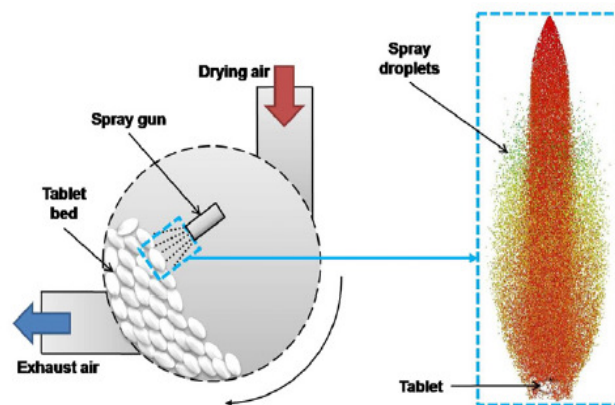


### Characterization of the Microenvironment in a Film Coater

Detailed understanding of film coating processes is of utmost importance for designing drug products that are sensitive to heat and moisture during production. Conditions such as the local temperature (of tablets or particles), local humidity, as well as the film thickness on the particles are critical quality attributes that determine film formation. Unfortunately, there is a lack of quantitative information on how these critical quality attributes affect the coating process. Since it is tedious to perform experimental studies to answer such questions, simulations can help in collecting data to establish a quantitative and mechanistic understanding of the coating process.

The thesis' work will focus on performing a literature research on film coating and drying process, characterization of the „microenvironment“ by means of dimensionless numbers, and computer simulations to quantify the relevance of these dimensionless numbers on the coating process. For the latter, computational tools will be used to simulate the coating and drying of liquid film on the spherical particles.



**Figure 1: Schematic of a modern pan coater for film coating applications**  
(Suzzi et al., Chem.Eng.Sci, 2010).

Theoretical developments will complement computational work.

#### Requirements

- strong background in particle technology and/or heat and mass transfer,
- motivation to conduct state of the art computer simulations, and
- programming skills (Matlab; knowledge of C/C++ is a plus, but not required)

#### We offer

- a topic relevant for many industries, and hence for your future career as an engineer;
- advice with respect to literature data, software, as well as financial support.

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**Possible Start Date**  
February 2015 or later