VEHICLE ACOUSTICS
OVERVIEW OF SERVICES AND COMPETENCES
The Fraunhofer IBP has a modern and well-equipped test center for vehicle acoustics and offers a wide range of research and development services for customers from the automotive industry. On the four-wheel drive chassis dynamometer in our semi-anechoic acoustic measuring hall we carry out various investigations on interior and exterior vehicle acoustics, for example simulated pass-by measurements.

**OUR RANGE OF SERVICES**

- Noise reduction and acoustic optimization of prototype and series-production vehicles
- Tire-road, power train, components
- NVH benchmarking (Noise Vibration Harshness)
- Simulated pass-by according to DIN ISO 362-3
- Improvement of communication and safety
- Sound design and psycho-acoustics
- Electromobility

**COOPERATIONS**

- Public research projects
- Research and development for the industry
- Measurements according to customer specifications
Four-wheel drive chassis dynamometer

- Four individually driven rollers
- Roller diameter: 1.90 m (75")
- Force per roller: 7500 N
- Electrical power: 4 × 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, 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 and with 2200–4000 mm wheel base

Varying roller surface coverings
- Safety walk
- Rough-textured asphalt simulation
- Impact bars: 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

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

Semi-anechoic measurement hall
- Lower cut-off frequency 40 Hz,
  hall dimensions (W × H × L) 18.9 m × 6 m × 25 m

Simulated pass-by
- PAK measuring system with 2 × 30 microphones

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

Vehicle fixation
- Hook fixation by chains and restraining bars
- Wheel hub fixation

Delivery zone
- Prototype-compatible indoor loading bay for high
  confidentiality
- Gate to the test bench 3.4 m × 3.4 m
Contact

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