

Abstract Submitted  
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**Fluid Mechanics Optimising Organic Synthesis** EVGENIA LEIVADAROU<sup>1</sup>, STUART DALZIEL<sup>2</sup>, University of Cambridge — The Vortex Fluidic Device (VFD) is a new “green” approach in the synthesis of organic chemicals with many industrial applications in biodiesel generation, cosmetics, protein folding and pharmaceutical production. The VFD is a rapidly rotating tube that can operate with a jet feeding drops of liquid reactants to the base of the tube. The aim of this project is to explain the fluid mechanics of the VFD that influence the rate of reactions. The reaction rate is intimately related to the intense shearing that promotes collision between reactant molecules. In the VFD, the highest shears are found at the bottom of the tube in the Rayleigh and the Ekman layer and at the walls in the Stewardson layers. As a step towards optimising the performance of the VFD we present experiments conducted in order to establish the minimum drop volume and maximum rotation rate for maximum axisymmetric spreading without fingering instability.

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