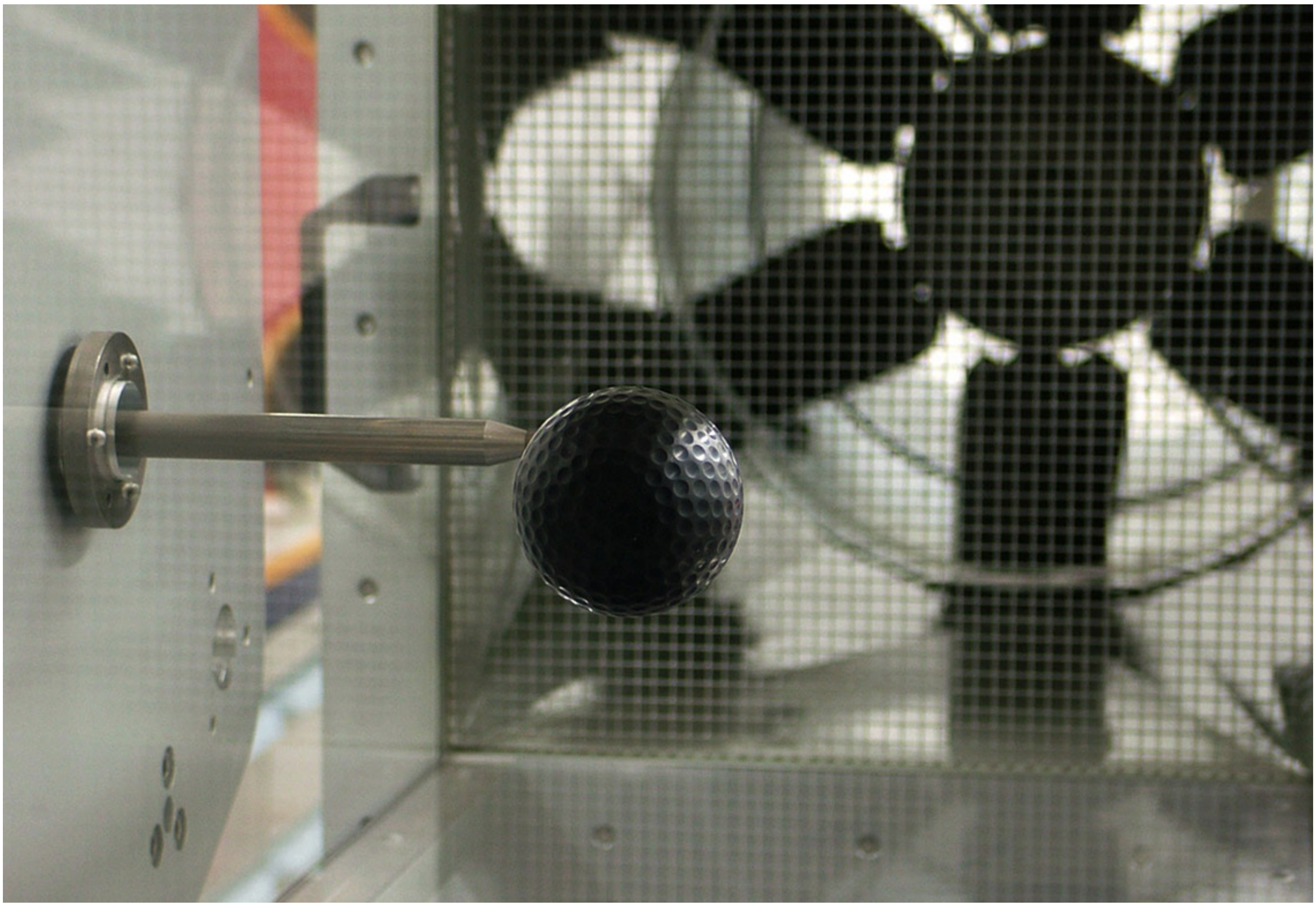
AF1300A TO AF1300L

SUBSONIC WIND TUNNEL MODELS

A selection of optional models for use with TecQuipment's Subsonic Wind Tunnel (AF1300)



DIMPLED SPHERE DRAG MODEL (FROM AF1300J) SHOWN INSIDE THE TECQUIPMENT AF1300 WIND TUNNEL.

- Cylinder, aerofoils, aircraft models, drag models, flat plate and flat plate boundary layer models for use with TecQuipment's Subsonic Wind Tunnel (AF1300)
- Allow realistic and accurate experiments and demonstrations
- Simple and quick to set-up and use
- Some models include pressure tappings for pressure distribution experiments
- All models work with the other optional instruments for the Subsonic Wind Tunnel
- High-quality surface-finish on all models for accurate results

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CYLINDER MODEL WITH PRESSURE TAPPING (AF1300A)

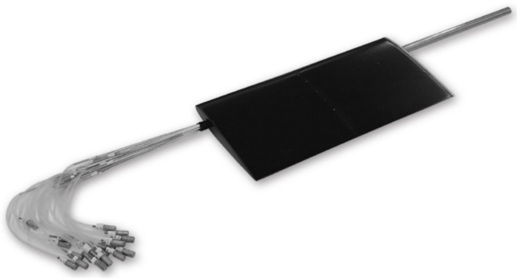
A cylinder model that spans the full width of the working section of the Subsonic Wind Tunnel (AF1300). A holder (included with the wind tunnel) supports the model in the tunnel. Also, the optional Three-Component Balance (AF1300t, available separately) or the two-component Basic Lift and Drag Balance (AF1300s, available separately) will support the model.

The model includes a single pressure tapping so, by rotating the model, students can find the pressure distribution around the cylinder. TecQuipment offers several suitable pressure-measuring instruments (available separately).

Using a Pitot tube, students can traverse the model wake to find the downstream pressure distribution and find the drag on the model. They can compare this to direct measurements, obtained using a balance.

TecQuipment's Smoke Generator (AF1300y, not included) increases the educational value of the experiments by showing the flow of air around the model.

150 MM CHORD NACA0012 AEROFOIL WITH TAPPINGS (AF1300B)



The aerofoil has 20 static pressure tappings along its chord on the upper and lower surfaces. They each connect to tubes that pass through the aerofoil and then out to clear, numbered, flexible tubes. Students can connect the tubes to other optional pressure-measurement instruments. They can then measure the pressure distribution around the aerofoil, from which they can find the lift.

Using a Pitot tube, students can traverse the aerofoil wake to find the downstream pressure distribution and find the drag on the aerofoil.

Students can compare these values of lift and drag with direct measurements found from a balance. They can also compare them with the results from another aerofoil with the same profile, such as the AF1300d (see opposite page). Varying the angle of attack of the aerofoil with respect to the air stream allows students to find the changes to the pressure distribution. It also allows investigations into the critical conditions at stall.

TecQuipment's Smoke Generator (AF1300y, not included) increases the educational value of the experiments by showing the flow of air around the model.

150 MM CHORD NACA2412 AEROFOIL WITH VARIABLE FLAP (AF1300C)

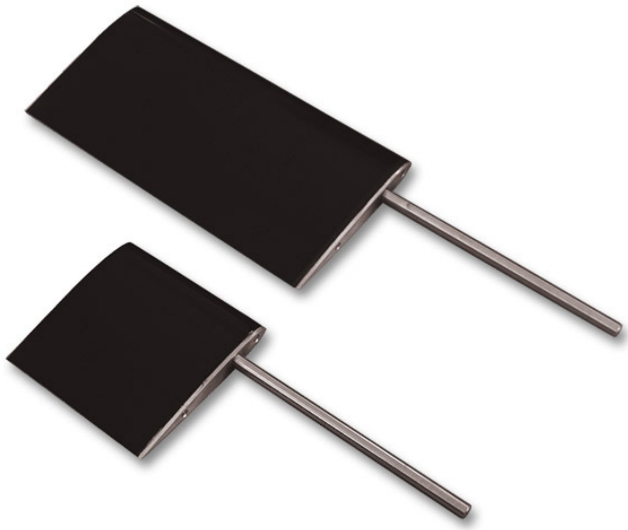
An unsymmetrical section (cambered) aerofoil with adjustable flap. The adjustable flap allows students to study the effects of control surfaces such as flaps, ailerons, elevator or rudder. Students can also examine the difference between unsymmetrical and symmetrical aerofoils, by comparing the results to the AF1300d symmetrical aerofoils. The Three-Component Balance (AF1300t, available separately) can hold the aerofoil to measure lift, drag and pitching moment.

Using a Pitot tube, students can traverse the aerofoil wake to find the downstream pressure distribution and find the drag on the aerofoil. They can compare these results with the direct measurements from a balance.

TecQuipment's Smoke Generator (AF1300y, not included) increases the educational value of the experiments by showing the flow of air around the model.

SUBSONIC WIND TUNNEL MODELS

150 MM CHORD NACA0012 AEROFOILS (AF1300D)



A set of two aerofoils. One aerofoil has a span that extends the full width of the working section of the Subsonic Wind Tunnel (AF1300). This model has the characteristics of a two-dimensional aerofoil. The other aerofoil has a span that extends for half of the working section of the wind tunnel. This model has the characteristics of a three-dimensional aerofoil. Comparing the measured lift and drag of the two aerofoils shows the differences between two-dimensional and three-dimensional aerofoils.

Using a Pitot tube, students can traverse the aerofoil wake of the full-width aerofoil. This gives them the downstream pressure distribution to find the drag on the aerofoil. They can compare their results to direct measurements from a balance (available separately).

Students can compare the results from the full-width aerofoil with the tapped aerofoil model (AF1300b, available separately) as it has the same (NACA0012) section.

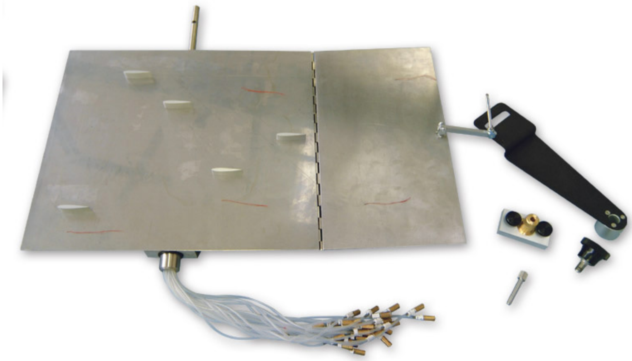
TecQuipment's Smoke Generator (AF1300y, not included) increases the educational value of the experiments by showing the flow of air around the model.

100 MM DIAMETER FLAT PLATE (AF1300E)

This model shows the flow around a bluff body mounted normal to the air flow direction, and the drag force exerted on it.

A holder (included with the AF1300 wind tunnel) supports the model in the tunnel. Alternatively, either the optional Three-Component Balance (AF1300t, available separately) or the Single-Component Lift and Drag Balance (AF1300s, available separately) can hold the model and measure the drag.

TecQuipment's Smoke Generator (AF1300y, not included) increases the educational value of the experiments by showing the flow of air around the model.



FLAT PLATE BOUNDARY LAYER MODEL (AF1300F)

Shows boundary layer development and separation.

The model is a flat plate that spans the full width of the AF1300 wind tunnel working section. It has aerodynamically shaped blocks mounted across the plate at different distances from the leading edge. Each block has five tapping points at different heights along its leading edge. Each tapping connects to flexible, numbered tubing that routes outside the wind tunnel. Students can connect the tubes to other optional pressure-measurement instruments.

The tapping points allow students to measure the stagnation pressure. They use this to find the velocity at different heights from the surface and at different distances from the leading edge. This allows students to find the growth of the boundary layer along the plate.

On the trailing edge of the plate is a hinged flap. Students can adjust the angles of both the plate and the flap independently. This lets them create different arrangements to control pressure distribution and the boundary layer.

The surface of the plate has small 'tufts' to help students see the air flow around the surface of the plate.

SUBSONIC WIND TUNNEL MODELS

AIRCRAFT MODEL – LOW WING (AF1300G) AND AIRCRAFT MODEL – HIGH WING (AF1300H)

Model aircraft with NACA profile wings. One has a low wing position (bottom of the fuselage), the other has a high wing position (above the fuselage). These models are good for experiments with lift, drag and pitching moment of fixed wing aircraft.

S1210 AEROFOIL (AF1300L)

An unsymmetrical aerofoil that spans the full width of the working section of the Subsonic Wind Tunnel (AF1300), for two-dimensional experiments. This aerofoil has an S1210 profile, based on a design originated by Michael S Selig of the University of Illinois. It provides excellent lift at low Reynolds numbers for high-lift, low-speed applications.

THREE-DIMENSIONAL DRAG MODELS (AF1300J)

A set of different shape models with identical frontal area to allow students to compare the different coefficient of drag for each shape. Includes a dummy stem for tests to cancel out the drag due to each model's support arm. Note: You also need the optional two or three component balance (AF1300s or AF1300t) for direct readings of drag.

SUBSONIC WIND TUNNEL MODELS

ESSENTIAL BASE UNIT

- Subsonic Wind Tunnel (AF1300)

STANDARD FEATURES

- Supplied with comprehensive user guides
- Five-year warranty
- Manufactured in accordance with the latest European Union directives

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

–25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

SPECIFICATIONS

CYLINDER MODEL WITH PRESSURE TAPPING (AF1300A):

- Total span: 300 mm
- Nominal diameter: 63.5 mm
- One pressure tapping at mid span

150 MM CHORD NACA0012 AEROFOIL WITH TAPPINGS (AF1300B):

- 300 mm span
- 20 pressure tappings (ten on each side)

150 MM CHORD NACA2412 AEROFOIL WITH VARIABLE FLAP (AF1300C):

- 300 mm span
- Flap adjustable by +/– 90 degrees

150 MM CHORD NACA0012 AEROFOILS (AF1300D):

- 300 mm and 150 mm span

100 MM DIAMETER FLAT PLATE (AF1300E):

- Round, flat plate 100 mm diameter, mounted on a support arm

FLAT PLATE BOUNDARY LAYER MODEL (AF1300F):

- 300 mm wide and 350 mm long
- Five aerodynamic blocks, each with five tappings

AIRCRAFT MODEL – LOW WING (AF1300G) AND AIRCRAFT MODEL – HIGH WING (AF1300H):

- Wingspan: 266.25 mm
- Length: 217.5 mm
- Wing Profile: NACA2415

THREE-DIMENSIONAL DRAG MODELS (AF1300J):

- Plain sphere, hemisphere, dimpled sphere (similar to a golf ball), flat plate and streamlined (teardrop) shape. All mounted on support arms.
- 50 mm diameter frontal area

S1210 AEROFOIL (AF1300L):

- 150 mm chord
- 300 mm span
- Profile S1210

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