

# Wheel-Axle Test Rig



## Main Application

- Steering behavior, transient tire behavior
- tire behavior at extreme manoeuvres
- Analysis of the influence of the axle on the tire behavior
- Determination of driving dynamics parameters
- Determination of the transmission behavior for harmonic excitations, individual obstacles and stochastic lanes
- strength tests
- Vibration behavior at combined use
- Sensitivity of the suspension to road, brake or tire caused vibrations

## Technical Data

static:

- Wheel load: max. 15 kN
- Speed: max. 250 km/h
- Steering wheel angle gradient: max. 900°/s
- Drum diameter: 2000 mm
- Drum width: 50 mm

Dynamic:

- Dynamic wheel load: wheel load control up to 12 kN

## Specimens

- Complete chassis including tires for light trucks and cars

## Special features

Max. dimensions of specimen:  
clamping table dimension: L x W: 1500 mm x 1300 mm

Specification of arbitrary wheel load and steering wheel angle curves possible

Various excitation profiles can be applied on a drum (corrugated profile 5 mm, cleat, rough surfaces)

## Location

George - Bähr - Straße 1 C, 01062 Dresden

### Measured values

- Tire forces: longitudinal, lateral, vertical
- Tire aligning torque
- Longitudinal speed
- Steering wheel angle
- Forces at all attachmentpoints from the axle to the vehicle body
- Change of wheel center in vertical direction
- Equipment with measuring tie rod possible

### Measuring device

- CAESAR measuring wheel with 17", 18" and 19" rims
- KEYENCE laser distance measuring system
- Acceleration sensor:
  - 1 - axial: 500g
  - 3 - axial: 5g, 50g, 5000g
- PCB 1: Acceleration- and Loadcell
- At testrig installed linear distance measuring system

### Equipment

- measuring wheel CAESAR: 17", 18", 19" (Measuring range:  $F_x = \pm 30$  kN,  $F_y = \pm 15$  kN,  $F_z = \pm 30$  kN,  $M_x = \pm 4000$  Nm,  $M_y = \pm 5600$  Nm,  $M_z = \pm 4000$  Nm)
- Rims for the measuring wheel: 8 J x 17, 8 ½ J x 18, 8 ½ J x 19
- Segments with different road surfaces
- Corundum coating on the drum
- Drum: Ø 2000 mm, width 50 mm
- Hydraulic cylinder: wheel load control up to 12 kN
- Electric motor for driving the drum ( $U = 400$  V,  $I = 281$  A,  $P = 100$  kW,  $n = 1250$  min<sup>-1</sup>)
- Measuring computer tire test rig located in the operator room
- Control computer located in the operator room
- Engine for Steering gear
- Steering Angle Sensor
- Linear distance measuring system
- laser distance measuring system KEYENCE with measuring head (measuring range: 28 mm) and measuring amplifier (analog output)

### Software for control and data collection

- Measuring and control system: PXI 8196 - RT von National Instrument, Realtime
- Control: LabVIEW
- Data collection: DIAdem, Matlab

### Provided connections in the test room

- Electrical connection 16 A (possibly 32 A)
- Druckluft 6 bar

### Reference projects

Various examinations for OEM

### Contact Person

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