

# R.J.Mitchell Wind Tunnel – University of Southampton

**Location:** University of Southampton

**Designation:** Low Speed  
Closed Return

**Owner(s):**

Faculty of Engineering and Physical Sciences  
University of Southampton  
Highfield  
Southampton  
SO17 1BJ  
United Kingdom

**Performance:**

**Mach Number:** 0.12 (max)  
**Maximum Flow Speed:** 40 m/s  
**Reynolds No:**  $2.71 \times 10^6$ /m (max)  
**Total Pressure:** Ambient.  
**Dynamic Pressure:** Up to  $1.152 \text{ kN/m}^2$   
**Total Temperature:** Ambient t 292K.  
**Turbulence intensity:** < 0.2%  
**Run Time:** Continuous  
**Typical Recharge Time:** n/a.

**Test Section Size:** 3.5m x 2.44m x 10.5m  
5:1 contraction ratio

**Operational Status:** Active

**Testing Capabilities:**

**Model Support:** 6-component overhead balance with various mounting options, two-axis motorised strut with in-car 6-component balance for vehicle work.  
**Data Acquisition:** multichannel simultaneous data acquisition.  
**Outputs:** Forces and moments; pressure, velocity (Stereo PIV, hot wire anemometry).  
**Flow visualisation:** Smoke, video, surface fluorescent oilflow, Streamwise ProCap with 5-hole and 14-hole omniprobe options.  
**Temperature control:** combined chiller/heat pump can be used to control/maintain temperature within a range of approx. 8 degrees to 30 degrees C.

**Number and Type of Staff:**

**Scientific:** 3  
**Technical Support:** 3

**Test support:**

Workshop for wind tunnel model design, manufacture and modification capability. 3D printers on site.

**Notes:**

Formerly at Farnborough the tunnel was moved to Southampton in the 1980s to accommodate extensive motorsport work.

**Specialist Rigs:**

- Rolling road (up to 40m/s) with dual stage boundary layer suction.
- Multi-geometry wake generator for vehicle studies.
- Dynamic flight rig for aircraft maneuver/stability investigations.
- Motorised yaw turntable on both floor and ceiling.
- In-yacht balance system to be installed early 2027.
- Rotor rigs have been developed and used in this tunnel as well as propeller/rudder rigs.