Venturi effect

The Venturi effect is an increase in flow velocity obtained with a decrease in fluid static pressure as it passes from a larger to a smaller section. This effect is based on both the fluid continuity principle, which states that:

$$AV = Q$$

A = cross-sectional area, V = fluid velocity, Q = constant

and on the principle of conservation of mechanical energy, or Bernoulli's principle:

$$\frac{V^2}{2g} + \frac{P}{\gamma} + z = C$$

V = fluid velocity, g = gravitational acceleration, P = pressure, γ = specific weight, z = elevation, C = constant

Thus, the energy in this increased speed comes from the reduction of the static pressure of fluid. This effect applies to both liquid and gas fluids; the evidence of the Venturi effect on gases can be clearly seen in the case of the passage of wind through two hills, as the wind speed increases and reaches its maximum when the cross-sectional area between the two hills reaches its minimum. A diagram of the Venturi effect is shown in detail in **Figure 1**.

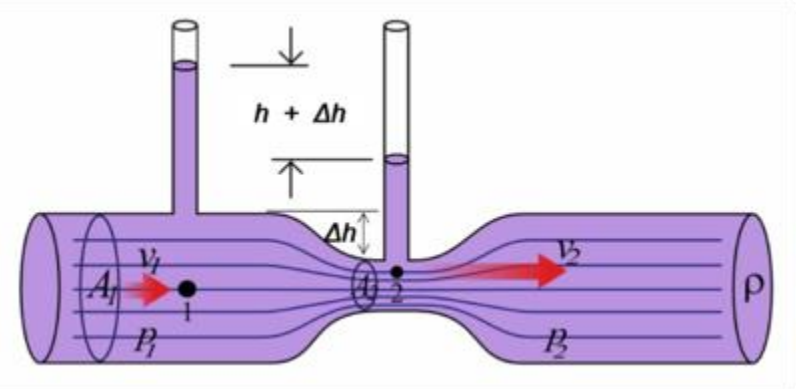

Figure 1: A diagram demonstrating the Venturi effect. The fluid flows faster in at point 2 than at point 1 due to the decrease in cross-sectional area. The pressure at point 1 is higher than at point 2, however, due to the conservation of energy.

References

Venturi effect - Energy Education

Theoretical Approaches Regarding the VENTURI Effect