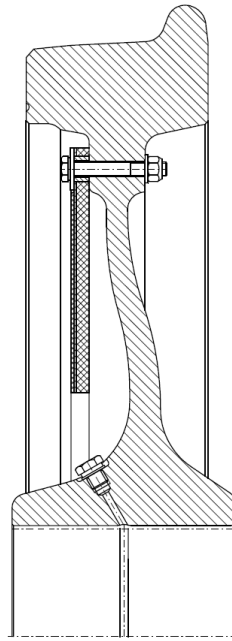


BONATRANS noise absorbers

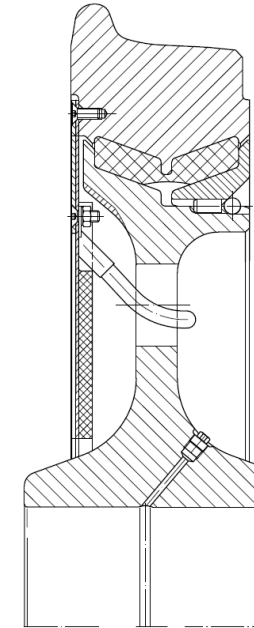
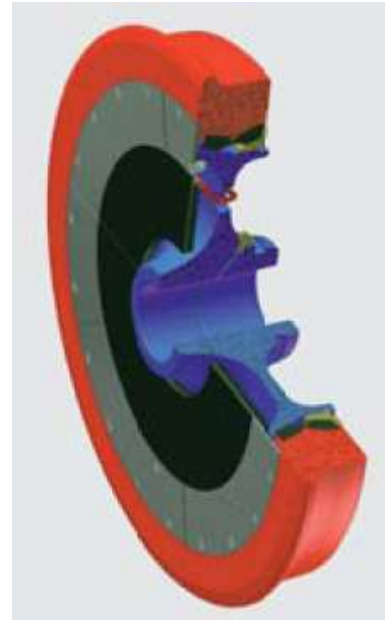
- Reduction of rolling and squealing noise (in curves) caused by the wheel/rail contact
- Squealing noise is dominant at lower speeds, rolling noise is dominant at high speed (> 250 km/h).
- Smaller noise reductions through noise reducing rings (cheap solutions suitable for some applications)
- More substantial reduction through BONATRANS composite noise absorbers.
- The highest attenuation effect can be achieved through combination of a composite noise absorber and a resilient wheel



BONATRANS noise absorbers



Scheme of the BONATRANS noise absorber mounted on a wheel

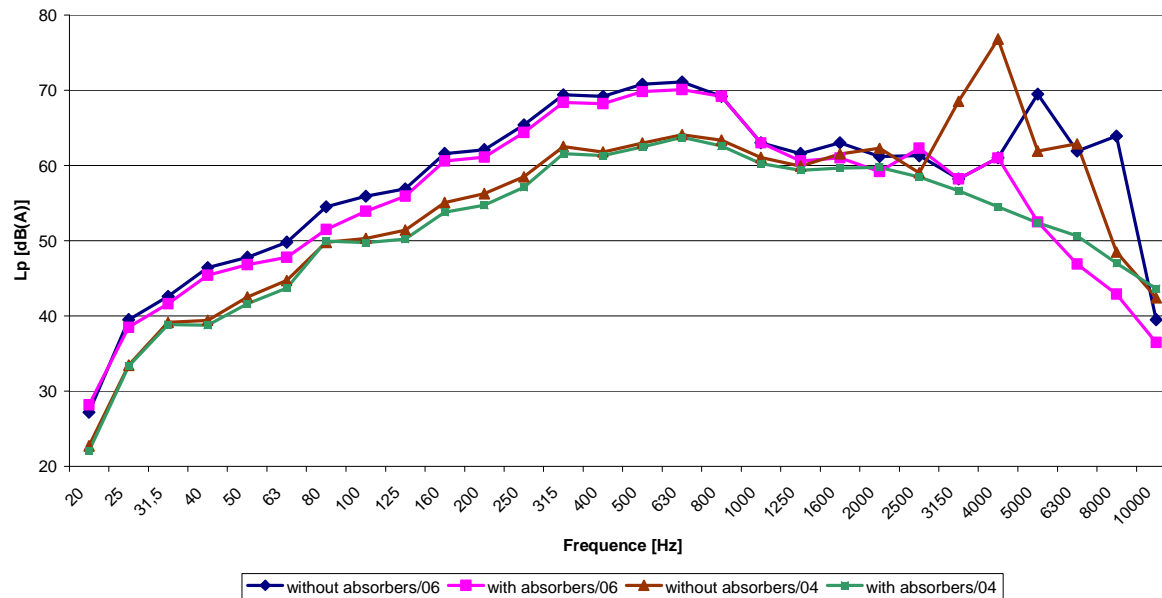


Scheme of the BONATRANS noise absorber mounted on a resilient wheel

Effectiveness of noise reduction

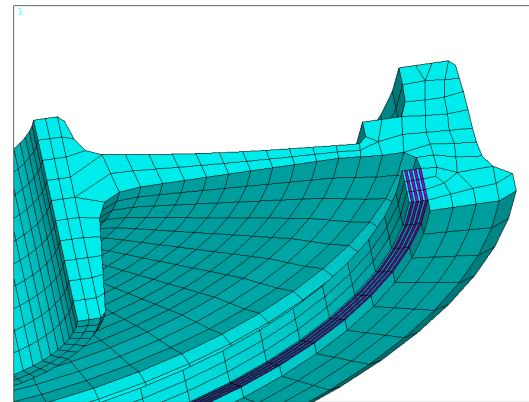
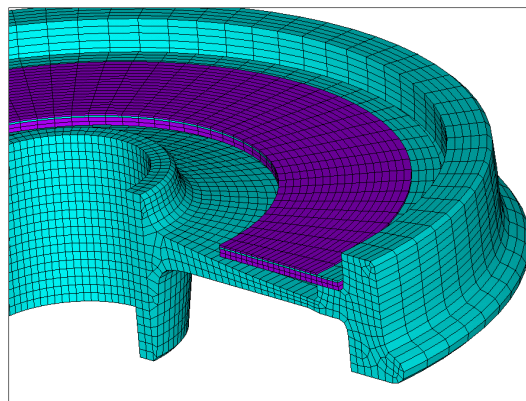
- Measured by field tests. Example – noise measurement in MBTA Boston, USA (microphone in the passenger compartment)

COMPARISON OF RESULTS FROM YEARS 2006 AND 2004
One-third-octave characteristic of sound pressure levels for Microphone Car
Measured section - State Street Station, outbound



Development of BONATRANS noise absorbers

- In the development of noise absorbers, BONATRANS cooperates with research centres and universities
- Design development: AutoCAD, Inventor, ProEngineering
- Vibration characteristics are verified through finite element method (FEM) calculation: ANSYS, COSMOS
- Laboratory tests of noise and vibrations (simulation of operating conditions)
- In-service measurements.



Main advantages of BONATRANS noise absorbers

- High absorption effect – up to 5dB(A) rolling noise, up to 30 dB(A) squealing noise
- Applicable in all types of rail vehicles
- Service life is not limited by the service life of the wheels
- Low weight (approx. 10 kg)
- Easy maintenance
- Specific design tailored to the customer's needs

