



PTF *Newsletter*

Particle Technology Forum

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Vol. 15 No. 2

Spring 2010

The PTF is an international and interdisciplinary forum that promotes information exchange, scholarship, research, and education in the field of particle technology – that branch of science and engineering dealing with the production, handling, modification, and use of a wide variety of particulate materials, both wet or dry, in sizes ranging from nanometers to centimeters. Particle technology spans a range of industries to include chemical, petrochemical, agricultural, food, pharmaceuticals, mineral processing, advanced materials, energy, and the environment. See www.erpt.org/ptf for more information.

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2010 AIChE Annual Meeting



November 7-12, 2010

Salt Palace Convention Center

Salt Lake City, Utah

Abstract Deadline: May 3, 2010

URL: <http://www.aiche.org/Conferences/AnnualMeeting/index.aspx>

Advanced On-Line Analytical and Optimization Tools in Pilot Plants	David C. Attridge
Advances and Case Studies in Crystallization and Post-Crystallization Processing	Seth Huggins and Xing Wang
Agglomeration and Granulation Processes	Gabriel I. Tardos, Paul Mort and Padma J. Narayan
Aggregate and Agglomerate Nanoparticle Formation Dynamics	Gregory Beaucage and Gary Liu
Applications of Continuous Processing in Manufacture of Pharmaceuticals	Nancy E. Sever and Ecevit Bilgili
Applications of Engineered Structured Particulates	Philip Bell and Wai Kiong Ng
Applications of Fluidization	Manuk Colakyan and Isaac K. Gamwo
Characterization and Measurement in Powder Processing	Clive E. Davies and Marco Verwijs
Characterization of Engineered Particles and Nano-Structured Particles	Stephen L. Conway and Daniel Lepek
Characterization of Engineered Particulate Systems for Pharmaceutical Active Ingredient Delivery	Stephen P. Beaudoin and Ranjit Thakur
Circulating Fluidized Beds	Juray De Wilde and Allan Issangya
Comminution - Experiments, Theory & Modeling	Priscilla J. Hill and Matteo Strumendo
Dynamics and Modeling of Particles, Crystals and Agglomerate Formation	Jan Sefcik and Deliang Shi
Dynamics and Modeling of Particulate Systems I and II	Joerg Theuerkauf, James F. Gilchrist, Kimberly H. Henthorn and Deliang Shi
Engineered Composite Particulate Systems for Pharmaceutical Active Ingredient Delivery	Rajesh Dave and Christopher L. Burcham
Fluidization and Fluid-Particle Systems for Gasification and Biomass Utilization	Fanxing Li and J. Ruud Van Ommen
Fluidization and Fluid-Particle Systems for Pharmaceutical and Biomedical Applications	Kimberly H. Henthorn and Matteo Strumendo
Fluidization and Handling of Submicron and Nano Particles	Reza Mostofi and Jesse Zhu
Functional Nanoparticles and Nanocoatings On Particles - I	David King and Karsten Wegner
Functional Nanoparticles and Nanocoatings On Particles - II	David King and Karsten Wegner

News and Announcements

Fundamentals of Fluidization - I	L.S. Fan and Azita Ahmadzadeh
Fundamentals of Fluidization - II	Ah-Hyung Alissa Park and T. C. Ho
Gas Phase Synthesis of Nanoparticles - I	Robert N. Grass and George Fotou
Gas Phase Synthesis of Nanoparticles - II	Robert N. Grass and George Fotou
Gas/Solid Mixing and Heat/Mass Transfers in Fluidized Beds	Hadjira Iddir and J. Ruud Van Ommen
Health and Environmental Effect of Nanoparticles	Evangelos K. Athanassiou and Amit Limaye
Industrial Application of Computational and Numerical Approaches to Particle Flow	Ray A. Cocco and Ken Williams
Industrial Solid-Liquid Separation Processes	Karl Jacob, G. G. Chase and Seyi A. Oduyungbo
Magnetic Particle Synthesis and Properties	Robert N. Grass and Evangelos K. Athanassiou
Measurement, Monitoring and Characterization Methods for Particulate Systems Research in Powder and Granular Mixing	Fernando Muzzio
Mixing and Segregation of Particulates	Steven W. Meier and Bruce D. Hook Sr.
Nano-Energetic Materials	Jan Puszynski and Edward Dreizin
Nanoparticle, Nanotechnology and Interfacial Phenomena Using Compressible or Supercritical Fluids	M. P. Srinivasan and Christopher L. Kitchens
Nanoparticles by Mechanical Breakage and Size Reduction	David King and Gregory Beaucage
Nanostructured Particles for Catalysis	J. Ruud Van Ommen and Kishori T. Deshpande
Nanowires III: Bulk Production, Dispersion and Large-Scale Assembly	R. Mohan Sankaran and Wendelin J. Stark
Particle Formation and Crystallization Processes From Liquids, Slurries, and Emulsions	Fang Wang and Ranjit Thakur
Particle Formation in Supercritical Fluids for Food and Pharmaceuticals	Rajesh Dave and Defne Kayrak-Talay
Particle Technology Forum Awards Lectures	Ray A. Cocco
Population Balance Modeling for Particle Formation Processes: Nucleation, Aggregation and Breakage Kernels	Edward P. Gatzke and Rohit Ramachandran
Poster Session: Particle Technology Forum	Manuk Colakyan and Ray A. Cocco
Processing and Safety	Dilhan Kalyon and Suzanne Prickett
Research in Power and Granular Mixing	Kenneth J. Ford and Gary Liu
Research On Multi-Scale CFD for Particle Mixing and Suspension	Richard V. Calabrese and James F. Gilchrist
Solids Handling and Processing	Kenneth J. Ford and Clive E. Davies
Solids Handling Considerations and Challenges in Pilot and Demonstration Plants	Karl Jacob and Bruce D. Hook Sr.
Thermophysical Properties	Veera Boddu and Paul Redner

Call for PTF Nominations



BEST PH.D. IN PARTICLE TECHNOLOGY AWARD

Winner: 2009 – Luis F. Hakim

Sponsor: Procter and Gamble

Description: This award recognizes an outstanding dissertation by an individual who has earned a doctoral degree. The dissertation can be in any discipline in the physical, biomedical or engineering sciences, but must be in particle science and engineering. The award includes a plaque and \$500 USD honorarium. Selection criteria include: (i) an outstanding original dissertation with relevance to particle technology, and (ii) the candidate must have received a doctoral degree within the last three calendar years prior to the year the award is given.

Deadline: June 9, 2010. Nominations can be made by any member of the Particle Technology Forum. Nominations should include: (1) A letter of nomination. The letter of nomination should include a critical review stating the value of the dissertation in terms of its originality, significance, and potential applications in the field of particle science and technology. The supporting letters may focus on any of these attributes. (2) An extended abstract of up to six pages including a list of refereed publications resulting directly from that dissertation, (3) No more than three supporting letters, all of which must be from institutions outside the one granting the dissertation, and (4) At least one letter from industry. Nominations should be sent to the Particle Technology Forum Awards Committee Chair: Dr. Ray Cocco, Particulate Solid Research, Inc. (PSRI), 4201 W 36th Street, Suite 200, Chicago, IL 60632, Phone: (773) 523 7227; Email: ray.cocco@psrichicago.com (preferred method of correspondence).

Award: A plaque and a \$500 honorarium.

Presentation: The award is presented at a PTF-sponsored event during the AIChE Annual Meeting.

Past Recipients: 2008 Janine Galvin	2007 Mahesh Iyer
2006 Griselda Bonilla	2005 Stephen L. Conway
2004 Ecevit Bilgili	2003 Stephan Tallon
2002 Himanshu Gupta	2000 H. Shinto
1999 R. Agnihotri	1998 Pat Spicer
1997 Christine M. Hrenya	

PARTICLE TECHNOLOGY FORUM AWARD

Winner(s): 2009 – Ted Knowlton

Sponsor(s): E.I. duPont de Nemours & Company

Description: This award recognizes a forum member's significant scientific/technical contributions to the field of particle technology, as well as leadership in promoting scholarship, research, development, or education in this field. Selection criteria include: (1) An outstanding contributor to the field of particle technology, (2) The awardee is invited to deliver a paper at the AIChE Annual Meeting, (3) The awardee is also required to submit a written manuscript, and (4) A member of the Particle Technology Forum,

Deadline: June 9, 2010. Nominations can be made by any member of the Particle Technology Forum. Nominations should include (1) A letter of nomination stating how the nominee contributed to the field of particle technology in terms of scholarship, research, development and education, and (2) No more than three supporting letters. Send nominations to the Particle Technology Forum Awards Committee Chair: Dr. Ray Cocco, Particulate Solid Research, Inc., 4201 West 36th Street, Suite 200, Chicago, IL 60632; Phone: 773-523-7227; Fax: 773-299-1007; E-mail: ray.cocco@psrichicago.com (preferred method of correspondence).

Award: A plaque and \$1,000 honorarium.

Presentation: The award is presented at a PTF-sponsored event during the AIChE Annual Meeting.

Past Recipients: 2008 L. S. Fan	2007 L. T. Fan
2006 Doug Fuerstenau	2005 J. Schwedes
2004 George Klinzing	2003 Chi Tien
2002 Brian Kaye	2001 S. K. Friedlander
2000 Brian Scarlett	1998 Andrew W. Jenike
1997 Reg Davies	1996 K. Leschonski
1995 Robert Pfeffer	

LECTURESHIP AWARD IN FLUIDIZATION

Winner: 2009 – Martin Rhodes

Sponsor: Particulate Solid Research, Inc.

Description: This award recognizes an individual's outstanding scientific/technical research contributions with impact in the field of fluidization and fluid-particle flow systems. Selection criteria include: (1) An outstanding contribution advancing fluidization or fluid-particle flow systems, (2) The awardee is invited to deliver a paper at the AIChE Annual Meeting, (3) The awardee is also required to submit a written manuscript, and (4) Membership in the Particle Technology Forum or AIChE is not required.

Deadline: June 9, 2010. Nominations can be made by any member of the Particle Technology Forum. Nominations should include (1) A letter of nomination stating how the nominee contributed to the field of fluidization and fluid-particle flow systems, and (2) No more than three supporting letters with at least one letter from industry. Nominations should be sent to Dr. Alissa Park, Columbia University, 918 SW Mudd Hall, 500 W 120th Street, Earth and Environmental Engineering, Mail Code: 4711, New York NY 10027; Email: ap2622@columbia.edu (preferred method of correspondence).

Award: A plaque and a \$1,000 honorarium.

Presentation: The award is presented at a Forum sponsored event during the AIChE Annual Meeting.

Past Recipients: 2008 Robert Pfeffer	2007 Jennifer Sinclair Curtis
2006 Yong Jin	2005 Shigekatsu Mori
2004 Ye Mon Chen	2003 Norman Epstein
2002 Dimitri Gidaspow	2001 M. Horio
2000 Wen Ching Yang	1999 Hamid Arastoopour
1998 Joachim Werther	1997 M. Kwauk

THOMAS BARON AWARD IN FLUID-PARTICLE SYSTEMS

Winner(s): 2009 – Alan Weimer

Sponsor(s): Shell Global Solutions, Inc.

Description: This award recognizes an individual's outstanding scientific/technical accomplishment which has made a significant impact in the field of fluid-particle systems or in a related field with potential for cross-fertilization. Selection criteria include: (1) An outstanding contribution advancing fluid-particle systems, or a related field, (2) The awardee is invited to deliver a Plenary Lecture at an AIChE Annual Meeting session, and (3) The awardee is also required to submit a written manuscript.

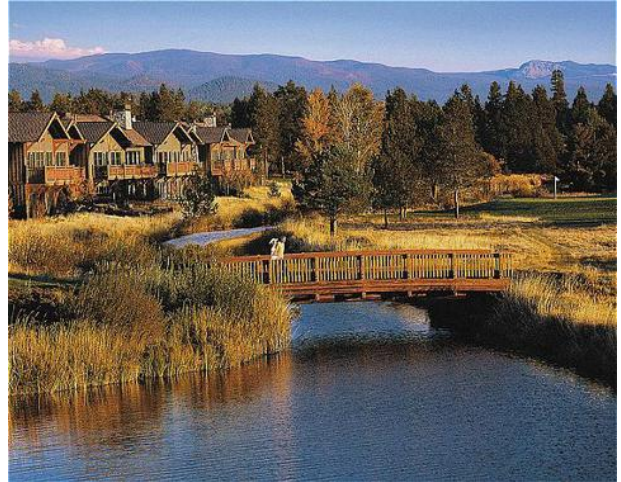
Deadline: June 9, 2010. Nominations can be made by any member of the Particle Technology Forum. Nominations should include (1) A letter of nomination stating how the nominee has made significant impact in the field of fluid-particle systems or a related field with potential for cross-fertilization, and (2) No more than three supporting letters. Nominations should be sent to Dr. Ray Cocco, Particulate Solid Research, Inc., 4201 West 36th Street, Suite 200, Chicago, IL 60632; Phone: 773-523-7227; Fax: 773-299-1007; E-mail: ray.cocco@psrichicago.com (preferred method of correspondence).

Award: A plaque and \$1,000.

Presentation: The award is presented at a PTF-sponsored event during the AIChE Annual Meeting.

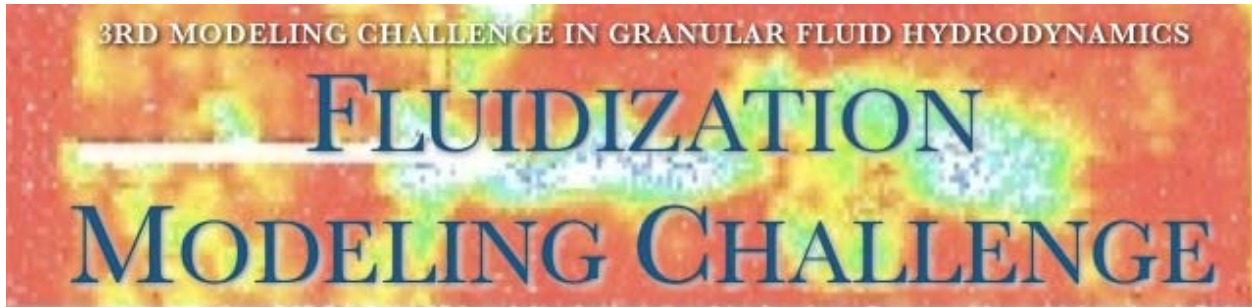
Past Recipients: 2008 Dilhan Kalyon	2007 John R. Grace
2006 Dimitri Gidaspow	2005 Sankaran Sundaresan
2004 Doraiswamy Ramkrishna	2003 Sotiris Pratsinis
2002 Darsh Wasan	2001 L. White
2000 Robert Pfeffer	1998 S. L. Soo
1997 R. C. Flagan	1996 D. D. Joseph
1995 John C. Chen	1994 L. Fan
1993 Roy Jackson	

CFB 10 – International Conference on Circulating Fluidized Beds and Fluidized Bed Technology

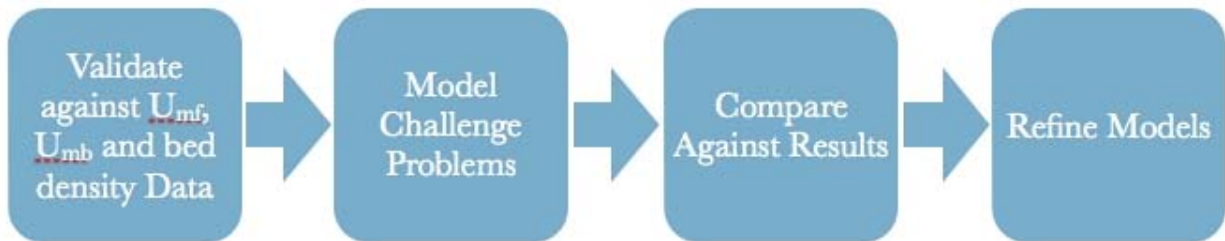


CFB-10 is the tenth conference in a series which started 1985 in Halifax/Canada. CFB-10 addresses both the fundamental and applied aspects of circulating fluidized beds and fluidized bed systems. A particular characteristic of this conference is the balanced participation of experts from industry and academia.

Chair: Dr. Ted Knowlton, PSRI
Dates: May 1-5, 2011
Location: Sunriver, Oregon, USA
URL: http://cfb10.org/CFB10/Welcome_4.html
Abstract Deadline: TBD



The NETL of the Department of Energy, in collaboration with PSRI, has generated a third Challenge Problem from data generated in NETL’s circulating fluidized bed and PSRI’s bubbling fluid bed. The results are to be presented at the Circulating Fluid Bed X to be held in Sun River Valley, Oregon, USA in May, 2011 (www.cfb10.org). You are hereby invited to predict the data with your hydrodynamic model. The third challenge problem will be designed to overcome the limitations of the first two challenge problems. Physical properties will include minimum fluidization and bubbling velocities and bed densities. The first step in model validation should include capturing the minimum fluidization and bubbling velocities and bed densities. Modelers will be asked to submit modeling results based on the experimental description alone, after which the data will be released and the modelers will have a second chance to provide modeling results. Both sets of results will be presented at CFB X. A description of the experimental unit used to obtain the hydrodynamic data, material parameters, and test conditions/parameters can be found at <http://www.mfix.org/challenge>.



A SYSTEMATIC APPROACH TO MODELING

Gas and particle properties will be provided including the entire particle size distribution. In addition, minimum fluidization and bubbling curves with bed density profiles will be available including a CAD of the unit in which these measurements were collected. Modelers will be able to validate against the known design and operating conditions with the results from a simple system before modeling the challenge problems. Thus, modelers will be able to “test” and “tune” their models on a known system before attempting to model the challenge problems.

After submission of the first modeling results for the challenge problems, modelers can refine their model against the data available on November 1, 2010. Modelers will then be allowed to submit their refined model results. Both the results from the initial and refined models will be published with explanations for any discrepancies. No additional entries will be considered after the release of the data on November 1, 2010. All submissions must be presented by October 30, 2010, before the release of the data. It is up to the modelers if they wish to submit a refined model after the data has been released.

HAVING ALL THE INFORMATION YOU NEED

It is up to the modelers that appropriate boundary conditions are used. Detailed CADs will be provided of all the units for the challenge problems including aeration ports, solid feeds, valves, bends and injectors. Additional information on the unit configurations will be available on request, if it is not already provided. The objective of this challenge problem is to provide the modeler with the information they need to make assumptions based on engineering judgment and not on limited design and operating parameters. Poor validation should not be due to poor boundary conditions.

LEAVING THE DATA

After the challenge problem, the problem statements and resulting data will remain available. This will allow model developers to have a “tested” set of data for years to come. We realize that our limitations are not the creativity of our model developers but the availability of data they need.

Questions should be addressed to Dr. Ray Cocco of PSRI at ray.cocco@psrichicago.com and Dr. Larry Shadle of NETL at lawrence.shadle@netl.doe.gov .

NSF Program Director Opening



Dear Colleague:

I would like to call your attention to a NSF Engineering program director position that is opening up in the late Summer of 2010 in the NSF CBET Engineering Division. The position is that of Program Director for the CBET program: *Particulates and Multiphase Flow*.

For more information go to:

<http://www.nsf.gov/pubs/2010/cbet10001/cbet10001.jsp?org=NSF>.

Since you have worked in this area, I thought that you might (1) be able to help us locate capable candidates for the position; and/or (2) be interested in applying for the position yourself.

If you are even tentatively interested in the position, please mail me your resume and cover letter showing how your background would qualify you for the position.

Please feel free to write me if you have any questions regarding the coming position opening. Also, feel free to call me: (703) 292-8370/8320.

This is an exciting time to be at NSF – and the work is very interesting.

Thank you very much for your consideration and possible help.

Robert M. Wellek PhD, rwellek@nsf.gov

* Deputy Director for Chemical, Bioengineering, Environmental, and Transport Systems (CBET) Division

* Program Director for Interfacial Processes and Thermodynamics

Poster and Paper Awards from the 2009 AIChE Annual Meeting



2009 Best Poster Awards

The last poster session was exceptional due to the high quality of the posters presented. The PTF would like to thank each speaker for their hard work and dedication. The judges for the poster awards were Clive Davies , Hugo Caram and Manuk Colakyan. Their services are greatly appreciated. This award is announced at the PTF dinner shortly after judging. Plaques are mailed one month afterwards.

First Place

Brenda Remy (Speaker), with Johannes G. Kinast and Benjamin Glasser, Rutgers University
“Granular Flow and Segregation in a Bladed Mixer”

Second Place

Michael O. John (Speaker), with Max L. Eggersdorfer and Sotiris E. Pratsinis, ETH Zurich
“Soft-Agglomerate Breakage by DEM Simulation”

Third Place

Melinda G. Hemingway (Speaker) and Ram B. GuptaI, Auburn University
“Hydrogel Nanoparticles by Inverse-Miniemulsion Polymerization and Supercritical CO2 Drying”

2009 Best Paper Awards

Best paper awards are given to each group in the PTF with selections based on the input of the session chair and co-chair and the Group chair and co-chair. The recipients of these awards are given a plaque at the next PTF Dinner in Salt Lake City where they will be provided with a free PTF Dinner voucher.

Group A

Arvind Ragendran (Speaker) with Taslima Khanam, Emmanouil Darakis, Vinay Kariwala and Anand K. Asundi, Nanyang Technological University
“Two and Three Dimensional Micro Particle Characterization Using Digital Holography”

Group D

Robert Büchel (Speaker) with Sortiris E. Pratsinis and Alfons Baiker, ETH Zurich
“Two-Nozzle Flame Synthesis of NOx Storage Reduction Catalysts”

Group E

Siri Chakka (Speaker) with Veera Boddu, Stephen W. Maloney and Reddy Damavarapu, US Army Engineer Research and Development Center
“Vapor Pressure and Melting Points of Select Munitions Compounds”

Snapshots from 2009 AIChE Annual Meeting



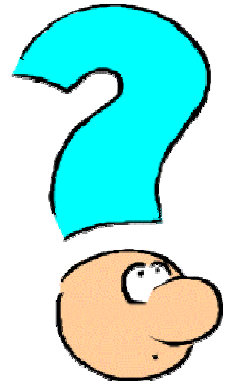
News and Announcements



News and Announcements



“Know Floe’s Korner”



Gas-Solid Cyclones

Shrikant Dhodapkar, The Dow Chemical Company, USA

George Klinzing, University of Pittsburgh, PA, USA

Lyn Bates, Ajax Equipment, UK

The earliest references of a cyclone design can be found in a patent literature dating back to 1886 when Orville Morse (Knicker-Bocker Company of Jackson - Michigan) filed several patents for a novel dust collector design. In the next 100 years or so, cyclones have proliferated; however, the essence of the design concept has largely remained unchanged. In this article, we intend to present a brief overview of the cyclone design concept along with some practical operational tips.

- 1) Cyclone designs can be classified into two major categories: Reverse-Flow and Straight Through (Uniflow). The reverse flow design consists of a tangential inlet into a cylindrical barrel. A cone is usually attached at the bottom. The tangential inlet results in the incoming dust-laden gas swirling in the cyclone body. This generates a centrifugal force which can be several hundred times the force of gravity. The Straight-Through or Uniflow Cyclones imposes a similar centrifugal force using guide vanes instead of a tangential entry. In both cases particles are forced to the wall. For the Reverse-Flow cyclones, the separated dust exits the bottom of the cone whereas the gas vortex further transitions from downward flowing outer vortex to an upward flowing inner vortex. A vertical tube, known as the vortex finder, guides the inner vortex as it exits the cyclone. In a Uniflow Cyclone, the separated particles are removed by a small amount of purge gas whereas the central core largely consists of cleaned gas stream. The gas flow does not change direction in uniflow cyclones.

Variations of conventional reverse-flow cyclone design:

- a) Inlet configurations: Tangential inlet (circular or slot), wrap around or involute shaped, helical with flat top, helical with profile top.
 - b) Cone and cylinder size: Different ratio of cone and cylinder heights, also affecting overall height of the cyclone.
 - c) Dust exit configuration: Disengagement hopper, inverted cone at the outlet or in disengagement hopper, straight pipe (dipleg), airlock.
 - d) Vortex finder design: length, shape (cylinder vs. cone), perforated design, with internal helix for pressure recovery, extent of penetration in the cyclone, segmentation.
 - e) Vortex breakers or dust hoppers: Devices above or below the cone exit to stabilize or break up the inner vortex in Reverse-Flow Cyclones.
- 2) The following factors must be taken into consideration while evaluating the performance characteristics of a cyclone:
 1. Overall collection efficiency (for specified incoming dust size distribution)
 2. Pressure drop (or energy consumption)

3. Sharpness of cut of the particle size distribution
 4. Attrition rate of product
 5. Erosive wear
 6. Turn down ability (gas flow)
 7. Coarse particle penetration; especially bouncy particles
 8. Propensity of blocking for dust outlet
 9. Dipleg termination (i.e., trickle valve, flapper valve, open, diverted, etc.)
- 3) While selecting a cyclone for a process application, the total cost of ownership must be considered. This includes -
10. Operating cost: pressure drop (energy)
 11. Performance across operating range: product loss or recovery
 12. Capital and installation cost: cyclone size and ancillary equipment size (e.g. air mover)
 13. Equipment life: wear and maintenance
- 4) The collection efficiency of a cyclone is characterized by its fractional or grade efficiency curve (see Figure 1). Fractional efficiency represents the collection efficiency for a given particle size. Stokes (or aerodynamic) equivalent diameter should preferably be used as the abscissa. To estimate the overall gravimetric collection efficiency (E) of a cyclone, one must include the particle size distribution of the incoming dust. Broad claims of cyclone efficiency (e.g. 99.9%) are meaningless unless the one specifies the particle size distribution of the incoming dust. Typically, cyclones are graded by their cut size which is the particle size where 50% collection efficiency is achieved.

$$E = \sum f_i (dp_i) \times w_i(dp_i)$$

f_i = fractional efficiency at particle size dp_i

w_i = weight fraction of dp_i fraction

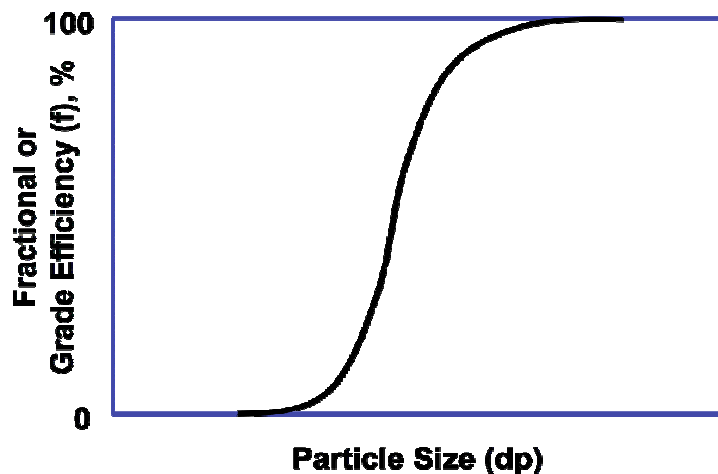


Figure 1. Typical performance curve of cyclone separator

- 5) Pressure drop across a cyclone can be attributed to contraction of gas upon entry into cyclone, solids acceleration loss, frictional loss within cyclone and in outlet duct, loss of angular momentum in inner and outer vortex, flow reversal loss and contraction losses into the vortex finder. The pressure drop across cyclone with zero loading (gas only) is typically higher than loaded cyclones (particle laden gas). The pressure drop will eventually increase at with further dust loadings. Pressure recovery is possible by installing vanes in the outlet duct.
- 6) Air leakage into a cyclone from the bottom (dust exit) will reduce its collection efficiency. This can be an issue even if the cyclone gas inlet and outlet are under positive pressure. A rotary airlock, loop seal, L-valve, trickle valve or flapper valve is recommended.
- 7) Re-entrainment of collected dust is a common problem. This can happen if the natural vortex penetrates through the bottom dust outlet (tornado effect) or if the material is allowed to accumulate at the bottom of the cone. Properly designed disengagement hopper, vertical pipe, dust hoppers, vortex breakers or an inverted cone below the dust outlet are common solutions to this problem.
- 8) Inlet and outlet (for Reverse-Flow Cyclones) gas velocities are the most significant operating parameters affecting cyclone performance. Typical inlet velocity ranges from 30 ft/s to 90 ft/s where as outlet gas velocities are typically higher at 40 to 150 ft/sec. Collection efficiency increases with increases in one or both of these gas velocities but so does the pressure drop, wear and particle attrition. There exists an upper limit on gas velocity beyond which the particles are re-entrained in the gas stream (similar to saltation velocity in horizontal pneumatic conveying).
- 9) It is a common practice to scale-up the performance characteristics of cyclones using data on smaller but geometrically identical cyclones. Two cyclones operating at the same Stokes number will have same efficiency as long as the Reynolds number and solids loading are approximately the same.
- 10) In a sufficiently long reverse flow cyclone, the outer vortex suddenly becomes significantly weak at a certain axial location signifies the end of the vortex. The length vortex measured from bottom of the vortex finder is called the *natural vortex length*. Knowledge of natural vortex length is essential to designing reliable cyclones. Further research effort is needed to better understand and quantify natural vortex length. The end of the vortex region can result in high wear. Plugging can occur below this region due to poor particle transport along the wall.

Acknowledgement: Thanks to Ray Cocco (PSRI) for his comments and suggestions.

Upcoming Conference Calendar



2010

Sixth World Congress in Particle Technology

April 26-29, 2010, Nuremberg, Germany

Website: <http://www.wcpt6.org>

Abstract deadline: Passed

FLUIDIZATION XIII

May 16-19, 2010, Korea

Website: <http://www.engconfintl.org/10af.html>

International Conference on Multiphase Flow

May 30-June 4, 2010, Tampa, FL

Website: <http://conferences.dce.ufl.edu/ICMF2010/>

Abstract Deadline: Passed

Gordon Research Conference on Granular and Granular-Fluid Flow

June 20-25, 2010, Waterville, ME

Website: <http://www.grc.org/programs.aspx?year=2010&program=granular>

Abstract Deadline: May 30, 2010

2010 AIChE Annual Meeting

October 17-22, 2010, Salt Lake City, Utah

Website: <http://www.aiche.org/Conferences/AnnualMeeting/index.aspx>

Abstract Deadline: May 3, 2010

2011

Circulating Fluidized Beds 10

May 1-5, 2011, Sunriver, Oregon, USA

Website: http://cfb10.org/CFB10/Welcome_4.html

Abstract Deadline: TBD

2011 AIChE Annual Meeting

October 16-21, 2011, Minneapolis, MN

2012

AIChE Annual Meeting

October 28- November 2, 2012, Pittsburgh, PA

2013

Powders & Grains 2013

July 8-12, 2013, Sydney, Australia

AIChE Annual Meeting

November 27-22, 2013, San Francisco, CA

Officer and Committee Listing



Officers:

Chair 2008-2012: Professor Hugo S. Caram, hsc0@lehigh.edu, 610-758-4259
Vice-Chair 2008-1012: Dr. Ray Cocco, ray.cocco@PSRIChicago.com, 773-523-7227
Immediate Past Chair 2006-2008: Dr. Shrikant Dhodapkar, sdhodapkar@dow.com,
979-238-7940
Secretary 2006-2008: Dr. Stephen Conway, Stephen-conway@merck.com, 215-652-6031
Treasurer 2006-2008: Professor Jennifer Sinclair Curtis, jcurtis@che.ufl.edu, 352-392-0882

Liaisons:

Academic 2008-2012: Professor Hamid Arastapoor, arastoopour@iit.edu, 312-567-3038
Academic 2008-2012: Professor Alissa Park, ap2622@columbia.edu, 212-854-8989
Academic 2006-2010: Professor Jennifer Sinclair Curtis, jcurtis@che.ufl.edu, 352-392-0882
Academic 2006-2010: Professor Joseph McCarthy, mccarthy@engr.pitt.edu, 412-624-7362
Industry 2008-2012: Dr. Greg Mehos, gregmehos@jenike.com, 978-649-3300
Industry 2008-2012: Dr. Stephen Conway, Stephen-conway@merck.com, 215-652-6031
Industry 2006-2010: Dr. Ecevit Bilgili, ecevit_bilgili@merck.com, 215-652-2821
Industry 2006-2010: George Fotou, george_fotou@cabot-corp.com, 505-563-4275
AIChE-CTOC: Professor Esin Gulari, egulari@chem1.eng.wayne.edu, 313-577-5767
AIChE Staff Associate: Ms. Nina Scatton, ninas@aiche.org, 203-702-7660

Standing Committees (Chairs):

Awards Committee 2006-2008: Professor Hugo S. Caram, hsc0@lehigh.edu, 610-758-4259
Education: Dr. Ralph D. Nelson, erptmged@aol.com, 302-239-0409
Membership: Mark Bumiller/Hugo Caram, mark.bumiller@malvernusa.com, 508-480-0200,
ext. 222/hsc0@lehigh.edu, 610-758-4259
Newsletter Editor: Professor Christine Hrenya, hrenya@colorado.edu, 303-492-7689
Nominations: Professor Alan Weimer, weimera@colorado.edu, 303-492-3759
Recognition: Professor Sotiris Pratsinis, pratsinis@ivuk.mavt.ethz.ch, 41-1-632-3180

Technical Programming Area Liaison and Group Chairs

The main focus of the PTF has been arranging for the extensive technical programs at the annual AIChE meeting in November. A lot of hard work goes into developing session themes, negotiating for sufficient time and reasonable scheduling of the sessions, attracting and screening papers, finding and training new session chairs, and making sure the whole process flows smoothly. Shrikant Dhodapkar, our Area 3 Liaison, attends an all-day session each January to plan the technical sessions at the Annual Congress and to arrange for co-sponsored sessions with other Divisions and Forums. Participation in this process is excellent training in and proof of management capabilities. The leaders selected this fall were

<u>Position</u>	<u>Person</u>	<u>Affiliation</u>
Area 3 Liaison	Dr. Manuk Colakyan	The Dow Chemical Co.
Area 3 Vice Liaison	Dr. Shrikant Dhodapkar	The Dow Chemical Co.
<i>Group 3a – Particle Production and Characterization</i>		
Chair	Prof. M. Silvina Tomassone	Rutgers University
Vice-Chair	Dr. Ecevit Bilgili	Merck and Company, Inc.
<i>Group 3b – Fluidization and Fluid-Particle Systems</i>		
Chair	Dr. Jesse Zhu	Univ. of Western Ontario
Vice Chair	Reza Mostofi	UOP LLC
<i>Group 3c – Solids Flow, Handling, and Processing</i>		
Chair	Prof. Benjamin Glasser	Rutgers University
Vice Chair	Dr. Bruce Hook	Dow Chemical
<i>Group 3d - Nanoparticles</i>		
Chair	Professor Yangchuan Xing	University of Missouri-Rolla
Vice Chair	Gary Liu	DuPont
<i>Group 3e – Energetic Materials</i>		
Chair	Charles R. Painter	Department of the Navy
Vice Chair	Jerry S. Salan	Naval Surface Warfare Center

Report from the Treasurer



Here is the PTF Treasurer's Report. This includes the state of the accounts through 2/28/10. The total PTF funds are \$17,423.59, which consists of \$13,665.76 in the AIChE Account and \$3757.83 in the Florida Account.

Jennifer Sinclair Curtis, PTF Treasurer

AIChE Account	Starting	Income	Expenses	Balance
As of 10/09	\$20,618.48			
Investment Loss – 9/09			\$5119.27	
Investment Gain – 1/10		\$3032.07		
Dues Income – Divisions (9/09)		\$510.00		
Dues Income – Divisions (10/09)		\$375.00		
Dues Income – Divisions (11/09)		\$465.00		
Dues Income – Divisions (12/09)		\$525.00		
Dues Income – Divisions (1/10)		\$375.00		
Dues Income – Divisions (2/10)		\$195.00		
Registration Income – PTF Dinner		\$7650.00		
Awards			\$4000.00	
Award Plaques			\$781.57	
Merchant's Restaurant for PTF Dinner			\$5695.00	
AV Equipment Rental – AIChE Natl. Mtg.			\$1165.10	
Site Costs – Special Events – AIChE Natl. Mtg			\$288.00	
Website Setup			\$3000.00	
Website Fee			\$30.85	
Totals as of 2/28/10	\$20,618.48	\$13,127.07	\$20,079.79	\$13,665.76

Florida Account	Starting	Income	Expenses	Balance
Contribution to Initiate Account – 5/09	\$100.00			
Charge for Checks – 5/09			\$31.00	
Fee for Low Balance in Account – 7/09-9/09			\$34.00	
Transfer of Funds from Pitt Account – 10/09	\$4,256.02			
Donation from DuPont – PTF Award – 11/09		\$1000.00		
Jenike and Johanson donation – PTF Dinner – 11/09		\$882.50		
Donation from Shell – Thomas Baron Award – 11/09		\$1000.00		
Two late PTF dinner checks – 11/09		\$170.00		
Check to PSRI to cover PTF Banquet Costs -12/09			\$3585.69	
Two late PTF dinner checks – 12/09		\$170.00		
Check to Martin Rhodes to cover PTF Dinner – 12/09			\$85.00	
Check to Fanxing Li to cover PTF Dinner – 12/09			\$85.00	
Totals as of 2/28/10	\$4,356.02	\$3,222.50	\$3,820.69	\$3757.83

From the Editor's Desk



The *PTF Newsletter* is published twice a year as a vehicle for communication for all PTF members. PTF members are encouraged to send in news and information of general interest to PTF members. Please address your communication to

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If you would prefer to continue receiving a hard copy of the newsletter instead of the electronic version, please send a note to this effect to the editor at the above address.

Advertisements may also be placed in the newsletter. The rates on a per issue basis are:

1/4 page \$40

1/2 page \$60

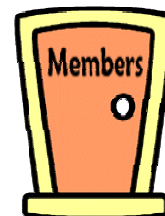
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Help us get PTF news to your new address by filling in and e-mailing a change of address form. See the PTF web page at

<http://www.erpt.org/ptf/addrchng.txt>



Membership Information

Membership Application for the Particle Technology Forum, AIChE

CONTACT INFORMATION (print or type):

Name: _____ Title: _____

Category (check only one): AIChE Member [# if you are a member = _____]

Not an AIChE member

Company or University: _____

Address: _____

City: _____ State: _____ ZIP: _____ Country: _____

Work Phone: _____ FAX: _____

Email: _____

MEMBERSHIP DUES (check only one line below) [Note that dues are for a calendar year]:

15.00 \$US for one year. Anyone use this option. For AIChE members dues will be listed on your AIChE dues invoice after your first year in PTF. Nonmembers don't receive a dues notice.

75.00 \$US for five years dues. **Only** nonmembers of AIChE are eligible for this option, which is provided as a courtesy so that non-members won't have to send in five small checks.

METHOD OF PAYMENT (check and fill-in only one line below):

check (must be in \$US on a U.S. bank or on a foreign bank with a New York City branch.)

Make payable to **Am. Inst. of Chem. Engineers**. Mail with form to the address below.

money order (an international money order in \$US is acceptable)

Make payable to **Am. Inst. of Chem. Engineers**. Mail with form to the address below.

credit card (only VISA or MasterCard are accepted)

I agree to pay the amount checked-off above to the **Am. Inst. of Chem. Engineers**

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