

# Numerical Simulation and Flow Behaviors of Taylor Flow in Co-Axial Rotating Cylinder

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## Abstract

This work uses the incense as the trace of flow to perform flow visualization of Taylor-Couette flow. The test section was made of a rotational inner cylinder and a stationary outer cylinder. Two modes of inner cylinder were employed. One had a smooth wall, and the other had an annular ribbed wall. Clear and complete Taylor vortices were investigated in both smooth and ribbed wall of co-axial rotating cylinder. Besides, a steady-state, axis-symmetrical numerical model was provided to simulate the present flow field. The Taylor vortices could be also successfully predicted. However, the assumption of steady-state flow might reduce some flow perturbations, resulting in an over-predicted critical Taylor number. A transient simulation is suggested to be performed in the future.

**Keyword:** Flow visualization, Taylor-Couette flow, Taylor vortices, numerical model

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