

NEW

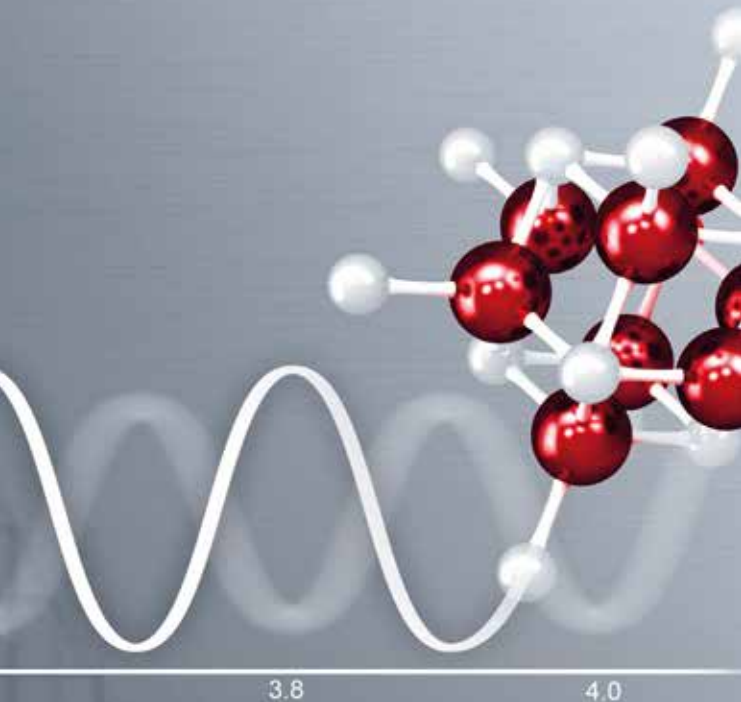
TTC TECHNOLOGY TRAINING CENTER

Workshop:

APPtec: POWDER SYNTHESIS

New technologies in high performance materials

29 November – 1 December 2016



WHY PARTICIPATE ?

The increasing worldwide demand for improved functionalities and increased service life of components and devices constantly creates new challenges for powder materials and related substance development across the entire value-added chain.

This workshop will explain the basic processing principles for powder synthesis with the brand-new method of spray pyrolysis – the APPtec. APPtec stands for Advanced Powder Process Technology and allows for controlling product properties of new kinds of powders through specific settings that impact or change the particle structure, particle composition or particle surface properties.

APPtec is especially suited to produce ultra-fine powders in nano or sub-micro range directly from solutions and suspensions and to perform single stage drying and calcination or sintering of moist powders.

Summarising, the novel APPtec-method allows for custom-tailoring of industrial powders for a wide range of applications and with great economic potential, including a clear perspective to also expand into new application fields.

With this newly designed workshop we introduce this highly innovative topic to our attendees, combining high level expertise from industry and academics with practical demonstrations in the lab including Glatt's own knowledge base.

WHO MAY ATTEND?

We kindly invite all interested employees from chemical and related industries and academic institutions, who are interested in gaining know-how and also practical insight into powder synthesis or powder treatment.

Typically, staff from product development and research, quality and technical operations will get most out of the workshop.

PROGRAM

TUESDAY, 29 NOVEMBER 2016

13:00 Snack buffet and LogIn (conference room)

13:45 Introduction. **Michael Jacob**

14:00 **Powder synthesis and powder coating options - a generic overview.** Systematic overview on processing options for powder synthesis and coating. Explaining the backgrounds in material science. **Isabel Kinski**

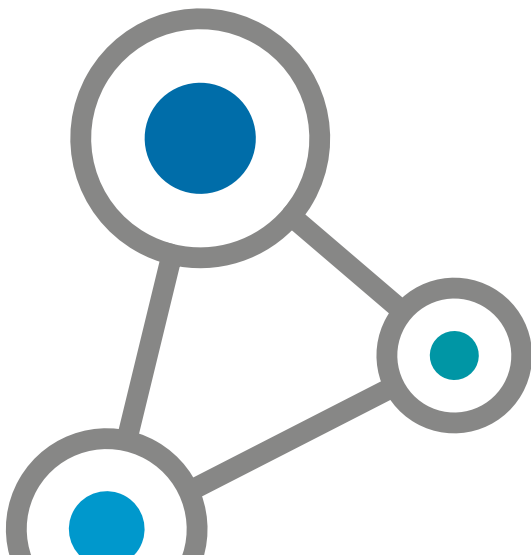
15:15 **Coffee break**

15:45 **Powder synthesis and thermal powder treatment - APPtec.** Explaining the basic processing principles for powder synthesis. Powder formation options will be introduced. Innovation approaches like core-shell or synthesis of doped materials will be explained in detail. Additional downstream processing options like dispersion or granulation will be discussed. **Lars Leidolph**

16:30 **Processing of powders - Particle engineering options for value-added product forms.** Particle enlargement principles using fluidized and spouted bed options like agglomeration and spray granulation will be introduced as well as spray coating options to customize particle functionality. Discussing the differences of batch and continuous processing. Outlining the advantages and benefits of each setup in respect to installation, operation and product properties. **Michael Jacob**

17:00 **Transfer to hotel**

19:30 **Workshop dinner**



WEDNESDAY, 30 NOVEMBER 2016

- 09:00 **Combustion instabilities – basic thermodynamics.**
Introduction to desired or undesired instabilities in burner systems. Evaluation and parameter analysis of flame and pressure oscillations. **Horst Büchner**
- 10:00 **Drying of single droplets.** Heat and mass transfer processes between single liquid droplets and surrounding gases will be discussed including fundamentals of single droplet drying. **Evangelos Tsotsas**
- 10:30 **Thermal processing of powders in stationary and pulsing gas flows.** Introduction to pulse combustion drying. Intensification of powder treatment processes by using pulsing (turbulent, oscillating) instead of stationary and partially laminar gas flows. **Evangelos Tsotsas**
- 11:00 **Coffee break**
- 11:30 **Characterisation of particle systems - the physical view.**
Physical characterisation of particle systems. Analysing particle size and shape by sieving, laser and optical approach. Determining the physical properties of bulk material such as dynamic vapor sorption (DVS), moisture and density. **Michael Jacob**
- 12:15 **Characterisation of particle systems - the chemical view.**
Chemical and mineralogical characterisation of particle systems. Analysing powder and particle composition as well as crystal structure. The complex evaluation of innovative materials will be discussed. **Lars Leidolph**
- 13:00 **Lunch**
- **Demonstration of processing options in the Technology Center.**
- 14:15 **Powder synthesis - APPtec.**
Explaining different configurations of the brand-new proAPP 500 pilot plant. **Lars Leidolph**
- 15:15 **Powder enlargement - fluidized bed systems.**
Fluidized and spouted bed systems for granulation and coating. Explanation of available options in laboratory and pilot scale. **Michael Jacob**
- 16:15 **Liquid preparation - preparation of slurries, suspensions and dispersions.** Explaining available options for liquid raw material preparation for powder synthesis and granulation. **Thomas Jähnert**
- 17:00 **Transfer to hotel**
- 18:00 **City Tour and Workshop Dinner**

THURSDAY, 1 DECEMBER 2016

→ **Analytics - practical measurement of material properties.**

09:00 **Physical analysis.**

Particle size and shape analysis. Demonstration of different measurement principles. **Michael Jacob**

09:20 **Chemical and mineralogical analysis.**

Chemical powder composition and structural analysis.

Lars Leidolph

09:40 **Powder synthesis – from liquid to powder / part I.**

Continuous powder synthesis using APPtec. Demonstration of process principle, start-up and parameter adjustment.

Lars Leidolph

10:00 **Coffee break**

10:30 **Powder synthesis – from liquid to powder / part II.**

Lars Leidolph

11:00 **Fluidized bed agglomeration - from powder to porous granules.** Batch and continuous fluidized bed agglomeration processes. Studying agglomeration processes in a lab scale system (practical demonstration). Comparing batch versus continuous processing. **Michael Jacob**

11:30 **Fluidized bed spray granulation - from suspensions/slurries to compact granules.** Continuous fluidized bed spray granulation processes. Studying spray granulation processes in a lab scale system (practical demonstration).

Thomas Jähnert

→ **Quality Assessment**

12:00 **Conclusions, feedback and services provided by Glatt for particle engineering.** Discussing the results of the various processes demonstrated during the workshop and comparing the outcomes. **Michael Jacob**

12:30 Summary and Snack-Buffer

13:00 Transfer to Station or Hotel

SPEAKERS

Dr. Isabel Kinski	Fraunhofer Institut Dresden , Germany
Prof. Horst Büchner	Universität Karlsruhe, Germany
Prof. Evangelos Tsotsas	Otto von Guericke Universität Magdeburg, Germany
Dr. Lars Leidolph	Glatt Ingenieurtechnik GmbH, Germany
Dr. Michael Jacob	Glatt Ingenieurtechnik GmbH, Germany
Thomas Jähnert	Glatt Ingenieurtechnik GmbH, Germany

MODERATION

Dr. Michael Jacob, Glatt Ingenieurtechnik GmbH, Germany

DETAILS

- >> The participation fee is € 1490,- (exclusive of VAT).
- >> This fee includes participation, accompanying course notes, daytime catering and dinner. Any other expenses are to be borne by the attendee.
- >> Free attendance granted to a limited number of students.
- >> Participation is limited. Registrations will be confirmed on a first come first serve basis.
- >> Courses taking place in Germany are subject to Value Added Tax (VAT).
- >> Each participant will receive a certificate of attendance at the end of the course.
- >> **Registration deadline: 13 October 2016**

LOCATION

Glatt Ingenieurtechnik GmbH
Nordstrasse 12
99427 Weimar, Deutschland

ORGANIZATON

TTC - Technology Training Center

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For further information or online registration please visit us on

www.ttc-binzen.de

REGISTRATION

Workshop:

APPtec: POWDER SYNTHESIS

29 NOVEMBER – 1 DECEMBER 2016

Name

Company

Dept.

Function

Address

Phone

Fax

E-mail

Yes, I want to receive information about future TTC workshops.

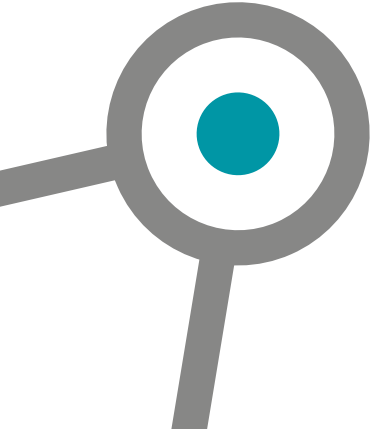
Signature

Accommodation required from

Check-in day:

Check-out day: _____ = _____ nights

(Approx. 124,00 €/night incl. breakfast)



Technology Training Center

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