

OUR BUSINESS ACTIVITIES IN VEHICLE ACOUSTICS

- Public research projects
- Own and preliminary research
- Developments for industry
- Customer-tailored measurements
- Noise reduction and acoustic optimization of prototype and series-production vehicles
- NVH Benchmarking
- Wheel – lane, power train, components
- Improvement of communication and safety
- Reduction and conditioning of interior noise and signals
- Electric mobility
- New acoustic parts and measuring methods
- Sound design and psycho-acoustics

The Fraunhofer Institute for Building Physics IBP is cooperating with scientific institutions and numerous manufacturers and suppliers of automotive industry on a national as well as international level. Moreover, the Fraunhofer IBP is a member of Fraunhofer Traffic and Transportation Alliance aimed at developing and implementing transportation-relevant technical and conceptual solutions for public and industrial customers.

CONTACT

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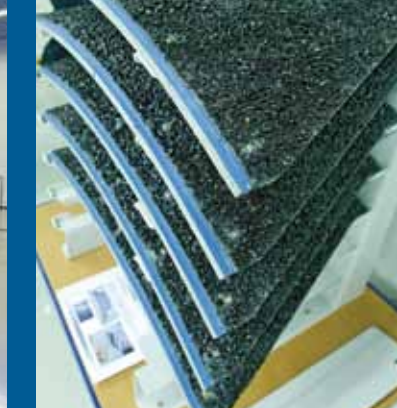
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GPS 48°44'26" N; 9°05'57" E

COMPETENCES IN DETAIL

VEHICLE ACOUSTICS





FOUR-WHEEL ROLLER TEST BENCH WITH PASS-BY MEASURING HALL

SEMI-ANECHOIC ROOM

Lower cut-off frequency 40 Hz,
room dimensions (W x H x L) 18.9 m x 6 m x 25 m

SIMULATED PASS-BY

PAK measuring system with 2 x 32 microphones

REMOVABLE PALLETS

- Closed exterior noise pallet
- Open interior noise pallet with space for pit lift

VEHICLE FIXATION

- Hook fixation by chains and rods
- Wheel hub fixation

DELIVERY ZONE

- Prototype-compatible HGV unloading place
- Gate to the test bench 3.4 m x 3.4 m

FOUR-WHEEL CHASSIS DYNO

- Four individually driven rollers
- Roller diameter: 1.90 m (75")
- Force per roller: 7500 N
- Electrical power: 4 x 300 KW
- Test speed: 0–320 km/h
- Precise synchronization of rollers:
deviation max. 0.05 km/h, per axle max. ± 1 mm
- Roller width: 550 mm
- Wheel track: 1100 mm
- Vehicle cooling: 20 km/h–100 km/h, test speed controlled,
min. 7000 m³/h, max. 42,000 m³/h,
incident flow height max. 800 mm
- For vehicles
 - up to 4 t total mass
 - with maximum axle load of 2 t
 - with 2200 mm to 4000 mm wheel base

VARYING ROLLER SURFACE COVERINGS

- Safety walk
- Rough-textured asphalt simulation
- Baffle plates: 20, 15 and 7.5 mm

EQUIPMENT AND EVALUATION

Two separate and lockable evaluation and equipment rooms with lifting platform

FURTHER TEST FACILITIES

- Test facility for windows
- Test facility for facades (reverberation room/semi-anechoic room)
- Test facilities for sound insulation (vertical and horizontal)
- Reverberation room: $V = 392$ m³
- Anechoic room: $V = 1090$ m³
- Semi-anechoic rooms
- Test facility for simulated rain shower according to DIN EN ISO 140-18
- Acoustic wind tunnel: volume flow 35 m³/s, variable test opening 0.5 m², incident flow up to 200 km/h

INSTRUMENTATION

- PAK measuring system for simulated pass-by
- SQ-Lab / Artemis
- Binaural artificial head measurement technique and analysis
- Laser scanning vibrometer
- Acoustic near-field holography (microphone array)
- Air and structure-borne sound intensity
- Measuring systems for material parameters:
 - sound absorption at normal sound incidence (impedance tube)
 - flow resistance
 - dynamic stiffness
 - modal analysis