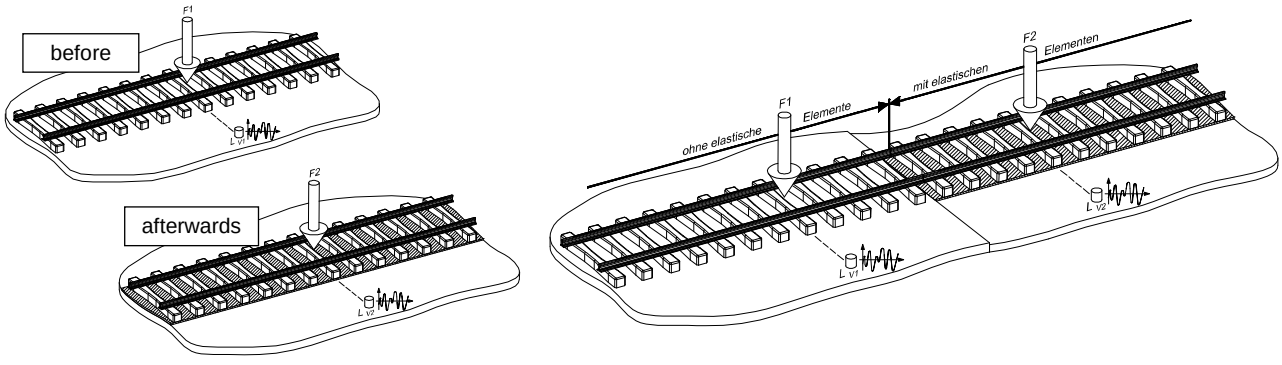
Several measures are used to reduce the environmental impact of ground-borne vibration from rail traffic. In order to verify the efficiency of these mitigation measures (e.g. under-sleeper pads) the *Baudynamik Heiland & Mistler GmbH* elaborates an experimental test procedure which can be applied on site to real track systems and quantifies the insertion loss of the isolation system. The procedure takes into account

- the influence of different subsoil conditions,
- the nonlinear force-deflection behaviour of the insulation material and therefore
- appropriate preload of mitigation system during the test.

Theoretical background

Theoretical background are the two different determination methods of the insertion loss acc. to the new draft of DIN 45673-3, the so called «before/afterwards» method and the «left/right» method, see Figure 1. That's why the insertion loss can be determined at new lines as well as at existing railway lines.



«before/afterwards» method *«left/right» method*

Figure 1: Two methods for the determination of insertion loss acc. DIN45673-3 (draft)

Test setup

The transfer mobility function from the head of rail to the point of interest is determined by means of *BUTTERFLY®*, an hydraulic operating, force-controlled as well as velocity-controlled shaker. *BUTTERFLY®* can operate in the frequency range 0,1 – 110Hz with a max. dynamic excitation force of 21kN.

Since the insertion loss depends from the unsprung and sprung masses, these parameters are simulated as follows: The unsprung mass is simulated by a steel foundation, whereas the sprung mass, which corresponds to the realistic static load under train passing, is provided by two dynamically decoupled road rail excavators, see Figure 2

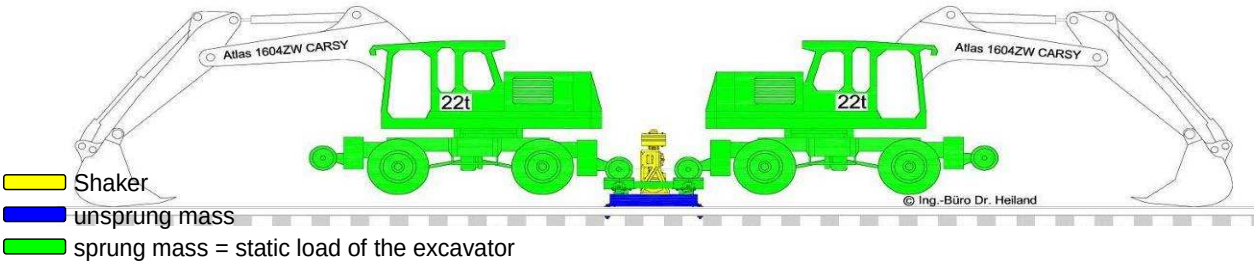
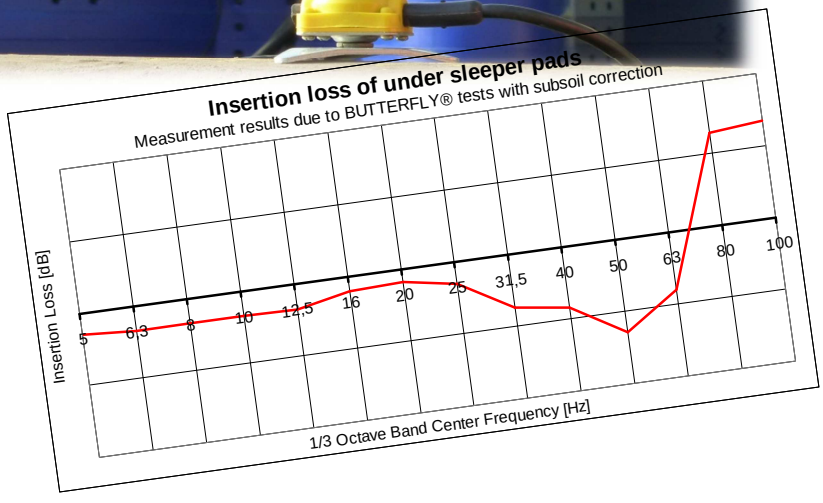


Figure 2: Overview of the whole test setup during the shaker tests

Each excavator is supported on the one side by the bucket, on the other side the excavator is supported by a steel frame which is itself supported by springs with appropriate elasticity. The static load depends on the position of the bucket: the nearer the bucket is, the lower is the force.



Don't hesitate to contact us if you need more information: www.baudynamik.de