

THE VENTURI EFFECT

BERNOULLI'S PRINCIPLE states that as the speed of a fluid increases, the pressure and temperature decrease.

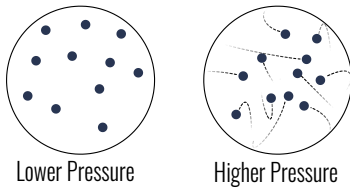
THE VENTURI EFFECT is the demonstration of this principle in a confined pipe.

STATIC PRESSURE

Static pressure is the force of air molecules bouncing around, not the force of them moving forward. The force of forward movement is dynamic pressure.

Because pressure and temperature are two ways of looking at a similar principle (molecular energy), they are related. As pressure drops, so does temperature.

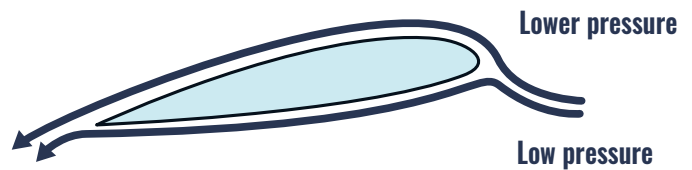
ENERGY STATES



THE SHAPE OF A WING ACCELERATES FLUID

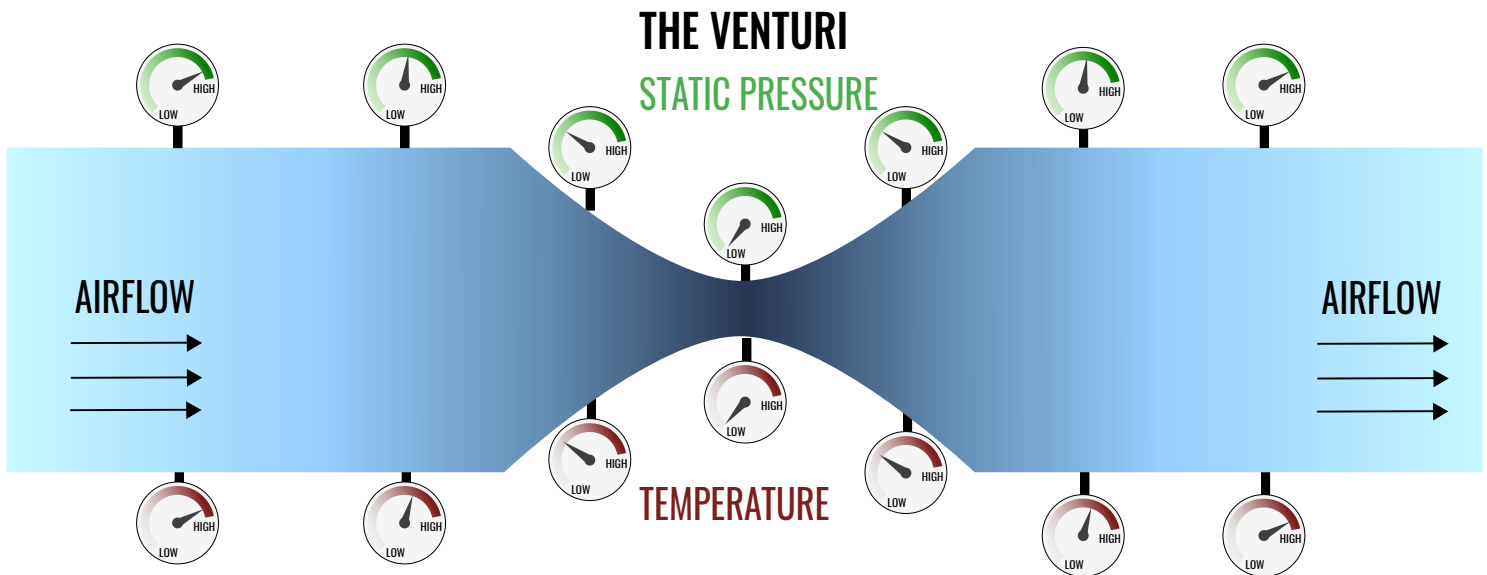
As the air moves faster, more of its energy is spent moving forward, and less is spent bouncing around. The static pressure and temperature drop.

Note that the air accelerates over the top and bottom of the wing. But a combination of wing shape (camber) and angle of attack (AOA) cause the acceleration to typically be greater over the top of the wing.



This effect can be demonstrated in a special pipe, called a venturi.

When the air is squeezed, it accelerates so that all the air can go through. The faster the air, the lower the pressure and the lower the temperature.



This same effect can be seen:

When you put your thumb over a hose and the water accelerates

Exhaling with a wide open mouth vs. as a whistle. Your breathe moves faster and is colder

Opening your car window driving down the highway. your ears might pop from low pressure

Wind speeding up as it passes through a valley

Carburetors use venturis to suck fuel into the engine