10×5 Low-Speed Wind Tunnel – Imperial College

Location: London

Designation: Low Speed
Closed Return

Owner(s):
Imperial College Aeronautics,
Exhibition Road,
London SW7 2AZ

Performance:
Mach Number: 0.11 (max)
Maximum Flow Speed: 32 m/s
Reynolds No: 2.14×10^6/m (max)
Total Pressure: Ambient
Dynamic Pressure: up to 0.62 kN/m^2
Total Temperature: Ambient
Turbulence intensity: 0.15% or better
Run Time: Continuous
Typical Recharge Time: n/a.

Test Section 1 Size: 3.04m x 1.52m x 20 m
3.41:1 contraction ratio. Max speed: 32 m/s.

Test Section 2 (Return) Size: 5.7 m x 2.8 m x 18 m
Max. speed: 10 m/s.

Operational Status: Active

Testing Capabilities:

- Automated turntable (3 m diameter) at the end of the lower test section + ABL simulation for building physics, wind farms, and wind turbines.
- Automated turntable (5.7 m diameter) at the end of the upper turntable + ABL simulation for wind farms and wind turbines.
- Automated Model Motion System for half-span aircraft model testing. Includes a 6-axis platform balance and BL suction.
- **Car Model Support**: internal 6-component sting-mounted balance (20° yaw range turntable). Underfloor turntable +20deg yaw

Rolling Road: 2.1m x 1.8m rubber/fabric belt, 41m/s, water-cooled, variable profile belt suction system, twin variable-speed boundary layer flow-control ahead of road.
Data Acquisition: National Instruments multichannel ADC, 300+ channel pressure scanning.
Outputs: Forces & moments, pressure, velocity (LDA, LDV, PIV, hot wire, multi-hole probes).
Flow visualisation: Video, surface fluorescent oil-flow, smoke wand.

Number and Type of Staff:
Scientific: 1 Adv Research Fellow
Technical Support: 1 – 2 engineers; 1 machining technician

Test support:
Fully equipped workshop for wind tunnel model design, CNC 4-axis mill, CNC 3-axis mill, CNC Lathe, CNC etching and cutting, a range of rapid prototyping manufacture and modification capability, 3D CAD support and drafting.

Specialist Rigs:

- **Air blowing**: 10 bar max pressure.
- **Fully automated Road Vehicle testing to 50% scale models.**
- **Automated Traverse system**
- **Half-span aircraft testing rig**
- **Turntables at end of each test section**
- **Car model motion control system (automated pitch, manual roll and yaw)**
- **Full atmospheric boundary layer simulation capability.**