Draft Programme

Fluid Bed Processing
Wednesday 15 – Friday 17 May 2019

Wednesday 15 May 2019

09:00 Registration and coffee
09:30 Welcome and housekeeping
   Dr Jim Bullock, iFormulate Ltd
09:40 Introduction to fluid bed processing
   Professor Andrew Bayly, University of Leeds (formerly of Procter and Gamble)
   - Overview and key features of fluid bed processing and key features
   - Objectives of processing and how/where it is used
   - Fluid bed designs – pros and cons
   - What can happen if it goes wrong
   - Introduction to the key scientific topics of the course

10:10 Fluidisation basics
   Professor David York, University of Leeds (formerly of Procter and Gamble)
   - Basics of fluidisation.
   - Particle properties, disengagement zone, elutriation, pressure drops
   - Includes a demonstration

11:10 Coffee
11:25 Benefit of mass transfer in the fluid bed
   Professor Andrew Bayly, University of Leeds (formerly of Procter and Gamble)
   - Drying and cooling operations
   - The importance of particle properties and interactions with the fluid bed

12:05 Particle agglomeration in fluid beds
   Dr Stephan Sternowsky, Neuhaus Neotec
   - Examples which illustrate the science of agglomeration

12:45 Lunch
13:45 Hands-on laboratory demonstration sessions
   Demo a: Pilot unit operation
   Dr Stephan Sternowsky/Henning Falck, Neuhaus Neotec
   Demo b: Fluidisation and Geldart Classifications
   Soyeb Manga, University of Leeds
   Demo c: Continuous operation
   Professor David York, University of Leeds

15:40 Tea
15:55 Spraying and coating in fluid bed drying
   Professor Nik Kapur, University of Leeds
   - Mechanisms of wetting and spreading
   - Impact of shape and liquid properties

16:35 Importance of powder material properties in fluid beds
   Nigel Somerville Roberts, NSR Innovations Ltd (formerly of Procter and Gamble) and visiting researcher, University of Leeds
   - Geldart classification
   - Impact of size distribution, moisture and temperature
   - Characterisation
   - Causes and consequences of unintended agglomeration
17:05  Particle engineering and characterisation of output particles  
Lieselotte de Smet, Xedev/ProCept
17:35  Q&A and wrap up
17:50  End of day one
19:00  Course Dinner

Thursday 16 May 2019

09:00  Coffee
09:15  Welcome  
Dr Jim Bullock, iFormulate Ltd
09:20  Basics of fluid bed design  
Nigel Somerville Roberts, NSR Innovations Ltd (formerly of Proctor and Gamble) and visiting researcher, University of Leeds  
Influence of shape, distributor plates, weirs, air distribution, static and vibratory beds  
- Wurster design  
- Continuous vs batch operation  
- Cyclones, internal filters
10:00  Basic modelling for fluid bed processing  
Dr Ali Hassanpour, University of Leeds  
- DEM and CFD Models  
- Heat balance
10:40  Coffee
10:55  Hands-on laboratory demonstration sessions  
Demo d: Particle mixing and separation  
Umair Zafar, University of Leeds
Demo e: Agglomeration and sintering  
Nigel Somerville Roberts, NSR Innovations Ltd (formerly of Proctor and Gamble) and visiting researcher, University of Leeds
Demo f: Encapsulation, coating and spouted bed  
Annelies Willekens, ProCept
12:40  Lunch
13:30  Operation: start up and shut down and handling difficult materials  
David Smith, DJS Process Consulting Ltd
14:15  Case Study Pharma 1 – Developing Fluid Bed Granulation High Potent Drug Products  
David O’Connell, PCI Pharma Services  
- introduction to potent molecules  
- overview of contained manufacturing facility  
- specific contain equipment for fluid bed granulation  
- case study of a challenging product.
14:55  Case Study Food 1 - powder morphology and powder performance  
Tobias Kockel, Nestlé R&D Konolfingen, Switzerland
15:25  Tea
15:45  Case Study Food 2 – powder morphology and powder performance  
Tobias Kockel, Nestlé R&D Konolfingen, Switzerland
16:15  Case Study Pharma 2 – Fluid Bed Processes in Pharmaceutical Coating and Granulation  
Conor Long, Almac
16:55  Case studies of continuous and batch operation  
Henning Falck, Neuhaus Neotec  
- Pros and cons of continuous vs batch
17:20  Panel Discussion (all speakers): Future challenges and opportunities
17:45  Q&A and wrap up
17:55  Drinks and poster reception
19:20  End of day two

Friday 17 May 2019

Innovation and New Horizons

09:00  Coffee
09:15  Welcome  
Dr Jim Bullock, iFormulate Ltd
09:20  Innovation Example 1 - Academic - Structured fluid beds: Towards more responsive processes  
Dr Victor Francia, Heriot-Watt University
10:00  Instrumentation and Control: sensors, soft sensors and control loops
Tobias Kockel, Nestlé R&D Konolfingen, Switzerland

10:40 Coffee

11:00 **Case Study: combining spray drying with a fluid bed**
Professor David York, University of Leeds and Nigel Somerville Roberts, NSR Innovations Ltd

11:40 **Innovation example 2 – Industry – High gravity fluid beds**
Prof. Dr. ir. Juray De Wilde, Université Catholique de Louvain (UCLouvain)

12:10 Troubleshooting and Q&A

13:00 Lunch

14:00 End of course