

## Optimising the Design and Simulation of a Globe Valve Using CFD in Perspective of Bangladesh

**Sakib Mahmud**

Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

**Mohammad Musfeq Iqfath**

Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

**Md Mahadi Hasan**

Department of Industrial and Production Engineering, American International University-Bangladesh, Dhaka-1229, Bangladesh

### Abstract:

This paper highlights a comprehensive study on the enhancement of globe valve design, widely used in oil and gas facilities for controlling fluid flow. Traditional globe valves are often facing issues such as valve leakage and valve passing, which significantly hamper their performance. To address these challenges, this study introduces an innovative design modification aimed at optimizing fluid flow performance and minimizing the pressure differential across the valve. The main purpose of this research lies in utilizing Computational Fluid Dynamics (CFD) to validate the improvements made over the original design. The results indicate that the modified globe valve exhibits superior performance in various parameters compared to the previous model, with the notable exception of valve passing issues at the contact seal between the seat and the disk in a fully closed position. A significant aspect of this project is that it marks the first-ever design and manufacturing of an industrial-grade globe valve in Bangladesh, setting a good impact on the country's industrial landscape. This breakthrough signifies a substantial advancement in the domestic production capabilities of industrial-grade globe valves in Bangladesh.

### Keywords:

Globe Valve, Computation Fluid Dynamics (CFD), Pressure Drop.