Technical specifications

Dyno performance

- Nominal power: 220 kW per axle
- Overload: 330 kW
- Max. speed.: 250 km/h (694 rpm)
- Max. drag force: 10,5 kN at 80 km/h
  4,9 kN at 250 km/h

Roller

- Roller diameter: 1.910 mm
- Vehicle wheelbase: 2.300 - 3.400 mm
- Vehicle width: 900 - 2.300 mm
- Roller width: 700 mm
- Max. load per axle: 3.000 kg

Acoustic chamber

- Clear length: 14,0 m
- Clear width: 10,7 m
- Clear height: 6,0 m
- cut-off frequency: 63 Hz (third-octave band)

Vehicle fixation

- Single-point driveability fixation rear, via trailer coupling
- Two-point fixation front and rear, hook fixation and/or tension belt via tow coupling
- Four-point axle leg fixation, tension belt
- Four-point wheel hub fixation

Contact

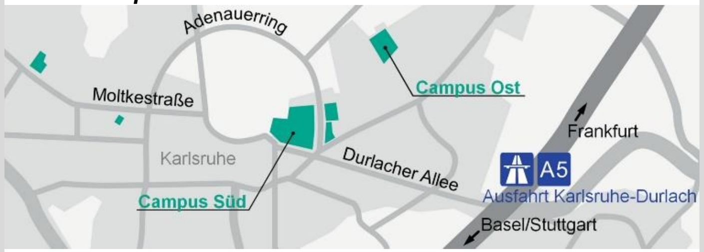
Karlsruhe Institute of Technology (KIT)
IPEK Institute of Product Engineering

Dipl.-Ing. Sascha Ott
Managing Director Institute of Product Engineering

Campus Ost
Rintheimer Querallee 2, Building 70.14
76131 Karlsruhe

Phone: +49 721 608 43681
Mail: Sascha.Ott@kit.edu

www.ipek.kit.edu



Organizational Questions

Yannik Weber +49 721 608 47176
E-Mail: yannik.weber@kit.edu

Updated March 2022

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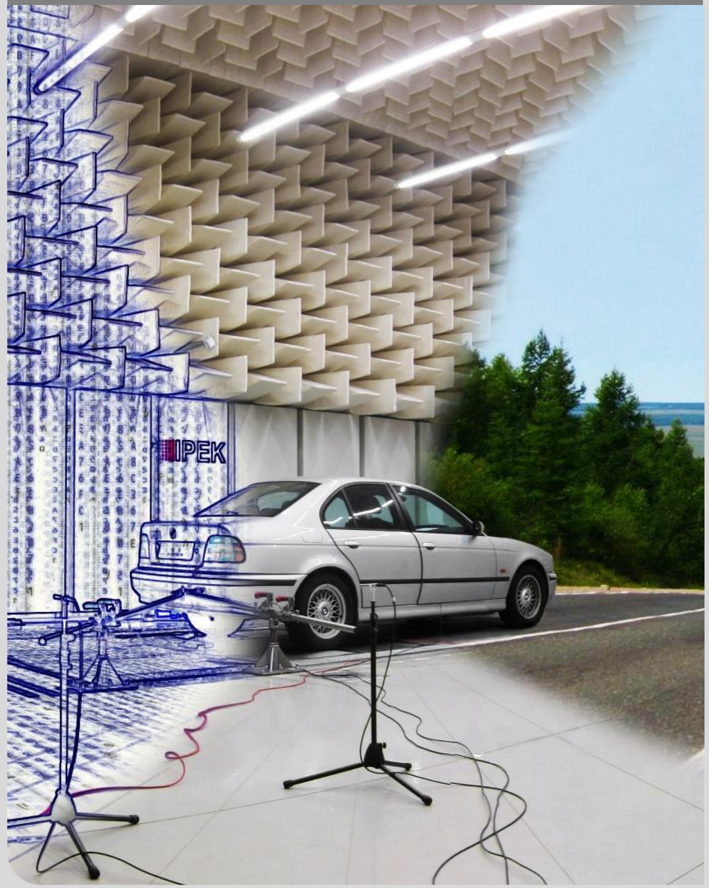
ARP

Acoustic Roller Test Bench with Vehicle-in-the-Loop-Technology

IPEK ▪ Institute of Product Engineering



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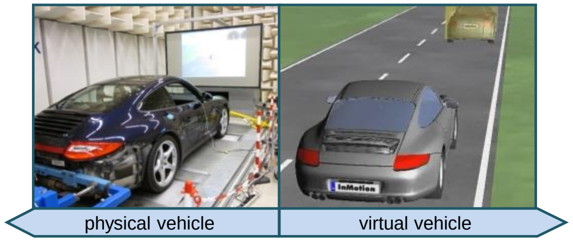
Research

The acoustic chassis dyno with Vehicle-in-the-Loop technology and two driven axles is feasible for investigations in acoustics and vibrations of passenger cars under real road conditions. The chassis dyno is surrounded by a semi-anechoic acoustic chamber (DIN EN ISO 3745, accuracy class 1, lower cut-off frequency 63 Hz, third-octave band)

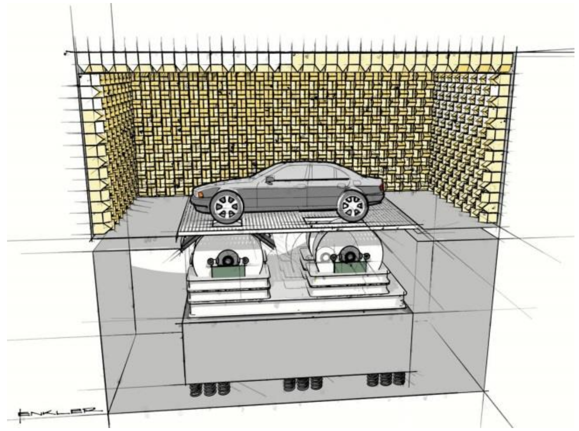


Main research

- NVH investigations in acoustics, vibrations and driving comfort
- Design of validation environments and methods according to the IPEK x-in-the-loop approach for drive systems
- Investigation and evaluation of driveability
- Operation- and drive-strategies
- Modeling, parameter identification and verification
- Virtual car
- Driver models and test run automation
- Area of conflict: performance, safety, energy efficiency
- Multi-domain-optimization (MDO)
- Comfort objectification
- Vehicle performance test
- Fuel consumption measurement
- Emission measurement

Instrumentation / Sensors

- Binaural artificial head
- Binaural microphone
- Near- and free field microphones
- Triaxial vibration sensors
- Uniaxial vibration sensors incl. calibration equipment
- Laser surface velocimeter
- Handheld speedometer with analogue output
- Infrared camera



Frontend (LMS SCADAS Mobile)

- 32 free configurable measuring channels
- CAN bus input

Frontend (HEAD acoustics HEADLab)

- 36 ICP Inputs
- 2 Tacho Inputs
- 6 Typ-K Inputs
- CAN Interface

Driving robot (Stähle SAP 2000)

- Accelerator-, brake-, clutch pedal
- Shifting (manual, automatic), ignition
- Driving cycle (fuel consumption, etc.)

Acoustic Camera (HEADVisor)

- Array of 56 microfones with Beamforming-technology for online source identification
- Frequency range 300 Hz to 20 kHz
- Distance between Array and Source ranging from 30 cm up to 200 m

3D sound intensity probe (LMS SoundBrush)

- Frequency range: 100 – 4.000 Hz
- Dynamic range: 33 dB(A) – 150 dB

3D scanning vibrometer (Polytec PSV 400)

- Contactless acquisition of 3D surface vibrations
- Target size 1 mm² up to several m²
- 512 x 512 measuring points per scan

Chassis dyno controller

- Flexible test run and maneuver definition (set point of drag force and driving speed)
- Drive cycles and load spectrum in road-load-simulation

Driveability evaluation (AVL DRIVE™)

- Objective evaluation in real time (VDI 2563)
- Uses ca. 450 criteria
- Evaluation of 75 driving states