Imperial College Hypersonic Gun Tunnel

HS1

Location: London

Designation: Intermittent impulsive facility

Owner(s):

Imperial College Aeronautics,
Exhibition Road,
London SW7 2AZ

Performance

Working gas: Nitrogen
Mach Number: 9
Maximum Flow Speed: 1500 ms^{-1}
Reynolds No: 7-47 x 10^6 m^{-1} (variable)
Total Pressure: 600 bar (max, variable)
Dynamic Pressure:
Total Temperature: 1150 K (max, variable)
Turbulence intensity: unknown
Run Time: 20 ms
Typical Recharge Time: 1 hr

Test Section Size: 0.6 m (diameter) x approx. 1 m. Key point is that tunnel can accommodate models 800+ mm long if slender

Operational Status: Operational

Number and Type of Staff:

Scientific: n/k
Technical Support: 1 – 2 technicians

Testing Capabilities:

Large working section: Can accommodate slender models 800+ mm in length, giving a unique (in the UK) capability for achieving high test Reynolds numbers
Measurement hardware: 64 channel high speed (100 kHz) DAQ with potential for further 32 channels, high speed Schlieren, surface pressure, hot films, thermographic liquid crystal, PIV & PLIF (currently in development)

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:

- **SWBLI:** Numerous fundamental axis-symmetric rigs (e.g. compression ramp / cowl) for studies of SWBLI, with and without shock-induced separation
- **Transition:** e.g. Cone with roughness elements – producing laminar and transitional flows, characterisation of turbulent spots
- **Cavity flows**
- **Optical laser-based diagnostics:** Toluene-based PIV / PLIF currently under development