



TU Wien
Automotive Test Center GmbH

TU Wien
Automotive Test Center GmbH

Ing. Mag. Markus Huber
Geschäftsführer

Karlsplatz 13 / E0074
1040 Wien

tel +43 (1) 58801 407201
eMail: markus.huber@atc-tuwien.com

Key services

Air conditioned 4-wheel chassis dynamometer

- Determination of the legally limited exhaust emissions (Euro 6d-compliant)
- Use of extended measurement equipment: FTIR, E-measurement technology, thermal measurements, etc.
- Support of the vehicle development process
- Research of battery electric and hydrogen powered vehicles
- Benchmarking

TECHNICAL DESCRIPTION – VEHICLE CHASSIS DYNAMOMETER

Supplier: AVL List GmbH, Graz

1. Dimensions

Climate chamber	
Dimensions (total) (L x W x H)	13,8 m x 6,18 m x 3,34 m
Gate dimensions (W x H)	3,5 m x 2,96 m
Chassis dyno – dimensions	
Wheelbase	1.800 mm - 4.200 mm
Distance - outer edges of rollers	2.300 mm
Distance - inner edges of rollers	914 mm
Distance - centre of front axle to gate	6.900 m
Diameter - rollers	1.219,2 mm
Chassis dyno – key facts	
max. speed	250 km/h
max. load (per axle)	3.500 kg
Initial inertia (per axle)	1.362 kg
Simulation masses	454 kg - 10.000 kg (2WD) 800 kg - 10.000 kg (4WD)
Rated power (as motor)	208 kW @ v≥80 kph (per axle)
Rated power (as generator)	210 kW @ v≥80 kph (per axle)
Peak power (10s; as motor)	333 kW @ v≥80 kph (per axle)
Peak power (10s; as generator)	336 kW @ v≥80 kph (per axle)
Cooling fan – key facts	
Max. fan speed (narrow / wide cross section, @23 °C)	210 kph / 145 kph
max. air flow	155.000 m ³ /h
Cross section (narrow / wide)	800 mm x 600 mm / 1.800 mm x 600 mm
max. height – top edge fan outlet	1.170 mm

2. Test bed conditioning

2.1. Temperature range

-35 °C to +50 °C

Additional Solarisation (IR radiators): up to 1.400 W/m², area of 5 x 2 m

2.2. Air heating durations

-20 °C to +50 °C w/o vehicle in 2:10 hours

-20 °C to +23 °C w/o vehicle in 1:45 hours

2.3. Humidity range and heat dissipation

Temperature [°C]	Humidity [%RH or °C _{TP}]	Altitude [m]	Power Test Object [kW]	Waste Heat Test Object [kW]
-35 ± 2 °C	-38 °C _{TP}	Local	10	15
-30 ± 2 °C	-33 °C _{TP}	Local	30	45
-25 ± 2 °C	-28 °C _{TP}	Local	100	150
-20 ± 2 °C	-23 °C _{TP}	Local	150	225
-15 ± 2 °C	-18 °C _{TP}	Local	200	300
-10 ± 2 °C	-13 °C _{TP}	Local	250	375
+10 ± 2 °C	+ 7 °C _{TP}	Local	250	375
+23 ± 1 °C	50 ± 5 %	Local	150	225
+23 ± 2 °C	50 ± 10 %	Local	250	375
+35 ± 1 °C	40 ± 5 %	Local	150	225
+35 ± 2 °C	40 ± 10 %	Local	250	375
+50 ± 2 °C	max. 20g/kg	Local	250	375

3. Exhaust measurement equipment

- High-precision, automation-supported emission and energy measurement technology
- AVL CVS i60 SII (designed for emission standards Euro6d and CFR 1066; GTR15) for diluted measurement (modal and exhaust bags)
- AVL Flowsonix Air (dilution air volume flow measurement; calculation of exhaust gas volume flow)
- CO₂ tracer (exhaust gas volume flow determination)
- AVL particle mass collector (4-phases)
- AVL Particle Counter (PNC_{23nm})
- AVL Micro-Soot-Sensor (MSS2)
- AVL i60 for 2-line raw exhaust gas measurement
- IAG FTIR for raw exhaust gas measurement
- Measured components: CO, CO₂, O₂, THC, CH₄, NMHC*, NO, NO₂*, NO_x, particle mass, particle number (*... calculated value)
- The test bench is suitable for all conventional (diesel, petrol and natural gas) fuels as well as alternative (hybrid, plug-in hybrid, purely electric and hydrogen) propulsion energies.

4. Quick charging station in air-conditioned test cell

- Charging power up to 300 kW
- max. DC charging: 300 kW with 400 A (continuous)
 - 20-minute boost function: 300 kW with 500 A (@ +20°C)
- max. AC charging: 22 kW (400 V / 32 A)
- freely selectable limitation of the maximum charging power

5. Test bed overview



- Retaining forces for bar attachment: max. 4m/s² at 2,500kg or tractive force max. 15kN up to 80km/h, then decreasing to 5kN at 200km/h
- Retaining forces for wheel hub attachment: max. 10 m/s² at 2,500kg or tractive force max. 15kN, then decreasing to 5kN at 200km/h