Fluid Bed Processing and Formulation

**Monday 11 – Wednesday 13 May 2020**

**About the course**
Fluid beds are widely used in industry due to their characteristic fluid like properties of good mixing and heat transfer. Applications of fluid beds range from combustion in power stations, catalytic reactors to the engineering of industrial processes, both batch and continuous. The course is grounded in practical experience gained across numerous industrial sectors by a range of speakers from academia, equipment manufacturers and end users. The scientific principles of fluid bed processing will be reinforced by a number of practical demonstrations which show the theory in practice.

**Expected outcomes**
- Apply an understanding of how material properties, operating parameters and equipment design can have an influence on product properties
- Manipulate operating parameters to influence materials properties and quality parameters
- Recognise how fluid bed processes can be scaled up and appreciate the challenges in start-up and shut down
- Understand how scientific principles can be applied to the processing of real industrial products for better performance, quality and economics
- Learn from how challenges are tackled across different industries
- Choose and design appropriate equipment for fluid bed processing
- Learn about scientific principles that have stimulated many development opportunities for our industry. - Volac International Ltd

**Intended audience**
- R&D scientists in industries such as pharmaceuticals, detergents, foods, agrochemicals or specialty chemicals and need a broad overview of the subject of fluid bed processing
- Scientists and chemical engineers who would value a deeper understanding of how science can be applied to real fluid bed processing problems
- Process technologists, plant managers, involved in R&D or process technicians who need a thorough practical grounding in the subject of fluid bed processing and how it can influence the properties of the final product
- University researchers who require a deeper insight into real industrial problems, unmet needs and potential new research themes

**Programme**

**Monday 11 May 2020**

09.00 Registration and coffee
09.30 Welcome and housekeeping
09.40 Introduction to fluid bed processing
10.10 Fluidisation basics
11.15 Coffee
11.30 Benefit of mass transfer in the fluid bed
12.10 Particle agglomeration in fluid beds
12.50 Lunch
13.50 Hands-on laboratory demonstrations
15.35 Tea
15.50 Fluid atomisation in fluid beds – basic science and mechanisms
16.30 Use and characteristics of twin-fluid nozzles in fluid beds
17.00 Importance of powder material properties in fluid beds
17.30 Q&A and wrap up
19.00 Course Dinner

**Tuesday 12 May 2020**

09.00 Coffee
09.15 Welcome
09.20 Basics of fluid bed design
10.00 Basic modelling for fluid bed processing
10.55 Hands-on laboratory demonstrations
12.40 Lunch
13.30 Fluid bed drying – mechanistic modelling and scale-up
14.10 How liquids spread, coat or agglomerate in fluid bed processing
15.30 Tea
15.45 Case studies of continuous and batch operation
16.30 Powder morphology and powder performance – case study food 2: thicken-up clear
17.00 Particle engineering and characterisation of output particles
17.30 Q&A and wrap up
18.00 End of day two

**Wednesday 13 May 2020**

09.00 Coffee
09.15 Welcome
09.20 Powder morphology and powder performance – case study food 2: thicken-up clear
10.30 Coffee
10.45 Case study: particle coating and controlled release
11.25 Case study: combining spray drying with a fluid bed process
12.05 Innovation example 1 – academic – structured fluid beds: towards more responsive processes
12.45 Lunch
13.35 Instrumentation and control: sensors, soft sensors and control loops
14.15 Innovation example 2 – industry – high gravity fluidized beds
14.55 Tea and end of course

**Course director:**
Professor David York, University of Leeds

**Course co-director:**
Dr Jim Bullock, Director, iFormulate Ltd

**Course Dinner**

**Venue:**
University of Leeds

**Contact:**
Nigel Somerville Roberts, NSR Innovations Ltd

**Registration and coffee**

**Welcome and housekeeping**

**Introduction to fluid bed processing**

**Fluidisation basics**

**Lunch**

**Hands-on laboratory demonstrations**

**Tea**

**Fluid atomisation in fluid beds**

**Use and characteristics of twin-fluid nozzles in fluid beds**

**Importance of powder material properties in fluid beds**

**Q&A and wrap up**

**Coffee**

**Basic science and understanding**

**Applications and case studies**

**Expected outcomes**

On completion of this course you’ll be able to:

- Apply an understanding of how material properties, operating parameters and equipment design can have an influence on product properties
- Manipulate operating parameters to influence materials properties and quality parameters
- Recognise how fluid bed processes can be scaled up and appreciate the challenges in start-up and shut down
- Understand how scientific principles can be applied to the processing of real industrial products for better performance, quality and economics
- Learn from how challenges are tackled across different industries
- Choose and design appropriate equipment for fluid bed processing
- Learn about scientific principles that have stimulated many development opportunities for our industry. - Volac International Ltd

**Great opportunity for me to learn about possibilities of this technology, beginning from the basics, practical experiments and real applications.” Fosta a.s.”

**“A great combination of fundamental basics and years of industrial expertise.” Elanco

**The full course details and online booking are now available from the course web page:**
https://eps.leeds.ac.uk/short-courses
Further information

Venue
The course venue will be within the Faculty of Engineering and Physical Sciences at the University of Leeds.

Please note, car parking for visitors is unavailable at the University. The nearest public car park is Woodhouse Lane (multi-storey) at LS1 3HQ.

Course Fees
The following course fees include the cost of tuition, course materials, lunches and light refreshments for the days of attendance:

**£999** – Monday 11 – Wednesday 13 May 2020

Accommodation
Delegates are responsible for their own accommodation (if required). A list of hotels close to the University will be sent out with the delegate joining instructions.

Course Dinner
The course dinner will be held at a Leeds city centre restaurant and is included in the course fee. This will take place on Monday evening and the dress code is smart casual.

Accessibility
Please let us know if you have any specific requirements including any access or dietary requirements in relation to this course.

How to Book
Booking for this course should be completed through our secure Online Store. To complete your booking please follow the instructions below:
1. Log on to our Online Store at: [https://store.leeds.ac.uk](https://store.leeds.ac.uk)
2. Select Conferences and Events in the left-hand navigation bar
3. Select CPD Faculty of Engineering and Physical Sciences
4. Select the course or event for which you wish to register and click on ‘Book’
5. If you are a new user, please follow the instructions to register. If you already have an account log in as instructed
6. Complete the application process as directed by the booking system.

You will receive an automatic confirmation email within 24 hours of your booking.

Our privacy notice tells you what to expect us to do with your personal information when you make contact with us or use one of our services: [https://eps.leeds.ac.uk/privacy](https://eps.leeds.ac.uk/privacy)

For online booking queries and for all other enquiries please contact:
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Terms and conditions for booking

Payment by debit/credit card
Payment should be made at the time of booking via the Online Store.

Payment via purchase order and invoice
A purchase order document should accompany your booking form. Our standard terms of payment are 30 days from date of invoice, however payment must be made prior to attendance. Attendance may be refused if payment has not been received.

Changes made by the University of Leeds
The course programme may have to be re-scheduled or the speakers changed for reasons outside our control. The University of Leeds reserves the right to cancel or postpone a course, in which case fees will be refunded in full. In the event of cancellation, the University will not be held liable for delegates’ travel or accommodation expenses.

Where a delegate cancels a registration
For cancellations made within seven days of booking: a full refund is payable unless the course starts within the next seven days, in which case the full fee is payable and no refunds will be made.

For cancellations made after seven days of booking: written cancellations received up to 15 working days before the course will be subject to an administrative charge of 20% of the total fee. Within 15 working days of the course the full fee is payable and no refunds will be made.

For non-attendance: the full fee is payable and no refunds will be made but copies of the course materials will be sent to the registered delegate. Substitutions may be made at any time.

Data/Privacy
Your right to privacy is important to us. We will only use your information to provide information on our CPD courses and relevant events. We will not pass your details on to any other organisations. The ways in which your personal data may be used when you provide it to us are defined in our Privacy Notice at [https://eps.leeds.ac.uk/privacy](https://eps.leeds.ac.uk/privacy)

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