

Venturi Effect

The Venturi Effect refers to the phenomenon where a fluid's velocity increases as it passes through a constricted section of a duct or pipe, resulting in a corresponding decrease in pressure. This principle is named after the Italian engineer Giovanni Battista Venturi, who first described it in the 18th century.

In practical terms, when air or any fluid flows through a narrow passage, the speed of the flow increases due to the conservation of mass. According to Bernoulli's principle, as the velocity of the fluid rises, the pressure within the fluid decreases. This effect is crucial in various applications, particularly in ventilation systems and HVAC (Heating, Ventilation, and Air Conditioning) designs.

Practical Examples:

1. **Ventilation Systems:** In house building, the Venturi effect is often utilised in ventilation systems to enhance air circulation. For instance, in a ducted heating system, strategically placed constrictions can help draw in air from different rooms, ensuring even distribution of heat throughout the building.
2. **Water Supply:** In plumbing, the Venturi effect can be observed in devices like venturi meters, which measure the flow rate of water. These meters create a constriction in the pipe, allowing for accurate measurement of flow based on the pressure difference before and after the constriction.
3. **Natural Ventilation:** In retrofitting older buildings, the Venturi effect can be harnessed to improve natural ventilation. By designing openings or using architectural features that create constricted air pathways, airflow can be enhanced, reducing the need for mechanical ventilation and improving indoor air quality.

A notable example of the Venturi effect in action can be seen in the design of the **BREEAM (Building Research Establishment Environmental Assessment Method)** certified homes in the UK. These homes incorporate features such as strategically placed vents and air pathways that utilise the Venturi effect to enhance natural ventilation. This not only improves indoor air quality but also reduces energy consumption by minimising reliance on mechanical systems.