

November/December 2016
Vol.24 No.4

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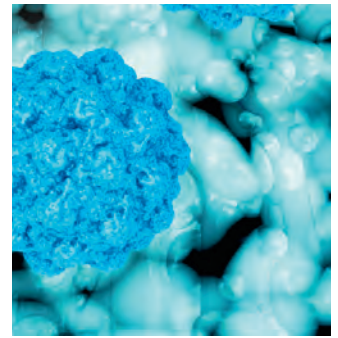
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This issue is available to read and download at www.foodprocessing.com.au/magazine

Packing pinched penguins

It is kind of hard to fathom why anyone would have a need to pack penguins — in truth, it is kind of hard to justify the existence of penguins. They don't actually do a lot and penguin-shaped stress balls do even less. They are, however, extremely cute.

For similarly unfathomable reasons *What's New in Food Technology & Manufacturing* elected to choose to have penguin-shaped stress balls as its 'giveaway' at Foodtech Packtech 2016. (We actually think some of the blame for this choice should be borne by the Australian Institute of Packaging's Nerida Kelton.)

Held every two years in Auckland, Foodtech Packtech attracts absolutely every food and beverage processor in New Zealand. It is a very busy and successful event — the traffic getting there is proof of this. But, once again, we are forced to report that New Zealand's seamier underbelly was evident at the event.

Penguin thieves were at work — snaffling innocent penguins from the *What's New in Food Technology & Manufacturing* exhibition stand and vacuum packaging them. Our admittedly totally useless penguins had proven to be extremely popular — only a carefully secreted handful were still around by day three and absolutely none by the end of the day.

The chief penguin pincher was D&L Marketing's Tim Morton. Sadly, Tim not only shows no remorse — he is proud to demonstrate how effective his company's vacuum packaging systems are by restoring emaciated, vacuum-packed penguins to full size and uselessness by simply opening the packs. What the penguins think of this gross invasion of their existence is hard to guess.

However, in Tim's defence, we have now established with certainty that if you ever need to pack penguins (well, stress-ball penguins), vacuum packing will allow you to fit more penguins into a given volume.

Next year will be a big exhibition year in Australia with both AUSPACK and foodpro and the pressure is on to find a penguin replacement that will defy the wily activity of penguin pinchers.



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AUSVEG urges Horticultural Code reform

The national body representing the Australian vegetable industry is supporting calls for reform to the Horticulture Code of Conduct.

AUSVEG has called on the Australian Government to implement all reforms from the independent review of the code by Mark Napper and Alan Wein, which included 13 recommendations for targeted reforms.

The code has recently been at the heart of high-profile media coverage of several Bundaberg sweet potato growers claiming they were owed a combined total of nearly two million dollars by agents at Melbourne produce markets.

"It is vital that there is a strong, effective code of conduct regulating trading relationships in the horticulture sector, and the recommended reforms would help to increase the code's ability to provide protections for growers against unfair behaviour from their trading partners," said AUSVEG spokesperson Jordan Brooke-Barnett.

"We completely agree that the existing dispute resolution process should be replaced with an improved system. On top of this, we absolutely agree with the reviewers' recommendation that the code should be amended to provide for civil penalties and infringement notices for breaches of the code."



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US beverage industry pours cash into fighting sugar taxes and warning labels

Analysis has revealed the three biggest members of the USA's soda (soft drink) lobby — the American Beverage Association, Coca-Cola and PepsiCo — have spent at least US\$67 million since 2009 to defeat taxes and warning labels in 19 cities and states.

The Center for Science in the Public Interest analysed lobbying and ballot initiative disclosure reports, revealing an additional annual spend of US\$14 million at the federal level. There, the public health objectives of the industry association and two companies have included opposition to a federal soda excise tax, the newly released and updated Nutrition Facts label with a line for added sugars, and the Dietary Guidelines for Americans, which proposed a quantitative limit — 12 teaspoons a day — for added sugars.

Spending by 'Big Soda' rose from around US\$1–5 million a year in the early 2000s to a peak of US\$40 million in 2009 when Congress considered a soda tax to pay for healthcare reform.

"There is no better way to understand the public health importance of soda taxes and warning labels than to see how much money Big Soda is willing to spend to oppose them," said CSPI Health Promotion Policy Director Jim O'Hara.

Adelaide Uni/Agilent Technologies complex carbohydrate collaboration lab opens

The first comprehensive facility for the analysis of complex carbohydrates ('glycans') in the Southern Hemisphere has opened at the University of Adelaide's Waite campus.

The lab, a collaboration between the University of Adelaide and Agilent Technologies Australia, will focus on the structure and function of glycans (glycoscience). Typical projects will include the development of baby's milk formula so it more closely matches breast milk, potatoes with better starch profiles and immune system additives.

Adelaide Glycomics will serve as a hub for local, national and international collaborations and will also offer training workshops and on-site demonstrations for researchers and technical staff. Highly qualified analysts and state-of-the-art instrumentation, made available through the collaboration with Agilent Technologies, will support fundamental and applied research in glycoscience and the development of new applications for a range of industries.



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Australia and China launch joint grain research centre

Australia and China have announced a grains biosecurity research centre partnership.

The Australia-China Joint Centre for Postharvest Grain Biosecurity and Quality Research is a partnership between Australia's Plant Biosecurity Cooperative Research Centre (CRC), Murdoch University and China's Academy of State Administration of Grain.

The joint centre will bring together researchers from both China and Australia to work on developing non-chemical controls to manage stored grain pests, with the aim of reducing biosecurity and trade risks while providing clean grain.

The joint centre will focus on innovative technologies such as the use of nitrogen for stored grain pest management and 'lure and kill' pest control using pheromones and light-based trapping systems. The partnership will work with grain suppliers and companies to commercialise the research and deliver it to industry.

CSIRO's contribution to global food security

CSIRO's work on predicting Australia's agricultural future is gaining international attention, with Dr Steve Hatfield-Dodds, leader of CSIRO's integration science and modelling work, presenting a paper at the 50th birthday celebration conference for the International Maize and Wheat Improvement Center (known as CIMMYT by its Spanish acronym).

The conference is themed: 'Turning research into impact: past, present and future' and Hatfield-Dodds's paper is titled 2015 Australian National Outlook.

CIMMYT is the organisation that catalysed the 'Green Revolution' and is known for its work in improving crop yields and food security. This year marks CIMMYT's 50th anniversary, with celebrations taking place in Mexico.

CSIRO's outlook linked nine national and global models to provide an integrated analysis of economic activity, agriculture and food, energy, water, land use, biodiversity, material flows and climate change.

"The aim of the outlook was to find and explore the ways Australia could navigate through interconnected future challenges, to better meet the needs of a growing national and global population," Dr Hatfield-Dodds said.

"These challenges are not unique to Australia, and CIMMYT can see how the flexible integrated approach demonstrated by CSIRO can help identify and test options for reducing poverty and improving food security across diverse developing world contexts," he said.

While CIMMYT is best known for supplying the world with hardier and higher-yielding wheat and maize varieties, the best science estimates this is only likely to contribute about half of the productivity gains needed to meet future food demands, with the remainder needing to come from more productive and efficient farming systems, such as precision maize and wheat farming, with efficient use of soil, water and fertiliser.



Building more supermarkets won't solve the obesity crisis

An analysis has challenged the notion that obesity rates can be reduced by improving access to supermarkets offering healthy food, finding that the bulk of soft drinks and junk foods are purchased in supermarkets.

The findings challenge the 'food desert' hypothesis, which posits that a lack of access to supermarkets and grocery stores in some communities worsens the obesity crisis by restricting access to healthy foods.

The study, published in the *European Journal of Clinical Nutrition*, looked at data from the National Health and Nutrition Examination Survey of 4204 adults who reported their daily food intake in two, non-consecutive 24-hour periods in 2011 and 2012.

The analysis found that nearly half (46.3%) of adults consumed sugar-sweetened beverages and 88.8% ate discretionary foods such as cookies, pastries, ice-cream, cakes, popcorn and candy on any given day.

Sugar-sweetened beverages add an average 891 kJ/day to the diet, the researchers found, while discretionary foods added an average of 1836 kJ/day, with the largest portion of both products coming from supermarket shelves.



Image courtesy of ElasticComputeFarm (via Pixabay) under CC0 Public Domain

Food FOR thought

Metabiota targets food risk

Metabiota has launched a Food Risk Insights platform to provide food producers, suppliers and retailers the ability to identify, analyse and proactively mitigate risks across the supply chain.

The company has also created a food risk team made up of industry veterans, public health and veterinary experts, and data scientists.

At the International Association for Food Protection's Annual Meeting, Metabiota also unveiled a partnership with

Ancera, which combines Metabiota's

analytics and Ancera's near real-time diagnostics to optimise safety and performance for the global food supply chain.

"The food industry is ready to innovate — and this partnership signals our joint commitment to helping these companies optimise and decrease pathogen risk for the global community," said Arjun Ganesan, co-founder and CEO of Ancera.



JBT pays \$160 million for Tipper Tie

JBT has signed a definitive agreement to purchase Tipper Tie for US\$160 million (before customary post-closing adjustments) with the sale expected to be completed this year.

Tipper Tie will expand JBT's protein platform to include complementary packaging solutions. Another bonus for JBT will be Tipper Tie's large installed equipment base that generates high recurring revenues from consumables and aftermarket parts sales.

Tom Giacomini, JBT's chairman, president and CEO, said, "Tipper Tie's globally recognised brand, advanced technology and relationships with major food processors in the US and Europe will prove critical as we grow the company's presence in Asia and Latin America."

Tipper Tie has a long association with the food industry, especially meat and poultry. The company supplies processing and clip packaging machines including fine cutters for emulsified products and a complete line of clippers from tabletop models to fully automated, high-speed systems that seal, clip, net, bag and hang.

Bayer and Monsanto's \$88bn deal could change the future of agriculture

One of the world's biggest agriculture conglomerates is set to be created, with the announcement that German chemical company Bayer will purchase US seed company Monsanto in an \$88 billion deal that could change the future of global food supply.

The acquisition signals a greater focus by Bayer on its agriculture business, which currently produces farming chemicals, crop supplies, herbicides and pesticides. As the world's largest supplier of genetically modified seeds, Monsanto is a key — and sometimes controversial — player in the push for farmers to produce higher yields from fewer resources.

Announcing the agreement, negotiations for which began in May 2016, Hugh Grant, chairman and chief executive officer of Monsanto, said the combined might of the two companies would deliver solutions for a new era in agriculture.

"This combination with Bayer will deliver ... an innovation engine that pairs Bayer's crop protection portfolio with our world-class seeds and traits and digital agriculture tools to help growers overcome the obstacles of tomorrow," said Grant.

Liam Condon, member of the board of management of Bayer AG and head of the Crop Science Division, said a new approach was required to tackle the global challenge of feeding an additional 3 billion people in the world by 2050 in an environmentally sustainable way. He said both companies were committed to systematically integrating expertise across seeds, traits and crop protection, including biologicals, alongside investment in innovation and sustainable agriculture practices.



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Fighting frankfurter fraud

Synonymous with American baseball games and kids' birthday parties, for many people the hot dog is a guilty pleasure. But what is actually in that frankfurter? (And do I really want to know?)

Frankfurter fraud is real, and for those who can't consume certain types of meats for health, cultural or religious reasons, it's important to know what they're eating. Now, scientists have come to the rescue.

Currently, testing the authenticity of a meat product involves sampling its DNA, amplifying the genetic material with the polymerase chain reaction (PCR) and looking for certain markers. But existing methods often only search for one, long DNA sequence, which could break down during food processing and lead to false results.

Scientists from Malaysia have developed a technique to look for pairs of short DNA sequences from beef, buffalo and pork in hot dogs. They used their approach on 20 beef frankfurters that they bought in local markets, and testing showed their target sequences were stable under food processing conditions.

Reinforcing the need for their work, the researchers found that all of the hot dogs labelled as 'beef' also contained buffalo meat. The research has been reported in ACS's *Journal of Agricultural and Food Chemistry*.



Japan's vertical farms take production indoors under LED lights

Two Japanese vertical farms have successfully trialled crops of lettuces and herbs grown under Philips horticultural LED lighting.

A vertical farm is a fully controlled facility where vegetables and herbs are grown in stacked layers without the use of daylight. Growing conditions are carefully controlled using tailored growth recipes which specify light, temperature, water, CO₂ and the best growing medium. Vertical farms enable producers to meet the growing demand for safe, fresh food in countries like Japan where space is at a premium.

After a trial starting in March 2015 at its Fuji Farm with a total floor area of 1851 m² — one of the largest completely closed-environment, vertical farms in the world using horticultural LED lighting — Innovatus now produces 12,000 heads of lettuce/day.

"The trial using Philips GreenPower LED production module has allowed us to grow five varieties of lettuces, mainly frilled lettuce, green leaf and romaine that are of a consistent quality and locally produced, using only a fraction of the water and compared to lettuces grown in open fields," said Hitoshi Wada, director at Innovatus.

The Innovatus lettuces arrive in Tokyo supermarkets just two hours after shipment from the farm and do not require washing prior to consumption.

Meanwhile, processed foods manufacturer Delicious Cook is using the vertical farm technology to grow its own produce. It has created a city farm in the urbanised Kanto region of Japan, using Philips' GreenPower LED production module in three layers in a total cultivation area of roughly 80 m² to grow relatively uncommon herbs, including edible chrysanthemums and coriander for the company's processed foods.

Healthy growth forecast for fish and seafood market

The global fish and seafood market has grown steadily, registering a compound annual growth rate (CAGR) of 3.8% between 2011 and 2015, according to data from research company MarketLine, whose analysis shows that market values have increased in all regions.

Global growth is primarily driven by Asia-Pacific and South America as the swelling middle classes begin to buy more expensive products through the organised retail channel. However, the US is still the single largest market.

"The US is the largest market by value for fish and seafood, accounting for 13.9% of global revenues. Value increases, while lower than in many other countries, have been driven by increased health awareness, as US public health bodies recommend eating two pieces of fish a week. Such advice is not unique to the US, and improved health consciousness is set to help the market globally in the mid to long term," said MarketLine analyst Nicholas Wyatt.

The global market is forecast to grow at a CAGR of 3.9% between 2015 and 2020.



packaging coding & logistics

Question time ...



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How important is checkweighing? Do you really need it?

"What you don't know can't hurt you" works for many things — manufacturing is not one. This quick Q&A will help you decide if checkweighing is a 'nice to have' for your business, or a 'must have'.

Q. What is a checkweigher?

A. Checkweighers check the weight of your products to ensure they are within specified limits. Any products outside the tolerance (so too heavy or too light) are rejected. They can also 'count' items, eg, a carton of 10 bottles should weigh X; if the checkweigher measurement is less, then a bottle can be added before the carton is sealed.

Q. How does this help me?

A. Taking out-of-spec products off the line, and preventing them from going out your door, reduces the risk for your business. Supplying the agreed product, fit for shelf, includes the correct weight. Your checkweigher can measure gross weight (total of contents and packaging) and net weight (just contents — based on the product). A checkweigher will ensure the 'nominal weight' (weight stated on the pack) is as close as possible to the actual weight.

Q. What if it's overweight? Isn't that better?

A. No — this is called 'giveaway'; it is the portion of the product above the nominal weight. You can't charge for it, so it's just straight lost profits, and it's deadly to bottom lines! Say if your nut-bagging machine puts 220 g into 200 g bags. If you sell 150 a week, that's 3 kg you're giving away — just in 7 days. Over 48 weeks, that's 144 kg for which you'll never earn any income. A checkweigher helps reduce giveaway.

Q. But isn't it nice for customers if product is a little overweight?

A. Most customers appreciate 'buy one get one free' promotions. But if you're giving away more product and they don't even know, that won't win loyalty. The more accurate your checkweigher, the more money you can save. Even with small packets of nuts, eliminating the tiniest amount of overfill can add up to massive savings.

Q. Can't my staff do this?

A. The demands on manufacturing processes are intense: production lines are increasingly fast, yet portioning must still be accurate. Even for slower lines, the aspect of human error is too much to risk if your staff have to individually weigh each pack.

For more information, visit the National Measurement Institute, www.measurement.gov.au.

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Modular labeller

Sacmi's OPERA 400 26T is a modular labeller with two modules — one for the application of labels using roll-fed technology, the other for the application of self-adhesive labels.

The two labelling stations are capable of up to 21,000 applications/h, while the entire quality control phase is handled by LVS (labelling vision system) units that position the container (using six video cameras) and inspect both label and nozzle (four image acquisition devices).

The modular configuration of the labeller allows, via a single passage through the machine, application of a main label by the roll-fed module and the barcode by self-adhesive technology. The outcome is an efficient production process that guarantees output quality due to integration with label control and container orientation.

HBM Packaging Technologies

www.hbm.com.au



Flow wrapper

ILAPAK's Delta 3000 is an entry-level flow wrapper suitable for use by processors of poultry and meat.

The system offers complete IP65 protection, enabling full washdown capability, even of the sealing elements. This has been achieved through full stainless steel execution, isolating the electrical cabinet from the main machine frame and smooth, sloping surfaces without recesses. A digital electronic platform gives precise control over the sealing cycle and parameters.

The modular construction allows users to start with a basic machine and add on modules at a later date.

Its flexibility makes it suitable for poultry packers as companies can use one machine to pack whole birds or parts (thighs, drumsticks, breasts, etc), with or without a supporting tray and with or without gas flushing.

The flow wrapper can produce a variety of pack formats, including ovenable MAP flushed polyethylene quattro packs, simple laminate film wrap, gas flushed barrier films and shrink bags, at speeds ranging from 60–100 ppm depending on the application.

Similarly, in the meat packing market, a range of products from pork or lamb chops to beef mince and barbecue skewers can be packed with or without a tray, with or without MAP, in a variety of films.

Linco Food Systems

www.linco.com.au

Jus de Fruits d'Alsace opts for aseptic line from Krones

The French province of Alsace is renowned as a gourmet's paradise. Beverage company Jus de Fruits d'Alsace continues this tradition, producing quality fruit juices, smoothies and fruit squashes.

When repackaging its sensitive products in PET bottles instead of in soft packages, the company invested in a Contiform AseptBloc from Krones.

Rated at 30,000 bottles/h, the new aseptic filling line at Jus de Fruits d'Alsace includes an aseptic blow-moulder, which is part of a blow-moulder/filler block. After preform decontamination using gaseous H_2O_2 , the block produces the containers in the aseptic blow-moulder and fills them in aseptic mode. This means that both the containers and the product

are processed in aseptic mode throughout. Besides the high microbiological safety levels it provides, the Contiform AseptBloc also improves cost-efficiency. It dispenses with a sterile-water UHT and a hygiene centre,

and does not consume any water in production mode, thus enabling Jus de Fruits d'Alsace to save on water, chemicals and energy.

Krones (Thailand) Co Ltd
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Craft brewery eliminates bottling line bottleneck

Founded in 1996 with a few hundred dollars and some repurposed equipment, Three Floyds Brewery, in Indiana, USA, had a modest beginning, growing to an output of 4600 hectolitres (HL) at the end of its first decade.

The subsequent boom in the popularity of craft beer saw demand explode, with production rising to 58,000 HL by 2015.

Responding to the increased demand, in 2012 Three Floyds commissioned a new and larger 35 HL brewhouse. But the 30-year-old pre-owned bottling line, rated at 4200 bottles per hour, became the production operation's bottleneck.

A new solution was urgently needed and was found in the shape of a complete line from Krones, which has been dimensioned for a speed of 15,000 bottles per hour. Three Floyds built a new hall adjacent to the existing brewery to accommodate it.

The line started operation in September 2015 and consists of a Pressant Universal 1N bulk-glass sweep-off depalletiser with low-level discharge onto a bulk conveyor. After being spaced, the bottles are passed directly to the rinser-filler bloc, comprising a Moduljet rinser and a Modulfill filler. "We don't need an empty-bottle inspector," said Packaging Manager Travis Fasano, "because we're using exclusively bulk glass and we put our trust in the rinser's quality."



The Modulfill HRS filler does not have a front table; the bottles are conveyed in neck-handling mode by free-standing starwheel columns so as to ensure optimum hygiene.

"The filler gives us excellent values for oxygen pick-up of 50 ppb, coupled with very consistent fill levels," explained Fasano.

The field-proven, short-tube, level-controlled filler with vent tubes operates with double pre-evacuation and an interpolated CO₂-flushing feature. The filling valves are electro-pneumatically controlled. The bottles are inspected for correct fill level in a Checkmat FM-X and immediately after that dressed in shoulder labels on a Prontomatic with a cold-glue station.

Correct label placement is verified in another Checkmat E. Complete end-of-the-line packaging is handled in a Varioline with two modules, which produces sixpacks with 355 mL bottles as a basket and packs them in 24-bottle cartons. Or it directly produces 12-bottle cartons holding 650 mL bottles. After that, palletising is still done by hand.

Future plans are to install a new bigger brewhouse, and then a new kegging line, and finally to expand the glass bottling line to include a Krones can filler and a fully automatic palletiser.

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Stretch blow moulder

KHS has developed modules for special packaging formats for its InnoPET Blomax Series IV stretch blow molder.

The preferential heating system (PH) enables bottlers to achieve bottle quality even with oval bottles via an energy-saving and safe process.

During preferential heating, the preform is selectively heated according to its later bottle shape to prevent any uneven distribution of materials. Preferential heating is made possible by a special heater section at the end of the heating segment. Here, the system first rotates the PET preforms through the heater to obtain a basic heating profile. In the downstream PH section rotation is stopped, giving the preform its selective heating profile.

The company has also developed a heater box to suit the wide-neck preforms used for various types of food packaging, such as PET packaging with 70 mm necks. The heater box requires little heating energy and, when the containers are changed over, no manual conversion is needed.

The TriBlock is a filling and packaging system for PET bottles that incorporates a stretch blow moulder, labeller and filler. With consistent neck handling, the system also enables lightweight PET to be processed.

The Bottles & Shapes program offers beverage and food producers an all-round service that starts with individual suggestions for possible designs and ends with a bottle that is ready for production.

KHS Pacific Pty Ltd

www.khs.com

Compact X-ray system

Loma Systems' compact X5c is an X-ray system suitable for food manufacturers looking to upgrade their product inspection technology. It's also suited to smaller production lines and is up to 50% shorter in length than Loma's X5 X-Ray Inspection System.

The system performs detection of a wide variety of contaminants including ferrous, non-ferrous, stainless steel, glass, ceramic, calcified bone, stone and dense plastic.

The X5c suits end-of-line, packaged goods and incorporates an automatic product learn wizard which eases the switchover of multiple products during operation.

The system can also be combined with Loma's CW3 checkweigher to provide a combination X-ray and checkweighing system.

The lead-free inspection system is compact, typically requiring less space than a conventional metal detector, requiring 1800 mm including auto-rejection, 1000 mm without. It includes a 300 mm-wide inspection window with no product blind spots and can perform product integrity inspection including counting and missing items.

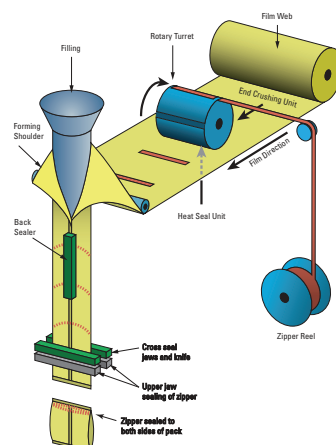
Typical packing rate is 150 packs/min, with product weights up to 6 kg. Rejection options include air blast, pusher, carriage retract, diverter, sweep arm and signal only for third-party rejection systems.

Inspection Systems Pty Ltd

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PET-based yoghurt packaging

Klöckner Pentaplast has launched klikPET, a PET-based technology for yoghurt packaging that can be used on major FFS lines, seals, labels and trays.

The packaging technology extends shelf life by up to 10 days. The material enables consumers to snap apart a single serving yoghurt cup from a multipack, and reduces cup breakages.

Klockner Pentaplast (Australia) Pty Ltd
www.kpfilms.com

Maintenance services for PET bottling lines

Sidel has developed services for proactive maintenance of PET bottling lines.

The proactive maintenance approach involves monitoring of equipment to enable pre-planning of scheduled downtime for regular maintenance. This reduces the potential for unplanned shutdowns and loss of production, as well as helping to ensure that production schedules and targets are achieved.

Services provided include diagnostic visits, spare parts supply, targeted skills training and regular maintenance work, as well as the recommendation and installation of new technologies to improve line performance.

Sidel Oceania Pty Ltd
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How Continental Kosher Butchers

reduced its label inventories and time to market

With the need for more than 5 million labels each year, Australia's largest Kosher meat supplier turned to insignia for an overprint solution that has reduced their label inventories and improved their time to market with new products.

Australia's largest Kosher meat supplier, Continental Kosher Butchers, provides meats, smallgoods, antipasto, specialty delicatessen items, dried spices and pantry staples to larger supermarkets, smaller retailers, the food-service industry and is now exporting to customers in Asia-Pacific. The company produces over 150 meat SKUs and 50 smallgoods items and prints in excess of 5 million labels each year.

Continental Kosher Butchers has unique labelling requirements due to its rapidly growing product range, ingredients lists, nutritional values and varying weights.

With traditional labels and packaging, Continental Kosher would be faced with having to hold label stock for each individual product. Finding space to store all the different label stocks would be difficult, not to mention the risk of getting stuck with expensive, unusable labels if packaging or labelling regulations were to change.

The solution

Continental Kosher uses a pre-printed template label and overprints the variable information for each product type, in-house, as each batch is produced. The labelling solution includes:



- Datamax-O'Neil thermal printers
- BarTender labelling software
- Template (overprint) labels with branding and thermal ribbon

The overprint labels are printed for both Continental Kosher Butchers' range of meats and smallgoods, as well as its new brand, Lewis & Son, which produces smallgoods, fermented vegetables, deli lines and dry goods. An industrial thermal printer is then used to overprint the variable information (product name, ingredients, and nutritional panel) into the remaining space provided.

The outcome

The labelling solution allows for brand consistency, improved efficiency, and cost-savings. Cash is not tied up in holding stock of hundreds of different labels, as Continental Kosher keeps only the template labels which are used across its product ranges.

In-house printing of variable information provides flexibility. Product information can simply be changed as needed and it is easy to delete a product line. This also means there is no label waste; should a product or labelling regulations change, it is just a matter of updating the software label template.

Flexibility and agility

Continental Kosher recognises the role this flexibility and agility has had in helping it remain responsive to its customers and the market in general. Being able to quickly make changes and respond to new product requests has helped facilitate its business growth.

When the meat industry felt the impact of the drought and the high dollar, Continental Kosher expanded into new markets with new products, introducing its Lewis and Son range.



Recently Lewis & Son became the first FODMAP Friendly certified smallgoods crafter and has also obtained endorsement from Coeliac Australia with its Gluten Free products. These lines have seen excellent growth in line with customers' needs.

With its in-house QA department and the ability to put together new product samples easily with its labelling solution, Continental Kosher has the ability to launch a new product line within days, not weeks or months.

The in-house, overprint label solution allows Continental Kosher Butcher to focus on what it does best — its extensive range of kosher meats, smallgoods and health foods — rather than wasting time on packaging and labelling inventory management.

"The strength of the current set-up is flexibility and adaptability of printing in-house. No delay time means no hindrance on creativity or speed to market; enabling a small business to do what small businesses do best," explained Daniel Lewis, General Manager, Continental Kosher Butchers.

"Using an attractive base label printed by insignia, with templates set up on Bartender software by insignia technicians means we've simplified our label inventory with no sacrifice to the visual appeal of the label."



insignia Pty Ltd
www.insignia.com.au

Photoelectric proximity sensors

SICK's PowerProx MultiTask photoelectric sensors combine the advantages of time-of-flight technology in a small housing with increased detection speed. Objects being conveyed at high speed, small and flat objects, jet-black and shiny objects can be reliably detected over an extensive sensing range.

The photoelectric sensor provides stable detection results over a large detection angle and is immune to ambient light. Sensing ranges are available from 5 cm to 3.8 m. The sensor provides eye safety at the level of laser class 1 and fast signal processing, while the VISTAL housing ensures the device is sufficiently rugged.

Adjusted by means of a potentiometer or teach-in button, there are variants available with either one or two separately adjustable switching thresholds, depending on the application. IO-Link can be used to define up to eight switching points and to make use of the smart sensor functions.

The four variants — distance, speed, precision and small — are designed for different detection tasks.

The distance variant is suitable for occupied bay and clearance detection, pallet handling, and collision protection in storage and conveyor technology.

Quick response times, high switching frequencies and reliable object detection at extended sensing ranges make the speed variant suitable for the packaging industry or in any application that relies on detection at top speed, such as high-speed counting.

The precision model detects the smallest of objects, cut-outs and recesses from a considerable distance. It copes well with changes in materials and surfaces, so is suitable for quality control and for handling and assembly applications.

The small variant is flexible and can be used in a wide range of different fields, offering high switching frequencies of up to 1000 Hz.

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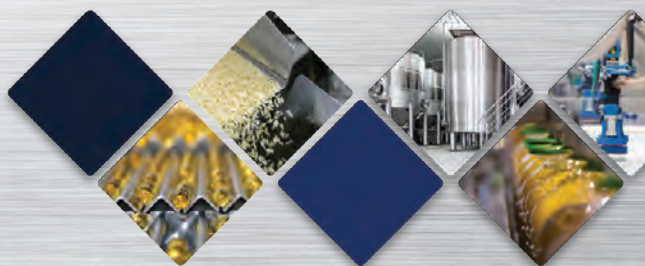
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Vacuum filler series

Handtmann has introduced its VF 800 vacuum filler series. Suitable for medium-scale and industrial producers, the range features a hygienic design coupled with refined and practical advantages for handling and ergonomics.

In addition to flexibility and high performance, a long service life and robust design ensure long-term stable portioning accuracy thanks to reduced wear. Numerous additional functions and modules support the operation of the vacuum filler. The TÜV tested and certified energy efficiency combines cost reduction with sustainable, resource-conserving production.

The performance rating and modularity of the vacuum fillers is flexible so as to minimise the time needed to respond to production conditions and parameters which have been changed at short notice.

Multivac Australia Pty Ltd
www.multivac.com.au



Modular double-end bottle washers

Krones' double-end bottle washers from the Lavatec, LavaClassic and LavaClassic Plus families will in future be constructed in a modular design to enable treatment zones to be matched to each client's specific needs.

In addition to the familiar loop routing in the caustic baths, either in single- or double-loop design, the concept offers an option for meeting requirements via a variety of pre- and post-treatment steps.

Four modules are available for the pre-treatment zones, ranging from a simple pre-jetting tank through to a highly automated module, comprising a high-pressure pre-jetting unit and presoak bath, plus automatic dirt and label removal systems.

For the post-treatment section, the kit offers three different modules: besides four- and five-stage post-treatment in the classical variant with tubular filters, users can also choose Clean Design for post-treating their bottles. This option includes automatic coarse filtration of the post-caustic by means of a sieving conveyor for relatively large dirt particles, such as label shreds, and fine filtration (down to 50 µ) of the post-caustic.

Design-enhanced or optionally available functions and assemblies, such as reducing the jetting pressure or matching pumps appropriately to requirements, enable consumption of energy and media to be reduced.

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Talking packaging

NZ's first two Certified Packaging Professionals discuss the benefits of certification

Nerida Kelton

The Certified Packaging Professional (CPP) designation is the leading mark of excellence internationally for packaging professionals and two New Zealanders have just received this must-have recognition of industry proficiency and achievement.

This designation, now available in Australasia under the partnership between the Institute of Packaging Professionals (IoPP) in the US and the Australian Institute of Packaging (AIP), has been awarded to Chris Hartwell MAIP, CPP, Packaging Innovation & Development Manager and Coster Ngirazi MSc, MAIP, CPP, Packaging Technologist, both from Fonterra Co-operative.

The AIP asked Chris and Coster a few questions about their careers, packaging education and why the CPP designation is so important for the industry...

Q: How long have you been in the industry? What are your areas of expertise?

Chris: Some may say too long. I spent approximately 10 years in the food industry in a range of technical and supervisory roles before moving into the packaging industry. I started in the corrugated case industry with Printpac UEB (which later became CHH) in New Zealand as Quality Assurance Manager, on to Process Improvement and then Regional Technical Manager before moving to the dark side and into a regional sales role for dairy packaging with CHH.

After 10 years in the paperboard packaging industry I moved to Unilever as their NZ Packaging Manager, before a family move

saw me heading up Fonterra's Packaging Technical Centre at Whareroa in New Zealand.

Following a couple of years there I moved south with Fonterra and have been based at their R&D Centre for the last 12 years as Packaging Innovation and Development Manager. I have extensive packaging expertise: Packaging Regulatory Compliance, materials technology and supply chain optimisation coupled with the desire to learn something new every day. After a few years you build up a lot of corporate knowledge (you get to see the good and the bad and you learn how to fix things that may have happened in the past) and you build a good network of people that can bring new ideas and make stuff happen.

Coster: I have been in the packaging industry for nearly 20 years, stretching back to 1995 when I started my packaging career with Unilever Zimbabwe. I have worked in Zimbabwe, United Kingdom and New Zealand.

My skills and areas of expertise include new product development, plastics materials and processing, packaging optimisation, packaging design, project management, packaging waste management and packaging validation. My experience includes FMCG — cosmetics, toiletries and detergents, personal products, food and dairy, and retail/general merchandise. >



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I have worked in different packaging roles but mainly as Packaging Development Technologist.

Within Fonterra NZ, my roles included packaging and process development and validation for dairy commodities for four years; new product development for nutritional dairy products in metal cans and sachets; and my current role involves providing quality packaging technology outputs in new product development (NPD) for Fonterra Global Brands.

Q: What made you apply for the CPP designation?

Chris: I applied for the CPP designation because I see a lot of expertise within the industry going unrecognised. Being keen for my team to pursue the designation I thought I might as well lead from the front — if I don't do it, how can I encourage my team to.

Coster: After working in different parts of the world I wanted to have a wider network with packaging professionals. With WPO (World Packaging Organisation) and AIP formally recognising CPP designation, it was worth giving it a go in attaining the certification. I wanted to get a deeper industry reach and have stronger peer connections worldwide working in multiple packaging fields.

Q: How important is attaining the CPP designation to you as an individual?

Chris: The designation of CPP for the wider group of packaging practitioners in the industry I believe is more important than for the individual.

Coster: It is very important and very significant to my career. Adding the CPP designation

to my name seals my adventurous packaging career. I have always wanted something very significant for myself in packaging so I did an MSc Packaging Technology at Brunel University in London, UK, in 2005 and was enticed to do a PhD in Packaging in Michigan thereafter. Attaining CPP designation will provide me some self-satisfaction and a mark of excellence to my career — a sense of belonging to the packaging world.



“Attaining CPP designation will provide me some self-satisfaction and a mark of excellence to my career — a sense of belonging to the packaging world.”


Q: How important is the CPP designation for the greater recognition of packaging professionals?

Chris: Having the Certified Packaging Professional designation shows that the industry has people who are highly competent in what they do and that the designation is 'live'. It is not a designation that you get and then do not need to work at to keep it live — that is the beauty of it.

Coster: Receiving the Certified Packaging Professional designation is important as it covers a very broad packaging aspect and has global recognition; it provides a sense of belonging to the packaging world — a must-have if you are a packaging enthusiast like me.

About the CPP program

Attaining the CPP designation is an excellent investment in professional development and the credential defines the packaging professional and allows organisations to seek out and hire the right professional based on verified knowledge, skills and industry contributions. CPP is a designation some of the leading packaging companies in the world want their influential team members to have because it demonstrates broad competency in all major areas of packaging. CPPs today typically enjoy more senior, decision-making positions in their companies, and research also suggests that holders of CPP often out-earn their non-certified peers. The CPP credential demonstrates that a packaging practitioner possesses packaging knowledge, experience and skills to the degree that they deserve recognition as a true packaging professional — a cut above their peers.

To find out more about the Certified Packaging Professional designation, email the AIP on educate@aipack.com.au. 

Australian Institute of Packaging
www.aipack.com.au



Roll-fed labeller with automatic glue applicator

B & H Labeling Systems' Marathon roll-fed labellers are now equipped with the GES 2.0 fully automatic extrusion-based, recipe-driven hot melt glue applicators.

The applicator applies a precisely extruded film of hot melt adhesive to preprogrammed locations on a label through a

vertical pattern nozzle. The resulting glue patterns are void-free, which improves adhesive bonding performance. The system offers precise control over the amount of adhesive applied to a label, the position of the adhesive pattern on a label and the size of the leading and trailing edge glue patterns.

The system is controlled by a single Allen-Bradley platform that controls both labeller and glue system operation. The recipes for every container/label/adhesive combination are stored in the PLC's memory. There is virtually no need for operators to set up and adjust the system during operation, which reduces downtime and training requirements.

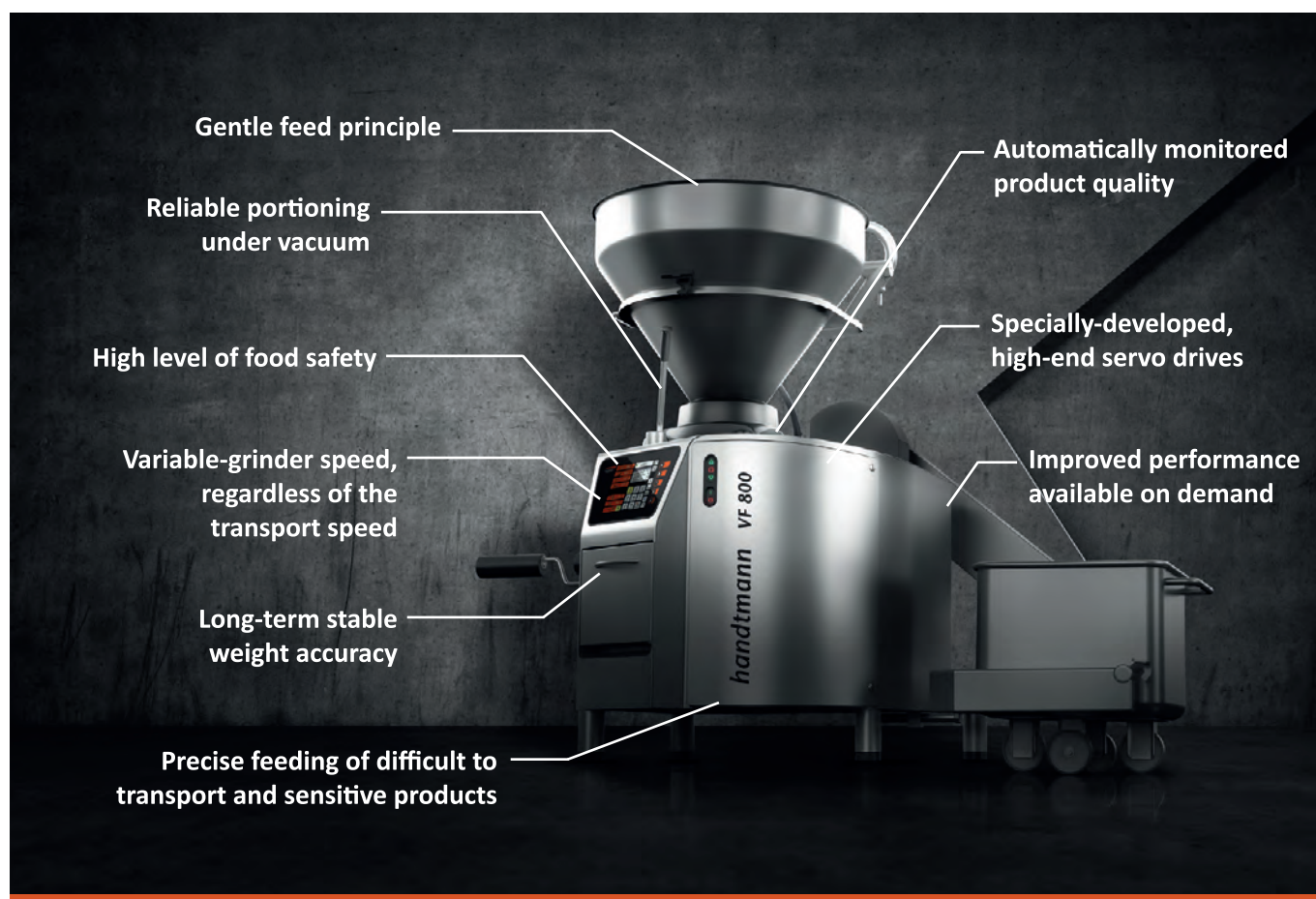
The recipe-based technology reduces applied glue weight variation by a minimum of 50% when compared to traditional glue wheel systems. The technology also eliminates glue slinging, angel hair and glue build-up on the vacuum drum and glue wires, and reduces glue waste. Glue recirculation is reduced by over 90%, which eliminates overcooking the glue and damaging its bonding properties.

The system can handle the highest speeds its host labeller is capable of achieving — up to 650 cpm with the high-speed Marathon XLA and XLUA models.

The applicator is suitable for all hot melt adhesives currently used for roll-fed labelling, as well as higher viscosity adhesives that will not run on glue wheel or spray glue systems.

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Machines for the future

Pig processor centralises vacuum supply



Pini Polonia operates three production facilities in Poland which slaughter and process 1000 pigs/h. The newest facility was commissioned in April 2015, and it manufactures cooked ham, salami and other sliced meat products. Located close to the company's existing abattoir and processing centres, the site employs 850 staff and is equipped with the latest technology, producing 130 tons of cooked ham and 60 tons of salami in a two-shift system.

The Pini Polonia management team was certain from the outset of project planning that a centralised vacuum system for the 24 packaging lines would be the best solution. In comparison to directly mounted vacuum pumps, centralised systems offer higher levels of energy efficiency, hygiene and performance.

Pini Polonia chose a Busch system, and Busch vacuum specialists were involved from the start, helping with specifications for the pipework, the location of the centralised system and the development of the controller unit. When the new plant started production, it was equipped with one of the most modern and efficient centralised vacuum systems in Europe.

As the individual packaging machines are not in close proximity to each other, it was decided to implement a so-called partial decentralisation. Panda vacuum boosters are mounted directly to the packaging machines, and all the R 5 rotary vane vacuum pumps are located in a separate room. This arrangement allows the rotary vane vacuum pumps to work at maximum efficiency, resulting in short evacuation times at every packaging machine.

The R 5 rotary vane vacuum pumps maintain a permanent prevacuum of 50 mbar throughout the pipework system. The Panda vacuum boosters operate on demand and activate only when a vacuum of 5 mbar is required in the chamber

or the packaging. They evacuate rapidly from the prevacuum of 50 mbar to the final pressure within the packaging of less than 5 mbar. This two-stage evacuation arrangement and the controller system allow packaging cycle times to be reduced substantially.

A second vacuum network for foil thermoforming is operated independently of the packaging vacuum. The thermoforming vacuum ring is maintained at 130 to 200 mbar, a considerably higher pressure than the level required for packaging. All the vacuum pumps required for the thermoforming of foil to trays are integrated into the centralised vacuum system and are thus located away from the packaging areas.

Energy efficiency

Due to their working principle, centralised vacuum systems require fewer vacuum pumps than decentralised systems. The two-stage evacuation process permits the use of rotary vane vacuum pumps with a smaller volumetric displacement, so the motor size can be reduced.

The system controller maintains a vacuum of 50 mbar in the pipework system, which acts as a vacuum reservoir for all the packaging lines.

Only the number of vacuum pumps required to maintain 50 mbar are active at any one time. As the packaging lines do not always run with short cycle times and high throughput, normally only a few of the vacuum pumps are in operation.

A further energy saving is achieved by vacuum supply centralisation: the vacuum pumps operate in a separate room, so no heat is given off to the packaging area. The air-conditioning unit of the packaging area has less work to do and thus requires less energy.

Improved hygiene

As the vacuum supply is centralised, no servicing of the rotary vane vacuum pumps is carried out in the clean areas of the packaging and processing lines. Any possibility of food contamination by oil aerosol (by equipment misuse) is excluded.

Maintenance

Centralised vacuum systems have a modular construction. Individual modules may be disconnected for maintenance purposes, in which case a standby unit will activate automatically. Servicing tasks can thus be carried out without affecting the packaging line output. As the vacuum pumps in a centralised system are subjected to lighter loads, the servicing intervals are longer than those of decentralised systems. The external location of the centralised vacuum supply is an additional advantage, as maintenance work does not cause production downtime or contamination of clean areas.

Busch Australia Pty Ltd
www.busch.com.au

Bag in box and pouch filler

Sacmi Packaging's BIB & Pouch Filler features filling valves capable of handling from 1.5 to 25 L stand-up pouch and bag-in-box formats.

The machine is compact and offers high productivity, nitrogen injection and steam sterilisation along with contamination and product leakage prevention to ensure oxygen absorption of less than 0.4 ppm and a filling precision of 0.3%.

The filler is suitable for wine, beverages, dairy, syrups, edible oils and detergents.

HBM Packaging Technologies

www.hbm.com.au



Flexible self-closing pouch

PepUp is an innovative, flexible, one hand use and self-closing pouch from Gualapack Group Italy.

Available in three forms — small flat bottle 40 to 200 mL, flat bottle 20 to 500 mL and ultimate stand-up pouch 100 to 500 mL — the pouch can be produced with different

laminate structures, making it suitable for both food and non-food products. Food uses include wa-

ters, juices and beverages, yoghurts and dairy snacks, wine and premix, snacks, sauces and dressings. Non-food markets include health and beauty, home and car care and industrials.

The pouch is safe to use as it has no sharp or cutting edges and a transparent option is available. It assists in eliminating product waste, is ultralight and compact, and recyclable versions are available. It is suitable for use in venues such as concert halls and stadiums as well as for all outdoor activities.

Unique and differentiating on shelf, the 360° high-quality print in matt or gloss makes a visual impact.

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Temperature-controlled packaging for blood products

DGP Intelsius has extended its ORCA range of temperature-controlled packaging with the introduction of the +22°C Plantol Phase Change Material (PCM), which meets the global requirements for the transportation of whole blood products at the temperature range 20–24°C.

The transit time for blood and blood components should not normally exceed 24 h: any variations from the specified temperature ranges during transportation can have detrimental effects on the efficacy of the constituents of blood, which could reduce the clinical benefits.

To ensure an uninterrupted and precise temperature-controlled blood cold chain, red blood cell components must be kept at a temperature of 2–10°C during transportation. All components routinely stored at 20–24°C need to be kept at these temperatures during shipment, and all frozen components need to maintain their frozen state.

Frozen components, such as Fresh Frozen Plasma (FFP), have been rapidly frozen within 6–8 h of collection and their temperature needs to be maintained at -20°C or lower during transportation.

The temperature-controlled packaging provides up to 168 h of thermal protection for 2–8°C, 15–25°C, -20°C and deep frozen temperature-sensitive payloads. In addition to this, with the now greater need for more complex shipping systems, the 20–24°C product provides good performance in hot conditions over 144 h against ISTA 7D.

The systems are designed to manage excursion risks, control costs and prioritise patient safety. The range utilises PCMs and vacuum insulated panels (VIPs) to create high performance while reducing volumetric weight.

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meat poultry seafood

Data-driven decision-making in the oyster industry



As filter animals, oysters are highly susceptible to water quality. If there's been a lot of rain flooding into the estuaries where oysters grow, they can quickly pick up contaminants that could make people ill. Farmers and regulators want to avoid that at all costs — so when there is a perceived risk, oyster farms have to close until conditions improve.

The lack of supply is frustrating for the consumer — but it's financially excruciating for farmers. During periods of high demand, such as Christmas and Chinese New Year, a day's lost production can cost farmers \$120,000 in foregone revenues.

In the Tasmanian oyster industry, Pacific Oyster Mortality Syndrome (POMS) has been wreaking havoc. Barilla Bay Oysters, once one of the state's largest farmers, lost 70% of its harvest to the disease in February 2016, crippling its operations.

"We have no control over what oysters consume — if there is something coming down the river that isn't appropriate we have no control. We could be closed for a couple of days or a couple of months depending on what is coming down the river," explained Justin Goc, manager of Barilla Bay Oysters.

Harnessing data

The problem has been that in the past the industry has relied largely on rainfall gauges to assess when there may be a risk, and often been required to shut shop when there's actually been no need. Analysis has revealed that around 30% of closures based on rainfall gauge readings are in fact unwarranted — the water quality and the oysters are fine.

However, the future looks brighter for Barilla Bay Oysters and the wider Tasmanian oyster industry, with the deployment of a technology solution developed by AgTech business The Yield, in partnership with Microsoft, Bosch and Intel.

The technology

The Yield is working with the Tasmanian Government and oyster farmers in 14 of the state's estuaries to deploy the new

system, which uses in-estuary sensors to collect data that is fed through Bosch's ProSyst software through to the Microsoft IoT Hub in Microsoft Azure, where it is stored alongside national weather data. Environmental data and near real-time sensor data is combined and presented to oyster growers and regulators as rich dashboard visualisations for the previous week, today and tomorrow to enable faster decisions based on local information.

The Yield believes that its technology could be more broadly deployed in aquaculture and agriculture, allowing crop growers to know exactly when and how to irrigate, for example.

Planning during uncertainty

In the oyster industry, while salinity measurement is clearly important in terms of identifying contamination risks, water temperature is equally critical to assess the risk of the POMS virus. Knowing there is bad weather ahead, when it might be hard for crews to get out in boats to harvest oysters, means oyster farmers are able to fine-tune their rosters — shaving cost and boosting efficiencies.

Barilla Bay's Justin Goc is optimistic that having access to more information much faster will help oyster farmers gain a better understanding of what is happening and "how we can plan in an uncertain future".

He now knows the salinity and temperature of the water, and has tide and weather details at his fingertips to help roster staff. In the future he's hopeful that even more data could be collected, such as algal profiles in the bays, which could provide insight as to which algae promote oyster growth, or potentially act as a POMS vector.

But ultimately he acknowledges: "It's a hard business and you can't control Mother Nature."

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Major production changes set for meat processors

A number of successful trials using rotary screw vacuum pumps instead of rotary vane pumps in operating industry-standard rotary vacuum packaging machines is set to have a major impact on the meat processing industry.

Until now, energy consumption for vacuum pumps in the meat processing industry was never considered that seriously.

The usual practice is to start the vacuum pumps in the morning and turn them off at the end of the shift. They run for the full duration of the shift unless the operator is conscientious and shuts them down during breaks. However, this is about to change as Atlas Copco's GHS VSD+ rotary screw vacuum pump offers savings for these particular scenarios.

The trials, held recently at two of Australia's leading meat processing plants in Queensland, clearly showed that Atlas Copco's rotary screw technology is far superior to the rotary vane technology presently used in the industry, in both energy efficiency and maintenance costs.

Atlas Copco Regional Business Line Manager – Utility Vacuum Pierre Matschke explained that the first trial involved

replacing a 22 kW rotary vane vacuum pump with a 15 kW rotary screw vacuum pump on the second stage of one of the meat processor's vacuum packaging machines.

"The trial showed that our rotary screw vacuum pump, which has now been running reliably for six months, is far superior in life cycle costs to the traditional rotary vane vacuum pump.

"While the customer was very pleased with the +17% energy saving the machine was achieving, it was when we looked at the customer's maintenance costs we realised our machine was able to make even larger savings by reducing their maintenance costs drastically."

The most recent trial achieved even better results, which involved replacing two 22 kW rotary vane vacuum pumps with just one 37 kW rotary screw vacuum pump, and one for one 15 kW on the second stage.



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Matschke said the customer was very impressed with the GHSVSD+'s reaction time and the major savings he is achieving on both energy and maintenance costs.

"As well, the performance of the packaging machine has improved. With the rotary vane vacuum pumps, the packaging machine used to run at only 2 mbar, as that was the lowest vacuum they could achieve on most days, but with our rotary screw vacuum pumps the vacuum is consistently down to '0' mbar.

"And with less air in the pack, the meat stays fresher with a longer shelf life; a major benefit for the meat processor, supermarkets and consumers."

Matschke admits it was a struggle at first to convince companies of the exceptional benefits of investing in rotary screw machines but following the outstanding results from the trial sites, he said companies are now preparing to make the switch.

"And not just energy savings, due to the rotary screw machine's proven technology, customers' maintenance costs are drastically reduced."

Atlas Copco has been successfully using the same screw technology worldwide in its air compressors since the late 1960s, with just minor machining differences to accommodate oil flow in vacuum applications.

Unlike rotary vane pumps, where the vanes are in constant contact with the stator and wear over time, the rotary screw pumps have no surface contact or wearing parts in the compression chamber.

This constant contact, and extra load at start-up, means the vanes need replacing every 16,000 running hours (three to four years on average) and, depending on the machining required, overhauls can cost anywhere between \$12,000 to \$20,000, which often leads to a complete pump replacement after just three to four overhauls.

Matschke pointed out that extending the overhaul intervals is not a viable option as it only causes more extensive damage to the pump, with overhauls costing even more, plus pump energy consumption increases by around 16% per year due to wear, adding an average of \$5300 over five years in energy costs alone. Customers also start to see pack quality reducing.

However, with the rotary screw vacuum pumps, overhaul intervals are only after 48,000 running hours (11–12 years) and cost less than half that of rotary vane. And with the extended intervals of the GHSVSD+, users can experience a reduction in overhaul costs of $\pm 89\%$ over 10 years.

Also, no machining is required (re-bearing only) plus the pumps' efficiencies remain constant throughout the life of the units and are not affected by start-up, with the VSD (variable speed drive) offering unlimited starts.

Investing in rotary screw pump technology also offers major savings on expensive exhaust filters (around \$200 each). Due to a multifunction inlet valve, which reduces the mass flow onto the filters, the rotary screw vacuum pump set only requires 18 filters as opposed to 48 on the vane pump set.

Matschke said all these savings mean the ROI on a rotary screw vacuum pump can be as low as 1.3 years, depending on the number of overhauls due on existing vane pumps, and lead to total cost of ownership savings of over \$170,000 over five years on just one packaging machine alone.

"We are also working closely with our customers to generate even more savings such as optimising piping and integrating the controls so that when the packaging machine slows or stops so do our machines, saving even more energy."



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Meat

NEWS



Egypt promotes farmed fish as food security measure

Some of Egypt's top chefs have come together to taste test new preparation methods and recipes for farmed Nile tilapia, as part of a project aimed at increasing the use of farmed fish to improve food and nutrition security in the region.

At a workshop hosted by WorldFish in partnership with the Egyptian Chef's Association, organisers sought to discover chefs' preferences and influencing factors when buying seafood and raise awareness of the range of tilapia products available.

Egypt is the world's second largest producer of tilapia — the country's most farmed fish — with the industry providing an average of one fish per week for each of its 90 million people.

Participants at the workshop tasted and gave feedback on new products such as small fish and fillets; two products rarely found in Egyptian restaurants but widely consumed in America and Europe. This method, based on sensory science research approaches refined by the Oregon State University's Food Innovation Center, provides an accurate way to gather rich consumer acceptance and purchasing data that can be replicated in other geographies for various fish species.

WorldFish hosted the event in collaboration with the Egyptian Chefs Association (ECA), a non-profit organisation representing 1000 professional chefs in Egypt and a national authority and opinion leader on food. Other highlights of the workshop, held at the WorldFish Aquaculture Research Center in Abbassa, Sharkeya, included field visits to Nile tilapia aquaculture farms, a cooking demonstration by chef Markus Iten and an educational session on Egyptian aquaculture.

"Farmed tilapia is affordable, tasty and environmentally friendly, and a healthy source of protein, nutrients and essential fatty acids. By encouraging chefs to use more farmed tilapia in their restaurants, they will contribute to improved food and nutrition security in Egypt, where around 17% suffer from food shortages throughout the year," WorldFish Egypt Country Program Manager Malcolm Dickson said.



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Robotic picking head system for frozen steak

G. Mondini has released a picking head system for the robotic loading of crust-frozen steak.

The system offers processors advantages in labour reduction, consistent placement and capacity without compromising on hygiene.

The system is fully washdown capable and utilises a hygienic picking head design that takes advantage of the Bernoulli Vacuum principle, resulting in a 'no suck back' effect.

The picking system uses the Adept Quattro s650HS parallel robot, which is USDA accepted for meat and poultry processing. The four-arm design, control algorithms and large work envelope make the overhead-mount robot suitable for smooth-motion, high-throughput applications. The robot is powered by compact controls and embedded amplifiers, which reduces the cycle time and improves the footprint efficiency.

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Kangaroo meat company targets European expansion

Kangaroo meat distributor Macro Meats is planning to establish a processing plant in Europe to target the home cooking market.

Kangaroo production was commercialised in the late 1980s and Macro Meats now processes about 10,000 tonnes/year for consumption in more than 30 countries.

The South Australian company currently sells about 75% of its kangaroo products domestically but is looking to grow sales in Europe, North America and Asia.

Moving from success in restaurants to finding a place in retail outlets with everyday kangaroo products such as hamburgers, sausages, meatballs and stir-fry strips has been a key to Macro Meats' success in Australia.

However, export rules require meat to be shipped from Australia in whole pieces, making it less appealing to the cook-at-home market, and prompting Macro Meats' decision to open its own value-adding processing plant in Europe.

"If you've just got lumps of meat or steaks, sometimes it's a little bit too much when you're trying to introduce it to people for the first time. So we want to be able to do meatballs or burgers or stir fries depending on the country and what they want," said managing director Ray Borda.

"This is a pilot plant and depending on how that works we hope to end up having a processing plant in Europe, Asia and the Americas," Borda said.

"It's ambitious, but we think we are sitting on gold — Australia is the only place in the world where you can get this product from and if we control it and market it then nobody is going to be able to do it like we do."

Macro Meats' species-specific range is designed to promote greater consistency for consumers and will include the mild-tasting Paroo (red kangaroo), medium-flavoured Mallee Roo (western grey kangaroo) and the robust Mulga Roo (eastern grey kangaroo).



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Vision inspection system at meatworks ensures compliance



A leading Brisbane-based meatworks producing high volumes needed an inspection system that guaranteed speed, product integrity and accuracy.

The Brisbane meatworks is unique. It is a globally recognised, fully integrated facility that completes a full circle in beef production including slaughter, boning, value add, retail ready and distribution. According to its production manager the site processes some 1200 head of cattle per day.

Apart from bulk meats it also produces stir-fry and diced beef and veal; beef sausages; corned, marinated, glazed and coated beef and veal products; corned beef silverside; and hamburger patties.

As a supplier of fresh meat products to major supermarkets and consumers across Australia, the company needed to ensure its products are never wrongly labelled, never display illegible date codes or have damaged packaging.

Through its integration partner, Pac Technologies, the meatworks commissioned Omron to install a vision inspection system that would minimise the risk of sending out any non-compliant products.

"All final packaged product lines were installed with Omron's FQ2 vision inspection cameras for traceability of all shelf-ready meat products," said Omron's Queensland state manager, Paul Gibb.

"The main aim was to increase productivity, while maintaining consistent, high-quality standards."

Stringent requirements

"We currently have an annual production of over 15 million kilos for national distribution to prominent retail and supermarket shelves," the product manager said.

"Due to very stringent requirements demanded by our retail distribution partners, our entire packaged shelf-ready product needs to be exactly as per what it is ordered and labelled as.

"The biggest challenge for any meatworks is traceability. Most facilities traditionally rely on casual labour in the final packaging and inspection process.

"We turned to Omron to assist us in greatly reducing the risk of sending out non-compliant product final packaged product," the production manager said.

A challenge for this application was to check both 1D and 2D barcodes at varying focal lengths on the final production line. Also there was a requirement to check and verify the date code on each shelf-ready product.

Vision solution

Kim Simonsen from Pac Technologies, in conjunction with Omron application engineers, created a vision solution using FQ2 machine vision cameras on each line. On some lines, two cameras were used at varying focal lengths to handle the varying heights of the target product.



The carton barcode is pre-checked to verify that the product is as expected before the individual packs are checked.

"We accessed some very powerful algorithms built in to the FQ2 camera to achieve what the customer needed to satisfy their date and barcode checks," said Yang Qui, a senior application engineer from Omron Electronics, Brisbane. "OCR, or objective character recognition, was used to not only check for the presence of the date code, but actually read the text to ensure that the date code was correct and readable. The small-sized 2D barcode was a challenge, and required us to employ the high-resolution version of the FQ2 vision camera to obtain a reliable and accurate reading each and every time."

Gibb said Omron is also assisting other Queensland-based meatworks that produce down to shelf-ready product as well as bulk packs.

Hundreds of different variants

"There are common issues emerging when talking to each company about checking integrity and accuracy of the final packaged product and its labelling and identification," Gibb said.

"Hundreds of different product and label variants, many types of barcodes and date codes, varying existing PLC ar-

chitecture, high turnover of transient workforce and a hostile operating environment all present a challenge to a solid and reliable vision solution."

One of the main challenges was how to process the data once reliable and accurate judgements of the final product are obtained.

"In this instance we used our powerful and flexible NJ Machine controller with SQL connectivity and Ethernet IP to communicate directly to the customer's database without the need for any software-based middleware," Gibb said. "Since Omron's NJ controller has the option of Ethernet IP communications, it communicated directly with the customer's existing PLCs, creating a seamless network from camera to database."

Gibb said Omron's FQ2 vision cameras are rugged enough to be installed directly on the production line in a meatworks hosedown environment and they have enough capacity to store more than the customer's total product line-up and label varieties.

Gibb said the main issues for quality assurance (QA) inspection in the meat industry are:

- Hundreds of different products and labels
- IP rating camera
- Huge variety of codes, different types of barcode, different type of 2D Codes
- Complex production and device information like expiry date, batch number, lot number, stamp
- Many workers lack technology, knowledge and training
- Difficult to use traditional sensors or PLCs to collect all of the information
- Difficult to integrate PLC/vision/motion/sensors all together
- Difficult to manage QA inspection information
- Image logging? Data logging?
- How to integrate to existing SCADA software

The solution

Omron FQ2 supports up to nine types of barcodes. Whether it's for verification or barcode character reading, the FQ2 can easily meet customers' requirements.

The Australian meat industry uses GS1-databar code widely and FQ2 has been successfully used for product verification and production information inspection.

2D Code

FQ2 can read the main six types of 2D codes. There is no need to use more than one code reader — even for processing that combines different types of codes.

FQ not only forms a powerful and accurate vision inspection/data sharing network. It is the beginnings of a fully futureproofed new single-platform, plant-wide architecture, ready for upcoming robotics, RFID, safety and advanced sensing.

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Good news

for the Australian livestock industry

The development of antibiotic resistance in humans may be somewhat overemphasised with respect to the risk posed by Australian meat and other livestock products, according to a recent survey.

All around the world there is increasing concern that the use of antibiotics, especially third-generation ones, in the livestock and pet industries is contributing to the development of ‘superbugs’ — disease-causing bacteria that are resistant to antibiotics and could potentially spread incurable diseases to humans.

The only problem with this conjecture was that there were no studies investigating the prevalence of antimicrobial resistance in Australian livestock and pets. We simply did not know our level of risk.

Now, however, the results of the first nationwide survey of antibiotic resistance in disease-causing bacteria in Australian livestock and pets have been released — and the news is good.

Rates of resistance to critically important drugs were found to be low and to compare very favourably with other countries around the world. This means the development of antibiotic resistance in humans may be somewhat overemphasised with respect to the risk posed by Australian meat and other livestock products. On a commercial level, consumers can be assured that buying Australian is safer.

The survey findings were released at the official launch of the University of Adelaide-located Australian Centre for Antimicrobial Resistance Ecology (ACARE). The new centre will monitor drug-resistant bugs in both humans and animals across Australia, and research the development of resistance and new ways of controlling disease.

Murdoch University researcher Dr Sam Abraham, who was a collaborator in the study, said, “These findings strongly suggest that Australia’s companion-animal and livestock veterinarians are largely following good antimicrobial stewardship principles when prescribing antibiotics to cure infections in animals.”

The project leader of the Australia-wide survey, Professor Darren Trott, said the survey result is an A-grade report for Australian agricultural industries and animal health practitioners.

“We are starting from a good base, but we need to ensure these rates are kept low by promoting One Health-focused initiatives on antibiotic stewardship, infection control and biosecurity, and

viable alternatives to antibiotics. Surveillance is the yardstick whereby all these excellent initiatives can be collectively measured,” said Professor Trott.

“It shows that concerns over animal antimicrobials contributing to the development of antibiotic resistance in humans may be somewhat overemphasised with respect to the risk posed by Australian meat and other livestock products.


“However, there is no way we should be resting on our laurels. We did find some resistance and we know this is a developing global problem.

“We now have an Australian benchmark showing where we are currently with respect to disease-causing bacteria in animals, and we need to ensure ongoing surveillance and continued vigilance, with good prescribing practice across livestock and pets by our veterinarians — just as we need in human medicine.”

Main findings from the report, which was initiated and funded by animal health company Zoetis, include:

- extremely low rates of resistance to third-generation cephalosporins (<3%) and fluoroquinolones (<1%) in *E. coli* isolated from livestock;
- the absence of resistance to carbapenems (the antibiotic of last resort in humans) in both companion animal and livestock *E. coli*;
- uniformly low rates of resistance (<10%) to some critically important antimicrobials (third-generation cephalosporins and fluoroquinolones) in *E. coli* isolated from companion animals (equivalent to the rates observed in humans in Australia).

John Tunbridge, adjunct professor at the University of Adelaide and senior medical advisor to the Australian Commission on Safety and Quality in Health Care, said the findings will be the first of the animal component of One Health national antimicrobial resistance surveillance.

“The first report of the human component, AURA 2016, was recently released by the commission. This landmark report has identified some significant issues in the use of antimicrobials and antimicrobial resistance in human health, and identifies areas for improvement,” Tunbridge said. 

Reducing the scourge of dark meat post-slaughter

Using high-pressure processing at low temperatures, the colour of unattractive dark meat can be lightened — potentially saving the red meat industry \$100 million/year.

Colour is the prime way that consumers ascertain meat quality — and they don't like dark meat. Interestingly, dark meat can also have a shorter shelf life and an off flavour, and its tenderness can be variable. So if a carcass is a darker colour its value to producers, processors and retailers is significantly less.

On-farm stress and stress during transport are known causes of dark meat, and until now, most efforts in reducing dark meat have concentrated on pre-slaughter conditions and treatment.

However, a team of researchers has looked at post-slaughter ways of improving meat colour with low-temperature, high-pressure processing (HPP) proving to be successful in lightening the colour of high-value primal meat cuts.

The use of low temperature along with the high-pressure processing means that the meat does not develop a 'cooked-like' appearance. In fact, the treatment does not confer any adverse effects on the eating quality.



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A muscle biochemist at CSIRO Food and Nutrition, Joanne Hughes, has just won the the red meat processing category of the Science and Innovation Awards for Young People in Agriculture, Fisheries and Forestry for her work on this project. Sponsored by the Australian Meat Processor Corporation, the award will provide the funding for this project.

Hughes and the team also surveyed a number of meat processors, covering 43% of the total cattle slaughtered, and found that dark meat could be costing the industry up to \$500 million per year, or \$1000 per animal — much more than previous estimates.

It is hoped that the HPP technology will enable meat processors to reduce carcass downgrading and improve the quality and colour of the meat before it reaches consumers — maximising carcass value for both the producer and processor. Over the next five years, the team aims to reduce this loss by 20% and save the beef meat industry alone up to \$100 million per year.

CSIRO has collaborated with Greenleaf Enterprises to develop a cost-benefit model to help processors determine the financial viability of adopting the technology.



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Inghams' zero waste to landfill goal



Inghams is one of Australia's largest poultry providers, supplying Australian families with quality chicken and turkey products.

Inghams (Inghams Enterprises) believes in 'doing things right' and its commitment to reducing waste by recycling and re-using its products and waste materials is no different.

As part of the company's sustainability strategy, Inghams Enterprises has set an ambitious goal of zero waste to landfill. In 2014, Inghams enlisted SUEZ's expertise in recycling and recovery to help meet this challenge.

SUEZ Queensland State Sales Manager Liesl Hull worked with Inghams to implement complete waste management solutions at its Murarrie Processing Plant and its Advanced Water Treatment Plant.

While an initial waste audit demonstrated that Inghams started on a strong footing, the challenge was to identify simple and cost-effective ways to achieve further diversion from landfill, while maintaining overall workplace efficiency.

"By reviewing Inghams' existing arrangements, we identified a number of gaps. We introduced soiled plastics, paper towel recycling and specialised liquid services solutions at the Murarrie Processing Plant. We also provided liquid services for their on-site award winning Advanced Water Treatment Plant," said Liesl.

The Murarrie Advanced Water Treatment Plant received the Australian Prime Minister's Water Wise Award in 2010, which demonstrates Inghams' commitment to sustainability.

"At times, operations at the plant were interrupted due to overloaded waste pits. We sat down with the Inghams team to review and forecast their liquid waste volumes and together developed a reliable service schedule that fit their specific requirements.

"We also introduced a number of innovations that transform the way Inghams handles soiled plastics. Plastic waste is now washed, shredded and then recycled. A further 20 tonnes of plastics per month is now diverted from landfill.

"We have also implemented other simple but effective steps for Inghams to be more cost efficient, including introducing a cardboard compactor to make recycling much easier," Liesl said.

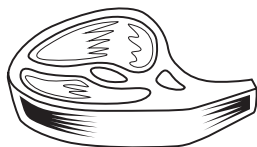
Engagement with over 1000 on-site employees was an important part of the change process, and included face-to-face training and regular communications on the new recycling practices.

Providing Inghams with a complete waste management solution has led to a significant cost saving of more than 30% per annum and an increased diversion rate of 95% at both plants.

With the zero-waste-to-landfill target edging closer, Inghams and SUEZ are now looking at further ways to achieve greater diversion and recovery.

SUEZ

www.suez-environnement.com



Experts warn booming seaweed industry of the risks of rapid growth

The seaweed industry is expanding at a rapid rate, driven by new and valuable uses for the crop — from food and fertiliser to

pharmaceuticals and industrial gels. The annual harvest is currently 25 million metric tons, valued at US\$6.4 billion in 2014.

But such growth comes with risks, and experts are now urging the industry to take heed of the lessons learned in both agriculture and fish farming in order to avoid the potential pitfalls.

Drawing on the expertise of 21 institutions worldwide, UN University's Canadian-based Institute for Water, Environment and Health and the Scottish Association for Marine Science (SAMS) have published policy advice to the seaweed industry, to help it avoid expensive mistakes and pursue best practices, backed by relevant case studies involving crops like bananas and shrimp.

Problems of rapid expansion

However, the policy authors warn of unforeseen ecological and societal consequences from the rapid expansion of any industry, urging industry leaders to focus on a range of issues, including:

- Biosecurity — preventing the introduction of disease and non-indigenous pests and pathogens.
- Investing in risk assessment and early disease detection.
- Building know-how and capacity within the sector.
- Cooperative planning to anticipate and resolve conflicts between competing interests in finite coastal marine resources.
- Establishing management policies and institutions at both national and international levels.



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Finally, a way to culture norovirus in the lab

Forty-eight years after noroviruses were first identified, researchers have found a way to grow them in the lab — opening a path for researchers to develop systems to prevent and treat norovirus infections.

Norovirus, also known as winter vomiting bug or the cruise ship virus, is the leading cause of illness and outbreaks from contaminated food. The virus is very tiny and very infective — as few as 18 virus particles can cause illness. Food can get contaminated with norovirus when infected people who have stool or vomit on their hands touch the food; when the food touches surfaces that have infectious stool or vomit on them; or when aerolised vomit from an infected person sprays through the air and lands on the food.

Foods can also be contaminated at source — for example, oysters grown in contaminated water or fruit and vegetables contaminated in the field.

Noroviruses are species specific — human noroviruses only infect and cause disease in humans, and mouse noroviruses only do so in mice. Human noroviruses do not grow in mice or other small animal models typically used for research.

You would think such an endemic virus would have been extensively studied but scientists have struggled to culture the viruses in the lab — until now.

Scientists at Baylor College of Medicine have, for the first time, succeeded at growing noroviruses in laboratory cultures of human intestinal epithelial cells. This work, published in *Science*, represents a major step forward in the study of human gastroenteritis viruses because it establishes a system in which a number of norovirus strains can be grown, which will allow researchers to explore and develop procedures to prevent and treat infection and to better understand norovirus biology.

“People have been trying to grow norovirus in the lab for a very long time. We tried for the last 20 years. Despite

all the attempts and the success of growing other viruses, it remained a mystery why noroviruses were so hard to work with,” said senior author Dr Mary Estes, Cullen endowed professor of human and molecular virology and microbiology at Baylor and emeritus founding director of the Texas Medical Center Digestive Diseases Center.

“My idea was that we had not succeeded at growing noroviruses because we didn’t have the right cell type,” said Estes. “We first showed that in patients with chronic norovirus infections, the virus could be detected in intestinal cells called enterocytes, but normal human enterocyte cells rapidly died when put into culture. A breakthrough came when we learned that Dr Hans Clevers’ team in the Netherlands had developed a method to make a new type of human intestinal epithelial cell culture system including enterocytes. These novel, multicellular human cultures, called enteroids, are made from adult intestinal stem cells from patient tissues. We anticipated that putting the virus in these non-transformed human cell cultures would let the virus grow.”

It took Estes and colleagues about one year to get the human intestinal epithelial cultures growing well in the lab. Then, before they tested the cultures with noroviruses, they tested them with another human gastrointestinal virus, rotavirus.

“Rotavirus grew well in the human intestinal epithelial cell cultures,” said Estes. “Then, we tried the human norovirus and found that some strains would grow, but others wouldn’t. We suspected that still something was missing.”


The researchers tried to improve the growth of the viruses by adding to the cultures substances that are naturally

present in the upper small intestine, the natural environment where the virus grows. Other intestinal viruses, such as rotavirus, use these substances to grow inside the body.

"The human body responds to food by secreting enzymes from the pancreas and bile from the liver into the small intestine. Pancreatic enzymes digest the large molecules and bile solubilises fats," said Dr David Y Graham, professor of medicine and molecular virology and microbiology at Baylor and the Michael E. DeBakey Veterans Affairs Medical Center. "Viruses that cause gastroenteritis, such as rotavirus, utilise

pancreatic enzymes to trigger their replication, but these enzymes had no effect on norovirus. We asked, if pancreatic enzymes were not important, was bile a key component allowing the virus to recognise where it was and replicate?"

"When we added bile to the cultures, norovirus strains that didn't grow before now grew in large numbers!" said Estes.

"This new cultivation system will finally allow us to gain an insight into how this virus causes disease," said co-first author Dr Sue Crawford, an assistant professor of molecular virology and microbiology at Baylor. 



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Detection and identification of beverage spoilage yeasts

The Pall GeneDisc product range has been expanded with a flexible solution designed so that beverage industries can detect and identify spoilage yeast in a timely fashion.

There are two testing options — a yeast screening test and a yeast identification test — for the 12 major beverage spoilage yeast species and genera, including *Saccharomyces cerevisiae* var. *diastaticus* and *Brettanomyces bruxellensis*.

For yeast slurry testing and colony identification, results are available in only 2 h. To determine the presence of down to one microorganism in the sample, the test results can be available in as little as 30 h.

Spoilage risk is greatly reduced as users obtain results faster and earlier in their process. As an example, with only 2 h from sample to result, breweries can prevent pitching contaminated yeast. In addition, beverage producers including breweries, wineries and wine bottlers can now consider next-day batch release controls.

The easy-to-use solution can be implemented at beverage producers from small to large across different industries. It complements the existing GeneDisc solutions for the detection of beer and TAB spoilage organisms.

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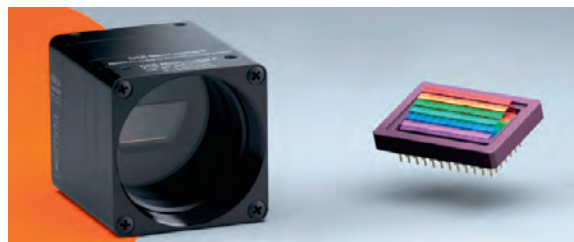
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Small, hyperspectral multiline-scan camera

XIMEA's xiSpec Multi-Linescan HSI camera is based on the design and technology of the xiQ series of industrial USB 3.0 cameras.

Instead of using a mosaic pattern of hyperspectral filters, the camera features a linewise arrangement of 150 HSI bands. Due to the high frame rate of the image sensor, the camera enables the detailed and crisp capture of moving objects at multiple wavelengths. The objects can be moved orthogonally to the horizontal colour filters of a mounted camera on a conveyor belt or the camera can be attached to a UAV, which flies over a large area.

The visual and near-infrared (NIR) spectrum of the camera is suitable for agriculture. Other applications include food inspection, precision agriculture, sorting and defect detection, and optical sorting.

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Food testing instrument for GMO and authentication

The Promega Maxwell RSC PureFood GMO and Authentication Kit for food testing delivers automated high-quality sample prep for food testing labs. The device provides an easy, automated method for efficient purification of DNA for use in PCR-based testing for genetically modified organism (GMO) DNA sequences, and PCR-based food and ingredient authentication.

The kit can purify DNA from raw and processed food samples including corn, soybeans, canola, ground pork, ground beef, pork gelatine, breaded fish, tortillas, corn chips and rice cakes in under 2 h.

The instrument purifies nucleic acid using novel paramagnetic particles and allows optimal capture, wash and elution of the target material from 1 to 16 samples with minimal manual intervention. Because there are no tubes or pipette tips involved, there are no clogs, drips, splashing or aerosols, greatly reducing contamination risk. The instrument is supplied with preprogrammed purification methods and is designed for use with the predisposed reagent cartridges, maximising simplicity and convenience.

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Precision balance

Mettler-Toledo's stable, durable and easy-to-clean XPE Precision Balance offers good repeatability when weighing minute forces without use of a draft shield.

The star-shaped SmartPan weighing pan, which is integrated into the balance, fosters repeatability at resolutions down to 1 mg while delivering results up to twice as fast as a comparable balance using a draft shield. Elimination of the draft shield makes weigh-in quicker and easier. This serves to enhance lab productivity and help operators to have a more comfortable weighing process.

The weighing pan design is said to maintain a faster-than-average settling time inside a fume hood, where continuous drafts are used to eliminate the danger posed by airborne gas or other toxins. Under these subtly more difficult conditions, XPE Precision 5 and 10 mg models in particular continue to deliver results up to twice as fast, with the balance's two-fold improvement in repeatability, without resorting to draft shield use.

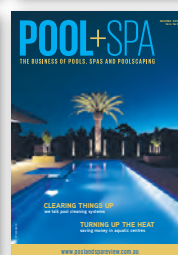
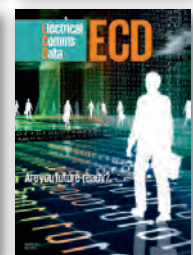
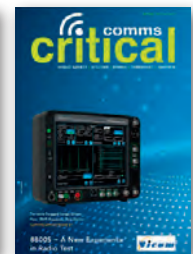
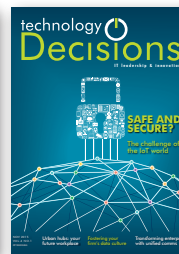
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Test bag

If water samples are being tested with colour-changing reagents, the Coli-Test Bag from Whirl-Pak can be used in place of a bottle. The bag is made of a special barrier film suitable for use with enzyme-based methods that result in a chromogen and/or a fluorogen release when total coliform and *E. coli* are present. The special film prevents colour change from permeating through the bag, contaminating another sample and creating a false positive, and making contact with a person's skin if they are not wearing gloves.

It is sterile, contains 10 mg of active sodium thiosulfate to neutralise chlorine, has a 100 mL fill line and is completely self-standing, with no rack or holder needed to keep the bag up-right. If the sample is not chlorinated, the bag can still be used; the sodium thiosulfate will not affect the sample, it is non-toxic and non-nutritive, and only neutralises chlorine if present.

The Coli-Test bag has been accepted by the EPA in USA and is listed in the EPA Manual for the Certification of Laboratories Analyzing Drinking Water.

The bag, which is available from AMSL Scientific, reduces costs as it is less expensive than the bottle, and incurs lower freight charges and reduced disposal costs.

Australasian Medical & Scientific Ltd
www.amsl.com.au


Portable pH meters for food industry

Hanna Instruments has launched a line of portable pH meters for the food industry. The Professional Foodcare pH Meter range includes a general-purpose model (HI98161) and versions specific for milk (HI98163), yoghurt (HI98164) and cheese (HI98165) products. Each meter is supplied with a unique pH/temperature probe that has been modified to deliver high performance and reliability.

The pH of a food can influence taste and texture and can also indicate the potential for spoilage. Industries are often required to measure pH and document the readings for record keeping. The meters allow for the log-on demand of measurements that can then be transferred to a Windows-compatible computer with the supplied USB cable and software. The Good Laboratory Practice (GLP) data including calibrations date, time, offset, slope and buffers used is also transferred with logged readings for increased traceability.

During the calibration process, the user is alerted if the electrode needs to be cleaned or if buffers are contaminated; and after calibration, the overall condition of the pH electrode is displayed as a percentage. The overall condition is based on the offset and slope characteristic of the pH electrode.

From refrigerated products, high solid content slurries and solids to semi-solids, food products can challenge a standard pH electrode. Each pH electrode supplied with the application-specific meters has unique features including the body material used, the shape of the sensing tip, the type of glass used and most importantly, the reference junction. Many of the electrodes have an open junction design that resists clogging.

Hanna Instruments Pty Ltd
www.hannainst.com.au


Processing



Hygienic welding in the food and beverage industry

The hygienic requirements of the food and beverage industry place high demands on the welds that hold tanks, pipes and vessels together.

The requirements for a high quality weld and weld surface finish are paramount in the dairy and other food and beverage industries as the consequences of surface discontinuity can be costly and dangerous.

Recent contamination scares in the dairy sector provide some examples of the consequence of not getting things right. In effect, every metre of weld inside a storage or process tank or vessel represents a risk to be managed. Fabricators must make significant efforts to ensure that both the weld integrity is adequate and that the surface finish meets the specified requirement for hygiene.

Automatic keyhole plasma arc welding (KPAW)

In the early 2000s, after a number of in-house implementations of semiautomatic welding, Furphy Engineering began searching for automated welding equipment to produce higher quality welds with improved efficiency. A global search resulted in the selection of keyhole plasma arc welding (KPAW) as the desired welding method.

French welding company SAF (Air Liquide Welding) was identified as the leading proponent of this equipment at the time, and remains at the forefront of KPAW development today, producing keyhole plasma welding equipment with

automated installations particularly suited to the tank/ vessel manufacturing sector.

KPAW enables an excellent weld quality to be produced, with the introduction of minimal heat and with no removal of parent material required for weld preparation. Unlike the TIG process, which is susceptible to tungsten inclusions from the exposed electrode, KPAW has no exposed electrode and consequently significantly reduced risk of inclusions.

Weld quality is evidenced by the superior radiography test performance that results from the KPAW method. Butt welds up to 8 mm thickness can be completed in a single pass with only a gas backing shield required. Weld reinforcement is minimised and this assists in the subsequent surface treatment to obtain a smooth weld finish suitable for sterile applications.

Early KPAW equipment didn't come preloaded with the variety of programs that modern day plasma's do and, when compared to other processes of the day, the systems were at first intolerant of all but the most precise preparation. This fostered a strong focus on stringently consistent weld preparation and the development of a robust welding R&D program became essential to realising the full potential of the process.

The need to tightly control preparation and understand the technicalities of this process in turn led Furphy to focus on



welding system control. The company expanded its AS 1796 welding supervisors program and today has three WTIA accredited AS 1796 Certificate 10 Welding Supervisors, with a fourth in the pipeline. Welding supervisors oversaw the development of our KPAW process and the writing of the welding programs, still in use today.

The original implementation of the plasma process quickly raised questions around achieving compliance with welding standards such as AS/NZS 3992 Pressure equipment – Welding and brazing qualification, which (for example) doesn't always directly address compliance matters such as thicknesses ranges qualified for KPAW.

Having a strong process and personnel developmental framework allowed Furphy to negotiate such compliance questions successfully on an ongoing basis. In the thickness range example, Furphy used internationally recognised standards such as ASME IX to fill in the 'compliance blanks', as permitted within the scope of AS/NZS 3992.

Furphy Engineering is now operating four KPAW machines which together perform 100% of the circumferential/seam welds in the hundreds of tanks that are produced in its Shepparton workshops. The consistency now delivered by the KPAW process has now dovetailed with the automated polishing systems to

deliver the highest quality and consistency sanitary finishing essential for clients in the food, beverage and pharmaceutical industries.

Laser beam welded heat exchanger plate

Technical expertise and process development in the welding area enabled the development of Furphy's Laser Beam Welded (LBW) heat exchanger plate. The use of cooling (or heating) cavity plates – an outer skin on a tank shell separated by a cavity to enable liquid to be passed through and across the surface of the tank to cool or heat – is one of a number of heat transfer options available when designing a process or storage tank.

The term used often in the industry for such equipment is 'dimple plate' owing to the dimpled appearance of the welds which attach the outer skin to the shell. The manufacture of this plate was originally very labour-intensive with the pressed and punched plate being placed over the outer skin of the formed tank and then manually welded at the punched holes and outer seams. Modern methods of producing dimple plate involve fusing the flat thinner outer skin to the shell of the tank prior to rolling the tank and then using hydraulic (Furphy Engineering inflate dimple plates to 4000 kPa) pressure to deform the thinner outer skin and therefore create the cavity.

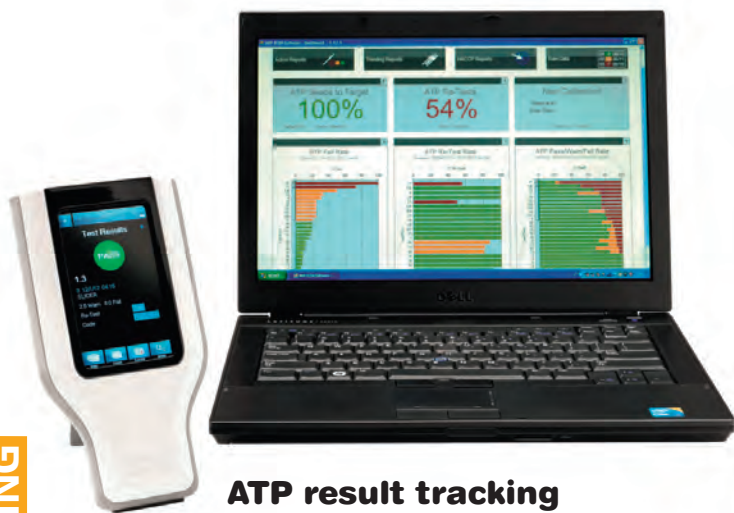
Dimple plate is essentially pressure equipment. Operating pressures within the cavity can be as high as 1,000 kPa. The result of poor welding in the manufacture of dimple plate can be disastrous. Leaking of coolant (dimple plates can be used to heat but are predominantly used to cool) through the shell and into the tank can contaminate and destroy the stored product. Leaking of coolant externally can damage insulation. Repair can be difficult as the dimple plate is usually covered by insulation and a hard cladding, both of which must be removed. Weld tint from repair operations is likely and must be removed by gaining access to the inside of the tank.

Single embossed dimple (lap welded without through penetration) using the LBW process isn't captured in Australian standards. The designer/manufacture is instead referred to ASME VIII (and IX) to establish the necessary design verification testing and subsequent manufacturing requirements, such as weld procedure qualification. However, Furphy's dimple design is unique even in this context, with no accurate representation given for this design/weld process combination in ASME VIII.

Therefore, Furphy utilised a hybrid test regime incorporating all key elements in consultation with experts such as the WTIA, and also obtained third party witnessing and approval as is a requirement of the test standard. As a result, Furphy's LBW cavity plate is Worksafe design registrable (if required), independently verified and manufactured in compliance with the pressure equipment standard for maximum reliability – a key element in any process plant environment.



Furphy Engineering
www.furphys.com.au



ATP result tracking

Rapid cleaning verification technologies are widespread throughout the food and beverage industry. A popular method involves detection of ATP as an indicator for product residues remaining on a surface after cleaning, but many systems are not capable of collecting or analysing the data.

The Biocontrol MVP ICON, available from AMSL Scientific, comes packaged with dashboard software which allows users to save data onto the instrument and eliminate the need for recording results manually. This information is then synched to the dashboard database for tracking, trending and reporting.

By identifying trends and problem spots, cleaning regimes can be modified accordingly, saving labour and chemicals and preventing contamination. Over the long term, by identifying trends and fixing problems, it is possible that the overall amount of testing can be reduced. The technology therefore can reduce costs while providing essential information about the effectiveness of a cleaning program.

Australasian Medical & Scientific Ltd
www.amsl.com.au

Spray nozzles for conveyor cleaning

Food and beverage manufacturing can be a dirty, sticky business. Often manual conveyor cleaning is undertaken to ensure hygiene protocols are attained. However, effective conveyor cleaning is achievable by installing the correct spray nozzles for the job.

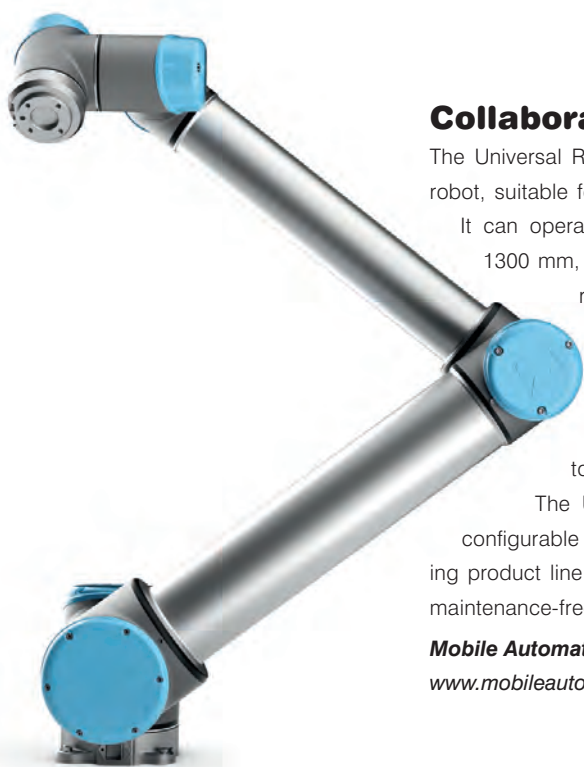
Tecpro Australia offers a wide range of spray nozzles suitable for every situation, plus technical consultants and engineers to provide advice and custom-designed spraying systems — including spray bars and manifolds — for any application.

An automated conveyor cleaning system should provide uniformed cleaning across the entire conveyor, as well as efficient water usage. Planned positioning of spray nozzles is required for optimal results. Other factors to consider include available water pressure and flow rate, nozzle size, droplet size and spray pattern.



Food manufacturers who need to remove soil from fresh produce prior to processing or packaging have different needs to processed food manufacturers wanting to remove sticky residues or food scraps from the conveyor.

Tecpro Australia
www.tecpro.com.au



Collaborative robot

The Universal Robots model UR10 is a versatile, user-friendly and safe collaborative-type robot, suitable for pick-and-place operations in the food and beverage industry.

It can operate within a temperature range of 0–50°C, is IP54 rated, has a reach of 1300 mm, a positioning repeatability of 0.1 mm, and can lift a payload of 10 kg. The robot can be mounted in any orientation, even upside down, only requires a standard 240 V power outlet and weighs only 29 kg.

The UR10 can be set up to operate alongside people without any safety guarding as all the safety features are built in to the robot and software.

Its footprint is 190 mm and the unit can easily be mounted on a trolley to be totally portable.

The UR10 is suitable for palletising boxes of products, and with the built-in configurable I/O, Modbus and ethernet capability, can be easily integrated into an existing product line or process. The UR10 is manufactured in Denmark and is claimed to run maintenance-free for 35,000 hours.

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Belt-fed digital sorters

Key Technology has introduced VERYX belt-fed digital sorters, which are customisable to suit varying product characteristics and production objectives.

The sorter is available in four widths. The B175 model features a 1750 mm-wide inspection area suitable for mid- to high-capacity operations such as potato processors and food processors sorting vegetables, fruits or other products.

For food processors requiring all-sided surface inspection, the sensors can be arranged to achieve full view of each object in the product stream.

High-resolution cameras and laser sensors detect and remove submillimetre size defects and FM. The sorter can utilise up to four channels of information from cameras and up to eight channels of information from the laser scanner, enhanced by LED lighting that operates at the optimal frequencies in relation to each sensor.

The product separation/ejection system tailors the distance between nozzles and the power of the valves varying for optimal management of the sort streams.

Richer product information and data processing architecture and intelligent software enables the system to make robust sorting decisions and handle spikes in incoming defect loads.

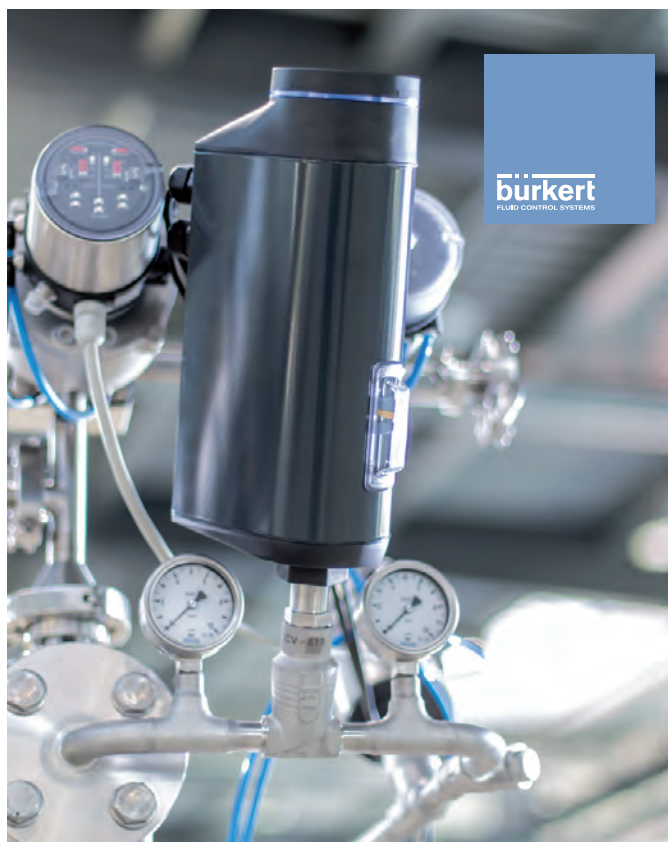
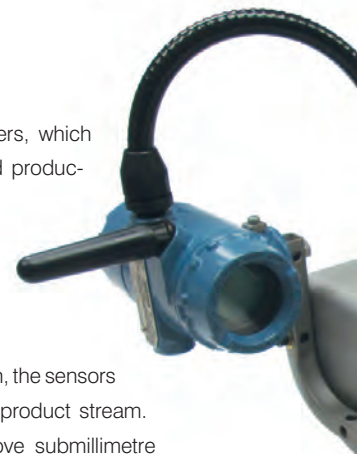
Smart features — including auto-learning, self-adjustment algorithms, predictive system diagnostics, smart alarms, FMAAlert and Sort-to-Grade — enable the sorter to operate virtually unattended during normal production.

Recipe-driven operation and repeatable calibration enables consistent performance, including running the same product across multiple sorters in different locations.

Product handling systems provide improved stabilisation of the product, creating a more consistent trajectory through the inspection and ejection zones, and ensuring sorting accuracy.

Key Technology Australia Pty Ltd

www.keyww.com



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Variable area flowmeter

Krohne has extended the available options for the H250 M40 flowmeter to suit the requirements of oil and gas applications, such as flow measurement on injection skids for corrosion, scale and hydrate inhibitors like methanol or monoethylene glycol. Common areas of application are also measuring agents and solvents in gas treatment processes like sweetening and dehydration of natural gas as well as reliably monitoring small amounts of nitrogen and fuel gas.

Standard materials for the range of DN15...150 / ½...6" flanged process meters include NACE MR0175/MR0103 compliant 316L or materials and welding following the NORSOK standard. Hastelloy, Monel, 6Mo, titanium and now also Inconel are available as optional materials to provide high corrosion resistance to any kind of fluid. Stainless steel indicator housings and offshore protective coatings are available.

Flange connections reach up to ASME B16.5 Class 2500 flanges. Higher pressure ratings can be realised when applying API flanges. For hazardous gas and dust areas, H250 M40 has achieved more than 30 approvals worldwide, including ATEX, IECEx, usFMc, NEPSI, INMETRO, KGS, EAC and PESO/CCOE. For quality assurance, comprehensive tests and certifications are in place such as positive material identification, material mill certificates, X-ray and dye-penetration examination of the welding seams, pressure and leakage tests, and finally, third-party factory inspection.

KROHNE Australia Pty Ltd

www.krohne.com.au



Emergency pressure relief vents

Emerson has introduced wirelessly monitored Enardo 2000 emergency pressure relief vents (EPRVs) that provide safety control by managing abnormally high storage tank pressures in the oil and gas, chemical, petrochemical and pharmaceutical industries.



Under normal operating conditions, an EPRV remains closed. The immediate knowledge of an open position can be vital and should warrant quick investigation.

However, because EPRVs are located on top of storage tanks, they are difficult to monitor. Site managers are increasingly looking for ways to increase safety and efficiencies.

The Enardo 2000 consists of a proximity indicator and wireless transmitter integrated with an EPRV. The proximity indicator senses movement of the emergency vent — 'open' or 'closed' signals are received by the wireless transmitter and can be sent to a control room via a WirelessHART gateway.

Emerson Process Management Aust Pty Ltd

www.emersonprocess.com.au

Vacuum booster

The Dynapumps vacuum booster provides high pumping capacities and high vacuums. It is a robust and energy-efficient alternative to many pumping methods.

A lobe-type booster unit can be added at the inlet to dry screw, rotary vane, rotary piston or liquid ring vacuum to produce a '2-stage' vacuum pump package.

Booster sets can be engineered to provide suction capacities of up to 10,000 m³/h and vacuum levels of <10⁻⁴ mbar.

Lobe-type boosters offer all the advantages of dry screw pumps and are suitable for a number of applications.

Dynapumps

www.dynapumps.com.au

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Wine waste becomes high-end gin

A South Australian company that reformulates wine industry waste into value-add products is helping to drive Australia's booming craft spirits sector.



Established in 1930, Barossa-based Tarac Technologies is Australia's largest producer of high-quality grape spirit, which it sells back to the wine industry or to beverage producers around the globe, including more than 50 of Australia's boutique distillers.

The company processes 40 million litres of distillation wine and lees and more than 120,000 tonnes of grape marc at its sites in Nuriootpa, Berri and Griffith, to ultimately produce about 10 million litres of grape spirit a year.

CEO Jeremy Blanks said high-strength grape alcohol was a core product across a number of styles, including neutral grape spirit, brandy spirit, fortifying spirit, matured brandy and industrial spirit.

He said the craft spirit industry in Australia was still very small but it was growing fast, and Tarac offers these new producers a cost-effective, high-quality base spirit.

"Grape spirit is not just grape spirit. If you're using it for a gin, for example, you need the highest grade," he said. "If you don't have the very best quality, the flaws or the taints will come through in your end products."

Tarac currently exports up to 80% of its grape spirit primarily to North America and Europe, where much of it goes into brandy and the wine industry.


One of the latest distillers to release a gin featuring Tarac spirit is Barossa Distilling Company, which launched the

wine region's first craft gin in July. Born out of winery Soul Growers, Barossa Distilling Company's Generations Gin uses Tarac grape spirit base made from marc recycled from local wineries including Soul Growers.

Barossa Distilling Company Managing Director Neil Bullock said being able to source high-quality grape spirit from the region was an important part of the Generations Gin story. He said up to 80% of Australian gin companies were using Tarac spirit as a base.

Tarac uses a closed loop system where it is able to repurpose 90% of grape industry waste. It also produces grape juice concentrate and processes solid residuals and filter cake to make a range of products including tartaric acid, which is a natural product from grapes used in the wine, food, pharmaceutical and chemical industries, as soil conditioner for broad acre farming and as stock feed.

"By us managing the wine industry's residuals we deal with what would otherwise be a significant problem and an expensive problem for the industry to deal with," Blanks said.

"We also run a very large wastewater treatment facility next to our production plant in the Barossa and that takes all of our production wastewater and cleans it up and that comes back to us for process water or is sold for irrigation." 

Tarac Technologies
www.tarac.com.au



Digital valve controller software upgrade

Emerson has enhanced the software for its Fisher FIELDVUE DVC6200 digital valve controllers, which are now available for use by process industries with PLCs and PROFIBUS communications as the dominant protocol. The digital valve controller with Device Type Manager (DTM) software supports control valve start-up, commissioning and diagnostic activities. It is also suitable for use with multiple Field Device Tool (FDT) host systems.

Suitable for industries including food and beverage, water and wastewater, pharmaceutical, pulp and paper, and metals and mining, the instrument is available in a variety of materials including stainless steel. The device comes with mounting kits to accommodate different actuators and can be remotely mounted for use in critical or hazardous areas, and in harsh process conditions such as high heat or vibration.

Features such as intuitive set-up, auto-calibration and simple tuning save time during commissioning. The failsafe option enables users to set the instrument to hold its last value or position to actuator fail, based on control valve process needs. The device incorporates control logic, module assignment and linkage-less, non-contact sensor technology.

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UV water purification system with remote monitoring

UV-Guard has released an SMS module that will enable the remote monitoring of UV water purification systems.

The module sends status alerts to maintenance staff or facility operators via SMS. The alerts include warnings of lamp failure, low UV intensity readings, power failure, end of lamp life and system operation initialisation.

The SMS module is suitable for UV water treatment systems located in hard-to-access areas like roofs, as well as on farms and in mining and remote communities.

The module integrates into the company's programmable logic controller (PLC) and provides specific UV system status descriptions so users know exactly what the issue is in real time.

UV-Guard Australia Pty Ltd

www.uvguard.com



Modular hygienic pipework system

JACOB's modular pipework system offers extra security for hygiene-sensitive industries. All components offer food contact compliance with European EC 1935/2004 regulations and American FDA guidelines. This applies to the stainless steel pipe components and fittings as well as for the sealing materials used. In addition, gaskets can be supplied as metal detectable and also optically demonstrable.

The range, comprising more than 3000 products, can be ordered through the company's webshop, which offers features that will facilitate the day-to-day work of buyers, project planners and plant engineers. These include saving and maintaining project and order data, downloading functions for project-related 3D drawings and dimension sheets and the option to allocate article numbers.

Additional innovations introduced by the company include a pipe sound damper, which is easy to integrate in the pipework system's modular design as it allows the internal insulating material to be replaced during maintenance work and also offers customisation options.

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Hybrid laser gas analyser

Emerson has released the Rosemount CT5100 continuous gas analyser, a hybrid analyser that combines tunable diode laser (TDL) and quantum cascade laser (QCL) measurement technologies for process gas analysis and emissions monitoring.

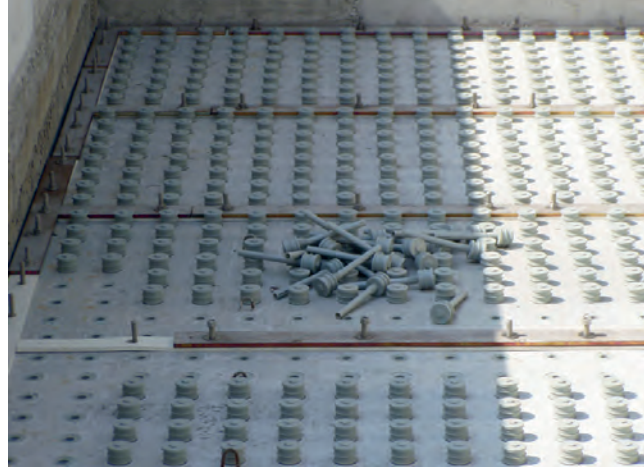
The analyser can detect down to sub-ppm level for a range of components while simplifying operations and reducing costs. The device can measure up to 12 critical component gases and potential pollutants simultaneously within a single system in order to meet regulatory requirements.

The analyser operates with no consumables, no in-field enclosure and a simplified sampling system that does not require any gas conditioning to remove moisture. The device is suitable for process gas analysis, continuous emissions monitoring and ammonia slip applications.

The 'laser chirp' technique expands gas analysis in both the near-and mid-infrared range, enhancing process insight, improving overall gas analysis sensitivity and selectivity, removing cross interference and reducing response time. The technique produces sharp, well-defined peaks from high-resolution spectroscopy that enable specificity of identified components with minimum interference and without filtration, reference cells or chemometric manipulations.

**Emerson Process Management
Aust Pty Ltd**

www.emersonprocess.com.au



Filter nozzles

A large and flexible range of ILMAP filter nozzles is available to meet any specification.

The range is available in 22 different models, eight standard stem lengths, eight types of thread and 10 different slot widths. The nozzles are manufactured from a range of materials, including stainless steel and polypropylene, as well as specialised formulations such as glass-filled polypropylene, mineral-filled polypropylene and polyvinylidene fluoride (PVDF) to offer increased strength, durability and chemical resistance.

The filter nozzles are precision-made and feature reliable dimensional accuracy of slot sizes, which prevents the passage of particles.

Tecpro Australia

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The history (and personality) of yeast

Belgian researchers have found that yeasts used for beer and winemaking were domesticated in the 16th century, around 100 years before the discovery of microbes. The researchers have describe a family tree of these microbes, with the resulting genetic relationships also revealing clues as to who the earliest beer brewers were and how humans have shaped the organism's development.

Teams from VIB, KU Leuven and Ghent University analysed the genomes and fermentation characteristics of more than 150 industrial yeasts used to produce different beers, wines and bread. The results show that the hundreds of beer and wine yeasts available today are the result of the actions of the brewers and winemakers from history.

Art becomes science

"The flavour of the beer we drink largely depends on yeast," explained Kevin Verstrepen, a yeast geneticist at the University of Leuven and VIB. "We're drinking the best beers now because ancient brewers were smart enough to start breeding yeast before they knew what they were doing. It was really an art."

Verstrepen explained that ancient brewers, winemakers and bakers often practised 'backslopping', a technique where a small part of a previous well-fermented dough or brew was kept apart to mix it with a new batch, to make the fermentation process quicker and more consistent. Without realising what they were

doing exactly, these ancient craftsmen were effectively selecting and transferring yeast cultures from one batch to the next, allowing the microbes to continuously grow and adapt to man-made industrial environments.

Why wine is 'wilder' than beer

Fascinatingly, beer yeasts show stronger signs of domestication than wine yeasts, most likely because they happily lived in the brewery throughout the year and lost all contact with their feral family members. While wine yeasts share their origins with beer yeasts, they show fewer signs of domestication, probably because wine yeasts are only used to ferment grape juice once a year, and survive in and around the winery for the rest of the year, where they may interbreed with feral yeasts.

In order to study a large variety of beers and yeasts, the Belgian team joined forces with White Labs, an American company that specialises in selling different yeasts to craft brewers. The scientists found that yeast strains were selected to provide beers with desired industrial characteristics.

Bioinformatics team leader Steven Maere from VIB-UGent said: "The consequences of four centuries of domestication were very clear in the DNA of industrial yeasts."

In particular, the researchers found evidence for amplification of genes involved in metabolising typical beer sugars and selection against production of 4VG, an undesirable flavour compound produced by most natural yeasts.

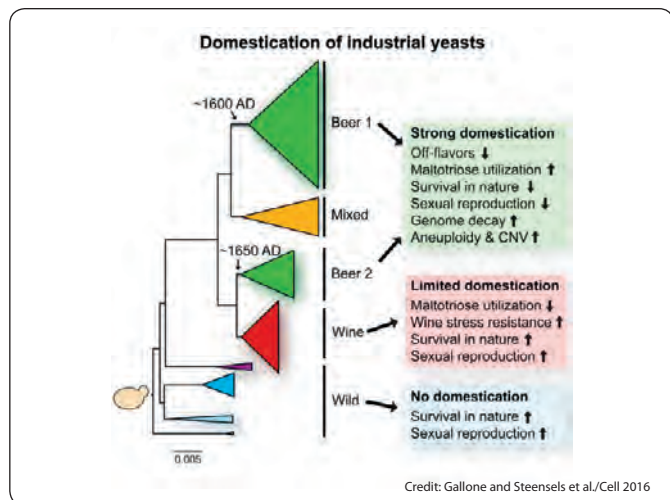
Tracing the family tree

According to the analysis, the industrial yeast used today came from only a few ancestral strains. Five large groups separated out genetically, with strains mainly clustered together according to their industrial purpose. Geographic boundaries further divided each category: in one grouping of beer yeast, for example, the strains from Belgium and Germany were closely related, but separate from those in the UK and US.

The new study could allow the breeding of even better yeast variants. The scientists are using the genome sequences to select hybrids that combine beneficial DNA regions from several existing beer and wine yeasts.

"Mapping out the genome structure of yeasts in food or drinks allows us to better understand the mechanics and applications of yeasts. As a result, it opens up new possibilities to breed yeasts to enhance flavours, aromas or conservation techniques," said Kevin Verstrepen.

The results are published in the scientific journal *Cell*. 



This graph represents the history and domestication of yeast used for making beer and other types of alcohol are revealed through genomic and phenotypic analyses.

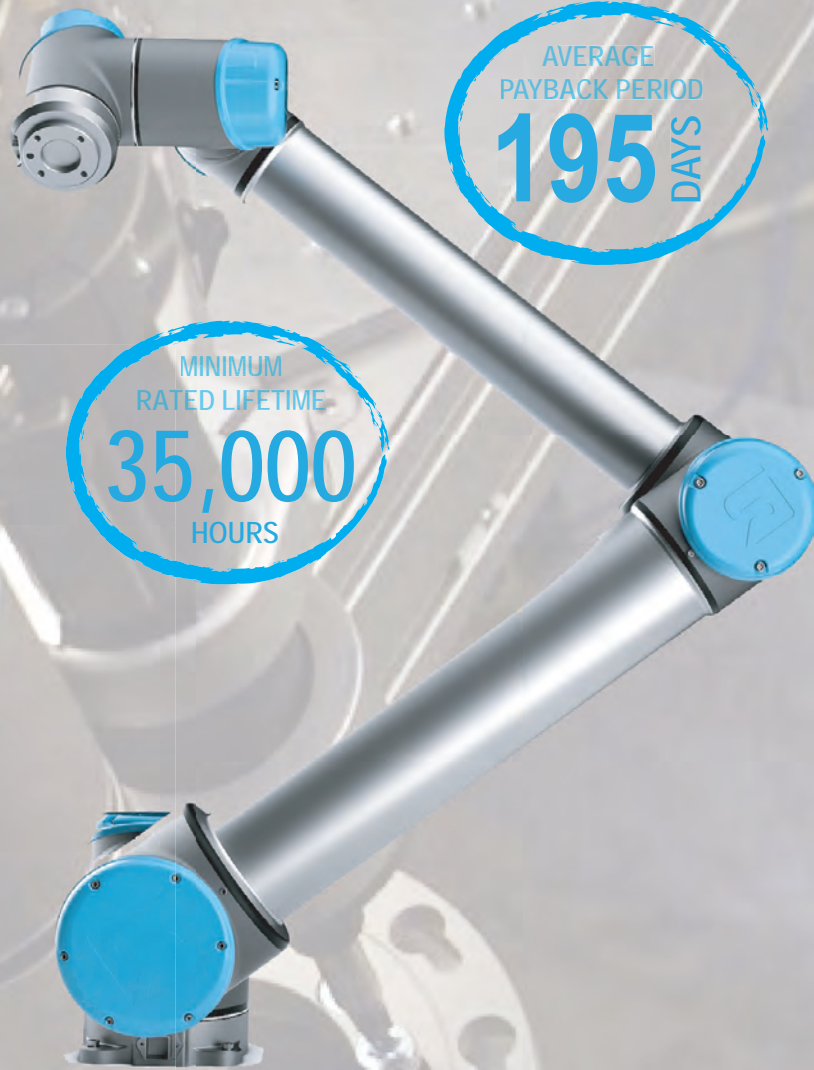
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Inductive angle sensors for rotary actuators

Turck has released two extensions of its inductive angle sensors for rotary actuators. The products provide users with a rotary valve sensing solution suitable for harsh environments. The RI360P1-DSU35-ELIU5X2-B1150/S1265 is available with a stainless steel Minifast connector, and the RI360P1-DSU35TC-ELI-EXI is available with ATEX and IECEx approvals.

Utilising the inductive resonant circuit measuring principle and introducing an open face sensor design for rotary valve sensing, the RI360-DSU delivers analog or discrete outputs with flexible mounting options.

The inductive angle sensors are able to monitor quarter-turn valves and three-way valves, while detecting the valve position during cleaning cycles. Additionally, the sensors are capable of detecting the wear of seals, saving downtime from seals that are worn from switching cycles. For flexible operation, the sensors are available with switching or analog outputs.

Featuring a protection rating of IP67 and a rugged, compact housing design, the sensors provide a wear-free sensing solution in harsh applications, in temperatures ranging from -25 to +75°C, making them suitable for a wide range of applications, including valve automation, steering position feedback and dancer arm control.

Turck Australia Pty Ltd
www.turck.com.au

Sanitising system

The Giselle system from De Nora Next produces a sodium hypochlorite sanitising solution called Soleva on-site and on demand using only salt, tap water and electricity.

The system is suitable for hygienically cleaning a wide range of locations and objects, including removing blood and urine from ceramic and steel.

De Nora Water Technologies
www.denora.com



Asset health app

Emerson's ATG View application allows easy access to critical asset health information by putting data from Emerson's CSI 6500 ATG machinery protection and prediction monitoring system in the palm of users' hands via a mobile device.

Users can scan a QR code located on the cabinet and immediately view the status and health of all cards and measurements from the associated rack on their mobile device. This enables quicker maintenance rounds and reduces unnecessary trips to the control room, helping maintenance teams be more productive and responsive to changes in equipment health.

The app is built to be intuitive and easy for users to get started quickly. It is available in both the Apple Store and Google Play.

Emerson Process Management Aust P/L
www.emersonprocess.com.au





Air monitoring system

KEMPER's AirWatch sensor technology verifies the presence of dust in production, determining and documenting the number and weight of nanoparticles and then analysing it with smartphone, tablet or PC and comparing it to limit values. A traffic light display visualises permanently the status of air quality.

The system is suitable for production facilities, warehouses and logistics halls. The system measures fine dust particles in a radius of up to 30 m using a laser-powered sensor. An integrated fan draws in ambient air.

Individual limit values can be saved for hazardous substances, and the system saves the data across a long time period. A trend display for day, week, month or year also allows companies to analyse concentration of hazardous substances in more detail.

The sensor captures particles in the range of 100 nm up to 16 μm . This includes the fine dust categories PM2.5 for alveolar common dust (A dust) and PM10 for all inhalable dusts (E dust) as defined by WHO. The system automatically classifies the captured particles accordingly, as well as monitoring the effectiveness of ventilation measures.

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Meeting increasing consumer demand

for healthier snacks with innovative processing technologies

Arnaud Jansse, food technologist, Florigo (from tna)

Snacking has become a way of life for consumers across the globe, with the category posting an impressive 9% value growth in 2015. Although traditional snacks continue to generate the greatest overall revenue, the health snack food production industry in Australia has grown at a rapid pace over the past five years, increasing by an average of 3% each year. Snack manufacturers are catering to this demand by incorporating alternative ingredients and raw materials. In line with this, fruit- and vegetable-based snacks are on the rise, as banana, kiwi, kale and coconut chips become increasingly popular amongst consumers.





© Freemages.com/Davide Guglielmo

As the trend towards ‘better-for-you’ products gains momentum, the demand for food that is readily available, tastes great and exhibits a desirable colour and texture remains high. As part of this, consumers look for foods that are ‘safer’ and have reduced fat content. Consequently, reducing fat absorption, preventing oil degradation and avoiding the formation of harmful chemicals, such as acrylamides, have become a priority for snack manufacturers. And with tightening government legislation calling for controlled levels of harmful fats and acrylamide in processed food, more and more manufacturers are reviewing their current processing methods. This is leading to an increased level of innovation, including pre-processing and frying innovations, as well as new product development (NPD) across the snack industry to address these demands and provide multiple benefits to consumers. Selecting the right ingredients and using cutting-edge manufacturing technologies can help snack producers benefit from these growing opportunities and maximise their growth potential.

Healthier fats for healthier snacks

Oil or fat is a key ingredient in most snack food production lines. Although the fats and/or oils that are absorbed by the raw material during the frying process provide the product with a unique taste and texture, limiting the absorption of unhealthy fats is vital for food manufacturers aiming to appeal to health-conscious consumers. Selecting the right type of oil is therefore essential.

From canola, sunflower and olive oil, to coconut and corn oil, manufacturers are inundated with choice. However, there are several considerations for snack manufacturers switching to healthier oils. Some types of oil create less harmful compounds but are not as stable at the heating stage, such as sunflower oil. This means they produce high levels of free radicals when they are heated, thus reducing the nutritional properties of the end product.

When an oil is less stable, shelf stability also becomes a significant concern. Oils that are rich in essential fatty acids and other polyunsaturated fats are the most fragile of oils. Because their longevity is generally shorter, snacks processed in healthier oils can become less stable over time. Furthermore, these generally cost more, due to their nutritional value and provenance. This means producers must find other ways to reduce spend, as well as increase total profits and production volumes.

Effective oil management practices

Oil quality is intrinsic to creating a healthy, high-quality snack product.

In most frying operations, the fatty acid level of the cooking oil will rise to an unacceptable level if the total volume of oil in the system cannot be turned over within a set time, resulting in inconsistencies in flavour and off-flavours. The most innovative frying technologies incorporate continuous filtration systems to help remove particulate material from the fryer during cooking. Typically, the oil is passed through a filtering system to remove both large and fine particles. The filtered oil is then blended with fresh oil and pumped back into the machine to return oil levels to the optimum level. An efficient oil turnover is critical in ensuring the product is cooked in the freshest oil, keeping free fatty acid levels to a minimum.

An evaluation of the oil management can help manufacturers identify opportunities to optimise their overall frying system. This includes regular maintenance of frying equipment, with emphasis placed on temperature controls, heating and heat transfer surfaces. Regular sanitation checks are also vital to ensure all food contact points are free of build-up. As such, they are able to produce cost-effective snacks that not only look and taste great but which are “better for you” with prolonged shelf life and superior flavours. In addition, more and more manufacturers are turning towards advanced pre-processing as well as innovative frying technologies to minimise the challenges related to oil degradation.

Innovative frying technologies

Creativity is key in today’s snack industry. While there have been significant advancements in filtration technology, manufacturers also continue to look for new and innovative ways to fry their products. As a result, multistage frying, vacuum frying and batch frying are all increasingly used as methods for the creation of healthier snack products.

Multistage frying — also referred to as two-stage frying — is divided into two stages, atmospheric pre-frying and vacuum frying. Initially,

the product is fried at a high temperature for a short amount of time to remove enzymes and sugars.

The process is then completed at a lower temperature in a vacuum fryer. At this temperature, acrylamide formation is reduced, ensuring a safer, healthier end product.

The solution is ideal for producing regular potato and vegetable chips, including organic varieties, and is compatible with a variety of oil types. Thanks to a much gentler process, the end product upholds the natural qualities of the raw material, including nutritional value, natural taste





“ ... reducing fat absorption, preventing oil degradation and avoiding the formation of harmful chemicals, such as acrylamides, have become a priority for snack manufacturers.

”

and colour, without the need for additives or colourants. At the same time, the process gives enough control to prevent discolouring such as browning or caramelisation. As a result, manufacturers are able to produce snacks with a distinctive taste and enhanced visual appeal.

Unlike multistage frying, vacuum frying continuously cooks products under a low temperature and low pressure conditions from start to finish. At these low temperatures, the degradation of the product's surface structure is reduced, lowering the amount of oil absorbed and therefore enabling significant fat reduction with minimal impact on product quality. The low temperatures and the lack of oxygen present in the system also make it possible to use high-quality, zero trans-fat oil varieties leading to a longer shelf life and cost savings.

Vacuum frying systems are ideal for producing chips from fruit and vegetables that are high in natural sugars, such as parsnips, beets, carrots, apples, kiwifruit or mango, since temperature-related reactions, such as acrylamide formation, are slowed down significantly and in some cases do not occur. This allows producers to meet consumer trends for healthier and low-fat products with positive organoleptic properties.

Batch frying systems equally help snack manufacturers to make the most of the healthy snacking trend. Frying at a temperature helps to seal the outside cells of the product, preventing oil absorption. This reduces oil uptake, allowing manufacturers to market their products as “reduced fat”. Batch frying also minimises acrylamide formation, maintains the desired crunchy texture and minimises colour formation and caramelisation.

Advanced pre-processing techniques

While optimising the frying process is key to improve the healthfulness of snack products, there are also a number of pre-processing techniques manufacturers can adapt. One of the most innovative solutions, which has emerged has a promising non-thermal alternative, is pulsed electric field (PEF) technology.


PEF systems work by using pulses of electricity to puncture cell membranes and allow fluid to exit. As a result, sugar and moisture are removed, resulting in reduced acrylamide formation during cooking. It also allows the use of all potato varieties, including those with high sugar levels/late season potatoes. Chip manufacturers are therefore able to decrease raw material costs while increasing product quality, as well as profitability.

As a non-thermal method, the product also remains raw throughout before further processing, maintaining its structure for improved texture and crispiness. At the same time, PEF treatment improves cutting, thanks to a smoother surface, offering manufacturers the possibility of developing new cuts and shapes. As well as helping manufacturers to create a crispier product, it also allows them to diversify their range, facilitating ongoing product innovation and providing consumers with the choice they're asking for.

In addition, PEF treatment has a direct impact on oil uptake by food, including chips, thanks to improved cut smoothness. The perfectly smooth surface of a PEF-treated slice, with smaller, intact cells, inhibits excessive oil uptake while maintaining crispiness. This allows for the production of natural, low-fat snacks, as well as delivering the texture consumers desire. Other benefits include improved appearance of the end product, reduced frying time and a clean and energy-efficient process.

Partnering with an expert

Over recent years, the demand for healthier snack products has reshaped the way manufacturers process food. While this offers an array of opportunities, manufacturers are also faced with the challenge to produce healthier foods while still maintaining a profitable process.

In a world where innovation is key to success, the industry recognises the need for advanced pre-processing and frying technologies to help food producers cater to these challenges. As such, it is important to work with a supplier that has the technological expertise and know-how to find the right solutions to fit individual production requirements. Partnering with a leading processing solutions supplier like Florigo (from tna) gives food manufacturers the ability to do just that and ultimately stand out from the competition in this dynamic and constantly evolving market. 



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Fibre laser cutter keeps Jmar Engineering on track



Founded by Mark and Janice Hooper 22 years ago, Jmar Engineering in Shepparton, Victoria, specialises in component manufacturing and repairs across a broad range of industries including those associated with conveyor and package handling equipment.

Nearly all Jmar's business comes from around the Goulburn Valley area within a 50 km radius of Shepparton, but ongoing diversification has seen the company achieve steady growth and increase its customer base since inception.

For example, the company now undertakes a considerable amount of 'reverse engineering' by fabricating many components and parts that clients may have previously bought from overseas suppliers.

The company is a long-time supplier of a product called the Christopher Dairy Bails — a retrofit product suitable for herringbone dairies that allows the farmer to feed in the bail at milking time.

In 2015 Mark spotted an opportunity to invest in a laser cutter to further grow his business and enhance the quality of the end product.

After further research a fibre laser cutter appeared to be the best choice due to a number of significant benefits including extreme accuracy and speed and consistency of cut, coupled with low operating costs.

Mark briefed Applied Machinery to supply him with a machine that would meet both his performance criteria and budget restrictions. He became Applied's inaugural fibre laser cutter customer with the supply and installation of a Hans GS LFD-3015 1 kW Fiber Laser Cutting System.

"The new Hans fibre laser installed in late February is already paying huge dividends for us. Not only is it improving productivity and quality of our finished products, but it has also opened up new market opportunities," Mark said.

"We're seeing work that we would never have seen and quoting on jobs that we have previously not been able to quote on — the Hans fibre laser is really helping to expand our business.

Another benefit of the new machine is that the quality of the finished product coming out of the company's Yawei pressbrake is now far superior, due to the huge increase in quality of the prebend parts from the fibre laser compared to their plasma.

"This new fibre laser is completely in keeping with the ethos of Jmar Engineering. It not only allows us to produce the highest quality components in a faster time, but also provides us with the opportunity to add to the diversity of products we produce," concluded Mark.

*Applied Machinery Australia Pty Ltd
www.appliedmachinery.com.au*

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Making SURE your nuts are sterile

Janette Woodhouse

Nuts, grains, spices and seeds were once considered low risk from a food safety perspective. As they had a low moisture content it was assumed they would not support microbial growth, but *Salmonella* can survive on nuts and *E.coli* in non-heat-treated flour. Making matters worse, both *Salmonella* and *E. coli* are pathogenic at such low doses that sampling and testing cannot guarantee that products are not contaminated.

In the current massive General Mills flour recall in the US, *E. coli* O121 and O26 contamination has resulted in 46 people being infected and 13 hospitalisations. Thousands of tonnes of flour have been recalled. The general recommendation now is that food processors should consider the use of pasteurised flour in ready-to-cook or ready-to-bake foods that are likely to be consumed without cooking or baking.

In 2001 and 2004 outbreaks of foodborne disease caused by *Salmonella*-contaminated almonds in the US resulted in a USDA requirement that all raw, blanched and roasted almonds be treated to achieve a 4-log reduction in *Salmonella*.

The Almond Board of California's Technical Expert Review Panel (TERP) has now validated a number of pasteurisation systems, many of which claim to retain the flavour, mouthfeel and nutrition of raw seeds and grains.

Technologies currently in use or in validation process:

- Cosmed H₂O Express — vacuum steam
- JBT Foodtech JSP-1 — moist steam
- Revetech Steam Pasteurisation — steam/hot air
- Napasol Sterilisation/Pasteurisation — vacuum steam
- Buhler/Barth — moist heat
- RF Biocidics — radiofrequency/heat (In Australia Riverland Almonds has implemented the RF Biocidics APEX 50 System.)
- Ventilex — atmospheric steam
- PPO (propylene oxide)

Dutch firm Log5 has developed a system that mixes humid air with saturated (dry) steam to manipulate water activity and temperature level with moist heat and achieve a 5-log bacterial reduction without adversely impacting product quality. The system can pasteurise up to 9000 kg/h.



Wholegrain, nut and seed consumers want minimally processed products and so some newer technologies are now coming to the fore.

With an even more benign image than steam and vacuum, ultraviolet light-based technologies are emerging. UV technologies in combination with other microbial interventions remain experimental as a pasteurisation solution, but validated lethality exists from radio waves and ionising radiation.

The Almond Board of California (ABC) has approved a non-roasting bulk pasteurisation process for raw almonds at Sran Family Orchards, a producer of organic and conventional almonds.

The ABC's Technical Expert Review Panel (TERP) has certified RF Biocidics' APEX 85 chemical-free, pasteurisation system that uses radiofrequency technology to significantly reduce the level of harmful pathogens in raw almonds.

Interestingly, there are three exceptions to the raw almond pasteurisation mandate — exported US almonds do not have to be pasteurised (except if they are going to Canada or Mexico), farmers can sell 45 kg bags of almonds and, most surprising, imports of raw almonds are not required to be treated before sale in the US.


Almonds in Australia

The following has been taken directly from the Almond Board of Australia website:

Food safety is a top priority for the Almond Board of Australia as we want our consumers to have an enjoyable eating experience every time almonds are snacked on or cooked with. However, natural or raw almonds, as with other raw products such as fruit and vegetables, do have a small inherent risk of contamination.

All Australian almond industry processors maintain high standards of Quality Assurance, including HACCP and Safe Quality Foods (SQF2000) accreditation. Facilities are regularly audited to ensure they meet or exceed food safety standards. In addition to extensive internal testing, all almond products are rigorously tested for both quality and food safety by third party laboratories accredited by the National Association of Testing Authorities Australia. Despite this on rare occasions it has been necessary to recall product.

To minimise bacterial risk, almond processors within Australia are progressing with plans to offer customers pasteurised almonds. Foods such as milk, juice, eggs and canned foods are also pasteurised, and pasteurisation has been proven to reduce the presence of harmful bacteria such as Salmonella. US research shows that commercial pasteurisation processes used for raw almonds do not impact on the taste, quality or nutritional value of natural almonds.

Roasting is a recognised way of pasteurising food products, and almonds are no exception. 



Stainless steel plumbing kits for air knife installation

Exair's Stainless Steel Plumbing Kits simplify installation of the Stainless Steel Super Air Knife by including all of the appropriate fittings and tube for hooking up to a compressed air supply, eliminating poor performance attributed to undersized fittings and compressed air supply lines. The plumbing kits can be fully assembled and installed on an air knife at the factory to further reduce unproductive time and effort.

Air knives that are 24" or longer must be supplied with compressed air at multiple inlets on the knife. The plumbing kits eliminate time wasted searching for the right fittings and enable users to achieve peak performance with the confidence of proper installation.

Plumbing kits include cut-to-length type 316 stainless steel pipe and fittings, in lengths ranging from 24 to 108".

Compressed Air Australia Pty Ltd

www.caasafety.com.au

NSF H1 compliant grease

Schaeffler Australia has introduced FAG Arcanol FOOD2 grease, a range of rolling bearing grease for the food and beverage industry that is designed to be softer, sturdier, more energy saving and produce less friction than other lubricants.

The grease is fully NSF H1 compliant, which means it has been certified by the National Sanitation Foundation (NSF) as acceptable for incidental food contact and can be used in food processing areas.

The grease also copes with high stresses and ambient conditions, as well as being kosher and halal certified for food preparation areas that have these requirements — which extend beyond the food to include the machinery and environment where they are produced.

The grease maintains its fluidity in cold environments, as low as -30°C. It is suitable for a range of applications, including filling plants, sealing machines, meat and fish processing machines, and freezing plants.

Schaeffler Australia Pty Ltd

www.schaeffler.com.au

Magnetic separator

Goudsmit Magnetics Group's Hydrohansu-type rotating clean flow magnet is suitable for the removal of very fine iron (Fe), AISI 304 and 316L particles in the dairy industry and for products such as baby food. It is also suitable for use in the sugar and lactose industries.

Rotating magnets prevent the accumulation of fatty powders on the magnetic bars and provide a high level of separation.

The single-piece, hydroformed housing is made entirely of grade 316 stainless steel and therefore has no dead ends, sharp corners or welded seams, which prevents bacterial growth.

The complete system has a high-quality surface finish ($R_a \leq 0.6 \mu m$). The magnet rotor has pneumatically operated magnet bars, is mounted in the door and rotates on a bearing. To prevent product from entering the space between the rotor and the housing, it is fitted with a removable labyrinth airlock. A continuous, clean stream of air (+0.2 bar) feeds that airlock and blows from the inside towards the product chute. The use of rotating pneumatic magnet bars ensures that the powerful magnetic value (11,500 G) is in direct contact with the product.

The semiautomatic cleaning process can be performed during a production stop. After the rotor is released and pulled out manually, compressed air internally shifts the magnet packs to the cleaning position. This provides a quick, easy and safe cleaning method in which the metal particles are carried away. Sensors ensure that all these steps can only be performed in the correct order.

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SPX FLOW helps brewery achieve expansion through efficiency

Italian brewer Brewfist had some clear processing goals when it looked to expand production capacity at its brewhouse near Milan, Italy, to meet growing market demand.

These included ensuring that oxygen pickup between the end of the fermentation process and bottle filling was no greater than 30 ppb, reducing process time and ensuring consistent quality without making the beer too 'yeasty'.

To assist Brewfist in meeting its production goals, SPX FLOW's Seital Separation Technology brand recommended a Seital clarifier with a hermetic mechanical seal designed to minimise the risk of oxidation. Hydraulic seal machines had previously been tested but did not meet Brewfist's requirements to limit oxygen pickup, while the Seital technology went beyond original requirements, producing oxygen pickup of less than 10 ppb. This performance resulted in high levels of consistency in product clarity and lower yeast content.

SPX FLOW Seital clarifiers use vertical disk stack centrifuge technology. The units' efficiency meant that production time for fermentation at Brewfist could be reduced from 16 to 11 days and maturation time from 6 weeks



to 3–4 weeks. This improvement in productivity meant that annual capacity could be increased to meet growing market demands without investment in additional tanks.

Seital centrifuges are designed with highly efficient gear or belt drive transmissions, continuous vibration monitoring and automatic solids discharge to offer reliability with long maintenance intervals. Precise control and adjustment of the machine is provided through an intuitive operator interface to ensure the process is providing the right product characteristics.

Pietro di Pilato, one of the owners of the Brewfist company, commented, "We are very satisfied with the Seital clarifier. It is very user friendly and I like the taste of the beer after it has gone through the centrifuge. The machine has worked for 750 hours without requiring maintenance."

Seital units are designed to maintain hygienic conditions and offer gentle processing to ensure favourable product characteristics are preserved and consistent, reliable production is achieved.

SPX Flow Inc
www.spxflow.com/au



5S hygiene management program

sort
set
shine
standardise
sustain

Wells Hygiene has developed a comprehensive, fully customisable 5S shadow board system to support hygiene management, colour coding and GMP (Good Manufacturing Practice) in the food and beverage industry.

The 5S management system ensures efficiency, consistency and safety in fast-paced manufacturing facilities. Originally derived from Japanese 'six sigma' practices, each 'S' in the 5S program has an important meaning and objective:

- 1. Sort:** Clearing up workplaces, keeping only what is needed. It is not about having a lot of equipment but having the right equipment.
- 2. Set in order:** Organise, identify and arrange everything in the workplace. Develop storage systems and processes to assist this.
- 3. Shine:** Regularly clean and maintain your equipment and work environment. This promotes responsibility and efficiency.
- 4. Standardise:** Make sure everyone is doing the same thing in the same way. Develop SOPs to ensure consistency, which helps ensure the best outcomes on a regular basis.

5. Sustain: Ensure adherence to the system to maintain a safe and efficient workplace. Put in place a review and assessment process to ensure the system is working and sustainable.

Wells has available a range of signage and storage systems to make it simple to implement 5S in workplaces. They can even develop shadow board storage systems for tools and machine parts and also have extensive experience in implementing 'best practice' with colour-coded cleaning equipment.

Wells has developed a large library of images and can custom configure a heavy-duty shadow board to exact needs, including wording, colours, products and any other important instructional notes. The process is simple and begins with an obligation-free site hygiene 5S survey. From this a report is generated and suggestions offered on best practice and implementation.

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Scaling up

How SMEs can grow into larger food manufacturing facilities



For small- and mid-sized food manufacturers, one of the biggest challenges is how to start scaling up operations. Today there is an endless amount of information available but interpreting this and making the best choices for your business is not simple.

There are plenty of opportunities today for Australia's small- to mid-tier food manufacturers, especially for companies that are agile and manufacture high-quality products. However, the entrepreneurial spirit that saw owners start businesses can easily be replaced with uncertainty as organic growth leads to the need to scale up. Lack of knowledge about how to scale up is frequently the main obstacle to growth. The initial entrepreneurial 'nothing-to-lose attitude' makes way for a defensive risk management strategy and while in the food industry this is critical, it doesn't need to stand in the way of growing businesses safely and even improving risk management along the way.

Scaling up can start by simply optimising and sweating your current assets or adding a shift or two, but as demand continues to build along with operational costs then the options start narrowing towards the need for a larger, newer

facility. Often manufacturers at this stage become almost paralysed by the challenges: "What do I do now, how much will it cost and how long will it take?"

Control scale-up for great results

If there is good news then it is this: the transition, when planned properly, can lead to an extremely controlled scale-up with great results. The strategy must be planned with precision yet the execution must allow for flexibility along the way as demand changes course.

The more you can define where you want to drive growth for your business and define your target market, the easier it will be to gain direction. It's important to be clear up front what controls and regulatory requirements need to be in place from your existing and future customers and collaborate closely with their quality teams to ensure that you are designing food-safe facilities and processes.



One important thing to keep in mind is that the food safety auditors are unlikely to accept 'unfavourable practices' in your current facility to continue in a newly designed facility.

When reviewing expansion options, you may be lucky enough to already have enough room in your factory or on your site to expand into. If not, the next best option is to find an existing site with the building in place (often referred to as a brownfield site) as typically this will be a lower cost option, even if you need to completely strip out the existing fit-out and flooring to renovate. If finance allows, then a new site and new building (referred to as a greenfield site) can give you the best long-term results and allows a blank canvas approach.

Design fit for purpose

Probably the biggest challenge for manufacturers when scaling up is working out where the capital should be spent.

Factory

For the facility, thankfully there are not too many options to confuse you with when choosing drainage, flooring, internal walls and ceiling materials, doors and lighting. It is critical that the materials and installation all comply with current food safety standards and are installed by industry experts that can demonstrate excellent track records specifically within the food industry. When designed and executed properly, your new facility will be of a world-class standard and export ready.



Concrete slab pour at brownfield site.

Consider the following practical ideas for your facility upgrade:

1. Sub-floor works such as drainage must be well designed and should not be compromised. Consider the impact of high-care rooms and the integration of drainage. A high-care room may not be required today but future opportunities or changes in food safety standards can lead to issues with unsuitable drainage plans in the future.
2. The drain points and floor slopes must be designed accurately to prevent water pooling. Ensure that the drain points are well positioned around equipment. Strip or trench drains should be avoided as they provide a greater risk of microbial growth problems. Some retailer standards will not allow these types of drains in some rooms. If the floor slopes are correctly designed and installed you should not have any water pooling concerns with point drains.
3. Ensure that walls and ceilings comply with food safety requirements as well as fire codes. Consider using FM approved fire-rated wall and ceiling panels.
4. Consider ventilation, room pressures and temperatures. Navigating through the food safety requirements for HVAC is difficult and an area where you should most certainly seek advice from industry experts.

Process

The process and packing lines are often the starting point for manufacturers when starting to evaluate options for scaling up operations. This can be a daunting task as competing suppliers can often provide solutions without seeking enough



Retort factory.

detail about the project, and that can lead you into a state of confusion with the direction you need to take.

Firstly, develop a plant layout that reflects your long-term 'wish list'. This will help to futureproof your factory footprint. Then determine which equipment is going to give you the best investment return at start-up and which equipment is the hardest to acquire quickly if demand exceeds your post start-up forecast (and it often does!).

Typically, these items are one and the same and may be high-speed filling machines or a spiral chiller or even retorts. Automated packing lines tend to be more modular and easier to add on later when cashflow allows, but you also need to understand how you will redeploy or scale up your workforce at start-up if considering this type of option.

Again, ask for examples, videos and referrals from suppliers when discussing process and packaging options. Remember that there are some great local equipment manufacturers in Australasia but one supplier alone does not usually have the silver bullet solution for your entire process and packaging requirements.

Process automation

One of the best decisions that you can make when scaling up your facility will be to automate tasks throughout your plant to guarantee repeatable, accurate and efficient processing. Properly executed process control allows your operators to focus on high-value dynamic tasks that require flexibility. Automation can provide some of the best returns for your business as it can significantly reduce labour costs as well as facilitate simple scaling up of processes and services for the future.

Consider the following when designing your processes:

1. Develop a plant layout incorporating future lines and design from an operator's perspective of how the factory will be controlled safely.
2. Design for hygiene — ensure that all equipment and rooms can be easily cleaned. Involve your quality managers early in the project.
3. Consider allergen control and elimination of cross-contamination from warehousing to processing and filling.
4. Automate where practicable to reduce labour costs and waste. Integrating key equipment and ancillary equipment will also minimise unnecessary line stoppages.

Services and infrastructure

Factory and process services must be designed with further scale-up in mind so try to establish what additional capacity will be required in the future. It is worth investing a bit more up front as modifying and upgrading services once the facility is operational will be far more costly and time consuming, especially for services such as steam or gas supply.


Consider the following when evaluating a potential site:

1. Check that there is enough power to service the new site with growth in mind. The upgrade or replacement of a substation can be the longest lead time item on the project so it's important to establish the requirements early.
2. Check the gas supply to the site. If one or more new boilers are to be installed then it is important to check that the gas meter and gas line into the site are adequately sized.
3. Check that the town water supply and line sizes are adequate. Upgrades are normally inexpensive and can be carried out relatively quickly.
4. Engage a town planning consultant to check that your plans will meet the planning conditions.

Financial and resource assistance

There are a number of government and private sector groups that will review your project, conduct a business health check and provide assistance by way of grants for items such as consulting fees, equipment purchase, loans for working capital and resources to advise on business matters such as scaling up, marketing and exporting. It is well worth exploring all of these options.

So finally, if you are considering expanding or upgrading your manufacturing facility, remember that it doesn't need to be a long stressful journey. Plan for the long term and plan for success. Once you have a visual plan and financial strategy on the table then seek help from industry experts to execute your plan.

The right advice up front will allow scaling up to happen quickly, cost-effectively and safely, and make it a highly successful and rewarding journey! 

**Peter Taitoko is General Manager at RMR Process. The company designs and builds food manufacturing facilities and processes for SME food manufacturers transitioning through scale-up — from facility and process design through to validation, training and ongoing facility support. Go to www.rmrprocess.com and contact them to arrange a tour through one of their newly built facilities.*

RMR Process Pty Ltd
www.rmrprocess.com.au

Wide-inlet bulk bag filler

The Wide-Inlet Bulk Bag Filler from Flexicon allows rapid filling and passage of large, moist or dense chunks and semisolid materials into open or duffle-top bulk bags.

The unit features powered height adjustment of the cantilevered fill head to accommodate all popular bag heights, pneumatically adjustable bag hooks, a roller conveyor, automated vibratory densification/deaeration deck and load cells with automated controls.

Material passes through a hopper equipped with a slide gate valve positioned above the filler, and through the filler's inlet chute that tapers from 660 to 508 mm² before discharging into an open-top bulk bag.

A vibratory deaeration deck activated at timed intervals during the filling cycle densifies the bulk material, stabilising the bag.

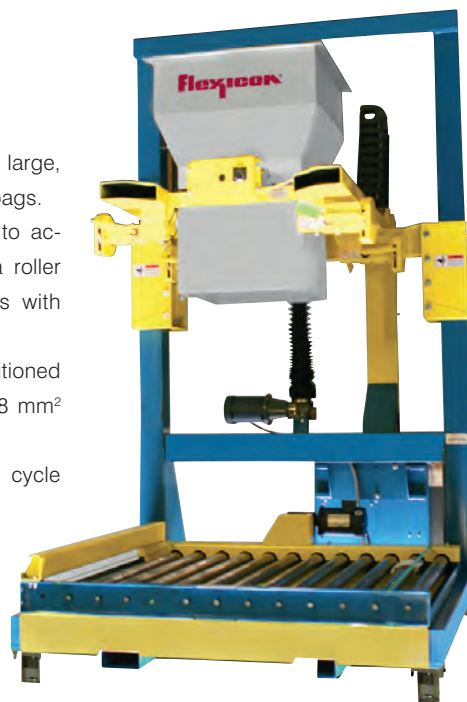
When load cells signal that the bag is approaching target weight, a controller shuts the slide gate valve, releases the bag straps and activates a powered roller conveyor to remove the filled bulk bag from the filling area.

Constructed of carbon steel with a durable industrial finish, the system is suitable for sludge-like materials, disparate-sized scrap, mulch, stone, coal, wood pellets and other bulk material containing pieces, chunks, agglomerates, clumps and other materials too large or non-free-flowing for conventional bulk bags and fillers. The unit is also available in stainless steel for filling of potatoes, cassavas, turnips and similarly sized crops.

The company also offers Twin-Centrepost bulk bag fillers for low-volume, low-cost filling applications and Swing-Down bulk bag fillers that lower and pivot the fill head to the operator at floor level for safe, rapid bag connections.

Flexicon Corporation (Aust) Pty Ltd

www.flexicon.com.au



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Textural changes of IQF fruits and vegetables during freezing

People often ask themselves about the changes of texture in IQF fruits and vegetables and whether the freezing process means a loss in nutrients. Questions like these can be answered only by studying the effect of freezing on various plant tissues.

As you may know, most fruits and vegetables contain over 90% water. The cell walls are responsible for the support structure and texture of the fruit or vegetable, and they contain this large quantity of water and other chemicals. This is the reason why freezing fruits and vegetables mainly means freezing the water in the cells walls.

In the freezing process, water expands and forms ice crystals, which break the cell walls. Therefore, the texture of IQF fruits and vegetables will be softer compared to the texture of the fresh products. This textural change is mostly noticeable in IQF fruits and vegetables since they are generally consumed raw.

The recommended freezing rate

The key to preventing and controlling the cell wall rupture is to freeze fruits and vegetables as quickly as possible. In the IQF freezing process, a large number of small ice crystals are formed. IQF fruits and vegetables contain lots of small ice crystals, which create less damage in the cell walls compared to the few large ice crystals produced in a slower freezing process.

The nutritional value of frozen fruits and vegetables

Freezing, when properly done in an IQF tunnel freezer, is a method of food preservation which can save a large quantity of nutrients. In order to maintain the best nutritional quality for IQF fruits and vegetables, it is essential to follow all the necessary procedures of the freezing process.

Dehydration

Dehydration is one of the most important aspects of the freezing process because it is less obvious and more difficult to

quantify — and has a great economic impact. Dehydration is the result of the imminent loss of water vapours that happens when products are exposed to air. In the case of IQF fruits and vegetables, dehydration is significantly reduced due to two factors:

- If the temperature of the products is rapidly reduced, this lowers the evaporation rate (the rate at which water is transferred from the product into the air).
- IQF fruits and vegetables benefit from the short period of time in which the water is evaporating at a higher rate. But in order to achieve a fast freezing, cold air is not enough. Cold air must be evenly distributed over the surface of the product with the help of an effective airflow, and this can be achieved in an IQF freezing tunnel.

The IQF designed by OctoFrost features high-performance fans and perforated bedplates, which distinguish this tunnel freezer from the traditional solutions. In the OctoFrost IQF a unique airflow is created, which, combined with the movement of the bedplates, is able to maintain an efficient separation of the products and to protect even the most delicate products.

IQF fruits and vegetables benefit from optimal airflow and pressure ratios during the freezing process, due to aerodynamics controlled and adjusted in separate freezing zones. This allows for dehydration to be kept at a minimum for IQF fruits and vegetables, which keep their natural appearance with a reduced level of fines or lumps. In addition, snow formation is prevented for OctoFrost IQF fruits and vegetables, which enables many hours of valuable uptime between defrost.



OctoFrost
www.octofrost.com



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Food-grade urethane belts

Working closely with the Rydell Beltech team, Gates has developed a range of drive system solutions for the Australian food processing industry.

Gates Mectrol food-grade urethane belts sit at the core of the range. Its stable base belt construction and availability of multiple tooth configurations means that production managers have a wide range of custom options to suit their requirements.

The design produces 43% less surface area that requires washdown when compared to traditional plastic modular belts, according to the company, meaning that the belts are faster and easier to clean.

All belts are appropriate for clean in place (CIP) cleaning protocol, providing sav-

ings in water consumption and labour costs.

The PosiClean food-grade urethane belts reduce downtime, wastewater and maintenance costs with CIP capabilities, as well as being resistant to elongation. According to the company, every foot of 24" wide plastic modular belting replaced with PosiClean results in more than 2000 L of water savings per year.

The CenterClean food-grade urethane belt is suitable for troughing due to having a row of 75 mm-wide teeth in the centre of the belt. It is reinforced with Kevlar belt tension members, which not only prevent elongation but also stabilise the belt across its width.

Gates Australia Pty Ltd

www.gates.com/australia



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Small stainless steel cabinet coolers

Exair's small 316 Stainless Steel Cabinet Cooler Systems keep electrical enclosures cool with -7°C air while resisting heat and corrosion that could adversely affect the internal

components. The wear, corrosion and oxidation resistance of Type 316 stainless steel assures long life and maintenance-free operation. Cooling capacities up to 550 Btu/h are suitable for small electrical enclosures and heat loads. Models with higher cooling capacities up to 5600 Btu/h for NEMA 12, 4 and 4X enclosures are also available.

The cabinet coolers circulate chilled air throughout the enclosure to prevent high temperature malfunctions. They mount through a standard electrical knockout while maintaining the NEMA 12, 4 or 4X rating of the enclosure. Systems include an automatic drain filter separator to ensure no moisture passes to the inside of the electrical enclosure. An optional thermostat control minimises compressed air use and keeps the enclosure at $\pm 1^\circ\text{C}$ of the temperature setting. A side-mount kit is available when space restrictions prevent mounting on the cabinet top.

Available from Compressed Air Australia, coolers are available with cooling capacities of 275 and 550 Btu/h and are UL Listed and CE compliant. There are no moving parts to wear out. Applications include cooling control panels used in food processing, pharmaceuticals, foundries, chemical processing and other corrosive locations.

Compressed Air Australia Pty Ltd
www.caasafety.com.au



Conveyor belt splice system

Flexco's Novitool Aero is a fast, easy-to-use assembly system for conveyor belts.

The system is a means of splicing thermoplastic belt materials like PVC or polyurethane, which are used in the food industry and other applications. Belts are securely spliced in just seven to 12 minutes, depending on the material.

All of the components necessary for the welding process are integrated into the system. A built-in air-cooling system quickly cools the belt after splicing, speeding up the work and improving the quality of the splice. Conveyor operations have to be interrupted only briefly when repairs are necessary. The splice press is available in five different models ranging in width from 600–2100 mm.

There are separate controllers for setting the temperature, time and pressure generated by the built-in compressor. The splicing operation itself takes place automatically. The temperature controller has a scrolling display which navigates the user through the settings in clear text messages. With two quick-clamping bars it is easy to position and fasten the material in the press.

Flexco (Aust) Pty Ltd
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RFID device for transparent material flow

The RFU65x RFID from SICK is a measuring RFID device with integrated passage and direction detection, which enables a consistently transparent material flow. It detects tags at long range, recording the direction in which objects are moving at the same time. The associated user data can be sent directly to an ERP or MES system — reducing processing times and increasing production efficiency.

Conventional RFID devices record RFID tags over long distances depending on sender power, aperture angle, tag properties and application environment. Until now, directions of movement could only be derived by using additional, external antennas and intelligent algorithms. With the technology supported by the RFU65x, both position and angle can be determined and direction of movement can be detected. Even tags which are moving in opposite directions at the same time can be detected and their directions of movement recorded.

The operating range of the RFID covers an angle of $\pm 45^\circ$ with a typical sensing range of up to 5 m. RFID tags are recorded below a certain measuring angle in relation to the zero point of the reader. Algorithms can be used to derive instances of passage — including the direction of movement — from the various measuring points.

The product family provides system integrators with the ability to install additional application software directly within variants of the RFU6xx. The user can develop and manage device-specific application software through the SICK development environment and transfer this to other devices.

SICK Pty Ltd

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Vehicle disinfection system

Those who manage a farm, or a food manufacturing or processing plant are acutely aware of the importance of keeping bacteria, disease, pests and other contaminants out of the property.

The vehicles that travel between farms and plants could be the weak link in the biosecurity of a site. When officials trace the origins of an outbreak of pests or diseases, the common denominator transferring the pathogen between each site is frequently the trucks and other vehicles that enter and leave the property.

Tecpro Australia offers cost-effective vehicle disinfection systems that are easy to install at the entrance (and exit) of a plant or farm.

Designed and manufactured in Italy, the modular system can be constructed to fit the largest trucks with just a screwdriver, a spanner and 40 minutes.

Trucks simply pass through the system as they enter or leave the premises and a series of nozzles spray disinfectant around the perimeter of each truck — from top to bottom and along the sides.

The system is available as a modular kit containing the pump, galvanised steel platforms and stainless steel enclosure to house the pump and electrical panels. Customised kits can also be designed by Tecpro to suit particular specifications.

Tecpro Australia

www.tecpro.com.au



Oil-free two-stage screw compressors

Gardner Denver Industrials Group has added a range of high-efficiency, CompAir oil-free two-stage screw compressors to its D-Series. With the addition of 10 new models, the D-Series now covers a wide flow range from 8.9 to 51.8 m³/min. The latest models (from 160 to 315 kW), which also utilise a CompAir designed and manufactured two-stage airend, offer oil-free and silicone-free air, in accordance with ISO 8573-1 Class 0.

The D-Series delivers improved efficiencies and produces 12% more air compared to the previous range.

Electric IE3 and IE4 motors and other components all meet and exceed stringent European standards and those from other jurisdictions, providing quality and efficiency. All connections within the modern design are on the same side of these compact compressors, allowing for simple installation with no specific foundation requirements.

Designed and built for continuous use in demanding applications with up to 45°C ambient temperatures, the D-Series features a patented water regulation system around the airend and specialist, hardened rotor coating to ensure long life. Low power consumption is also delivered, while maintaining high air outputs with reliability and performance efficiency.

CompAir (Australasia) Limited

www.compair.com.au



Counterbalance forklift

Crown Equipment's FC 5200 Series heavy-duty counterbalance forklift is suitable for warehouse and manufacturing applications.

Offering strength, stability and manoeuvrability, the AC drive motors are central to the forklift's efficiency, while supporting loads ranging from 1800 to 3000 kg. These combine with improvements to the motor-controller interface and the battery cut-off, furthering the forklift's economical battery use.

Crown Equipment Pty Ltd

www.crown.com

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Dematic gives Americold a voice for the future



Headquartered in Atlanta, USA, Americold owns and operates over 185 temperature-controlled warehouses in the United States, Australia, New Zealand, China, Argentina and Canada, offering warehousing, transportation and logistics solutions to the food industry.

In Australia, Americold's network of cold storage warehouses connects food producers, processors, distributors and retailers to the end consumer. With demand increasing, the company's management recognises the need to constantly improve standards, practices and technology.

Americold's picking systems have evolved significantly over the years. In the past, the company's cold and frozen storage DC in Arndell Park, NSW relied on paper-based picking systems. This was then upgraded to a label-pick solution, which delivered higher levels of picking accuracy. Now, the facility has implemented a fully automated advanced voice picking system from Dematic.

The voice picking solution has transformed the Arndell Park DC into a paperless facility, where operators no longer need to look away from what they are doing or waste time retrieving new pick slips. When an order is processed, the operator will go to the location and confirm with the check digit that they are at the right location by speaking into a wireless headset. The voice system will then instruct the operator to pick a certain number of crates or units and ask the worker to confirm they picked the right amount. The system will repeat this process until the order is finished.

"I've worked in logistics a long time and in the past have used paper-based picking processes or an RF solution. When I came to Americold I used voice picking for the first time, and it's dramatically improved my picking productivity because it is automated and hands-free. The hands-free aspect allows me to concentrate on the environment around me and look at the locations I am picking from. Because the system is fully automated and tells me the locations and number of goods I have to pick, and confirms these, there

is no possibility of human error," said Dean, DC operator for Americold.

The voice-directed picking solution also facilitates a real-time, two-way data flow between workers on the distribution floor and the WMS. This flow of information makes it easy for managers to generate reports and to provide comprehensive and accurate real-time insights.

Given the challenging operating environments of cold storage DCs, the equipment and technology must function for extended periods in colder temperatures, as well as accommodating the needs of pickers themselves.

"As Americold operates in chilled environments, users are frequently moving in and out of cold storage areas. Carrying technology, having to take off gloves to key in information, putting equipment down and picking up the product becomes a real problem. Voice is a hands-free, eyes-free solution where users don't face these problems," said Brian Lang, director of Real Time Logistics for Dematic.

Voice technology has also enhanced the overall safety of Americold's Arndell Park DC, explains David Gardner, operations manager for Americold, as the hands-free, eyes-free operational benefits of voice makes workers much more aware of their environment and allows them to anticipate the actions of others for increased safety in the warehouse.

Voice picking technology has also provided productivity improvements. Order fulfilment accuracy has increased and labour costs can be more effectively managed by enabling appropriate staffing levels throughout the working day.

"Real-time data in the DC allows managers to manipulate staffing levels to respond to customer volume fluctuations throughout the day. It also helps us to better manage our labour by ensuring we are putting staff to work in the areas of the business where they are needed most," said Gardner.

Dematic Pty Ltd
www.dematic.com.au



Scissor lift actuators

Firestone Airstroke Air Springs are air-actuated scissor lifts that provide durable, hygienic and safe lifting solutions for applications which require pneumatic operation rather than hydraulic.

Scissor lift and tilt tables can be actuated by compact heavy-duty air bag actuators which are connected to a plant's standard 7 bar shop air system. Such air bag (or air springs) scissor tables are used in a wide variety of applications to improve worker ergonomics and enhance plant efficiencies.

Air-actuated scissor lifts can be customised to fit specific material handling application requirements, including conveyors and lift tables in production and packaging applications. They are easy to wash down and have no oily surfaces to attract dirt.

The scissor lifts are available in capacities from a few dozen kilograms to more than 40 tons/unit. The largest triple convoluted actuator is 940 mm in diameter and will collapse to 140 mm. The smallest is 58 mm in diameter, collapsing to 31 mm in height.

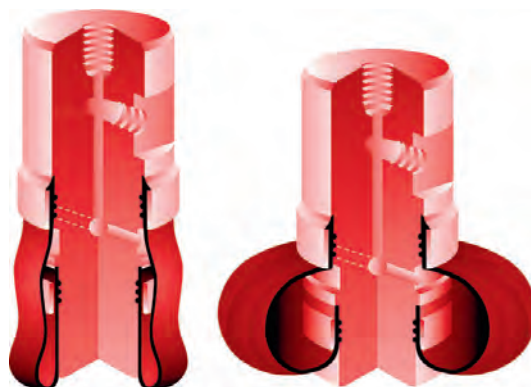
The company's even smaller Airomatic pneumatic actuators stand 11 mm high deflated for ultracompact installation in light load applications, such as delicate conveying and food and beverage processing.

Both convoluted and rolling sleeve types of air spring operate in the same simple way: compressed air (and sometimes liquids) is directed into the air springs, expanding their fabric-reinforced rubber bladders to expand in a linear fashion from their compact collapsed state to become force-developing actuators.

The available stroke of an air spring is limited by the length of the side wall. This length is determined by stability factors (length-to-diameter considerations). These design needs can frequently be met by specifying either single, double or triple-convoluted air springs.

Air Springs Supply Pty Ltd

www.airsprings.com.au



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Flowcrete flooring features in flour mill renovation

When US\$800 million food producer Bakhresa Group renovated its ageing flour mill in Durban, South Africa, it specified a hardwearing epoxy floor.

Bakhresa knew that the floor coating would need to maintain a hygienic surface despite the challenging working conditions that are unavoidable within large-scale food production facilities, including heavy equipment, intense cleaning regimes, corrosive by-products, thermal shock and frequent foot traffic.

To ensure the floor was up to the task, a combination of high-performance resin solutions from Flowcrete was chosen for the revitalised flour mill.

The resilient, self-smoothing epoxy flooring system Flowshield SL was applied within the mill's critical production area. The ability of Flowshield SL to withstand high mechanical and chemical stress made it the right fit for this part of the site, as it will be able to maintain a seamless finish in the face of Bakhresa's busy daily workload.

The joint-free, impervious nature of the system leaves no hard-to-clean gaps for bacteria, mould, mildew and fungi to get trapped within. Instead, any dirt or grime can be quickly and easily washed away by the site's cleaning routine, minimising the risk of contamination incidents.



The non-critical areas of the site, such as the warehouse, packaging and logistics spaces, were coated with the epoxy resin finish Flowshield SL 1000. This system provides the same hygienic and aesthetic properties as the production room floor, but it could be thinner in these areas as it would not have to endure such rigorous conditions.

In total, 11,000 m² of resin materials were required to bring the facility's floor up to the desired standard. Flowcrete supplied all the systems in a custom 'sand yellow' colour to meet the client's aesthetic requirements.

Bakhresa chose Flowcrete in recognition of the resin specialist's long history of supplying food and beverage producers, and its

ability to meet the tight deadline required.

Flowshield SL is suitable for businesses that want to limit the time required to complete a flooring project, as it can be quickly installed and its fast cure formulation avoids long waiting periods where it is impossible to walk across the site or send in follow-on trades.

Flowcrete Australia
www.flowcrete.com



Multifunctional blast chiller

Coldline Living's VISION commercial blast chillers can perform multiple functions, including blast chilling, shock freezing, proving, thawing, storage and chocolate crystallisation/holding.

With an adjustable temperature range from -40 to 35°C, humidity from 40 to 95% and ventilation intensity from 30 to 100%, chefs can set the right type of cold for each type of food.

Using only specific processes according to the nature and quantity of each product respects their original characteristics and eliminates bacteria that determine the risk of food poisoning. The chiller is suitable for a wide array of functions, including freezing fish, cooking frozen meat straight away, deep freezing cured meats, storing fresh pasta, ice-creams and deep freezing seasonal fruit pieces, while avoiding cold burns or frost formation.

Euroquip Food Service Equipment
www.euroquip.com.au

The Truth About Compressed Air!

If you think compressed air is too expensive and noisy - read this. The facts will surprise you!

Compare these Blowoffs

There are a variety of ways to blow the water from the bottles shown in the photo below, but which method is best? To decide, we ran a comparison test on the same application using four different blowoff methods: drilled pipe, flat air nozzles, Super Air Knife (each using compressed air as a power source), and a blower supplied air knife (using an electric motor as a power source). Each system consisted of two twelve inch long air knives. The following comparison proves that the EXAIR Super Air Knife is the best choice for your blowoff, cooling or drying application.

The goal for each of the blowoff choices was to use the least amount of air possible to get the job done (lowest energy and noise level). The compressed air pressure required was 60 PSIG which provided adequate velocity to blow the water off. The blower used had a ten horsepower motor and was a centrifugal type blower at 18,000 RPM. The table at the bottom of the page summarizes the overall performance. Since your actual part may have an odd configuration, holes or sharp edges, we took sound level measurements in free air (no impinging surface).



Drilled Pipe

This common blowoff is very inexpensive and easy to make. For this test, we used (2) drilled pipes, each with (25) 1/16" diameter holes on 1/2" centers. As shown in the test results below, the drilled pipe performed poorly. The initial cost of the drilled pipe is overshadowed by its high energy use. The holes are easily blocked and the noise level is excessive - both of which violate OSHA requirements. Velocity across the entire length was very inconsistent with spikes of air and numerous dead spots.



Blower Air Knife

The blower proved to be an expensive, noisy option. As noted below, the purchase price is high. Operating cost was considerably lower than the drilled pipe and flat air nozzle, but was comparable to EXAIR's Super Air Knife. The large blower with its two 3" (76mm) diameter hoses requires significant mounting space compared to the others. Noise level was high at 90 dBA. There was no option for cycling it on and off to conserve energy like the other blowoffs. Costly bearing and filter maintenance along with downtime were also negative factors.



Flat Air Nozzles

As shown below, this inexpensive air nozzle was the worst performer. It is available in plastic, aluminium and stainless steel from several manufacturers. The flat air nozzle provides some entrainment, but suffers from many of the same problems as the drilled pipe. Operating cost and noise level are both high. Some manufacturers offer flat air nozzles where the holes can be blocked - an OSHA violation. Velocity was inconsistent with spikes of air.



EXAIR Super Air Knife

The Super Air Knife did an exceptional job of removing the moisture on one pass due to the uniformity of the laminar airflow. The sound level was extremely low. For this application, energy use was slightly higher than the blower but can be less than the blower if cycling on and off is possible. Safe operation is not an issue since the Super Air Knife can not be dead-ended. Maintenance costs are low since there are no moving parts to wear out.

Facts about Blowers

Energy conscious plants might think a blower to be a better choice due to its slightly lower electrical consumption compared to a compressor. In reality, a blower is an expensive capital expenditure that requires frequent downtime and costly maintenance of filters, belts and bearings.

Here are some important facts:

Filters must be replaced every one to three months.

Belts must be replaced every three to six months.

Typical bearing replacement is at least once a year at a cost near \$1000.

- Blower bearings wear out quickly due to the high speeds (17-20,000 RPM) required to generate effective airflows.
- Poorly designed seals that allow dirt and moisture infiltration and environments above 50°C decrease the one year bearing life.
- Many bearings can not be replaced in the field, resulting in downtime to send the assembly back to the manufacturer.

Blowers take up a lot of space and often produce sound levels that exceed OSHA noise level exposure requirements. Air volume and velocity are often difficult to control since mechanical adjustments are required. To discuss an application, contact:

Compressed Air Australia

Phone: 1300 787 688

Int'l: +61 8 8983 3999

email: info@caasafety.com.au

www.exairaustralia.com.au

The Super Air Knife is the low cost way to blowoff, dry, clean and cool.

Blowoff Comparison

Type of blowoff	PSIG	BAR	Comp. Air		Horsepower Required	Sound Level dBA	Purchase Price	Annual Electrical Cost*	Approx. Annual Maintenance Cost	First Year Cost
			SCFM	SLPM						
Drilled Pipes	60	4.1	174	4,924	35	91	\$50	\$4,508	\$920	\$5,478
Flat Air Nozzles	60	4.1	257	7,273	51	102	\$208	\$6,569	\$1,450	\$8,227
Blower Air Knife	3	0.2	N/A	N/A	10	90	\$5,500	\$1,288	\$1,500	\$8,288
Super Air Knife	60	4.1	55	1,557	11	69	\$1,188	\$1,417	\$300	\$2,905

*Based on national average electricity cost of 8.3 cents per kWh. Annual cost reflects 40 hours per week, 52 weeks per year.



Sanitary drum tipper with roller conveyor

Flexicon has released a TIP-TITE sanitary drum tipper with roller conveyor.

Constructed of stainless steel and suitable for washdown, the tipper is pneumatically powered and certified for use in areas with hazardous conditions. It allows dust-free transfer of bulk materials from drums to downstream equipment and rapid sanitising between changeovers.

A hydraulic cylinder raises and seats the drum against a discharge cone, after which a second hydraulic cylinder tips the drum to an angle of 45, 60 or 90 degrees with a motion-dampening feature.

At full rotation, the outlet of the discharge cone mates with a gasketed receiving ring fitted to the lid of any receiving vessel, creating a dust-tight seal and allowing controlled, dust-free discharge through a pneumatically actuated butterfly valve into the vessel.

The hydraulic power unit enclosure with sight glass to check gauges and valves is located on the frame exterior for accessibility during set-up, inspection and maintenance, and houses a pneumatic motor to drive the unit.

It is equipped with a roller conveyor that can be fed by an optional or existing infeed conveyor, allowing drums to roll into place by gravity.

Other drum tippers are available constructed of carbon steel with durable industrial finishes or with material contact surfaces of stainless steel.

Flexicon Corporation (Aust) Pty Ltd

www.flexicon.com.au

Compact rotary blowers

The BBC and FBC series of rotary blowers from Kaeser are compact, quiet and energy efficient.

Suitable for the supply of low pressure compressed air in applications such as conveying and water treatment, the units are supplied complete with all sensors, controls and a choice of star-delta starter or variable speed drive.

The systems are CE and EMC certified. Their quiet operation is thanks to effective broadband sound and pulsation damping, which applies to both the machine and the pipework.

Operational reliability and uptime is enhanced due to the inclusion of a blower block with Omega profile rotors, while adaptive compression reduces energy consumption and long bearing life minimises maintenance costs.

Components such as control valves and exhaust silencers, which would normally be installed external, are integrated. In addition, the design allows all service work to be carried out from the front of the unit. With the star-delta equipped models, this makes it possible to install several blowers side by side.

All blowers come with an internal Sigma Control 2 controller to enable quick and easy blower mode selection, such as remote speed control or pressure control.

Performance parameters are monitored by sensors, automatically generating warning or fault signals. Optional communication via databus (multiple databus systems can be connected) allows operational status readout and enables the machine to be remotely controlled.

Efficient and energy saving, the rotary blower range covers air deliveries from 2 to 72 m³/min at up to 1000 mbar gauge pressure and 500 mbar vacuum.

Kaeser Compressors Australia

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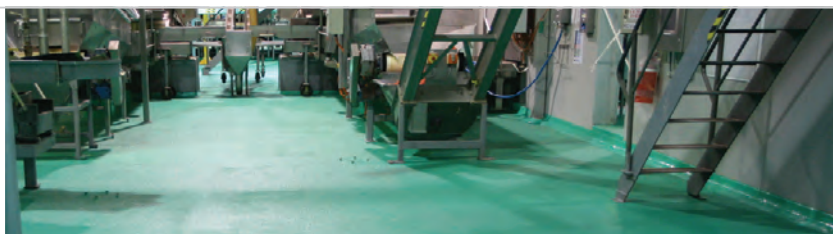
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ISO 2200 certified oil-free air compressors

Atlas Copco's oil-free Z compressor production facility in Antwerp, Belgium has received ISO 22000 certification to confirm its systems provide safe

products for the food and beverage industry.

With compressed air being a key piece in the manufacturing process of food and beverage products, producers can have peace of mind knowing their compressor was made in a clean and safe environment.

The company also offers transparency, with a documented food safety management system in place.

Derived from the ISO 9001 quality certification, ISO 22000 is aimed at any organisation in the food and beverage industry that wishes to implement systems that consistently provide safe food products. The standard demonstrates an organisation's ability to control food safety hazards.

Atlas Copco Compressors Australia

www.atlascopco.com.au

Belt centring station

Flexco's PT Pro EZ belt centring stations can detect and correct misalignment of conveyor belts. The belt guide roller is polyurethane-coated, which increases service life and gives it better traction when moist.

Suitable for light to medium-duty applications and for reversible belts with belt widths up to 1200 mm, the station is quick and easy to fit thanks to the simple design of brackets and components. With the help of the PT Pro Belt Trainer, conveyor system operators can also use this system on belts with worn or damaged edges.

The centring station corrects belt misalignment on one or both sides. No sensor rollers are required as the tapered rollers initiate movement of the belt guiding system. The unit responds immediately to misalignment and corrects it, while ensuring that the belt does not touch the structure, thus preventing damage and reducing maintenance costs.

The system features pivot and tilt movement. Pivoting affects the direction while tilting increases the tension on the incorrectly guided side. These two forces therefore move the belt quickly back to the centre. The belt centring system is suitable for belt speeds of up to 5 m/s and can be used in both damp and dry environments.

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What will the warehouse of 2020 look like?



Zebra Technologies Corporation has released the Asia-Pacific results from its latest Warehouse Vision Study. The global survey compares input from over 1000 IT and operations warehouse professionals from retail, manufacturing, logistics, transportation and wholesale distribution sectors on expectations for 2015 through to 2020.

The study shows that local enterprises are expected to increase the number of warehouses as global online sales continue to grow. Surveyed warehouse executives say they plan on equipping staff with new technologies to meet the needs of increasing shipment volumes.

In Asia-Pacific, 74% of respondents have plans to outfit their warehouse staff with technology, specifically to raise investment in the Internet of Things (72%), barcode scanning technologies (70%), tablet computers (69%), big data/data analytics (67%) and warehouse/truck loading automation (64%) in the next five years.

Half of respondents say warehouse investments are mainly driven by the need to reduce transportation costs, while 41% demand shorter delivery times and 38% see the need to accommodate new supplier and trading partner locations. Other factors include change to inventory policies (33%), talent/skill shortages (28%) and omnichannel pressures (21%).

From 2016 until 2020, companies surveyed expressed expansion plans in terms of total volume of items shipped (74%), automation of processes (69%), annual inventory turns (64%), number of stock keeping units (SKUs) (57%) and employees (56%).

Currently, 81% of respondents are using legacy warehouse management software (WMS), and this number is projected to drop by half to 40% in 2020. By contrast, full-featured WMS and real-time location systems (RTLS) will grow in usage by an average of 29% in five years.

Executives expect to see growth in percentage of inbound items that will be barcoded in the next five years, from 59% to 84%. In inventory management, 86% of respondents said they will use mobile handheld computers and tablets with real-time access to WMS, while 79% of them plan to use RFID-equipped solutions. Only 24% of those polled expect to continue using pen and paper in 2020.

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