	Additional elastic bearings on the ends of the sleepers
Client:	London Underground/CEMEX Rail Products
Operator:	London Underground/Transport for London
Project manager:	Lukas Mayer
Completion:	August 2011
Sleeper manufacturer:	CEMEX Rail Products
Construction company:	Balfour Beatty

Getzner Werkstoffe GmbH

Foundation:	1969 (as a subsidiary of Getzner, Mutter & Cie)
Chief Executive Officer:	Ing. Jürgen Rainalter
Employees:	380
2016 turnover:	EUR 80.4 million
Business areas:	Railway, construction, industry
Headquarter:	Bürs (AT)
Locations:	Berlin (DE), Munich (DE), Stuttgart (DE), Lyon (FR), Amman (JO), Tokyo (JP), Pune (IN), Beijing (CN), Kunshan (CN), Charlotte (US)
Ratio of exports:	90 %

Railway references (extract)

- Channel Tunnel Rail Link (UK)
- Thameslink, Blackfriars Bridge (UK)
- Crossrail, London (UK)
- Extension of the East London Line (UK)
- Marmaray Tunnel, Istanbul (TR)
- Gautrain, Johannesburg (SA)
- Attiko Metro, Athens (GR)
- Metro, Madrid (ES)
- New York City Subway (USA)