

January/February 2014
Vol.21 No.6

what's new in **Food** technology & manufacturing



Milk products
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world

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Conductivity and freshness

Cogeneration

Spray drying



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9-10 APRIL 2014 | MELBOURNE PARK FUNCTION CENTRE, MELBOURNE OLYMPIC PARK



ACI Connect is Australia's new conference and exhibition focused on automation, control and instrumentation technology, advances and applications.

ACI Connect is brought to you by Westwick-Farrow Media, publisher of *What's New In Process Technology* and ProcessOnline.com.au, and developer of industry-specific events like the Industrial Technology Regional Roadshows and (Radio) Comms Connect www.Comms-Connect.com.au.



If you are an industrial technology professional looking to enhance your knowledge base, engage in hands-on workshops and see the latest products and technologies, then you need to be in **Melbourne** on **April 9-10** at **ACI Connect**.

Features of the conference program* include:

- Wireless protocols panel discussion
- Machinery safety workshops
- Cybersecurity technical paper
- Which bus? panel debate
- Local case studies



A FREE trade exhibition will feature the leading suppliers of automation, control and instrumentation products, technology and services.

Exhibition space is strictly limited. For more information or to book your space, contact Narelle Granger — ngranger@westwick-farrow.com.au or (02) 9487 2700.

**The full conference program will be posted on the website in mid February.*

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2014 will be an eventful year

2014 has all the signs of being busy for the food industry - if only in attending events. Here is a quick rundown of some events that look pretty tasty:

AIP & SCLAA Technical Lounge

5 March 2014, Woolloongabba

www.aipack.com.au/index.cfm?MenuID=28&EventID=366

Approved Persons Course for Thermal Processing of Low-Acid Foods

7-11 April 2014, Werribee, Vic

www.csiro.au/Organisation-Structure/Divisions/Animal-Food-and-Health-Sciences/Food-processing/Workshop-APC.aspx

ACI Connect

9-10 April 2014, Melbourne Park Function Centre

www.ACIconnect.com.au

ConTech2014

30 April 2014, Pullman Melbourne Albert Park

contech.aigroup.com.au/registration

Foodservice Australia 2014

25-27 May 2014, Moore Park, Sydney

www.foodserviceaustralia.com.au

2014 AIP National Conference

17-18 June 2014, Sofitel Wentworth, Sydney

www.aipack.com.au/index.cfm?MenuID=28&EventID=361

foodpro 2014

22-25 June 2014, Melbourne Convention Exhibition Centre

<http://www.foodproexh.com>

The Asia Pacific's major food manufacturing event, foodpro will be held in Melbourne in 2014 for the first time in its history.

Held only once every three years, foodpro is a must-attend event for anyone in, or associated with, the food processing industry in Australia. From food machinery to food science and food packaging, foodpro is a comprehensive resource of information, contacts and networking opportunities.

Foodtech Packtech 2014

23-25 September 2014, ASB Showgrounds, Auckland

www.foodtechpacktech.co.nz

Foodtech Packtech is a national trade event for the New Zealand food, beverage, packaging and manufacturing industries, showcasing innovation to New Zealand businesses and the world.

What's New in Food Technology & Manufacturing will be particularly involved in foodpro and Foodtech Packtech. When you visit the events come by our stand and introduce yourself.



Regards

Janette Woodhouse

Chief Editor

*What's New in Food Technology
& Manufacturing*

www.foodprocessing.com.au

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Food

FOR
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Soft drink marketing should target the middle-aged

Sharp declines in soft drink consumers under the age of 35 mean that middle-aged Australians (aged 35 to 49) are now the group most likely to buy a soft drink in an average week, new research from Roy Morgan Research shows.

In the 12 months to June 2009, approximately two in three Australians aged 14-25 or 25-34 had some soft drink in an average week. By June 2013, the consumption rate in both of these age brackets had declined 9% to 56 and 57% respectively.

Consumption did also decline among 35-49 year olds, but only by 3% to 58%. Soft drink remains least popular among those aged 50+, with weekly consumption now at 40%, down from 44% in 2009.

In total, 50% of Australians aged 14+ consume soft drink in a seven-day period, down from 56% in 2009.



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University and industry partnership to foster food innovations

Researchers from across multiple disciplines within the University of Newcastle (UoN), as well as government members and experts from within the Central Coast food and beverage industry, are linking up to develop solutions for complex problems in the food and beverage industry.

The joint UoN and Central Coast Food Innovation Cluster has just been launched at Central Coast Campus at Ourimbah.

The cluster will combine the diverse skills, backgrounds and expertise of its participants to ensure an innovative approach to addressing industry and community concerns, such as identifying new products for market; establishing new opportunities to export; and issues such as nutritional value and food additives. The cluster will also generate new ideas and create opportunities for research breakthroughs which can be applied to real-life issues.

The Food Innovation Cluster will stage a number of networking events in 2014 inviting industry participants to put forward topics, themes or specific challenges for discussion.

The aim of the networking events will be to provide a forum for industry colleagues to discuss common challenges, share knowledge and tap into the university's research capabilities to develop practical solutions that allow the food and beverage industry to prosper.

"The vision for the University of Newcastle clusters is to offer a one-stop shop for business, industry and government partners to work with our researchers, who bring different expertise to the table," said Deputy Vice-Chancellor (Research), Professor Nick Talley.

Cargill to label 'pink slime' in ground beef products

US meat processor Cargill has announced it will label all its fresh ground beef products containing finely textured beef in the interests of transparency.

After a similar product, lean finely textured beef, was revealed to use ammonium hydroxide during processing, it attracted negative public attention and earned the unfortunate title of 'pink slime'. Cargill appears to be keen to distance itself from the negative publicity by being up-front in its labelling of the product.



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Chocolate consumption lowers body fat (no, really)

Finally, the news we've all been hoping for has arrived: researchers have discovered that the more chocolate you eat, the lower your body fat. Unfortunately, it doesn't mean that munching your way through a family-sized block each day will help you become bikini-ready in time for summer, but nevertheless it's good news for chocolate lovers: your addiction may be helping, rather than harming, your health.

In an article published in the journal *Nutrition*, researchers from the University of Granada have shown that higher consumption of chocolate is associated with lower levels of total fat and central (abdominal) fat, independent of an individual's diet and whether they exercise regularly, among other factors.

Examining data from the HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence)

study, the researchers aimed to determine whether greater chocolate consumption was associated with higher body mass index (BMI) and other indicators of total and central body fat in adolescents.

The data showed that a higher level of chocolate consumption was associated with lower levels of total and central fat when these were estimated through body mass index, body fat percentage and waist circumference. The results were independent of the participant's gender, age, sexual maturation, total energy intake, intake of saturated fats, fruit and vegetables, consumption of tea and coffee, and physical activity.

Although chocolate is considered a high energy content food, "recent studies in adults suggest chocolate consumption is associated with a lower risk of cardiometabolic disorders", said Magdalena Cuenca-García, principal author of the study.



Too many foodies, not enough food producers

More and more consumers are starting to question where and how their food was produced as the locavore and slow food movements gain traction in the mainstream. Conversely, fewer and fewer young Australians are entering the food production industry, either as primary producers or in the processing and export sectors.

"Exact figures on the employment shortfall are hard to calculate, but in agriculture alone, it has been shown that while there have been only around 700 graduates per year Australia-wide in recent years, job advertisements have suggested a demand for approximately 4500 tertiary qualified graduates per annum," said Dr Brian Jones from the University of Sydney's Faculty of Agriculture and Environment.

Our agricultural sector produces just 3% of GDP, but the value-adding process post-farm gate means that food processing and agricultural production sectors together account for 12% of GDP.

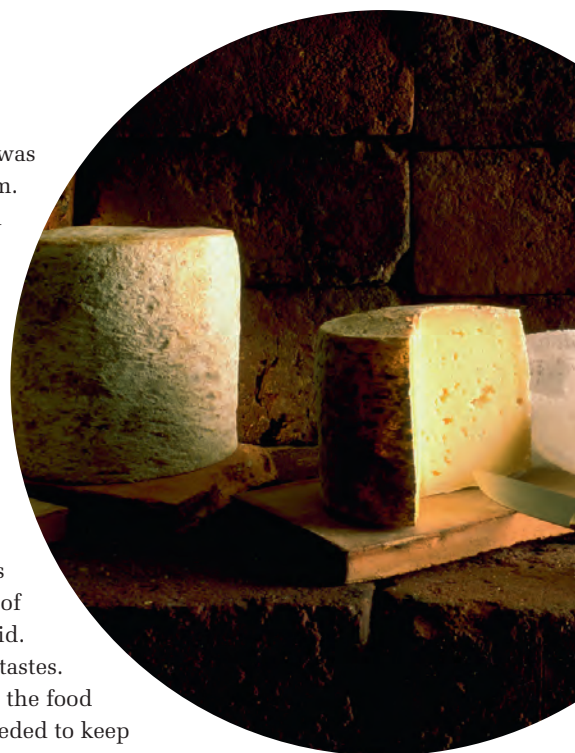
"More Australians are moving into cities and the production and supply chains mean we give little thought to food production. Out of sight, out of mind is one of the reasons that too few people are moving into careers in this sector," Dr Jones said.

"But fortunately, Australians are also increasingly 'foodies', with sophisticated tastes. One of the outcomes of this is that people are starting to once again question how the food got to our plates. The reality though is that an increasingly skilled workforce is needed to keep good food on our tables and there is currently an unsustainable shortfall."

The University of Sydney is offering a new Bachelor of Food and Agribusiness degree in 2014 to encourage young people back into the food production industry.

"This is a great time for young people in the industry, when real innovation is not only possible, but essential. In order to capture the emerging opportunities, we need a new generation of food innovators and entrepreneurs in Australia," said Dr Jones.

"Interest in our cross-disciplinary undergraduate degree in food and agribusiness is looking strong. There's still a long way to go, but it is an indicator that we are heading in the right direction."



Food

FOR
thought

Why you shouldn't call your product 'natural'

If you want your product to be successful, don't refer to it as 'natural'. This is the advice of food specialist Julian Mellentin, author of 12 Key Trends 2014, which is published by New Nutrition Business.

"If you want to be successful, don't use the word natural on your product," Mellentin cautions. "You run the risk of getting bogged down in a regulatory minefield - and there are plenty of other ways of communicating the naturalness of your product without ever using the word natural."

In the right product formats, Mellentin says, 'naturally healthy' ingredients will help give your product a health halo and increase sales - sometimes significantly.

Mellentin points to coconut water and almond milk as prime examples of products that have successfully combined a natural image with convenience - and have taken off. Mellentin predicts that Canadian maple water will be the next big thing - but only if maple water brands get their marketing right.

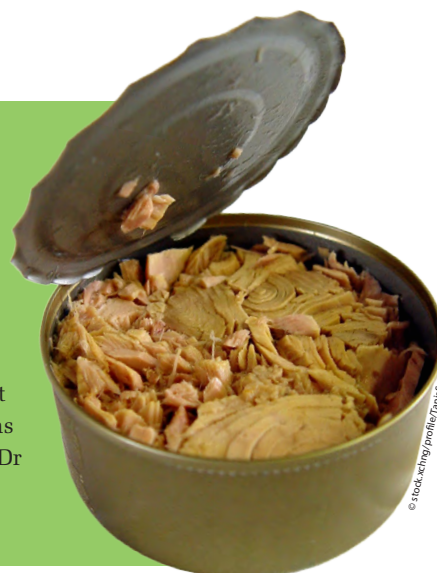
'Slow energy', kids' nutrition, snacking and protein are just some of the growth opportunities for the food and health market that Mellentin highlights in 12 Key Trends 2014.



Half of consumers ignore 'best before' dates

Less than half of Australian consumers read and comply with 'best before' dates, new research shows. In addition, only 55% always read and comply with 'use by' dates, a national Newspoll survey, commissioned by the Food Safety Information Council for Australian Food Safety Week, has revealed.

"Frightening is not too strong a word to describe other results, including that only a third (33%) of people always read and comply with storage instructions and a meagre 14% always read and comply with cooking instructions," said Dr Michael Eyles, Chair of the Food Safety Information Council.



Cat's eye flip flow to improve industrial mixing

In the domestic kitchen, mixing is a crucial step when baking. Mix too little and ingredients will not be evenly distributed; mix a soufflé too much and it will fall flat. In commercial operations, mixing becomes even more critical.

Researchers in the UK claim to have developed a new recipe for industrial mixing that has the potential to optimise mixers. Fluid mechanics expert Lionel Rossi, a researcher at the French Alternative Energies and Atomic Energy Commission (CEA), and colleagues from Imperial College London have published a paper that describes what they call a 'cat's eye' mixing sequence.

The process uses magnets to generate synchronised flows of jets that move in opposite directions and whose positions are slightly offset from each other. By controlling the timing of the jets and their strength and position, the researchers created a promising mixing sequence called a 'cat's eyes flip flow', named because the resulting pattern, as visualised with coloured dyes added to the solution, resembles the almond shape of a cat's eye. They studied the flows created by this sequence and compared them to other patterns, and found that the cat's eyes flip flows were most efficient at mixing solutions.

Better packaging and smarter process technology for less spoilage

Innovative packages are the key in the fight against food loss and wastage. More effective barrier layers, germicidal films and freshness indicators are intended to help products to keep for longer and halt consumers' throwaway mentality. However, despite all these improvements, companies have to keep a constant eye on process efficiency and on costs.

In developing countries, one child in six is undernourished, which amounts to an absolute figure of 100 million globally. The United Nations (UN) estimates that undernourishment causes the deaths of 2.6 million children under five years old per year. This means that hunger is still one of the biggest scourges of humanity.

Yet no one should have to go hungry. Every year some 1.3 billion tonnes of food worldwide ends up in the bin - a conclusion of the current report 'Food Waste Footprint: Impacts on Natural Resources' from the Food and Agriculture Organisation of the United Nations (FAO). If food losses were reduced by using food more prudently, famines could be curbed.

According to the report, 54% of wasted food is lost during production, post-harvest treatment and storage. Particularly badly affected are the poorer countries of Africa and Asia where shortcomings during harvesting and logistics destroy 6 to 11 kg of food per capita each year. Exposed to heat, fruit and milk spoil, and meat is rendered inedible by contamination with dangerous germs.

On the other hand, wastage during processing, transport and consumption is more a problem of the industrialised nations. In Europe and North America, some 100 kg of food is thrown away per person a year, although it is still fit for

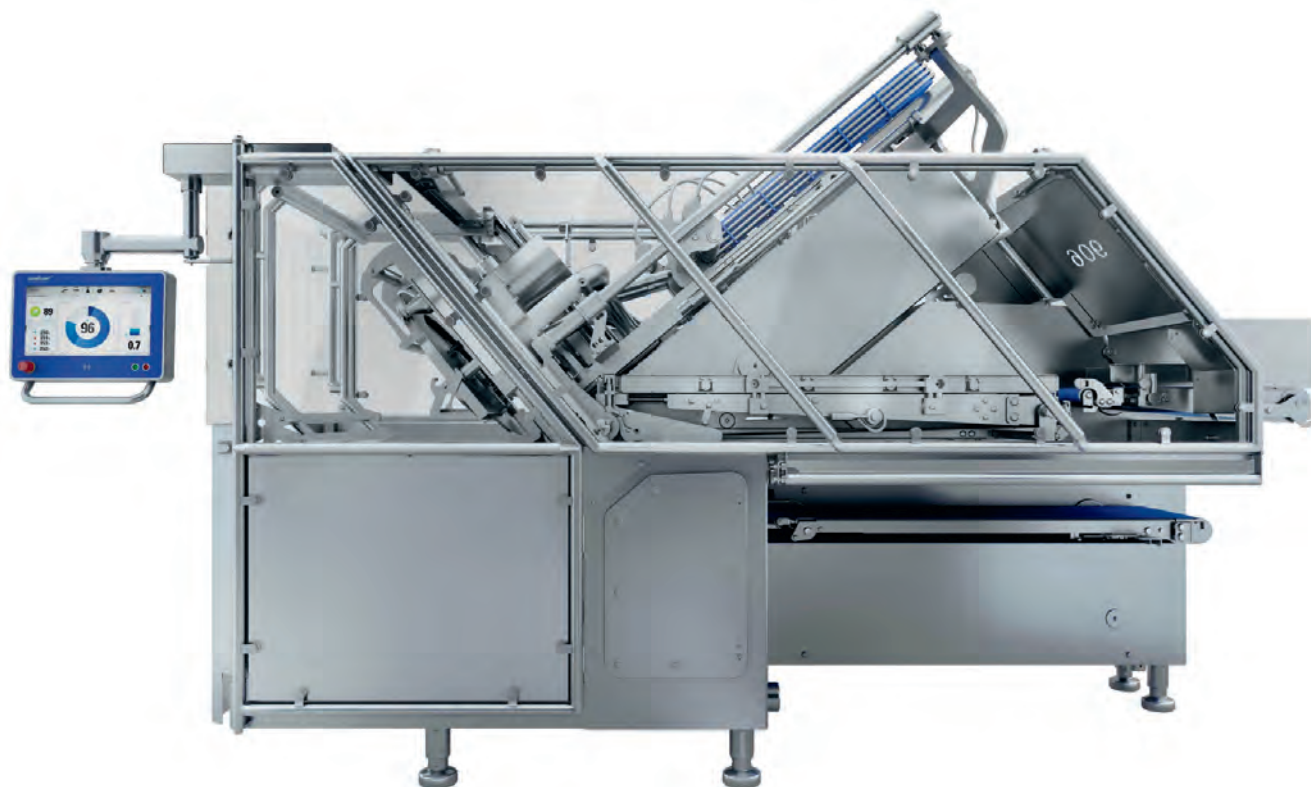
consumption. Demands for a change of attitude are therefore coming from the highest authorities. At his general audience during World Environment Day last June, Pope Francis called for an end to consumerism and the wastage of food.

Central theme of interpack 2014

Industry has already got the message. According to a current study by RMIT University in Australia, suitable packages are capable of reducing food loss considerably. Developers are therefore working hard on new concepts for packaging machines, the related process technology and 'smart' packages.

A total of 100 companies from the entire food value chain, from production, retailing and packaging through to logistics, are now participating in the SAVE FOOD Initiative, a joint project of the FAO, the UN Environment Programme (UNEP) and Messe Düsseldorf GmbH. Its goal is to foster dialogue between industry, research, the political sphere and civil society on the subject of food loss.

Reducing spoilage will also be the central theme at the Innovationparc Packaging at interpack 2014 in Düsseldorf. Exhibitors at this show will be presenting their ideas on how food can be protected better from 7 to 14 May 2014. Furthermore, during the SAVE FOOD Conference at Messe Düsseldorf's Congress Center South on 7 and 8 May, experts



from politics, industry and society will be exchanging views on food loss and wastage.

The sector has a lot of work ahead. Farmers in Africa first have to be convinced that it is better to package their produce at source than to send it off unprotected. It is not high-tech that is called for here, but education locally. Representatives of companies like Bosch, for example, therefore toured emerging and developing countries with mobile packaging machines some years back in order to demonstrate to farmers the advantages of packaged foods.

The throwaway mentality of the Western world, on the other hand, is even more difficult to combat. According to a survey by Berndt + Partner management consultants, 20 to 25% of food in Europe is binned even though it is still fit for consumption. One contributory factor is the best-before date that has to be printed on all food packages. Once it is reached, food is often thrown away.

However, best before does not mean that food is no longer edible after this date, but merely that its colour and consistency may change. Big packs also exacerbate the problem. The best-before date is often reached before the package contents have been consumed.

Smaller, customised packages could help to solve the problem. "In our view, portioned packages for one-person households, for example, can help to stem food wastage," said Christian Traumann, managing director of Bavaria packaging specialist MULTIVAC Sepp Haggenmüller.

Creative package solutions

Reporting continuously on a product's state of freshness, time/temperature indicators are another approach in the battle against spoilage and waste. The useful thing about them is that they render visible any breaks in the cooling chain, for instance. BASF and the Swiss Freshpoint company are already producing labels containing a special pigment which are printed straight onto the package. The colour changes when the contents spoil.

Research is also being conducted on active packages that interact with their contents. PET bottles are treated with oxygen absorbers like iron so that oxygen-sensitive beverages such as beer and fruit juice keep for longer. Then there are films enriched with preservatives like sorbic acid that combat germ proliferation on foods. Critics claim that the additional chemicals on active packages impair the products' natural quality. In their search for a remedy, scientists of the Fraunhofer Institute for Process Engineering and Packaging (IVV) in Freising, Bavaria, are developing antimicrobial materials based on plant extracts such as rosemary.

"This way, food manufacturers can go further towards meeting the consumer's wish for natural, health-promoting-products," said IVV materials developer Sven Sänglerlaub.

The downside of many food-saving packages, however, is that they are relatively expensive to produce. If, for example, a 'stronger' package calls for more material, it uses up more resources. The sector is therefore trying to offset the expenditure on 'smarter' packages by economising elsewhere along the food value chain. The manufacturers of packaging machines therefore endeavour to boost the efficiency of their lines by increasing the degree of automation and optimising their processes.

MULTIVAC, for example, offers its customers innovative technologies that ensure, among other things, that as little film waste is generated during production as possible, marketing manager Valeska Haux explains. This is achieved with the aid of advanced machine tools, she says, citing cutting tools as examples. The integration of handling modules in the packaging line as well ensures package-by-package quality control for maximum consumer protection, says Haux.


"We boost the efficiency and hygiene of our production lines and prevent waste arising during production," said Mathias Dülfer, managing director of Weber Maschinenbau. This company specialising in high-performance cutting machines is constantly refining its range of lines. In the latest

machines, innovative blade technologies, intuitive operating concepts and an open design ensure ease of operation, good accessibility and inspectability, and simple cleaning.

“All this helps to make production even more efficient, more reliable and hence more sustainable,” said Dülfer.

Packaging foods more securely and with higher throughput - this is also the aim of Spanish machine manufacturer ULMA Packaging. The company covers all packaging technologies from tubular bag packages to deep-drawing machines. At interpack 2014, the Spanish company will be showing new deep-drawing systems for skin packages, among other things. The main function of this kind of packaging is to extend shelf life while also preventing liquid loss due to evaporation. This retards germ growth.

ULMA has also developed a new control for all machine models with user-friendly software. The newly developed control promises “a huge boost to productivity on all systems”, the company claims. The innovations from the manufacturers demonstrate that a whole battery of packaging strategies for preventing food loss is already available. And that they can be realised on the industrial scale at acceptable cost thanks to ongoing improvements in the efficiency of the production technology.

At interpack from 8 to 14 May 2014, food manufacturers will have the chance to see them for themselves. 



20 to 25% of food in Europe is binned even though it is still fit for consumption.

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Lightweighting plastic bottles for packaging

Reducing the plastic component of the overall package is a great environmental initiative; however, in today's competitive market the opportunity to save money in the actual packaging cost is very appealing. There is a need to understand this opportunity; quick savings in plastic could end up costing much more in other areas like filling and function failures.

Extrusion blow moulding (EBM) for plastic bottles is a very flexible process and of all the moulding processes offers the most cost-effective method to reduce packaging costs by way of tooling and process adjustments.

High-volume production bottles should be targeted for 5% or less weight reduction immediately. In most cases this can be achieved with little effort and the impact on the supply chain may be non-existent. The key to achieving quick weight loss is to ensure that the process(es) remain stable; if the process becomes less stable at 3%, choose this as the benchmark. It's a small percentage value; however, on large-volume products, it will add up.

Low-volume products require a more substantial percentage target to achieve savings that are worth the effort and - in many cases - the investment.

A change in the bottle weight of more than 5% will potentially impact the structural performance of the bottle and this may be an ideal time to re-evaluate the expectations of the pack. Is this expectation overstated? The bigger percentage changes become more technical and the impact on each of the processes will vary based on the shape and size of the bottle and design features.

Bottles can be redesigned to reduce the weight while maintaining and even improving the structural and physical performance. For example, a bottle that is relatively square with a single radius corner can be greatly improved by a series of compound curves around the perimeter of the bottle and a conical shape to the panels.

Such design enhancements on high-volume products can pay for the capital investment. The resin

saved in a package redesign will quite often pay for the associated tooling components and the impact on the shelf appeal can be very minimal or even prove to be a style upgrade.



Stephen Barter MAIP
Australian Institute of Packaging
www.aipack.com.au



Bio-based takeaway containers

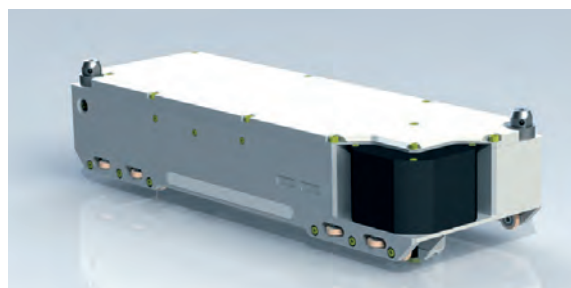
BioPak's BioCane Takeaway Containers are made from sugarcane pulp - the fibrous material that remains after sugar is extracted from the sugarcane stalks. The containers are compostable, making the diversion of organic waste from landfill an option.

The containers are microwave safe and ovenproof up to 220°C. The clip-lock, leak-resistant lids hold hot foods and liquids without leaking or breaking apart. In addition to the clip-lock pulp lid, the option of a clear lid made from recycled PET for cold foods is available.

Sizes include 280, 480, 630, 750 and 1000 mL. The containers are available in white and unbleached natural.

BioPak

Contact info and more items like this at wf.net.au/V246



Transporting robot

The third generation of the Schubert Transmodule - claimed to be the world's first transporting robot - has been reworked and released. Transmodule 3.0 will be used in Schubert machinery from mid-2013 onwards.

The Transmodule controls the product to package, from collating to carton erecting to closing, and directly to palletising. According to the company, this allows Schubert packaging machines to be smaller, compact and flexible, with a higher efficiency than traditional machine transport systems.

It takes its signal wirelessly and power inductively. No cables, wires, chains or sprockets are required for operation.

The third generation offers automatically swappable size plates, positioning precision of ± 0.1 , acceleration up to 8 m/s², speed up to 4.5 m/s, adjustable vacuum generators, data transfer of 4 Mbps and drive power of 1 kW.

Selpak Automation Pty Ltd

Contact info and more items like this at wf.net.au/V077

Product recovery system range

The ProductSaver line of product recovery systems from National Bulk Equipment (NBE) has been designed to provide automated, controlled removal of free-flowing liquids or flow-resistant wet contents from their packaging.

The systems enable reclaim of contents for residual resale, re-use or efficient disposal; and reclaim of packaging material for recycling or disposal. The recovery systems provide tangible metrics for sustainability improvements; protect product safety; reduce material loss; and keep labour on-task. They are engineered to integrate with legacy processing and packaging operations, and can also be designed to run as self-contained wet material reclamation systems.

The systems combine package infeed, package opening and contents, and package separation processes into a single-stream product recovery sequence. Whether pallet loads, cases or single packs, no break-pack or razor knife steps are necessary.

Package opening occurs within the compression screw press where precision-formed, specially pitched, 304-2b stainless steel screw flights draw packages from the infeed chute into the compression sequence. The screw flights are edge-finished to open packages and accelerate material release prior to compression action.

The conical screw shaft, together with an end block press, create a progressive compression force on the pre-opened packages to ensure thorough release of contents and separation of contents from packaging material. Two large-bore pneumatic cylinders power two compactor gates for final-stage material release.

Automated discharge of compacted packaging material is provided by sensors at the compactor gates that gradually release compactor pressure and open the gates to discharge recovered packaging. According to the company, the systems provide up to 99.95% of content recovery for most wet material.

National Bulk Equipment

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Simplicity, packaged

When SPC Ardmona decided to develop a healthy alternative to fast food snacks, the company kept it simple. The result was the epitome of simplicity: fresh apples, sliced and bagged.

In fact, the most complicated aspect of the new product is its packaging. When researching packaging machinery options, SPC Ardmona engineers conducted extensive Factory Acceptance Trials at the PFM factory in Italy using the PFM Comet vertical form-fill-seal bagger and MBP C2 Series multihead weigher.

“Using both the bagger and multihead weigher, the line speed trials ran at 100 packs/min, with an accuracy of well below one standard deviation achieved,” said Chris Johnson, Emrich’s engineering manager.

“As the Comet is a continuous motion machine, the line performed exceptionally well in terms of speed and accuracy, and therefore met SPC Ardmona’s performance requirements.”

The machines are both easy to clean and the C2 weigher can be cleaned using a washdown process.

“SPC Ardmona’s engineers also cited the Comet’s setting flexibility, self-diagnosis capability and durability as reasons for choosing to purchase the PFM Comet vertical form fill seal bagger,” said Johnson.

“They also valued Emrich’s backup and support in deciding to purchase the packaging equipment through Emrich.”



The packaging machinery was installed in SPC Ardmona’s Mooroopna factory in late 2012. Johnson says the feedback from SPC Ardmona is that the equipment is reliable and delivers everything that was promised.

“The Emrich technical team installed and commissioned the equipment and we have also provided operator training, parts supply and ongoing technical support. Overall, the project has been a success for all parties.”

Emrich Industries Pty Ltd

Contact info and more items like this at wf.net.au/V601

Laminating solution for inkjet-printed labels

QuickLabel’s Lustro-Lam is a clear thermal transfer ribbon that mates with the surface of a label and does not require a laminator or die cutter. It can be digitally applied via thermal printing processes, as a full bleed or spot application, and enhances the gloss of the label and provides extra resistance against various abrasions, chemicals and water.

The ribbon is suitable for use with the Kiaro! inkjet label printer to produce water- and chemical-resistant labels with a glossy finish. The company claims Lustro-Lam has been tested and shown to be more chemically resistant to water, alcohol, essential oils, hydraulic fluid and cleaning chemicals than unlaminated polypropylene printed labels.

The lamination provided by the film protects labels and enhances gloss. It is not suitable for matte stocks. The gloss level of the product is rated almost three times higher than non-laminated gloss paper labels printed by an inkjet label printer.

The solution is compact and user-friendly. When used with a QuickLabel Pronto! printing system, the Lustro-Lam solution becomes a standalone laminating station.

Users can download the print file to the onboard memory of the system and apply laminate as desired. Users can choose to add lamination to a spot area or cover an entire label.

Both NiceLabel software and Custom QuickLabel software, which is included with the Kiaro! inkjet label printer, can drive the Pronto! system and be used to apply the laminate to the surface of a printed label.

Metromatics Pty Ltd

Contact info and more items like this at wf.net.au/V850



Electric extrusion blow-moulding machine

The Techne Graham Packaging Company Italy has introduced a '4-shuttle' extrusion blow-moulding (EBM) machine: the Advance ADV4. It is fully electric and is suitable for medium production capacities.

According to the company, the ADV4 range offers energy savings of up to 40% compared with conventional hydraulic EBM machines. The company claims that, with the removal of hydraulics, the ADV4 machines are cleaner, quieter and cheaper to maintain than conventional machines.

The machine provides high cycle repeatability and is controlled by a powerful industrial-grade PC (B&R). The range is available in different shuttle stroke lengths and can run containers from 60 mL to more than 10 L, with a range from 4 to 40 cavities.

Selpak Automation Pty Ltd

Contact info and more items like this at wf.net.au/V173



Big 8 installs big beverage line

For nearly 30 years, Big 8 Beverages has been manufacturing high-quality spring water and soft drinks from Nova Scotia in Canada.

Recently, the company engaged Italian company SIPA to install a complete beverage line. SIPA also assisted in the design of Big 8's new PET preform and spring water bottle designs for its 500 mL and 1 L PET bottles.

SIPA installed a SincroBloc, which included an integrated SFR 6 EVO rotary stretch blow-moulding unit and a Stillfill SP gravity filler. The line runs at 12,000 bottles/h when producing and filling 500 mL PET bottles.

The Sincro Bloc is a compact integrated system for high-speed blowing, filling and capping and is suitable for operations where reduced footprints are required. It can handle a range of bottles, necks and cap sizes and can be operated by just one person - providing significant savings in labour costs.

"Big 8 liked the idea of getting everything it needed for its new production system from a single source," said Denis Marcon from SIPA.

"SIPA was able to configure the system to run at high speeds while producing quality bottles."

HBM Packaging Technologies

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FRESH TO THE TABLE.

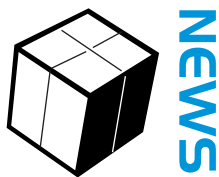
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Packaging



PACKAGING



Multiple awards for Wine-In-Tube product

Taylors Wines has received a number of awards for its packaging across its special edition and exclusive ranges.

The family-owned company won two gold medals at the 2013 Printing Industry Craftsmanship Awards, a gold medal at the 2013 Australian Packaging Design Awards and an award at the 2014 Worldstar World Packaging Organisation Awards.

The company's special edition Wine-In-Tube product won both the Australian Packaging Design Awards in Melbourne and the 2014 Worldstar World Packaging Organisation Awards. In total, 249 packages from 35 countries were judged, and Taylors' Wine-In-Tube was the only finished wine product entry to be selected as a 2014 Worldstar winner.

The Wine-In-Tube was designed to promote consumer sampling and tasting. Taylors was the first winery in Australia to sell the customised 60 mL glass tubes, which are flacon sealed with an aluminium cap. The Wine-In-Tube reportedly optimises the wine sampling process by minimising the oxygen present, keeping the wine's properties intact.

In addition, Taylors was reportedly the only brand to take out multiple gold medals at the Printing Industry Craftsmanship Awards. The Taylors Tateham's Waterhold range won gold in the categories of Flexographic Printing and Labels (any process other than offset).

FODMAP friendly certification

An estimated 35% of Australian consumers have intolerance towards ingredients high in FODMAPs (which stands for fermentable oligosaccharides, disaccharides, monosaccharides and polyols) - foods like wheat, rye, apple, honey, legumes, onion, garlic and milk. FODMAPs are a collection of sugars and related molecules that are found naturally in foods, and can often trigger symptoms of irritable bowel syndrome (IBS) including bloating, wind, abdominal pain and changes in bowel habits (diarrhoea or constipation).

Not only do FODMAPs trigger symptoms in the one in eight people who suffer from IBS, but FODMAPs can also affect sufferers of coeliac disease and other inflammatory bowel diseases such as Crohn's disease.

Food products that are low in FODMAPs (including fructose-friendly and lactose-friendly foods) are now eligible to display the FODMAP Friendly certification; a new logo to help people advised to follow a diet low in FODMAPs easily identify and select suitable foods.

The FODMAP Friendly Logo is the first Australian Government-approved labelling system for fructose-friendly and lactose-friendly foods and is now available on select foods Australia-wide, with more to begin displaying the logo in coming months.

FODMAP Friendly Certification founder dietitian Dr Sue Shepherd said the labelling system is a handy shopping companion for those with specific dietary requirements who find looking at ingredients and packaging time consuming and difficult.

"The new FODMAP Friendly logo is to help people advised to follow a low-FODMAP diet easily identify and select suitable foods for their dietary needs.

"People who experience problems due to hidden ingredients in foods, and who find themselves spending time reading food packaging and labels will benefit from the new FODMAP Friendly logo," Dr Shepherd said.

Each food product is analysed independently in a food-testing laboratory before it is given the FODMAP Friendly accreditation.



Lightweight packaging to take off, despite challenges

Rigid plastic and flexible packs are poised to take off in the US, with demand expected to increase by 32.85 billion packs between now and 2017, according to a new report from Canadean.

The research firm says the demand for greater convenience and cost-effectiveness will drive the use of lightweight flexible and rigid plastic packaging with innovative pack shapes, closures and dispensers.

“The key advantage of flexible packaging is its low intrinsic weight, which ensures lower transportation overheads and reduces the overall supply chain costs. These incremental weight savings not only provide cost benefits, but also reduce transportation costs and overall breakages,” said Dominic Cakebread, director of packaging services at Canadean.

While manufacturers are feeling the pressure to reduce the weight and gauge/thickness of packaging materials, consumers still expect these new packs to exhibit the same technical performance and functionality as existing packaging formats, making the production of lightweight packaging materials more technically demanding than ever.

Bioplastics made from agricultural by-products offer manufacturers a reduced carbon footprint. These eco-friendly plastics also reduce dependence on petrochemicals and other mineral-rich packaging materials.

These materials can reduce fuel consumption by up to 70% per ton, while releasing significantly less carbon into the atmosphere. But they’re not without controversy: the use of valuable agricultural land for growing biopolymers instead of food in a world facing increasing food insecurity has been criticised by some.

Despite increased demand, it won’t all be smooth sailing for the flexible packaging industry: it still faces challenges such as unstable raw materials prices and a lack of skilled labour, Canadean says.



IP scholarship winner Justin Chong with AIP NSW Chairman Brent Du Preez.

First-ever joint winners announced for AIP scholarship

For the first time in five years, the Australian Institute of Packaging (AIP) scholarship has been awarded to two winners. The scholarship is traditionally awarded to one finalist in the Cormack Innovation Awards; however, this year it was awarded to two: University of Technology, Sydney students James Bossi and Justin Chong.

“Both candidates were excellent samples of the quality of students undertaking design courses in Australia,” said Ralph Moyle, National President of the AIP.

“James Bossi demonstrated good methodology and thinking throughout the scholarship process. He displayed a clear interest and involvement in the packaging industry. He understood the importance of recycling and sustainability within packaging design development and has a real interest in solving some of the packaging problems the industry has currently been experiencing.

“Justin Chong is already doing Point of Sale construction and design and his mechanical skills were part of his in-depth answers. He provided compelling answers to all questions and he was well spoken and articulate.

“The judges would hope that other schools throughout Australia would allow their students to participate and take advantage of opportunities like the Cormack Innovation Awards. The AIP would like to take this opportunity to congratulate James Bossi and Justin Chong for being such exceptional candidates and the institute looks forward to seeing both of these students become outstanding packaging technologists.”

The Cormack Innovation Award scholarship complements other programs initiated by the AIP including the APPMA (Australian Processing and Packaging Machinery Association) scholarship for the Diploma in Packaging Technology and the AIP scholarship for the PCA Southern Cross Awards.



Conductivity and fish freshness

- or a new take on fish and chips

Consumers and retailers could ascertain the freshness of the fish without opening the packaging if an RFID chip that measures freshness is included in the packaging. Consumers could then read the chip with their smartphones before deciding whether or not to buy.

Water temperature, the sex of the fish and the type of food a fish has recently eaten can all influence the speed at which the meat decays and so determining fish freshness is not always straightforward. Even the catch from a single fishing boat can contain fish with very different shelf lives.


To try to make fish selection less risky for consumers, Wageningen University PhD candidate Jenneke Heising is looking at three different ways of measuring the freshness of packaged fish without disturbing the packaging.

Heising decided to look at acidity, conductivity and ammonia as measures of freshness. All three metrics can be measured by including a sensor in the pack.

As the fish decays, various substances are released into the air inside the packaging and they subsequently dissolve in water in the sensor. The ammonia sensor does not

appear to be very useful because the substance is only released once the fish is almost 'off'. Acidity is unreliable because temperature appears to have too much influence on the readings. However, conductivity looks promising, Heising says.

Various substances released from the fish cause water to conduct electricity more easily. At differing temperatures, Heising investigated whether the sensor readings represented how fresh the fish was. "We can see an effect very rapidly and that is just what we need. It seems we've found a good method. To confirm that, we'd also like to know in more detail which substances cause that effect. That's what we're investigating at the moment."

Jenneke Heising's research into three ways of measuring the freshness of packaged fish has been published in the *Journal of Food Engineering*. 



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NZ\$45m dairy distribution centre for Brazil



Fonterra and Nestlé have opened a NZ\$45 million dairy distribution centre in Brazil through joint venture Dairy Partners Americas (DPA).

The facility has been built on the same site as the DPA Araras factory, which makes a variety of chilled dairy products including yoghurts, desserts and cream cheese. More than 200,000 tonnes of dairy products are expected to pass through the distribution centre each year.

Combining the production and cooling site with the distribution facility will offer considerable energy savings, reducing the amount of diesel required for transport by approximately 150,000 litres and saving 400 tonnes of CO₂ each year.

“Brazil is an important market for Fonterra. Rapid urban growth and a focus on healthy nutrition are driving demand for dairy products and we continue to invest significantly in the region through our partnership with Nestlé and by developing selected milk pools,” said Fonterra CEO Theo Spierings.

“The new centre enables us to lower distribution costs and move product quickly across the country. And it is leading the way in sustainability, using efficient systems, reducing gas emissions and waste, and increasing recycling and the safety of our people.”

Fonterra's Latin American footprint drives more than 900,000 metric tonnes of volume per year and NZ\$3.4 billion in revenue from consumer dairy, food service and high-value ingredients. As well as extending Fonterra's business portfolio, the DPA partnership also enables the cooperative to work with dairy farms in the region to improve milk quality, safety and sustainability.



New dairy standard to improve milk testing accuracy

A key analytical standard for the dairy sector has been updated following joint work between ISO and the International Dairy Federation (IDF).

ISO 9622/IDF 141: 2013, ‘Milk and liquid milk products - Guidelines for the application of mid-infrared spectrometry’ contains guidelines for the testing of milk and milk products with mid-infrared instruments. These instruments are extensively used in laboratories and dairy plants worldwide.

The new version now fully covers the use of Fourier transform infrared (FTIR) technology, which improves the routine compositional analysis of milk, according to Paul Sauvé and Harrie van den Bijgaart, two experts involved in the development of the standard.

“FTIR analysers measure the full mid-infrared spectrum whereas the description in the old standard was limited to traditional wavelengths,” said Sauvé, who is an expert at the IDF.



“This means we can be more accurate with fat and protein measurements and test for more components such as urea and added water.”

This increased accuracy is important for products intended for export and trade and will help set pricing in milk payment schemes, as milk prices vary depending on the fat and protein contents, according to Harrie van den Bijgaart, chair of the ISO committee that developed the standard.

“Furthermore, it could lead to the development of new tools to help dairy farmers optimise their herd management; for example, indicators for ketosis and feed efficiency,” van den Bijgaart said.

The fact that multiple parameters can be measured at the same time reduces costs in testing laboratories, the organisations say.

The IDF and ISO have been working together for many years to develop and publish standard methods of analysis and sampling for milk and other dairy products.

“Joint international standards are important to prevent duplication of work in the development of standards and to avoid incongruences,” van den Bijgaart said. “That is what standardisation is all about: reaching consensus between stakeholders in the broadest sense and documenting it.”



Dairy



Spray-dried dairy processes to benefit from research

New research into spray-dried dairy products could improve food safety and efficiency.

Postdoctoral Research Associate Debolina Das from the University of Sydney has won the Best Research Paper Award at the annual Chemeca conference for her paper titled 'Solid-Phase Crystallisation of spray-dried glucose powders: a perspective and comparison with lactose and sucrose'. The research project investigated the tendency of spray-dried glucose-based powders to crystallise over time.

The results of Das's analysis could mean better scale-up and prediction of crystal growth in commercially produced lactose-based powder products.

"We compared molecular dynamic simulations with empirical theory and now have a new view on the 'activated-rate one'; or put simply, the chemical reactions involved in the spraying-drying process of glucose powders," Das said.

Professor Tim Langrish, Head of the School of Chemical and Biomolecular Engineering and Das's PhD supervisor, said the work will assist in engineering new combined approaches to controlling the particle properties of spray-dried glucose products.

"At the moment, the spray-drying methods used often result in powder agglomeration and caking that may cause the powder to degrade quickly. Imagine the powder as a bowl of tangled spaghetti: obviously there will be gaps in the mass. These gaps allow the powder to absorb moisture, allowing bacteria to grow.

"If we can develop improved spraying methods we can reduce stickiness, improve the yield from processing and improve the properties in storage and use. This is significant for products such as powdered milk which Australia produces and distributes globally."

Two in a row for Aurecon: Lactose Evaporator project wins award

For the second year in a row, Aurecon has won the Food and Drink Award at the global IChemE Awards 2013. Aurecon won the award for its work on the Clandeboyne Lactose Evaporator Project in New Zealand.

In 2012, the company's work on the Dominion Salt Vacuum Plant Upgrade Project won it the Food and Drink Award.

The award recognises the best project or process that demonstrates innovation to optimise manufacturing operations and contributes to safe, nutritious and affordable food for the international market.

Looking to increase the yield of edible-grade lactose from its existing lactose plant at its Clandeboyne dairy factory site, Fonterra engaged Aurecon to design, engineer and project manage the installation of a new lactose crystallising evaporator.

Aurecon faced the challenge of achieving the target process performance - increasing plant product yield from 64% to 76% - without the use of any additional raw material.

Evaporation plants used in the lactose manufacturing process typically operate at high solids concentrations. These process conditions often result in significant fouling

of evaporator heat transfer surfaces, which necessitates regular cleaning and results in lost production time and the formation of small crystals in the downstream batch cooling crystallisation process.

Aurecon's innovative design, which also incorporated features to improve lactose crystal growth, dramatically reduced heat transfer surface fouling. The novel design provides extended product run times, improved product yield, reduced water and chemical requirements for cleaning, lower product losses and less wastewater generation than existing evaporator options.

The project increased the plant's lactose manufacturing capacity by more than 25% without using any additional raw material and enabled the recovery of lactose for incorporation in higher value export dairy products that previously Fonterra would have sold as a low-value animal feed or spray irrigated on land.

"I am honoured to have been part of the team to receive an IChemE award for chemical engineering innovation and excellence," said Paul Stephenson, Aurecon's Project Leader on the Clandeboyne Lactose Evaporator project. "This is a great achievement for all who worked on the project."

Dairy



NEWS

Fonterra to open \$235m milk powder plant

The Fonterra Board has approved a \$235 million high-efficiency milk powder plant, which will enable the co-operative to process an additional 2.4 million litres of milk each day. The plant will be built at Fonterra's Pahiatua site on New Zealand's lower North Island.

The co-operative has continued to invest in milk powder driers to meet the growing global demand for dairy nutrition, according to Robert Spurway, Fonterra's Director of NZ Operations.

"This new drier in Pahiatua will help drive greater efficiencies across our manufacturing footprint," Spurway said.

"Last season we set a new record for the most milk collected in one day and overall milk production has been increasing by roughly 3% each year. This drier will help us process the extra milk in a way that delivers the most value to our farmers."

The new drier will use the latest energy-efficient processing technology and will be the first in the country to re-use its own condensate. Its wastewater will be treated and used for irrigation.

The new facility will create 45 full-time jobs, as well as additional jobs during the construction phase.

Preliminary earthworks have begun at the site; construction of the drier and associated infrastructure will begin in mid-December. The first milk powder from the new drier is expected to roll off the site by September 2015.

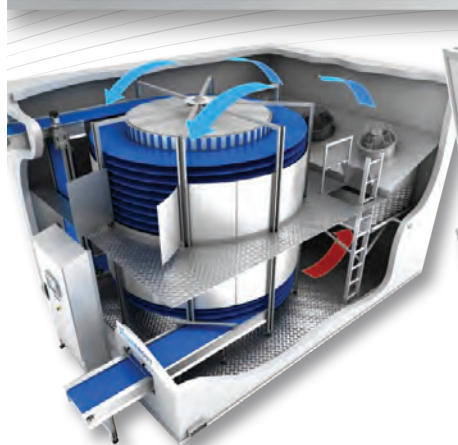
The company recently opened the world's largest milk powder drier at its newly completed Darfield site in Canterbury.



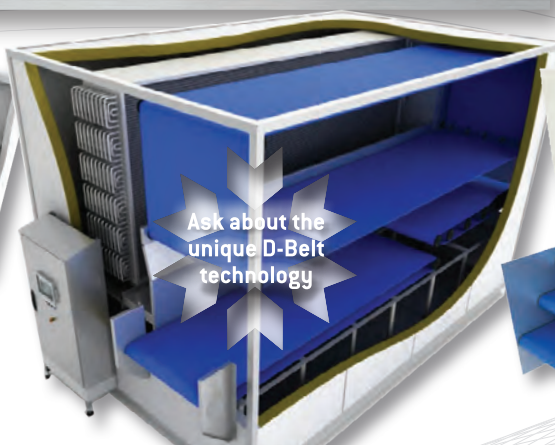
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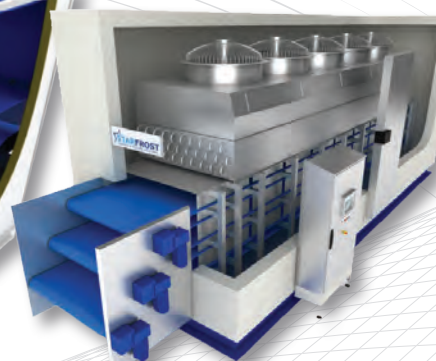
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Updating spray-dryer controls gives productivity gains

+20% increase in production capacity with zero increase in energy consumption

Finnish dairy company Valio has increased its production capacity by 20% without increasing its energy consumption, simply by updating its spray-drier controls.

Valio, solely owned by the Finnish dairy farmers, is the largest dairy company in Finland. The company is represented by 8000 milk producers who own and operate family farms, each having on average 30 milk cows.

Valio, operating in the world's northernmost agricultural region, is faced with many challenges. High feed costs, a direct result of the short growing season, set the price of milk quite high and careful cost control is imperative to remain competitive. Valio concentrates much effort on developing innovative added-value products such as lactose-free, protein-rich and functional dairy items to maximise the value of milk products.

Demineralised whey - from by-product to value-added raw material

Evidence of Valio's innovativeness is found in its demineralised whey product.

A by-product of cheese making, whey is composed of nutritionally beneficial whey protein, lactose and minerals.

Due to its high mineral content, it has traditionally been used in animal feed. Whey can be used for human consumption only after lowering its mineral content using ion exchange, electrodialysis and membrane filtration. This demineralised whey is dried and can then be used in baby foods, infant formulas, confectionaries, dairy products, ice cream and bakery goods.



© stockphoto/Profile/Prapan

Challenges	Solution	Benefits
Over-drying increases energy consumption and creates additional costs.	Optimisation of the drying of demineralised whey using Vaisala HMT333 transmitters to measure humidity and temperature in the dryer inlet and outlet air.	+20% increase in production capacity without increasing energy consumption.
Over-drying leads to whey powder dusting and solubility problems.	Inlet air humidity data to optimise the process.	Optimisation of product properties, such as powder particle size, a critical factor for dusting and solubility.
Inadequate drying results in whey powder sticking to the dryer walls.	Outlet air humidity data to describe the final product quality.	Maximised yield with optimal water content of the final product.

sensors needed to withstand +80 ... +100°C and to tolerate some dust; (the outlet air is filtrated). The accuracy and easiness of cleaning were also important selection criteria.

The dryers were equipped with two Vaisala HUMICAP Humidity and Temperature Transmitter HMT333 units; one in the inlet and the other in the outlet air.

The inlet air humidity data is used to steer the process.

The outlet air humidity data correlates with the moisture content of the powder, thus it can be used as an indicator for the final product quality.

Optimised drying brings benefits

Marko Outinen, R&D Manager at Valio, describes the benefits of the optimised dryer controls: "By the implementation of humidity controls the production capacity was increased by at least 20% without increasing energy consumption. As drying is the most expensive unit operation in the powder processing, this naturally has a huge economic impact on total profitability. In addition, optimising the drying process makes it possible to finetune important product properties, such as powder particle size, a critical factor for dusting and solubility. At the same time, the water content of the final product was optimised for maximum yield."

Relying on reference and reputation

When the planning of the optimisation of dryer controls was done, scientific literature was intensively researched. As Vaisala's humidity instruments were used by another research group in a similar process, Outinen decided to contact Vaisala directly.

Another decisive factor in choosing the instrumentation was reliability: "For us reliability is both product quality and fluency of support functions. We are familiar with Vaisala's good reputation. Vaisala's humidity sensors work on Mars, why would they not work in our process?" concludes Outinen.

Vaisala Pty Ltd

Contact info and more items like this at wf.net.au/V954



The water content of the final product was optimised for maximum yield.



With a production of 40 million kg in 2012 Valio is one of the world's largest producers of demineralised whey powder.

From over-drying to optimised process controls

Demineralised whey is spray dried. There is seasonal variation in the humidity of the inlet air. Due to lack of efficient process control, the dryers were forced to run with a safety margin to ensure adequate drying. This led to high energy consumption and costly over-drying.

To optimise the drying process, Valio implemented controls based on online humidity measurement. The chosen humidity

Cheese culture for cottage cheese applications

DSM has launched two cheese culture ranges for cottage cheese applications. Delvo Cheese CC-300 and Delvo Cheese CC-200 have been developed for medium- and large-scale cheese producers.

With set times of between 5 and 5.5 h, the Delvo Cheese CC-300 range provides fast and consistent acidification and achieves a higher curd integrity, allowing for a more accurate dosage of the cream. According to DSM, this results in a more optimised and cost-effective cheesemaking process with improved yield and good product quality.

The CC-300 range is a phage robust series, with 10 rotations, making it suitable for large-scale producers wishing to speed up their processes.

The Delvo Cheese CC-200 cultures were developed for medium-size producers using mesophilic solutions. The cultures are claimed to deliver improved phage protection with four rotations and good curd integrity.

Both products are claimed to preserve the fresh and characteristic mild flavour of the product over its shelf life, enabling consumers to enjoy their cottage cheese for longer.

DSM Food Specialties

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Titrateable acidity mini titrator for dairy analysis

There are two fundamentally different conventions for expressing acidity in dairy products: titrateable acidity and pH. The pH is a measurement of hydrogen ion concentration while titrateable acidity is the neutralising capacity by a base.

An increase in acidity can be the result of bacteria formation. Monitoring acidity is a way of determining the quality and freshness of dairy products. Acidity is determined by an end point titration using sodium hydroxide (a base).

The Hanna Instruments HI 84529 titrateable acidity mini titrator eliminates the subjective end point colour change detection determined by the human eye, and instead employs the sensitivity and accuracy of a pH sensor. The titration method is a potentiometric end point determination using a pre-determined pH value.

Acidity can be expressed in percent lactic acid, Soxhlet Henkel degrees, Thorner degrees or Dornic degrees by selecting the desired unit on the instrument, without the need to change titrant.

This mini titrator improves on the titrant delivery system and measuring ranges compared to previous models, according to the company.

Features include a precise piston dosing system, dynamic dosing for speed and accuracy, intuitive user interface, real-time graphing of the titration curve on the LCD, logging of up to 200 samples, on-screen help and rear USB outputs for PC connection and to save data to a USB drive.

This titrator is also designed to be used as a benchtop pH/mV meter. The instrument includes Hanna's Cal-Check feature and comprehensive GLP data.

Hanna Instruments Pty Ltd

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Rapid optical microbiology testing system

The Soleris rapid optical microbiology testing system is available through Cell Biosciences, an authorised distributor of Neogen Corporation.

Soleris, formerly sold as MicroFOSS in Australia, is a rapid testing system to detect microbial contamination in dairy and other food samples. According to the company, the system provides answers during the same work shift, which can result in reduced hold times and improved efficiency.

The system can provide early detections of various groups of organisms, including coliforms (14 h), total aerobic count (24 h) and yeast and moulds (48 h). Problematic samples can be easily identified, monitored and mapped.

By providing trend analysis and multiple format reports with a simple click of the mouse, Soleris can alert the user to any deviation and help management ensure that all critical control points are stable.

Cell Biosciences Pty Ltd

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New equipment gives operators cheesy grins

When the time came to replace a vertical form-fill-seal packaging machine and a multihead weigher, wholesale cheese processor Di Rossi Foods turned to Emrich Packaging Machinery.

Having purchased from Emrich previously, Di Rossi Foods knew Emrich would deliver solutions that offered reliability and consistency in performance.

"The machine we wanted to replace was from another supplier and was only two years old when we took the decision to replace it," said Di Rossi Foods' General Manager Jim Leckey.

"It had required constant adjustment by our operators and so we were looking for equipment that would overcome this problem. Critical to our decision was that the replacement equipment had to offer exceptional reliability and consistency in weigh control."

Leckey opted for the the Italian-designed and -manufactured PFM Zenith vertical form-fill-and-seal packaging machine and PFM's MBP C2 Series multihead weigher.

"Purchasing the PFM Zenith and multihead weigher has proven to be a good decision," Leckey said. "The machinery has been faultless and offers really dependable performance. Its speed and accuracy have impacted very favourably on our profitability."



According to Leckey, technical support requirements have been minimal in the 12 months Di Rossi Foods has been using the equipment, and the Emrich support team has been happy to call out for a few on-site adjustments to ensure the machinery was running as effectively as possible.

"Another advantage has been that the PFM machinery is very easy to use and maintain," Leckey said. "Introducing them to our operations definitely put a smile on our operators' faces."

Emrich Industries Pty Ltd

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Cogeneration in food and beverage manufacturing

It seems only a few months ago that major industrials were concerned about electricity price rises and saw gas as an easy option. With the emergence of competition for new gas supplies from large export projects, expectations are for a seller's market and we now see predictions of significant gas price rises over the next few years. In this article, pitt&sherry Principal Consultant Dr Steve Edwards discusses cogeneration as an alternative form of energy generation in food and beverage manufacturing.

Cogeneration is becoming an increasingly important option to consider when designing and delivering new plant in the food and beverage manufacturing industry, according to engineering consultancy pitt&sherry.

Whether it is designing a greenfields start-up or smaller plant expansion, there are vital energy questions in regards to economics and the environment for developers to consider. According to Dr Steve Edwards, with the current volatility in the energy sector it is attractive for developers to turn to options more within their sphere of operations.

"Cogeneration and trigeneration are in your control and becoming increasingly attractive from a long-term management perspective," explained Edwards.

"However, it generally takes a more immediate 'kick in the pants' for decision-makers to move out of their old procurement habits.

"More important spurs in making the choice are the immediate economic and environmental gains."

Typical centralised electric power plants produce lots of electricity, but also produce a lot of heat and expend a

fair bit of energy getting rid of it. The heat is not used and makes the production energetically inefficient, and a high degree of electricity is lost along the transmission lines to the plant. Edwards explained that a centralised plant works economically because the energy supply is historically cheap and the operations are a long way along the learning curve.

"But what happens if use can be made of the heat?" questioned Edwards.

"Cogeneration basically takes the generation of electricity to the site and allows the heat to be used rather than expending energy getting rid of it.

"If it is done correctly this is heat that would have been normally paid for in the boilers."

For dairy processing, trigeneration is particularly pertinent, Edwards continued, as it uses heat to drive refrigeration and is well placed in the cycle for efficiencies. According to Edwards, trigeneration using absorption chillers needs very low-grade heat and is able to 'scavenge' what is left over after heat has been used for steam and hot water production.



"This option is energetically efficient and good for the environment - using less energy from traditional fuels means less greenhouse gas emissions," explained Edwards.

"But is it going to work for you economically? These plants are not cheap and they require additional skills and maintenance."

Economic decision

Even if the capital cost of a plant is not a concern, the greater issue is that energy supply is not as cheap as that used at a centralised power plant.

According to Edwards, to make it all pay back in an appropriate time requires efficient design, efficient use and the right energy prices.

He believes the first element in that efficiency is likely making sure all of the energy that comes in is being used.

"A powder plant may have little need for refrigeration, other than in milk receipt and storage, while a cheese plant can be expected to require a high level of temperature control and a high level of refrigeration usage," said Edwards.

"Conversely, the powder plant will have a higher relative heat demand. If refrigeration is taken out of the picture, each may use about the same amount of electricity relative to milk inputs." It is important to make sure the plant being considered matches your needs, added Edwards.

Fortunately, there is a large variety of plant sizes, from the engines and turbines generating the electricity through to heat recovery steam generators, heat exchangers and absorption chillers.

"How we match up these differing demands is actually a relatively simple, but highly detailed, process," said Edwards.

"The overall aim, not surprisingly, is not to waste anything, including capital."

Factors to consider

It is difficult to get economies of scale if plant is too small, Edwards explained, adding that there is a maintenance requirement at the least for these machines.

"Even if this is outsourced it will require a site presence that will need to be paid for, along with travel costs, regardless how brief the time on site," Edwards said.

"There are installation costs that will have economies of scale and plant costs that have economies of scale.

"Up to a point, larger plants will do better economically. An unfortunate reality, but possibly a useful rule of thumb is that plant sizes under 1 MW will struggle.

"It's not that you shouldn't look at it, but it is one of the risk factors."

Usage also needs to be relatively constant for the plant to pay for itself, according to Edwards.

There are also technical requirements around the way plants operate that mean they run better, cleaner and with less maintenance if they run consistently.

Where there is a peaking requirement there is a need to provide for that through various solutions.

Edwards regards the spark gap as the 'biggy' when it comes to assessing how to approach generation in a food or beverage facility.

"It's actually not independent of these other factors since only in extreme circumstances will it kill a project," said Edwards.

"But if your plans have survived the stages of sizing and peaks and troughs then it is frequently the killer. It is also the most external of the three factors and the easiest to model."

The spark gap is the difference in energy pricing between the chemical energy source, such as natural gas, biomass or syngas, and the cost of electricity delivered to site. It effectively dictates the final profitability of any cogeneration or trigeneration operation.

The chemical energy is the same fuel used in boilers or steam generators on-site and the electrical supply is what is used when in operation.

Once a facility has made the most effective use of its resources, a spark gap is still required to make it all work.

Where does that leave us?

The environment wants cogeneration or trigeneration to be installed, but the economy may have a different view, explains Edwards.

In order, the main risk factors and limitations for a greenfields site are scale of operations, peak matching and energy pricing.

"If you have a new demand with a reasonable scale of need, low hourly variation and good access to, say, piped natural gas at reasonable rates, then it is something worth doing more detailed study on," said Edwards.

"If you are not fortunate enough to have these three, there are likely to be technical solutions that help - but at a cost.

"It has the potential to improve cost-effectiveness, help you look good and help save the world for your children - all at the same time."



Pitt & Sherry

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Cavitation mixing equipment

The APV Cavitator in-line mixer is a modular process technology which forms part of SPX's family of mixing and dispersing equipment. It enables heating of liquids without scale build-up and is claimed to provide solutions to difficult mixing and dispersing challenges for food and beverage processing.

Named for the effect of shockwaves produced from the collapse of 'controlled cavitation' bubbles, the APV Cavitator works by taking a fluid into the machine housing, where it is passed through a controlled cavitation field created by the reactor's spinning rotor.

The design uses the force of cavitation in a controlled manner, rather than using impellers or blades to process materials, increasing the mass transfer rate. Additionally, the cavitation effects are achieved without damage to metal surfaces.

The machine can be used for a range of sanitary applications ranging from pasteurisation to low-pressure homogenisation. It is designed for easy disassembly and CIP and has been manufactured to meet 3-A standards.

SPX Flow Technology Australia Pty Ltd

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Turning waste into power with anaerobic digestion

Economic, social and environmental factors dictate the necessity to manage waste to a new level. Wastewater plants, landfills, farms and food plants are all the owners of biomass that can be digested to produce biogas and turned into power.

Biogas can be burned directly in boilers for heat recovery and used for manufacturing, heating or cooling; this is the simplest method of direct biogas utilisation on site. Alternatively, it can be burned in engines to generate electric power (cogeneration). Combining hot water recovery with electricity generation, biogas can provide an overall conversion efficiency of 65-85%.

Apart from the main purpose of capturing biogas and using its energy, there are other advantages, such as:

- Reducing emissions of landfill gas into atmosphere
- Saving space required to store/utilise the waste
- Removing odours and increasing liveability of the surrounding areas
- Using a by-product to produce fertiliser
- Attracting government funding for capital expenditure

There are three types of reactors used for anaerobic digestion of the biomass: covered lagoons, plug flow and complete mix reactors. Covered lagoons, though being the cheapest method, provide a very low rate of conversion; they are also very smelly and require a lot of space. The plug flow method is only used for dairy manure as it requires a higher

presence of solids. The material requires 20-30 days to convert the biomass.

Complete mix digesters, though implying higher initial investments, have significant advantages over the other types of reactors:

- High yield of biogas
- Minimum footprint
- Faster return of the investment
- Greater bioenergy conversion
- Reduction in solid waste
- Better quality of biosolids
- Pacification of volatile organic compounds

There are several mixing technologies used in the digesters, falling into two categories - liquid (sludge) mixing and gas mixing methods. The gas mixing diffuser method has numerous advantages over the liquid mixing, such as:

- Compact and highly reliable
- Energy efficient
- Can be retrofitted
- No moving parts within the digester
- No need for decommissioning for routine servicing
- Heat from compression of gas increases overall efficiency
- Sizing and selection of equipment is based on digester design and floor geometry, allowing selection of the most suitable option
- Roof-mounted manifold or ground-level installation are possible

Anaerobic digester systems in Australia are coming back into use due to the further understanding of their benefits and the development of technologies. There are several organisations providing grants for construction of biogas plants and installation of digester systems, such as Low Carbon Australia and the Australian government's Clean Technology Investment Program.

Hurl Nu-Way Pty Ltd

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Eco-friendly dairy implements SIG Combibloc filling machines

Based in Port Elizabeth, South Africa, Coega Dairy reportedly has the smallest CO₂ footprint of any dairy in the southern hemisphere. Thirteen local farmers joined forces in 2010 to create an eco-friendly, energy-efficient dairy which supports local dairy production while fostering a sustainable management system and protection the dairy region.

Due to its positioning as an environmentally friendly and energy-efficient dairy, Coega Dairy focuses not only on the dairy products and production processes, but also on its packaging. The company uses SIG Combibloc carton packs which carry the Forest Stewardship Council label.

Being made predominantly from cardboard manufactured from wood - a renewable resource - carton packs reduce consumption of fossil resources such as crude oil. Since trees absorb CO₂ from the atmosphere while growing, sustainably managed forests also help protect the climate.

When expanding its production facilities, Coega Dairy decided to use filling machine technology from SIG Combibloc. Since mid-2013, two CFA 312 filling machines have been in operation, packaging dairy products in combibloc Slimline aseptic carton packs.

Dr Victor Korsten, the recently appointed CEO of Coega Dairy, says the filling machines are an important tool that enables his company to continue its path to success.

"The ability to fill different volumes as well as different products on a single filling machine makes us very flexible in our production. That will have a positive impact on our business going forward," Dr Korsten said.

"Coega Dairy had SIG Combibloc's full support from day one, which ensured a smooth and quick installation of the filling machines, and a smooth and quick start to production. That's a good basis for a stable, long-term partnership."

Alongside the technical support, training provided onsite at Coega's plant and at SIG Combibloc's training centres ensures that production runs smoothly.

Coega Dairy also uses SIG Combibloc's Efficiency Control System (ECS). ECS is a software solution that automatically provides real-time monitoring, recording and analysis of



all relevant production data. Information on the overall efficiency of all lines connected to the system, and on the productivity of individual equipment components, is displayed clearly and concisely. In this way, the ECS helps operators identify potential areas for increasing productivity, thus contributing to ongoing improvement of the production process and system efficiency. In addition, any weak points can be identified and selectively optimised.

"As a dairy industry business, we're under a lot of competitive pressure; the ECS helps us enormously in increasing productivity and efficiency," said Korsten. "The filling machines' very low wastage rates are also a strong feature. That's right in line with our own corporate philosophy."

"We're very proud of the partnership with Coega Dairy. It's an outstanding example of the positive growth within the entire region," said Steve Stewart, Marketing Manager Sub-Sahara/South Africa for SIG Combibloc.

"Since 2001, we've seen growth rates of up to 35% per year in the Middle East and Africa region. Some of the reasons for this growth are that more and more food and beverage manufacturers are discovering the aseptic carton packs for their products, and they're looking for innovative packaging formats and system solutions that are as flexible and efficient as possible. In this respect, our portfolio puts us in a very favourable position. Alongside our system of packaging materials and filling machines, our offer includes technical support and a variety of added-value services."

Coega Dairy benefits from this as well. The company currently has a UHT full-cream milk, a low-fat and a fat-free UHT milk on the market in the combiblocSlimline 1000 mL carton pack with combiSwift screw cap. Coega Dairy also fills various UHT milk brands for one of the largest supermarket groups in South Africa, and various types of UHT milk under the brand name Coastal View. The company also offers a full-cream milk in the 500 mL volume with combiSwift under this brand name.

Visy Industries

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Matcon mixes it up for British Bakels

As part of a £2.5 million project to improve its production flexibility to accommodate its broadening portfolio of bakery ingredient premixes, British Bakels looked to Matcon for a solution.

Matcon proposed a more agile system to cope with recipe variety and small batch runs, some of which include allergens.

British Bakels' original powder blending facilities were based on two vertical conical fixed mixers with capacities of 1500 and 2000 kg. The mixers are fed via a conveyor system from silos holding bulk flour and sugar; other ingredients are added from large bags and sacks via conveyors. The mixers are directly coupled to the packing lines, which pack the bakery premixes into bags.

As the company's product portfolio grew, British Bakels realised it had no spare production capacity, even with 24/7 operation. In addition, the inline production process was not flexible enough to cope with smaller batch runs.

Each mixer took four operators around three hours to clean, resulting in 22% downtime for cleaning alone. The company would campaign manufacture to cope with demand, creating expensive inventory as completed batches were stored in the warehouse.

Matcon's solution included equipment with a small footprint that fits into the existing production area and runs alongside the existing fixed mixtures, which are now dedicated to the high-run, high-volume lines.

The Matcon system processes the small batch runs in which a variety of recipes are handled, including allergens.

Based on 'lean' philosophy, the Matcon system separates the processes of filling, blending and packing by using intermediate bulk containers (IBCs) to transport material throughout the manufacturing process, allowing each procedure to take place simultaneously. This means the packing line is no longer held up while the mixer is loaded, mixed and cleaned, and the mixing line does not need to wait for the packing lines to complete the batch.

IBCs are prepared offline in preparation for the blending process. The 3-in-1 Sack Tip Unit provides a closed transfer of material from sack to IBC, improving housekeeping and reducing the risk of cross-contamination. All ingredients are sieved and passed over a permanent magnet during the filling operation to give further quality assurance.



Blending takes place within the IBC itself. The IBC is loaded onto the Matcon Blender, which tumbles it on an asymmetrical 360° axis to create a homogenous mix. Because the ingredients are blended within the IBC itself, there is no need to clean the blender between recipes, even when allergens are used. This flexibility has enabled British Bakels to develop its gluten-free ranges.

The Matcon Blending System has reduced overall mixing time required for recipes that have both liquid and solid fat additions. British Bakels' previous fixed mixers took an hour for the process, as the fat needed to be whipped together with the sugar before the other ingredients could be added. By using the supplementary intensifier on the Matcon blender, this can now be achieved in a single-stage process, taking just 12 minutes per batch. The bakery premixes are packed into bags using an existing auger vertical form-fill-seal packer. The IBCs are loaded onto a Matcon Discharge Station where they feed directly into the packer, without the need for additional equipment to regulate the flow.

The action of the Matcon Cone Valve within the IBC and the operation of the Matcon Discharge Station safeguards against product segregation and helps the more 'sticky' recipes to flow, optimising the packing line's efficiency and ensuring that the final product meets British Bakels' quality standards.

The new system has reduced downtime due to cleaning from 22 to 6% and increased capacity overall. By significantly reducing the inventory, £175,000 of cash has been released.

Even with the 'unique' products on this line, the facility now has 88% equipment availability - a significant increase from the previous availability of 68%. Since fewer operators are required to manage the Matcon system, British Bakels has reduced its labour cost by 25%.

Overall, manufacturing time has reduced by 55% with the new system as mixes with fat content are completed in a single-stage mixing process. British Bakels is understandably delighted with the results to date.

"We can now offer an enhanced product range, better flexibility of pack sizes, along with significantly enhanced quality assurance and customer service," said Simon Dawson, operations and engineering manager at British Bakels.

Matcon Pacific Pty Ltd

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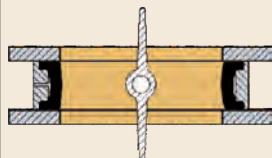
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The benefits of integration

Dannielle Furness

Identification and inspection in food manufacturing are often regarded as two discrete processes; one bound by a plethora of legal and compliance requirements, the other an inherent part of manufacturing operations. As the food and grocery industry follows world's best practice and moves towards a more collaborative value chain management approach, there is a call for streamlined processes that integrate these elements, offering improved production visibility, advanced product traceability and error-free handling.

Australia's food and grocery manufacturing industry is one of the nation's most significant employers, retaining about 300,000 workers and boasting a turnover of \$108 billion in the 2011-12 financial year, according to the Australian Food and Grocery Council (AFGC).

The AFGC annual report for the same period states that the local food manufacturing industry is entering a particularly challenging phase, as external pressures combine to create difficult market conditions. These outside forces include aggressive price war tactics which negatively impact on margins, increased regulatory demands which add to overall manufacturing costs and complex and uncertain labelling specifications that serve to encumber manufacturers and create increased financial obligation.

Never has a process of rationalisation been more important; in an industry constrained by regulation and compliance requirements, where accurate product identification and communication of information forms the backbone of the value chain.

Identification and recognition

The average grocery item on Australian shelves displays an abundance of external information; some legally required for

sale and some included as part of the manufacturing process. Typically, a product will encompass the following information on primary and/or secondary packaging elements during part, or all, of the distribution journey:

- Date and batch information
- Barcode and product labelling
- Product identification marks and branding
- Carton and pallet labels

Each of these indicators is an important channel for identification and traceability at some point during the manufacture and distribution of food product items. Current developments in packaging technology are being driven by the need for high yield and low-cost output. The end result must be produced reliably and repeatedly and the identifiers must be legible, or the whole process is thrown out.

Date and batch marking

Date marking on primary packaging provides the end user with information on how long products can be stored prior to consumption. Food Standards Australia New Zealand (FSANZ) develops and administers the ANZ Food Standards code, which encompasses labelling obligations. Under the

code, date marking for products with a shelf life of less than two years falls into two categories: 'use by' and 'best before'.

Foods that must be eaten within a particular time frame for health and safety reasons are marked with a use-by date and it is illegal to sell the product once that date has passed. Best before is less stringent in that it indicates food may be eaten beyond the labelled date but may have diminished in quality. The exception to the date stamp rule is bread, which is marked with a 'baked on' or 'baked for' date if the product has a shelf life of less than seven days.

Batch marking in manufacturing is a valuable quality control tool for traceability. As food safety is the ultimate responsibility of the producer, it is vital to be able to move quickly in the event of a recall and to limit exposure using accurate batch tracking. In addition to primary packaging requirements, date code information is essential on secondary packaging. The Food Standards Code stipulates that all marking be indelible and clearly legible.

There is a range of available marking technologies for batch and date coding and the most appropriate is driven by the product and packaging form. Primary packing options include label application, laser coding, thermal transfer overprinting and continuous inkjet, with other alternatives including drop on demand and print and apply being used chiefly for secondary packaging.

Barcode and product labels

Barcodes present product data in machine-readable form and provide a capture point at various stages of the production and distribution process. The barcode system was developed in the United States in 1973 by the Uniform Code Council (UCC), which is now known as GS1 US. Europe followed suit in 1977 and Australia in 1978. Today we have full global compatibility through the GS1 System.

GS1 Australia is part of the global not-for-profit organisation. The local arm issues barcodes and administers the GS1 system, which was developed to allow ordering, tracking, tracing, delivery and payment for goods across the supply chain, anywhere in the world.

The GS1 system includes GS1 Identification Keys, which supply access to specific information about a product. These numbers include the Global Trade Item Number (GTIN) - an 8-, 12-, 13- or 14-digit number that is unique worldwide.

Data carriers, such as barcodes, are used to encode the GS1 ID Keys to facilitate communication, data collection and exchange of information between trading partners.

The grocery and liquor industry in Australia is moving towards adoption of the key principles of efficient consumer response (ECR), which dictate that consumers are served better through a value chain that exercises collaborative management.

ECR best practice involves delivering superior business results while reducing costs and by achieving efficiency through streamlining processes. To that end, accurate data capture at all points of the supply chain is essential, with electronic data interchange (EDI) and barcodes being the primary forms of communication in this process.

GS1 Australia has published a set of guidelines for barcoding and numbering in the Australian grocery and liquor industry, which lists a number of benefits associated with using a standard industry approach as follows:

- More accurate information
- Real-time information
- Reduced manual entry
- Improved traceability (including for product recalls/withdrawals)
- Common identification across industry
- Improved stock handling
- Improved stocktaking
- Reduced picking errors
- Reduce customer order errors

Barcodes can be printed directly onto products or form part of the artwork in pre-printed labels, which are applied using inline label applicators. Generic film packaging, commonly used in fresh produce and snack foods, employs a thermal transfer overprint process which can be used with form fill and seal machines to print barcodes during the packing process.

Product identification marks and branding

Product identification and branding are important for protection against counterfeit products, particularly in the pharmaceutical and industrial industries. Laser coding and marking is often used in these applications, as it provides a fast method for printing high-quality permanent codes.

Laser marking uses no consumables, so the cost of ownership is low and investment payback relatively cheap. Laser marking is being increasingly used in the wine industry, where bottles are unobtrusively marked with identification numbers.

Carton and pallet labels

Legible carton and pallet labels are integral to the smooth flow of product through the supply chain. Distribution centres hold thousands of pallets at any one time and cartons are sorted through a series of automated processes. Accurate and legible carton barcode placement is imperative to avoid the costly and inefficient practice of manual handling and identification.

Pallet labels also have a defined format and placement under the Australian Grocery and Liquor Industry requirements, whereby a GS1 Logistics Label must be placed on the fork entry side of the pallet exterior. Failure to meet or adhere to these standards can have broad implications; direct and indirect costs are passed on to retailers as the time to carry out the receiving process extends from a few seconds per pallet to minutes. Manual intervention is required as pallet details need to be rekeyed and a new generic label printed and applied on-site. Generic labels generate further problems as they prevent accurate serial shipping container code (SSCC) traceability, potentially adding significant costs.

In the case of generic cartons and SSCC pallet labelling, automated carton print-and-apply solutions can be used to print a GS1 and retailer specification compliant barcode label, which is then applied to one or more sides of the package. In the case of low volume lines, a standalone barcode label printer with integral software can also be used to manually apply the labels.

New technologies

As technology improves and differing application requirements drive a need for change, development in data carriers continues to deliver significant advances. The advent of 2D codes including GS1 DataMatrix and QR (quick response) in recent years meant that larger amounts of data were able to be stored in a more compact format.

There is a range of inspection technologies in food and grocery covering everything from physical parameters to the presence of impurities

The newest development in data carriers, the GS1 DataBar, was introduced to complement the standard barcode, rather than replacing it. These marks are capable of carrying more data in a smaller package size, which makes them suitable for items that were previously unable to carry a code, such as fresh fruit and vegetables.

The increased information capacity means that data carriers can now contain product records including weight and expiry dates, as well as serial and batch numbers, while the reduced footprint means that valuable space can be used for product branding and marking.

DataBars are currently in wide use in the United States and extensive trials in Europe and Asia, with full global open trade scheduled for 2014.

To further increase efficiencies in communications and data exchange, EPCglobal (a division of GS1) is currently developing standards for the Electronic Product Code (EPC) to support the use of radio frequency identification (RFID). RFID is not a new technology, but has come down in price significantly in recent years, resulting in increased use. The benefit it offers above the more widely used barcode marking is the ability to be read without a direct line of sight. Each tag contains a microchip and antenna, which is read as it passes by or near a reader station. The technology is particularly effective for identification of bulk materials in areas where a direct line of sight may be difficult, such as pallet identification and tracking in a distribution centre.

Inspection

In today's fast moving lines, product inspection is no longer a job for a set of human eyes. There is a range of inspection technologies in food and grocery covering everything from physical parameters to the presence of impurities:

- Vision inspection ensures that the physical appearance and dimensions of a product match expectation. This includes checking closures for tamper seals, fill levels and product content.
- Checkweighing systems automatically check the weight of packaged goods and remove packs that fall outside specified tolerances.
- Metal detection and X-ray is common in the food industry to ensure not only that product remains contaminant free but to minimise downtime on affected machinery in the event of contaminant damage.

Vision inspection

Machine vision inspection reduces labour costs and assists in the minimisation of reworks, rejections and recalls. Comprising a camera and customisable software, the system is integrated into the production line, checks the product against predetermined criteria and displays data back. The data is interpreted in real time and if the product is not shelf-ready

the system then instigates the appropriate predefined course of action: product rejection, raising an alarm or stopping the line altogether.

Real-time reporting software also allows the manufacturer to identify the cause of rejects quickly and to take preventative action to avoid further instances.

Checkweighing

Inline checkweighers are paramount to ensure product is of the proper weight.

By increasing the accuracy of package weights, a producer/manufacturer can reduce waste caused by overweight packages - the reduction in give-away increases the number of packages which can be filled from the no-longer-wasted product.

At the simplest level, the checkweighing process is used to identify goods that fall outside manufacturing tolerances and to remove them from the line, ensuring they don't end up on retail shelves.

Stand-alone manual weighers can be used for weight-based marketing with an integrated database, while fully automatic labellers can be integrated into existing automated production lines to carry out weigh and weigh price labelling automatically.

The reporting capability of a checkweigh system ensures that both short- and long-term statistics can be evaluated and stored for future reference. Production data reporting on random testing for packaging conformity and information on materials, machines, batches, shifts and alarm messages, including a time stamp, allows the manufacturer to identify trends and process efficiency quickly and easily. This in turn reduces costs, provides greater customer satisfaction, leads to fewer line stoppages and provides a greater degree of transparency.

Metal detection and X-ray

The presence of glass, bone, metal (ferrous and non-ferrous), stone and other contaminants can spell disaster in food processing. Metal detection and X-ray systems assist in ensuring that products meet expectations in both safety and integrity. Today's more advanced systems are capable of much more than foreign object detection; they are able to check for completeness and broken products and can be used to inspect fillings inside food products.

Smart systems can easily learn product features, such as aluminium clips on the end of smallgoods, so there are no inaccuracies when identifying foreign bodies.

Why integrating identification and inspection makes sense

Much of the food manufacturing process takes place using automated equipment, but the trouble with automated lines is that they are not infallible; a production tool can easily move out of tolerance or human error could lead to an incorrect machine set-up. Either of these issues could quickly lead to a large quantity of bad production items.

Early detection and correction of problems benefits the manufacturer in terms of realising less wastage, provides the ability to identify and fix upstream issues and to avoid costly recalls.

An integration software system desegregates the processes to deliver a more efficient product traceability solution via a centralised control approach. The integration of labelling, cod-

ing and other end-of-line packaging equipment such as vision systems and scanners creates a more streamlined operation.

The key benefit to implementation of an integrated software solution is the added security it provides. The provision of a single data management point ensures that coding is always accurate and that inspection characteristics are intrinsically linked to that coding. The centralised approach means that correctly labelled product will come off the line and always meet with packaging integrity, weight and fill level requirements, as well as being contaminant-free.

Specific benefits of an integrated approach include:

- Coding and labelling errors are eliminated: Through a system of centralised control, the correct code (barcode, data code or batch code) is always placed on the correct product at the correct time. This lessens the risk of product recall, rework, lost production, wasted materials and penalties from customers, as well as the subsequent brand damage that can occur.
- Increased efficiency: Centralised management of coding data eliminates the need for message editing on the factory floor. Line performance is improved as product changeovers can be executed quickly and easily. Fault alerts and warnings for any devices connected to the network are communicated instantly via a human machine interface (HMI), dashboard, scoreboard, email or SMS.
- Simplified message design: The WYSIWYG editor and centralised database formats make message design quick and simple for coding and labelling products.
- Centralised product ID management: All coders and labelers on a production line are networked, which means that primary, secondary and tertiary product identification is controlled centrally, reducing the chance of errors and improving efficiency.
- Real-time production visibility and reporting: The system tracks real-time production effectiveness, performance and quality information for packaging lines. Detailed production data for a day or even several years of operations are stored in a central database and accessed via the internet or extranet. The availability of comprehensive performance information allows manufacturers to make improvements and changes as required.
- Process improvements: By analysing data over time, manufacturers can improve production processes. If maximum downtime is recorded due to a carton erector, or products are consistently overweight because a filling machine needs adjusting, these problems can be easily identified and a rectification plan developed.

What works today should work tomorrow

As retail, regulatory and organisational needs change, existing hardware, equipment and software solutions must be readily reconfigured to meet simple individual or large-scale operations, whether it be one plant or one hundred.

Some businesses have straightforward requirements, needing no more than an off-the-shelf solution which provides management of primary and secondary coding, as well as labelling and manual pallet SSCC labelling. It may also feature remote fault diagnostics, alerts and rectification capability.

At the other end of the scale, a software solution must be able to grow with a business and incorporate tailored logic



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to meet the differing needs and business processes relevant to specific industries. It should not only be able to work alongside existing MRP, WMS, SCADA or ERP systems, but also factor in future technologies.


Accurate data collection puts the power back into the hands of the user. A smart software integration solution will provide data for in-depth, real-time production line performance monitoring. It should offer accurate production efficiency information including idle times and breakdowns, and identify the cause of any production stoppages. This type of information gives the user visibility and insight into production efficiencies by date and line, allowing immediate action to avoid downtime, and means that long-term strategic decisions can be made on the basis of facts, not 'feel'.

Having access to detailed operational information in real time means that operators and line supervisors are instantly aware of current production efficiencies against known targets and are therefore able to quickly address them and avoid significant productivity losses.

Streamline to success

In a market increasingly influenced by external forces, where costs continue to escalate and margins are continually put under pressure, the argument for rationalisation of manufacturing processes and efficiency improvements is clear.

Continually changing technologies and regulatory requirements as well as the individual needs of a business means that there is no 'one-size-fits-all' solution in software integration. As companies strive towards a more customer-focused approach, delivery of the right product with less wastage, fewer recalls and optimised manufacturing processes will set them apart from competitors.

Employing a solution that not only provides immediate efficiencies but allows for future growth and change just makes good business sense. 

Dust hood for bulk bag dischargers

A Dust Hood for Flexicon Bulk Bag Dischargers contains spillage and dust that can escape through seams in the bag and folds in the spout.

The six-sided enclosure sits against the rim of a hopper or flange of downstream equipment and is equipped with an exhaust port for dust collection and a hinged door with inspection window.

The top of the enclosure contains a circular opening that allows passage of the bag spout to the equipment connection point. The flat bottom of the enclosure supports a Tele-Tube telescoping tube that pneumatically raises a Spout-Lock clamp ring which connects the clean side of the spout to the clean side of the equipment.

Allowing the telescoping tube to descend under its own weight maintains constant downward tension on the spout as the bag empties and elongates, as Flow-Flexer bag activators raise and lower opposite bottom edges of the bag at timed intervals to loosen compacted materials, promoting material flow and complete discharge from the bag.

The enclosure contains incidental leakage of fine powders from seams in the bag, as well as material released from bag spout folds during connection and disconnection activities. Associated dust is vented through the sidewall-mounted port to an optional Bag-Vac dust collector or plant bag house, preventing contamination of the environment.

Constructed of stainless steel finished to food, pharmaceutical and industrial standards, the Dust Hood is offered on all Flexicon dischargers. All can be integrated with the company's mechanical, pneumatic and tubular cable/disc conveyor systems, and are available with controls for automated weigh batching directly from bulk bags.

Flexicon Corporation (Australia) Pty Limited

Contact info and more items like this at wf.net.au/V650

Don't let your flooring floor your safety or staff

Flooring systems in food preparation areas must comply with Australian and New Zealand food processing legislation. When a national food manufacturer in Queensland was establishing a new food processing facility, the company had to ensure that the flooring system was easy to clean and maintain on a daily basis; non-slip; and fume safe to ensure it would not taint food during and after its installation.

The company found that the Epirez Supatuff FG (Food Grade) flooring product met all three requirements and had Supatuff applied on the floors and covings.

The facility was completed to specification and all legislative requirements were met. The company was happy with its floor's non-taint and low-odour properties. Its tile-like surface has proven easy to clean and non-slip so HACCP requirements and personnel safety have been assured.

The seamless hygienic flooring coat is abrasion and chemical resistant and is available in a range of colours. It was tested and approved by CSIRO, Australian Standard AS2542.

The floor coating is suitable for use in food manufacturing establishments, hospitals, educational facilities, catering establishments, dairies and nursing homes.

ITW Polymers & Fluids

Contact info and more items like this at wf.net.au/V057



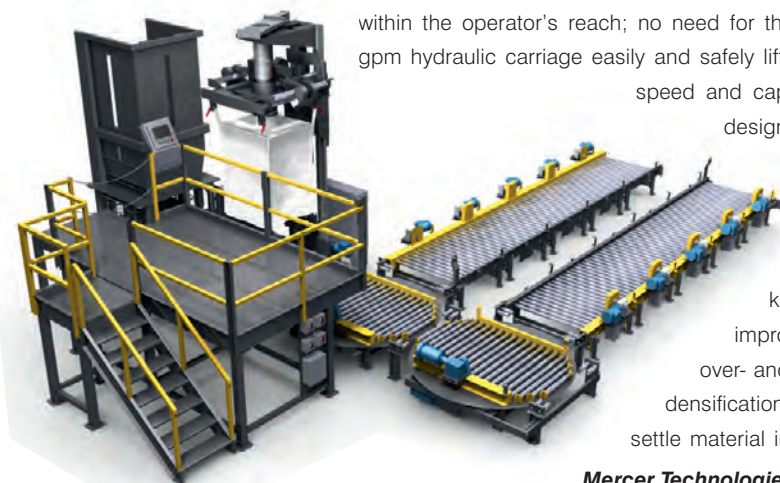
Bulk bag filling process system

NBE has introduced a bulk bag filling process system that includes an automated pallet introduction, automated metering of material supply, NTEP-certified precision bag weighing and automated, filled-bag accumulation conveyors. It is designed to enable a single operator to process up to twenty 2000 kg bulk bags per hour or 40,823 kg of dry bulk material per hour.

NBE integrated automation uses a single, menu-driven HMI to centralise system-wide operations - including legacy, upstream material supply equipment. NBE integrated automation directs all equipment controls, communication, sensing, monitoring and data reporting using UL listed panels built by the company.

Process line optimisation begins immediately upon the introduction and staging of the first pallet. The cantilevered fill head/bag hanger carriage uses pneumatic actions to bring the fill head and rear bag hooks to well within the operator's reach; no need for the operator to step or lean into the equipment. The 8 gpm hydraulic carriage easily and safely lifts bag capacities up to 2000 kg, far exceeding the lift speed and capacity of ball screw designs. The physical ergonomic design maintains optimal operator posture for safe and efficient operation.

The NTEP-certified weigh systems provide valid, accurate and repeatable weighing of the bulk bags to an accuracy of $\pm 0.01\%$ of the 2000 kg bag weight. The NTEP-certified precision weighing improves total process efficiency by eliminating reworking of over- and under-filled bags and reducing material loss. The bag densification platform uses 3 g high-speed, low-intensity vibration to settle material in the bag to a dense, stable and safe load.



Mercer Technologies

Contact info and more items like this at wf.net.au/V035

Freezer spacer removal

The Optimum FSR freezer spacer remover machine operates at an ergonomic working table height to allow simple pallet replacement and freezer spacer removal. By tilting the loaded pallet to a horizontal position, this is claimed to allow freezer spacers to be removed by up to 90% faster than stacking or restacking boxes by hand. The system is suitable for frozen food, cold storage, abattoirs and poultry processing facilities.

Built to handle the rugged demands of the frozen food and cold storage environments, the machine is powered by a durable electric/hydraulic power pack that is operated by easy-to-use dual hydraulic lever controls. With a low-profile platform, ground-level entry with a manual or electric pallet truck is easy. The large jaw opening makes loading and unloading with powered forklifts easy. The machine comes standard with side and rear fence guarding for added operator safety.

For the higher volume and more automated sites, a conveyor fed inline system is available that transits pallets into the FSR for freezer spaces/product separators to be removed. Pallets are then discharged at 90° into an automatic stretch wrapper for the final process before despatch, reducing pallet handling by more than 50%.

Optimum Handling Solutions

Contact info and more items like this at wf.net.au/T716

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CHEP reduces carbon emissions with new compressors



Installing energy-efficient Atlas Copco compressors at its pallet production and repair sites in the UK has helped CHEP save more than 1000 tonnes of CO₂ emissions.

Seven of CHEP's service centre facilities have installed Atlas Copco equipment, including 8-9 bar compressed air, which is used to transport the wooden pallets around the inspection and repair process. There are also two air-drive nail guns on each repair bench and an average of 20 benches at each site. Together, these installations have helped optimise the compressed air system used in all sites as well as eliminate air leaks.

Acting on its commitment to minimise its energy demand and carbon footprint, CHEP's UK site managers undertook an 18-month review of energy efficiency and CO₂ emissions at the company's plants. The review included monitoring and assessment of compressor system efficiency at the seven service centre sites.

As part of this energy consumption and performance audit, Atlas Copco's Manchester-based distributor, Compressor Engineering, installed iiTrak data-logger units for a specific period at each compressor installation. From this data, the conclusion was reached that by installing more energy-efficient compressors, backed by a program of planned, preventative maintenance, optimum performance could be achieved, along with reduced energy costs and increased carbon savings.

At the end of 2011, CHEP installed a number of new Atlas Copco GA-series rotary screw compressors at five of its sites and transferred other existing units between the company's remaining two sites. All of the Atlas Copco machines installed featured variable speed drive (VSD) technology that matches compressor output to fluctuating demand - with the potential to realise consequent energy savings in the region of 35%.

CHEP also chose to support the new VSD compressors and the existing machines with an Atlas Copco Comfort Air service and maintenance package handled by Compressor Engineering.

"Our relationship with Atlas Copco in the UK is fantastic, and the whole project has been a resounding success," said Simon Wood, plant manager at CHEP's Pontefract Service Centre, who managed the project.

Atlas Copco Compressors Australia

Contact info and more items like this at wf.net.au/U779

Palletising gripper tubes

The Pronal palletising gripper tubes range from Air Springs Supply is designed for rapid automated bottling and packaging tasks while also enabling efficient handling of new-generation complexly shaped bottles and flasks.

Made from hot vulcanised elastomer coated fabrics, the grippers are designed to securely grip glass bottles and flasks for palletising and depalletising.

The grippers are compatible with rapid automated bottling and packaging systems. They are able to accommodate minor variations in bottle positioning during rapid movement.

The grippers are typically used in multiple banks of gripping lengths configured to user requirements. Available in standard sizes of 1230 and 1460 mm, special lengths are available on request.

The range of grippers includes different set-ups for different bottle styles to cater to the diverse demands of the food and beverage industry. In addition to the standard ranges, short neck and half inflatable ranges are available. Each range has an optional double feed system or quick-setting nut manufactured from reinforced fabric.

A variety of configurations are available within each of these ranges, including different inflated diameters, height when empty and thickness when empty.

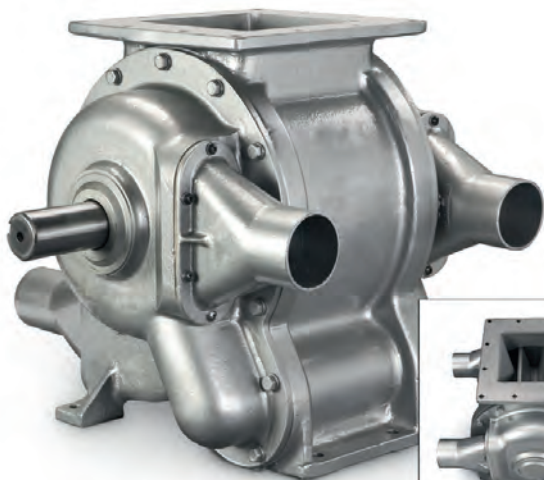
Pronal palletising grippers complement Firestone's range of AirPicker and AirGripper end-effectors, also available from Air Springs Supply.

These product handling devices incorporate neoprene bladders which inflate gently and evenly to manipulate delicate products or containers as light as 20 g or as heavy as 20 kg.

AirPickers work by being inserted into products while deflated, then inflated outwards and evenly to hold onto the product's interior walls. AirGrippers surround a product with a collar from which a rubber sleeve is inflated inwards to grip the product's exterior.

Air Springs Supply Pty Ltd

Contact info and more items like this at wf.net.au/V296



Rotary feeders

The Aero-Flow Series of rotary feeders is designed specifically for pneumatic conveying of dense materials such as fine powders used in chemical and pharmaceutical processing, food and bakery processing, plastics, and milling. It provides highly efficient, air-assisted, material introduction to pneumatic conveying systems.

The ACS Aero-Flow Series of rotary feeders uses a proprietary, dual-induction endplate design to introduce pressurised air from both endplates into the rotor pockets carrying process material. The high bulk density material, when mixed with air, is more effectively released from the rotor pockets and is more efficiently introduced to the pneumatically conveyed material flow. The Aero-Flow Series dual-induction design speeds the material fluidisation process, improves material consistency and optimises feeder energy consumption when compared to conventional, single-induction feeder designs.

Further energy efficiency is provided by an available ACS variable frequency drive to modulate the feeder drive speed and reduce power requirements based on the fluctuating performance needs of the system.

ACS Aero-Flow feeder housings are available in cast iron and 304 or 316 stainless steel; in either 44 or 54 cm heights. They provide optimal service in applications with pressure differentials up to 15 psig and elevated temperatures to 260°C. The Aero-Flow Series 10-vane rotor is precision machined with bevelled vane tips and sides. Other rotor configurations include Teflon-coated and adjustable tips. Adjustable rotor tips are available in hardened steel or stainless steel. Rotor housing interior surface coating options include hard chrome, tungsten and Teflon.

ACS Valves

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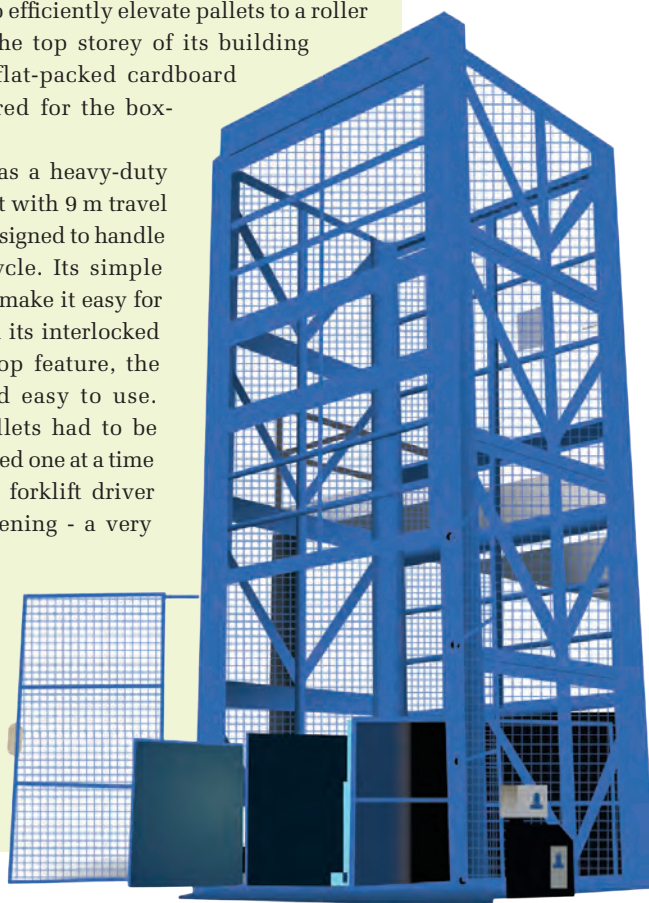
Goods hoist for food processing plant

Optimum Handling Solutions recently supplied an electric goods lift to a large food processing plant. The company needed to efficiently elevate pallets to a roller door opening in the top storey of its building where pallets of flat-packed cardboard boxes were required for the box-making machine.

The solution was a heavy-duty 2000 kg goods hoist with 9 m travel and a goods cage designed to handle two pallets per cycle. Its simple operation controls make it easy for operators and with its interlocked doors and anti-drop feature, the device is safe and easy to use. Previously, all pallets had to be carefully manoeuvred one at a time by an experienced forklift driver up to the door opening - a very tiresome process when 32 pallets get delivered each day.

Optimum Handling Solutions

Contact info and more items like this at wf.net.au/V423



Dunnage bags

Bates Cargo dunnage bags are used to fill cargo voids, preventing unwanted cargo movement and damage to goods.

The bags are easy to use: simply place in the cargo void and inflate. The bags have a patented valve that inflates from any angle and closes automatically after inflation.

Constructed for maximum strength, the dunnage bags have outer layers of heavy-duty wet strength paper and strong inner layers of multilayer film. According to the company, the bags' high-friction outer layer ensures bags do not shift during transportation.

Australian Warehouse Solutions Pty Ltd

Contact info and more items like this at wf.net.au/V259

Warning system for forklifts

The SpotMe warning system from Toyota Material Handling Australia (TMHA) is designed to guard against collisions at 'blind' intersections and help improve forklift safety within a warehouse.

Using infrared (IR) direction-sensitive sensors to detect the movement of approaching forklifts and pedestrians at the crossroads, the system can guard against both forklift-to-forklift and forklift-pedestrian collisions.

If a collision danger is spotted, the SpotMe warning unit is activated to help the forklift operator(s) and/or pedestrian to avoid an accident. The alternating flashing lights (LEDs) used by the system are claimed to be more efficient in preventing accidents than flashing beacons or other types of warning lights.

Other benefits claimed include: reduced wear and tear on the forklifts, reduced energy consumption and less chance of damage to goods as the risk of dropping goods is reduced.

Suitable for use at crossings, blind corners, doors and exits, the warning unit can be connected to a standalone battery or plugged into the mains, and the sensor battery lasts up to three years. The sensor and warning devices are simply fixed to the walls; no set-up is required on the mobile fleet.

Toyota Material Handling Australia Pty Ltd

Contact info and more items like this at wf.net.au/V075



Encapsulated LED area lights

The Banner Engineering WLA Series encapsulated area lights are designed for use in industrial environments. These powerful, solid-state LED lights are completely encapsulated in optically clear polyurethane - enhancing chemical compatibility and increasing their resistance to shock and vibration.

The encapsulated WLA light is a rugged, high-intensity light ideal for machine lighting, visual inspection stations and general industrial area lighting. The sealed light is available in four sizes and has a sleek polycarbonate housing and slim profile.

Featuring a maintenance-free design, the energy-efficient Banner WLA encapsulated area lights are designed to withstand high-pressure, high-temperature washdown applications and are rated to IP69K. Easy installation options include quick disconnect or cable versions, a versatile angle bracket and a magnetic mount solution.

Micromax Pty Ltd

Contact info and more items like this at wf.net.au/V031



Washdown duty drives

Dart Controls has developed the 125DV200E DC drive for washdown applications. Two NEMA 4X enclosures are available: black and white, with speed and direction controls right on the outer panel where they are needed.

The 125DV drive carries all the features found in now obsolete and difficult-to-find older drives, but built with all current componentry.

The dwindling number of DC drive suppliers has made it difficult to find suitable and adequate replacements for legacy drive brands that are still widely used in industry today.

With six standard models incorporating on/off, forward/brake/reverse and run/job settings, the 125DV has all the features of DC drives in an up-to-date package for motors in the 1/4 to 2 hp range. Acceleration, deceleration and current limits are all adjustable, giving full motion control.

The drives can be configured and customised to suit the application.

Motion Technologies Pty Ltd


Contact info and more items like this at wf.net.au/V014



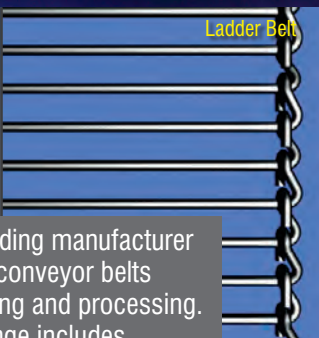


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Stainless steel scissor lift with safety rail

Actisafe has a stainless steel ergonomic goods lift with safety rails which can be used just as easily in the primary foods sector as it can in more industrial environments.

Because the unit is constructed of food-grade stainless steel - and is a 'goods lift' only, not a people lift - it provides ergonomic lifting solutions in the meat and meat processing, poultry and pork industries, and other areas where carcasses and other heavy masses need to be moved.

It is also suitable for general use in warehouses, industrial premises, third-party logistics operations and general retail.

This stainless steel single scissor goods lift table can be used either indoors or outdoors and can either be installed in a pit or operated on the factory floor. Models range in terms of stroke (0.8 to 1.8 m) and platform length (950 to 3000 mm).

The product can also be customised to suit a user's exact requirements.

Actisafe

Contact info and more items like this at wf.net.au/V915

Mobility software for ERP/WMS systems

ASP Microcomputers has released Mobility software to integrate with enterprise resource planning/warehouse management software (ERP/WMS) systems.

ASPluris is an easy-to-deploy and -maintain, mobility suite of modular solutions which provides a robust real-time mobility link to existing ERP/WMS systems. Using web services and rugged portable barcode terminals, the software provides advanced distribution and logistics, inventory and stocktake, field service, job costing and manufacturing functionalities.

ASP has designed ASPluris to be platform-agnostic, which means integration into most ERP/WMS systems will be possible.

The software is suitable for a range of sectors, including warehousing and logistics, manufacturing, third-party logistic (3PL), health and supply chain, and wherever inventory management is needed.

ASP Microcomputers

Contact info and more items like this at wf.net.au/V248

Microwave barrier level limit sensor

Whether in bulk solids or liquids, the VEGAMIP 61 microwave barrier is designed to detect the limit level with absolute certainty in very rough process conditions. The sensor is insensitive to dirt, dust and build-up. It is especially adapted to the requirements and needs of the bulk solids industry.

The measurement is non-contact and the sensor itself has no direct contact with the medium. This is advantageous particularly for abrasive media or very high temperatures. In such cases, the sensor can simply measure from the outside through a microwave-permeable window, such as ceramic or plastic.

Also, when used for level detection of liquids or object detection, the microwave barrier offers many advantages over other measuring principles.

The device can be used both as a maximum and minimum level sensor and fits in VEGA's plics concept, offering all the advantages of a modular system. Housings of plastic, aluminium or stainless steel, as well as different antenna systems and process fittings, are at the user's disposal, making it possible to configure the sensor to meet exact requirements.

VEGA Australia Pty Ltd

Contact info and more items like this at wf.net.au/V050



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Image exploitation used to improve wine quality

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Grapes can be graded for quality and be checked for foreign object contamination simultaneously using a new system under development in Germany.

A novel piece of optical sorting equipment is set to help make the most out of grapes' quality. Researchers from the Fraunhofer Institute for Optronics, System Technologies and Image Exploitation IOSB in Karlsruhe are working to develop the equipment together with Armbruster Kelterei-Technologie GmbH, Ingenieurbüro Waidelich and Geisenheim University in the GrapeSort project, which is funded by Germany's Federal Ministry of Economics and Technology (BMWi).

Several tons of grapes pass through the sorting facility every hour. Grapes of the Trollinger, Riesling, Weißburgunder and Lemberger varieties have been successfully sorted in preliminary testing, with project partners unanimously declaring the results of the sorting to be good.

Sorting the good grapes from the bad and the miscellanea

Once the vats of grapes have been delivered, their contents pass through a feeding unit into the destemmer provided by Armbruster, which separates the berries from their stems.

Next, the grapes are individually placed on a conveyor belt by a newly developed conveying system. "What's important is to get the berries onto the belt without damaging them," says Dr Kai-Uwe Vieth, a scientist at the IOSB.

The grapes are then carried along by the conveyor belt past the IOSB's sorting module at a speed of 3 m/s. At the heart of the module is a high-speed line scan camera that records the material flow, taking photos of the fruit as it rushes past - 18,000 times a second. IOSB analysis software evaluates each image in milliseconds and controls compressed air jets that blow foreign objects such as insects, vine shoots, stones or twigs out of the material flow. Bad or undesirable berries are also removed by the Waidelich air ejection unit.

The 'good' grapes fall into a container.

"Our sorting module is designed to exceed the capabilities of current machines. Not only does it remove foreign objects, it also sorts the berries into various quality grades. That lets you create exactly the wine you want," says Vieth.




The good grapes land unharmed in a container. Insects, leaves, unripe grapes and other foreign objects are removed by the optical equipment. Image: © Fraunhofer IOSB

The camera is trained in advance what to deem 'bad'. Mould, earwigs, leaves and the wrong degree of ripeness are typical rejection criteria. Sorting is done based on analyses of shape and colour.

The researchers are already able to use their equipment to recognise various degrees of berry ripeness based on nuances of colour. In future, they also want to be able to tell the ripeness by investigating how much sugar there is in the fruit.

"Winemakers measure sugar content using a refractometer, which allows them to read out on a scale the degree to which sugar molecules in the must influence the angle of refraction of incoming light. The higher the sugar content, the more the light is refracted. The line scan camera can also measure reflected light, as it is a light-sensitive line," Vieth explains. This integrated line sensor is sensitive to both visible and invisible light. For the laboratory analyses that run while the measurements are taken, Vieth and his colleagues use imaging sensors for the wavelength range of 240 to 2500 nm. The sensors generate spectra for each pixel.

An optimised functioning prototype that will serve as a basis for a production-ready facility is set to be tested for the first time in October 2013. All the components undergoing constant development and optimisation - the feeding unit, the camera box and the air ejection unit - will be connected up and tested in time for the grape harvest. And the entire project will be put to the sensory test at another premiere in June 2014: the tasting of the resulting wine by the Geisenheim University viticulture experts who are providing their expertise to the project.

Vieth and his project partners are convinced that their wines will be a great success: "The sorting system helps to improve quality and separate the harvest into various quality levels. This will allow winemakers to expand their premium output." 

CIP system for potato strip automatic defect removal system

Key Technology has introduced CleanBelt, a clean-in-place (CIP) system for ADR 5, the company's automatic defect removal system for potato strips. According to the company, this automated CIP system reduces sanitation and maintenance labour, minimises the cost of replacement parts and helps maintain the ADR 5 system's performance.

Because starch hardens over time, starch build-up can be a persistent problem on potato strip production lines, especially on equipment with moving parts and on inspection equipment where build-up over viewing surfaces can degrade system performance.

With a combination of passive and active cleaning systems, CleanBelt continuously removes starch from the ADR belt to prevent build-up. The consistency of this routine reportedly ensures a uniform inspection background for the ADR cameras over time, which eliminates the need to recalibrate ADR and helps maintain optimal inspection performance without degradation.

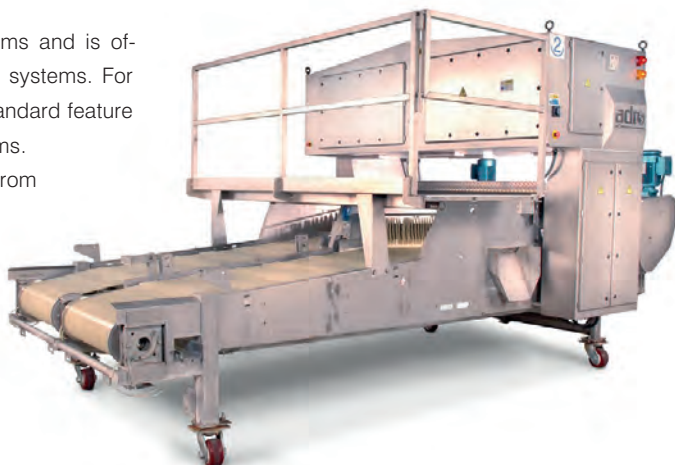
Preventing starch build-up also reduces the risk of belt mis-tracking, which can cause damage to the knives and cutting wheel.

The CleanBelt is a standard feature on all new ADR 5 systems and is offered as an in-field upgrade to processors with installed ADR 5 systems. For processors with older ADR systems, Key offers CleanBelt as a standard feature on upgrades to ADR 5 from ADR II, ADR III and ADR 4c systems.

The system eliminates the need to manually remove starch from between belt lanes and reduces the need for the ADR belt to be manually cleaned. The company claims it extends the intervals between cutter wheel rebuilds and reduces knife replacements, saving labour and parts.

Key Technology Australia Pty Ltd

Contact info and more items like this at wf.net.au/V572





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Temperature transmitter

ifm efector has released the TD series temperature transmitter with display and IO-Link for food applications.

Available in probe lengths from 30 to 150 mm, the unit has a bright, 4-digit display and a fast response time of $T05/09 = 1/3$ s.

The integrated clamps and G1/2" process adapters allow quick and easy installation. The transmitters of the TD series are supplied with a preset measuring range. No complex configuration is required.

For special applications, the temperature range can be scaled via IO-Link 1.1.

The transmitter has a compact and hygienic design with integrated adapters, as well as a display for local temperature indication. The unit is embedded in a high-grade stainless steel housing and protected to IP69K standards. It is designed to be operated in harsh applications.

ifm efector pty ltd

Contact info and more items like this at wf.net.au/V501

Steam and cold water mixing unit

The M-5000TG Low Flow Series mixing unit produces hot water instantly from a steady supply of steam and cold water. The range is claimed to help users achieve savings in water, sewage and energy costs.

The models are equipped with a dial-type gauge that indicates the wash water's temperature and can be easily regulated by turning the unit's steam and cold water valves. It is also available as either a manual or thermostatically controlled unit.

As an added safety measure, the units shut off their steam source automatically if the cold-water pressure falls below 50 psi for any reason. This prevents hazardous steam from exiting the unit and causing steam burns.

The product is designed to be wall mounted, 2.5 cm away from the wall for easy cleaning and safe stowage. The rugged, one-piece construction make the unit robust and long-lasting. It is constructed of bronze, with stainless steel internal parts, and finished in either chrome or chrome-plated material. It comes complete with hose rack, inlet check valves and temperature gauge.

Water-saving trigger guns, including a low-pressure unit for difficult applications, are also available for the station.

Spray Nozzle Engineering

Contact info and more items like this at wf.net.au/V565

High-vis polo range

The XAX Apparel Retro OB Tape Polo high-visibility garment range uses a stretchy heat-seal silver Loxo OB Retro tape which is designed to provide the wearer with improved comfort. The tape fully conforms to all Australian and New Zealand Safety Standards, as well as the Euro EN Standards, and provides two important added features. Firstly, the stretch OB tape provides the wearer with less restricted movement and, as a result, more comfort. Secondly, the heat-seal application enables the tape to have an open striped pattern design allowing more airflow through the fabric, resulting in a lighter weight tape and thus providing further worker comfort.

Available in two fabric selections, the 'all natural' knitted 100% cotton and the 'easy care' 100% knitted polyester fabric, the range has both long- and short-sleeve styles in orange/navy and yellow/navy high-visibility colour combinations. A full size range is available from SM to 6XL.

Other features include: all plastic press-stud buttons, double button flap chest pockets; pen compartment and spectacle/security hang loops for safety glasses or security name tag.

Fabrics and Retro OB Tape fully comply with Australian standards ASNZ 1906.4 Safety materials with ASNZ 4399 ultra violet protection rating UPF50+ protection, and the garments also comply with Standard ASNZ 4602 for safety garment design.

XAX Apparel Pty Ltd

Contact info and more items like this at wf.net.au/V066



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Make your security and tracking edible

Counterfeit product is a huge and growing problem that is affecting the food and pharmaceutical industries worldwide. Companies invest heavily to develop and market unique products only to have 'fake' versions pilfer their market share and threaten their reputations.

A new technology is offering a solution - edible microtags. These covert, low-cost, heat-resistant and edible silica microtags serve as an invisible 'edible barcode' and can be incorporated into the very fabric of a food or pharmaceutical. A vast library of unique spectral codes is available, which allows for the authentication of high-volume, high-value items at the lot or batch levels.


The microtag developer, TruTag Technologies, a Honolulu-based innovator of an edible security platform to address the trillion-dollar global counterfeit problem and the issue of food and medicine safety, has been named a 2014 Technology Pioneer by the World Economic Forum.

TruTag microtags are inert, edible and can integrate into the very fabric of a product, independent of packaging and labels, much like fingerprints on a human being. Millions of optical patterns can be embedded into a TruTag, which is a dust-sized particle less than the width of a human hair.

TruTag can be used for the authentication of food, drugs, electronics, industrial components and consumer products. The

security platform will help prevent counterfeiting, enhance the safety and traceability of food and medicine, improve tracking and logistics, and assure product quality.

TruTag has just been selected as a Technology Pioneer by the World Economic Forum. Technology Pioneers will be awarded for their achievements in a ceremony on 12 September at the Annual 'Summer Davos' Meeting of the New Champions 2013 in Dalian, People's Republic of China. Past Technology Pioneer winners include Google and Twitter.

"With their ability to profoundly affect the world's current counterfeit crisis, TruTag Technologies is a great fit for the Technology Pioneer awards," said Tom Byers, professor and endowed chair of entrepreneurship at Stanford University, and a past judge for the World Economic Forum Technology Pioneer awards. "Technology Pioneer candidates are evaluated by the world's leading technology experts in a rigorous selection process. This selection distinguishes TruTag Technologies as a global innovator and disruptor." 

Bandsaw safety device

While bandsaws are an essential tool in the meat processing industry, they also pose a high risk to health and safety. Bandsaw accidents can result in injuries such as cuts, muscle damage, nerve damage and amputations.

In collaboration with Meat and Livestock Australia, Machinery Automation & Robotics has developed a solution to bandsaw injuries. BladeStop is designed to reduce risks of serious injury by mechanically stopping the bandsaw blade when the unit senses that a person has come into contact with the blade.

On sensing contact with the operator, the blade stops operating within 15 ms, which can mean the difference between a small skin cut and an amputated finger.

According to the company, the product can reduce production time lost to injuries, insurance premiums, operator turnover and training costs, and product spoilage.

Machinery Automation & Robotics

Contact info and more items like this at wf.net.au/V739



Salad and vegetable cutting machine

The KSM 100 salad and vegetable cutting machine from Kronen is suitable for cutting vegetables, salads and harder fruits.

It has a large cutting door with two infeed openings: a large opening for products like cabbage, leafy vegetables and broad leaf endives, and a small opening for long products such as cucumbers, zucchinis, carrots, radishes, etc.

The machine comes with a variety of cutting tools and accessories, including a scraper which can be used with all knives. All cutting tools can be changed easily and quickly.

Reactive Engineering Pty Ltd

Contact info and more items like this at wf.net.au/V892

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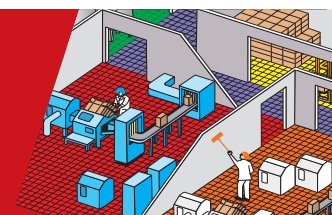
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Vision guidance for robots

ABB Integrated Vision is a smart camera system that makes vision-guided robotics applications faster and easier to deploy. Using 2D vision guidance, manufacturers have the ability to track products more accurately, improve supply chain management, improve quality, troubleshoot challenging lines and processes and significantly expand their use of robotic automation. Taken together, the advantages of vision-guided robotics can significantly improve a company's bottom line, saving time, money and resources.

The system, powered by Cognex, features sophisticated imaging technologies such as Cognex's PatMax algorithm for advanced part location. The result is robust inspection, defect detection, guidance, alignment and measurement which are necessary to ensure manufactured products meet the highest standards.

RobotStudio, ABB's PC-based programming tool, provides the platform for creating vision tasks quickly and easily. Operators can select features, set parameters and operate under real-world conditions from a library of common vision applications. The smart camera offers a wide range of built-in communication protocols that interface directly with the ABB robot, making it simple to get a robot up and running.

ABB Australia Pty Ltd

Contact info and more items like this at wf.net.au/V878



'Hand-pulled' meat research project

The increasing popularity of the 'hand-pulled' look for beef, lamb, pork and chicken has resulted in a research collaboration between Meat & Livestock Australia (MLA) and Summit Machinery.

Using the FAM Yuran dicer, the research project will investigate the different appearances that can be created in a range of red meat products.

According to Summit, the machine has proven its capability is slicing, dicing and strip cutting various products. Trials run by MLA will investigate its ability to produce various pulled beef and lamb products.

To understand the shapes and textures that can be commercially achieved with the Yuran dicer, MLA will conduct trials using cooked beef brisket, lamb shoulder and extruded meat, as well as raw 'hot boned' cuts - meat which has been boned out prior to the onset of rigor mortis.

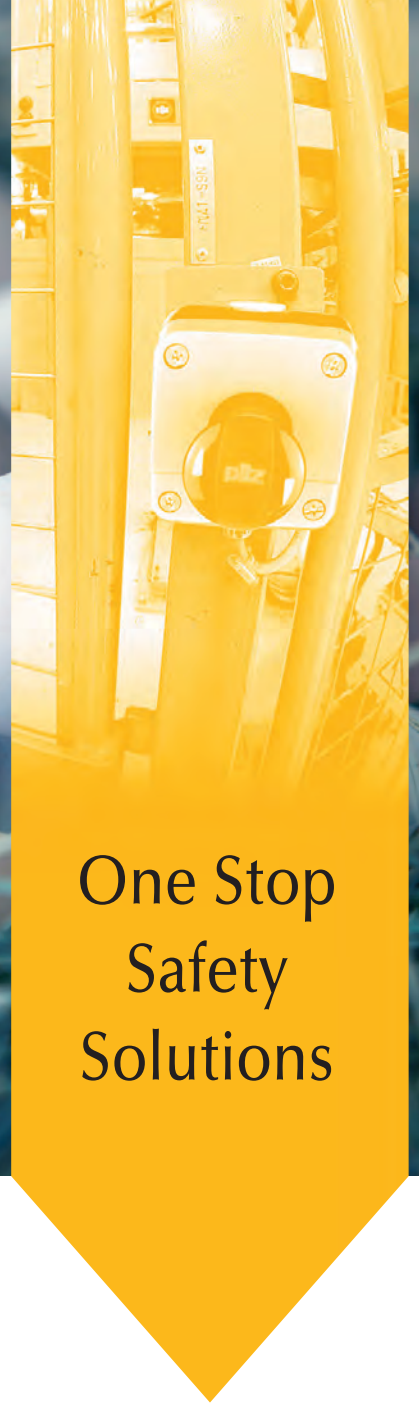
Once the trials determine the viability of the end product and process, MLA intends to conduct a series of workshops for interested parties to undertake their own evaluation and trial the machinery.

The Yuran dicer is currently used by one of the largest pork processors in the US for pulled-look meat. A Melbourne chicken processor has also installed the unit to produce pulled chicken meat products. The Melbourne company has reported great success with the machine.

Summit Machinery Services

Contact info and more items like this at wf.net.au/V758





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Gently does it

Gentle Motion reciprocating retorts have been installed in a European food plant for the first time and are being used on shelf-stable soup products packed in flexible containers.

Gentle Motion agitation is a high-capacity retort process designed for pouches and bowls that are oriented horizontally in a retort, rather than vertically, like cans, bottles and jars. The back-and-forth reciprocating motion of the retort baskets in a Gentle Motion retort produces waves of heat that flow longitudinally through the package.

For soups and sauces that have low-to-moderate viscosity and moderate-to-high liquid and particulate content, this process is ideal. Each Gentle Motion retort can have up to six full-sized baskets and can be loaded and unloaded via an automated system.

In the European food plants, the reciprocating agitation process has reduced processing time on average from 5 to 40%. Besides increasing plant capacity, the reduced cooking time also improves a shelf-stable product's taste, texture and appearance.

"Flexible packaging is steadily growing in Western and Eastern Europe and Russia," said Greg Jacob, vice president and general manager, Allpax.

"We believe that this new Gentle Motion line will be an important demonstration for the European food industry of how flexible packaging combined with horizontal agitation sterilisation can produce significant quality and capacity improvements."

Allpax recently conducted research into the impact of Gentle Motion agitation on 15 foods packaged in various microwaveable pouches and bowls. The research showed reduced processing time, increased capacity compared to static retort processing and subjective improvements in quality, including taste, texture and appearance.

In these tests, sterilisation time reduced from 14 to 59% over static retorts. In addition, food quality improved across the board.

Allpax

www.allpax.com



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Sugar-dissolving and pasteurisation system

Krones has revamped its sugar-dissolving and pasteurisation system. The entire SyPro S sugar preparation unit is modular in construction, so that it can be individually expanded as needed and adjusted to suit raw material qualities. The concept has been designed for energy economy, with appropriate measures for heat recovery incorporated.

The system is mounted on a frame as a plug-and-play solution, and serves as an important input stage for the production process of a range of soft drinks.

The continuous sugar-dissolving unit primarily consists of a tank holding the water being used, a pre-warming water unit, an internal dissolving circuit with separator strainers and a Brix-controlled syrup flow channel leading to the downstream process (eg, the pasteuriser).

The compact sugar-dissolving unit has been pre-assembled on a frame, can be shipped in a container and integrated into any existing process ready for operation. According to the company, this unit philosophy improves conditions and reduces the time for commissioning.

An integrated control function, which can be linked to a higher-order control system, ensures that the concentration desired for the sugar solution is reliably set, with minimised deviations of $\pm 0.1^\circ\text{Brix}$. This concentration is then continuously passed onto the next processing step.

The inlet nozzle in the dissolving tank aids the complete dissolution of the granulated sugar. Without the need for any additional pump or agitator, the nozzle's design helps achieve complete blending, irrespective of the fill level obtained in the dissolving tank, giving shorter dissolving times and reduced energy consumption.

The system is available in two performance categories of 7.5 to 15, and 15 to 30 m^3/h , with reference to a sugar syrup of 65°Brix . In both sizes, the process can be adjusted between full and half throughput.

JL Lennard Pty Ltd

Contact info and more items like this at wf.net.au/V931

Electrical energy logger

The Fluke 1730 three-phase energy logger is claimed to be an intuitive, easy-to-use tool with professional-level, energy data-gathering capabilities.

Detecting electrical waste normally requires logging energy consumption over time, using expensive power-quality analysers operated by engineers with advanced training.

The Fluke 1730 energy logger offers a straightforward, intuitive design that lets technicians load studies and energy logging right out of the box. The results provide facility managers with the information necessary to identify and prioritise energy saving projects.

The compact energy logger conducts key measurements of voltage, current, power and power factor to identify areas of energy waste. All measured values are logged automatically and can be reviewed during logging. Common set-up errors are rectified, through re-engineered cables, digital check and auto-correct of all connections and an on-screen wizard for interval set-up. It has a high safety rating (600 V CAT IV/1000 V CAT III), can be powered directly from the measured circuit eliminating the need to find a power outlet, and has two USB ports for fast data downloads to PCs or standard thumb drives.

Data logged by the device can be imported into the the company's Energy Analyse software for further processing and archiving. The software lets users analyse energy or load profiles including zoom in and zoom out on details, add comments, pictures and other information to data, overlay different logging sessions, create reports and export measurement results.

Fluke Australia Pty Ltd

Contact info and more items like this at wf.net.au/V193



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Advancing Food Safety, SAI Global Ltd (AFS) is a Registered Training Organisation (RTO). AFS offers a suite of Food Safety and HACCP courses designed to assist you with training all levels of staff within your business. Our training is available in public courses scheduled across Australia or alternatively we can come to you to train a group of your staff.

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Food Legislation and Labelling		10-11		17-18		13-14		19-20		
HACCP Refresher	14	4	21	4	11					18
Internal Food Safety Auditor		27-28		6-7	20-21					
Introduction to Food Safety and HACCP Awareness		3	20		10		21			
Lead Food Safety Auditor	20-24		13-17		17-21					
Principles and Applications of HACCP	15-17	5-7	22-24	12-14	22-24		26-28			
Principles and Applications of HACCP for Produce		24-25	30-31		14-15					
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Sorting the MOG from the must

Key Technology has conducted several full-season trials with wineries in North America, Europe and Australia to verify the effectiveness of its VitiSort sorter for red wine grapes.

Suitable for wineries producing 5000 to 50,000 cases per year, VitiSort sorts up to five tons of red grapes per hour, removing MOG (material other than grape) such as insects, skins, raisins, shot berries, petioles and leaves from the product flow. This enables the winery to better control the quality of must going to the fermentation tanks.

Both Pepper Bridge Winery near the Washington-Oregon border and Chateau Ste Michelle in Woodville, Washington, have used VitiSort for more than one vintage.

"With its MOG shaker and optical sorter combined, VitiSort is very effective at improving the quality of our must. If it's not removed, MOG will release a bitterness - a harsh tannin - to the wine. Removing the non-grape attributes like this will improve the quality of our wine," said Jean-François Pellet, Winemaker at Pepper Bridge Winery.

"Thanks to this system, we're able to receive, sort and crush 3.5 tons of grapes per hour with only four workers. One is overseeing the operation, one is feeding product to the system, and two are sorting out leaves before the destemmer. It's hard to say how many people we would need without VitiSort - maybe 15 or 20, I'm not sure - but it's virtually impossible to achieve this high level of MOG removal at the volume we're doing with manual labour."

"With Key's VitiSort, we're removing 99.9% of the MOG while sorting 4 to 5 tons of grapes per hour with two and a

half workers," said Ray McKee, Red Winemaker for Chateau Ste Michelle.

"The effectiveness of the technology allows us to use machine-picked grapes and put only berries and pure juice into fermentation. It gives us exceptional quality control to end up with a very rich and dense wine that doesn't have the tannin from green stems and leaves."

The stainless steel VitiSort is compact and mobile, designed to easily roll into position under the destemmer so fruit automatically flows from one machine to the other. The two-stage VitiSort features a mechanical MOG removal system followed by an optical sorter.

First, a vibratory conveyor gently shakes the grapes to separate MOG, which falls through uniquely designed slots in the shaker's screen, along with juices. MOG is accumulated on a sloped surface for easy disposal, while the juices are recovered for reintroduction to the must. Singulated grapes freefall from the end of the vibratory conveyor into the sorter, presenting a 'sheet' of product that allows a camera to inspect each grape. A specially designed drip tray keeps juice out of the camera line of sight. The sorter quickly analyses the images, comparing each object to previously defined accept/reject standards. When unwanted objects are identified, the sorter activates the ejector system, which is made up of a series of air jets that span the width of the system. While still air-borne, the air jets pinpoint MOG to reject and remove it from the product stream. Grapes are discharged from the sorter into a trough or screw conveyor for delivery to the fermentation tank.

Compared to sorters that feature horizontal belts to inspect product on a horizontal plane, Key's VitiSort inspects product on a vertical plane to simplify the operation while achieving the same results. VitiSort offers a smaller footprint, improved sanitation with the elimination of belts and gentle handling with fewer transitions.

Key says the VitiSort can do the work of 8 to 12 people, and yield loss associated with the sorter is 2 to 4%, depending on the grape variety and the effectiveness of the destemmer. A colour touch-screen panel features a graphical user interface where the winemaker can adjust the sort parameters to remove more or less MOG to meet requirements. Product settings can be stored and retrieved.

VitiSort can function along with the destemmer or combined with Key's Grape Receiving and Inspection Platform (GRIP) upstream of the destemmer.

"The MOG shaker is very effective at removing insects and shot berries, which reduces the load on the optical sorter and improves its performance. The optical sorter takes out stem jacks and other MOG," said Pellet. "It's a very simple, gravity-fed system. Since it has no belts, it's easy to use, easy to clean and easy to maintain."

Key Technology Australia Pty Ltd

Contact info and more items like this at wf.net.au/V947



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Rotary positioning encoder

The DFS60I incremental rotary positioning encoder from SICK is suitable for applications in food processing, beverage filling and the pharmaceutical and packaging industries.

Its housing, flange and shaft are made of inox steel. The seal ring is made of ethylene propylene diene monomer rubber (EPDM), which offers good resistance to water and water-based systems such as acids and brines. The surfaces and seal ring meet requirements relating to corrosion resistance and chemical resistance during exposure to humidity and aggressive media.

Due to a resolution of 16 bits, the user can program the number of pulses from 1 to 65,536, zero pulse position and zero pulse width, and set the voltage level of the output-side TTL or HTL interfaces as is necessary for the application.

An external power source is not required for the programming. The encoder is connected via the output cable to the PGT-08-S programming tool, which first reads the current DFS60I settings of the electronic-type label and saves the new settings in the encoder.

The DFS60I has a solid shaft (10 mm in diameter), which provides for a variety of mechanical and electrical adjustments for easy mounting. The compact housing with a diameter of 60 mm facilitates the space-saving installation of the encoder.

The M12 connector with a radial cable outlet makes the encoder suitable for difficult mounting situations due to limited space.

For electrical interfaces, the encoder includes: a 24 V open collector interface; two six-channel TTL/RS422 interfaces with different signal levels; one six-channel HTL/push-pull interface; and programmable TTL/HTL interfaces.

Sick Pty Ltd

Contact info and more items like this at wf.net.au/V821

USER REVIEW: THE KIARO! INKJET LABEL PRINTER



*"It's the easiest printer I've ever used.
It makes my job a lot easier"*

—Greg Dragna
Director of Label Production, Progressive Labs



Progressive Labs, a developer and manufacturer of nutraceuticals located in Irving, TX, recently purchased a Kiaro! inkjet label printer. **Speed, economy and ease of use are just a few of the benefits** Progressive has experienced since purchasing the Kiaro!.

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Bass Electrical helps Tooheys automate beer-brewing process

When Tooheys decided to upgrade its brewery in Lidcombe, NSW, it turned to Bass Electrical Engineering for assistance. The ARA Group-owned Bass has been carrying out electrical work at the Tooheys Lidcombe site for several years. There was a tendering process for the installation and part of the reason Bass was successful was due to the company's quality work and high safety standards.

The production capacity of Tooheys Lidcombe brewery (in operation since 1978) is around 3.3 million hectolitres a year. The brewery is the group's primary facility in NSW and delivers around 43% share of the NSW beer market. As a part of the upgrade, a new Bright Beer Tank (BBT) cellar was installed to replace three BBT cellars. The old cellars had a manual process and were replaced to eliminate the manual handling component and to improve product quality. With the help of Bass's electrical engineers and technicians, the cellar now has an automated beer-brewing process. Bass designed and built the stainless steel local control panels and provided power, automation and control communications to the cellar.

"The tank-top lighting posed a challenge. Due to the height of the top of the tanks, there was a risk of tools and equipment falling when installing lights on traditional light poles. This was solved by the use of the Swivelpoles," said Bass Electrical General Manager David Le Beau.

The Swivelpole light-mounting system allows for safe and easy access to lights for installation, inspection and maintenance. The poles have a bracketing arrangement for affixing the lights, eliminating the need to drill holes. Swivelpole's innovative design eliminates the risk of working at heights through the controlled lowering of the pole top to a safe working position. The system solved access issues, raised safety standards and lowered maintenance costs.

"Another challenge was a very short time frame to complete the project. Bass Electrical was required to use services of the on-site mechanical contractor for manufacture of all stainless steel cable supports for the entire project. The mechanical contractor also had to complete other contract work for the same project within the same time frame. This was addressed by planning,



prioritising and holding regular meetings with the mechanical contractor to keep communication lines open and to ensure both trades met their respective timelines," said Le Beau.

"Tooheys' projects are always interesting because Tooheys uses innovative systems. The work is of a niche nature and fits well with Bass's experience and capability," said Le Beau. Bass Electrical was also named a finalist in the National Electrical and Communications Association (NECA) NSW Excellence Awards in the Industrial Project Category for the company's work on the project.

Bass delivers services across a wide range of markets including the mining and resources, steel, oil, gas, water, energy generation, manufacturing, food and beverage, process, and petrochemical industry sectors.

ARA Group

Contact info and more items like this at wf.net.au/V454

Machine control software

The latest version of Allen-Bradley IntelliCenter software integrates added features - IntelliCenter Integration Assistant and IntelliCenter Energy - designed to accelerate the configuration time and enhance end users' data-driven energy decisions.

With IntelliCenter Integration Assistant, users can seamlessly integrate their IntelliCenter motor control centres (MCCs) into their Rockwell Software RSLogix 5000 programming software. This feature reduces programming time by automatically adding the Allen-Bradley Centerline MCC devices to the RSLogix 5000 I/O tree. In addition, Integration Assistant also takes advantage of existing integration features to automatically create controller tags and IP address configuration in RSLogix 5000 software, reducing errors and the time it takes to configure the intelligent devices.

IntelliCenter Energy offers a preconfigured set-up of FactoryTalk Energy-Matrix software for intelligent motor control devices in the MCC, including variable speed drives, overload relays and SMCs. In addition, users can view energy consumption at the device level directly from IntelliCenter software. With IntelliCenter Energy, it becomes easier to monitor and manage energy usage in the industrial facility for cost savings and allows for easy integration of IntelliCenter MCCs into plantwide energy-management systems. IntelliCenter Energy gives users the information necessary to make fact-based decisions to help them optimise energy usage, improve equipment performance and even predict equipment failure.

Rockwell Automation Australia

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Shortening production system

For bakeries using large volumes of shortening, producing it in-house can bring significant cost benefits. Producing shortening in-house can lower raw material costs, reduce waste and eliminate the need to dispose of cardboard and plastic packaging.

Shortening is often purchased in crystallised form and provided in bag-in-box format. Handling this at the bakery is a labour-intensive process and the operation is affected by temperature and consistency changes, which can lead to variance in end quality.

With SPX's Gerstenberg Shröder (GS) system, bulk hydrogenated oil is received and used as input to the shortening production process. After pre-cooling, the oil is pumped through a GS scraped surface heat exchanger (SSHE) to crystallise it and a pin rotor machine to knead it to the required consistency.

It is then tempered for final maturation of the crystals to stabilise the product structure. If required, it can be passed through an intermediate tank to be heated and other ingredients added. The whole process line is completely automated and can connect directly into further systems, such as an automatic blending system, without the need for manual intervention.

SPX's in-house shortening solutions use technologies such as the SPX Nexus SSHE, which uses CO₂ for higher efficiency cooling and faster product crystallisation. Using a natural refrigerant further reduces environmental impact.

If production of shortening is more than 900 kg/h, the estimated return on investment period for the machinery is one to two years, the company claims. Savings can be realised in raw material costs and required labour.

SPX Flow Technology Australia Pty Ltd

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Oil-lubricated rotary vane vacuum pump

The Busch R 5 0155 A is a fifth-generation oil-lubricated rotary vane vacuum pump that can be used to perform numerous tasks within the food packaging and processing industry.

The economical vacuum pump can be used for various forms of vacuum packaging including modified atmosphere packaging, blister packaging and foil handling. The vacuum pump can assist processors in conserving food items by providing effective protection against exposure to air, bacteria, mould and dryness.

The device provides optimised pumping speeds at low end pressures, which enables faster pump-down times and thereby achieves shorter packing cycles. It is distinguished by its high suction capacity and its energy efficiency by means of air cooling and internal oil recirculation. While continuing to feature the reliability and robustness of the R 5 range, the vacuum pump offers a pumping speed of 150 m³/h (at 50 Hz) and an ultimate end pressure of 0.1 mbar, making it suitable for continuous operation, for pumping out large volumes and when working at ultimate pressure.

The vacuum pump has low noise and vibration levels and has a refined extractor system ensuring a clean and oil-free exhaust. Special versions are available for applications such as oxygen handling, increased humidity and explosion-prone areas.

Accessories and technical options are also available, including an optional gas ballast valve which enables the pumping of humid air so that damp and wet foods can be safely and reliably packaged.

Busch Australia Pty Ltd

Contact info and more items like this at wf.net.au/V953

Keeping the rats at bay

The first anniversary in a new warehouse should be a time for celebration. Unfortunately for the owner of a small fruit and vegetable warehouse in Brisbane, it was a time of concern.

The owners had begun to notice that their customers weren't the only ones enjoying their fruit and vegetables - rodents had also been gnawing away at the products. It began with a nibbled pumpkin and escalated to droppings on the warehouse floor and rodents in the cold room.

Having tried several home solutions for two to three months with no luck, the business called in its local Rentokil technician to up the ante.

Inspecting the warehouse, the Rentokil consultant noted that conditions were perfect for rodents. The warehouse held lots of cardboard boxes and pallets - perfect homes for rodents. Rentokil had already implemented a pest management plan for the warehouse, and the technician knew it had to be escalated.

The technician knew the rodents had to be targeted to ensure their eradication from the warehouse so the managing director could run the business with peace of mind.

Baiting stations were positioned around the inside, outside and roof areas of the warehouse using a different formula to the existing pest management plan. At this stage, increased treatment had only just begun, yet the business reported a decrease in rodent numbers.

Currently, Rentokil is continuing treatment and regular monitoring to ensure the problem is eradicated permanently.

According to the business owner, the cost of implementing a pest management plan is worthwhile when compared to the potential cost of repairing damage caused by a rodent infestation.



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PROCESSING

Food and vegetable warehouses and other food businesses are especially at risk of rodent infestations, simply due to the presence of food. While cardboard boxes and pallets are a necessary part of the business, they are attractive homes for rodents.

Rodents are always on the lookout for warm, food-rich environments, and sometimes no amount of precaution will prevent an infestation. Rentokil says an inspection by one of its technicians can help minimise the risk.

Rentokil advises that business owners and managers can take proactive steps by ensuring hygiene and housekeeping is of a high standard, as well as checking stock before it is brought onto the premises.

Rentokil Initial Pty Ltd

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Exair's 1" Stainless Steel Flat Super Air Nozzle produces a flat 25 mm (1") wide airstream with a blowing force of 278 g when mounted 305 mm from the target.

The design of this nozzle makes it suitable for tight spaces, and its Type 316 stainless steel construction makes it suitable for corrosive, high-temperature food and pharmaceutical environments.

The nozzle uses Exair's patented technology to maximise entrained airflow while reducing noise levels. A precise amount of air is released through the 0.38 mm air gap opening that is set with a stainless steel shim positioned between the body and removable cap. The high-velocity airstream pulls in surrounding room air to produce a wide stream of laminar airflow.

Air consumption is 10.5 SCFM at 80 PSIG. Force and flow may be easily adjusted by installing different shim thicknesses.

Distributed by Compressed Air Australia, it is also available in zinc aluminium alloy construction, suitable for industrial applications, such as ejecting heavy parts and slugs, chip removal, part cleaning, drying, liquid blowoff and cooling.

Compressed Air Australia Pty Ltd

Contact info and more items like this at wf.net.au/V354

Safety certification

A collaboration between two international leaders in their respective fields - Pilz and TÜV NORD - Certified Machinery Safety Expert training (CMSE) is the first of its kind to be run in Australia. As an internationally recognised machinery safety course, CMSE provides an expert level of training and an industry-wide recognised level of competence.

CMSE is targeted at professionals who require a thorough understanding of the safety life cycle and who actively lead, coordinate and review the more complex and demanding activities in machinery safety.

Training is delivered over four days in the form of individual modules containing lectures, discussions, problem solving and practical workshops. The final day is an open book examination conducted by the independent TÜV Nord Group to verify understanding and enable certification.

Four CMSE training courses have been scheduled for 2014: Brisbane and Auckland in mid-March, followed by Melbourne and Sydney in early May. Places are limited so booking early is recommended.

Pilz Australia Industrial Automation LP

Contact info and more items like this at wf.net.au/V933



Prescription safety glasses

Prescription Safety Glasses (PSG) can supply, through its nationwide network of local optometrists, a wide range of safety frames and lens combinations. Being a division of Essilor, PSG has access to a wide range of quality lenses and technologies.

Essilor Airwear polycarbonate lenses are thin and lightweight while also providing good strength, durability and impact resistance. The lenses are compliant with stringent impact resistance tests including FDA (USA), CEN (Europe), High Velocity Impact test (ANSI Z87.1) and AS/NZS 1337.6. They also provide 100% UV protection.

With more than 22 frame models registered as certified medium-impact, PSG frames are available in a range of styles to suit a variety of applications. All the frames are manufactured to exceed regular ophthalmic frames standards and are tested as part of the SAI Global audited QA system.

All PSG safety frame and lens combinations are supplied with detail markings on the frame and lens as required in section 5.2 of the standard, and supplied with written compliance documentation to AS/NZS 1337.6, AS/NZS 1337.1 and AS/NZS ISO 21987.

Prescription Safety Glasses

Contact info and more items like this at wf.net.au/V265



High-pressure protection clothing

The Aussie Pumps Safe Operator range of high-pressure protection clothing is designed for use with pressure cleaners up to 500 bar (7300 psi). Made from a material called Dyneema, which is claimed to be strong, comfortable and lightweight, the range includes overalls, jackets, trousers and aprons.

The clothing comes lined for comfort, has waterproof zippers with overlapping flaps and integrated underarm ventilation. Detachable hoods are standard on jackets and overalls, and both products feature adjustable waterproof cuffs and pockets. Trousers have elasticised waist and reinforced knee areas.

There will also be a range of 500 bar (7300 psi) protection gloves available soon.

Australian Pump Industries Pty Ltd

Contact info and more items like this at wf.net.au/V209

Expanded hygienic valve range

In the production of foods and beverages, and also of pharmaceuticals and cosmetics, the requirements for hygiene and process reliability are especially stringent. The fittings used in these applications have to be able to be cleaned quickly, easily and, above all, thoroughly.

Bürkert is now expanding the line of valves in the Element design and is increasing the maximum available orifice size of the seat valve type 2100 (angle seat on/off), 2101 (globe valve on/off), the control seat valve type 2300 (angle seat) and 2301 (globe) from 15 to 100 mm. This significantly expands the area of application for these valve types, enabling their use at higher medium pressures on pipelines with an orifice opening up to DN 100.

The expanded area of application now makes it possible to equip many systems entirely with fittings from the Element series. The advantages of the modular Element platform can be used comprehensively. The valves and sensors control fluids, steam, caustic solutions and chemicals, as well as abrasive or high-purity substances in many applications and process environments. The stainless steel valves are rugged, hygienic and easy to use. The special drive design facilitates integration of automation units at all levels of the modular valve system, from the position transmitter to the electropneumatic positioner or process controller. This concept allows complete decentralised automation of even complex systems with minimal expense for cables and hoses.

Bürkert Fluid Control Systems

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Herbal products don't match their labels

The majority of herbal products on the market contain ingredients not listed on the label, according to recent research from the University of Guelph (supported by Genome Canada through the Ontario Genomics Institute; the Canada Foundation for Innovation; International Science and Technology Partnership Canada; and the Social Sciences and Humanities Research Council).

The researchers found most companies were substituting cheaper alternatives and using fillers. The study used DNA barcoding technology to test 44 herbal products sold by 12 companies. Their research has been published in the open access journal *BMC Medicine*.

Only two of the companies provided authentic products without substitutions, contaminants or fillers. Overall, nearly 60% of the herbal products contained plant species not listed on the label. Researchers detected product substitution in 32% of the samples and more than 20% of the products included fillers such as rice, soybeans and wheat not listed on the label.

"Contamination and substitution in herbal products present considerable health risks for consumers," said lead author Steven Newmaster, an integrative biology professor and botanical director of the Guelph-based Biodiversity Institute of Ontario (BIO), home of the Canadian Centre for DNA Barcoding.

"We found contamination in several products with plants that have known toxicity, side effects and/or negatively interact with other herbs, supplements and medications."

One product labelled as St John's wort contained *Senna alexandrina*, a plant with laxative properties. It's not intended for prolonged use as it can cause chronic diarrhoea and liver damage and negatively interacts with immune cells in the colon.

Several herbal products contained *Parthenium hysterophorus* (feverfew), which can cause swelling and numbness in the mouth, oral ulcers and nausea. It also reacts with medications metabolised by the liver.

One ginkgo product was contaminated with *Juglans nigra* (black walnut), which could endanger people with nut allergies.

Unlabelled fillers such as wheat, soybeans and rice are also a concern for people with allergies or who are seeking gluten-free products, Newmaster said.

"It's common practice in natural products to use fillers such as these, which are mixed with the active ingredients. But a consumer has a right to see all of the plant species used in producing a natural product on the list of ingredients."

Until now, verifying what's inside capsules or tablets has posed challenges, Newmaster said. His research team developed standard methods and tests using DNA barcoding to identify and authenticate ingredients in herbal products.

"There is a need to protect consumers from the economic and health risks associated with herbal product fraud. Currently there are no standards for authentication of herbal products."

Medicinal herbs now constitute the fastest-growing segment of the North American alternative medicine market, with more than 29,000 herbal substances sold, he said.

More than 1000 companies worldwide make medicinal plant products worth more than \$60 billion a year.

About 80% of people in developed countries use natural health products, including vitamins, minerals and herbal remedies.

Canada has regulated natural health products since 2004. Regulators face a backlog of licence applications and thousands of products on the market lack a full product licence. Globally, regulatory problems involving natural health products continue to affect consistency and safety, Newmaster said.

"The industry suffers from unethical activities by some of the manufacturers."



Touch-screen food texture analyser

The texture of food plays a large role in consumers' perception of quality, therefore it is vital for companies to obtain and maintain texture standards through a routine system of objective monitoring.

Easy to operate, Food Technology's TMS-Pilot texture analyser is said to be an affordable, portable, mid-range system designed for quick and easy food texture testing.

The analyser was designed to perform basic texture testing of most food products, including baked goods, confectionery items, dairy products, fruits, meats, vegetables and snacks. Test methods such as breaking, snapping, tension, shearing, bulk analysis, compression, penetration and extrusion tests are all easily performed.

Controlled by an easy-to-use LCD touch-screen interface, the analyser requires minimal operator training. Tests are performed at the touch of an icon and regularly used tests can be saved as 'favourites' for instant test recall and set-up.

With a plug-and-play design, load cells can be interchanged in seconds. The majority of the company's wide range of test probes and fixtures can be used with the analyser.

Next Instruments Pty Ltd

Contact info and more items like this at wf.net.au/V901



Rheometers

The Kinexus Series from Malvern Instruments extends the strengths of the Kinexus rotational rheometer.

The Kinexus Ultra+ is optimised for advanced research applications. The model has high sensitivity, achieved through its adaptive air-bearing technology plus a wide torque range. The Kinexus Pro+ model is suitable for a wide variety of routine, research and development applications. Both systems offer dual-action capabilities for both shear and vertical testing.

Designed from the ground up, the rheometer series was developed to address the needs of different users. The intelligent platform means users spend less time learning how to interact with their system and more time investigating ways to characterise and enhance a material's performance. Adaptive intelligence allows the product to actively guide users at

every stage: from sample preparation and loading, through measurement set-up and operation, to data analysis and reporting.

Features include: cartridge system and geometry interchange for ease of use; SOP-driven tests on a rheometer interface; complete sample history captured every time; vertical test capabilities that give the ability to measure more; total flexibility of control.

ATA Scientific Pty Ltd

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Get ready to reformulate: *Trans fat may be losing* its GRAS status

Trans fats have long been avoided by many consumers. Choice began agitating to have trans fat levels included on labels in Australia in 2005. This still hasn't happened but now moves afoot in the US may induce Australian regulatory authorities to relook at the trans fat situation.

Trans fat has been linked to an increased risk of coronary heart disease, in which plaque builds up inside the arteries and may cause a heart attack. The Centers for Disease Control and Prevention estimates that a reduction of trans fat in the US food supply could prevent an additional 7000 deaths from heart disease and up to 20,000 heart attacks each year.

This is even though US manufacturers have been required to declare the amount of trans fat on nutrition facts labels since 2006 and have been reducing trans fat content. In 2003, the average American intake of trans fats was 4.6 g/day, according to the FDA, and that number had fallen to about 1 g/day in 2012.

There will always be some trans fats in diets as dairy products, beef, veal, lamb and mutton contain small amounts of naturally occurring trans fats. However, many foods are still made with partially hydrogenated oils (PHOs), the major dietary source of trans fat in processed food.

PHOs have been incorporated into processed foods since the 1950s, where they are claimed to increase shelf life and flavour stability. The most common foods containing trans fats are:


- crackers, biscuits, cakes, frozen pies and other baked goods,
- snack foods (such as microwave popcorn),
- frozen pizza,
- vegetable shortenings and stick margarines,
- coffee creamers,
- refrigerated dough products (such as biscuits and cinnamon rolls),
- ready-to-use icings.

The most widely used PHOs have long been considered 'generally recognised as safe' (GRAS) ingredients by the food industry. But this is now under question.

Due to the health risks now known to be associated with consuming PHOs, the US Food and Drug Administration has issued a Federal Register notice with its preliminary determination that PHOs are no longer GRAS. If this preliminary determination is finalised, then PHOs would become food additives subject to premarket approval by FDA. Foods containing unapproved food additives are considered adulterated under US law, meaning they cannot legally be sold.

If FDA determines that PHOs are not GRAS, it could, in effect, mean the end of artificial, industrially produced trans fat in foods. FDA is soliciting comments on how such an action would impact small businesses and how to ensure a smooth transition if a final determination is issued.

If FDA makes a final determination that PHOs are not GRAS, the agency and food industry will have to figure out a way to phase out the use of PHOs over time. To help address this concern in an appropriate manner, the Federal Register notice calls for comment on how long it would take the food industry to phase out its use of PHOs.

Australian manufacturers are not required to include trans fats on food labels unless a nutrition claim is made about cholesterol, polyunsaturated, monounsaturated fats: omega 3, omega 6 or omega 9 fatty acids. The Heart Foundation recommends that consumers avoid foods that show 'hydrogenated oils' or 'partially hydrogenated vegetable oils' in the ingredients list. However, the law doesn't currently enforce companies to list these fats on labels. The Heart Foundation has been lobbying government for mandatory labelling of trans fat but in the meantime, vegetable oils and margarines with the Heart Foundation Tick must contain no more than 1% trans fat as part of their total fat. Other products must be virtually free (trace levels only) of trans fat to qualify for the Tick. 

Application note on extraction of lipids from food samples

Complete extraction of lipids from food samples can be a time-consuming and labour-intensive process. Ordinarily, techniques that require acidic or alkaline pretreatments can corrode stainless steel cells and pathways of extraction systems; however, a solution for accelerated solvent extraction technology uses a pH-hardened pathway with Thermo Scientific DioniumT components to prevent this corrosion.

Thermo Scientific has available an application note that explains how the ability to extract these pretreated matrices using accelerated solvent extraction can increase laboratory productivity.

Thermo Fisher Scientific

Contact info and more items like this at wf.net.au/V561

Interfacial rheology system

The thin layer of froth on the surface of an espresso, known as the crema, is considered to be a sign of a good coffee. The crema comprises a dispersion of tiny gas bubbles surrounded by surfactants and emulsified oils.

Interfacial rheology does not probe the foam itself, but measures the adsorption of the amphiphilic ingredients and their network formation at the liquid-foam interface. Higher values of the interfacial properties and a faster film formation are expected to correlate with a better foam stability.

The Anton Paar interfacial rheology system (IRS) combined with an MCR rheometer enables 2-D rheological measurements of interfacial films at the air/liquid and the liquid/liquid interface. With the IRS, a bi-cone measuring system is placed in the interface and measures absorbed or spread films, eg, films produced by proteins or surfactants.

Employing the low-torque capabilities and the TruStrain feature of the MCR302/502 rheometers, the IRS enables rheological measurements of weak interfacial structures.

Measurements can be performed in rotational and oscillatory mode, eg, allowing flow curves and creep tests at an interfacial layer or oscillatory tests during the film formation process.

MEP Instruments Pty Limited

Contact info and more items like this at wf.net.au/V936

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Why beer bubbles over - the physics of beer bottle foam-over

Finally, some important physics - researchers have worked out why if you tap the bottom of a newly opened beer bottle it froths up and foams everywhere.

This insight into the science behind foaming beer bottles was acquired by researchers from Carlos III University in Madrid, Spain and Université Pierre et Marie Curie, Institut Jean le Rond d'Alembert, France who presented their explanation based on the phenomenon of cavitation at the annual meeting of the American Physical Society (APS) Division of Fluid Dynamics.

Cavitation is the mechanism by which bubbles appear in a liquid such as beer after an impact, said Javier Rodriguez-Rodriguez.

After a sudden impact against a bottle's mouth, back and forth movement of compression and expansion waves will cause bubbles to appear and quickly collapse. The team's investigation of beer bottle-fluid interactions demonstrated that the cavitation-induced break-up of larger 'mother' bubbles creates clouds of very small carbonic gas 'daughter bubbles' which grow and expand much faster than the larger mother bubbles from which they split. The rapid expansion of these daughter bubbles gives the foam buoyancy.

"Buoyancy leads to the formation of plumes full of bubbles, whose shape resembles very much the mushrooms seen after powerful explosions," Rodriguez-Rodriguez explained. "And here is what really makes the formation of foam so explosive: the larger the bubbles get, the faster they rise, and the other way around." This is because fast-moving bubbles entrain more carbonic gas.

The team's work is believed to be the first quantitative analysis of the beer bottle foam-over. "We wanted to explain the extremely high efficiency of the degasification process that occurs in a beer bottle within the first few seconds after the impact," Rodriguez said.

Beyond happy-hour enrichment, the study's findings can be applied to other engineering systems and serious natural phenomena such as the sudden release of dissolved carbon dioxide in the Lake Nyos disaster.

Republished from www.labonline.com.au.



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CIRCULATIONS
AUDIT BOARD

March 2013 total CAB audited circulation (Aust + NZ):
6501 readers (81% personally requested)

Printed and bound by Webstar +61 2 9748 0020
Print Post Approved PP100007395
ISSN No. 1039-8414

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- 31 Mining
- 32 Oil/Gas/Coal
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