2nd International Hosokawa Powder Technology Symposium
Free Educational Event - October 4th, 2017 – Summit, NJ

Challenges & Opportunities in Particle Characterization & Processing

The development of particle processing technology is closely related to the new economy, which made use of more high-tech products towards the beginning of the 21st century. Applying ultrafine powders and nanoparticles to create new materials has caught the imaginations of researchers around the world. Although particle processing technology has gained significant progress in recent years, learning to use the processing technologies via particle characterization to achieve new product functionalities while meeting with the environmental and safety requirements is still challenging, but full of opportunities.

The Hosokawa Powder Technology Symposium deals with these technologies, future trends and offers academic/industrial presentations by well-known experts with the opportunity to get acquainted with other particle/powder processing professionals. The Symposium will be hosted at the Hosokawa Micron Powder Systems in Summit, New Jersey on October 4, 2017 from 10:00 AM to 3:00 PM.

Symposium Agenda

- **Leveraging Particle and Nano Bio Technologies for Product and Process Innovations**
  Dr. Brij M. Moudgil - Center for Particulate and Surfactant Systems (CPaSS), University of Florida

- **Size Reduction Technologies for Efficient Powder Processing Systems**
  Mr. Bill Brown – Hosokawa Micron Powder Systems

- **Laboratory & Process Equipment Exhibition**
  Hosokawa Micron Powder Systems

- **Particle Shape Analysis – Sometimes It's Very Important**
  Dr. Raymond S. Farinato - Solvay Technology Solutions

- **Particle Technology for Dry Powder Inhalers**
  Dr. Anthony J. Hickey - RTI International, Research Triangle Park

The Symposium was originally started by the Hosokawa Micron Corporation in 1968 to promote powder science and technology, which was closely related to the processing of numerous kinds of materials, from daily commodities to advanced functional materials.

The first International Hosokawa Powder Technology Symposium was held in Germany in 2014 as part of a special event for the 20th anniversary of the establishment of the Hosokawa Powder Technology Foundation. We are excited to announce that the second symposium will be held in New Jersey this year. For the Symposium, specialists in the area are invited as lecturers from both the academic and industrial fields. Various topics concerning powder science and technology will be discussed during the lectures.

Check-in opens at 9:00 AM with a light breakfast and presentations start at 10:00 AM. Lunch will be included and the presentations conclude at 3:00 PM. Although the event is free to attend, registration is required. Register early – only 150 tickets are available.

Hosokawa Powder Technology Foundation
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Date: June 2, 2017

Dear Sirs:

Second International Hosokawa Powder Technology Symposium

It is with our great pleasure to invite you to attend the second International Hosokawa Powder Technology Symposium to be held at Hosokawa Micron International Inc. in Summit, New Jersey on October 4, 2017. It is being organized by Hosokawa Powder Technology Foundation with the support of Hosokawa Micron International Inc. In the past, our Foundation has annually held the Symposium on Powder Technology in Japan.

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The first International Hosokawa Powder Technology Symposium was held in Germany in 2014 as part of a special event for the 20th anniversary of the establishment of the Foundation. For the Symposium, specialists in the area are invited as lecturers from the academic as well as industrial fields. Various topics concerning the powder science and technology will be discussed during the lectures.

I hope to see you at the Symposium and take advantage of all the opportunities this Symposium has to offer to you and your business's future growth.

Yours sincerely,

Yoshio Hosokawa
President
Hosokawa Powder Technology Foundation

Seminar Agenda

- 10:00 AM – Welcome Address
- 10:15 AM – “Leveraging Particle & Nano Bio Technologies for Product & Process Innovations”
- 11:00 AM – Coffee Break
- 11:15 AM – “Size Reduction Technologies”
- 12:00 Noon – Lunch & Laboratory/Process Equipment Exhibit
- 1:00 PM – “Particle Shape Analysis – Sometimes It’s Very Important”
- 1:45 PM – Coffee Break
- 2:00 PM – “Particle Technology for Dry Powder Inhalers”
- 2:45 PM – Closing Remarks

Leveraging Particle and Nano Bio Technologies for Product and Process Innovations

Dr. Brij M. Moudgil - Center for Particulate and Surfactant Sysytems (CPaSS)

Conventional particle processing techniques have contributed significantly to particles and product development efforts over the years. Industrial practitioners and university researchers continue to make progress in achieving new functionalities especially with greener reagent schemes. On the other hand, adapting/hybridizing new processing technologies can produce a quantum leap in the types, quality, and economics of the industrial particle products and processes. For example, nanotechnology derived concepts may be used in producing value added products from existing industrial minerals or waste particle streams.

In this regard, researchers at the Center for Particulate and Surfactant Systems (CPaSS) at the University of Florida have been investigating technologies that can lead to the development of functionalities that can lead to new products/processes. Specific efforts are being made to cross fertilize products and process innovations across a spectrum of industries - from mining to microelectronics to bio technologies. In this presentation, select project developments will be discussed, and challenges and opportunities for developing greener and more sustainable industrial particle processes and products will be outlined.

Dr. Brij M. Moudgil

Dr. Brij M. Moudgil is a Distinguished Professor of Materials Science and Engineering, Director of the Particle Engineering Research Center (PERC), and the Center for Particulate and Surfactant Systems (CPaSS – NSF I/UCRC) at the University of Florida, Gainesville, FL. Dr. Moudgil also serves as the Director of the UF Mineral Resources Research Center. He received B.E. (Metallurgy) degree from the Indian Institute of Science (IISc), Bangalore, and M.S. and Eng.Sc.D. Degrees in Mineral Engineering from the Henry Krumb School of Mines, Columbia University, New York, NY.

He has published more than 300 technical papers and has presented over 450 papers at scientific meetings and seminars including 100 invited/plenary talks. He has been awarded 23 patents, and has edited 10 books. His research and professional leadership accomplishments are recognized by several major awards including his election to the National Academy of Engineering (NAE), U.S.A

His current research interests include nano engineered particulate systems for enhanced performance in advanced materials and minerals, nano and bio technologies, corrosion inhibition, antiscaling agents, removal of microbes from surfaces, nanotoxicity, and greener reagents and particle technologies.

Brij M. Moudgil
Center for Particulate and Surfactant Sysytems (CPaSS)
Department of Materials Science & Engineering
University of Florida, Gainesville, Florida

Size Reduction Technologies for Efficient Powder Processing Systems

Bill Brown – Hosokawa Micron Powder Systems

Many process engineers know the material characteristics they want but are unfamiliar with the specific size-reduction technology they may require. As products and technologies become more advanced in today's markets, the need for materials with specific properties for special applications becomes more important. With the broad range of requirements, it's not practical to think that one type of milling technology will satisfy all needs. This presentation will give you an overview of five product-specific milling technologies used in many industrial applications today.

- Hammer Mills
- Pin and Knife Mills
- Air Classifying Mills
- Fluidized Bed & Spiral Jet Mills
- Ball & Media Mills

The most important aspect of selecting a size-reduction technology is to know some basic information about the product you want to process: feed particle size material characteristics, required particle size, and desired particle size distribution. It is important to note that based on product characteristics only certain milling technologies may be suitable for a given application. Starting a project understanding these basic requirements will result in an economical and trouble-free milling system solution.

There are four basic techniques utilized in size-reduction of dry powders. They include impact, shear, attrition and compression forces. In some cases a combination of these may be found in any single mill type. Impact and attrition size-reduction methods include air classifying mills, pin mills, hammer mills and jet mills. Shear, impact and compression methods are used in media or ball mills. We chose to discuss these five types of milling technologies because they cover more than 90-percent of size-reduction applications in major chemical, food, pharmaceutical, cosmetics and mineral industries.

William "Bill" Brown

William (Bill) Brown is the Division Manager of the Chemicals & Minerals Group of Hosokawa Micron Powder Systems, the North American division of the Hosokawa Micron Group, responsible for sales and engineering functions. Hosokawa Micron is the global leading provider of powder and particle processing solutions for size reduction, classification, mixing and drying applications. Bill has worked in the powder processing industry for 22 years, serving many roles in the Hosokawa Micron Group. Bill holds a BS degree in Mechanical Engineering from Rutgers University and MBA from University of Richmond.

William "Bill" Brown
Chemical & Mineral Division Manager
Hosokawa Micron Powder Systems
Summit, New Jersey

Particle Shape Analysis – Sometimes It's Very Important

Raymond S. Farinato - Solvay Technology Solutions

The importance of particle shape on the material properties of suspensions is especially evident at particle concentrations where particle-particle interactions and networking begins to become important. Critical particle concentrations where these effects manifest depend on particle shape distribution as well as particle size distribution. Analysis of shape distributions then becomes an important tool for deconvoluting the effects of shape and size on suspension behavior. Two examples, one based on suspension rheology in confined geometries and one based on filtration, are used to illustrate these issues.

Raymond S. Farinato

Ray Farinato is currently a Senior Research Fellow in the Technology Solutions business unit of Solvay in Stamford, Connecticut, USA. He began his industrial career in 1981 at American Cyanamid, which became Cytec Industries in 1993, then Solvay's Technology Solutions business unit in 2015. He also spent four years (2006-2010) with the Oilfield Chemicals group at Kemira.

Ray received a B.S. in Chemistry from Rensselaer Polytechnic Institute and a Ph.D. in Physical Chemistry from the University of Massachusetts – Amherst. He was a post doc in biophysics at the University of California at Berkeley, and consulted at the Lawrence Berkeley Labs on radiation damage to DNA. He also spent some time as an Assistant Professor at the University of Massachusetts, as a Senior Engineer at the Nearshore Environment Research Center in Tokyo, Japan and, since 2005, as an adjunct professor at Columbia University where he continues to co-teach a graduate level course on Advanced Surface & Colloid Chemistry. Over his career he has worked predominantly in the areas of water soluble polymers, colloid chemistry, and adhesion science, with an emphasis on applications in the waste management, oilfield and mineral processing industries. He is a founding member of the International Symposia on Polyelectrolytes, and an editor of the Encyclopedia of Surface and Colloid Science.

Raymond S Ferinato
Senior Research Fellow
Solvay Technology Solutions, Stamford, Connecticut

Particle Technology for Dry Powder Inhalers

Anthony J. Hickey - RTI International

The performance of dry powder inhalers (DPIs) depends on the formulation and its interaction with the device. DPIs have been used for 50 years in the treatment of asthma and more recently for the treatment of chronic obstructive lung disease. These disease states require low doses and it is sufficient to use micronized drug in blends with lactose, a large particle carrier. Micronized drug formulations require a thorough understanding of the forces of interaction and methods of overcoming them. More recently high dose antimicrobial therapies for lung infections have been developed which require that readily dispersible drug particles are prepared notably by spray drying. The type of inhaler employed and its suitability for developing world applications in terms of simplicity and low cost must be considered. Since a range of inhalers are available for each formulation it would be helpful to adopt a standardized method for evaluating the formulation independent of the inhaler to define desirable operating characteristics, e.g. pressure drop across the device, which could be incorporated into the design specification.

Anthony J. Hickey

Dr. Hickey is Distinguished RTI Fellow, at the Research Triangle Institute, Emeritus Professor of Molecular Pharmaceutics of the Eshelman School of Pharmacy (2010-present, Professor 1993-2010), and Adjunct Professor Biomedical Engineering in the School of Medicine, at the University of North Carolina at Chapel Hill. He obtained Ph.D. (1984) and D.Sc. (2003) degrees in pharmaceutical sciences from Aston University, Birmingham, UK. Following postdoctoral positions, at the University of Kentucky (1984-1988) Dr. Hickey joined the faculty at the University of Illinois at Chicago (1988-1993). In 1990 he received the AAPS Young Investigator Award in Pharmaceutics and Pharmaceutical Technology. He is a Fellow of the Royal Society of Biology (2000), the American Association of Pharmaceutical Scientists (2003) and the American Association for the Advancement of Science (2005). He received the Research Achievement Award of the Particulate Presentations and Design Division of the Powder Technology Society of Japan (2012), the Distinguished Scientist Award of the American Association of Indian Pharmaceutical Scientists (2013) and the David W Grant Award in Physical Pharmacy of the American Association of Pharmaceutical Scientists (2015). He has published numerous papers and chapters in the pharmaceutical and biomedical literature, one of which received the AAPS Meritorious Manuscript Award in 2001. He has edited five texts on pharmaceutical inhalation aerosols and co-authored three others on ‘Pharmaceutical Process Engineering’, pharmaceutical particulate science and ‘Pharmaco-complexity’. He is founder (1997, and formerly President and CEO, 1997-2013) of Cirrus Pharmaceuticals, Inc., which was acquired by Kemwell Pharma in 2013; founder (2001, and formerly CSO, 2002-2007) of Oriel Therapeutics, Inc, which was acquired by Sandoz in 2010 and founder and CEO of Astartein, Inc. (2013-present); member of the Pharmaceutical Dosage Forms Expert Committee of the United States Pharmacopeia (USP, 2010–2015, Chair of the sub-committee on Aerosols) and formerly Chair of the Aerosols Expert Committee of the USP (2005-2010). Dr. Hickey conducts a multidisciplinary research program in the field of pulmonary drug and vaccine delivery for treatment and prevention of a variety of diseases.

Anthony J. Hickey
Research Fellow
RTI International, Research Triangle Park, North Carolina