

CHEMICAL ENGINEERING IN AUSTRALIA

APRIL 2011

NEWS

Produced by Engineers Media, Engineers Australia's publishing company, for the IChemE in Australia and the Chemical College of Engineers Australia. The statements made or opinions expressed in this newsletter do not necessarily reflect the views of Engineers Australia or the Institution of Chemical Engineers in Australia.

EDITOR: Dietrich Georg – dgeorg@engineersmedia.com.au

New research cluster for biofuels

A new research collaboration between CSIRO and four Australian and UK universities to develop biofuels was launched last month in Canberra. The \$8.3 million CSIRO Energy Transformed Cluster on Biofuels will develop new processes using enzyme biotechnology techniques to produce liquid fuels from waste plant feedstocks.

According to the director of CSIRO's Energy Transformed Flagship, Dr Alex Wonhas, sustainable biofuels can significantly reduce emissions from transport, strengthen energy security and create new business opportunities.

Second-generation biofuels that are produced from agricultural waste could potentially be cost competitive with and more sustainable than oil-based fuels, he said.

"As oil supplies decline and petrol prices soar, alternatives such as biofuels could become economically very attractive.

The three-year collaboration between CSIRO's Energy Transformed Flagship and the Australian National University (ANU), RMIT University, the University



CSIRO's Energy Transformed Cluster on Biofuels will develop new processes using enzyme biotechnology techniques to produce liquid fuels from waste plant materials such as wheat stubble.

PHOTO: SHUTTERSTOCK

of Queensland and the University of Manchester in the UK, will deploy cutting-edge biological methods to produce liquid

transport fuels and other valuable chemical products from the cellulose and lignin solids of waste plant material.

Cluster leader ANU Professor Chris Easton said the expertise and complementary skills in the Cluster will combine to develop new processes for generating biofuels in a sustainable way.

"These alternative fuels will be low-carbon because as much carbon will be taken out of the atmosphere when they are produced, as is released back when they are used."

Top chemical engineering departments revealed

University rankings broken down for the first time by subject have revealed that the chemical engineering departments at five Australian universities are among the world's top 50.

They are the chemical engineering departments at the University of Melbourne (ranked in 12th position), the University of Queensland (29), the University of New South Wales (30), the University of Sydney (44) and Monash University (47).

The world's top 10 chemical engineering departments are at the Massachusetts Institute of Technology, University of Cambridge, University of California Berkeley, University of Oxford, Stanford University, University of California Los

Angeles, California Institute of Technology, Imperial College London, Yale University and National University of Singapore.

IChemE qualifications vice-president and head of chemical engineering at the University of Melbourne, David Shallcross said: "Being ranked [12th] in the list is a real morale boost to the department – its academic staff, research higher degree students and of course the undergraduate students. I can imagine my colleagues at other departments will be working to close the gap between us. And we'll be working harder to get into the top 10."

QS launched its first university rankings in 2004.

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Chemeca conference launched

Chemeca 2011, the annual conference hosted by the Institution of Chemical Engineers in Australia (IChemE), Engineers Australia, the Royal Australian Chemical Institute (RACI) and the ICChemE in New Zealand, was officially launched in Sydney on 3 March. It was attended by some 50 guests.

Conference chair Professor Rose Amal outlined some of the highlights of the conference including several distinguished keynote speakers and a special industry leaders session. Among the international keynote speakers will be Sir William Wakeham (UK, incoming president of ICChemE), Bill Hoyle (US, senior investigator, Chemical Safety Board) and Dr Phillippe Tanguy (France, vice-president of the Research Division, Total).

Australian keynote speakers will include Prof Aibing Yu (2010 Ian Wark Medal recipient, NSW Scientist of the Year for 2010 for Engineering, Mathematics, Computer Sciences Category), Prof Hugh Durrant-Whyte (2010



At the launch with conference chair professor Rose Amal (centre front) were (l-r) Ken Mirams, managing director of Dow Chemicals Australia/New Zealand, which is the gold sponsor for the conference; Debashis Raha representing Engineers Australia's College of Chemical Engineers; Dr Gary Bowman, sponsorship committee chair; Jan Althorp, executive director of ICChemE in Australia; and members of the organising committee Dr Gordon Weiss and Emeritus Professor Rolf Prince.

NSW Scientist of the Year) and Dr Bart Follink (chief of Division Process Science and Engineering CSIRO).

For more information on the conference and to register go to www.chemeca2011.com.

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in Australia

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email chemicalcollege@engineersaustralia.org.au

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New catalyst for nanocarbon products

A new process for the production of catalysts used in the manufacture of nanocarbon products has been developed by the US-based operational arm of Australia's Eden Energy.

Eden announced last month that the breakthrough meant major time, cost and output gains in the current high production costs for the catalysts, which are an essential aspect for the production of such nanocarbon products as carbon nanotubes and nanofibres.

The breakthrough was achieved by Eden's Colorado-based subsidiary Hythane Company.

"The new process works for a variety of catalyst compositions, reduces the quantity of chemicals needed, is easily scalable for higher production and eliminates the majority of the time and labor needed for previous catalyst production methods," said Eden's executive chairman Greg Solomon.

"With the new catalyst production process, Hythane Company has reduced the particle size range from approximately 100 micron down to about 1 micron. In addition, the bulk densities of the catalyst powders have been reduced by a factor of about five, an indication of the micro-porous structure and much higher surface area created by the new method.

"In tests to date, catalysts made with the new process have increased both multiwall carbon nanotube production and carbon nanofibres production yields by about 20%," he said.

According to the company, the total production process for the catalyst has been reduced from six steps to two.

Sydney refinery to close

Shell's Clyde Refinery and Gore Bay Terminal in Sydney could be turned into a fuel import terminal under a proposal by the company announced this month.

If accepted by the relevant Shell Australia boards, the proposal would see the end to refining operations at the site.

Shell said the 75,000 barrel per day refinery is no longer competitive against new megarefineries in the region and requires significant investment including a maintenance turnaround scheduled for mid 2013.

It said employees at Clyde and Gore Bay have been informed of the proposal and a period of consultation with them and their representatives will be undertaken before a decision is made on the proposal.

Coal handling and preparation contract

Coal handling and processing specialist Sedgman has won an \$18.5 million design contract for a coal handling and preparation plant (CHPP) at Aston Resources' Maules Creek Project.

The design contract relates to the first phase of the project in the Gunnedah Basin of New South Wales where Aston Resources is preparing to commence operations in late 2012. Maules Creek is one of Australia's largest coal deposits and full production rate from the mine is expected to be 13Mt/a.

Sedgman managing director and CEO Nick Jukes said: "We have already commenced engineering design work and procurement activities for the CHPP and will continue with this work in the coming months, as well as continue with negotiations for the supply, construction and commissioning of the CHPP."

The contract is Sedgman's third significant one this year following a US\$31 million contract at Mongolia's UHG coal mine and a \$145 million coal plant expansion contract with joint venture partner Thiess in central Queensland.



It's not what you know, it's what you don't know

Mechanical Aspects of Centrifugal Compressors
Melbourne 30th-31st April

The Oil & Gas Industry – A Non Technical Overview
Melbourne – 1st June

Practical Aspects of Process Control and Instrumentation
Perth 8th – 10th June

LNG Technical Overview
Brisbane 21st – 22nd July

Control Operation & Design of Reciprocating Gas Compressors
Perth 19th -20th September

Control & Operation of Centrifugal Compressors
Perth 21st – 23rd September

Floating LNG – Production Storage and Re-gasification
Perth 26th – 27th September

Design and Operation of FPSO
Perth 28th – 29th September

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Energy discussion raises heat

Local energy experts sparked a lively debate at the IChemE Energy for the Future seminar in Victoria in February.

Speakers from Greenearth Energy, Esso Australia and TRUenergy shared their views on how Australia will meet future energy demands.

The TRUenergy and Esso representatives were grilled over their use of fossil fuels and questioned on what steps they were taking to reduce their energy footprint. Both said they are also exploring renewable power to meet future energy requirements in a more sustainable way.

TRUenergy generation development manager Geoff Gay explained how the company is currently considering gas, coal and renewables for its 2.7 million customer base in Victoria and New South Wales: "We are also investigating ways to sequester carbon storage from the use of fossil fuels and the huge coal resource in the La Trobe Valley has good storage potential for using coal in a sustainable way.

"Exploring renewables such as wind, solar and geothermal is

under way and we already have a solar flagship The Roaring 40s. The business is currently looking at its existing generation fleet to help address the future challenges it faces, but the issues around carbon tax and policy uncertainty make it hard to commit," he said.

Kerrie-Anne Lanigan, Esso Australia's gas and power marketing director, said the organisation is also exploring economic choices for power generation and investigating how carbon taxes will influence any future decisions: "Natural gas is an attractive choice as it is abundant and a proven technology." She also acknowledged that protecting the environment for future generations is a priority and that improved technology plays a key role in efficiency, expanding supplies and mitigating emissions.

Richard MacRae from Greenearth Energy said the company is focusing on hot sedimentary aquifer geothermal development and is currently operating a small plant in Queensland.

Greenearth Energy is one of Australasia's geothermal exploration and development companies, with interest in the Otway and Gippsland basins of Victoria and also Indonesia.



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Training courses in Australia 2011

Fundamentals of process safety

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29 August-2 September, Melbourne, VIC

Chemical engineering for non chemical engineers

18-20 July, Melbourne, VIC

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11-12 August, Brisbane, QLD

Project engineering - fundamentals of a project lifestyle

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Honorary fellowship to European politician

Jerzy Buzek, the president of the European Parliament and former prime minister of Poland has been awarded an Honorary Fellowship by IChemE in recognition of his contribution to the process industries.

Buzek was presented with his fellowship certificate at a reception in Brussels, Belgium, by IChemE past president and current president of the European Federation of Chemical Engineering (EFCE), Richard Darton.

Buzek graduated from the mechanics and energy division of the Silesian University of Technology in Gliwice, Poland, in 1963 before becoming a scientist in the chemical engineering institute of the Polish Academy of Sciences. He is also an honorary doctor of the universities in Seoul, South Korea and Dortmund, Germany.

He is the author of about 200 research papers and has lectured at the Technical Universities of Silesia and Opole, Poland.

Buzek was founder of the Polonia School of Diplomacy and between 2002 and 2004 was vice-rector of Polonia University.

He served as prime minister of Poland from 1997 to 2001. Since 2004 he has been

a member of the European Parliament, elected with the best result in Poland.

Upon accepting the fellowship certificate, he called for a better synergy between

industry, academia and public authorities and stated that chemical engineers are leaders in the pursuit of solutions to major global challenges.

Top chemical engineers of all time

Fritz Haber and Carl Bosch have been named as the world's most influential chemical engineers of all time by readers of *tce* magazine.

The German duo were responsible for devising the Haber-Bosch process, perhaps the most recognised chemical process in the world, which captures nitrogen from the air and converts it to ammonia for use in fertilisers.

Haber developed a high-temperature high-pressure process to break the triple bonds of atmospheric nitrogen while Bosch was responsible for scaling up the process, finding cheaper ways of producing hydrogen and developing both a new catalyst and reactor which could withstand both the temperature and pressure of the reaction.

The process is still used throughout the

chemical process industries today, 100 years since its inception.

The pair topped a poll in which members of IChemE were invited to vote for the chemical engineers that have most changed the world. They received 24% of the vote.

The poll runner-up was Henry Bessemer, a nineteenth century English engineer. His Bessemer process saw a dramatic cut in the cost of steel.

Other candidates included George Rosenkranz, Luis Miramontes and Carl Djerassi, who were behind the contraceptive pill; Carl von Linde and William Hampson who developed the Hampson-Linde air separation cycle; Csaba Horváth who introduced high-throughput liquid chromatography; and Jasper Kane and John McKeen for scaling up the production of penicillin in the midst of World War II.

2010 Engineers Australia Salary and Benefits Survey

Engineers Australia's 2010 Salary and Benefits Survey, encompassing **447 companies** and over **150,000 Australian engineers**, is our largest engineering employment survey to date. With such a response, this is the essential tool for remuneration – by discipline and grade – in both public and private sectors.

Commissioned by Engineers Australia and conducted by New Focus Research Pty Ltd, the survey delves into HR departments nationwide to provide you with a dependable guide to salary packages.

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www.eabooks.com.au or contact

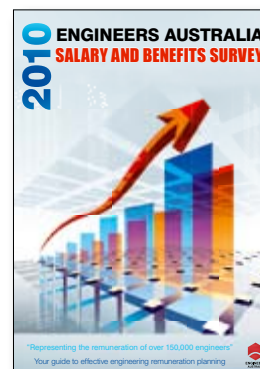
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Early Bird Registration up to 29 July

Keynote speakers will include:

- Sir William Wakeham (UK, Incoming President of IChemE)
- Prof Martyn Poliakoff (UK, University of Nottingham)
- Prof M Flytzani Stephanopoulos (USA, Editor of Applied Catalysis B)
- Bill Hoyle (USA, Senior Investigator, Chemical Safety Board)
- Dr Phillipe Tanguy (Vice-President Research Division, Total, France)
- Dr Jens Rostrup Nielsen (Haldor Topsoe, Denmark)
- Julian Segal (CEO Caltex Australia)
- Prof Mark Biggs (University of Adelaide)
- Prof Aibing Yu (2010 Ian Wark Medal recipient, NSW Scientist of the Year for 2010 for Engineering, Mathematics, Computer Sciences Category)
- Prof Hugh Durrant-Whyte (2010 NSW Scientist of the Year)
- Prof Xungai Wang (Deakin University)
- A/Prof Tim Langrish (University of Sydney, Head of School of Chemical and Biomolecular Engineering)
- Prof Paul Webley (Monash University)
- Dr Bart Follink (Chief of Division Process Science and Engineering CSIRO)
- A/Prof Martina Stenzel (UNSW, LeFevre Memorial Prize winner 2010)
- Em Prof David Wood (President RACI)

There will also be an **Industry Leaders Session** dedicated to addressing key issues facing Australia's future and a more targeted call for industry papers to generate some highly relevant and industry-focused sessions.

A new award will be introduced at CHEMECA 2011

"David Trimm Catalysis Award" for best catalysis student paper submitted to CHEMECA. (Certificate and monetary award of \$1000)

Journal Special Issues

There will be a Special Issues of:

- (1) Journal of Nanoparticle Research on "Nanotechnology on Energy and Environment" for selected papers from CHEMECA 2011
- (2) Advanced Powder Technology
- (3) Asia-Pacific Journal of Chemical Engineering

Contributions to these special issues will be by invitation only based on the quality of the contribution to Chemeca 2011.



This communication is authorised by:

ICMS Pty Ltd, 84 Queensbridge Street, Southbank, Victoria 3006, Australia
 Telephone: +61 3 9682 0244 Fax: +61 3 9682 0288
 Email: chemeca2011@icms.com.au
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CHEMECA

Nominations open for Chemeca awards

The Australian and New Zealand Federation of Chemical Engineering is seeking nominations for the 2011 Chemical Engineering Awards of Excellence from industry, academia and the public sector.

The awards will be presented at Chemeca, to be held in Sydney on 18-21 September. Entries close Friday 27 May.

The awards are:

Chemeca Medal

This is the most prestigious award in the chemical engineering profession in Australia and New Zealand. It is awarded to a prominent Australian or New Zealand chemical engineer who has made an out-

standing contribution, through achievement or service, to chemical engineering in its widest sense and who continues to serve the profession.

Caltex Teaching Award (\$5000 and Certificate)

Recognises outstanding achievements in the teaching of chemical engineers. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The ExxonMobil Award (\$5000 and Certificate)

Recognises significant ongoing contributions to chemical engineering through innovations or a series of related publica-

tions over a number of years. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The Fluor Award (\$5000 and Certificate)

Recognises exceptional management and leadership talent that has directly resulted in a sustained corporate success over a significant period. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The Freehills Award (\$5000 and Certificate)

Recognises innovation in product design or development, or service delivery by a Chemical Engineer from Australia or New Zealand. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The Rio Tinto Award (\$5000 and Certificate)

Recognises outstanding applied Chemical Engineering in the field of mineral processing. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The Uhde Shedd Medal and Prize (\$4000)

Recognises practical services to the profession and to the practice of chemical engineering in Australia or New Zealand. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI and must be under 40 years of age.

The WorleyParsons Award (\$5000 and Certificate)

Recognises personal commitment and leadership by a chemical engineer in the area of safety and/or the environment. The candidate must be a member of Engineers Australia, IChemE, SCENZ or RACI.

The David Trimm Catalysis Award (\$1000 and Certificate)

This new award, to be presented for the first time, will be for the best student paper on catalysis submitted to the conference.

For more information on Chemeca 2011 go to www.chemeca2011.com.

Broadening the horizon of staff recruitment



Looking for staff? Look no further than engteam.com.au

Engineers Australia's official recruitment service, engteam.com.au has been introduced as a leading-edge solution to provide engineering professionals and employers with a cost effective service that semi-automates the recruitment process. It allows employers to source qualified engineering talent quickly at a low cost and gives engineering professionals the opportunity to confidentially search for roles. Offering an efficient alternative to full service recruitment consultants, engteam.com.au is the right choice.

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NOTICES

Prize named after distinguished member

A new prize in memory of former IChemE president and longest-serving member, the late Sir Frederick Warner, will be presented for the first time this year.

The biennial Sir Frederick Warner Prize includes a £1000 cash prize and will be presented to an individual in the early stages of their career who has shown exceptional promise in the field of sustainable chemical process technology, nuclear technology or in making chemical engineering more accessible to a wider scientific community.

Sir Frederick joined IChemE in 1936. He sat on its council from 1948-50, became honorary secretary in 1953 and held the presidency in 1966-67. He was also a founding member of the Royal Academy of Engineering, elected to the Royal Society in 1976 and knighted for services to chemical engineering in 1968.

Sir Frederick was instrumental in the formation of the Royal Academy of Engineering, the creation of the chemical engineering consultancy Cremer & Warner and the investigation of Chernobyl. He was presented with a range of awards and prizes during his distinguished career including the Royal Society's Leverhulme

Medal (1978) and Buchanan Medal (1982), the Rhineland Prize for Environmental Protection (1984) and the Gerard Piel Award for Service to Science in the Cause of Man (1991).

Nominations of no more than 600 words should be made in writing and submitted to medals@icheme.org no later than 31 May. The inaugural prize presen-

tation will take place later this year and the successful candidate will be expected to deliver a related presentation to an audience of invited guests upon receipt of the prize.

The prize is sponsored by URS Corporation and the winner will be determined by the IChemE awards committee in conjunction with the relevant subject groups.

IChemE seeks Australian ChemEnvoys

IChemE is looking for Australia-based members to act as spokespeople for the Institution within their areas of expertise as part of its global communications strategy.

The Institution appointed its first Melbourne-based communications officer in 2010 and new spokespeople are now being sought to help handle the growing number of media inquiries in Australia and New Zealand.

IChemE members of all grades and across all sectors who are keen to register as a spokesperson should contact communications officer Trish Dwyer at tdwyer@icheme.org.

IChemE communications manager Matt

Stalker said: "We have a responsibility to make sure that the vital contributions being made by chemical and process engineers all over the world are properly being communicated with wider society. Being able to explain complex chemical engineering ideas in a simple way is not easy and we rely on member support to do this."

"We are often asked to provide expert comment or analysis immediately or very quickly – this often makes recently retired or self-employed members the best placed people to respond. We can support any volunteers with media training and guidance and we're looking forward to raising the profile of chemical engineers in Australia."

EA BOOKS

www.eabooks.com.au



Biochemical Engineering

Shigeo Katoh, Fumitake Yoshida

\$81.82 + GST = **\$90**

2009 9783527325368 282pp Hardcover

Written by renowned professors drawing on their experience gained in the world's most innovative biotechnology market, Japan, this advanced textbook provides an excellent and comprehensive introduction to the latest developments in the field.



White's Handbook of Chlorination and Alternative Disinfectants, 5e

George Clifford White

\$172.73 + GST = **\$190**

2009 9780470180983

1062pp Hardcover

With extensive updates and revisions, this book reflects the current state of the science as well as the latest practices.



Incidents That Define Process Safety

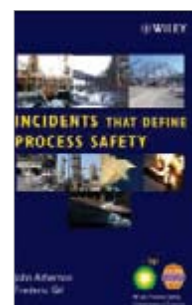
Center for Chemical Process Safety

\$118.18 + GST = **\$130**

2008 9780470122044

336pp Hardcover

This book describes approximately fifty incidents that have had a significant impact on the chemical and refining industries' approaches to modern process safety.



NEW PRODUCTS

The Sitron CF Series of thermal flow switches is suited for flow detection of liquids or gases in pipes or ducts.



Thermal flow switches for liquids and gases

The Sitron CF Series of thermal flow switches from Control Components is suited for flow detection of liquids or gases in pipes or ducts.

With no moving parts to wear out, the units are designed for a long life and low maintenance costs.

The combined flow switch and transmitter is durable, and suitable for general industrial applications and harsh process environments with average response times of between 1s-10s. A display chain of eight LEDs is included to help the set point adjustment.

All models are manufactured from

316 stainless steel and can be coated with Halar when necessary for particularly aggressive mediums.

Standard operating temperatures for the CF 12 Series are between -10°C and 120°C (up to 200°C available upon request), combined with a maximum working pressure of 30,000kPa. Control Components stocks 24V DC and 250V AC powered versions, both of which have 5A 250V AC relay outputs.

The CF Series has excellent low flow sensitivity and is relatively insensitive to dirt and to most particles.

www.controlcomponents.com.au

Decontamination mitt

Enware is introducing to Australasia a toxic chemical decontamination mitt. The Decon Mitt consists of a pouch containing a wipe-down mitt impregnated with decontaminating powder called Fast-Act. A soft pad material is backed on the mitt by a film, to protect the user.

Fast-Act is a non-toxic, non-corrosive and environmentally friendly sorbent that adsorbs a wide range of dangerous toxic substances and neutralises them to safer byproducts. It can neutralise acids, halogens, phosphorus and nitrogen organic compounds.

It provides personal, portable and immediately accessible first-response protection for personnel working far from fixed safety equipment, such as decontamination showers.

The self-contained mitt package is designed to fit comfortably within work garment pockets, or may also be carried or stored comfortably in small spaces.

www.enware.com

Detecting gases

Industrial Scientific has introduced the Ventis MX4 multi-gas detector. It is a lightweight, configurable instrument that is available with or without an integral pump and is compatible with iNet, the company's gas detection service.

The unit detects 1-4 gases, including oxygen, combustible gases (LEL or CH₄) and any two of the following toxic gases: CO, H₂S, NO₂ and SO₂. It is suitable for confined space monitoring and/or continuous personal monitoring in potentially hazardous environments. In confined space applications, the Ventis can be used to draw samples from up to 30m with the integral pump. The gas detector alerts users in dangerous conditions through an audible, visual and vibrating alarms.

Users can choose from a wide range of sensors, batteries, chargers and more. Among the battery options is an extended range lithium-ion battery which enables up to 20 hours of uninterrupted personal monitoring when used without the pump. Colour options are either black or orange.

www.indsci.com

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NEW PRODUCTS

Monitoring tanks

It is now possible to use measurement devices based on impedance tomography to create real-time 3D images from inside the pipelines and tanks used by the processing industries. Finnish company Numcore Oy is applying this technology to concentration plants in the mining industry.

The company's Numcore measurement devices use electric conductivity distribution to monitor the size and quantity of air bubbles and the solid matter content of the froth bed. By supplying a weak alternating current to the electrodes of the sensor, it is possible to measure conductivity differences between the phases, for example for liquids, inside pipelines and tanks, as different substances show different conductivity values. The actual image is created by means of inverse calculation.

Depending on the diameter of the pipeline or tank, Numcore measurement devices are realised either as a flow-through sensor or as a probe-type sensor for installation inside large pipelines or tanks.

The CoreApus flow-through sensor lends itself for analysing material flows inside pipelines of less than one metre in diameter, whereas the probe-type CoreHydra sensor can analyse a larger area of the tank. With several sensors, a large tank or cell can be analysed.

www.numcore.com



Numcore's CoreHydra sensor and its power supply unit can operate in harsh environments. The device pictured analyses interfaces inside a thickening basin.

PHOTO: NUMCORE

Gas chromatography system designed for faster heating and cooling

Agilent Technologies has introduced the Agilent LTM Series II system for gas chromatography, the second generation of its low thermal-mass technology that aims to increase sample throughput using faster column heating/cooling cycles.

The LTM Series II system can use standard Agilent chromatography data system software, including the OpenLAB CDS program.

The Agilent LTM Series II system works with the Agilent 7890A gas chromatograph (GC), but rather than using the 7890A as a conventional GC oven, the columns are wrapped with heating elements and tem-

perature sensors, enabling faster temperature ramp rates and rapid cooling.

The system uses the same injectors, detectors and fused silica columns as the 7890A GC. Agilent Method Translation Software facilitates method changes that can take advantage of faster temperature ramp capabilities for faster chromatographic runs.

The Capillary Flow Technology extends column life by providing a reliable, leak-free backflush function. This protects the column from contamination and further increases productivity by eliminating time-consuming bake out of late eluting compounds. Capillary Flow Technology

can also provide new capabilities in two-dimensional chromatography via simultaneous, independent temperature profiles for each column.

The Agilent LTM Series II system is suitable for hydrocarbon processing, environmental, forensics, pharmaceutical and food/flavour/fragrance analysis applications.

LTM hardware consists of a replacement door for the Agilent 7890A GC containing built-in electronics and slots for up to four LTM column modules. If desired, the 7890A GC can still be used as a conventional oven-based GC.

www.agilent.com/chem/LTM