# Improving the Flow Capacity (CV) of the Valves

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**Abstract :** The major problem in the flow control valve is of lower Cv, which will reduce the overall efficiency of the flow circuit. Designers are continuously working to improve the Cv of the valve, but they need to validate the design ideas they have regarding the improvement of Cv. The traditional method of prototyping and testing takes a lot of time. That is where CFD comes into the picture with very quick and accurate validation along with visualization, which is not possible with the traditional testing method. We have developed a method to predict Cv value using CFD analysis by iterating on various Boundary conditions, solver settings and by carrying out grid convergence studies to establish the correlation between the CFD model and Test data. The present study investigates 3 different ideas put forward by the designers for improving the flow capacity of the valves, like reducing the cage thickness, changing the port position, and using the parabolic plug to guide the flow. Using CFD, we analyzed all design changes using the established methodology that we developed. We were able to evaluate the effect of these design changes on the Valve Cv. We optimized the wetted surface of the valve further by suggesting the design modification to the lower part of the valve to make the flow more streamlined. We could find that changing cage thickness and port position has little impact on the valve Cv. The combination of optimized wetted surface and introduction of parabolic plug improved the Flow capacity (Cv) of the valve significantly.

**Keywords :** flow control valves, flow capacity (Cv), CFD simulations, design validation
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