

CHEMICAL ENGINEERING IN AUSTRALIA

FEBRUARY 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.

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Senator Kim Carr (second from right) with (l-r) RACI president Professor David Wood; IYC 2011 Australia convener Dr Vickie Gardiner and chief scientist for Australia Professor Penny Sackett at the Australian launch of the International Year of Chemistry in Canberra.

International Year of Chemistry launched

Chemistry plays a major role in Australia's well-being and it impacts on people's daily lives, according to federal innovation minister Senator Kim Carr.

Speaking at the official Australian launch of the International Year of Chemistry at Parliament House in Canberra on 8 February, he said: "We are determined to give our chemists the support they need to excel, and encourage the next generation to follow in their footsteps. Science and innovation are the keys to a strong economy, a healthy environment, and a better future for all Australians."

Also speaking at the function, chief scientist for Australia Prof Penny Sackett said science and technology would play a crucial role in developing solutions to national issues ranging from the environment to economics.

IChemE in Australia is a supporting

partner of the Royal Australian Chemical Institute's (RACI) IYC2011 activities. The Australian calendar of events includes a national tour, travelling exhibitions, a Marie Curie lecture series and the RACI national awards for chemistry. Speaking at the launch, IChemE in Australia executive director Jan Althorp said: "IChemE has forged a strong relationship with the Royal Australian Chemical Institute over the years and is looking forward to supporting the IYC2011 events and activities throughout the year."

The IChemE is supporting the IYC internationally. CEO David Brown said the year provides an opportunity to raise the public profile of chemical engineering: "Chemistry is at the heart of almost every aspect of daily life and industry. But chemical engineers are the people who translate the science into the products and services

that create prosperity, take care of our environment and sustain our quality of life. "IYC2011 is a fantastic opportunity to celebrate the work of chemists and chemical engineers and to encourage the next generation to make the most of the opportunities that these fields offer," he said.

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NEWS

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Ferrotungsten plant nears completion

Perth-based ferroalloy producer Hazelwood is playing a role in the construction of what it calls the largest ferrotungsten refinery outside of China. The Asia Tungsten Products Company (ATC) ferrotungsten refinery, which is located near Vihn Bao in Vietnam, is nearing completion, with commissioning activities about to commence.

“The ATC Ferrotungsten Project is getting ready to make metal. The main furnace building is nearly complete and mechanical installation commenced during December. Our team of furnace installation engineers are currently completing mechanical and electrical installation,” said Hazelwood managing director Terry Butler-Blaxell.

“Mechanical commissioning activities will commence this quarter. Electrical commissioning and first metal production is expected shortly afterwards,” he said.

Stage one of the ATC Ferrotungsten Plant has a nameplate capacity of approximately 4000t/a of ferrotungsten alloy, equivalent to 3000t/a of contained tungsten (at 75% minimum tungsten content). A second stage would have sufficient capacity to supply around 25% of the world’s ferrotungsten.

Hazelwood obtained a 60% interest in



Ferrotungsten crushers will be installed in this furnace hall.

ATC last May, the remaining share being held by representatives from the Chinese tungsten and ferroalloy industries. The company plans to vertically integrate the ATC refinery with its Australian tungsten projects to decrease the reliance on third party feedstock. The Western Australia-based Big Hill tungsten deposit, which is 100% owned by Hazelwood, is expected to provide two-thirds of the feedstock for the project.

“The long-term success of our business hinges on the development of Big Hill,”

said Butler-Blaxell.

“We aim to bring Big Hill into production by 2013 to secure our supply chain and complete the vertical integration. Our vertical integration strategy allows us to mine and extract lower grade ore, maximising the utilisation of the resource.”

Hazelwood contributed 60% of the capital cost for construction, and will provide 100% of the working capital required for production as a loan to the ATC joint venture. Total capital cost for the construction of the project is a little over \$11 million.

IChemE
in Australia

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College contact: **David McCarthy**
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email chemicalcollege@engineersaustralia.org.au

NEWS

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Acquisition of Australian process business

Aker Solutions has signed an agreement to transfer ownership of a number of its operations within its process and construction business area to Jacobs Engineering Group Inc.

Jacobs is one of the world's largest and most diverse providers of technical, professional and construction services.

Included in the transaction is Aker Solutions Australia, which

has operations in Melbourne, Adelaide, Perth and Brisbane.

“With the broader resource base and deeper service offerings resulting from this integration, we can bring even greater services and support to our clients,” said Tom Quinn, the company's regional senior vice-president for Australia and Asia-Pacific.

The acquisition is subject to the relevant regulatory approvals and the parties aim to complete the transaction early this year.



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

Control Operation & Design of Reciprocating Gas Compressors

Perth 28th February - 1st March

Melbourne 7-8th March

Brisbane 4-5th April

Control & Operation of Centrifugal Compressors

Perth 2nd - 4th March

Melbourne 9th - 11th March

Brisbane 6th - 8th April

Subsea Systems

Perth 14th - 15th March

LNG Technical Overview

Perth 16th - 17th March

Brisbane 21st - 22nd July

The Oil and Gas Industry – A Non-Technical Overview

Perth 1st April

Melbourne 1st June

Practical Aspects of Process Control and Instrumentation

Perth 8th - 10th June

DAREN REID +08 9355 5599 DAREN.REID@ESD-SIMULATION.COM

www.esd-simulation.com

Take part in salary survey

IChemE members are invited to participate in an online salary survey, which closes at the end of this month. All members should have received a link to it. Those who haven't received the link can contact IChemE communications manager Matt Stalker at mstalker@icheme.org.

The survey data is used to update the IChemE salary calculator. IChemE members can access the 2010 salary calculator by going to www.icheme.org/salariesurvey.



Training
courses in
Australia
2011

HAZOP study for team leaders and team members

6-8 April, Melbourne, VIC

7-9 June, Perth, WA

Fundamentals of process safety

16-20 May, Brisbane, QLD

29 August-2 September, Melbourne, VIC

Chemical engineering for non chemical engineers

18-20 July, Melbourne, VIC

Introductory HAZOP

11-12 August, Brisbane, QLD

Project engineering - fundamentals of a project lifestyle

26-28 October, Perth, WA

For further information
austcourses@icheme.org
icheme.org/shop

IChemE
in Australia

NEWS

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Improving thickener efficiency

The international supplier of thickeners to the minerals processing industry Outotec has been developing a new technology to improve the efficiency of the thickening process. The technology is known as shear-enhanced Thickening (SET).

First full-scale applications have shown extremely promising results, according to Chad Loan and Ian Arbuthnot, who have prepared a paper on the technology.

Loan is a thickening specialist with the company's Global Thickener Technology Group and Arbuthnot is director for special projects based in Perth.

"Within the body of the thickener tank, several zones or layers of varying aggregate composition and suspension density exist," they explain in their paper.

"It is conventionally considered that to achieve an appropriate underflow density, the free settling, hindered and networked zones should be largely undisturbed. As the pulp bed increases in depth, it becomes increasingly difficult for released liquid to permeate through the pulp bed.

"Dewatering pickets mounted to the rake arms aid removal of such liquid and pickets are typically arranged at equally spaced intervals to produce dewatering channels. It has also been found that the



Chad Loan (l) is the technology sales manager for thickeners and Ian Arbuthnot the director for special projects with Outotec in Perth.



rotation of the rake assembly with pickets increases the possibility of pulp bed rotation, which is also known as donutting or islands," they say.

Following previous studies of applying shear to the hindered settling zone to increase sedimentation rate and compressive yield stress of the pulp bed, Outotec carried out further modelling and investigative testwork. Tests were carried out on a range of materials, however their paper specifically discusses gold tailings and mineral sands slimes. The development has now moved into full-scale installations.

"Experimental investigations of the theories have resulted in some remarkable outcomes," the authors say. "Standard results from high rate test work shows a drop in underflow density with increasing flux rates.

"When SET is applied, the underflow densities remain and also, in some circumstances, increase significantly at up to three times the flux rate, having major implications on thickener design, specifically footprint reduction."

For more information contact chad.loan@outotec.com.

HAZOP COURSES

Orica – 2011 Course Schedule

| | Sydney | Brisbane | Melbourne | Adelaide | Perth |
|--------------|-------------|-------------|-------------|---------------|-------------|
| Basic HAZOP | 3 & 4 May | 3 & 4 May | 10 & 11 May | 15 & 16 March | 24 & 25 May |
| | 18 & 19 Oct | 8 & 9 Nov | 16 & 17 Aug | 13 & 14 Sept | 22 & 23 Nov |
| HAZOP Leader | 10 & 11 May | 5 & 6 May | 12 & 13 May | 17 & 18 March | 26 & 27 May |
| | 25 & 26 Oct | 10 & 11 Nov | 18 & 19 Aug | 15 & 16 Sept | 24 & 25 Nov |

These popular and highly respected 2 day courses are now in their 21st year. If desired, courses can be run in-house and customised to meet your requirements. For further information please contact:

Brisbane/Perth: Dean Shewring (02) 9913 7284, Sydney: Karin Nilsson (02) 9427 7851
Melbourne/Adelaide: Myrna Hepburn (03) 9527 1037

NEWS

Rare earths project takes another step forward

Infrastructure company Parsons Brinckerhoff has entered into a contractual agreement with Australian rare earths company Arafura to create a larger integrated client team to address the engineering aspects of the Bankable Feasibility Study (BFS) for Arafura's Nolans project.

The Nolans Project is an Arafura-initiated venture which is aimed at tapping the phosphate-hosted rare earths deposit contained within the Nolans bore mine in the Northern Territory. Mineral concentrate from the mine will be transported in purpose-built containers along the Darwin-Adelaide rail line for chemical treatment at the Whyalla rare earths complex in South Australia. Annual produc-

tion of 20,000t of rare earth oxides from the Whyalla complex, equivalent to about 10% of the world's supply, is scheduled to begin in 2013.

With the company's recent decision on the Whyalla site location for its rare earths complex, Arafura representatives reported the BFS is scheduled for completion later this year. According to Arafura, the remaining engineering work on the BFS will gather all previous bodies of work and finalise the engineering and project definition to a level where the information will be ready for project financing.

Arafura will be approaching first tier process consulting/engineering, procurement and construction management

(EPCM) organisations to complete the study program as their study contractor, while Parsons Brinckerhoff will help manage the study contractor for the final phase of the study.

"With the announcement of Whyalla as our preferred location for the rare earths complex, we now have a clear business model where we will add value to the Nolans resource in Australia and produce rare earth oxides for users worldwide," said Arafura managing director and CEO Dr Steve Ward.

"We recognise that we need to supplement our existing team with appropriate skills to ensure we deliver the Nolans project to plan."

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www.iyc2011.org.au



NEWS

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A new process plant and powerstation are being planned for the Didipio gold mine in the Philippines.

Contract for gold project

Brisbane-based Ausenco has won an engineering contract for the Didipio gold project in the Philippines.

The \$7 million contract comprises engineering and procurement services for the mine's process plant and powerstation.

The project owner OceanaGold has announced it has in place funding for the expected US\$140 million capital to complete the project and has started preconstruction activities, with the aim of commercial production commencing

in early 2013.

Ausenco had already been involved in the project before it was put on hold due to economic circumstances.

The Didipio mine is located about 270km north of Manila in northern Luzon.

EA BOOKS

www.eabooks.com.au



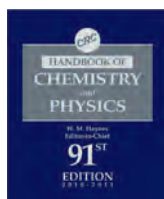
CRC Handbook of Chemistry and Physics, 91e

Ed: David Lide

\$209.09 + GST = **\$230**

2010 9781439820773 2610pp Hardcover

Mirroring the growth and direction of science for a century, the *CRC Handbook of Chemistry and Physics*, now in its 91st edition, continues to be the most accessed and respected scientific reference in the world, used by both students and Nobel Laureates. This year's edition adds many new tables and major revisions, including the stopping power of electrons, physical properties of selected polymers, properties of ice and super cooled water, and many more. A carbon footprint calculator is also included.



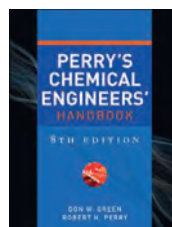
Perry's Chemical Engineer's Handbook, 8e

Robert H Perry, Donald W. Green

\$181.77 + GST = **\$199.95**

2007 9780071422949 2400pp Hardcover

First published in 1934, *Perry's Chemical Engineers' Handbook* has equipped generations of engineers and chemists with an expert source of chemical engineering information and data. Now updated to reflect the latest technology and processes of the new millennium, the Eighth Edition of this classic guide provides unsurpassed coverage of every aspect of chemical engineering: from fundamental principles; to chemical processes and equipment; to new computer applications.



Purification of Laboratory Chemicals, 6e

W.L.F. Armarego, Christina Chai

\$175.45 + GST = **\$193**

2009 9781856175678 743pp Paperback

A best seller since 1966, this book keeps engineers, scientists, chemists, biochemists and students up to date with the purification of the chemical reagents with which they work, the processes for their purification and guides readers on critical safety and hazards for the safe handling of chemicals and processes. The book has been reorganised and is now fully indexed by CAS Registry Numbers.





18-21 September 2011
Hilton Sydney
New South Wales, Australia
www.chemeca2011.com

International Year of
CHEMISTRY
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ABSTRACT DEADLINE EXTENDED

CLICK HERE TO
SUBMIT YOUR ABSTRACT NOW
DON'T MISS OUT!

Call for Abstracts

You are invited to submit abstracts on the following topics. Submissions will be considered for oral and poster presentations. All abstracts are to be submitted online and should be a maximum of 250 words.

- Sustainability: Water, Environment, Climate Change and Natural Resources
- Energy and Fuels
- Food, Pharmaceutical and Bioengineering
- Mineral Processing and Particle Technology
- Iron and Steel Making
- Material Sciences and Engineering
- Catalysis and Reaction Engineering
- Process Design and Management
- Sensing, Control and Safety
- Meso, Micro and Nanotechnology
- Engineering Sciences and Fundamentals
- Education and Society
- Industrial Best Practices and Innovation.

For more information and to submit your abstract online visit chemeca2011.com

Abstract submission deadline is Friday, 4 March 2011.

Please note that if you wish to submit an abstract for consideration by the Technical Program Committee, you must also intend to submit a full paper for peer review and to register for the Conference. Presentations will also need to be made available to all delegates.

Important Dates

Abstract Submission Closed:
Friday 4th March 2011

Notification to Authors - Invitation to submit full paper:
Friday 25th March 2011

Full Paper Submission Deadline:
Friday 8th April 2011

Full Paper Re-submission Deadline:
Friday 17th June 2011

Full Notification to Presenters:
Friday 8th July 2011

Early Bird Registration:
Friday 15th July

A new award will be introduced in 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.

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CHEMICAL ENGINEERING

FEBRUARY 2011

IN AUSTRALIA

NOTICES

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Associate Fellows of IChemE named

The IChemE has named 11 leading figures in chemical engineering as its first Associate Fellows. This new membership grade has been introduced to recognise professionally qualified people who hold senior positions in the chemical, biochemical or process engineering industries, without a formal chemical engineering qualification.

The presentations took place at Foster Wheeler's UK headquarters in Reading and were hosted by IChemE president Desmond King and qualifications director Neil Atkinson.

Atkinson said the new membership grade helps IChemE better recognise senior figures without a traditional chemical engineering background: "The new Associate Fellow grade helps us recognise senior professionals that work with chemical engineers, or have major roles of responsibility in industry or academia and have a natural interest in the process industries."

Among the new Associate Fellows are Janice Crawford, director of engineering operations at Foster Wheeler (FIMechE); Ronny Lardner, director of the Keil Centre (Chartered occupational

psychologist); Jonathan Atkinson, patent attorney and partner at Harrison Goddard

Foote (FRSC); and Steve Elliott, CEO of the Chemical Industries Association.

Rapid membership growth

New figures published by IChemE reveal a 7% growth in membership last year, with more than 32,000 new chemical, process and biochemical engineers now part of the global membership. Neil Atkinson, director of qualifications and international development, said the global interest in IChemE is driven by changes in the process industries: "Our continued growth reflects strong interest in professional qualification and this is a trend we're seeing all over the world. As the process industries globalise and economies develop, the need for ever-stronger chemical engineering talent pipelines emerges."

IChemE's status as a global organisation is now well established with members in more than 120 countries and offices in Australia, China,

Malaysia, New Zealand and the UK. IChemE CEO David Brown said the increasingly international spread of IChemE members is unsurprising given the nature of the process industries: "When I joined IChemE in 2006 our president at the time (Greg Lewin) described chemical engineering as a boundaryless profession. He recognised that chemical engineers are working across an increasingly diverse range of sectors and most effectively alongside other engineers, scientists and specialists."

"That makes our role as the professional organisation that represents chemical engineers more challenging. The boundaryless profession must be supported by a boundaryless institution," he said.

2010 Engineers Australia Salary and Benefits Survey

Engineers Australia is proud to announce the release of the 2010 Salary and Benefits Survey. The eighth year of the 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.

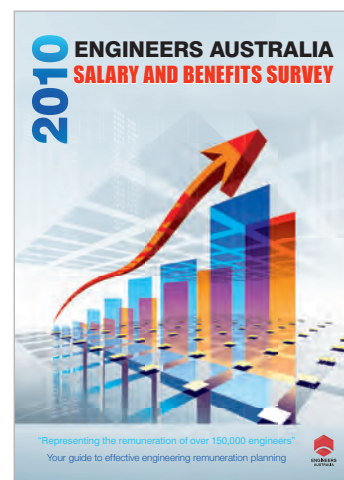
Commissioned by Engineers Australia and conducted by New Focus Research Pty Ltd, this unprecedented survey delves into HR departments nationwide to provide you with a dependable guide to salary packages.

Download your electronic copy at www.eabooks.com.au or contact EA Books customer service on **02 9438 5355**.

Electronic version: \$57.50 or \$40 for EA Members.

Print version: \$74 or \$51.50 for EA Members (Available 1 March).

PRICES INCLUDE GST



NEW PRODUCTS

9

Analysing volatile compounds

Agilent Technologies has introduced an instrument for gas chromatography sample analysis, the 7697A headspace sampler.

Based on Agilent's automatic liquid sampler technology, the 7697A headspace sampler is designed to avoid loss or degradation of volatile components found in the gas portion of partitioned samples.

Headspace sampling allows the introduction of volatile compounds directly into an instrument.

The 7697A is suitable for diverse applications, including:

- pharmaceutical quality assurance and quality control
- environmental applications, such as identifying volatile substances in water
- forensic analysis, such as distinguishing the presence of alcohol and other volatiles in blood
- flavor and fragrance profiling
- food safety testing, such as detecting volatiles in beer and other beverages.

The 7697A headspace sampler is available as both a high-end sampler with 111 vial capacity or as a mid-range unit with 12 vial capacity. Additional features include:

- a barcode reader
- pneumatics control for consistent sampling
- automatic calibration and vial leak checking
- a comprehensive software package
- automatic shut-down and wake-up.

www.agilent.com.



The 7697A headspace sampler is designed to avoid loss or degradation of volatile components found in the gas portion of partitioned samples.

Self-cleaning acoustic switch

Hawk Measurement, has introduced the Gladiator Acoustic Switch series with non-contact self-cleaning technology for blocked chute detection.

The Gladiator Acoustic Switch uses acoustic wave technology in a new sender/receiver form for blocked chute detection, point level detection and anti-collision for heavy machinery.

The Gladiator amplifier powers two AW transducers, which use special Hawk software in which both units pulse and receive each other's acoustic echoes. When the path between the transducers is blocked, the units immediately detect the change of the return signal and trigger a communications relay for indication or control purposes.

The transducers work either together or independently to detect pulse interference, allowing twice the application security. Hawk's acoustic wave transducers are self-cleaning and do not require contact with the product. The power of each pulse (pressure wave) blows the water, moisture and build-up off the face of the diaphragm. The switch requires a simple setup and allows for remote test function. Communication options include

GosHawk, Modbus, HART, Profibus DP and DeviceNet.

The acoustic switch is designed for continuous operation in dusty or wet environments.

www.hawkmeasure.com



The acoustic switch is designed for continuous operation in dusty or wet environments.

NEW PRODUCTS

10

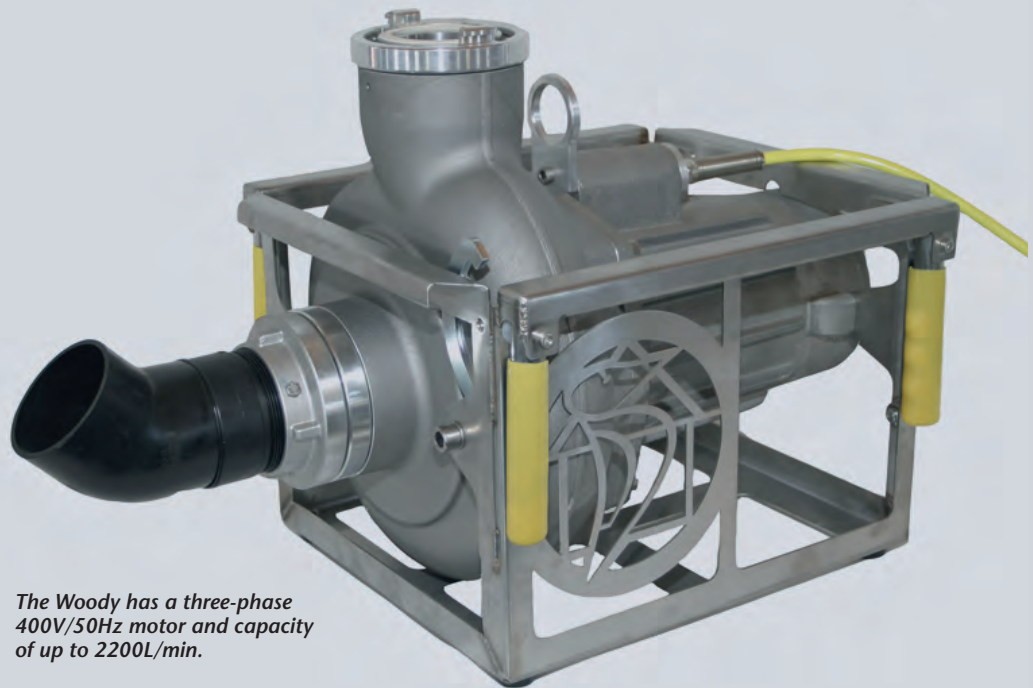
Pumps are designed for easy mobility and handling

Gaam Emergency Products is introducing two new Spechtenshauser specialty pumps, designed for easy mobility and handling.

The Woody has a three-phase 400V/50Hz motor and boasts a capacity of up to 2200L/min. Primarily designed for moving large quantities of water around, the pump is blockage-free for solids up to 80mm in size and can operate continuously when used with 6.5kVA generators.

The pump, which is dry-run-safe because of its impeller cooling system, features a slurping operation and is capable of low level pumping down to a few millimetres depth due to its flat intake socket.

The Mini Woody pump can be fitted with either an AC 230V/50Hz motor or three-phase 400V/50Hz motor. Its capacity reaches up to 1400L/min with con-



The Woody has a three-phase 400V/50Hz motor and capacity of up to 2200L/min.

tinuous operation possible using 3kVA generators (B1000 version) or 5kVA generators (all other versions).

The unit is blockage-free for solids up to 55mm in size and enables low level pumping down to a few millimetres

depth, thanks to its flap system.

Both models are available with a number of accessories, including PVC spiral hoses, non-returnable flaps and separate float switches.

www.gaam.com.au

Energy-efficient wastewater pump

KSB's Amarex/KRT series of wastewater pumps are coupled with energy-efficient motors that meet the new European IE3 requirements for standard motors.

These pump sets can be supplied with or without explosion protection.

By optimising the electric and magnetic design, KSB has fulfilled the requirements of efficiency class IE3 for its KRT series up to a drive rating of 150kW.

Dry-installed pumps up to 45kW can also be driven by the KSB-developed SuPremE motor, cutting the losses of the highly efficient IE3 motors by another 15%.

www.ksb.com



The wastewater pumps meet new efficiency requirements.