

In-service training course

Powder Flow, Handling and Storage

26 - 28 April, 2017

At Hotel Phoenix Copenhagen
in the Heart of Copenhagen, Denmark

More than 100
persons trained!

Outcome

Through presentations, exercises and plenum discussions participants will acquire solid knowledge of powder flow, powder handling and powder storage and be able to address practical problems in these areas.

Main subjects taught in the course

(see also last pages of flyer for the detailed program)

- Particle technology & Engineering basics relevant for powder flow
- Powder flow properties, design principles
- Pneumatic conveying—dilute/dense phase
- Powder feeding
- Powder storage
- Particle enlargement, dry/wet granulation
- Particle size reduction, Milling and micronisation
- Powder blending and segregation issues
- Mechanical properties of particles
- Case stories from the food and biotech industry



Target group

The course addresses technicians as well as product and process engineers working in the chemical, pharmaceutical, biotech and/or food industry with manufacture or development of powder products.

Form

The course runs for three consecutive days with alternating presentations, exercises and plenum discussions. The course is held in English.

Social event

On the afternoon of the first day the participants are invited on a one-hour guided harbour tour followed by dinner in the colourful 17th century waterfront of Nyhavn in the heart of Copenhagen.

Registration and further information: Please see the next pages

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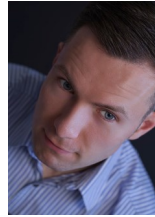
Teachers

Joseph Marinelli, B.S. Mechanical Engineering



- President and Consultant with Solids Handling Technologies
- Powder testing and handling systems design
- Lectures at University of Wisconsin, at several industry exhibitions and columnist ("Powder Perspectives") for www.powderbulksolids.com. Provides in-house seminars on powder handling
- Contact: joe@solidshandlingtech.com

Peter Dybdahl Hede, M.Sc. (Chem. Eng.), Ph.D.



- Science Manager in industrial particle technology
- Speciality in granulation processes
- Teaching experience from The Danish Society of Engineers, Technical University of Denmark and numerous service training courses in particle technology
- Co-founder of Seydlitz United Consultants. Provides in-house seminars on powder technology and consultancy
- Contact: PTHD@seydlitz.dk

Venue

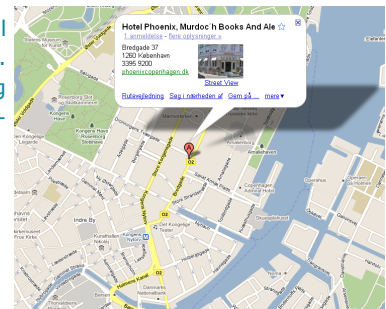


Hotel Phoenix Copenhagen is a 4-star deluxe hotel housed in one of Copenhagen's historic buildings. Situated in central Copenhagen, near Amalienborg Palace, just a few metres' walk from Nyhavn, Kongens Nytorv, Strøget and other sights.

Address: **Bredgade 37, DK-1260 Copenhagen K, Denmark**

Telephone: **+45 33 95 95 00**

Booking & service: bookphoenix@arp-hansen.dk



Fee

The course fee is payable in advance and includes course materials, HP calculators, coffee & refreshments, lunch all three days as well as canal cruise tour and dinner on the first afternoon.

Per delegate EUR 1935,- plus VAT. VAT is reclaimable.

Overnight stay at the delegates own expense can be arranged at the course venue or elsewhere nearby. Please contact Hotel Phoenix Copenhagen at **+45 33 95 95 00** or bookphoenix@arp-hansen.dk.

Kindly note that central Copenhagen is very popular in spring time and that Copenhagen hotels may be fully booked well in advance.

Registration

Binding registration at www.powderinfonews.com under "Courses" no later than 31st of March 2017. In case of any questions please contact info@seydlitz.dk or phone **+45 29 49 30 40**.

The course may be subject to cancellation in case of too few participants

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Course contents

Day 1:	Subject
10.00 - 10.15	<u>Course introduction</u>
10.15 - 11.30	<u>Particle technology basics</u> Particle size and particle shapes, measurement of particle shape and size, particle size distributions Calculation exercise
11.30 - 12.00	<u>Particle technology basics</u> Influence of particle size on different powder product properties
12.00 - 13.00	Lunch
13.00 - 16.00	<u>Pneumatic conveying</u> Engineering fundamentals: Single and multiple particles in fluids Stokes and Newton's laws Fluidisation, Minimum fluidisation velocity, terminal velocity, Geldart Chart Dense phase transport - principle and equipment Dilute phase transport - principle and equipment Scaling requirements: Conveying distance, Pipeline bends Determination of conveying characteristics Erosive wear and product degradation
18.30 - 21.30	Course dinner in central Copenhagen
Day 2:	Subject
9.00 – 10.30	<u>Introduction to powder flow</u> Flow properties, flow patterns and principles, Typical flow problems
10.30 – 12.00	<u>Flow properties and measurement of powder flow</u> Angle of repose, the Jenike shear cell, Mohr's circle etc.
12.00 – 13.00	Lunch
13.00 – 13.45	<u>Mechanical properties of particles</u> Strength of dry and semi-dry particles, measurement of particle strength and equipment
13.45 – 15.00	<u>Design principles for reliable powder flow</u> Principles & Equipment, flow agents etc.
15.00 – 16.00	<u>Design examples</u> Hopper designs, bin/silo designs

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Course contents—continued

Day 3:	Subject
9.00 – 11.00	<u>Case examples and experience with powder flow measurements in different industries</u> Presented by: freemantechology
11.00 – 12.00	<u>Powder feeding</u> Principles & Equipment: Volumetric feeders, mass flow auger feeders, gravimetric feeders, forced feeders, big bag handling
12.00 – 13.00	Lunch
13.00 – 13.30	<u>Particle size reduction</u> Principles & Equipment: Milling, jet milling, micronisation,
13.30 – 14.00	<u>Particle enlargement</u> Principles & Equipment: Dry and wet granulation
14.30 – 15.00	<u>Particle blending and segregation issues</u> Principles & Equipment: Powder blending and design of powder blending equipment, convective, shear and diffusive blenders
15.00 – 15.45	<u>Case example from the bulk chemical industry</u>
15.45 – 16.00	Final remarks, Course evaluation

