

Flow Visualization Experiments of Cellular Stokes Flows Induced by Rotation of a Cylinder Variousy Positioned Inside Channels

Emin F. Kent

Istanbul Technical University, Istanbul, Turkey

In this work, flow visualization experiments of cellular Stokes flows induced by rotation of a circular cylinder variously positioned inside channels of different shapes have been performed. Flow visualization experiments have been carried out inside wedge-shaped and rectangular channels. These channels are filled with silicon rhodorsil oil of different viscosities and CMC. The motion is generated by the uniform rotation of a circular cylinder positioned at different locations inside these channels. Flow visualization experiments are carried out using solid tracers of magnesium for the Newtonien fluid and Rilsan for CMC. They are illuminated by a thin sheet of light coming from a laser device and the visualization photographs are obtained by means of long time exposure photography. A series of experiments have been performed at different rotational speeds and viscosities. High quality visualization photographs have been presented. The inner cylinder is positioned at different locations inside these channels and many interesting flow patterns have been visualized. The shape of the separating streamline and recirculating eddies are clearly seen and compared for the channels.

[View the extended summary](#)