

# Program

## SOLID-LIQUID SEPARATION SYSTEMS

December 14-19, 2003  
Grand Hotel Pucón  
Pucón, Chile

### Conference Co-Chairs:

Prof. Fernando Concha  
Department of Metallurgical Engineering  
University of Concepción, Chile

Dr. Raimund Bürger  
Institute of Applied Analysis  
University of Stuttgart, Germany

Dr. Karsten Keller  
DuPont, USA.

# ECI

Engineering Conferences International  
6 MetroTech Center  
Brooklyn, NY 11201  
T: 1-718-260-3743 - F: 1-718-260-3754  
info@eci.poly.edu - www.engconfintl.org

Sunday, December 14, 2003

- 04.00 p.m. – 06.00 p.m. Registration
- 06.00 p.m. – 07.30 p.m. Dinner and Welcoming
- 07.30 p.m. – 08.30 p.m. Social Hour

Monday, December 15, 2003

- 07.00 a.m. – 08.15 a.m. Breakfast

**SESSION I: CHEMICAL ADDITIVES**

Session Chair: John Gregory, University College, London, England.

- 08.15 a.m. – 09.00 a.m. **KEYNOTE LECTURE:**  
Graeme Bushell, School of Chemical Engineering and Industrial Chemistry, University of New South Wales, Sydney Australia.  
*Focused beam reflectance measurement as possibility for on-line floc characterization*
- 09.00 a.m. – 09.30 a.m. Cordelia Selomulya, (UK)  
*The use of light scattering and tomographic techniques for the determination of aggregate and sediment properties*
- 09.30 a.m. – 10.00 a.m. Graeme Bushell, (Australia)  
*Forward light scattering to characterise floc structure in the Fraunhofer approximation*
- 10.00 a.m. – 10.30 a.m. M. Hermawan, (Australia)  
*Investigation of sediment compaction behavior through controlled flocculation*
- 10.30 a.m. – 11.00 a.m. Refreshments  
**POSTER SESSION**  
Session Chair: Graeme Bushell, School of Chemical Engineering and Industrial Chemistry, University of New South Wales, Sydney Australia
- 11.00 a.m. – 11.30 a.m. John Gregory, (UK)  
*Formation and breakage of flocs. The role of suspension concentration*
- 11.30 a.m. – 12.00 noon John Farrow, (Australia)  
*The effective use of flocculant in gravity thickeners in the mineral industry*
- 12.00 noon – 12.30 p.m. Birgül Benly Cönül, (Turkey)  
*The relation between the surfactant concentration and the surface charge of clay of clay minerals during vacuum and pressure filtration*

Monday, December 15, 2003 (continued)

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|-------------------------|---|
| 12.30 a.m. – 01.00 p.m. | A.C.Araujo (Brazil)<br><i>Selection criteria for the preparation of pastes from iron ore tailings</i> |
| 01.00 p.m. – 01.30 p.m. | Teresa Castelo-Grande, (Portugal)<br><i>Supercritical extraction of pesticides from soils</i>         |
| 01.30 p.m. – 02.30 p.m. | Lunch   |
| 02.30 p.m. – 07.00 p.m. | <i>Ad hoc sessions / free time</i>  |
| 07.00 p.m. – 08.00 p.m. | Dinner  |
|                         | Session Chair: Wilfred Sturm, General Manager, CIBA<br>Especialidades Químicas Cono Sur, S.A., Chile  |
| 08.00 p.m. – 09.30 p.m. | <b>Round Table on the use of Chemical for Solid-liquid Separation Systems</b>                         |
| 09.30 p.m. – 10.30 p.m. | Social hour   |

Tuesday, December 16, 2003

07.00 a.m. – 08.15 a.m. Breakfast

**SESSION II: PARAMETER DETERMINATION**

Session Chair: Fernando Concha A., University of Concepción (Chile)

08.15 a.m. – 09.00 a.m. **KEYNOTE LECTURE:**  
Peter Scales, (Australia)  
*Flocculation effects on thickening*

09.00 a.m. – 09.30 a.m. Pamela Garrido, (Chile)  
*Parameter determination and numerical simulation for sedimentation-consolidation processes*

09.30 a.m. – 10.00 a.m. Anthony D. Stickland, (Australia)  
*Identification of mutually relevant dewatering parameters across numerous solid-liquid separation processes*

10.00 a.m. – 10.30 a.m. Goetz Bickert, (Australia)  
*The relationship between coal floc micro-properties, filter cake properties and hyperbaric filtration performance*

10.30 a.m. – 11.00 a.m. Refreshments

**POSTER SESSION**

Session Chair: Goetz Bickert, School of Chemical Engineering and Industrial Chemistry, University of New South Wales, Sydney, Australia

11.00 a.m. – 11.30 a.m. Anibal Coronel, (Chile)  
*Determination of flux and diffusion parameters in the mathematical models of sedimentation and centrifugation of flocculated suspensions*

11.30 a.m. – 12.00 noon Paulo A. Augusto, (Portugal)  
*A new magnetic separator and classifier: Improving the environmental and potential applications*

1200 noon – 12.30 p.m. Elías Ovalle (Chile)  
*Wave propagation at the air-water interface of a conical hydrocyclone*

12.30 p.m. – 01.30 p.m. Lunch

01.30 p.m. – 07.00 p.m. *Ad hoc* session /free time

07.00 p.m. – 08.00 p.m. Dinner

Tuesday, December 16, 2003

Session Chair: Peter Scale, Particulate Fluids Processing Centre,  
Univ. Melbourne, Australia

08.00 p.m. – 09.30 p.m.

**Round Table on Parameter determination for Solid-liquid  
Separation Systems**

09.30 p.m. – 10.30 p.m.

Social hour

Wednesday, December 17, 2003

07.00 a.m. – 08.15 a.m. Breakfast

**SESSION III: PHYSICO-MATHEMATICAL MODELING AND SIMULATION OF SOLID-LIQUID SEPARATION PROCESSES**

Session Chair: Katarina Gustavsson, Department of Numerical Analysis and Computer Science, Royal Institute of Technology, Stockholm, Sweden

08.15 a.m. – 09.00 a.m.

**KEYNOTE LECTURE**

Raimund Bürger, University of Stuttgart, Germany  
*A mathematical model and numerical simulations for clarifier-thickener units treating flocculated suspensions*

09.00 a.m. – 09.30 a.m.

Fernando Concha, (Chile)  
*Further development of software for the simulation of batch and continuous thickeners*

09.30 a.m. – 10.00 a.m.

TBA

10.00 a.m. – 10.30 a.m.

Shane P.Usher, (Australia)  
*Steady state thickener modeling from the compressive yield stress and hindered settling function*

10.30 a.m. – 11.00 a.m.

Refreshments

**POSTER SESSION**

Session Chair: Raimund Bürger, University of Stuttgart, Germany

11.00 a.m. – 11.30 a.m.

Giulio Massarani (Brazil)  
*Physical-mathematical modeling of cross-flow filtration*

11.30 a.m. – 12.00 noon

Katarina Gustavsson, (Sweden)  
*Numerical study of a viscous consolidation model*

12.00 noon – 12.30 p.m.

Juan Pablo Segovia, (Chile)  
*New strategies for the control of industrial thickeners*

12.30 a.m. – 01.00 p.m.

Vladimir V. Rumyantsev (Ukrania)  
*Numerical methods for enrichment estimation of H-D-T gaseous mixture filtrated through palladium membrane*

01.00 a.m. – 01.30 p.m.

Eliás Ovalle (Chile)  
*Numerical stability in the solution of the flow in a hydrocyclone*

01.30 p.m. – 02.30 p.m.

Lunch

02.30 p.m. – 07.00 p.m.

*Ad hoc session/Poster Sessions/free time*

07.00 p.m. – 08.00 p.m.

Dinner

Wednesday, December 17, 2003 (continued)

Session Chair: John Farrow, AJ Parker CRC for Hydrometallurgy  
(CSIRO Minerals), Perth, Australia

08.00 p.m. – 09.30 p.m.

**Round Table on Mathematical modeling of Solid-liquid  
Separation Systems**

09.30 p.m. – 10.30 p.m.

Social hour

Thursday, December 18, 2003

07.00 a.m. – 08.15 a.m. Breakfast

**SESSION IV: FLOW THROUGH POROUS MEDIA**

Session Chair: Giulio Massarani, COPPR, UFRJ, Brazil.

08.15 a.m. – 09.00 a.m.

**KEYNOTE LECTURE:**

Pedro Toledo, Department of Chemical Engineering, University of Concepción, Chile

*Pore space microstructure transitions and their relationship to permeability*

09.00 a.m. – 09.30 a.m.

L.A. Segura y P. Toledo (Chile)

*Pore-level modeling of isothermal drying of pore networks accounting for evaporation and viscous flow. Pore shape and size distribution effects on saturation and transport parameters*

09.30 a.m. – 10.00 a.m.

H. Salas y P. Toledo (Chile)

*Pore level mechanisms of drying in etched-glass: micromodels of pore-networks*

10.00 a.m. – 10.30 a.m.

Verónica Soto, P. Toledo y F. Concha (Chile)

*Drying and shrinking of pore networks. Pore-level model of fluid distribution and transport properties*

10.30 a.m. – 11.00 a.m.

Javier Quispe (Chile)

*Permeability of two-dimensional pore networks as a simple geometrical model of compaction decreases porosity: Experiments and Lattice-Boltzmann simulations*

11.00 a.m. – 11.30 a.m.

Refreshments

**POSTER SESSION**

Session Chair: Pedro Toledo, Department of Chemical Engineering, University of Concepción, Chile.

11.30 a.m. – 12.00 noon

G.E.S. Valdao (Brazil)

*Generation and description of capillary ducts in porous media*

12.00 noon – 12.30 p.m.

Pedro Toledo, Díaz, S., Rozas R. y Quispe, J.

*Permeability of two-dimensional pore networks as a simple geometrical model of compaction decreases porosity: Experiments and Lattice-Boltzmann simulations*

12.30 p.m. – 01.00 p.m.

Emilio Cariaga, (Chile)

*Flow through porous media with applications to heap Leaching*

01.00 a.m. – 01.30 p.m.

TBA

01.30 p.m. – 02.30 p.m.

Lunch



Thursday, December 18, 2003 (continued)

02.30 p.m. – 07.00 p.m.      *Ad hoc* sessions /free time

07.00 p.m. – 08.00 p.m.      Dinner

Session Chair: Pedro Toledo, Universidad de Concepción, Chile

08.00 p.m. – 09.30 p.m.      **Round Table on Flow through porous media**

09.30 p.m. – 10.30 p.m.      Social hour

Friday, December 19, 2003

07.00 a.m. – 08.15 a.m.

Breakfast

**SESSION V: OTHER SOLID-LIQUID SEPARATION PROCESSES**

Session Chair: Thomas Friedmann, DuPont Central Research & Development, USA.

08.15 a.m. – 09.00 a.m.

**KEYNOTE LECTURE:**

Karsten Keller, DuPont, Central Research & Development, USA.  
*Separation Processes with decanter centrifuges versus deep bed filter.*

09.00 a.m. – 09.30 a.m.

Wanwilai Kraipech (Thailand)

*Influence of the particle-fluid and particle-particle interactions on the performance of a hydrocyclone*

09.30 a.m. – 10.00 a.m.

Michael Doby and A. Nowakowski W., (UK)

*Numerical prediction of outlet velocity pattern in solid-liquid separators*

10.00 a.m. – 10.30 a.m.

Andrew Nowakowski, Michael Doby, and Paul Grassia (UK)

*Using a Parallel Computer Cluster to Assist in Hydrocyclone Design*

10.30 a.m. – 11.00 a.m.

Refreshments

**POSTER SESSION**

Session Chair: Karsten Keller, DuPont Central Research & Development, USA.

11.00 a.m. – 11.30 a.m.

Thomas Friedmann, (USA)

*Solid-liquid separation challenges in the food industry*

11.30 a.m. – 12.00 noon

Evghenii Maximuk (Moldavia)

*Washing of filtration sediment of drum continuous vacuum filters*

12.00 noon – 12.30 p.m.

General Discussions and Conclusions.

12.30 p.m. – 02.00 p.m.

Lunch and Adjournment