

Spray Drying and Atomisation of Formulations

Tuesday 31 March – Thursday 2 April 2020



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**COURSE EXPERTLY PRESENTED BY 6
ACADEMIC AND 16 INDUSTRIAL SPEAKERS
FROM 4 DIFFERENT COUNTRIES AND WITH
OVER 400 YEARS CUMULATIVE EXPERIENCE!**

Spray Drying and Atomisation of Formulations

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About the course

A practical course involving demonstrations, theory and real industrial case studies.

Day 1: Spray Drying and Atomisation Basics: Industry and academic experts provide the essential scientific background as well as practical hands-on laboratory demonstrations.

Day 2: Industrial Formulation Case Studies: Experienced specialists will show how the science of spray drying has been applied to influence the properties of real formulated products across a wide range of business sectors. Including more laboratory demonstrations.

Day 3: Powder finishing, modelling and future development of spray drying.

During the course you will have an opportunity to discuss problems/individual challenges for discussion with experts in the field.

Intended audience

- R&D scientists in industries such as pharmaceuticals, detergents, foods, agrochemicals and pigments who are working in product formulation and who need a broad overview to the subject of spray drying and atomisation.
- Scientists and chemical engineers who would value a deeper understanding of how science can be applied to real spray-drying problems.
- Process technologists, plant managers, R&D and process technicians who need a thorough practical grounding in the subject of spray drying and how it can influence the properties of formulated products.
- Plant and process engineers from contract manufacturers who are seeking process improvements and efficiencies.
- University researchers who require a deeper insight into real industrial problems, unmet needs and potential new research themes.

Expected outcomes

- Gain an appreciation of how the choice of formulation composition can impact processing and product quality.
- Apply an understanding of how fluid properties, rheology and atomisation performance can have an influence on spray drying.
- Learn how to manipulate drying parameters to influence product microstructure, materials properties and quality parameters.
- Gain an appreciation of the hazards involved in spray drying and how to ensure safe operation.
- Learn how spray drying processes can be scaled up and appreciate the possible pitfalls on scaling up.
- Understand how spray drying principles can be applied to the manufacture of real industrial formulated products for economic and better performing processes as well as improved product performance and quality.
- Gain an insight into how challenges are tackled across different industries.
- Learn how to choose and design appropriate equipment such as atomisers and towers for laboratory, pilot and production-scale spray-drying.

Course director:

Professor David York, University of Leeds

Course co-director:

Dr Jim Bullock, Director, iFormulate Ltd

“Thoroughly enjoyed the course. Massively informative with new concepts and further knowledge of the basics. Great speakers, will recommend” **TasteTech Limited**

“The course gave a great overview of spray drying and the common challenges faced by industry. The course was a good balance of lecture-based and workshop learning” **AWE**

“A really great course to provide information for people from many different industries, from the basic science through different processing techniques” **Kerry**

Programme

Tuesday 31 March 2020

Spray Drying and Atomisation Basics

- 09:00 Registration and coffee
- 09:30 **Welcome and group introduction – what do delegates want to get from the course?**
Dr Jim Bullock, iFormulate Ltd
- 09:40 **Introduction to spray drying, how it compares with other drying techniques, mechanisms and impact of the formulation on process and plant design**
Professor David York, University of Leeds (formerly of Procter and Gamble)
- 10:20 **Fluid properties and rheology**
Professor Andrew Bayly, University of Leeds (formerly of Procter and Gamble)
- 11:00 Coffee
- 11:20 **Atomisation**
Professor Phil Threlfall-Holmes, TH Collaborative Innovation & Visiting Professor, University of Leeds (formerly of AkzoNobel)
- 12:00 **Drying the particle**
Filip Van der Gucht, ProCept
- 12:30 **Modern approaches towards explosion safety in spray dryers**
Francesca Vincenzi, REMBE
- 13:00 Lunch
- 13:45 **Hands-on laboratory demonstrations**
Feedstock/rheology
Soyeb Manga, University of Leeds
Atomisation
Professor Phil Threlfall-Holmes, TH Collaborative Innovation & Visiting Professor, University of Leeds (formerly of AkzoNobel)
Characterisation of spray dried powders
Professor David York, University of Leeds
Single droplet
Professor Andrew Bayly, University of Leeds
Particle sizing
Dr Ben Douglas, University of Leeds
Drying parameters
Filip Van der Gucht, ProCept
- 15:35 Tea
- 15:55 **Spray drying: basic models, energy balance**
Professor Andrew Bayly, University of Leeds
- 16:20 **Scale up of spray drying processes**
Henrik Schwartzbach, GEA Process Engineering A/S
- 16:50 **Water in our world, water in our materials**
Dr Daryl Williams, Imperial College London
- 17:25 End of day one
- 19:00 Course dinner

Wednesday 1 April 2020

Industrial Formulation Case Studies

- 08:45 Coffee
- 09:00 **Welcome**
Dr Jim Bullock, iFormulate Ltd
- 09:10 **Phase changes in spray drying**
Professor David York, University of Leeds
- 09:35 **Spray drying with two-fluid nozzles; atomisation, scale-up and modelling**
Ian Kemp, Consultant, previously GSK
- 10:20 Coffee
- 10:40 **Engineering particle structure**
Professor Andrew Bayly, University of Leeds
- 11:15 **Spray drying of pharmaceuticals**
Andrew Naylor, Upperton
- 11:50 **Spray drying an alternative to freeze drying**
Dr Sune Klint Andersen, Janssen Pharmaceuticals, Beerse, Belgium
- 12:25 **Modelling of the spray drying process using empirical inputs**
Henrik Schwartzbach, GEA Process Engineering A/S
- 13:00 Lunch
- 13:45 **Hands-on laboratory demonstrations**
Feedstock/rheology
Soyeb Manga, University of Leeds
Atomisation
Professor Phil Threlfall-Holmes, TH Collaborative Innovation & Visiting Professor, University of Leeds (formerly of AkzoNobel)
Characterisation of spray dried powders
Professor David York, University of Leeds
Single droplet
Professor Andrew Bayly, University of Leeds
Particle sizing
Dr Ben Douglas, University of Leeds
Drying parameters
Filip Van der Gucht, ProCept
- 15:35 Tea
- 15:55 **Processing science in an infant milk formulae factory**
Dr Koen van Dijke, Danone
- 16:30 **Spray drying for encapsulation and congealing**
Filip van der Gucht, ProCept
- 17:00 **Trouble shooting forum/ expert consultation session and networking drinks reception**
- 18:30 End of day two

Thursday 2 April 2020

Powder finishing, modelling and future developments

- 08:45 Coffee
- 09:05 **Welcome**
Dr Jim Bullock, iFormulate Ltd
- 09:15 **Agglomeration and build-up in the spray drying tower**
Stefan Egan, Procter and Gamble
- 09:45 **Managing moisture in practice**
Sophie Samain, Nestle Ireland
- 10:20 Coffee
- 10:40 **Product design by fluid bed systems as downstream units of spray dryers**
Henning Falck, Neuhaus Neotec
- 11:10 **Modelling and scale up of spray drying**
Dr Pedro Valente, Hovione
- 11:40 **Future directions in atomisation technologies for pharmaceutical applications**
Dr Pedro Valente, Hovione
- 12:15 Lunch
- 13:00 **Mechanistic model enhanced digital design and digital operation of spray drying processes**
Dr David Slade, Process Systems Enterprise Ltd (PSE)
- 13:30 **Innovative electrostatic spray dryer**
Audrey Maudhuit, Spraying Systems Co./Fluid Air
- 14:05 Tea
- 14:25 **Dryer operation and operational challenges**
George Svonja and Deon Pistorius, Dedert
- 14:55 **Particle separation: cyclones, filters etc**
Professor David York, University of Leeds
- 15:30 Close of course

Please note that, although the organisers remain devoted to the programme specified, they reserve the right to vary the programme in detail if required to do so by factors beyond their control.



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 – Tuesday 31 March – Thursday 2 April 2020

Accommodation

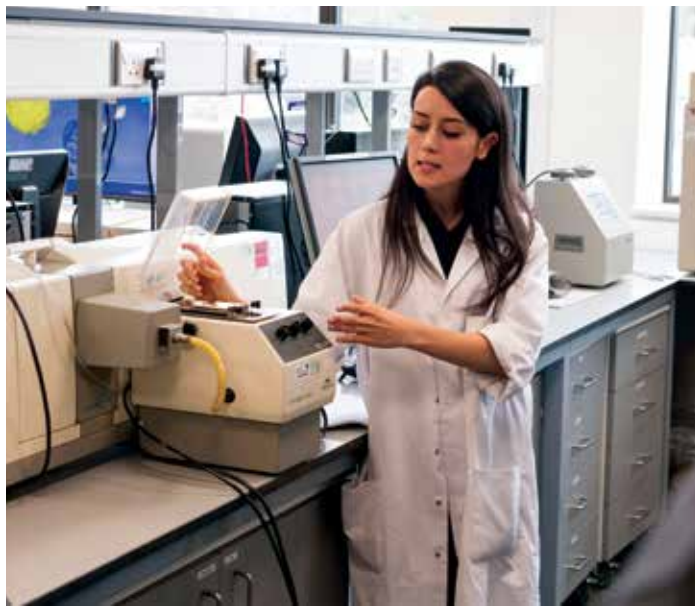
Delegates are responsible for their own accommodation (if required). A list of hotels close to the University will be sent out with the delegate joining instructions.

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 Tuesday 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 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>

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

Katie Warner
CPD, Conference & Events Unit
Faculty of Engineering and Physical Sciences
School of Chemical and Process Engineering, 3.11
University of Leeds
LEEDS, LS2 9JT, UK

T: + 44 (0) 113 343 8104

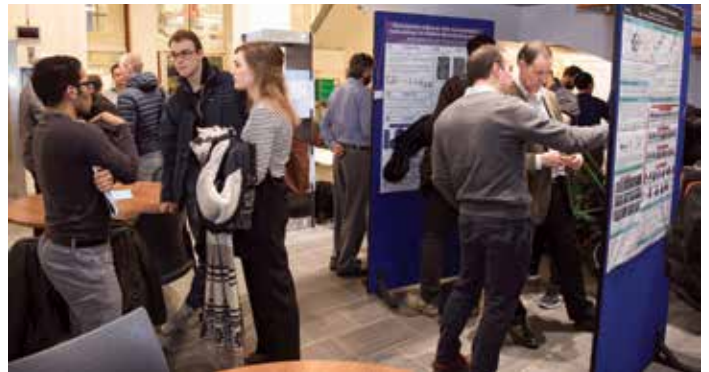
E: cpd@engineering.leeds.ac.uk

W: www.engineering.leeds.ac.uk/short-courses

Twitter: @LeedsUniCPD

Facebook: @LeedsUniCPD

LinkedIn: CPD, Conference and Events Unit, University of Leeds



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>