

# Guy Hassall

## Wall Build-up in Spray Drying Processes Engineering Doctorate Project with Procter and Gamble



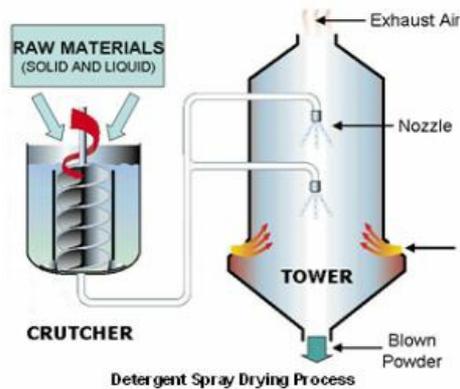
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Guy Hassall graduated from Birmingham in 2005 with an M.Eng in Chemical Engineering and started his EngD in June 2006. He is based at Procter and Gamble's Newcastle Technical Centre and is supervised academically by Dr. Mark Simmons and industrially by Dr. Andrew Bayly and Dr. Carlos Amador.

### Project Introduction

Spray dried detergents are the most common type of detergent products sold today, with sales running in billions of dollars worldwide. In all spray drying processes material is found to deposit on the dryer walls and those of ancillary equipment.

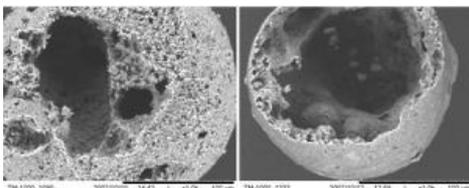
This is a particularly important issue for the spray drying of detergents as deposition of product on the dryer walls can have negative effects on operation of the process (downtime for cleaning, particulate emissions, etc) and more importantly product quality. The aim of this project is to develop an understanding of wall build-up in spray dryers such that the phenomenon can be modelled mathematically.



### Project Approach

Work towards the goal of understanding and modelling wall build-up is a combination of laboratory and pilot plant experimentation coupled with modelling and has been broken down into four main work packages each of which include both experimentation and modelling.

- Particle Characterisation – Understanding the structural, surface and mechanical properties of spray dried detergent granules and how these change during the spray drying process.
- Air Flow Patterns and Particle Trajectories – Studying the movement of particle through the spray dryer and how this is affected by the air flow patterns.
- Particle Impacts – Recreating the impact of particles on dryer and equipment walls and modelling particle deformation, adhesion and breakage.
- Wall Deposition Studies – Measuring the rate of wall deposition during spray drying.



SEM Images of Spray Dried Detergent Particles