

# **SIMULATION OF A HYDROCYCLONE WITH SOLID PARTICLES**

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## *Abstract*

This report aims to investigate the flow of the primary fluid and movement of the solid particles in a hydrocyclone and optimise its design and performance by varying different parameters and observing their effects. Optimal design of a hydrocyclone is necessary to facilitate its use and reduce the power consumption by reducing the separation time as cyclones are utilized to segregate the mineral particles based on their sizes and densities. MPPICFoam solver is used to study the effects. It is observed that the feed inlet pressure has major influence on the mass flow through cyclone compared to spigot diameter.

## **1. Introduction**

Hydrocyclones are widely used in industries such as mining, oil and gas, and chemical processing to separate solid particles from a liquid mixture. The efficiency of a hydrocyclone is crucial for the quality of the final product and economic viability of the process. The complex flow patterns in a hydrocyclone make its design and optimisation a challenging task. This paper presents a detailed understanding of the flow patterns and separation efficiency of the hydrocyclone using different operating conditions.



Geometry in SolidWorks