



Adelaide Wind Tunnel

South Australia's industrial-scale wind tunnel



The Adelaide Wind Tunnel is the largest industrial and research wind tunnel in South Australia. The tunnel features three working sections that cater for the needs of the aerospace, defence, wind engineering, sports, automotive and mining industries.

The facility was designed and built by the School of Mechanical Engineering at the University of Adelaide with the support of the Sir Ross & Sir Keith Smith Fund and the South Australian Government.

The Adelaide Wind Tunnel is driven by six large fans with a rated power of 800kW which drive the flow to 180 km/h in the 2.75m x 2m aerospace and open jet sections, and to 120 km/h in the 3m x 3m wind engineering test section. The open-jet section allows larger objects to be tested without blockage limitations.

The tunnel is equipped with state-of-the-art instrumentation to measure velocities, pressures, forces, noise and vibration. University staff can provide expertise to support all areas of aerodynamic research, development and testing activities, including model fabrication.

Industry applications

The Adelaide Wind Tunnel is an important facility for South Australia. Designed in consultation with leading local companies, the tunnel caters for a wide range of needs in key areas such as aerospace, mining, wind energy, sports and defence. The tunnel offers direct street access to all working sections, facilitating the installation of large and heavy test items.



Examples of applications include:

- Wind turbines
- Wind engineering, including building aerodynamics
- Aero-acoustics
- Aeronautical, aerospace and maritime applications
- Environmental aerodynamics, including dust dispersion studies
- Sports engineering
- Automotive engineering up to 1/4-scale vehicles

The Adelaide Wind Tunnel is located at the University's Thebarton Campus, Stirling Street Thebarton, 4 km from the Adelaide CBD and 6km from Adelaide Airport.



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Adelaide Wind Tunnel

Location

Thebarton Research Precinct
Corner Stirling & Winwood Street
Thebarton, South Australia

Features

- The only industrial-scale wind tunnel in SA
- The second largest wind tunnel in Australia
- Three working sections in one wind tunnel
- Aeroacoustic research capability
- Automotive models up to 1/4 scale

Wind-engineering test section

Applications:

- Testing of buildings and other large structures
- Environmental studies (atmospheric flow simulation)

Design flow conditions:

- Cross-section area: 3 x 3m²
- Maximum air speed: 33 m/s (120 km/h)
- Boundary-layer thickness: 1.2m

Aerodynamics test section

Applications:

- Aircraft structures
- Aerospace
- Aeroacoustics
- Sports engineering
- Wind turbine testing

Closed-Section specifications:

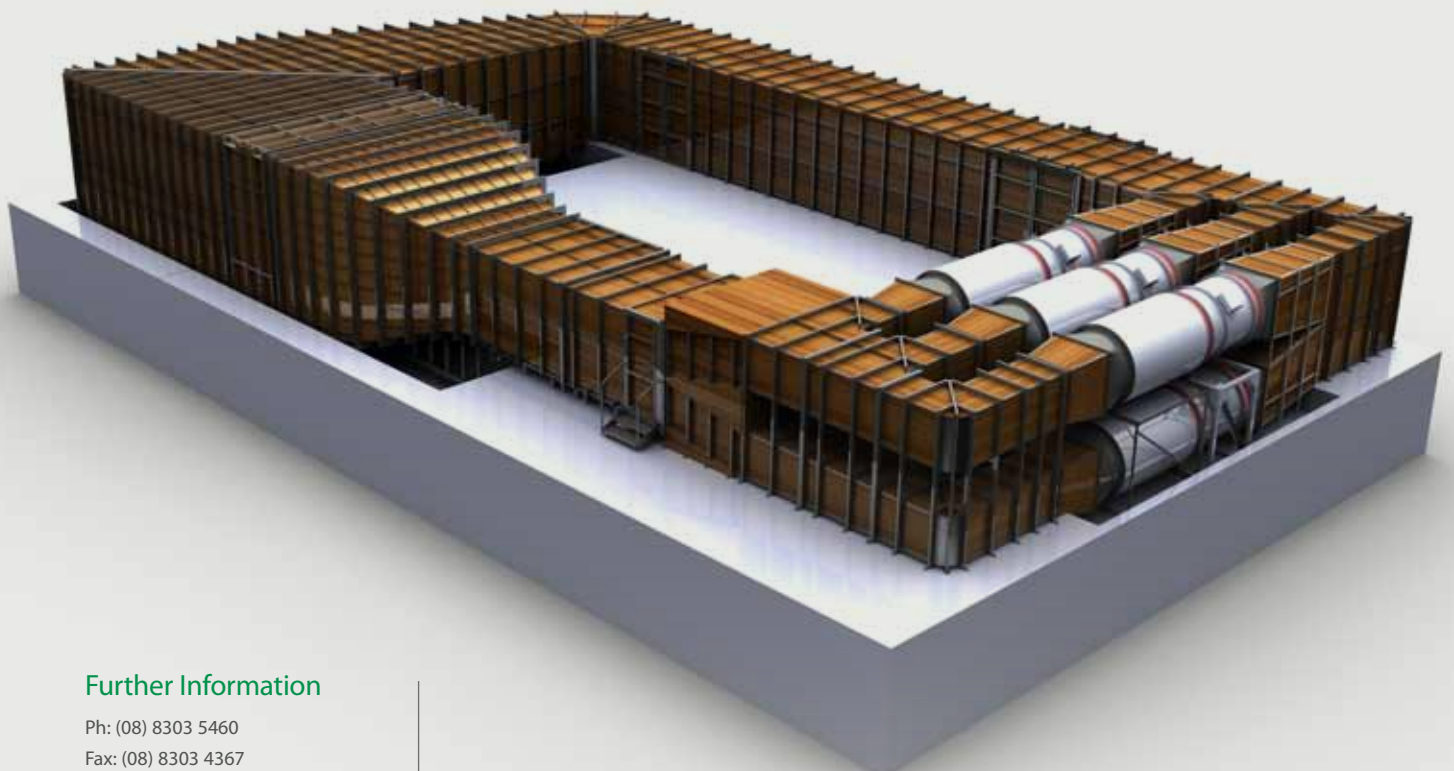
- Cross-section area: 2.75 x 2m²
- Maximum air speed: 50 m/s (180 km/h)
- Turbulence intensity: less than 0.8%

Open-Jet specifications:

- Cross-section area: 2.75 x 2m² x 50 m/s (as per closed section)
- Up to 3.5m x 5.5m x 15m/s open jet working section capability

Test capability and support

- Turntable and force balance (wind engineering)
- Support stings with load cells
- Hot-wire, Pitot and Cobra Probe anemometry (1, 2 and 3-component)
- Flow visualisation
- Laser diagnostics (LIF, PIV)
- 3D scanning laser vibrometer
- Acoustic instrumentation
- Dedicated staff to give technical support and expert consultation on projects.



Further Information

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