

Details

European Transonic Windtunnel (ETW)

Wind tunnels, using scaled down aircraft models, are the major source of aerodynamic design data for new aircraft projects. Wind tunnels are indispensable tools for aerodynamic research and aircraft development, and complement the most powerful computers. ETW, the European Transonic Wind Tunnel, was designed, constructed and is operated by the four European countries France, Germany, Great Britain and The Netherlands based on a non-profit policy. It is located in Cologne, Germany. European researchers and engineers harness ETW's capabilities for advancing aeronautical science into aircraft innovation by accessing real-flight conditions in this cutting edge ground-test laboratory. Training opportunities for researchers and engineers are provided. ETW is the worldwide leading wind tunnel for testing aircraft at real flight conditions. Aircraft performance and their flight envelope limits can be accurately determined with unique quality at ETW long before flight testing of a first prototype. This enables significant reduction in the technical and economic risks associated with the development of new aircraft. Manufacturers from all over the world take advantage of the exceptional features of this high-tech facility enhancing the performance, economic viability, and environmental friendliness of their future aircraft. ETW operation and access complies with ISO9001:2008 quality management.

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Deutschland
[To website](#)

Host Institution

Gesellschafter Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)

Linder Höhe
51147 Köln
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Deutschland
<http://www.dlr.de>

Gesellschafter Stichting Nationaal Lucht- en Ruimtevaartlaboratorium (NLR)

Anthony Fokkerweg 2
1059 CM Amsterdam
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<http://www.nlr.nl>

Gesellschafter Department for Business, Energy & Industrial Strategy (BIS)

1 Victoria Street
SW1H 0ET London
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<https://www.gov.uk/government/organisations/department-for-business-energy-and-industrial-strategy>

Scientific Domain

Primary Subjects:

- Mechanical and Industrial Engineering

Secondary Subjects:

- Physics

Category

Wind Tunnels, Fluid Dynamics

Scientific Services

ETW offers worldwide experimental wind tunnel investigations focussing on aerodynamic and aeroelastic measurements on lifting bodies in the subsonic, transonic or supersonic speed range up to Mach-numbers of 1.35. Taking the benefit of the cryogenic technique is allowing for an extremely accurate simulation of flow effects at high Reynolds-numbers of up to 90 Million. Beside classic measurements of forces and moments additional techniques

are available for analyses of the origination and development of aerodynamic processes. The application and operation of non intrusive techniques is here the most favoured approach. A small cryogenic wind tunnel scaled 1:8.8 is additionally available for basic investigations as well as for the development or adaptation of new techniques for operation under cryogenic conditions. Further on, a worldwide unique balance calibration rig covering the full temperature range from ambient down to cryogenics is available for balance calibrations. Two cryogenic chambers of different size can be offered for investigations of temperature effects on structural elements or mechanical components not requiring fluid flow.

Scientific Equipment

- Balances for Force -& Moment Measurements
- Pressure Measurement system
- Optical Deformation measurement system
- Transition detection by temp. sensitive paint
- Pressure measurem. by press. sensitive paint
- Flow field analysis with PIV
- Unsteady pressure measurement system

Keywords

- Aerodynamic
- Aeroelastic
- Wind tunnel measurements
- Wind tunnel measurement technique
- Flight Reynolds-number Simulation
- Cryogenic Temperatures
- Liquid Nitrogen
- Aeroakustik

Networks

Users per annum

Internal Users: 4
External Users in total: 60
External Users: 12
External Users in the EU: 30
External Users outside of EU: 18