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## WORLD CONGRESS

The 7th World Congress of Chemical Engineering in Glasgow last month attracted some 1800 delegates from 70 countries. The following articles cover some of the highlights of the four-day event.\*



Dr George Maxwell Richards, a chemical engineer and president of Trinidad and Tobago, stressed the importance of tertiary education in developing countries.

## Trained people are an asset

President of Trinidad and Tobago, Dr George Maxwell Richards addressed the Congress by stressing the importance of tertiary education in developing countries.

A chemical engineer with a doctorate from Cambridge, he was sworn in as president of the Caribbean island state in 2003 for a five-year term.

In his plenary speech he said: "The most important asset a developing country has is its pool of highly-trained people."

Referring to the experiences of South Korea, Malaysia and Singapore, he said investment in science and engineering is

"the critical factor in the transformation process from a small economy to a world-class competitor".

Richards gave the use of natural gas as an example of how engineering can help in this transformation process. Methane was previously considered a useless byproduct of oil drilling and flared at the well. In recent years, however, natural gas has been harnessed. It is now used as a vital raw material in the production of ammonia and methanol, and is also liquefied for export, especially to the US.

He warned academics should not get trapped "in their ivory towers, completely

out of touch with their community".

He pointed to an interesting enrolment statistic in the University of the West Indies, where women outnumber men by 2:1.

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\* Sources for the articles were the IChemE's tce, the Congress website and comments from two Australian delegates.



## WORLD CONGRESS

### Research, energy and education among keynote topics

#### Biotech research

A sceptical public, laborious bureaucracy and inadequate financial support have left Europe trailing behind the US in biotech research into new drug development, warned Ken Wright, chief executive of the centre for excellence in life sciences.

In his keynote address Wright identified cell therapy and nanotechnology as two important areas for development, but he also stressed the importance of partnerships between biotech and pharmaceutical companies.

"The biotech success of the US has been much less compelling in Europe," he said. "There are fundamental differences in funding between the US and Europe. In the US the extra R&D dollars go into an improved asset base, management and marketing. This has been critical for the US companies."

#### Sobering views

In his plenary talk, Oliver Sparrow of the UK Challenge Forum gave a sobering view of the future of chemical engineering. "It is pretty safe to say that 2025 will be more complicated than the present. There will be a vast expansion of knowledge and access to power," he said.

"There will be more graduates in 2025 than there were people in 1900. As a result no idea will last very long, the world will move very fast."

One of the themes of Sparrow's lecture was "more regulation, less innovation". He traced the inverse relationship between the two and suggested that, as industries become more and more afraid of damaging their public image, they will become more conservative.

This is in keeping with his view of the "burden of the elderly", who will form a very important voting block in 20 years' time. A society controlled by older people would be quite "rejectionist", further stifling innovation.

So, despite the large amount of ideas and skilled people in the future, the lot of

the poorest people will not improve very much, if at all. He summed up: "Am I scaring you? Because I should be."

#### Radioactive waste

In his keynote speech, Phil Hallington said chemical engineering skills are vital for treating the UK's legacy of radioactive waste and decommissioning its nuclear powerplants.

Hallington is head of technical waste treatment and external affairs at British Nuclear Group's Sellafield headquarters.

He said the vast majority of the UK's radioactive waste stems from its very early nuclear powerplants, especially the Magnox reactors. Those reactors were not designed with waste minimisation and decommissioning in mind, and the prevalent solution for waste treatment for many decades appears to have been one of "store now, worry about it later".

"At least now that our vitrification plant is finally running at full capacity, we are well under way of dealing with some of those legacy wastes," Hallington said.

Lessons from the past have been very valuable in new designs. For example, the Westinghouse AP1000 reactors create only a tenth of the amount of discharged fuels per gigawatt of power per year than the old Magnox reactors did.

Hallington said there is concern over the disappearing nuclear skill base in the UK. He said the British Nuclear Group is looking at ways to ensure that the existing know-how is at least not lost when engineers retire or change their careers.

#### Energy supply

Royal Dutch Shell exploration head Malcolm Brinded used his plenary session to outline the energy supply challenges facing the world, and how chemical engineers can help.

"There is no silver bullet in sight for this important issue," he said. "We need to employ all we know about existing energy supplies, new and cleaner technologies,

unconventional sources of energy and many other areas if we are to meet the challenge."

Responding to a question from the floor, Brinded acknowledged that renewable energy sources, like wind and solar power, ▶

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## WORLD CONGRESS

would not contribute much to growth in the energy industry over the next 20 years. But he was confident that by 2050, those clean energy sources will play an important part in meeting global energy needs."

Iain Conn, BP director responsible for process technology, in his keynote address, warned that with energy consumption rising at a rate of 4.4%/a (almost half of which is due to galloping demand in China), global energy demand is forecast to rise 60% by 2030. At the same time, the increasing reality of global warming is making it imperative to cut greenhouse gas emissions, putting the focus on new technologies, he said.

"Alleviating global warming will require full cooperation from the G8 – and that is including the US – as well as India and China," he said. To achieve necessary cuts in greenhouse gas emissions while satisfying rising demand for energy means that greenhouse gas emissions per unit of energy will have to be at least halved.

He said while renewable energy will have a very large part to play in future, he was convinced that hydrocarbons are here to stay for some time yet. Coal in particular will see continued interest, he said, especially because it is the one hydrocarbon that is commonly found in the industrialised world. As a result, he predicted that the various hydrocarbon conversion technologies – particularly syngas – will become increasingly important, as will carbon sequestration projects.

"Sequestration and fission must be important options in a low-carbon energy world," he said.

### Food technology

Speaking at the 13th keynote Seligman lecture, Jose Aguilera, food material scientist and professor of chemical engineering at the Universidad Catolica de Chile, called for a multidisciplinary approach that utilises breakthrough technologies, such as nanoscience and

real time imaging, in order to satisfy consumer-driven demand in the food industry.

Aguilera said the main challenge was to find ways of linking product, properties, structure and science. He said the recent trend is to look for continuous and noninvasive techniques, often borrowed from other industries.

He also highlighted the value of going back to nature for answers; for example, membrane emulsification mimics a cow's production of milk.

### Teaching outdated

Ed Cussler, professor of chemical engineering at the Georgia Institute of Technology, posed some difficult questions in his keynote address: is today's syllabus appropriate for the marketplace, and is teaching in the profession at a crossroads?

He said the job market for chemical engineering graduates has changed radically over the past 30 years. In 1975, 80% of ▶

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## WORLD CONGRESS

chemical engineering graduates found employment in the commodities business – base chemicals, and oil and gas for the most part. But today, those fields only provide 25% of chemical engineering jobs. Product-development-type jobs, where the focus is on producing an end product with certain desirable features, rather than making a specific chemical at the lowest possible price, now make up 50% of positions for chemical engineers, while the remainder land in consulting of some form. Despite that change, Cussler said, the syllabus of chemical engineering courses has barely changed since 1975.

"The simpler truth is, there has barely been a single new chemical plant built in

the US over the past 10 years, and there won't be in the next 20 years either," he said. He added the same holds true for any other Western country. "Then why are we continuing to teach our students how to design and run large process plants?"

The need for change is clear to universities around the world. The German chemical engineering establishment is considering splitting the degree into research and applied science streams.

Cussler said in the US the trend is toward moving further into the biochemistry niche. A French university is considering a split between ingredients, colloids, production methods and end-use properties.

## Pleased with Congress

Profs Geoff Barton from the University of Sydney and David Shallcross from the University of Melbourne were impressed by the organisation of the congress and the quality of some of the plenary and keynote speakers.

Barton said there was also a good industry attendance, so it was not only "academics talking to academics".

There were 1800 participants from 70 countries for the four-day event, and 13 parallel sessions each day.

Barton said this was a general conference, as opposed to the many specialised events that are increasingly becoming the norm. It provided an overall perspective of the current state of chemical engineering worldwide and of where it is going.

Shallcross, who was a theme leader on the Technical Program Committee responsible for the chemical engineering education section, was equally pleased. He said there was an excellent trade exhibition, which provided a main focal point.

Monash, Curtin, Adelaide and Queensland universities were also represented at the congress.

The two Australians among the keynote speakers were Profs Matt Trau from the University of Queensland and Jim Petrie from the University of Sydney. Trau spoke on applications of optical bar coding of colloidal suspensions in genomics, proteomics and drug discovery; Petrie's address was on new models of sustainability for the resources sector.



Princess Anne with Congress chairman Prof Colin Grant (l) at the BOC.

## Patron challenges delegates

Princess Anne, the patron of the Congress, addressed the delegates on 13 July.

She said: "We are living through a time of great change and there is no shortage of problems that must be tackled by chemical engineers. Some of these, including climate change and poverty in the developing world, are issues that have

grabbed public attention to a degree that we have not previously seen. I feel that you have a golden opportunity to show the world what you can do in helping to alleviate these problems."

She attended the presentation by the president of Trinidad and Tobago, George Maxwell Richards, and had a 40-minute tour of the exhibition.

## Next Congress

The 8th World Congress of Chemical Engineering will be hosted in Montreal, Canada, in 2009.

The baton was passed to Canada in the closing ceremony of the 7th Congress by congress chairman Colin Grant, who presented the Scottish flag to Philippe Tanguy, from the Ecole Polytechnique Montreal, the organiser of the Montreal event.

The 8th World Congress, to be held on 23-27 August, will incorporate the 59th Canadian Chemical Engineering Conference. Its website is [www.wcce8.org](http://www.wcce8.org).



NEWS

**Woodside expands LNG production**

While work has just started on the expansion of the Northwest Shelf Venture's onshore liquefied natural gas (LNG) facilities at Karratha in Western Australia, Woodside Energy has begun planning a new LNG project in Western Australia, based on its 100%-owned Pluto gas field.

The \$2 billion Phase V expansion project at Karratha will include a fifth train to process 4.2 Mt/a of LNG a year and will increase the plant's capacity to 15.9 Mt/a.

The project is operated by Woodside Energy on behalf of BP, BHP Billiton, ChevronTexaco Australia, MIMI (a company owned by Mitsubishi and Mitsui) and Shell.

The project is expected to take about three years to complete with commissioning due to start in mid-2008 and first LNG cargoes planned from the fourth quarter of 2008.

Woodside's director of Northwest Shelf Ventures, Dr Jack Hamilton, said: "With the assistance of the Industry Capability Network Western Australia, the Venture has developed an Australian Industry Participa-

tion Plan for the project which will ensure local industry has the opportunity to tender on key procurement packages."

"The plan will also allow local suppliers to bid for lower-tier supply chain opportunities," he said.

Australian companies and suppliers without specialist knowledge or with capacity limits will be encouraged to form joint ventures with foreign companies to improve their competitiveness.

Woodside, as Northwest Shelf Venture Operator, will award the engineering, procurement and construction management contract for the expansion project to Foster Wheeler WA and WorleyParsons Services, following a letter of intent agreed between the companies in February.

The Pluto field, which was discovered by Woodside in April in permit WA-350-P, is about 190km northwest of Karratha and 90km west of the Woodside-operated Goodwyn production platform on the

Northwest Shelf.

Woodside's CEO Don Voelte said the company had intensified and accelerated its studies and appraisal program to commercialise Pluto due to a forecast strong LNG demand window opening between 2010 and 2012 in the Asia-Pacific region and in North America.

"Our 100% ownership of the field will enable fast yet rigorous decision making," he said. "We are confident that we have sufficient gas to justify an LNG plant with a capacity of 5 to 7 million tonnes a year."

With a final investment decision planned for mid-2007, LNG shipments could begin in late 2010.

Development options for Pluto include an offshore production platform, an offshore trunkline, up to two LNG processing trains, loading jetty and associated infrastructure.

**Calciners for Gove**

Outokumpu Technology will supply three large calciners with an output of 3500 t/d of alumina for the Alcan Gove Alumina Refinery expansion.

The contract by Alcan Gove Development, a 100%-owned subsidiary of Alcan Inc, has a total value of about \$42 million.

It includes the engineering design of the three calciners, and advisory service for the fabrication, preassembly, erection and commissioning of the two calciners that will be installed in this phase of the project.

This project will make full use of the "Preassembled Module" concept, according to which the equipment is brought to the site in the largest possible modules. Each calciner will be preassembled in Southeast Asia in two modules and shipped to the Gove site.

Each module will include structural steel, mechanical equipment, refractory lining, insulation, vessels, piping, electrical equipment and instrumentation. The larger module will be 22.5m long, 20.5m wide, and 34m high, and weigh 1750t.

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## NEWS

### Powerstation waste turned into fertiliser

Researchers from the CRC for Coal in Sustainable Development have developed a technique to produce “designer” fertilisers from fly-ash, a waste by-product of electricity generation.

“Australia produces 13Mt/a of fly-ash, only 15% of which goes to economic products like cement and concrete. As the cement industry can’t use much more than this, we decided to look for other possible valuable uses,” explained Curtin University of Technology PhD researcher Alex Elliot.

Fly-ash is rich in silicates and it has long been known that treating it with caustic soda produces substances known as zeolites – minerals with a cage-like crystal structure that are widely used as catalysts and cleaners in industry.

Producing zeolites for use in large-vol-

ume applications like agriculture has benefits such as protecting water quality, saving nutrients and improving food output from fertiliser use. While turning fly-ash to zeolite is not new, Elliot said, not all fly-ashes return favourable yields of zeolite.

Elliot and his supervisor at Curtin University, Prof Dong-ke Zhang, have devised a process that produces “designer” zeolites more suited for trapping nutrients such as nitrogen and potassium, and releasing them as plant growth requires.

“It’s based on an equilibrium reaction with the nutrients in the soil. As these are taken up by the crop and their levels in the soil decline, the zeolite releases more nutrient. It works the other way too: if nutrient levels are too high, the zeolite absorbs them and holds them till needed,” Elliot

said.

“Up to three quarters of Australia’s \$2 billion fertiliser bill flushes right through the soil without benefiting the crop. This wastes money and creates pollution and blue-green algae problems when it leaks into rivers, lakes and estuaries. Excess nutrients have also been implicated in the decline of some of Australia’s coral reefs.

“By keeping the nutrients close to the crop roots and releasing them only as needed, we hope we can save a lot of fertiliser and prevent it from causing unwanted downstream effects.”

The new process could also turn a major cost to the power industry – the disposal of waste fly-ash – into a source of income, helping to keep down the cost of electricity to consumers.



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## NEWS

### Screen for hot slurry in cold climate

One of the largest screens in the world, a flat deck screen with a mass of nearly 60t, was shipped from Australia to Canada earlier this year, for use in an oil sands operation. The material screened is a 70°C corrosive slurry of hot water and very abrasive oil sand.

Powered by six Schenck DF601V exciters, the screen measures 4m by 9.6m.

Built by Schenck Australia in Sydney it is installed on an existing isolation frame and uses an existing dual output gearbox and motor to drive two rows of exciters. It receives up to 10,000t/h of solid feed, which includes large frozen lumps up to 1m in size.

The oil/sand material contains up to 15% bitumen and is very variable in its handling properties – depending on the bitumen content, geological properties and seasonal conditions. The properties range from free-flowing, frozen-lumpy to a cohesive mat that is difficult to break up. The raw feed is mixed with up to 2000t/h of hot water, for processing.

The deck is a thick, heavy-duty screen surface, with a combination of tungsten carbide and chromium carbide coatings, overlaid on a heavy steel backing. The screen will operate outdoors, exposed to ambient temperatures ranging from -45°C to +35°C.

Special materials and construction methods were used to cope with the extremely cold environment and unusual process requirements of high temperature corrosive liquid.

### Go-ahead for Gorgon

Western Australian premier Geoff Gallop has welcomed the announcement of the go-ahead for the next phase of the proposed Greater Gorgon development.

“The project involves an investment of \$11 billion and has the potential to be Australia’s biggest ever industrial project, providing gas to Australia and the world,” he said.



*Built in Australia, this large screen is now installed at an oil sands operation in Canada.*

Perth will be the focus for upstream work for the front end engineering and design phase being carried out by a joint venture involving J P Kenny and Technip.

The premier said the downstream con-

tractor, Kellogg Joint Venture – Gorgon, has established its project management office in Perth and will conduct the civil, marine engineering and procurement work in Perth.

### Happy birthday mineral flotation

One of the world’s most commonly used mineral processes – froth flotation – is celebrating its centenary.

According to popular belief the mineral flotation process was first discovered and used successfully at Broken Hill in 1904 by Guillaume Delprat, although the patent was contested by Melbourne brewer Charles Potter.

A gathering which included engineers, researchers and academics celebrated this Australian milestone in Brisbane in June.

Emeritus Prof Alban Lynch, founding

director of the Julius Kruttschnitt Mineral Research Centre (JKMRC) of the University of Queensland, presented the history of the flotation process.

JKMRC, which has been carrying out research into flotation for more than three decades, presented its recent developments in this field.

There have been several scientific breakthroughs, such as identifying “bubble surface area flux”, recognising froth recovery, developing new models and instruments and coming up with a flotation simulator.



## CONFERENCES SEMINARS EXHIBITIONS

For a comprehensive list of upcoming engineering events, visit Engineers Media's fully searchable continuously updated events database.

[CLICK HERE TO VISIT THE DATABASE](#)

### Chemical Engineering

**Conference: Chemeca 2005: Smart solutions – doing more with less** Brisbane 25 Sept (4 days). *Inquiries:* ICMS Pty Ltd 07 3844 1138, fax 07 3844 0909, email chemeca2005@icms.com.au, web www.icms.com.au/chemeca2005

### Computing

**Courses: Matlab fundamentals** Melbourne 22 Aug (2 days), Sydney 12 Sept (2 days); **Simulink modelling** Melbourne 24 Aug (2 days), Sydney 14 Sept (2 days). *Inquiries:* Ceanet 1800 628 320, email info@ceanet.com.au, web www.ceanet.com.au

**Course: Reliability data analysis and maintenance optimisation** Melbourne 19 Sept (4 days). *Inquiries:* Advanced Technology Training 03 9686 8081, fax 03 9694 1020, email info@attraining.com.au

### Control

**Workshop: Tuning of industrial control loops** Sydney 26 Sept (2 days), Melbourne 29 Sept (2 days). *Inquiries:* Bethany France, IDC Technologies 02 9957 2706, fax 02 9955 4468, email register@idc-online.com, web www.idc-online.com

### Education

**Conferences: ASEE international colloquium of engineering education; Annual conference of the Australasian Association for Engineering Education; Australasian women in engineering forum; YEA national summit** Sydney 26 Sept (4 days). *Inquiries:* Sally Brown email sally.brown@uq.edu.au, web www.gcee2005.com

### Energy

**Meeting: Energy law forum** Thredbo Valley 22 Aug (2 days). *Inquiries:* Informa Australia Pty Ltd 02 9080 4307, fax 02 9290 3844, email registration@informa.com.au, web www.ibcoz.com.au

### Engineering – Other

**Conference: Sustainable futures and resilient communities: Courageous conversation between policy, industry and community** Binna Burra 22 Aug (5 days). *Inquiries:* Sally MacKinnon, Gondwana Centre 07 5533 3646, email safehaven@austarnet.com.au, web www.gondwanacentre.org.au

**Conference: EMAC2005: Engineering mathematics and applications conference** Melbourne 25 Sept (4 days). *Inquiries:* web www.ma.rmit.edu.au/emac2005

### Hazard and Risk

**Workshop: Hazardous areas simplified** Melbourne 29 Aug (2 days), Whyalla 12 Sept (2 days), Adelaide

15 Sept (2 days). *Inquiries:* Colin Baker, Explosion Protection Technology 03 9707 3110, email colin@eptech.com.au, web www.eptech.com.au

### Management

**Courses: Project management** Darwin 24 Aug (2 days), Hobart 31 Aug (2 days); **Stormwater management (WSUD)** Brisbane 1 Sept (2 days), Sydney 15 Sept (2 days), Adelaide 22 Sept (2 days); **Contract management** Darwin 22 Aug (2 days), Hobart 29 Aug (2 days); **Power system design principles** Sydney 25 Aug (2 days); **Risk management** Adelaide 25 Aug (2 days), Perth 21 Sept (2 days); **Negotiation skills** Perth 30 Aug (2 days), Sydney 13 Sept (2 days); **Mentoring** Perth 1 Sept, Canberra 7 Sept, Sydney 15 Sept; **Strategy performance management** Perth 1 Sept (2 days); **Legal and professional liability** Brisbane 7 Sept (2 days); **Writing winning technical documents** Adelaide 13 Sept (2 days); **Protection systems, motor starters and power quality** Sydney 22 Sept (2 days). *Inquiries:* Frank Martinelli, Engineering Education Australia 03 9326 9777, fax 03 9326 9888, email frankm@eeast.com.au, web www.eeast.com.au

**Courses: Contract administration** Townsville 30 Aug (2 days), Darwin 14 Sept (2 days); **Preparing specifications and scopes of work** Brisbane 6 Sept. *Inquiries:* Contract Control International 07 3236 1936, fax 07 3236 2064, email ann.winzar@ccintl.com.au

**Course: Advanced SPC for problem analysis** Melbourne 29 Sept (2 days). *Inquiries:* Centre for Learning email info@centreforlearning.com.au, web www.centreforlearning.com.au

### Minerals Processing

**Courses: Practical application of flotation** Perth 29 Aug (2 days); **Separation processes** Perth 12 Sept (2 days); **Separation processes (advanced)** Perth 15 Sept (2 days). *Inquiries:* web www.scieng.murdoch.edu.au/mineral

### Process Engineering

**Course: Practical aspects of process control and instrumentation** Perth 29 Aug (3 days). *Inquiries:* Rebecca Coen, ESD Simulations 08 9367 1844, email rebecca.coen@esd-simulation.com, web www.esd-simulation.com

### Project Management

**Course: Prince for practitioners** Sydney 23 Aug (4 days), Canberra 13 Sept (4 days), Melbourne 20 Sept (4 days), Sydney 27 Sept (4 days). *Inquiries:* Codarra Advanced Systems 02 6264 0100, fax 02 6264 0199, email information@codarra.com.au, web www.codarra.com.au

**Conference: Project management Australia conference (PMOz)** Brisbane 30 Aug (3 days). *Inquiries:* web www.pmoz.com.au

**Seminar: Taking control: Managing projects effectively** Sydney 1 Sept (2 days), Perth 8 Sept (2 days), Brisbane 15 Sept (2 days), Adelaide 29 Sept (2 days). *Inquiries:* PSMJ Resources 03 9686 3846, fax 03 9699 6171, web www.psmj.com

### Systems Engineering

**Courses: Prince2 project management methodology** Melbourne 13 Sept (3 days); **Prince2 revision and practitioner examination** Sydney 25 Aug, Canberra 22 Sept; **Life cycle costing in project management using Pipercope System Analysis and Microsoft Project** Canberra 26 Aug (3 days), Sydney 29 Aug (3 days); **Systems engineering** Sydney 29 Aug (5 days), Adelaide 26 Sept (5 days). *Inquiries:* Project Performance International 03 9876 7345, fax 03 9876 2664, email taa@taa.com.au, web www.taa.com.au

**Course: Systems thinking and modelling** Canberra 26 Sept (3 days). *Inquiries:* UNSW@ADFA Business Services 02 6268 8135, web www.unsw.adfa.edu.au/bdo/short\_courses/index.html

### Water

**Course: 1st geochemical and reactive transport modelling** Brisbane 29 Aug (5 days). *Inquiries:* Trevor Pillar, Centre for Groundwater Studies 08 8201 5632, fax 08 8201 5635, email trevor@groundwater.com.au, web www.groundwater.com.au

## OVERSEAS

### Biotechnology

**Exhibition: Biotechnica Asia** Hannover, Germany 18 Oct (3 days). *Inquiries:* Hannover Fairs 02 9280 3400, fax 02 9280 1977, email info@hannoverfairs.com.au, web www.hannoverfairs.com.au

### Chemical Engineering

**Symposium: 16th international symposium on industrial crystallisation** Dresden, Germany 11 Sept (4 days). *Inquiries:* VDI-Society for Chemical and Process Engineering +490 21162 14640, fax +490 21162 14575, email kundencenter@vdi.de, web www.isic16.de

### Petrochemicals

**Conference: 2nd petroleum and chemical industry conference** Basel, Switzerland 26 Oct (3 days). *Inquiries:* VDI-Society for Chemical and Process Engineering +490 21162 14640, fax +490 21162 14575, email kundencenter@vdi.de, web www.isic16.de



## NEW PRODUCTS

### Aseptic filler for milk products

A Krones volumetric filler developed specifically for aseptic filling of milk products is being introduced to Australia by J L Lennard.

Designated the VODM-PET filling system – for UHT milk and milk-based mixed drinks in PET – it enables the volume of product being handled to be precisely specified by an inductive flowmeter.

Krones builds the VODM-PET filler with six diameters, from 1800mm to 4320mm, for 50 to 120 valves.

In line with the dairy industry's stringent requirements for hygiene, the filler features a reduced number of function valves, making it easier to clean as a result.

The machine's isolator design presupposes sterilisation of all components inside it and of inflowing media and packaging components.

• *More information? Qikreply 17*

### Heat transfer software

Palmer Technologies has introduced P-Thermal, a 1D transient heat transfer software program for engineers in the refractory, ceramics, concrete, lime, minerals, petrochemical and petroleum industries.

P-Thermal provides a fast estimate of the temperature profile for multilayered walls, ducts, pipes, floors and roofs under a range of conditions. It can operate in either imperial or SI units.

The user interface for P-Thermal is easy to navigate. Material types, properties and dimensions as well as the temperatures and model time-frames can all be simply entered into the screen.

Thermal conductivities of materials can be entered as functions of temperature or as constant values and adjusted to the type



*This volumetric filler comes in six diameters with up to 120 valves.*

of gaseous environment and initial moisture content. Material properties are entered by the user, allowing either material supplier datasheets or analysis results to be used.

The software automatically calculates conduction, radiation and convection for each increment based on changes in temperature and material properties. Both natural and forced convection are calculated, based on Nusselt number correlations, which can be found in

Incropera & DeWitt (1996). Thus, the coefficients are determined for the bulk gas conditions on both hot and cold sides.

Temperature results are available in both graphical and numerical form. Graphical form is useful for obtaining a general overview of the operating conditions, while numerical values are useful where precise data or further calculations are required. The heat loss (in W/m<sup>2</sup>) is also provided in tabular form.

• *More information? Qikreply 16*

### Welding wire for duplex steels

Sandvik has developed an enhanced MIG (metal inert gas) welding wire for duplex steels.

Designated Sandvik 22.8.3.LSi, the wire is for welding duplex stainless steels such as grade UNS S31803/S32205 (Sandvik SAF 2205), UNS S32304 (Sandvik SAF 2304), and UNS S31500 (Sandvik 3RE60).

The company said the high deposition rate MIG welding process is particularly suited to applications such as welding oil and gas pipelines. It said its new consumable also provides good arc stability, little spatter and a smooth transition between weld and parent material.

• *More information? Qikreply 20*



### NEW PRODUCTS



Illustration of the Flexi-Drive system which can remotely operate valves in inaccessible or hazardous locations.

### Remote operation of valves

The Flexi-Drive from Smith Flow Control Ltd is a cable-driven remote operator for valves in inaccessible or hazardous locations. The company said the system can transmit drive to valves as far as 60m away, accommodating 540 degrees of bends in the cable run.

The Flexi-Drive consists of three elements: an operator station (with a geared handwheel and mounting facility), a valve station actuator, and a "continuous loop" helix drive cable. Due to the strength and flexibility of the steel cable, turning the handwheel of the operator station simultaneously operates the valve actuator.

The drive is available in a range of reduction ratios, including 4:1, 2:1 and 1:1.

The gearing system can be "piggy-backed", allowing more than one valve to be operated from a single operator station.

The drive can operate at temperatures from -54°C to 200°C and will work under water to a depth of 15m.

It is available in Australia through Fortress Systems, of Braeside, Victoria.

• More information? Qikreply 18

### Fittings for tubes

SMC is marketing the KQG range of 316 stainless steel one-touch fittings. The range includes various fitting types such as male connector, male elbow, hexagon socket head male connector, straight union, union elbow, male branch tee, union tee, union Y, and bulkhead union. Totally grease-free, all parts of the fittings, except the FKM seals, are made of stainless steel 316.

The fittings can be used with air, water or steam with different types of tubes including FEP, PFA, nylon, polyurethane, or polyolefin. For all fittings, an outside tube diameter of 4mm, 6mm, 8mm, 10mm or 12mm can be accommodated.

Proof pressure of the fittings is 3MPa with an operating pressure range of -100kPa to 1MPa.

According to SMC the KQG range can operate in temperatures between -5°C and 150°C, and is suitable for sensitive food, packaging, beverage and pharmaceutical applications.

• More information? Qikreply 19

### Nozzle for tank cleaning

Spraying Systems is offering Rokon fluid-driven nozzles suitable for tank cleaning. The nozzles are available in sanitary 3-A standard versions for CIP duty.

European ATEX standard versions can also be supplied for explosive environments.

The company said spray coverage is 360 degrees and tanks to a diameter of 3.7m can be cleaned by an individual nozzle.

It said the nozzles minimise fluid consumption and rotate at near constant speeds in the range of 2rpm to 30rpm.

The nozzles are suitable for tanks with minimum openings of 32mm and can be selected from four capacity sizes to provide flow rates to 128L/min and operating pressures to 1.6MPa (16 bar). Operating temperatures are up to 150°C.

• More information? Qikreply 21

For more information on any of these products, send an email to [ithomas@engaustr.com.au](mailto:ithomas@engaustr.com.au) with the subject headline "CEA Qikreply". Your contact details and the Qikreply number of the product should be included in the body of the email.