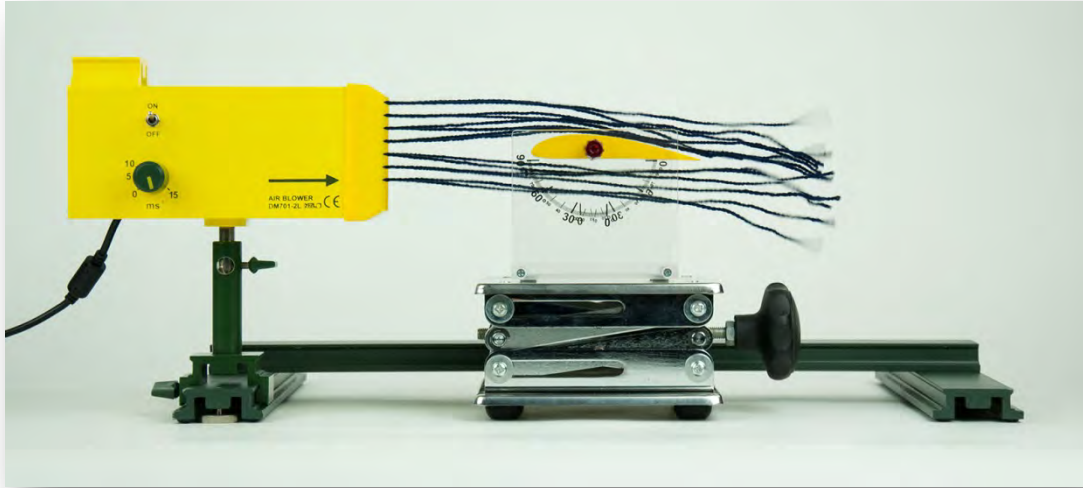


FLOW PATTERNS AT THE WING

MED 19.17



Material:

Item Code	Qty	Description
DS101-1G	1	Support base, large, L=500 mm
DS103-7G	1	Sliding saddle, H=70 mm
DM701-2L	1	Blower 12 V
P3130-2Q	1	Fixed voltage transformer 12V DC/10 A
DM702-2L	1	Streamline adapter
DM711-2T	1	Airfoil, model, with scale
C7235-2B	1	Lab-jack small, 150x150 mm

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Purpose

Flow configurations show the behavior of stationary flows.

The streamlines show the paths of the air particles.

These configurations, on the one hand, make eddies visible and on the other, facilitate conclusions about the pressure conditions around the body about which the flow is taking place. In this model, the streamlines are shown by the woolen threads

Preparation

- the streamline adapter is fixed to the blower
- the sliding saddle is fixed to the side arm of the support base
- the blower is inserted into the sliding saddle and screwed down tightly
- the lab-jack is placed 10 cm in front of the blower
- the airfoil model is placed on the table
- the rotary knob for the flow speed of the blower is turned to the very left
- the blower is powered by a fixed voltage transformer (12 V DC, min. 6 A)
- the woolen threads are placed atop and below the airfoil model.

Experiment 1

We turn on the blower and slowly increase the flow speed to 13 – 15 m/s.

We observe the streamlines and turbulences above and below the airfoil model.

Experiment 2

We change the angle of incidence.

Again, we observe the streamlines and turbulences above and below the airfoil model.



Experiment 3

We change the angle of the airfoil model into the other direction.

Again, we observe the streamlines and turbulences above and below the airfoil model.



Result

Turbulences and pressure conditions can be observed on top and below the airfoil model.

In experiment 2 we can clearly see that the woolen threads above the airfoil are attracted. This indicates negative pressure.

This negative pressure results in a lifting force which enables an airplane to fly.