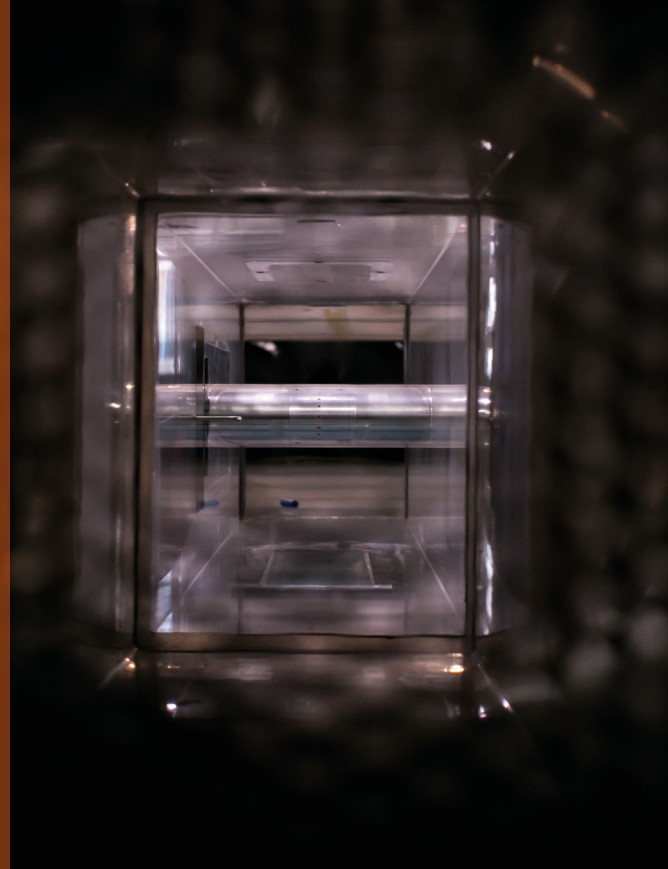




AERODYNAMIC LABORATORY

Laboratory for fluid dynamics
research activities



Laboratory Manager: Ing. Gabriele Campanardi

DIPARTIMENTO DI
SCIENZE E TECNOLOGIE AEROSPAZIALI

Description

The experimental aerodynamics laboratory is located in Building B14. It is provided with different wind tunnels of various dimensions and test regimes. The complete experimental equipment allows carrying out a wide range of tests.

Accredited Staff

Two technicians accredited ISO-IEC 17025 for anemometers calibrations.

Certifications

Anemometers calibration accredited by National Standard Accreditation Body.

References

Agusta Westland, Vulcanair, Oma Sud, CETENA Fincantieri.

Laboratory Manager

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Testing Equipments

- Low-turbulence closed-loop subsonic wind tunnel with 1x1.5m test section. 55 m/s max. speed. The wind tunnel is certified for anemometers calibration.
- Open-loop subsonic wind tunnel; 0.5x0.7m test section; 20m/s max. speed.
- Air duct to test porous screens with circular cross-section duct, 0.4m diameter. It's provided with a Venturi transducer compliant to ISO 5167-1 Standard.
- Open-loop subsonic wind tunnel for calibration of anemometric probes; 100m/s max. speed.
- Small impulsive hypersonic wind tunnel (up to Mach 10) to test small models (20mm test section diameter).
- Experimental rig for the simulation of dynamic stall phenomenon on helicopter blades.
- Experimental rig for micro wind turbines characterization.

Instrumentation & Facilities

- 2C/3C Particle Image Velocimetry measurement system. 200 mJ Nd: YAG laser and up to 2 Megapixel cameras.
- 2C Laser Doppler anemometer provided with 4W continuous argon laser.
- Hot wire measurement equipment: 6 measurement channels, wire and film probes for 1C, 2C and 3C measurements.
- Differential pressure transducers, uni-directional and bi-directional, ranges from 10 up to 10000 pa, accuracy up to 0.01 % FS.
- Kulite differential high sensitivity dynamic pressure transducers. 2 psi bi-directional range.
- Esterline DTC Initium pressure measurement system. Miniature electronics pressure scanners available with pressure ranges from 10 "wc up to 2.5 psi (bi-directional).
- Six components balances for aerodynamic loads measurements on aircrafts and ground vehicles models.
- High accuracy absolute pressure transducers.
- Temperature and relative humidity probes.
- Smoke and fog generators for flow visualization.
- High sensitivity digital camera.
- Multi-axis motorized linear guides.

Activities

Wind Tunnel Testing

- Measure of airfoils aerodynamic coefficient in static and dynamic conditions.
- Measure of forces and moments on scaled models of aircrafts and ground vehicles.
- Pressure measurements on external surfaces of scaled models or full scale items or components (hoods, cowlings, helmets, etc.).
- Sport aerodynamics wind tunnel testing.
- Real scale micro wind turbines characterization.

Flow field measurements

- Wake characterization.
- Two and three components PIV measurements.
- Mono, two and three components hot wire measurements.

Other activities

- Measure of porous screens pressure loss.
- Anemometers calibrations.