

## CONFERENCE REPORTS

*Gravity Concentration 2004*. Perth, Australia, March 22–23, 2004

This two-day conference on Gravity Concentration, held in Perth, Australia, attracted about 63 delegates from more than 17 countries. Gravity concentration, one of the oldest of the mineral beneficiation methods, has undergone a renaissance over the past 20 years, with a number of new developments involving high G-force devices, jiggling, spiral separators, fluidisation, and lamellae plate separators emerging. In general the aim is to achieve improved separations, and target finer particles, with higher throughputs. The conference attracted most of the major innovators in gravity concentration, industry representatives, and academics. Contributors used the feedback following their presentations to improve their manuscripts for consideration in a Special Issue of Minerals Engineering.

Day one of the conference was concerned with *new technologies* and other innovations, covering the Yang Jig, the Inline Pressure Jig, high capacity Spirals, and the Ludowici MPE Reflux Classifier. The performance of these systems was outlined, together with the underlying mechanisms. A new gas pycnometer developed to replace heavy liquids used in sink–float analysis was also introduced. The robotic device must select one particle at a time, measure its density and locate the particle in the right bin. The role of gravity separation in a new gold recovery process that also employs flotation and leaching was outlined. The Inline Pressure Jig featured in two of the presentations, with a study characterising the water pulse and its effect on process efficiency, and a second on a major installation at the San Rafael plant. The use of polymers to lower the viscosity of magnetite suspensions was discussed.

The second day focussed on *design, optimisation, and enhanced gravity*. Presentations were concerned with similar issues, namely how to generate information in the laboratory to design a new plant, or operate and optimise an existing plant. Examples were given on a test used for Falcon Concentrators, while a new model for predicting gravity recoverable gold was outlined by a project sponsored by Knelson Concentrators. Four applications of a high capacity Kelsey Jig were described. The importance of mineralogical examination in arriving at the ideal flowsheet for oxide minerals was examined. Finally, the application of enhanced, centrifugal gravity concentrators, run in combination with flash flotation to target ultrafine gold, was outlined.

A number of these studies revealed one basic problem, the difficulty in analysing the liberation and recovery of ultrafine minerals during comminution, especially gold at specific particle sizes. This is also an issue when assessing the performance of a gravity concentrator. Below the usual sieve sizes it is necessary to use the Cyclosizer to recover such particles in a laboratory for analysis. Significant correction factors must be

applied, especially when the particles are as dense as gold. Further problems emerge when other lower particle densities are involved. These presentations demonstrated the need to develop analytical techniques to separate these ultrafine particles on the basis of size and density. If this were possible on-line, considerable savings due to lower energy consumption of ball mills, and higher recoveries from circuits would be possible.

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*9th World Filtration Congress*. New Orleans, USA, April 18–24 2004

The 9th World Filtration Congress was organised by The American Filtration and Separations Society (AFS), and is the largest international forum on filtration and separation technologies. This year, the event was hosted in the Hyatt Regency, New Orleans, and over 500 delegates from 34 countries attended the congress consisting of 297 papers in over 60 oral sessions.

About one-third of the papers were on membrane separation, and the remainder covering the other topics of solid/liquid, solid/gas and liquid/gas separation, like filtration, nanotechnology and sedimentation. There were numerous papers on characterisation and modelling, covering techniques like imaging, CFD simulation, tomography, testing, and porometry. Specialist filtration application topics included indoor air quality, reverse osmosis, high temperature filtration, wastewater treatment, bio-filters and enhanced field filtration. Papers varied from the highly fundamental, to presentations about new products by manufacturing companies.

Every day's proceedings were opened with a plenary lecture. Prof. Enrico Drioli of the Institute on Membrane Technology, Italy, outlined the role of membranes on sustainability, in his lecture *Membrane Separations for Process Intensification and Sustainable Growth*. A fascinating talk by Dr. Mike Rocco, of the NSF in the USA, described the remarkable growth and future role of nanotechnology in *The Future of the National Nanotechnology Institute*. He reported that the world-wide expenditure on nanotechnology research and development exceeded \$3 billion in 2003. On day three, Prof. Chi Tien of Syracuse University revisited the old engineering practice of granular filtration.

The guest speaker at the Gala Dinner was E. Robert Baumann (Emeritus Professor at Iowa State University), giving a highly enjoyable trip through filtration history in *Is there a State of the Art in Water Filtration?*

WFC9 was combined with an Exposition featuring over seventy exhibitors of filter manufacturers, design companies and testing agencies. Four short basic and advanced filtration courses were held on the day before the congress, and two post-congress workshops (*Membrane Fundamentals and Applications*, *Membranes for Bio-separation*) were presented afterwards.

The organising committee did a sterling job under its Chairperson, Dr. Wallace Leung, assisted by Dr. George Chase (Co-chair) and Ms. Judy Angelo (Program Coordinator). The technical side was well planned with daily speaker briefing breakfasts, and the presentations mostly ran smoothly without the usual technology problems. The major task of coordinating up to six parallel sessions was well run by

the session moderators. One frustration however, was the absence of interpreter services, making it very difficult to follow some of the foreign delegates.

The World Filtration Congress events are held every four years at various international venues, under the auspices of INDEFI (International Delegation on Filtration Associations). The next World Filtration Congress will be held in 2008 in Leipzig, Germany.

Of course, any conference has its social events as well. Being in New Orleans, spouses enjoyed tours of the famous cemeteries of New Orleans, jazz music tours, city tours and culinary courses featuring Cajun and Creole cooking. Other attractions were the French Quarter Festival, the annual Jazz Festival, and swamp, bayou and river tours. Congress delegates all experienced the well known southern hospitality of Louisiana.

Some of the presentations of the Congress included the following, which may be of interest to readers of this Journal:

*Magnetic separation: from minerals towards bioproducts* by K. Keller, T. Friedmann and C. Hoffmann of DuPont (Karsten.keller@usa.dupont.com);

*Turbo magnetic oil filter-activator "Uragan-M"*, by A. Karabach from Russia (vitytk@uct.ua);

*Filtration of finest ferrous particles in process liquids by high gradient magnetic filtration*, by U. Kohaupt of Steinert GMBH, Germany;

*Effects of electrostatic interactions on small molecule clearance in ultrafiltration*, by J. Shao and A. Zydney of the Department of Chemical Engineering, Pennsylvania State University;

More details about these and other papers can be obtained from the AFS at [www.afsociety.org](http://www.afsociety.org). The official website of the 9th World Filtration Congress may be visited at [www.wfc9.org](http://www.wfc9.org).

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