

*Full service for the aviation industry*

# Wind Tunnel Measurements



DEUTSCHE  
**WINDGUARD**

# OUR EXPERIENCE IS YOUR GREAT ADVANTAGE

As a designer, OEM or component supplier in the aviation industry, you require highly professional wind tunnel services for your research and development project or the design verification of a new part. Profit from our long standing experience, our first-class equipment and the high quality standards we set for ourselves and the services we provide.

## ELECTRIC PROPULSION: PROPELLERS AND DEP

Electric propulsion is here to stay. Based on customer requests, we actively expand our testing capabilities, in the wind tunnel and outside. Several test rigs for aeroacoustic characterization of propulsion units are now routinely in operation.



## FEATURES AND BENEFITS:

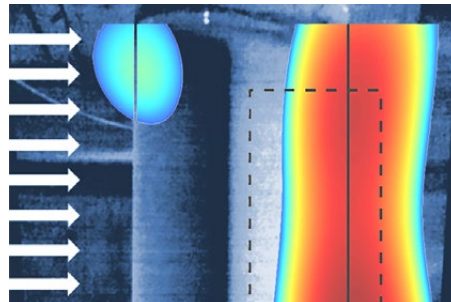
- Propeller, motor and controller characterization incl. acoustics (SPL & Directivity)
- Three test rigs (up to 25 kW)
- Thrust, torque, rpm, power, pitching moment, etc.
- High-speed thermography for propellers
- Wake characterization (PIV, multi-hole pressure rakes)
- Distributed electric propulsion (DEP) tests with fully instrumented multi-element airfoils, nacelles, etc.

## AT YOUR SERVICE:

- Deutsche WindGuard's wind tunnel centre with 8 wind tunnels
- DAkkS accredited calibration laboratory according to DIN EN ISO/IEC 17025, MEASNET associated member, IECRE approved and ISO 45001 certified
- Aeroacoustic measurements up to 100 m/s
- Traceability of all measured quantities to national standards
- Redundant measurement system for double reliability
- Over 30 years of combined expertise in commercial wind tunnel tests and experience of 20,000 accredited sensor calibrations per year
- Full service: from model design to wind tunnel testing, customised post-processing and reporting – all from one single source

## OPTIMALLY EQUIPPED FOR ACOUSTIC MEASUREMENTS

Deutsche WindGuard's aeroacoustic wind tunnel, coupled with custom made measurement equipment and state-of-the-art post-processing, is silent enough to permit acoustic measurements while operating with a closed test section.



## FEATURES AND BENEFITS:

- Trailing edge noise measurements
- Trailing edge modifications: serrations, flaps, splitter plates, etc.
- 80 microphone, wall-mounted array
- Custom designed array, permits locating sources and filtering unwanted sources
- State-of-the-art post-processing
- In-flow measurements (3D traversing around test item)
- Directivity measurements

## AIRFOIL AND SCALED MODEL MEASUREMENTS

With expertise and experience in testing components and models since 2008, and several thousand airfoil-polars since 2012, Deutsche WindGuard is your competent partner for conducting airfoil and scaled model measurements.



## FEATURES AND BENEFITS:

- Polars up to Re 6 million ( $c = 0.9$  m)
- Surface condition effects: clean, rough, eroded, etc. as well as icing simulation
- In-house manufacturing of test-parts: 7 additive manufacturing systems
- Flow visualization: laminar-turbulent transition and stall-cell detection through thermography, oil-flow and tufts
- Optical deformation measurements, static and dynamic

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