

FREEZE DRYING TECHNOLOGY: A PRACTICAL GUIDE TO PROCESS DEVELOPMENT

4-5 JUNE, 2025

WINCHESTER, UNITED KINGDOM



Course overview

This course, 80% classroom-based and 20% laboratory-based, offers an in-depth understanding of freeze drying theory and practice. It covers formulation design and characterization, freezing and sublimation fundamentals, and Process Analytical Technology (PAT), along with product analysis and Quality by Design (QbD). Laboratory sessions provide opportunities to observe analytical techniques, explore practical aspects of freeze-drying equipment, and discuss cycle design strategies, bridging theory with real-world applications for a detailed learning experience.

Suitable for industries including:

- ✓ Pharma R&D to Production
- ✓ Diagnostics
- ✓ Lyo Processing & Production
- ✓ Biotechnology
- ✓ Cytotoxics

What is covered in the price?



Over 12h of freeze drying content



Printed learning materials (full lectures notes)



Lunch & Refreshments



Course schedule

Day 1: Fundamentals of Freeze Drying



Start the course with a comprehensive introduction to freeze-drying technology, exploring the principles behind product freezing, including controlled nucleation, and the science of primary and secondary drying. Delve into the key aspects of formulation design and characterization methods, highlighting their importance in successful lyophilization. Gain insights into process monitoring and analytical technologies, which are critical for optimizing freeze-drying processes. The day concludes with a hands-on group activity, evaluating the appearance of lyophiles and applying theoretical knowledge to practical observations.

Day 2: Advanced Techniques and Product Analysis



Day 2 builds on foundational knowledge, focusing on cycle development through both classical iterative approaches and modern Quality by Design (QbD) strategies, including SMART software. Understand how to scale up processes and ensure robustness, followed by sessions on advanced product analysis techniques, such as moisture content measurement, thermal analysis, and evaluation of appearance, structure, and mechanical properties. The afternoon is dedicated to a detailed laboratory session, split into two parts, where participants gain practical experience with freeze-drying processes. The course concludes with a final wrap-up and Q&A session, providing an opportunity to solidify learnings and address specific challenges.

****Course agenda available upon request****

About our instructors

Dr. Bhaskar Pandya



Bhaskar joined Biopharma Group in 2021 as a Senior Scientist after earning a PhD on single-vial freeze drying monitoring using vial impedance spectroscopy (TVIS) at De Montfort University, UK. At Biopharma's Winchester lab, Bhaskar manages collaborative pharma and diagnostics projects and provides consultancy for new and existing products. He also holds a Master's by Research (MRes) from University College London, enhancing his expertise in the field.

Mervyn Middleton



After earning a BSc (Hons) in Biochemistry from the University of Portsmouth in 2009, Mervyn joined Biopharma Group where he worked through to 2015, gaining expertise in product analysis and lyo cycle development. Returning in 2021 as a Senior Scientist, Mervyn has worked on over 50 projects, including pre-lyophilised and lyophilised product characterisation, formulation development, freeze drying cycle optimisation, process auditing, and consultancy across all stages of lyo development and scale-up.

Registration

Use our online form to register for this training courses. We will contact you to confirm payment details, number of attendees and course choice.

Please note that multiple bookings from the same organisation can qualify for a discount, contact us for more details.

Accommodation

Please note that the cost of accommodation is not included in the course fee and that bedroom bookings must be made by the participants. A list of local hotels will be provided with the registration confirmation.

Cost: £1,800

Early Bird Rate: £1,530
(deadline April 22nd 2025)

Contact us

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