

## Numerical Simulation and Experimental Validation of the Hydraulic L-Shaped Check Ball Behavior

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**Abstract :** The spring-driven ball-type check valve is one of the most important components of hydraulic systems: it controls the position of the ball and prevents backward flow. To simplify the structure, the spring must be eliminated, and to accomplish this, the flow pattern and the behavior of the check ball in L-shaped pipe must be determined. In this paper, we present a full-scale model of a check ball made of acrylic resin, and we determine the relationship between the initial position of the ball, the position and diameter of the inflow port. The check flow rate increases in a standard center inflow model, and it is possible to greatly decrease the check-flow rate by shifting the inflow from the center.

**Keywords :** hydraulics, pipe flow, numerical simulation, flow visualization, check ball, L-shaped pipe

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