



Aerodynamics & acoustics

Micro-pressure waves: Evaluating and assessing, and rectification measures

When high-speed rail vehicles enter a tunnel, this can produce acoustically radiated sounds (tunnel boom) in the adjacent portal when certain conditions prevail. In order to avoid subsequent complications, the relevance of micro-pressure waves should not only be taken into consideration for new tunnel projects, but also for projects being carried out to increase travel speeds in tunnels as well as for new vehicles procured to service high-speed railway programmes. The aerodynamics and acoustics engineers employed at DB Systemtechnik are leaders in this field of work Europe-wide. We have direct access to all simulation tools and testing and inspection methods that we can leverage to formally evaluate and assess your project plans in qualified inspection reports at an early stage. We have already developed portal hood-type constructions for more than 12 tunnels to minimise the effects of micro-pressure waves. Our simulation exercises have also been confirmed and validated by way of measurements taken by our accredited testing laboratories.

Our services

- Expedited classification, or categorisation of potentially endangered structures
- Execution of validated simulations for investigating micro-pressure wave phenomena
- Development and design of structural rectification measures (hood-type constructions)
- Supplementary measurement programmes during tunnel commissioning

Your advantages

- Planning certainty thanks to formally recognised inspection reports based on calculations
- Action plan envisaged at an early point for the project almost entirely cost neutral from a building/construction perspective
- Requirements specified in Deutsche Bahn guideline 853 maintained and upheld
- You profit from the far-reaching know-how amassed by our experts in having conducted and completed national and international projects

Technical details

- Flow simulation tools and specially developed calculation methods for quantifying the propagation of pressure waves and acoustic radiation
- Specialised measuring instruments for synchronous measurement points, including in very long tunnels
- Comprehensive database of measurements taken in tunnels and on model test rigs

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Our Knowledge: **Your Success**

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