

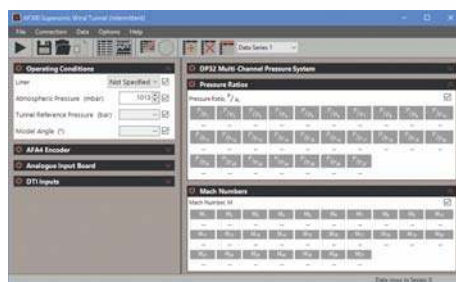
# INTERMITTENT SUPERSONIC WIND TUNNEL

**VDAS® AF300**

Investigates subsonic and supersonic air flow, including flow around two-dimensional models.



SHOWN WITH THE  
OPTIONAL SCHLIEREN  
APPARATUS (AF300A)



SCREENSHOT  
OF THE VDAS®  
SOFTWARE

- Laboratory-scale wind tunnel for subsonic and supersonic tests, nominally up to Mach 1.8
- Supplied with aerodynamic models for supersonic tests – includes model angle-feedback encoder
- Supplied with a set of different liners for controlled subsonic and supersonic air flow
- Induction flow for better air flow and accurate results

## LEARNING OUTCOMES:

- Pressure distribution along a convergent/divergent (Laval) nozzle with subsonic and supersonic air flow
- Comparison of theoretical and actual pressure distributions
- Comparison of actual and theoretical area ratios of a nozzle at supersonic air velocities (Mach numbers)
- Pressures around a two-dimensional model in subsonic and supersonic flow conditions, at different angles of incidence
- Lift coefficients for aerodynamic models in supersonic flow
- Shock waves and expansion patterns around a two-dimensional model in supersonic flow conditions (when used with the optional Schlieren apparatus)

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INTERMITTENT SUPERSONIC WIND TUNNEL (AF300) CONTINUED FROM PREVIOUS PAGE

A compressed air supply (AF300b, available separately) induces a flow in the working section of the wind tunnel. This gives a less turbulent and more stable flow for accurate results and comparison with theory. The essential compressed air supply includes filters and air dryers to give the dust-free and dry air source needed for good results.

**ESSENTIAL ANCILLARIES:**

- Air Compressor Receiver and Dryer (AF300b)
- Versatile Data Acquisition System – Frame-mounted version (VDAS-F) 299

**RECOMMENDED ANCILLARIES:**

- Schlieren Apparatus (AF300a) 60

**ALTERNATIVE PRODUCTS:**

- Bench-Top Subsonic Wind Tunnel (AF1125) 39
- Subsonic Wind Tunnel (AF1300) 41
- Subsonic Wind Tunnel (AF1450S) 47
- Subsonic Wind Tunnel (AF1600S) 49
- Laval Nozzle Flow Apparatus (AF27) 58
- Continuous Supersonic Wind Tunnel (AF302) 61

## SCHLIEREN APPARATUS

### AF300A

Allows students to visualise density gradients as variations in intensity of illumination, when connected to the AF300 Intermittent Supersonic Wind Tunnel.

- High-quality, laboratory-standard mirrors and lenses for clear images without distortion
- Shows supersonic air flow patterns around models
- Shows shockwaves and expansions
- Includes digital imaging equipment and TV monitor

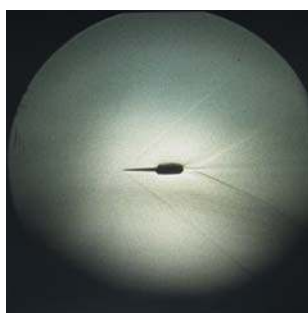


IMAGE OF AIR FLOW PATTERN ROUND A 5° SINGLE WEDGE MODEL



The focused light from the light source (and condenser lens) passes through the optical slit and is reflected at 90 degrees to the first achromatic lens. The light passes through the working section of the wind tunnel, then through the second achromatic lens. A second mirror reflects the light at 90 degrees towards the Schlieren edge. The Schlieren edge enhances the light refracted image. The small lens focuses this image onto the imaging screen.

Achromatic lenses are chosen because of their ability to pass light without colour distortion, that would normally ruin the Schlieren image.

**ANCILLARY FOR:**

- Intermittent Supersonic Wind Tunnel (AF300) 59