German-Dutch Wind Tunnels

DNW fact sheet
Car driving resistance wind tunnel testing

WHICH SERVICES DO WE OFFER?

Climate change is recognized as one of the largest environmental challenges we are being faced with today in which the impact of road and air vehicles play an important part.

DNW is one of Europe's most advanced and specialized organizations for wind tunnel testing. DNW's eleven wind tunnels include subsonic, transonic and supersonic facilities, and provide experimental aerodynamic simulation capabilities to the user community at large, addressing the environment.

What are the benefits of our wind tunnel services?

- Large size vehicles (shuttle vans, campers, mini-transporters, commercial vehicles etc.)
- Measuring your 'real world' mid-size road vehicle drag to access fuel consumption and thus exhaust pollution levels.
- Highly efficient and low cost testing approach meeting the stringent Worldwide Harmonized Light Vehicle Test Procedures (WLTP) and support achieving global regulatory approval for new vehicle models.
- Reducing the environmental impact of your vehicle by optimizing its design.

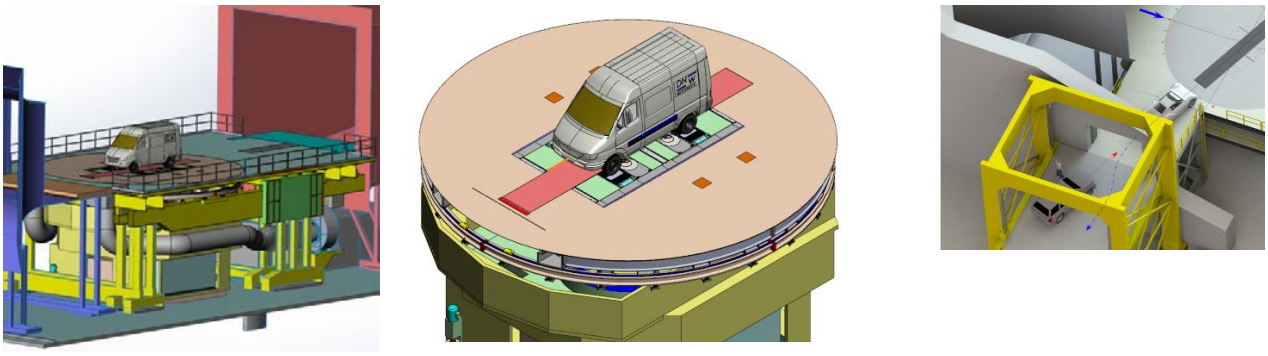
Typical tests

- 'Real world' mid-size road vehicle aerodynamic drag, roll resistance and drive train resistance measurements at driving cycle conditions to reflect actual on-road vehicle performance.
- Acoustic signature and cabin noise assessment.

DNW's economies of scale, operating wind tunnels at five sites, allow application and sharing of a wide range of measurement and data acquisition systems covering any need. Modernized control systems, test object setting precision, excellent repeatability and high operational productivity guarantee best value for money. By adopting the ISO 27000 family requirements for our security management system, we guarantee secure handling of own and third party assets such as intellectual property, customer wind tunnel models and test data.

WHO CAN BENEFIT FROM THESE SERVICES?

Car, light duty vehicle, truck and bus manufacturers can profit from our experience and experimental services that go beyond traditional wind tunnel testing. We can provide evidence showing your product matches the performance requirements (for use in Conformity of Production CoP documentation).



DNW-LLF Automotive test section ATS: artist impression

17 June 2020

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OUR TEST ENVELOPE

The DNW-LLF has been designed as a closed return circuit wind tunnel (with open and closed test sections) for industrial aerodynamic and aero-acoustic testing of complete (scaled) aircraft or road vehicles or its components. It has excellent air flow characteristics (turbulence levels well below 1%: <0.015% longitudinal and <0,030% lateral, flow angularity <0.1 degree) and a very low background noise levels (out-of-flow OSPL(A)=63dB for at 160 km/h).

The DNW-LLF is an atmospheric (outside air conditions), single return wind tunnel with exchangeable closed test sections and an open-jet configuration. A dedicated ¾-open Automotive Test Section is under development with a five-belt rolling road belt system (with four wheel drive units) and an active system to minimize the boundary layer. A 12m diameter turntable simulates side wind conditions and a six-component balance and four wheel load cells measure the total vehicle driving resistance (WLTP parameters f_0, f_1 and f_2). From 2022 onwards accurate large size vehicles can be tested under actual on-road conditions for speeds up to 250 km/h.

Vehicle size	Vehicle exchange	Wind tunnel features
▪ Weight: 4*1500 kg (max load per wheel unit, individual load measurement) ▪ Wheel base: 1900 - 4650 mm ▪ Wheel track : 1230 -1840 mm ▪ Wheel width (max): 360 mm (front) , 480 mm (rear)	▪ Elevator for fast vehicle exchange ▪ Turntable alignment for quick vehicle pick-up ▪ Wheel drive unit width adjustment time: 2h	▪ Wind speed: 75 m/s (270 km/h) ▪ Contraction 1:9 ▪ Straightener + four meshes in stilling camber ▪ Nozzle exit area: 48 m² ▪ Test section length: 20 m ▪ Plenum size 50, 30, 20 m [x,y,z] ▪ Wheel drive unit speed setting accuracy: +/ 0.1 m/sec (0.36 km/h) ▪ Synchronous running of wheel drive units: +/ 0.2 m/sec (0.72 km/h)