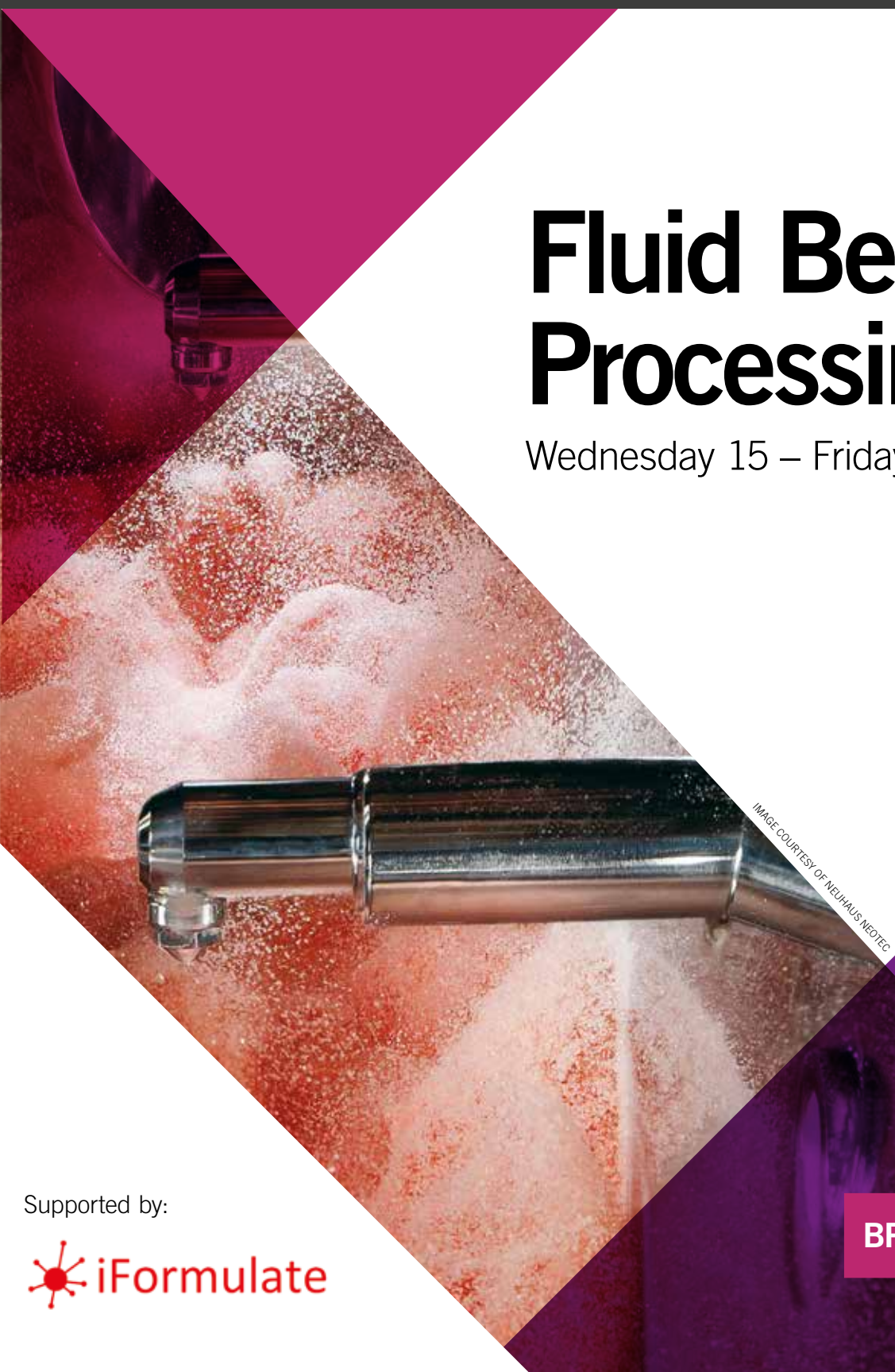
Faculty of Engineering

UNIVERSITY OF LEEDS

Fluid Bed Processing

Wednesday 15 – Friday 17 May 2019



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Supported by:

iFormulate

BRAND NEW COURSE FOR 2019

Fluid Bed Processing

Wednesday 15 – Friday 17 May 2019

About the course

Fluidised 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 particles via methods such as low density agglomeration and encapsulation.

This new course focuses on the use of fluid beds in the particle engineering area and covers:

- the basic principles behind fluidisation
- the importance of particle properties
- the impact of bed design on the structure and optimal operation of fluid beds, 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 operation will be reinforced by a number of practical demonstrations which show the theory in practice.

What the course will cover

Day 1. Fluidisation Basics:

Industry and academic experts will cover:

- what causes powder beds to fluidise
- what are the properties of the powders that make this more or less straightforward
- what are the watch-outs in this technique
- how can one engineer particles with different properties

Day 2. Industry Case Studies:

Topics will include:

- The importance of the bed design on how it operates
- The key operating parameters from starting up to steady state
- Agglomeration, encapsulation, coating and separation
- Real-life case studies examples from a range of industries, covering what can go wrong and how to avoid it

Day 3. New Developments and Innovations

On the final half day, examples will be provided of the latest developments in fluid bed applications from industry and academia. The course will end with a discussion and problem solving forum.

Practical demonstrations will also be included on the course to showcase the topics and the troubleshooting forum at the end of the course will give you the opportunity to discuss any problems or individual challenges for discussion with experts in the field.

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

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 from extensive academic and industrial experience, demonstrations, theory and real industrial case studies
- and, importantly learn from attendees what others are doing in the field of fluid bed processing

Course director:
Professor David York, University of Leeds

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

Programme

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)

10:10 **Fluidisation basics**
Professor David York, University of Leeds (formerly of Procter and Gamble)

11:10 Coffee

11:25 **Benefit of mass transfer in the fluid bed**
Professor Andrew Bayly, University of Leeds (formerly of Procter and Gamble)

12:05 **Particle agglomeration in fluid beds**
Stephan Sternowsky, Neuhaus Neotec

12:45 Lunch

13:45 **Hands-on laboratory demonstrations**

Fluidisation and Geldart Classifications
Soyeb Manga, University of Leeds

Continuous operation
Professor David York, University of Leeds

Particle mixing and separation
Umair Zafar, University of Leeds

Pilot unit operation
Stephan Sternowsky/Henning Falck, Neuhaus Neotec

Agglomeration and sintering
Nigel Somerville Roberts, NSR Innovations Ltd

Encapsulation, coating and spouted bed
Ben de Schepper, ProCept

15:40 Tea

15:55 **Spraying and coating in fluid bed drying**
Professor Nik Kapur, University of Leeds

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

17:05 **Particle engineering and characterisation of output particles**
Lieselotte de Smet, Xedev

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 Procter and Gamble) and visiting researcher, University of Leeds

10:00 **Basic modelling for fluid bed processing**
Dr Ali Hassanpour, University of Leeds

10:40 Coffee

10:55 **Hands-on laboratory demonstrations**

Fluidisation and Geldart Classifications
Soyeb Manga, University of Leeds

Continuous operation
Professor David York, University of Leeds

Particle mixing and separation
Umair Zafar, University of Leeds

Pilot unit operation
Stephan Sternowsky/Henning Falck, Neuhaus Neotec

Agglomeration and sintering
Nigel Somerville Roberts, NSR Innovations Ltd

Encapsulation, coating and spouted bed
Ben de Schepper, ProCept

12:40 Lunch

13:30 **Operation: start up and shut down and process control**
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

14.55 **Case Study Food**
Speaker to be confirmed

15.35 Tea

15.55 **Case Studies Food – powder morphology and powder performance**
Tobias Kockel, Nestlé R&D Konolfingen, Switzerland

16.25 **Case Study Pharma 2 – Fluid Bed Processes in Pharmaceutical Coating and Granulation**
Conor Long, Almac

17.05 **Case Study – Case studies of continuous and batch operation**
Henning Falck, Neuhaus Neotec

17.30 **Panel Discussion (all speakers): Future challenges and opportunities**

17.55 **Q&A and wrap up**

18.05 Drinks and poster reception

19:30 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

The full course details and online booking are now available from the course web page:
www.engineering.leeds.ac.uk/short-courses

Further information

Venue

The course venue will be within the Faculty of Engineering 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, light refreshments and the course dinner.

Bookings made on or before Friday 12 April 2019:
£940 (VAT exempt)

Bookings made after Friday 12 April 2019:
£990 (VAT exempt)

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 Wednesday 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
2. Select Conferences and Events in the left-hand navigation bar
3. Select CPD Faculty of Engineering.
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://tinyurl.com/CPD-Privacy-Notice**

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

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W: www.engineering.leeds.ac.uk/short-courses
@LeedsUniCPD
CPD, Conference and Events Unit, University of Leeds

Terms and conditions for booking

Payment in full should accompany your booking. The course fee is exempt from VAT. Fees must be paid in full no later than 15 working days before the course commences. Failure to pay may result in attendance being refused.

Registrations are accepted on the understanding that the printed programme is given in good faith but 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 the 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.

Delegates will receive a full refund for cancellations made within 7 days of online booking, except where the booking has been made for an event commencing within the next 7 days. Where a delegate wishes to cancel a registration after this 7 day period, written cancellations received up to 15 working days before the course will be subject to an administrative charge of 20% of the total remittance. After this date the full fee is chargeable and no refunds will be made, this also applies for non-attendance but copies of the course documents will be sent. Substitutions may be made at any time.

If you are unable to complete your registration using the online booking system please contact the CPD, Conference & Events Unit to discuss alternative arrangements.

The CPD Unit takes your privacy seriously and we will only use your details to provide information on our CPD courses and relevant engineering events. We will not pass your details to any other organisations. You can unsubscribe at any time by emailing us at **cpd@engineering.leeds.ac.uk** and your details will be removed from our database.