

Faculty of Engineering



UNIVERSITY OF LEEDS

# Spray Drying and Atomisation of Formulations

Tuesday 12 – Thursday 14 April 2016



Supported by:



**EARLY REGISTRATION  
IS RECOMMENDED**

**2015 COURSE WAS FULLY BOOKED**

# Spray Drying and Atomisation of Formulations

Tuesday 12 – Thursday 14 April 2016

## 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.

**Day 3:** Following the success of the 2015 course the 2016 programme now includes an additional half day to look at powder finishing, modelling and future development of spray drying.

**During the 2.5 day course there will be 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.

“An excellent introduction to spray drying and atomisation of formulations.” **Syngenta**

“100% of 2015 respondents said they would recommend the course to their colleagues”

## 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

“An excellent, information packed course allowing participants to hear from industry and academic experts, and share ideas with delegates from other industries” **GSK**

“Great overview of spray drying, across a broad range of industries and applications” **Unilever**

## Programme

Tuesday 12 April 2016

### 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 Atomisation  
Dr Phil Threlfall-Holmes, TH Collaborative Innovation (formerly of AkzoNobel)  
11:40 Coffee  
11:55 Drying the particle  
Filip Van der Gucht, ProCept  
12:35 Spray drying hazards and safe operation  
Mike Halliday, Halliday Stack and Dewhirst Ltd  
13:10 Lunch  
13:45 Hands-on laboratory demonstration sessions  
**Fluid Rheology:**  
Professor Andrew Bayly, University of Leeds  
**Atomisation**  
Dr Phil Threlfall-Holmes, TH Collaborative Innovation (formerly of AkzoNobel)  
**Drying Parameters:**  
Filip Van der Gucht, ProCept  
15:15 Tea  
15:40 Hands-on laboratory demonstration sessions (continued)  
**Characterisation of spray dried powders:**  
Professor David York  
**Explosion hazards:**  
Mike Halliday  
16:40 Spray drying: Basic models, energy balance  
Professor Andrew Bayly, University of Leeds  
17:00 Scale up of spray drying processes  
Henrik Schwartzbach, GEA Niro  
17:30 Wrap up of day 1  
Dr Jim Bullock, iFormulate Ltd  
17:40 End of day one  
19:00 Course Dinner

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:  
[www.engineering.leeds.ac.uk/short-courses](http://www.engineering.leeds.ac.uk/short-courses)



Wednesday 13 April 2016

### 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  
09:45 Modelling of the effect of atomisation on scale-up of spray dryers  
Ian Kemp, GSK  
10:20 Coffee  
10:40 Agglomeration, build-up and the potential for charring in the spray drying tower  
Luis Martin de Juan, Procter and Gamble  
11:15 The importance of moisture  
Dr Majid Naderi, Surface Measurement Systems UK Ltd  
11:50 Spray drying of pharmaceuticals  
Nikki Whitfield, Quotient  
12:25 Lunch  
13:25 Application of spray dried materials in the pharmaceutical industry – what, where and how much?  
Andrew Parker, Juniper Pharma Services  
14:00 Spray drying biomolecules at the bench-top scale  
Geoffrey Lee, Erlangen University  
14:35 Modelling of the spray drying process using empirical inputs  
Henrik Schwartzbach, GEA Niro  
15:10 Tea  
15:30 Cyclone science and improving product recovery in spray drying processes  
Professor Romualdo Salcedo, Advanced Cyclone Systems, Porto  
16:05 Spray drying for encapsulation and congealing  
Filip Van der Gucht, ProCept  
16:40 Panel Discussion (all speakers): Future challenges and opportunities  
16:50 Wrap-up: What would delegates still like covering?  
End of day two

Thursday 14 April 2016

### Powder finishing, modelling and future developments

- 09:00 Coffee  
09:15 Managing moisture in practice  
Dr Tobias Kockel, Nestlé R&D Askeaton  
09:50 Product design by fluid bed systems as downstream units of spray dryers  
Henning Falck, Neuhaus Neotec  
10:20 Coffee  
10:40 Engineering particle structure  
Professor Andrew Bayly, University of Leeds  
11:15 Modelling and scale up of spray drying  
Dr Pedro Valente, Hovione  
11:50 Future directions:  
3 phase nozzle  
Dr Pedro Valente, Hovione  
Recent advances in modelling  
Speaker to be confirmed  
12:25 Tour of Leeds atomisation and spray drying facilities  
13:15 Lunch and close



# Administration Details

## Venue

The course venue will be within the Faculty of Engineering at the University of Leeds.

The University is located in city centre, in walking distance from the train station, with easy access to both the M1 and M62 and Leeds Bradford airport is approximately 7 miles away from the University, so easily commutable by taxi.

## 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 26 February 2016: **£900** (VAT exempt)

Bookings made after Friday 26 February 2016: **£950** (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 Tuesday evening and the dress code is smart casual.

## Special Requirements

Potential delegates who have any special requirements should contact the course coordinator as soon as possible.

## 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.

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

**Jenny Carter**

CPD, Conference & Events Coordinator

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**W:** [www.engineering.leeds.ac.uk/short-courses/](http://www.engineering.leeds.ac.uk/short-courses/)

**Twitter:** @LeedsUniCPD



## 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.