

## PAID MASTER THESIS

### *Drop Formation with a Piezoelectric Drop-on-Demand Generator*

#### *Ref.Nr.*

To dedicated students of Process Engineering, Physics or related disciplines, we offer an opportunity to write a paid Master's thesis.

#### **OBJECTIVE:**

This thesis focuses on drop formation with a commercial piezoelectric device, also called "Drop-on-Demand" generator. The study motivation lies in the interest of the pharmaceutical community for printed medicines that are dosage forms obtained by printing solution(s) containing active(s) on a substrate. Such an approach is of interest for translational and personalized medicine since doses can be varied and actives combined.



Example of printed medicine for oncological application figuring an opiate, an antiemetic and a laxative.



Typical drop formation at the orifice of a piezoelectric Drop-on-Demand device

In this context, it is crucial to accurately measure and control the volume of dispensed solutions and thus the volume of single printed drops. This work therefore aims to describe, understand and model drop formation while using a simple commercial piezoelectric drop generator. Parameters to be varied and investigated include the process parameters (voltage, duration, frequency of the driving signal) as well as the liquid properties (density, surface tension, viscosity).

#### **WITHIN THE FRAMEWORK OF THIS MASTER'S THESIS WE OFFER THE FOLLOWING:**

- Extensive participation in a top-level research project in an international environment involving both RCPE and the Institute of Fluid Mechanics and Heat Transfer of the TU Graz (ISW)
- High quality supervision with recognized experts in the field
- Being familiar with experimental methods (liquid characterization, fast imaging, image analysis)
- Being familiar with image analysis procedures
- Access to highly modern infrastructure on campus of Graz University of Technology and RCPE
- Adequate compensation and opportunities for personal and professional development

**FINANCING:** Compensation on the basis of a service contract

If you are interested in writing your thesis at the interface between university research and industry/business and to contribute to the optimization of product and process development in the pharmaceutical industry, please contact us indicating the reference number.

**Research Center Pharmaceutical Engineering GmbH**

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