

# [Converging-diverging nozzle experiment report examples](https://assignbuster.com/converging-diverging-nozzle-experiment-report-examples/)

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1. Convergent-Divergent nozzle experiment
When the downstream pressure in a converging diverging nozzle reduces below a critical value, no further reduction in throat pressure or increase in mass flow rate occurs. Under this condition, the nozzle is said to be choked.

## Pressure: U-Tube manometers to measure the pressures in the nozzle relative to atmospheric pressure.

• A water manometer is connected to the inlet pressure tap (P0-P1).
• Mercury manometers are connected to the throat (P0-P2) and downstream (P0-P3) pressure taps.
• Atmospheric pressure, P0, to be read on the barometer.
2. Objectives

## The objective of this experiment is to find conditions that give choked flow. These conditions include;

• To find choke velocity, UC
• To find Critical Pressure Ratio, P2C/P0
• Compare to Theoretical Values for Isentropic Flow
Additionally, the results of this experiment will compare with the theoretical pressure set, (critical pressure) for the chocked flow to be observed.
3. Expected results/ findings
This experiment seeks to confirm that, for the chocked flow to occur, a certain threshold of pressure must be achieved. This pressure is referred to as the critical pressure. The value obtained from this examination is then compared with the theoretical value to validate its accuracy. Constants such as atmospheric pressure and temperature factored in, this figure should be similar for a specific fluid under similar conditions.
4. Significance
C/D nozzle does indeed become choked when velocity approximately equals sonic velocity. Additionally isentropic predictions give good agreement meaning it is a good assumption. This experiment enables one to understand the relationship between pressures, critical mass flow to the chocked flow. The results of this study would be used in determining the force expended by jet engines during flight. The critical mass at the point of the chocked flow for instance would be extrapolated to a larger chocked flow of similar magnitude in determining its workings.