

Kapweg, Berlin

The foundations of buildings in the direct vicinity of tunnels for instance for underground railways need vibration insulation. The objective of the insulation is to minimise the nuisance caused by low-frequency vibrations and the resulting secondary airborne sound. The demands made of materials for vibration insulation go beyond their pure insulating effect and also include resistance to ambient influences, together with long-term functionality.

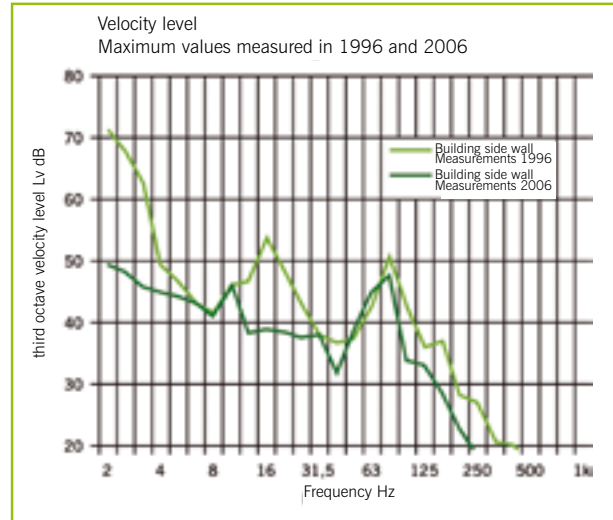
The material **Regupol® PL** developed by BSW GmbH has already been used successfully for vertical insulation solutions in several tunnels.



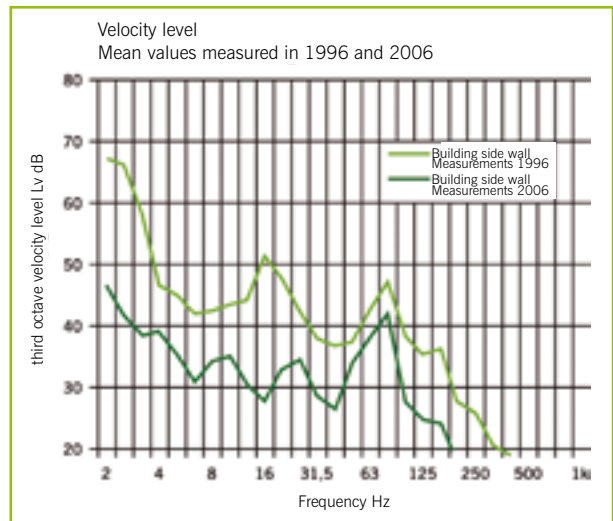
Measurement of vibration insulation completed in 1996 revealed that **Regupol® PL** fulfils its insulation function in the long term, even when exposed to groundwater. The vibration insulation was measured in the Kapcarree office and business building in Kapweg, Berlin. The building foundations run parallel to an underground railway tunnel at a distance of just a few metres over a length of approx. 70 metres. The diaphragm wall between building and tunnel was fitted with vertical vibration insulation consisting of **Regupol® PL**. In 1994 to 1996, the Institute for Acoustics and Structural Acoustics (IAB), Oberursel, measured the sound velocity level (third octave velocity level L_v dB) at the tunnel wall, the diaphragm wall constructed in front of it and at several points of the side wall of the building which adjoins the tunnel. The IAB examined the building walls again in July 2006.



As the dB values of the entire frequency range have to be used to assess the impact of the vibration severity on humans, the KB value defined in DIN 4150-2 sets limit values for buildings and structures. Here the lower reference value is 0.2 (day) or 0.15 at night. The upper reference value A_i is 5 (day) or 0.3 (night). The appraisal vibration severity A_r is 0.1 (day) and 0.07 (night). IAB calculated a KB value of 0.02 from the latest measurement at the building inner wall. Accordingly, the results are well below both the appraisal vibration severity (A_r) and also the lower reference value (A_u). In other words, there are no disturbing nuisance effects from the underground railway tunnel inside the building even after ten years. **Regupol® PL** has therefore proven suitable for insulating the vibrations of passing underground trains to an adequate extent even after 10 years.



As most of the **Regupol® PL** insulating material is located several metres below the groundwater level, it can be presumed that penetration of water, influx of sediment and other ambient influences have no detrimental effect in practice on the vibration insulating properties of the rubber material.



More references can be found on our website.

