



***THE 5TH INTERNATIONAL CONFERENCE
FOR CONVEYING AND HANDLING
OF PARTICULATE SOLIDS***

PROGRAM

Conference Chairman: P. Massacci



**Hilton Hotel, Sorrento, Italy
August 27 – 31, 2006**

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PLENARY AND KEYNOTE LECTURES

MONDAY, AUGUST 28, 2006

1. **Observations Based on Personal Industrial Exposure to Particulate Solids in Various Industries - Aerospace, Minerals, Pharmaceuticals**
G. Fortuna, Teva Pharmaceuticals Industries LTD, Israel (Opening – 09:20)
2. **Attrition of Particulate Solids**
M. Ghadiri, University of Leeds, UK (Keynote – Session B1 – 10:40)
3. **Solids Handling in Waste Treatment**
P.C. Rem, Delft University of Technology, The Netherlands (Keynote – Session D2 – 13:20)
4. **Future Directions for Pneumatic Conveying**
M.G. Jones, The University of Newcastle, Australia (Keynote – Session A3 – 16:20)


TUESDAY, AUGUST 29, 2006

5. **Brian Scarlett – 45 Years of Impact - 45 Years of Friendship**
R. Davies, University of Florida, USA (Plenary 1 - 08:30)
6. **The Transport Loss Factor Revisited**
G. Lodewijks, Delft University of Technology, The Netherlands (Plenary 1 – 09:20)
7. **Industrial Powder Mixing: Present Practices and Future Revolutions**
H. Berthiaux, Ecole des Mines d'Albi-Carmaux, France (Keynote – Session B5 – 13:20)

WEDNESDAY, AUGUST 30, 2006

8. **Powder and Particulate Solids Technology Issues for Sustainability and Survival**
M. Horio, Tokyo University of Agriculture and Technology, Japan (Plenary 2 – 08:30)
9. **About Particulate Solids Modeling with Discrete Element Methods**
S. Luding, TU Delft, The Netherlands (Plenary 2 – 09:20)
10. **Powder Mechanics Principles Applied to Compaction Process**
V.M. Puri, Penn State University, USA (Keynote – Session B7 – 10:40)
11. **A Continuum - Mechanics View of the Flow of Dry, Fine Powders**
G.I. Tardos, The City College of the City University of New York, USA
(Keynote – Session C8 – 13:20)
12. **Advances in Direct Measurement of Structure and Permeability from 3D Tomographic Imaging**
R.A. Williams, University of Leeds, UK (Keynote – Session D9 – 16:20)

THURSDAY, AUGUST 31, 2006


13. **Production and Handling of Nanoparticles**
W. Peukert, University of Erlangen-Nuremberg, Germany (Plenary 3 – 08:30)
14. **Size Enlargement**
M.J. Hounslow, G.K. Reynolds & M. Oullion, The University of Sheffield, UK
(Plenary 3 – 09:20) Sponsored by  **BASF**
The Chemical Company
15. **Nanomaterials as Flow Regulators in Dry Powders**
I. Zimmermann, K. Meyer & M. Eber, University of Würzburg, Germany
(Keynote – Session B11 – 13:20)

GENERAL PROGRAM


SUNDAY, AUGUST 27, 2006

13:00 – 14:00	Lunch for Members of the International Scientific Council of CHoPS <i>(Sorrento Restaurant)</i>
14:00 – 16:00	Meeting of Members of the EFCE Working Party for Mechanics of Particulate Solids <i>(Sala Capri)</i> H. Feise
16:00 – 16:30	Coffee Break <i>(Sala Capri)</i>
16:30 – 18:30	Meeting of Members of the EFCE Working Party for Mechanics of Particulate Solids <i>(Sala Capri)</i> H. Feise
18:30 – 20:30	Meeting of Members of the International Scientific Council of CHoPS <i>(Sala Capri)</i> H. Kalman
20:30 – 22:00	Get Together Reception at Hilton Hotel, Sorrento <i>(Citrus Garden)</i> Host: Organizing and International Scientific Committees


MONDAY, AUGUST 28, 2006

08:00 – 09:00	Registration <i>(Foyer Barcaccia)</i>			
09:00 – 10:10	OPENING SESSION <i>(Ulisse Hall)</i>			
10:10 – 10:40	Coffee Break <i>(Citrus Garden)</i> and Exhibition <i>(Foyer Barcaccia)</i>			
	 Track A Sponsored by IFPS <i>(Sala Ulisse)</i>	Track B <i>(Sala Capri)</i>	Track C <i>(Sala Tritone)</i>	Track D <i>(Sala Amalfi)</i>
10:40 – 12:20	SESSION A1 Pneumatic Conveying I	SESSION B1 Attrition & Processing	SESSION C1 Flowability I	SESSION D1 Dust & Explosion Hazards
12:20 – 13:20	Lunch <i>(Sala Ginester)</i> and Exhibition <i>(Foyer Barcaccia)</i>			
13:20 – 15:00	SESSION A2 Pneumatic Conveying II	SESSION B2 Caking	SESSION C2 Flowability II	SESSION D2 Environmental & Waste
15:00 – 15:50	POSTER SESSION 1 <i>(Foyer Barcaccia)</i> Pneumatic Conveying – Heat & Mass Transfer – Caking - Flowability			
15:50 – 16:20	Coffee Break <i>(Citrus Garden)</i> and Exhibition <i>(Foyer Barcaccia)</i>			
16:20 – 18:00	SESSION A3 Pneumatic Conveying III	SESSION B3 Heat & Mass Transfer	SESSION C3 Flowability III	Workshop D3 Dust Hazards
18:00 – 19:00	Happy Hour at the Hilton Sorrento Bar (cash bar)			
20:30	Dinner for IFPS Directors			

TUESDAY, AUGUST 29, 2006


08:30 – 10:10	PLENARY SESSION 1 (<i>Sala Ulisse</i>)			
10:10 – 10:40	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
	 Track A Sponsored by IFPS (<i>Sala Ulisse</i>)	Track B (<i>Sala Capri</i>)	Track C (<i>Sala Tritone</i>)	Track D (<i>Sala Amalfi</i>)
10:40 – 12:20	SESSION A4 Pneumatic Conveying IV	SESSION B4 Segregation	SESSION C4 Storage I	SESSION D4 DEM-I
12:20 – 13:20	Lunch (<i>Sala Ginester</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
13:20 – 15:00	SESSION A5 Pneumatic Conveying V	SESSION B5 Mixing I	SESSION C5 Storage II	SESSION D5 DEM-II
15:00 – 15:50	POSTER SESSION 2 (<i>Foyer Barcaccia</i>) Processing – Segregation & Mixing – Storage – Slurry & Capsule Transport - Education			
15:50 – 16:20	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
16:20 – 18:00	SESSION A6 Pneumatic Conveying VI	SESSION B6 Mixing II	SESSION C6 Storage III	SESSION D6 DEM-III
19:30	Departure to an authentic Neapolitan dinner at O’Parrucchiano Restaurant with Entertainment			

WEDNESDAY, AUGUST 30, 2006

08:30 – 10:10	PLENARY SESSION 2 (<i>Sala Ulisse</i>)			
10:10 – 10:40	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
	 Track A Sponsored by IFPS (<i>Sala Ulisse</i>)	Track B (<i>Sala Capri</i>)	Track C (<i>Sala Tritone</i>)	Track D (<i>Sala Amalfi</i>)
10:40 – 12:20	SESSION A7 Slurry I	SESSION B7 Compaction	SESSION C7 Characterization	Workshop D7 DEM
12:20 – 13:20	Lunch (<i>Sala Ginester</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
13:20 – 15:00	SESSION A8 Slurry II	SESSION B8 Separation & Classification	SESSION C8 Flow of Powders	Workshop D8 DEM (continues)
15:00 – 15:50	POSTER SESSION 3 (<i>Foyer Barcaccia</i>) Separation & Classification – Size Enlargement –Characterization – Fundamentals & Modeling			
15:50 – 16:20	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)			
16:20 – 18:00	Workshop A9 Pneumatic Conveying	SESSION B9 Size Enlargement	SESSION C9 Cohesive Powders	SESSION D9 Tomography
19:30	Departure from the Hilton lobby to dine-around at selected restaurants in Sorrento (Optional)			

GENERAL PROGRAM (continues)

THURSDAY, AUGUST 31, 2006

08:30 – 10:10	PLENARY SESSION 3 (<i>Sala Ulisse</i>)		
10:10 – 10:40	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)		
	 Track A Sponsored by IFPS (<i>Sala Ulisse</i>)	Track B (<i>Sala Capri</i>)	Track C (<i>Sala Tritone</i>)
10:40 – 12:20	SESSION A10 Capsule Conveying	SESSION B10 Size Reduction I	SESSION C10 Mechanical Conveyors
12:20 – 13:20	Lunch (<i>Sala Ginester</i>) and Exhibition (<i>Foyer Barcaccia</i>)		
13:20 – 15:00	SESSION A11 Fluidization	SESSION B11 Nano Technology	SESSION C11 Belt Conveyors
15:00 – 15:30	POSTER SESSION 4 (<i>Foyer Barcaccia</i>) Size Reduction – Mechanical Conveyors – Measurements – Flow of Powders		
15:30 – 16:00	Coffee Break (<i>Citrus Garden</i>) and Exhibition (<i>Foyer Barcaccia</i>)		
16:00 – 17:40	SESSION A12 Fluidizing of Fine Powders	SESSION B12 Size Reduction II	SESSION C12 Fundamentals & Modeling
17:45- 18:00	Closing Remarks (<i>Sala Ulisse</i>)		
19:30	Departure to a farewell dinner at the Zi Ntonio a Mare Restaurant (Optional)		

PROGRAM

MONDAY, AUGUST 28, 2006

09:00 – 10:10	OPENING SESSION	(Sala Ulisse)
	CHAIR: G. Bonifazi, Università Degli Studi di Roma "LA SAPIENZA", Italy	
09:00 – 09:20	General Information and Greetings G. Bonifazi, Conference Co-Chair	
09:20 – 10:10	Observations Based on Personal Industrial Exposure to Particulate Solids in Various Industries - Aerospace, Minerals, Pharmaceuticals G. Fortuna, Teva Pharmaceuticals Industries LTD, Israel	
10:10 – 10:40	Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)	
10:40 – 12:20	SESSION A1: PNEUMATIC CONVEYING I	(Sala Ulisse)
	CHAIR: M. Jones, The University of Newcastle, Australia	
10:40 – 11:05	Pressure Fluctuations in Assessing Flow Regimes in Pneumatic Conveying of Polymer Pellets J.B. Pakk, I. Sahin & G.E. Klinzing, University of Pittsburgh, USA	
11:05 – 11:30	Scaling up Technique to Determine the Minimum Conveying Boundary of a Pneumatic Transport System C. Ratnayake ¹ , B.K. Datta ¹ & M.C. Melaen ^{1,2} , ¹ Telemark Technological R&D Centre, Norway. ² Telemark University College, Norway	
11:30 – 11:55	Master Curve for Threshold Velocities in Particle-Fluid Systems E. Rabinovich, Y. Weiss & H. Kalman, Ben-Gurion University of the Negev, Israel	
11:55 – 12:20	A Comparison of Pressure Drop Relations and Flow Patterns Between Experiment and a CFD Model of a Section of Pneumatic Conveying Pipeline D. McGlinchey, A. Cowell, V. Cheung, J.R. Pugh & E.A. Knight, Glasgow Caledonian University, UK	
10:40 – 12:20	SESSION B1: ATTRITION & PROCESSING	(Sala Capri)
	CHAIR: J. Gyenis, University of Veszprém, Hungary	
10:40 – 11:30	KEYNOTE: Attrition of Particulate Solids M. Ghadiri, University of Leeds, UK	
11:30 – 11:55	Some Physical and Chemical Aspects of Obtaining the Special Cements on the Base of Calcium Aluminates and Barium Ferrites V. Taranenkova, G. Shabanova & D. Byelov ² , ¹ National Technical University "Kharkov Polytechnic Institute", Ukraine. ² Consultant, Ukraine	
11:55 – 12:20	Comparison Between Different Tests of Sag Grinding for the Determination of the Specific Energy for the Comminution of a Sulfide Copper Ore P.E. da Cunha Pereira ¹ & A.E. Clark Peres ² , ¹ ECM S.A. – Projetos Industriais, Brazil. ² Federal University of Minas Gerais UFMG, Brazil	
10:40 – 12:20	SESSION C1: FLOWABILITY I	(Sala Tritone)
	CHAIR: A.W. Roberts, The University of Newcastle, Australia	
10:40 – 11:05	Stockpile reclaim prediction W. McBride, University of Newcastle, Australia	
11:05 – 11:30	A Novel Approach to Describing the Flow Related Aspects of Bulk Solids E. McGee ¹ & D. McGlinchey ² , Ajax Equipment Limited, UK. ² Glasgow Caledonian University, UK	
11:30 – 11:55	Shear Experiments on Cohesive Powders in an Aerated Rotational Shear Cell D. Barletta, G. Donsi, G. Ferrari, G. Ferrentino & M. Poletto, Università degli Studi di Salerno, Italy	
11:55 – 12:20	An Investigation of the Effect of Annular Shear Cell Geometric Factors on the Measured Failure Loci and Derived Failure Functions R.J. Berry & M.S.A Bradley, The University of Greenwich, UK	
10:40 – 12:20	SESSION D1: DUST & EXPLOSION HAZARDS	(Sala Amalfi)
	CHAIR: H. Kuopanportti, Mikkeli Polytechnic, Finland	
10:40 – 11:05	Bulk Solids Fires – A Potential Explosion Hazard P. W. Wypych, University of Wollongong, Australia	
11:05 – 11:30	Morphological and Morphometrical Characterization of Ornamental Stone Airborne Dust: Equipment and Methods G. Bonifazi, V. Giancontieri & S. Serranti, Università Degli Studi di Roma "La Sapienza", Italy	
11:30 – 11:55	Dust Emissions Generated During the Down Movement of Free Falling Bulk Solids G. Rheina-Wolbeck & W. Höflinger, Technical University of Vienna, Austria	
12:20 – 13:20	Lunch (Sala Ginester) and Exhibition (Foyer Barcaccia)	

MONDAY, AUGUST 28, 2006 (continues)

13:20 – 15:00	SESSION A2: PNEUMATIC CONVEYING II	(Sala Ulisse)
	CHAIR: G.E. Klinzing, University of Pittsburgh, USA	
13:20 – 13:45	New Component Technology for Bulk Powder Conveying Systems B. Zinser & R. Ernst, Coperion Waeschle GmbH, Germany	
13:45 – 14:10	Investigations into Rotary Valve Air Leakage P. W. Wypych, University of Wollongong, Australia	
14:10 – 14:35	The Study of Air Pressure Drop in Bends Manufactured from Spiraled Grooves Pipe D. Ionescu, University of Johannesburg, South Africa	
14:35 – 15:00	Bend Losses Associated with the Pneumatic Conveying of Polyethylene Pellets D. Mills, Pneumatic Conveying Consultant, UK	
13:20 – 15:00	SESSION B2: CAKING	(Sala Capri)
	CHAIR: R.W. Besant, University of Saskatchewan, Canada	
13:20 – 13:45	Glass Transition and the Caking of Food Powders J.J. Fitzpatrick, M. Twomey, P.S.M. Cerqueira, N. Descamps & Y.H. Roos, University College, Cork, Ireland	
13:45 – 14:10	Caking Behaviour Investigation with Coal/ Biomass Mixes Using Uniaxial Tester N.S. Khan, M.S.A. Bradley & R.J. Berry, University of Greenwich, UK	
14:10 – 14:35	Fracture Stress Measurements and Images of Caked Particles of KCl and NaCl J. Sun, R. W. Besant & R.W. Evitts, University of Saskatchewan, Canada	
14:35 – 15:00	Measurement of Cake Strength in a Potash Bed Y. Wang, R.W. Evitts, R. W. Besant & A. Dolovich, University of Saskatchewan, Canada	
13:20 – 15:00	SESSION C2: FLOWABILITY II	(Sala Tritone)
	CHAIR: J.M. Rotter, University of Edinburgh, UK	
13:20 – 13:45	Effects of Cyclic Loading and Various Test Conditions in a Uniaxial Tester T.O. Nysaeter ¹ , A. Kleppe & G.G. Enstad ² , ¹ Telemark University College, Norway. ² Tel-Tek, Norway	
13:45 – 14:10	Using Data from Vertical Shear Cell Tests to Define the Flowability of Bulk Solids E. McGee ¹ & D. McGlinchey ² , Ajax Equipment Limited, UK. ² Glasgow Caledonian University, UK	
14:10 – 14:35	Surface Characterization of Pharmaceutical Excipients – Influence of Surface Roughness on Powder Flowability C. Pabel & I. Zimmermann, Bayerische Julius-Maximilians-Universität Würzburg, Germany	
14:35 – 15:00	Comparisons Between Observed Powder Behaviour in Industrial Feeders and Measured Powder Failure Properties Obtained Using a Short Cut Silo Design Procedure R.J. Berry & M.S.A Bradley, The University of Greenwich, UK	
13:20 – 15:00	SESSION D2: ENVIRONMENTAL & WASTE	(Sala Amalfi)
	CHAIR: S. Serranti, Università Degli Studi di Roma "La Sapienza", Italy	
13:20 – 14:10	KEYNOTE: Solids Handling in Waste Treatment P.C. Rem, Delft University of Technology, The Netherlands	
14:10 – 14:35	Analysis of Enzyme Dust Formation in Detergent Manufacturing Plants H. Ahmadian & M. Ghadiri, University of Leeds, UK	
14:35 – 15:00	Pelletising Waste Compost and Fly Ash Mixture to Produce Fertilizing Material H. Orava ¹ , H. Kuopanportti ¹ , T. Tontti ² , ¹ Mikkeli Polytechnic, Finland. ² MTT Agrifood Research, Finland	
15:00 – 15:50	POSTER SESSION 1	(Foyer Barcaccia)
	PNEUMATIC CONVEYING	
PS 1.01	Theories for Dynamic Pressure Analysis of Low-Velocity Single-Slug-Flow Pneumatic Conveying S. Tan, K.C. Williams & M.G. Jones, The University of Newcastle, Australia	
PS 1.02	The Influence of Material Type and Degradation on the Pneumatic Conveying System Design D. Mills ¹ & V.K. Agarwal ² , ¹ Pneumatic Conveying Consultant, UK. ² IIT, India.	
PS 1.03	Pressure Drop Gradient in a Straight Horizontal Pipe for Dense Phase Pneumatic Conveying of Calcium Hydroxide T. Deng, R.J. Farnish & M.S.A. Bradley, University of Greenwich, UK	
PS 1.04	The Progressive Method of Pneumatic Conveying of Powder Bulk Materials from Silos and Hoppers of Bag Filters and Electrical Precipitators P. Rayman & I. Raymanova, Rayman Ltd., Czech Republic	
PS 1.05	Non-Intrusive Mass Flow Measurements in Pneumatic Transport C. Arakaki ¹ , A. Ghaderi ¹ , B.K. Datta ¹ & B. Lie ² , ¹ Telemark Technological R&D Centre, Norway. ² Telemark University College, Norway	
PS 1.06	Numerical And Experimental Studies of Dilute Vertical Pneumatic Transport A. Mathisen & M.C. Melaaen, Telemark University College, Norway	
PS 1.07	Dense-Phase Pneumatic Conveying of Slush Ice Through Plastic Pipes T.J. Sheer, C.Y. Chan & T.W. Manyaz, University of the Witwatersrand, South Africa	
PS 1.08	An Investigation into the Effect of Product Type and Pipeline Diameter in Pneumatic Conveying Through Vertical Pipelines K. Hettiaratchi, M.S.A. Bradley, A.R. Reed & M. Smith, University of Greenwich, UK	

HEAT & MASS TRANSFER	
PS 1.09	Application of the Theory of Markov Chains to Model Heat and Mass Transfer Between Stochastically Moving Particulate and Gas Flows V. Mizonov ¹ , H. Berthiaux ² , P. Arlabosse ² & D. Djerroud ² , ¹ Ivanovo Power Eng. State University, Russia. ² Ecole des Mines d'Albi – Carmaux, France
PS 1.10	Numerical Simulation of Moisture Uptake and Transport in a Bed of Urea Particles X. Nie, R. Evitts & R.W. Besant, University of Saskatchewan, Canada
PS 1.11	Applicability of the Spouting Regime for Drying of Biomass Wastes in Conical Spouted Beds with a Draft Tube M.J. San José, S. Alvarez, A. Ortiz de Salazar, A. Morales & J. Bilbao, Universidad del País Vasco, Spain
PS 1.12	Drying Sludge with Hot Steel Balls G.W. van Gemert & P.C. Rem, Delft University of Technology, The Netherlands
CAKING	
PS 1.13	The Effect of Particle Size and Magnesium Content on the Strength of Caked Potash D. Gillies, Y. Wang, R.W. Evitts & R.W. Besant, University of Saskatchewan, Canada
FLOWABILITY	
PS 1.14	Flow - Ability Measuring Techniques-Sensitivity to Change in Composition P.A. Kulkarni, M.S.A. Bradley & R.J. Berry, The University of Greenwich, UK
PS 1.15	Development of New Approaches to Investigate the Action Mechanism and the Potency of Flow Regulators J. Spuziak, C. Pabel & I. Zimmermann, University of Würzburg, Germany
PS 1.16	Fragmentation of Nanoscaled Flow Regulators as Criterion for Their Potency A.-K. Peter & I. Zimmermann, University of Würzburg, Germany
15:00 / 15:30 (Sala Ulisse)	Static Charge Elimination on Solid Particulates: Application in Polymer Production J. Taillet, Scientific adviser, VALITEC, France (DVD Presentation)
15:50 – 16:20 Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)	
16:20 – 18:00	SESSION A3: PNEUMATIC CONVEYING III (Sala Ulisse)
	CHAIR: D. Mills, Pneumatic Conveying Consultant, UK
16:20 – 17:10	KEYNOTE: Future Directions for Pneumatic Conveying M.G. Jones, The University of Newcastle, Australia
17:10 – 17:35	Experimental Studies of Dilute Vertical Pneumatic Transport A. Mathisen, B. Halvorsen & M.C. Melaaen, Telemark University College, Norway
17:35 – 18:00	Dispersion of Solid Particles in Conveying Jets K. Luo ¹ , J.R. Fan ¹ , M. Klein ² & K. Cen ¹ , ¹ Zhejiang University, P.R. China. ² Technische Universität Darmstadt, Germany
16:20 – 18:00	SESSION B3: HEAT & MASS TRANSFER (Sala Capri)
	CHAIR: A. Levy, Ben-Gurion University of the Negev, Israel
16:20 – 16:45	Preparation of Defined Bulk Densities for Using the Capillary Rise Method in the Case of Fine Powders S. Thümmler, D. Höhne & K. Husemann, Freiberg University of Mining and Technology, Germany
16:45 – 17:10	The Effect of Internal Particle Heat Conduction on Heat Transfer Analysis of Turbulent Gas-Particle Flow in a Dilute State M. Haim, Y. Weiss and H. Kalman, Ben-Gurion University of the Negev, Israel
17:10 – 17:35	Spray Drying of Wet Particles M. Mezhericher, A. Levy & I. Borde, Ben-Gurion University of the Negev, Israel
17:35 – 18:00	Measurement of Moisture Uptake and Transport in a Bed of Urea Particles X. Nie, R. Besant & R. Evitts, University of Saskatchewan, Canada

MONDAY, AUGUST 28, 2006 (continues)

16:20 – 18:00	SESSION C3: FLOWABILITY III	(Sala Tritone)
	CHAIR: M. Poletto, Università degli Studi di Salerno, Italy	
16:20 – 16:45	Pressure Measurements in Full-Scale Steel Silos with Eccentric Hoppers A. Ramirez ¹ , J. Nielsen ^{2,3} , F. Ayuga ¹ & J. Munch-Andersen ² , ¹ Universidad Politécnica de Madrid, Spain. ² Danish Building Research Institute, Denmark. ³ Brunel University, UK	
16:45 – 17:10	The Control of Powder Flowability by Particle Surface Additives is Monitored by Measuring Interparticle Forces M.A.S. Quintanilla, J. M. Valverde and A. Castellanos, University of Seville, Spain	
17:10 – 17:35	Handling Characteristics of Biomass / Coal Mixes for Co-firing: Failure Properties of Mixes N.S. Khan, M.S.A. Bradley & R.J. Berry, University of Greenwich, UK	
17:35 – 18:00	The Experimental and Theoretical Analysis of the Flow Behaviour of Granular Materials in Silos with Inserts M. Wójcik & J. Tejchman, Gdansk University of Technology, Poland	
16:20 – 18:00	WORKSHOP D3: DUST HAZARDS	(Sala Amalfi)
	CHAIR: P. Wypych, University of Wollongong, Australia	

Dust Hazards – Minimisation and Control

Dust emissions in the workplace can be hazardous to health and damaging to equipment and instrumentation, affecting plant reliability. Under the right conditions of concentration, ignition and oxidant, dust clouds also can create explosion hazards inside and outside process components (e.g. bins, mixers, screens, etc). The build-up of explosible dust over time can provide the opportunity of secondary explosions, which can be far more devastating than the initial or primary explosion.

The purpose of this workshop is to discuss some of the more important considerations that should be made when designing, operating, analysing or auditing powder handling systems and processes. Emphasis is placed on:

- ◆ Damaging nature of dust, in terms of human health, equipment damage and explosions;
- ◆ Dust generation and air entrainment mechanisms;
- ◆ Effect of product temperature on dust generation;
- ◆ Design/operation of plant to minimise generation/turbulence of dust – including risk and severity of dust emissions and explosions;
- ◆ Safe handling/processing of highly explosible powders - new technologies;
- ◆ Safe fire control methods to prevent dust explosions.

Recent research findings and several industrial case studies are used to demonstrate and emphasise particular issues.

TUESDAY, AUGUST 29, 2006

08:30 – 10:10	PLENARY 1	(Sala Ulisse)
	To the Memory of Prof. Brian Scarlett and Prof. Muhamed Fayed CHAIR: H. Kalman, Ben-Gurion University of the Negev, Israel	
08:30 – 09:20	Brian Scarlett – 45 Years of Impact - 45 Years of Friendship R. Davies, PERC Advisor, University of Florida, USA	
09:20 – 10:10	The Transport Loss Factor Revisited G. Lodewijks, Delft University of Technology, The Netherlands	
10:10 – 10:40	Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)	
10:40 – 12:20	SESSION A4: PNEUMATIC CONVEYING IV	(Sala Ulisse)
	CHAIR: F. Rizk, BASF, Germany	
10:40 – 11:05	An Innovative System for Investigating Materials in a Pneumatic Conveying Pipeline A. Mason, D. McGlinchey & A. Cowell, Glasgow Caledonian University, UK	
11:05 – 11:30	Problems for Pneumatic Conveying Extra-Dense Materials T. Deng, R.J. Farnish & M.S.A. Bradley, University of Greenwich, UK	
11:30 – 11:55	Controlling Impact Forces During Plug Conveying R. Ernst, Coperion Waeschle GmbH, Germany	
11:55 – 12:20	Investigations into the Factors Influencing the Fluidized Motion Conveying of Flyash S.K. Gupta ¹ , V.K. Agarwal ² , V. Seshadri ² , S.N. Singh ² & D. Mills ³ , ¹ NERIST, Arunachal Pradesh, India. ² IIT, India. ³ Pneumatic Conveying Consultant, UK	
10:40 – 12:20	SESSION B4: SEGREGATION	(Sala Capri)
	CHAIR: G. Ferrari, Università degli Studi di Salerno, Italy	
10:40 – 11:05	Percolation Segregation Model for Similar and Differing Constituents P. Tang & V.M. Puri, Penn State University, USA	
11:05 – 11:30	Single Particle Properties Vs. Bulk Flowability A. Santomaso & P. Canu, University of Padua, Italy	
11:30 – 11:55	Segregation due to Air Flow While Filling Bulk Material Silos K. Gottschalk & Ch. Füll, Leibniz-Institut für Agrartechnik Bornim, Germany	
11:55 – 12:20	A Non-Linear Model of Particulate Flow in a Continuous Blade Mixer D. Ponomarev ¹ , V. Mizonov ¹ , H. Berthiaux ² & E. Barantzeva ¹ , ¹ Ivanovo Power Eng. State University, Russia. ² Ecole des Mines d'Albi – Carmaux, France	
10:40 – 12:20	SESSION C4: STORAGE I	(Sala Tritone)
	CHAIR: U. Tuzun, University of Surrey, UK	
10:40 – 11:05	Modal Analysis of Coal Bunkers and Silos with Special Reference to Thermal Power Stations S. Venkatesh ¹ & E. Koorapati ² , ¹ Osmania University, India. ² JNTUniversity College of Engineering, India	
11:05 – 11:30	Analysis of Bulk Terminals: Chances for Exploration D.L. Schott & G. Lodewijks, Delft University of Technology, The Netherlands	
11:30 – 11:55	Coal Handability Using Real-Time Testing: An Overview Z. Zhong, J.Y. Ooi & J.M. Rotter, University of Edinburgh, UK	
11:55 – 12:20	Influence of Moisture of Powder Material on the External Angle of Friction R. Fekete, M. Peciar & M. Hanzel, Slovak University of Technology in Bratislava, Slovakia	
10:40 – 12:20	SESSION D4: DEM I	(Sala Amalfi)
	CHAIR: H. Feise, BASF Aktiengesellschaft, Germany	
10:40 – 11:05	Discrete Element Simulation of Direct Shear Test with Experimental Validation J. Härtl & J.Y. Ooi, University of Edinburgh, UK	
11:05 – 11:30	Experimental Study and DEM Simulation of Granular Breakage by Impact S. Antonyuk, J. Tomas, S. Heinrich & L. Mörl, Otto-von-Guericke-University of Magdeburg, Germany	
11:30 – 11:55	Modelling Glued Particle Contacts with DEM L. Brendel, University Duisburg-Essen, Germany	
11:55 – 12:20	Recent Results of Experimentation and DEM Modeling of Centrifugal Fertilizer Spreading E. Tijssens ¹ , P. Van Liedekerke ¹ , E. Piron ² , J. Van Geyte ³ , S. Vilette ⁴ & H. Ramon ¹ , ¹ Katholieke Universiteit Leuven, Belgium. ² CEMAGREF, France. ³ Centre of Agricultural Research, Belgium. ⁴ UMR ENESAD-Cemagref CPAP, France	
12:20 – 13:20	Lunch (Sala Ginester) and Exhibition (Foyer Barcaccia)	

TUESDAY, AUGUST 29, 2006 (continues)

13:20 – 15:00	SESSION A5: PNEUMATIC CONVEYING V	(Sala Ulisse)
	CHAIR: D. McGlinchey, Glasgow Caledonian University, UK	
13:20 – 13:45	Influence of the Isometric in Plug Phase Conveying System T. Destoop, NEU International, France	
13:45 – 14:10	Measurement of Wall Friction in SLUG FLOW Pneumatic Conveying T. Krull, M.G. Jones & A.W. Roberts, The University of Newcastle, Australia	
14:10 – 14:35	Verification of Pressure Drop Model Over a Single Slug Based on Conservation of Air Mass S. Tan, K.C. Williams & M.G. Jones, The University of Newcastle, Australia	
14:35 – 15:00	New Pneumatic Dense Phase Conveying Technology for Powders R. Ernst, Coperion Waeschle GmbH, Germany	
13:20 – 15:00	SESSION B5: MIXING I	(Sala Capri)
	CHAIR: V.M. Puri, Penn State University, USA	
13:20 – 14:10	KEYNOTE: Industrial Powder Mixing: Present Practices and Future Revolutions H. Berthiaux & C. Gatumel, Ecole des Mines d'Albi-Carmaux, France	
14:10 – 14:35	Aerated Discharge of Horizontally Segregated Glass Beads of Different Sizes from Two- and Three-Dimensional Silos A. D'Arco, G. Donsi, G. Ferrari, M. Montesano and M. Poletto, Università degli Studi di Salerno, Italy	
14:35 – 15:00	Improving Efficiency of Granular Material Mixing V. Royzen & M. Shapiro, Technion – Israel Institute of Technology, Israel	
13:20 – 15:00	SESSION C5: STORAGE II	(Sala Tritone)
	CHAIR: J.M. Rotter, University of Edinburgh, UK	
13:20 – 13:45	Piping in a Silo-Centrifuge A. Cannavacciuolo, A. Kwade & J. Schwedes, Technical University Braunschweig, Germany	
13:45 – 14:10	FE-Investigations of Shear Localization During Quasi-Static Granular Flow J. Tejchman, Gdansk University of Technology, Poland	
14:10 – 14:35	Bulk Solid Pressure Effects due to Eccentric Discharging of Circular Silo Bin A. Lapko & W. Konopacki, Bialystok Technical University, Poland	
14:35 – 15:00	Critical Pressure Conditions in Silos J.M. Rotter, J.Y. Ooi & Z. Zhong, University of Edinburgh, UK	
13:20 – 15:00	SESSION D5: DEM-II	(Sala Amalfi)
	CHAIRS: U. Tuzun, University of Surrey, UK J. Ooi, University of Edinburgh, UK	
13:20 – 13:45	Post-Simulation Analyses of Large Datasets Using Wavelets to Probe Dynamic Evolution of Stress, Strain-Rate and Voidage Coupling in Granular Media U. Tuzun, University of Surrey, UK	
13:45 – 14:10	Influence of Filling Method on Packing Structure in Model Silo and DEM Simulations J. Sykut, M. Molenda & J. Horabik, Polish Academy of Sciences, Poland	
14:10 – 14:35	Shear Dynamics of Ultrafine Cohesive Powders: Simulations and Experiments R. Tykhoniuk & J. Tomas, Otto-von-Guericke University Magdeburg, Germany	
14:35 – 15:00	Modifications on a Transition Chute for Dust Reduction Aided by Discrete Element Simulations T. Gröger ¹ & P. Kisters ² , ¹ Consultant, Germany, ² AUMUND Fördererbau GmbH, Germany	
15:00 – 15:50	POSTER SESSION 2	(Foyer Barcaccia)
	PROCESSING	
PS 2.01	Manufacturing of Ceramic Body for Moisture Control with Excellent Self-Absorbing and Moisture-Releasing Functions B. Kim ¹ , C.L. Park ¹ , Y.I. Kim ¹ , H.S. Jeon ¹ & D.S. Jang ² , ¹ Korea Institute of Geoscience & Mineral Resources, Korea. ² KangWon National University, Korea.	
PS 2.02	The Coal's Preparation for the Production of CWF A. Bonoli, A. Parisi & S. Goldoni, DICMA University of Bologna, Italy	
PS 2.03	Simultaneous Powder Deposition in Three Parallel-Oriented Cylindrical Dies X. Xie & V.M. Puri, Penn State University, USA	
	SEGREGATION & MIXING	
PS 2.04	An Investigation into the Mixing and Segregation of Non-Spherical Particles using Digitalpacking Algorithm R. Caulkin, X. Jia, M. Fairweather & R.A. Williams, University of Leeds, UK	
	STORAGE	
PS 2.05	Investigations of Density Changes During Granular Silo Flow Using Electrical Capacitance Tomography and Particle Image Velocimetry M. Niedostatkiewicz & J. Tejchman, Gdansk University of Technology, Poland	
PS 2.06	Elastic Predictions of Pressures in Granular Materials in Converging Hopper I. Sielamowicz, Bialystok Technical University, Poland	
PS 2.07	Prediction of Honking Frequency Based on a Study of Five Honking Silos J.Y. Ooi, P. J. Chavez-Sagarnaga, University of Edinburgh, UK	
PS 2.08	Numerical and Experimental Modelling of Hydro – Thermal Effects in Grain Stored in Cylindrical Silo Bin J.A. Prusiel & A. Lapko, Bialystok Technical University, Poland	

PS 2.09	Ideal Bulk Material Interpretation of Yield Coefficient and Tangent of Angle of Internal Friction Product K.F J. Zegzulka & O. Dokoupil, VS~B-Technical university Ostrava-Poruba, Czech Republic
PS 2.10	Granular State of Material Aggregation Comparison of Ideal Bulk Material with Ideal Fluid and Ideal Solid Matter J. Zegzulka & O. Dokoupil, VS~B-Technical university Ostrava-Poruba, Czech Republic
PS 2.11	The Effect of Grinding on the Ground Material Flowability E. Grant, H. Kalman & M. Averbuh, Ben-Gurion University of the Negev, Israel
SLURRY & CAPSULE TRANSPORT	
PS 2.12	Flow of Non-Newtonian Fluid Over a Smooth Surface B. Horeni, Z. Chara & P. Vlasak, Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic
PS 2.13	A Physical Model for Yield Plastic Fluids D. Hallbom ^{1,2} & B. Klein ² , ¹ Pipeline Systems Inc., Canada. ² University of British Columbia, Canada
EDUCATION	
PS 2.14	Educational Web Environment for Chemical Engineering T.A. Carvalho, L.N. Souza, V.H.S. Miranda & K. Tannous, State University of Campinas – UNICAMP, Brazil

15:50 – 16:20 Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)

16:20 – 18:00 SESSION A6: PNEUMATIC CONVEYING VI (Sala Ulisse)
CHAIR: T. Destoop, NEU International, France

16:20 – 16:45	Air Extraction - A Viable Alternative to Stepped Pipelines D. Mills, Pneumatic Conveying Consultant, UK
16:45-17:10	Study on Double-Tube-System for Long Distance Pneumatic Ash Handling X. Li, Electric Power Construction Research Institute, P.R.China
17:10 – 17:35	An Investigation in the Micro-Mechanical Failure Mode of Severe Localised Wear in Pneumatic Conveying of Alumina K.C. Williams, A.A. Cenna & M.G. Jones, The University of Newcastle, Australia
17:35 – 18:00	Performance Comparisons for By-Pass Pipelines D. Mills, Pneumatic Conveying Consultant, UK

16:20 – 18:00 SESSION B6: MIXING II (Sala Capri)
CHAIR: M. Shapiro, Technion – Israel Institute of Technology, Israel

16:20 – 16:45	Modelling and Experimental Investigation in Continuous Dynamic Powder Mixing by Means of the Fokker-Planck-Equation D. Dopfer & K. Sommer, Lehrstuhl für Maschinen- und Apparatekunde, Germany
16:45 – 17:10	Batch Mixing Study of Granular Materials in an Innovative Mixer: The Triaxe J.F Demeyre ^{1,2} , C. Gatamel ¹ , H. Berthiaux ¹ & M. Grandjean ² , ¹ Ecole des Mines d'Albi-Carmaux, France. ² Hogon SA, France
17:10 – 17:35	Mixing of Cohesive Material in Low Shear Mixers M. Hubert ¹ , M. Djomlija ² , K. Johanson ² & B. Scarlett ² , ¹ Mettler Toledo Real Time Analytics, USA. ² University of Florida, USA

16:20 – 18:00 SESSION C6: STORAGE III (Sala Tritone)
CHAIR: D.L. Schott, Delft University of Technology, The Netherlands

16:20 – 16:45	Loads on Support Structural Elements Buried in Bins and Stockpiles A.W. Roberts, The University of Newcastle, Australia
16:45 – 17:10	Experimental Investigation of Flow Pattern and Wall Pressure Distribution in a Silo with Double-Cone Insert M. Wojcik ¹ , J. Härtl ² , J. Ooi ² , J.M. Rotter ² , S. Ding ³ & G.G. Enstad ³ , ¹ Gdansk University of Technology, Poland. ² University of Edinburgh, UK, ³ Tel-Tek, Norway
17:10 – 17:35	Calculation of the Bulk Material Stress in Former Funnel Flow Silos with "Cone in Cone" Inserts with Use of a New Material Law Th. Schuricht ¹ , Ch. Füll ² & K. Gottschalk ² , ¹ Warnowdesign, Rostock, Germany. ² Leibniz-Institut für Agrartechnik Potsdam-Bornim, Germany
17:35 – 18:00	Non-Axial Stress State in a Model Silo Generated by Eccentric Filling and Internal Inserts M. Molenda ¹ , M.D. Montross ² , J. Horabik ¹ , ¹ Polish Academy of Sciences, Poland. ² University of Kentucky, USA

16:20 – 18:00 SESSION D6: DEM III (Sala Amalfi)
CHAIRS: J. Ooi, University of Edinburgh, UK
U. Tuzun, University of Surrey, UK

16:20 – 16:45	Towards a Better Understanding of Granular Material Processes: The Coupling of Micro-Mechanical Models Within a Computational Fluid Dynamics Framework M.K. Patel ¹ , N. Christakis ² , P. Chapelle ³ & M. Cross ⁴ , ¹ University of Greenwich, UK. ² University of Crete, Greece. ³ Ecole des Mines, France. ⁴ University of Wales, UK
16:45 – 17:10	Large Scale DEM Computation – Expectations and Recent Results E. Tijssens, B. Van Besien, S. Vandewalle & H. Ramon, Katholieke Universiteit Leuven, Belgium
17:10 – 17:35	On the Numerical Calibration of Discrete Element Models for the Simulation of Bulk Solids T. Gröger ¹ & A. Katterfeld ² , ¹ Consultants, Germany, ² Otto-von-Guericke University of Magdeburg, Germany
17:35 – 18:00	Assessment of Mill Lifter Bar Deflection Measurements Using Wavelets and Discrete Element Methods K.T. Tano ¹ & B. Pålsson ² , ¹ LKAB, Research and Development, Sweden. ² Luleå University of Technology, Sweden

WEDNESDAY, AUGUST 30, 2006

08:30 – 10:10	PLENARY 2	(Sala Ulisse)
	CHAIR: J. Tomas, Otto-von-Guericke-University Magdeburg, Germany	
08:30 – 09:20	Powder and Particulate Solids Technology Issues for Sustainability and Survival	
	M. Horio, Tokyo University of Agriculture and Technology, Japan	
09:20 – 10:10	Particulate Solids Modeling with Discrete Element Methods	
	S. Luding, TU Delft, the Netherlands	
10:10 – 10:40	Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)	
10:40 – 12:20	SESSION A7: SLURRY I	(Sala Ulisse)
	CHAIR: P. Vlasák, Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic	
10:40 – 11:05	Pressure Drops for Pipeline Transport of Slurries with Broad Grading	
	A. Sellgren ¹ & K.C. Wilson ² , ¹ Luleå university of Technology, Sweden. ² Queen's University, Canada	
11:05 – 11:30	Solids Stress at Wall of Vertical Slurry Pipe	
	V. Matoušek, Czech Academy of Sciences, Czech Republic	
11:30 – 11:55	Concentration Distribution in Pipeline Flow of Highly Concentrated Slurry	
	D.R. Kaushal ¹ & Y. Tomita ² , ¹ IIT Delhi, India. ² Kyushu Institute of Technology, Japan	
11:55 – 12:20	Effect of Fine Particles on the Flow of Bi-Modal Slurry Downstream of a 90° Bend at Medium Concentration	
	U. Kumar ¹ , S.N. Singh ² & V. Seshadri ² , ¹ BIET Jhansi, India. ² IIT Delhi, India	
10:40 – 12:20	SESSION B7: COMPACTION	(Sala Capri)
	CHAIR: J. Tomas, Otto-von-Guericke-University Magdeburg, Germany	
10:40 – 11:30	KEYNOTE: Powder Mechanics Principles Applied to Compaction Process	
	V.M. Puri, Penn State University, USA	
11:30 – 11:55	Geometric Analysis of Bi-layered Tablets of Microcrystalline Cellulose (MCC) Using Laser Profilometry and the Relevance to Their Resistance to Fracture	
	S.J. Inman ¹ , B.J. Briscoe ¹ & K.G. Pitt ¹ , ¹ Imperial College London, UK, ² Merck, UK	
11:55 – 12:20	Jamming and Compaction of Fine and Ultrafine Powders	
	J.M. Valverde & A. Castellanos, University of Seville, Spain	
10:40 – 12:20	SESSION C7: CHARACTERIZATION	(Sala Tritone)
	CHAIR: P. Bevilacqua, University of Trieste, Italy	
11:05 – 11:30	2D Fractal Based Algorithms for Fine and Ultra-Fine Particulate Solids Systems Characterization	
	G. Bonifazi, Università Degli Studi di Roma "La Sapienza", Italy	
11:05 – 11:30	Measurement of Electrostatic Charge Transfer by Single Particle Impact with a Metal Plate	
	H. Watanabe ¹ , Y. Ding ¹ , M. Ghadiri ¹ , T. Matsuyama ² , K.G. Pitt ³ , H. Maruyama ⁴ , S. Matsusaka ⁴ & H. Masuda ⁴ , ¹ University of Leeds, UK. ² Soka University, Japan. ³ Merck Sharp and Dohme, UK. ⁴ Kyoto University, Japan	
11:30 – 11:55	Hyperspectral Imaging Based Techniques in Particles and Particulate Solids Systems Characterization	
	S. Serranti & G. Bonifazi, Università Degli Studi di Roma "La Sapienza", Italy	
10:40 – 12:20	WORKSHOP D7: DEM	(Sala Amalfi)
	CHAIRS: S. Luding, TU Delft, the Netherlands, S.Luding@tnw.tudelft.nl J. Ooi, University of Edinburgh, UK, j.ooi@ed.ac.uk U. Tuzun, University of Surrey, UK, U.Tuzun@surrey.ac.uk	
EFCE Working Party on Mechanics of Particulate Solids		
DEM is currently been used extensively in bulk solids handling research. However, for wider acceptance the DEM-codes for simulation of bulk solids behavior needs to be validated. This requires carefully selected problems with a good experimental database for test runs. The workshop is intended to help identify a suitable set of problems for the quantitative validation and verification of DEM type models in the area of bulk solids handling. The workshop will commence with introductory presentations on the issues and methods relating to validation currently used in chemical, mining and agricultural engineering and physics research, as well as in industry. This will be followed by a discussion session by all workshop participants.		
The workshop shall produce a framework for engagement between academic researchers, professional software companies and potential industrial beneficiaries of DEM numerical simulations that will identify areas that need significant further development both in terms of computational methodologies as well as the experimental validation procedures. It is hoped that in the longer term, the group of researchers brought together for the event will form the nucleus of a wider project formation aimed at setting the European/International standards of "best practice" in DEM Simulation software development and implementation in a broad range of industry sectors		
12:20 – 13:20	Lunch (Sala Ginester) and Exhibition (Foyer Barcaccia)	

13:20 – 15:00	SESSION A8: SLURRY II	(Sala Ulisse)
	CHAIR: V. Matoušek, Academy of Sciences, Czech Republic	
13:20 – 13:45	Conveying of Solid Particles in Newtonian and Non-Newtonian Carrier P. Vlasák, Z. Chára & J. Konfršt, Institute of Hydrodynamics of Academy of Sciences of the Czech Republic, Czech Republic	
13:45 – 14:10	A Phenomenological Model for Yield Plastic Fluids D. Hallbom ^{1,2} & B. Klein ² , ¹ Pipeline Systems Inc., Canada. ² University of British Columbia, Canada	
14:10 – 14:35	The Effect of Particle Size Distribution on the Rheology of Fly Ash Slurries T.F. Bunn, M.G. Jones & C. Wheeler, The University of Newcastle, Australia	
13:20 – 15:00	SESSION B8: SEPARATION & CLASSIFICATION	(Sala Capri)
	CHAIR: K. Gottschalk, Leibniz-Institut für Agrartechnik Bornim, Germany	
13:20 – 13:45	Modeling the Filtration and Consolidation Dynamics of Flocculated and Not Flocculated Ultrafine Limestone Suspensions J. Tomas & T. Mladenchev, Otto-von-Guericke-University Magdeburg, Germany	
13:45 – 14:10	An Effective Technology to Minimize Rejects Stockpiles P. Bozzato ¹ , P. Bevilacqua ² & Paolo Bozano ¹ , ¹ Ecomin S.r.l., Italy. ² University of Trieste, Italy	
14:10 – 14:35	Magneto-Hydrostatic Separation of Pet E.J. Bakker & P.C. Rem, Delft University of Technology, the Netherlands	
13:20 – 15:00	SESSION C8: FLOW OF POWDERS	(Sala Tritone)
	CHAIR: M.S.A Bradley, The University of Greenwich, UK	
13:20 – 14:10	KEYNOTE: A Continuum - Mechanics View of the Flow of Dry, Fine Powders G.I. Tardos, The City College of the City University of New York, USA	
14:10 – 14:35	Characterization of Cohesive Powders at the Single Particle Level X. Ling ¹ , L. - O. Heim ¹ , R. Tykhoniuk ² , J. Tomas ² , S. Luding ³ , M. Kapp ¹ & H.-J. Butt ¹ , ¹ Max Planck Institute for Polymer Research, Germany. ² Otto-von-Guericke-University, Germany. ³ DelftChemTech, The Netherlands	
14:35 – 15:00	DPIV Technique in Measurements of Eccentric Granular Material Flows in Plane Hoppers I. Sielamowicz ¹ & T.A. Kowalewski ² , ¹ Bialystok Technical University, Poland. ² Institute of Fundamental Technological Research, Poland	
13:20 – 15:00	WORKSHOP D8: DEM	(Sala Amalfi)
	CHAIRS: S. Luding, TU Delft, the Netherlands, S.Luding@tnw.tudelft.nl J. Ooi, University of Edinburgh, UK, j.ooi@ed.ac.uk U. Tuzun, University of Surrey, UK, U.Tuzun@surrey.ac.uk	
CONTINUE		
15:00 – 15:50	POSTER SESSION 3	(Foyer Barcaccia)
	SEPARATION & CLASSIFICATION	
PS 3.01	Granular Material Velocity on a Sieve R. Modrzewski & P. Wodzinski, Technical University of Lodz, Poland	
	SIZE ENLARGEMENT	
PS 3.02	Sucrose Crystallization from a Multicomponent Solution Using <i>Fondant</i> as Model System M.B. Queiroz ¹ , I.R.L. Braúna ¹ & T.G. Kieckbusch ² , ¹ CEREAL CHOCOTEC - Instituto de Tecnologia de Alimentos, Italy. ² Universidade Estadual de Campinas, Brazil	
PS 3.03	Influence of Oil Content, Temperature and Steam Pressure on Steam Jet Agglomeration of Maltodextrin Powders P.C. Martins & T.G. Kieckbusch, Universidade Estadual de Campinas, Brazil	
PS 3.04	Snow Granulation by Rotary Snow Plow T. Kobayashi, Nagaoka Institute of Snow and Ice Studies, Japan	
PS 3.05	Energy Input for Disk Granulation A. Heim, R. Kazmierczak & A. Obraniak, Technical University of Lodz, Poland	
PS 3.06	The Effect of Equipment and Process Parameters on Energy Consumption in Drum Granulation A. Obraniak & T. Gluba, Technical University of Lodz, Poland	
PS 3.07	Development of Edible Coatings for Application in Blackberries F.M. Fakhouri, R.C. Monteiro, T.G. Kieckbusch & F.P. Collares, Universidade Estadual de Campinas – UNICAMP, Brazil	
PS 3.08	Model of Tumbling Agglomeration in a Rotary Drum A. Obraniak & T. Gluba, Technical University of Lodz, Poland	
	CHARACTERIZATION	
PS 3.09	Effect of the Mineral Filler on the Surface Properties of Co-Ground Polymeric Composites C. Zapata-Massot & N. Le Bolay, Laboratoire de Génie Chimique – UMR CNRS 5503 – INP-ENSIACET, France	
PS 3.10	Morphological and Mechanical Properties of Instantized Maltodextrins of Different Dextrose-Equivalent Degrees C.Y. Takeiti, T.G. Kieckbusch & F.P. Collares, State University of Campinas, Brazil	
PS 3.11	Physical Properties of Maltodextrins of Different Dextrose-Equivalent (De) and of the Agglomerates Obtained by Steam Jet Agglomeration C.Y. Takeiti, T.G. Kieckbusch & F.P. Collares, State University of Campinas, Brazil	

WEDNESDAY, AUGUST 30, 2006 (continues)

FUNDAMENTALS & MODELING

- PS 3.12 **Particle/Gas Interactions in Taylor/Couette Flow**
A.J. Gyllensten^{1,2}, M.C. Melaen¹, & E. Manger², ¹Telemark University College, Norway. ²Norsk Hydro ASA, Norway
- PS 3.13 **Quasi-Spherical Model for Solid Particle Reaction for Ion Exchange Process**
F. Aurelian, National Institute for Metals and Radioactive Resources-ICPMRR, Romania
- PS 3.14 **Simulator Software Applied to Fluidized Bed Reactor - Serea**
D. Rimoli, D.M. Assis & K. Tannous³, State University of Campinas – Unicamp, Brazil
- PS 3.15 **A Numerical Investigation into the Simulated Packing of Multi-Tubular Catalytic Reactors**
R. Caulkin, M. Fairweather, X. Jia & R.A. Williams, University of Leeds, UK
- PS 3.16 **A Particle Packing Algorithm for Packed Beds with Size Distribution**
G.A. Georgalli¹ & M.A. Reuter², ¹Technical University of Delft, The Netherlands. ²University of Melbourne, Australia

15:50 – 16:20 Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)

16:20 – 18:00 WORKSHOP A9: PNEUMATIC CONVEYING (Sala Ulisse)

CHAIR: F. Rizk, BASF, Germany

Pneumatic Conveying Workshop 7 / International Working Party (IWP)

Theme: Evolution or Revolution in the Two-Phase Flow Gas/Solids

The IWP decided at the '4th International Conference Conveying and Handling of Particulate Solids in Budapest / Hungary in 2003 to tackle the issue: 'Prediction to Design of Full-Scale Pneumatic Conveying Systems on the Basis of Small Product Samples'.

Proposals for discussion:

- Above stated Issue as main Challenge
- 2 Characteristic Models describing the Flow in Pipes
- Parameters Influencing the Two-Phase Flow
- Scale-up Factors
- Why Dimensionless Numbers?
- Data-Base
- Etc.

Other points of interest regarding experiences, observations and maintenance of performing pneumatic conveying systems will be presented and discussed.

16:20 – 18:00 SESSION B9: SIZE ENLARGEMENT (Sala Capri)

CHAIR: M.J. Hounslow, University of Sheffield, UK

16:20 – 16:45 **A Micro-Level Study of the Morphology and Strength of Solidifying Inter-Particle Bridges in a Granule**
G.I. Tardos, The City University of New York, USA

16:45 – 17:10 **Influence of the Bulk Properties on the Design of Roller Press**
P. Müller, L. Grossmann & J. Tomas, Otto-von-Guericke-University, Germany

17:10 – 17:35 **Compaction Properties of Pregelatinized Starch (Starch 1500™): Viscoelasticity and Strain Rate Sensitivity**
S. Toson¹, B.J. Briscoe¹ & K.G. Pitt², ¹Imperial College London, UK, ²Merck Sharp & Dohme Limited, UK

16:20 – 18:00 SESSION C9: COHESIVE POWDERS (Sala Tritone)

CHAIR: D. Barletta, Università degli Studi di Salerno, Italy

16:20 – 16:45 **Mechanics of Particle Adhesion**
J. Tomas, Otto-von-Guericke-University Magdeburg, Germany

16:45 – 17:10 **Steady State Flow of Cohesive and Non Cohesive Powders**
M. Röck¹, M. Morgener¹, J. Schwedes¹, D. Kadau^{2,3} L. Brendel² & D.E. Wolf², ¹Technical University Braunschweig, Germany. ²University Duisburg–Essen, Germany. ³Institute for Building Materials, Switzerland

17:10 – 17:35 **Modification of the Flow Properties of Cohesive Bulk Solids with Surface Active Agents**
M. Schumann¹, D. Höhne², S. Thümmeler² & K. Husemann², ¹Saint-Gobain CREE, France. ²Institut für Mechanische Verfahrenstechnik und Aufbereitungstechnik, Germany

17:35 – 18:00 **Investigation of Bidisperse Powders**
M. Morgener¹, L. Brendel², M. Röck¹ & J. Schwedes¹, ¹Technical University Braunschweig, Germany. ²University Duisburg–Essen, Germany

16:20 – 18:00 SESSION D9: TOMOGRAPHY (Sala Amalfi)

Dedicated in Memory of Prof. Tom Dyakowski
CHAIR: M. Takei, Nihon University, Japan

16:20 – 17:10 **KEYNOTE: Advances in Direct Measurement of Structures and Permeability from 3D Tomographic Imaging**
R.A. Williams¹, X. Jia¹ & C. Selomulya², ¹University of Leeds, UK. ²Monash University, Australia

17:10 – 17:35 **Micro-tomographic Techniques Applied to Particulate Solids Based Products Characterization**
G. Bonifazi, P. Massacci & S. Serranti, Università Degli Studi di Roma "La Sapienza", Italy

17:35 – 18:00 **Measurement of Particle Concentration in Powder Coating Process using Capacitance Computed Tomography**
M. Takei & M. Ochi, Nihon University, Japan

THURSDAY, AUGUST 31, 2006

08:30 – 10:10	PLENARY 3	(Sala Ulisse)
	CHAIR: G.I. Tardos, The City College of the City University of New York, USA	
08:30 – 09:20	Production and Handling of Nanoparticles	
	W. Peukert, University of Erlangen-Nuremberg, Germany	
09:20 – 10:10	Size Enlargement	
	M.J. Hounslow, G.K. Reynolds & M. Oullion, the University of Sheffield, UK.	
10:10 – 10:40	Coffee Break (Citrus Garden) and Exhibition (Foyer Barcaccia)	
10:40 – 12:20	SESSION A10: CAPSULE CONVEYING	(Sala Ulisse)
	CHAIR: Y. Tomita, Kyushu Institute of Technology, Japan	
10:40 – 11:05	Experimental Set-Up and Capsule Feeding System Designed for Spherical Capsule Train Flows	
	D. Ulusarslan & I. Teke, Yildiz Technical University, Turkey	
11:05 – 11:30	Motion of Large Particles in a Horizontal Pneumatic Pipe	
	H. Tashiro ¹ & Y. Tomita ² , ¹ Kurume Institute of Technology, Japan. ² Kyushu Institute of Technology, Japan	
11:30 – 11:55	Comparison of Mathematical Expressions and Experimental Findings for Pressure Drops in the Flow of Low Density Spherical Capsule Train with General Expressions Regarding Spherical Capsule Flows	
	D. Ulusarslan & I. Teke, Yildiz Technical University, Turkey	
10:40 – 12:20	SESSION B10: SIZE REDUCTION I	(Sala Capri)
	CHAIR: F. La Marca, Università di Roma "La Sapienza", Italy	
10:40 – 11:05	An Industrial Perspective on Bulk Solids Attrition in Pneumatic Conveying	
	L. Frye ¹ & W. Peukert ² , ¹ BASF AG, Germany. ² University of Erlangen-Nuremberg, Germany	
11:05 – 11:30	PIV Analyses and CFD Simulations within an Air Classifier Mill	
	P. Toneva, K. Wirth & W. Peukert, Friedrich-Alexander University Erlangen-Nuremberg, Germany	
11:30 – 11:55	DEM Simulation of Particle Breakage due to Fatigue	
	V. Rodnianski, M. Haim & H. Kalman, Ben-Gurion University of the Negev, Israel	
11:55 – 12:20	On Correlation Between the Fraction Balance and Energy Balance in Models of Grinding	
	V. Mizonov ¹ , H. Berthiaux ² & V. Zhukov ¹ , ¹ Ivanovo Power Eng. State University, Russia. ² Ecole des Mines d'Albi – Carmaux, France	
10:40 – 12:20	SESSION C10: MECHANICAL CONVEYORS	(Sala Tritone)
	CHAIR: K. Hoffmann, Vienna Technical University, Austria	
10:40 – 11:05	Coreless Screw "Extraction and Proportioning Machinery" and the Properties of Food Powders: a Cobweb of Interactions	
	J.L. Ilari, ENITIAA, Nantes, France	
11:05 – 11:30	Guidance of a Flat Belt by Angled Pulley Axis	
	M. Egger ¹ , K. Hoffmann ² & A. Pirko ² , ¹ Upper Austria University of Applied Science, Austria. ² Vienna Technical University, Austria	
11:30 – 11:55	Simulation-based Knowledge Acquisition for On-line Intelligent Belt Conveyor Monitoring	
	Y. Pang & G. Lodewijks, Delft University of Technology, The Netherlands	
11:55 – 12:20	Design of a Self-Compensating Soft Loading Hood	
	W. McBride & D. Ilac, University of Newcastle, Australia	
12:20 – 13:20	Lunch (Sala Ginester) and Exhibition (Foyer Barcaccia)	
13:20 – 15:00	SESSION A11: FLUIDIZATION	(Sala Ulisse)
	CHAIR: D. Ulusarslan, Yildiz Technical University, Turkey	
13:20 – 13:45	Solids Motion Analysis in the Jet Region of a Gas Fluidized Bed	
	L. Mirmome & M. Alavi, Iran University of Science and Technology Tehran, Iran	
13:45 – 14:10	Entrainment of Heterogeneous Particles in a Laboratory Scale Fluidized Bed	
	L.A. Obata, M.W. Donida & K. Tannous, State University of Campinas – UNICAMP, Brazil	
14:10 – 14:35	Spouting of Fine Powder by the Injection of Air From Top and Bottom of Powder Bed	
	K. Ogata, Oshima National College of Maritime Technology, Japan	
14:35 – 15:00	Hydrodynamic Parameters of a Solid-Gas Semi-Fluidized Bed	
	Y. Kechroud & K. Allia, University of Sciences and Technology "Houari Boumediene", Algeria	
13:20 – 15:00	SESSION B11: NANO TECHNOLOGY	(Sala Capri)
	CHAIR: W. Peukert, University of Erlangen-Nuremberg, Germany	
13:20 – 14:10	KEYNOTE: Nanomaterials as Flow Regulators in Dry Powders	
	I. Zimmermann, K. Meyer & M. Eber, University of Würzburg, Germany	
14:10 – 14:35	Preparation of Protein Containing Nano and Microparticles	
	T. Feczko, J. Tóth & J. Gyenis, University of Veszprém, Hungary	
14:35 – 15:00	Nanoparticle Structural Organisation and Scaffolding in Organic Media	
	O. Gundogdu ¹ , M. Roso ² , G.C. Stevens ¹ & U. Tuzun ¹ , ¹ University of Surrey, UK. ² University of Padova, Italy	

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13:20 – 15:00	SESSION C11: BELT CONVEYORS	(Sala Tritone)
	CHAIR: J-L. Ilari, ENITIAA, Nantes, France	
13:20 – 13:45	Dynamics of Multiple Driven Belt Conveyor Systems A.J.G. Nuttall & G. Lodewijks, Delft University of Technology, The Netherlands	
13:45 – 14:10	Minimising the Motion Resistances of Belt Conveyors C. Wheeler, The University of Newcastle, Australia	
14:10 – 14:35	Energy Saving Conveyor Belting – Design Considerations, Applications, Experiences M. Keller, ContiTech Conveyor Belt Group, Germany	
14:35 – 15:00	RopeCon – A new long Distance Conveyor Based on Ropeway Technology K. Hoffmann, TU-Wien, Austria	
15:00 – 15:30	POSTER SESSION 4	(Foyer Barcaccia)
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PS 4.01	Experimental Analysis of a Spiral Jet-Mill Performance A. Catz & H. Kalman, Ben-Gurion University of the Negev, Israel	
PS 4.02	Attrition of Particles due to Shear Loads H. Kalman & E. Grant, Ben-Gurion University of the Negev, Israel	
PS 4.03	Modelling of Comminution Rate of Ceramic Body in a Pilot-Plant Ball Mill A. Heim & T.P. Olejnik, Technical University of Lodz, Poland	
PS 4.04	Disintegration of Microorganisms in a Bead Mill M. Solecki, Technical University of Lodz, Poland	
PS 4.05	Analysis of Inhomogeneity Tribles of HST Surface Treated Fillers Production T. Sverak, Brno University of Technology, Czech Republic	
	MECHANICAL CONVEYORS	
PS 4.06	Bulk Solid and Conveyor Belt Interactions in Belt Conveying Systems: Transition Zone D. Ilic, C. Wheeler & A.W. Roberts, University of Newcastle, NSW, Australia	
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PS 4.07	An Investigation of Gas-to-Particle Heat Transfer for Non-Invasive Mass Flow Measurement in Pneumatic Conveying Y. Zheng, J. Pugh & D. McGlinchey & R. O. Ansell, Glasgow Caledonian University, UK	
PS 4.08	Evaluation of an Image Based Bulk Particulate Size Distribution Analyzer S. Al-Thyabat ¹ , N. Miles ² & T. Koh ² , ¹ AL-Hussein Bin Talal University, Jordan. ² Nottingham University, UK	
	FLOW OF POWDERS	
PS 4.09	The Flow and Damping Behaviours of Ultrafine Powders A. Haack, G. Kache & J. Tomas, Otto-von-Guericke-University Magdeburg, Germany	
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	CHAIR: H. Tashiro, Kurume Institute of Technology, Japan	
16:00 – 16:25	Flushing Phenomenon of Fine Powder due to the Head H. Tashiro ¹ , K. Ogata ² , Y. Wakamizu ³ , K. Funatsu ⁴ & Y. Tomita ³ , ¹ Kurume Institute of Technology, Japan. ² Oshima National College of Maritime Technology, Japan. ³ Imaging Company, Nikon Corporation, Japan. ⁴ Kyushu Institute of Technology, Japan	
16:25 – 16:50	Effect of Gas Viscosity and Particle Agglomeration on the Fluidization Behavior of Fine Particles J.M. Valverde & A. Castellanos, University of Seville, Spain	
16:50 – 17:15	Fluidization of Cohesive Particles by Surface Modification Y. Chen, J. Yang, R. Dave & R. Pfeffer, New Jersey Institute of Technology, USA	
17:15 – 17:40	Microstructural Investigations of Nano Particle Fluidisation in Model 2-D and 3-D Beds Using High Speed X-Ray Imaging and Microtomography O. Gundogdu & U. Tuzun, University of Surrey, UK	
16:20 – 18:00	SESSION B12: SIZE REDUCTION II	(Sala Capri)
	CHAIR: A. Heim, Lodz Technical University, Poland	
16:00 – 16:25	Analysis of Soda Ash Comminution using Fatigue Functions L. Berg ¹ , P. Mort ¹ & H. Kalman ² , ¹ Procter & Gamble Co., USA. ² Ben-Gurion University of the Negev, Israel	
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10:40 – 12:20	SESSION C12: FUNDAMENTALS & MODELING	(Sala Tritone)
	CHAIR: L.-O. Heim , Max Planck Institute for Polymer Research, Germany	
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16:25 – 16:50	Handling of Particulate Solids on the International Space Station J. Blum¹, R. Schröpfer¹, T. Poppe¹ & G. Borst² , ¹ Technical University at Braunschweig, Germany. ² Dutch Space B.V., The Netherlands	
16:50 – 17:15	Characterization of Voids in Spherical Particles Systems by Delaunay Empty Spheres S. Rémond, J.L. Gallias & A. Mizrahi , Université de Cergy-Pontoise, France	
17:15 – 17:40	A New Method to Investigate Mechanical Properties of High-Porosity Microscopic Agglomerates L.-O. Heim¹, H.-J. Butt, J. Blum² & R. Schröpfer² , ¹ Max Planck Institute for Polymer Research, Germany. ² Technical University of Braunschweig, Germany	
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	H. Kalman & G. Bonifazi	

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