

January/February 2016  
Vol.23 No.5

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



**Splash into 2016**  
with our Dairy feature

PP-100007395

**Reclosability**

**Cleaning and sanitation**

**Brazil nut effects**

# BESTECH

Sensors & Teaching Equipment



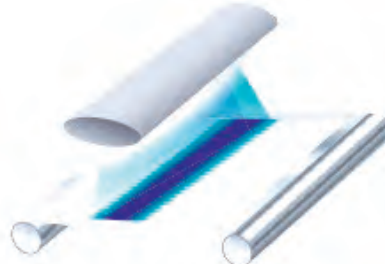
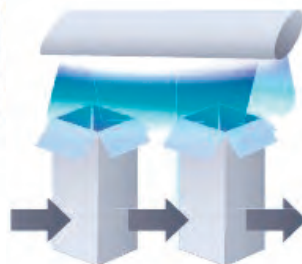
## Leak Testing for Large Packaging Products Such As Pet Food



## Thermal Imaging, Line Scan Camera TIM G7 for Glass



UV sterilization of food packaging



Hardening of:

- UV printing inks
- UV adhesives
- Coating resins



# contents

January/February 2016



## 6

### food for thought

- 6 The latest innovations in automation, control and instrumentation in food and beverage manufacturing
- 10 And you thought your electricity bill was out of control?



## 11

### bulk handling, storage & logistics

- 12 Cold facts



## 21

### processing

- 22 Beware the brazil nut effect
- 35 Infrared surface disinfection for both the bakery and the bread



## 39

### packaging

- 40 Beyond claggy glue!
- 48 Open and shut case



## 53

### testing

- 53 The genetics behind Salmonella's host specificity



## 57

### dairy

- 58 Conductivity measurement: a hidden key to dairy industry success
- 64 CIP cleaning and sanitation in food processing areas



Front cover pic: © wacomka/Dollar Photo Club

## READ ONLINE!

*This issue is available to read and download at [www.foodprocessing.com.au/magazine](http://www.foodprocessing.com.au/magazine)*

# Global food and drink trends for 2016



©iStockphoto.com/Neustockimages

**Mass connectivity, the media, natural disasters, tightly held misconceptions and a draw to simplicity are some of the factors that influence food and drink habits worldwide. As lifestyles shift and global markets influence how and what consumers purchase, manufacturers must keep pace with an ever-evolving consumer landscape.**

**M**arket intelligence agency Mintel has identified the top 12 food and drink trends that will impact global markets, as well as mapping how these trends are playing out across the globe.

## **Alternatives everywhere**

Alternative is becoming mainstream, particularly across the developed world, as novel protein sources and potential replacements cement their appeal with the everyday consumer.

## **Artificial: public enemy no. 1**

An established trend in Australia and Europe, consumers are looking for natural formulations with recognisable ingredients. Consumer demand for 'less processed' food and drink is forcing companies to remove artificial ingredients.

## **Eco is the new reality**

Natural phenomena such as drought, which affect global food and drinks supplies, are beginning to influence preparation and production. Sustainability is evolving from an economic consideration to a necessary concern for the common good. This is another established trend in Australia, mostly due to climactic factors.

## **From the inside out**

Consumers are recognising that diets can connect with the way they look and feel, placing new emphasis on products formulated to enhance physical appearance and wellness. This in turn creates an emerging trend for products enhanced with everything from collagen to probiotics.

## **For every body**

Sports nutrition is becoming mainstream, with products focused on energy, hydration and protein intake capitalising on the rising promotion of athletic programs that encourage consumers to get and stay active. Already established in North America, the rest of the developed world is not far behind with this trend.

## **Based on a true story**

Romancing consumers with stories woven around product origin, ingredients or inspiration is moving from traditionally hand-crafted products towards the mass produced. This is driving a demand for verified claims from both consumers and regulators in developed economies.

## **E-revolution: from carts to clicks**

Innovations in online shopping, apps and delivery services are beginning to transform consumer expectations, which in turn could translate into changes in the grocery shopping landscape.

## **Diet by DNA**

Interest in historical ingredients such as ancient grains and superfoods has boomed on the back of a belief that age-old staples are better than today's manufactured options. This in turn could begin a trend towards diets tailored to individual physiology and ancestry.

## **Good enough to tweet**

Followers are joining friends and family as those we wish to dazzle with our cooking, as increasing numbers of consumers seek to create a profile based around culinary ability. Thanks to a plethora of food-centric media, interest in cooking is not only focused on nourishment and social enjoyment, but also on sharing one's creations via social media.

## **Table for one**

Across age groups, eating meals alone — whether at home or in restaurants — is becoming more common. Products, packaging and promotion will need to adapt to this emerging trend.

## **Fat sheds stigma**

Fat is no longer the enemy — consumers are adjusting their attitudes to the concept of good and bad fats. This is ushering in a paradigm shift in which fat content is not the first and foremost consideration in the search for healthy products.

## **Eat with your eyes**

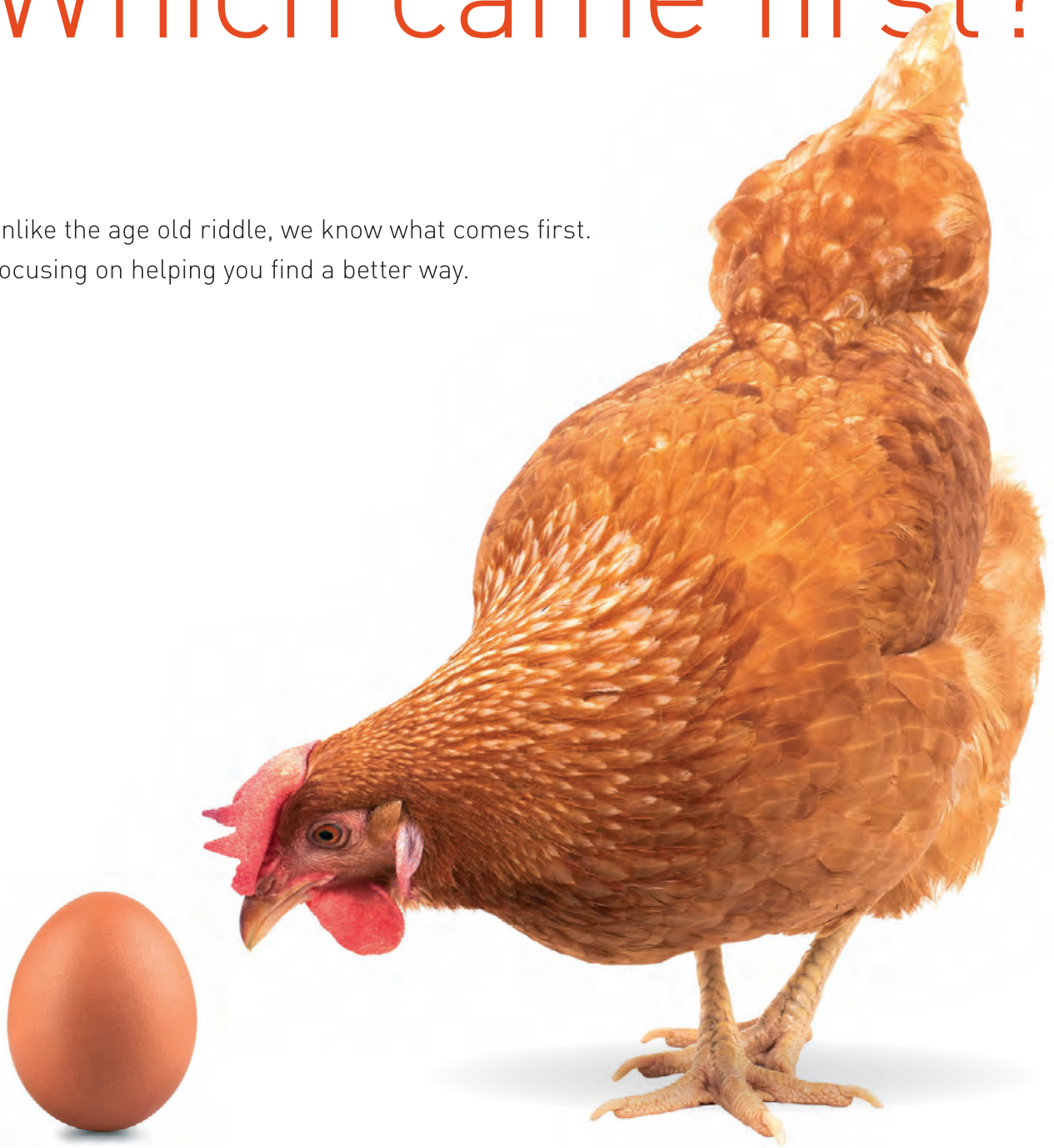
Another offshoot of the social media boom — food must look as good as it tastes. Demand is high for innovation that is boldly coloured, artfully constructed and worthy of Instagram.

"These trends explore how consumers' evolving priorities, opportunities from advancements in functional formulation and the almost inescapable reach of technology will affect food and drink in the coming year," said Jenny Zegler, global food and drink analyst at Mintel. "The trends will play out differently across the world based upon a variety of factors, including cultural norms, regional availability and societal needs. In some cases, established trends from one area are migrating to new regions, while a few emerging trends have the potential to disrupt the worldwide landscape." 



# Which came first?

Unlike the age old riddle, we know what comes first.  
Focusing on helping you find a better way.



DESIGN • ENGINEERING • PROJECT MANAGEMENT



[linkedin.com/company/wiley](https://www.linkedin.com/company/wiley)



[@wileytalk](https://twitter.com/wileytalk)



[/wileytalk](https://www.facebook.com/wileytalk)



**WILEY**

Excellence reimagined

BRISBANE • KUALA LUMPUR • MELBOURNE • SYDNEY • TOOWOOMBA

[www.wiley.com.au](http://www.wiley.com.au)

# Food

FOR  
thought

## ACCC takes action against Arnott's for fat content claims

Arnott's Biscuits has paid penalties totalling \$51,000 following the issue of five infringement notices by the Australian Competition and Consumer Commission relating to representations made by Arnott's about the fat content of its Shapes Light & Crispy product.

Between October 2014 and July 2015, Arnott's represented on the packs of four varieties of Shapes Light & Crispy, as well as a multipack, that Shapes Light & Crispy contained "75% less saturated fat". Shapes Light & Crispy contain approximately 60% less saturated fat than original Shapes. However, Arnott's was not comparing the product to its original Shapes recipe, but to potato chips cooked in 100% palm oil. This information was included in a fine-print disclaimer at the bottom of the packs.

Even if potato chips had been an appropriate comparison for the saturated fat content of Shapes Light & Crispy, the ACCC notes that since only around 20% of potato chips sold in Australia are cooked in palm oil, the representation may still have been misleading.

"Consumers should be able to trust the claims that businesses make to sell their products. Small-print disclaimers cannot correct false or misleading representations which are made in a prominent way in advertising or on packaging," ACCC Chairman Rod Sims said.



## US online tool offers instant data on foodborne disease



The US Centers for Disease Control and Prevention (CDC) has redesigned its online tool, making it easier to search data on foodborne disease outbreaks. The updated Foodborne Outbreak Online Database Tool (FOOD Tool) lets users search nearly 20 years of outbreak data by state, food or germ.

Originally developed in 2009, the FOOD Tool includes national foodborne outbreak data reported to CDC from 1998 to 2014. New interactive features such as maps, graphs and tables allow users to search by specific foods and ingredients, view a 'quick stats' display and get case counts for multistate outbreaks.

An estimated 1 in 6 Americans get sick from foodborne illness every year. During an outbreak, public health investigators can use the database to help point them towards possible contaminated food sources by searching foods, and the germs, implicated in past outbreaks. Reporters and members of the public can use the database to understand the history of recent or ongoing outbreaks of foodborne illness.

The FOOD Tool lets users search foodborne disease data by year, state, location of food preparation, food and ingredient and cause. It provides information on numbers of illnesses, hospitalisations, deaths, the germ and the cause — confirmed or suspected.







## SAI Global launches food industry qualification

SAI Global has launched a new qualification for the food industry. The 10140NAT Diploma of Food Safety Quality Assurance Management is a nationally recognised qualification specifically designed for professionals working in the food industry in operations, food safety and quality assurance roles.

Paul Butcher, chief commercial officer, SAI Global, said, "In 2014, it was identified that 36.6% of Australian employers had jobs requiring vocational qualifications. This new diploma will help address this need for training, helping food industry professionals develop a clear career path.

"We're committed to upskilling the Australian food industry and providing those working within it

[with] the unique recognition they deserve for their skills and knowledge."

Representing almost 30% (\$119 billion pa) of total manufacturing in Australia, the agrifood sector (food manufacturing and grocery) provides jobs for over 332,000 people nationally.

Research shows there's a skill shortage in existing workforces, particularly for roles such as food safety auditors in the food and beverage industries and quality assurance personnel in the meat and seafood industries.

The new diploma was launched in response to a growing gap in the Food Processing Training Package qualifications for food industry quality and compliance professionals, and to help overcome a national skills shortage this is creating. With the median age of auditors being 55 years, 14 years older than the average age of the workforce in Australia, this qualification will also help to encourage young emerging managers into the industry.

Certified assessor and food safety and quality trainer Cathy Lee said, "Australia has an enviable reputation for producing quality and premium foods that are safe. The introduction of this new qualification ensures a consistent standard is maintained so Australia continues to be a modern, safe, reliable and sustainable producer of food."

The qualification has been developed in consultation with food industry representatives and is available exclusively through SAI Global.

The flexible qualification can be achieved through a combination of face-to-face or online learning as well as through a recognition of prior learning and credit transfer pathway. It will generally take up to two years to achieve the diploma.

## Online tool simplifies FTAs

The Export Council of Australia has launched an online tool for Australian exporters that provides a quick summary of free trade agreement benefits, with search functions by agreement, industry and country.

The tool also provides information on doing international business and links to a range of export-related resources and video tutorials.



© FreeImages.com/Bernad Gabi



## FAO and Mars to collaborate on global food safety

Mars Incorporated has joined forces with the Food and Agriculture Organisation of the United Nations (FAO) to improve food safety and quality along the food chain, particularly in developing countries.

The two organisations have signed a partnership agreement aimed at promoting international standards for food safety and quality, improving food safety management to reduce foodborne illness and facilitating global access to information. Under the agreement, Mars will support FAO's food safety program by providing access to food safety data and providing experts in key areas such as traceability.

### Managing mycotoxin risks

The FAO-Mars collaboration will also focus on reducing food safety risks related to mycotoxin contamination. Mycotoxins, toxic substances for humans and animals, can be produced by certain fungi and may be found in staple crops such as maize, wheat and sorghum. Limiting the intake of mycotoxins is a critical factor to improving public health and animal health globally.

The data and knowledge related to mycotoxin contamination developed by Mars would be of great benefit in expanding the functionalities of the FAO mycotoxin sampling tool, which has already drawn the interest of a number of member countries as well as other UN agencies.

"Partnership with the private sector to improve food safety globally is critical. FAO recognises this and engages with the food industry at national and international levels to both leverage and disseminate knowledge that will promote effective food safety practices along the food chain," said Ren Wang, assistant director-general of FAO's Agriculture and Consumer Protection Department.



# Food

FOR thought

## ACCC pledges support for Food and Grocery Code

The Australian Competition and Consumer Commission (ACCC) has committed to a dual role of outreach and enforcement, to ensure the success of the Food and Grocery Code of Conduct.

Speaking at an event hosted by the Australian Food and Grocery Council (AFGC) in Canberra, chairman Rod Sims expressed confidence in the code's ability to redress the imbalance in bargaining power that often exists between suppliers and larger grocery retailers, by prohibiting certain types of unfair conduct and by requiring retailers to deal with suppliers in good faith at all times. Sims welcomed the approach of the AFGC in conducting training sessions on the code, but expressed disappointment in the conduct of major retailers with regard to presenting supply agreements.

"We have written to these retailers expressing our concerns. This action, which we made public, as some suppliers urged us to do, was not a signal that the code faces great difficulties; it was, instead, a signal that we will do what we can to ensure the code succeeds," Sims said. "Ensuring suppliers are aware of their rights is crucial to the success of the code."

Sims also outlined the ACCC's plans for an increased focus on the agricultural sector, which includes establishing a dedicated Agricultural Enforcement and Engagement Unit and a new Agriculture Consultative Committee. The government will also shortly appoint an Agriculture Commissioner. He said the commission was planning to enhance its understanding of the competitiveness of agricultural supply chains through market studies, to assist the agricultural sector deal with market concentration and fair trading issues, and identify key supply chain issues across the agricultural sector for enforcement focus, investigation and prosecution.

Sims also discussed proposed changes to the country of origin labelling regime and the role of regulators, describing the proposed new COO scheme as "major change" that would reshape the obligations of traders, requiring most food to display the percentage of local content in addition to stating a country of origin.

"The government's proposal also transfers roles traditionally undertaken by food regulators to the ACCC and state and territory Australian Consumer Law (ACL) regulators," he said.



© iStockphoto.com/Kelly Cline

## Why some get severe allergic reactions and others do not

A newly discovered cell type that appears to drive life-threatening food allergies may help explain why some people get severe allergic reactions and others do not.

Scientists at the Cincinnati Children's Hospital Medical Center say their findings in mice could also provide insights into new therapeutic strategies and diagnostics for food allergies and anaphylactic shock triggered by the immune antibody IgE (immunoglobulin E). The recently found cells, called 'IL-9-producing mucosal mast cells' (MMC9 cells), produce large amounts of an inflammatory immune protein, interleukin 9 (IL-9), which amplifies anaphylactic shock in response to ingested food. Prior to this study, the primary cellular source of IL-9 was unknown.

"Our study suggests that although you need to have some level of IgE to trigger a food allergy response, you also have to produce MMC9 cells to get a severe response and anaphylaxis," says Yui-Hsi Wang, PhD, lead investigator and a researcher in the Division of Allergy and Immunology at Cincinnati Children's. "Without these cells, you will not get severe food allergies."

Set off by certain foods like peanuts, shellfish and a host of others, IgE-associated food sensitivity prompts the immune systems of some children to surge out of control. Unless there is immediate medical intervention, this can trigger a molecular chain reaction in the intestines and other organs — leading to diarrhoea, hypothermia, respiratory distress and shock.

About 40% of children have some IgE-associated food sensitivity, but only 8% of the 40% develop the severe food reactions that can lead to anaphylactic shock, according to Wang.

"Unfortunately, the best medical intervention for these allergies remains avoiding the foods that cause them," he said. "We don't know why some patients develop such a strong response and why some don't. This is where we as basic scientists are coming in to see if we can use mouse models to learn this, because mice are very much like humans."

Wang and his colleagues suspect that some people are wired genetically to have higher or lower susceptibility to severe IgE-related allergic reactions. Still, it also remains unknown exactly how genetics contributes to these molecular chain reactions. Just as people with food allergies have different degrees of susceptibility, so do mice. To account for this, the researchers conducted their study in several distinct strains of genetically bred mice. They gave the mice an egg-white protein called ovalbumin to trigger allergic reactions and study biological reactions in the animals. They observed that after allergic sensitisation, some mouse strains generated large populations of MMC9 cells while other strains did not. Mice that did not produce MMC9 cells exhibited only minor allergic responses. Mice that produced intestinal MMC9 cells all had severe allergic reactions, regardless of whether they had low or high levels of IgE.



© iStockphoto.com/Cheryl Griffin





# Lachenmeier Stretch Hood Pallet Wrapping



- Flexibility – multiple pallet sizes can be handled by a single machine
- Reduce dependence on extra packaging material – less straps, less corner posts, less costs.
- Protection – fully enclosed hood, waterproof, contaminant free.
- Clarity of stretch hood material allows instant barcode scanning of products on the pallet
- High throughput – fastest end of line packaging solution, bar none.

- Load is secured by vertical force, which drastically reduces the pressure on the packaged goods – Less damage in transit, less rejects from end user.

We have a dedicated test machine in Melbourne, where we test wrap your pallets, and you can see the benefits of stretch hood on your products. Contact us to find out more.

[lachenmeier.com/food](http://lachenmeier.com/food)



**Lachenmeier**

Fynsgade 6-10 ▪ 6400 Sønderborg ▪ Denmark  
Tel. +45 7342 2200 ▪ [info@lachenmeier.com](mailto:info@lachenmeier.com)  
[www.lachenmeier.com](http://www.lachenmeier.com)

**Distributor Australia**

Bliss & Reels, Bulleen, Victoria  
Tel. +61 3 9850 6666 ▪ [sales@blissandreels.com.au](mailto:sales@blissandreels.com.au)  
[www.blissandreels.com.au](http://www.blissandreels.com.au)



# And you thought your electricity bill was out of control?

Mathew Pugh, Hydroflux Industrial Pty Ltd

## How closely are you monitoring your wastewater discharge costs?

**T**he media, with its focus on news for general public consumption, has been full of coverage of the growing cost of electricity.

As a consequence, the public in general, and managers in most industries in particular, are well aware of increases in the cost of electricity. Both have taken steps to reduce their power consumption and, in the case of managers, the impact on their bottom line.

But members of the general public do not pay directly for the cost of the pollutants discharged into their wastewater. Thus, the massive increase in the cost of discharging wastewater pollutants has not received any coverage in the media and has largely gone unnoticed.

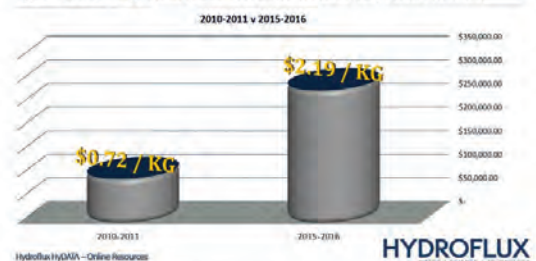
Only the most diligent of managers will be aware of just how massively these costs have gone up and/or taken any action to mitigate the cost.

If we look at Sydney Water's charges, the actual increases are materially very significant. As Sydney Water's models are often used as the benchmark for other water authorities and councils throughout Australia, industry should take note and take action.

As an example, a typical food and beverage manufacturer discharging a couple of hundred thousand litres a day was just five years ago paying \$0.72 per kilogram of BOD discharged. Today, that manufacturer is paying a whopping \$2.19 for that same kilogram.

That's a massive 300% increase in just five years! In annual terms, the charges for this single pollutant will have gone from \$95,000 to \$282,000.

Typical BOD Charges and Annual Costs for a 200kl/Day Food Processor



Given that many factories discharge five to 10 times this quantity, this makes the 35% increase in the cost of electricity over the same period look minuscule in comparison.

To make matters worse, this bill shock for pollutants is often masked in authority agreements by complex formulas setting rates based on milligrams per litre and then converting to kilograms discharged.

### What can you do?

Most industries discharging these volumes of water will have, or should have, some form of wastewater treatment plant. These plants often do not run at their optimum and, like other complex process units, need a professional to review the operation on a regular basis.

Optimisation and/or minor upgrades can significantly reduce both the rate of milligrams per litre (thus dollars per kilogram) and the total number of kilograms discharged. Considerable savings can often be achieved with minimal expenditure.

Hydroflux Industrial Pty Ltd  
[www.hydrofluxindustrial.com.au](http://www.hydrofluxindustrial.com.au)



# PURE EFFICIENCY

**NSF** Premium  
No-Tox<sup>®</sup>  
Food Grade  
Lubricants

Increase Efficiency & Reduce Operating Costs

Reduce Wear & Extend Component Life

Multiple Lubrication Capabilities

SAVE Time SAVE Money



Bel-Ray's high-performance industrial Food Grade greases and oils are specially engineered to withstand the effects of load, heat, water and dust. Maximize performance and reduce downtime by using superior lubricants from Bel-Ray<sup>®</sup>.  
**SEE THE ENTIRE LINE OF BEL-RAY<sup>®</sup> PRODUCTS AT BELRAY.COM**



© 2015 Bel-Ray<sup>®</sup> Company, LLC



Contact us for a **FREE** onsite lubricant survey.

# Cold facts

Few other sectors rely on refrigeration and freezing more than the food and beverage industry. It is an often ignored essential so it is good to see some research into ice crystal-size minimisation plus some warnings about counterfeit and mis-labelled refrigerants appearing as R-22 is phasing out.





**B**etter refrigeration techniques are on the horizon. The ice crystals that form when water freezes can damage cells and tissues resulting in a loss of texture when food is thawed. In the food industry flash freezing partially overcomes this problem by limiting the size of the ice crystals that can form.

Ice crystals also cause problems when preserving biological and medical samples. Cryopreservation has already found widespread use for preserving semen, blood, embryos and plant seeds but scientists would like to be able to preserve tissues and even organs for later use. A new approach to freezing that will limit ice crystal-caused cellular damage is being explored by researchers at the College of Engineering at Oregon State University. Their 'vitrification' or ice-free cryopreservation system could ultimately allow a much wider use of extreme cold to preserve tissues.

Previously researchers have used various types of cryoprotectants that help reduce cell damage during the freezing process — among them is ethylene glycol, literally the same compound often used in automobile radiators to prevent freezing. However, many of these cryoprotectants are toxic and can damage or kill the very cells they are trying to protect from the forces of extreme cold.

In the new OSU research, the engineers developed a mathematical model to simulate the freezing process in the presence of cryoprotectants and identified a way to minimise damage. They found that if cells are initially exposed to a low concentration of cryoprotectant and time is allowed for the cells to swell, then the sample can be vitrified after rapidly adding a high concentration of cryoprotectants. The end result is much less overall toxicity.

The research showed that healthy cell survival following vitrification rose from about 10% with a conventional approach to more than 80% with the new optimised procedure.

"The biggest single problem and limiting factor in vitrification is cryoprotectant toxicity, and this helps to address that," Higgins said. "The model should also help us identify less toxic cryoprotectants, and ultimately open the door to vitrification of more complex tissues and perhaps complete organs."

There is not a lot of scope for this technique in the food processing industry yet but it is good to see research into refrigeration and its effects on cellular structure.

### Phasing out refrigerant R-22

Wilhelmsen Ships Service, a leading global provider of services and products to the shipping industry, is warning of price, supply and safety risks in the run-up to the global ban on R-22 (chlorodifluoromethane or HCFC) refrigerant. The colourless gas, which has high ozone depletion and global warming potential, is

still said to be in use on between 6000 and 8000 vessels worldwide. R-22 was outlawed throughout the EU in a process that ran from 2010 to 1 January 2015. It is currently being phased out in the US, where no new or imported R-22 will be permitted from 1 January 2020. As part of the Montreal Protocol (MP), a UN agreement to protect the ozone layer, HCFC use will be phased out in member countries by 2030.

"R-22 is a versatile and effective refrigerant gas that has served the shipping industry well, but it is fast approaching the end of the line," commented Sverre Jacobsen, technical product manager refrigeration at Wilhelmsen Ships Service. "The compliance deadlines are approaching and this has, quite rightly, impacted tremendously on global production. As availability goes down price and supply risks go up, and this is potentially bad news for the owners of those remaining vessels that still use R-22."

Industry figures indicate that legal global R-22 production this year will be only 10% of the volume produced in 1990. This weak supply and relatively strong demand will exert upward pressure on prices. Jacobsen believes that, if ships are slow to switch to ozone-friendly refrigerant alternatives, costs "could easily double over the course of the next year". This creates a new problem.

"When prices increase and/or availability shrinks, alternative and illegally produced products suddenly start appearing on the market," he stated. "This is happening already, and will only increase with demand."

"Gases are being smuggled into countries, mis-declared and counterfeited. The consequences of this can be serious for vessels, catastrophic for equipment, with adulterated refrigerant causing poor mechanical performance and breakdown, and potentially deadly for individuals."

On the latter point Jacobsen refers to the US, where the FBI has noted that some unapproved refrigerants contain propane, a highly flammable and explosive gas. The federal agency says that many of these substitutes are made in China and sold onwards on the black market.

The solution, Jacobsen says, is clear: "At the end of the day all vessels will have to find environmentally friendly alternatives to R-22. In the meantime, those shipowners and operators that still require it must use reliable suppliers that can provide genuine refrigerant from approved producers. This is the only way to assure quality, standards of purity and worldwide compliance."

"There are heavy fines for not complying with regulations — the EPA can assess fines of up to \$37,000 a day for violations — and real risks to vessels and crews in not doing so. R-22 is on its way out; the industry has to be aware of how it can bid farewell in the safest, securest and most appropriate manner."



**Roxset**<sup>TM</sup>

HEALTH AND SAFETY FLOORING  
SLIP RESISTANT • ULTRA CLEAN • IMPERVIOUS



**1800 ROXSET**  
1800 769 738  
[www.roxset.com.au](http://www.roxset.com.au)



Do you need **flooring** for your **Food Facility**?

Food Factories, Meat Processing Facilities, Bakeries,  
Hotels, Nursing Homes, Hospitals, Restaurants, Retail  
Outlets, Seafood and all other Safety Surfaces.



## Forklift attachments give brewery a secure grip on the future

In 1777, an enterprising Charles Hall started brewing beer for the troops stationed in Weymouth as they waited to face Napoleon. Beer was very popular with the troops and trade was brisk.

Over the years, the brewer continued to innovate and expand. Today, the Hall & Woodhouse pub estate has grown to over 200 pub restaurants across England.

Owned and run by the seventh generation of the Woodhouse family, Hall & Woodhouse is proud to be an independent regional brewer.

To support Hall & Woodhouse's keg and cask line operations, and ensure productivity levels are met, B&B Attachments — supplier of forklift attachments — has worked together with forklift and storage system specialist Locators to provide the brewer with keg clamp forklift attachments.

The keg clamp attachments supplied from B&B Attachments were fitted to Still RX-2020 forklift trucks, enabling a secure grip of kegs and casks and providing ease of movement of both full and empty barrels around the yard and production facility. The attachment allows for up to 18 barrels to be handled in a single lift. It provides the driver with excellent visibility when approaching the load, whilst also increasing driver confidence and ensuring safe and secure handling on-site.



The standard features of the keg clamp include low-profile stabilisers with long-lasting rubber pads, wear indicators on tines, solenoid valves and end-of-stroke cushioning on side-shift movement.

Mark Davis, logistics supervisor for Hall & Woodhouse, commented, "The attachments have saved significant time in many areas of the process of moving both full and empty barrels around site. These attachments are used every day and are now an integral part of our operation."

**B&B Attachments Ltd**  
[www.bandbattachments.com](http://www.bandbattachments.com)

## NMI-approved scales

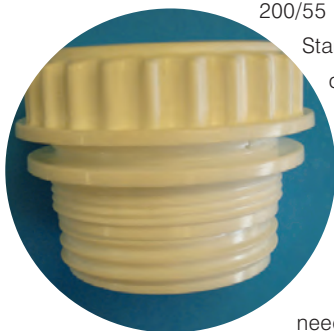
Adam Equipment has released its NMI-approved WBW-M scales in Australia.

WBW-M scales are IP66 rated for washdown applications. Easy to operate and durable, the scales are suitable for trade and retail settings. Features include a backlit LCD with a capacity tracker, which helps prevent users from exceeding the scale's capacity, as well as colour indicators for under and over limits.

The scales are lightweight and portable, with an internal rechargeable battery pack that offers 50 h of operation before needing to be recharged. An auto-sleep/power-down function helps save battery life, and an AC power adapter comes with the scale.

Other scales available from Adam Equipment include: the AZextra retail scales for supermarket produce departments; the CBC-M bench scale for portable weighing or counting applications such as farms and pack houses; the GBK-M bench checkweighing scales; and the high-capacity, stainless steel GFK-M floor scales.

**Adam Equipment (SE ASIA) Pty Ltd**  
[www.adamequipment.com.au](http://www.adamequipment.com.au)



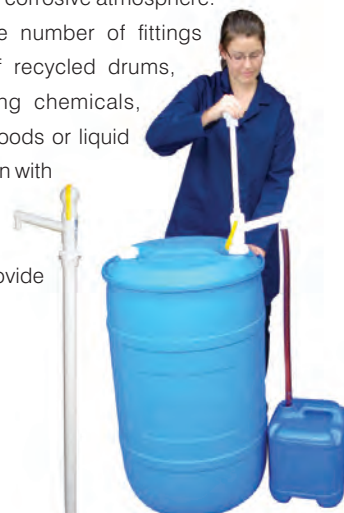
## Drum pump adaptor fitting

Ezi-action MBSP55 combines two thread styles in one adaptor fitting. It can be used to secure the chemical-resistant, food-safe Ezi-action 200/55 Drumpump into either a metal drum with British Standard fine thread (58 mm outside diameter) opening or into a plastic drum with a 56 x 4 buttress opening.

The adaptor fitting simplifies the transfer of the drum pump between different drums used in the food and beverage industry. Its FDA compliant, plastic construction makes the fitting withstand washdown, corrosive chemicals and a corrosive atmosphere.

The device reduces the number of fittings needed to cover the use of recycled drums, whether the contents are cleaning chemicals, disinfectants, food-safe lubricants, liquid foods or liquid food ingredients. The three-part construction with locking nut, which can be loosened by hand, and the locking ring which grips the drum pump shaft when hand tightened, provide security and leak-free operation.

**New Zealand Pump Company Ltd**  
[www.nzpump.com](http://www.nzpump.com)





# EXAIR® SAFETY AIR GUNS

WATCH

[www.exairaustralia.com/sgvideo/](http://www.exairaustralia.com/sgvideo/)

CE



POWERFUL

EFFICIENT

ERGONOMIC

OSHA COMPLIANT

EXAIR Safety Air Guns are reliable, durable and comfortable to use. Each model uses an engineered Air Nozzle to provide superior performance while using **less compressed air** and producing **lower noise levels** than typical air guns. Safe operation is assured by a design which prevents exiting airflow from being blocked. If **saving energy** and keeping **personnel safe** are important to you, contact CAA for the solution! To further enhance their performance, EXAIR Safety Air Guns can be upgraded with a chip shield and extension pipes.

## Practical, Lightweight, Precision Airflow

The **Precision Safety Air Gun** is a small ergonomic gun good for light duty cleaning or blowoff and fits well in smaller hands. It also has a strong focused blast of air capable of reaching into tight spaces.

## Industrial Duty, Versatile, Ergonomic, and Reliable

The **Soft Grip Safety Air Gun** is cast from aluminium with a comfortable four finger trigger to reduce fatigue over long periods. A large variety of air nozzle options provide a solution for light to heavy duty blowoff applications.

## High Performance, Rugged, Durable

The **Heavy Duty Safety Air Gun** is the powerhouse you need for the harshest environments and stubborn blowoff applications. It is outfitted with many of our most powerful nozzles to provide the highest force for your application.

[www.exairaustralia.com/safetyguns](http://www.exairaustralia.com/safetyguns)

INTELLIGENT  
COMPRESSED AIR®  
Products

Distributors of  
**EXAIR**  
Intelligent Compressed Air®  
Products for Industry



**Compressed Air Australia Pty Ltd**  
Improving Safety and Productivity Since 2004

Phone: 1300 787 688 | Int'l: +61 8 8983 3999  
[info@caasafety.com.au](mailto:info@caasafety.com.au) | [www.exairaustralia.com](http://www.exairaustralia.com)  
GPO Box 2792, Darwin, NT 0801, Australia





## When grain travels, sometimes unwelcome guests hitch a ride

New research can help grain handlers and grain inspectors find key locations for pathogens and pests along rail routes in Australia and the United States, helping to make the food supply safer and address stored grain problems that cost hundreds of millions of dollars annually.

In analysis presented in the journal *BioScience*, researchers from the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) evaluated how wheat moved along rail networks in the United States and Australia. Through their analysis, they identified US states that are particularly important for sampling and managing insect and fungal problems as they move through the networks.

"The movement of pests and pathogens can be especially important when there are quarantines against the movement of particular species or when pesticide-resistant insects invade new areas and make management more difficult," said Karen Garrett, a UF plant pathology professor with the Emerging Pathogens Institute and senior author of the study.

Researchers examined important locations including hubs that are linked to many other locations and bridges that link separate parts of the network together, Garrett said.

The analysis revealed that Australia may have a geographical advantage in pest management. The central US is a major wheat-producing area, and wheat can move in multiple directions towards processing centres or American ports for export. In Australia, wheat production tends to move more directly towards the coast for export and, as a result, the internal system is simpler and in some ways easier to manage for pests, Garrett said.

Jim Anderson, professor of food and resource economics in UF/IFAS and director of the UF Institute for Sustainable Food Systems (ISFS), said that understanding the functioning of the world's food networks and how they can be improved is one of his team's core missions.

"Pests and fungi can damage grain and leave it unusable," said Garrett. "In addition to this waste, some fungi associated with wheat produce toxins that are significant health risks if grain contaminated with them is not removed efficiently. These toxins, known as 'mycotoxins', pose an important health risk if they are not detected effectively and removed. The movement of quarantined pathogens or pests, or the movement of pesticide-resistant pests, poses a risk to stored grain systems in the locations to which the grain is being shipped — and to the crops growing nearby for some species, Garrett said.

Mycotoxin contamination in US grain has been estimated to cost more than US\$900 million a year, she said. UF researchers are also applying this type of network analysis to other post-harvest networks and crop epidemics so they can identify key locations for detecting and managing the spread of pests and pathogens.

"We are evaluating crop seed systems in several developing countries to identify system strengths and weaknesses for managing diseases of potato, sweet potato, cassava, banana and yam," Garrett said. "We are also studying epidemic networks for diseases such as soybean rust in the US, to guide strategies for sampling and mitigation."



## CHEP comes to the aid of UNHCR with supply chain expertise

For the United Nations High Commissioner for Refugees (UNHCR), the efficiency of its supply chain can be quite literally a matter of life and death, as it ships relief items to millions of refugees each year. The UNHCR has therefore welcomed global supply chain leader CHEP's agreement to volunteer its resources and expertise to evaluate the organisation's logistics and associated costs.

UNHCR operates in 123 countries with a staff of more than 9300, providing protection and assistance to more than 46 million refugees, returnees, internally displaced and stateless people. In 2014, with an annual budget of more than US\$5 billion, UNHCR dealt with approximately 51.2 million people of concern: 33.3 million internally displaced people (IDPs) and 16.7 million refugees, plus another 10 million stateless people and more than 1.2 million asylum seekers.



CHEP provided its Plant Network Optimisation (PNO) Team for the in-depth study, which is reviewing the current state of UNHCR resources to reduce the lead time required to service refugee camps. Currently CHEP's PNO team is conducting a detailed analysis of UNHCR's supply chain network in Africa.

UNHCR maintains a network of seven global stockpiles managed from distribution centres strategically located in Copenhagen (Denmark), Amman (Jordan), Dubai (UAE), Nairobi (Kenya), Isaka (Tanzania), Douala (Cameroon) and Accra (Ghana). If needed, UNHCR can ship core relief items (CRIs) from these stockpiles to assist up to 600,000 people within 72 hours.

CHEP Senior Vice President for Supply Chain Carmelo Alonso Bernaola said the UNHCR project is unique compared to other projects undertaken by CHEP, as the study involves multicountry, air, sea and road transportation and multiple data sources — factors which greatly increase the scale and complexity of the study.

The study will be completed by late 2015, with findings and recommendations presented to UNHCR shortly afterwards.





## High-density pallet racking

Dematic has available Colby Push-Back Pallet Racking high-density storage solution for warehouse operations.

The racking provides high-density storage where pallets are stored up to six pallets deep. Using a forklift, pallets are pushed back on carts on inclined rails mounted inside the racking. As a pallet is withdrawn, the cart holding a pallet behind automatically slides forward to the front position.

The racking is an alternative to double-deep or drive-in racking, maximising the use of space while allowing fast and easy access to stock. The system operates on a first in, last out (FILO) basis.

The system is suitable for bulk storage, order consolidation and despatch. The carts are of rigid frame construction and run on large wheel bearings for smooth performance. The rails enclose the wheels, preventing dislodgement of the carts and keeping the running surface free of debris. Stopper plates locate the pallets securely on the carts.

Other features include a diamond-slot profile to provide a strong and efficient interlock between upright and beam; front and rear upright protectors to avoid damage; and rack end protection for worker safety.

**Dematic Pty Ltd**

[www.dematic.com.au](http://www.dematic.com.au)



## Pantograph reach truck

The Mitsubishi EDR18N2 pantograph double deep reach truck enables users to maximise the value of warehouse space. The reach truck provides good load handling at high lift heights, allowing for accurate work in double deep racking at heights of up to 11 m.

The reach trucks achieve good lift and travel speeds without compromising control, helping operators move more pallets in less time. A rigid mast with cushioning at all mast stage transitions enables operators to smoothly and confidently lift and transport materials.

**MLA Holdings Pty Ltd**

[www.mlaholdings.com.au](http://www.mlaholdings.com.au)

## Vacuum Solutions Tailored to your Needs

- › Vacuum Pumps and Blowers
- › In-house and On-site Service
- › 24/7 Service of other Brands
- › Genuine Spare Parts

Dedication has earned us a reputation for superior service. Benefit from our expertise, give us a call.

[sales@busch.com.au](mailto:sales@busch.com.au) | [www.busch.com.au](http://www.busch.com.au)

**Victoria: 30 Lakeside Drive | Broadmeadows, VIC 3047 | +61 3 9355 0600**

**New South Wales: Unit 1, 3 Cullen Place | Smithfield, NSW 2164 | +61 2 9609 6690**

**Queensland: 8-10 Commerce Circuit | Yatala, QLD 4207 | +61 7 3807 2766**

**Western Australia: Unit 14, 24 Baile Road | Canning Vale, WA 6155 | +61 8 9456 4233**



## Clean and safe bulk handling for biscuits

When an iconic Australian food company needed a new method of reliable, continuous supply of snack biscuits to its high-speed weighers and feeders for packaging, it sought the assistance of two Australian manufacturing companies. Kiel Industries and Pro Ali Design collaborated on the project to design and build a new production line for the snack biscuit manufacturer.

Kiel Industries supplies the largest range of plastic pallets in the Southern Hemisphere, developing innovative designs for pallets, bins and ancillary products. Pro Ali Design provides conveying solutions for many of Australasia's leading food manufacturers.

A major requirement of the biscuit packaging line was to replace the existing bins and handling system with a line that used a cleaner, more versatile bin.

Colin Kiel, managing director of Kiel Industries, explained: "For the production line, 'cleaner' meant that the bins had to empty completely, with no residual biscuits being trapped by corners or edges."

The biscuit production process involves several basic steps. Pastry is made and spread before the topping is added and then cut to shape and baked. Once through the ovens, the snack biscuits are placed into the Kiel-designed plastic storage and transport bins in large plastic bags. When the biscuits are ready for packing, the bins are moved and the biscuits decanted to portion pack sizes of 25 and 70 g. Portion packs are retained in the bins until bin emptying is required to create multipacks on the packaging line. The portion packs are then boxed, ready to be sent out to supermarkets across the country.

The customer requirements were for 650 L, food-grade polyethylene bins that were standard pallet-sized with smooth walls and were easy to clean. The bins also needed the capability to be safely stacked up to eight high.

The biscuit manufacturer ensures the freshness of its product by insisting on a 14-day turnaround between baking and packaging. During this two-week period, approximately 1000 bins of snack biscuits are produced. To meet this demand and ensure there were always sufficient bins, Kiel Industries manufactured 1500 bins in total.

Once the design of the bin had been confirmed, prototypes were sent to Pro Ali Design for the development of the automated tipping machinery that was to be part of the new production line. It was a change in process for Kiel to develop a bin and have the handling equipment built for it. "Usually a company designs and builds a processing plant, and then asks us to give them a bin that fits their system," said Kiel.

According to Jon Ball, Pro Ali's business development manager, his company received a very specific brief from the biscuit manufacturer for the development of its new production line. The main requirement was to improve efficiencies and remove the need to manually load biscuits from different-shaped bins.

The cubic-metre bins developed by Kiel Industries had to be robust enough to



withstand being picked up and moved around in areas where there were multiple forklifts operating, so the Pro Ali design incorporated a heavy-duty bin tipper.

"We were working with very fragile product in both the contents and the packaging," said Ball. "The consumer packs are highly decorated, so cannot be scuffed during transport along the line." The packaging line includes elevated and radius conveyors, so Ball had to ensure that there were minimal junctions, bends, lips and edges in the line on which packets of biscuits could be caught.

The feeder hoppers all include a laser level, which sends an alert when the biscuit level is low and requests that another bin be decanted into the packaging line. The line has four units operating on a continual basis to ensure that it is conveying a regular, constant stream of product.

The processing line design incorporates a number of safety features to protect workers, including light curtain safety lockouts. "Safety was paramount, and our design had to reflect this," Ball added. "When the beam of one of the light curtains is broken, the system shuts down and must be manually reset in order to start the process again."

One feature of the project was that the new production line was to be built on a blank floor area dedicated to the bin tippers and conveyor system — not around or over existing machinery, as is often the case. "This allowed us to have a lot of straight runs to ensure nothing gets stranded high up on an elevated section," Ball said. "In the past, it was possible to get the contents of different packs mixed because some got caught at a junction and dislodged on a later run."

Kiel Industries  
[www.kielindustries.com.au](http://www.kielindustries.com.au)





## Three-wheel electric lift trucks

CAT ECTCB series three-wheel electric lift trucks are suitable for a range of unit loads including pallets, pallet boxes and stillage cages.

The trucks, available from United Forklift and Access Solutions, are available in capacities from 1.3 to 2.0 tons. They have large battery capacities and versatile configurations that can be programmed at the power level that suits the lifting task.

The trucks' energy regeneration system channels power back into the battery during simple activities like braking, plugging or decelerating, and trucks will shut down automatically after 15 minutes when left in standby mode.

The power control system provides good acceleration and the truck offers precise inching and control. Maintenance is reduced due to the absence of carbon brushes in the motors.

For warehouse applications, the trucks have a tight turning circle and rounded rear surfaces to enhance manoeuvrability and minimise collision and damage risks in confined spaces. The maximum lift height of 7.5 m makes them suitable for most standard wide-aisle racking operations, and their clean operation makes them suitable for food, beverage, pharmaceutical and sensitive and refrigerated goods handling.

Hydraulic shock absorption reduces load impact caused by bumps, and the highly stable design means they can be cross-utilised to perform duties both inside and outside.

The trucks' vacuum fluorescent display is located at the right front of the cab so as not to obstruct the driver's view of the forks. The display is easy to read under direct sunlight and bright conditions.

The truck helps protect operators by initiating a series of protective actions if operators leave the normal seated operating position.

**United Forklift and Access Solutions**

[www.unitedequipment.com.au](http://www.unitedequipment.com.au)



## When experience counts...

**when your product won't flow from the hopper, you don't need 'just a vibrator', you need experience and expertise in selecting the right sort.**

VSS have pneumatic, electric and hydraulic models from Europe and USA, from companies with a total of 130 years' experience (plus our 42 of course!)



**Call now to let us help you.**

**For more information call 1800 300 877**



ESS P/L Trading as:  
**Vibration Systems & Solutions (Australia)**  
[www.vibrationsystems.com.au](http://www.vibrationsystems.com.au) ABN 34 001 931 746

**BRANCHES AND DISTRIBUTORS IN ALL STATES AND NEW ZEALAND**



Eye-Flex®

CCure Edge™

**Wirebelt** is the leading manufacturer of stainless steel conveyor belts for product handling and processing. Manufacturing range includes **Flat-Flex®**, **Eye-Flex®**, **Compact Grid™**, **Honeycomb** and **Spiral Woven Mesh**. **Wirebelt** - for conveying, cooking, cooling, covering, drainage, heating and drying applications.

Flat-Flex®

Compact Grid™



**Richard Foot Pty Ltd.** Unit 14, 2 Apollo Street,  
Warriewood NSW Australia 2102  
Tel: +61 2 9979 8311 Fax: +61 2 9979 8098  
Email: [sales@rfoot.com.au](mailto:sales@rfoot.com.au) [www.rfoot.com.au](http://www.rfoot.com.au)



## Robotic shipping container storage and handling system

Israel Aerospace Industries has introduced the Robotic Container Management & Storage System (RCMS), an autonomous solution for container management and storage in ports.

The system offers a flexible solution for minimising storage operations. Containers are mounted on low-cost robotic carts that move on robotic elevators. The robotic carts and elevators increase throughput and enable optimal use of all available storage areas.

The command and control centre uses algorithms to provide constant, autonomous supervision augmented by human operators.

The system is energy efficient and reduces greenhouse emissions, offering increased operational efficiency and cost savings. It can reduce up to 50% of the volume at a port and lessens the need to drain the sea during port construction. Containers can be loaded and unloaded 1.5 times faster than they are currently and the system has the option of cancelling the shuffling (or rearrangement) of containers, which reduces profits and hinders the loading and unloading process.

**Israel Aerospace Industries Ltd**

[www.iai.co.il](http://www.iai.co.il)

## Multihead weigher

Select Equip has released Bilwinco's Revolution RW010 Series multihead weigher. With 14–16 heads, making it suitable for small manufacturers, the weigher has a low build height and a high constant output. Suitable for handling fragile products, the machine's direct weighing ensures 20–30% less giveaway compared to traditional weighers, according to the company.

**Select Equip**

[www.selectequip.com.au](http://www.selectequip.com.au)

## Bulk



NEWS

## Tetra Pak instructs suppliers to provide ethics reports

As part of a commitment to improve supply chain transparency, Tetra Pak has informed its key suppliers that they will be expected to file ethical performance reports on the Supplier Ethical Data Exchange (Sedex).

“As a global company with a large number of suppliers, we recognise the significant role we play in assuring good corporate governance and responsible sourcing,” said Sam Strömersten, executive vice president, supply chain operations at Tetra Pak. “We already report via Sedex on our own operations, but believe it is time to go further by asking our key suppliers to do the same.”

Tetra Pak currently reports data related to labour practices, health and safety, business ethics and environmental performance for all of its production operations. The company has also worked with Sedex to develop training for its employees at more than 60 Tetra Pak sites.

Jonathan Ivelaw-Chapman, CEO at Sedex, said: “Tetra Pak was one of the first Sedex supplier member companies to go beyond supply chain data reporting to the training of its people. We have seen a real commitment from the management as well as employees across the organisation. The move to engage all suppliers clearly demonstrates the company's leadership and commitment to driving improvements in ethical and responsible business practices in global supply chains.”





# Processing







# Beware the brazil nut effect

The production and packing of sweets and snacks presents new challenges to machines and their constructors as market demands increase. In particular, the processing of nuts and cereals for sweets and snacks is treading new paths in the handling of these sensitive, free-flowing materials.

Over 300 companies will be presenting techniques and solutions for the sweets and snacks industry at the ProSweets Cologne 2016 international supplier fair. From 31 January to 3 February 2016, ProSweets Cologne will offer comprehensive information and a direct line to suppliers of techniques, machinery and technology.

The path taken by a cereal flake during the production of muesli shouldn't be underestimated, and sweet and snack manufacturers have plenty of tales to tell. The flow behaviour and transport characteristics of nuts, pistachios, chocolate crispies or dried fruit are very difficult to predict in advance. Elaborate test series of varying degrees nearly always precede the implementation of mixers, driers or other systems for handling the free-flowing goods.

Mixtures that include particles of differing sizes, weight and densities prove to be particularly tricky. Some of the physical phenomenon can actually be observed at the breakfast table. If one pours muesli out of a packet, the big nuts always land on top. The reason: while pouring, hollow spaces form under the larger particles. Smaller particles flow into these hollows and thus move further and further down in the mixture. The phenomenon that is referred to as the 'brazil nut effect' causes technologists considerable headaches because the prerequisite for sweets of high quality is the exact adherence to the recipes.

## Segregation-free on the way to becoming a muesli bar

They are a first choice for between-meal hunger: sweet bars filled with cereals and pieces of fruit. Often the granular ingredients have to be carefully heated during the mixing process so that the liquid chocolate can flow into the spaces between the granular ingredients when the chocolate coating is finally applied. Hence, there is the optimal mixer for almost every application.

Volumetric plate metering devices ensure the exact supply of cereals, dried fruit and nuts in the Conbar bar manufacturing systems of Sollich. It not only enables rectangular-shaped products to be produced, but also bars with different cross-sections. The SnackFix by Hosokawa-Bepex is an easy way for manufacturers to get started in the automatic bar production sector, with a system for the production of fruit bars consisting of just two components. The cereals are continually mixed with the binding agent in the processing unit. After the mixing process, the mass is moulded into an endless carpet by two calibrating rollers and cut into the desired product width.

## A coat for crunchy granules

Crisps lend chocolate and bakery products a crunchy effect and produce interesting colour effects in ice-cream. However, the crunchy granules obtain their characteristic properties after





© margo555/Dollar Photo Club



*Mixtures that include particles of differing sizes, weight and densities prove to be particularly tricky.*



the coating process, where the cereal extrudate is coated with a layer of chocolate, yoghurt cream, caramel or fruit mass. The coating protects the crisps and retains their crunchiness in the end product. Fluidised bed systems or coating drums are the appropriate equipment for the coating process.

Predominantly, the size of the particle to be coated is decisive for the choice of process. Whereas for particle sizes under 1 mm, fluidised bed systems are the standard choice, coating drums are used for larger products. So that the crisps don't stick together, liquid nitrogen is conducted directly onto the product bed. The cryogenic gas allows the applied mass to crystallise evenly.

### Packed in small target weights

Whether pure or as a fruit and nut mix, cashew nuts, crisps and dried fruit are packed inside bags, plastic cups or in cans. When six or more components are mixed together, modern multiple-head scales ensure the desired mixing ratio.

Suitable for small target weights, the solutions by Ishida, Multipond and Yamato that are being exhibited at ProSweets Cologne can also accurately weigh oily or fragile products. The multiple-head scales work using the part quantity weighing principle, feeding the materials to the weighing pans that are arranged in pairs. The computer chooses the combination from these that is closest to the filling weight. An additional

ring of booster pans enables the intermediate storage of part quantities already weighed. A sophisticated vibration control ensures a uniform product flow.

Whether to improve the recipe, for the introduction of a new product or if the packing format is altered, the right equipment is decisive when processing free-flowing goods. At ProSweets Cologne the focus is on processing and packing systems, which enable fast retrofitting and easy cleaning, allowing manufacturers to keep pace with market demand.

### 'Power Nuts & Cereals'

Companies whose product portfolios include nuts, seeds, cereals or grain will be presenting at the 'Power Nuts & Cereals' special event. In addition to various types of nuts and almonds, the product range also includes the super food ingredients quinoa and chia.

This theme will also be included in lectures presented during the supporting program. The 'Speakers' Corner' is the location for this: in the midst of the trade fair action, expert speakers will highlight new product trends and their impact on the manufacturing processes.

Held in conjunction with ISM, the international fair for sweets and snacks, ProSweets Cologne will cover the entire value chain in the production of sweets and snacks.





## Compact stainless steel embedded controller

Interworld Electronics has released the ACS-2702A compact stainless steel embedded controller from Apex. The ACS-2702A is a waterproof box PC housed in an IP67-certified and IP69K-compliant stainless steel case. All I/O connections are made via IP67 fully sealed M12 connectors. The ACS-2702A uses an energy-efficient Intel Baytrail N2930 (1.83 GHz) or E3845 (1.91 GHz) processor with 2 GB of DDR3L 1600 MHz SDRAM installed. The ACS-2702 provides a DC power input, two USB 2.0 ports, a Gigabit Ethernet port, an RS232 port, an RS232/422/485 serial port and a VGA port. The controller features an internal 2.5" SATA connection hard drive and a 32 GB SD slot for operating system and data storage. An internal Mini-PCIe slot is also provided.

Measuring 200 x 250 x 58 mm, the stainless steel enclosure is rugged and vibration resistant. With appropriate airflow, the ACS-2702A can operate in temperatures ranging from -20 to 60°C. For easy installation, the ACS-2702A is attached to a stainless steel wall mounting plate that can be bolted into equipment enclosures or onto existing processing plant machinery. Despite its compact size, the ACS-2702A provides enough processing power for advanced process control applications. Its stainless steel, corrosion-resistant, waterproof construction makes the controller suitable for the food industry, farming applications, factory/machine automation, outdoor digital signage and environment monitoring.

**Interworld Electronics and Computer Industries**

[www.ieci.com.au](http://www.ieci.com.au)



## Flow computer

Process Control's UNIFLOW-200

MFC flow computer is suitable for a variety of flowing fluids — liquid, gas or steam — and a range of devices, including flow meters, orifices, turbine meters or ultrasonic meters. Versatile communication protocols enable easy integration with complex SCADA/HMI systems. The device's modular multirun and multistation design incorporates eight meter runs, four station totalisations and user-configurable meter runs.

The flow computer was designed for hydrocarbon gas and liquid flow measurement. The standard features of the instrument make it suitable for fiscal measurement and custody transfer; however, it is applicable for process applications as well, where accurate flow calculation helps in process optimisation.

The flow computer has the EC-type examination certificate from the Hungarian Office of Measure (OMH) according to the Directive 2004/22/EC (MID) as a gas volume conversion device. It is OIML R117 compliant and is certified for custody transfer measurement of liquids, like crude oil and refined products.

Supported fluids include: hydrocarbons (natural gas, coke oven gas, blast furnace gas, crude oils, refined products), industrial gases (air, nitrogen, oxygen, argon, hydrogen, carbon dioxide, carbon monoxide, propane, ethylene, ammonium, synthesis gas for ammonium, hydrogen reach natural gas, general gases), liquids other than water (ethanol, MTBE, ETBE, general liquid), water, water steam and water-glycol mixtures.

Supported flow meters include: orifice, Venturi tube, nozzle, V-Cone, averaging pitot tubes, vortex, turbine, positive displacement, ultrasonic, electromagnetic and Coriolis.

**AMS Instrumentation & Calibration Pty Ltd**

[www.ams-ic.com.au](http://www.ams-ic.com.au)



PharmEquip supplies quality sanitary and industrial hose assemblies in both PTFE and Silicone material, as well as stocking a broad range of stainless steel fittings, gaskets and silicone tubing



Factory 2 & 8, 756 Burwood Hwy  
Ferntree Gully, Vic 3156 Australia  
p: (03) 9758 5591  
e: [admin@pharmequip.com.au](mailto:admin@pharmequip.com.au)  
[www.sterileprocesscomponents.com](http://www.sterileprocesscomponents.com)



## Baiada chases more cluck for its buck with streamlined software



With extensive farming and operation sites, Baiada is one of the largest poultry operators in Australia, with business operations that include broiler and breeder farms, hatcheries, processing plants, cooking plants, feed milling and protein recovery.

Baiada currently operates separate business management systems for:

- financials and scheduling — general ledger, accounts payable, purchasing, cash management and manufacturing planning
- inventory management and order fulfilment
- accounts receivable — sales order entry, customer invoicing and similar

To improve business performance and flexibility, Baiada will streamline its three business software systems into a single platform, deploying Sage X3 from Sage Business Solutions.

“Our business is one of constant change, and we need systems that enable us to implement changes to our business very quickly. A key criteria for us was to avoid a situation where a change in our business or marketplace would require us to go through a three- to six-month process to make changes within the system. Our business can and will experience significant changes from one week to another, and we have to be able to react very quickly and respond with agility. We can’t risk being caught out by support systems that don’t move at our pace,” said Craig Ford, national IT manager, Baiada.

As well as providing improved flexibility and functionality, the new business management software has been chosen to help make it easier for customers to interact with Baiada, enabling the company to offer differentiated and innovative services.

*SAGE Business Solutions*  
[www.sagebusiness.com.au](http://www.sagebusiness.com.au)

## Introducing... the Rieger Advantage in Design, Quality and Value

Inclined Seat



Mix Proof



Regulating Control



Shut-off



Biocheck Sampling



Piggable Double Seat



**Dixon, exclusive Distributor for Rieger in Australia and New Zealand**

Ph: +61 1300 134 651

Email: [customerservice@dixonvalve.com.au](mailto:customerservice@dixonvalve.com.au)

Web: [www.dixonvalve.com](http://www.dixonvalve.com)





## Relative humidity sensor

Michell Instruments has launched an upgraded version of its HygroSmart I7000XP interchangeable relative humidity sensor, which enables users to carry out maintenance on industrial relative humidity and temperature transmitters in approximately 30 s.

The unit features polymer capacitive technology to give an accuracy of 1% RH. It has a modular format that enables faster and easier maintenance of compatible transmitters and probes. The calibration data is stored in the electronics of the unit, and recalibration of a transmitter or probe only requires the replacement of the sensor — a simple process that is similar to changing a light bulb.

**AMS Instrumentation & Calibration Pty Ltd**

[www.ams-ic.com.au](http://www.ams-ic.com.au)

## Variable speed drive vacuum pump

Atlas Copco's GHS VSD+ 350-900, introduced a year ago, offers an all-in-one vacuum pump with efficient variable speed drive (VSD), easy to install plug-and-play design, and display and connectivity features that provide controllability.

Now introduced is the GHS VSD+ 1300-1900 vacuum pump, offering a range of 1300-1900 m³/h with an ultimate pressure of 0.35 mbar(a) and with VSD providing the ability to keep up with fluctuating production demands for vacuum. The GHS VSD+ 1300-1900 is a plug-and-play installation with a footprint of less than 2.3 m³, enabling easy installation without taking up valuable floor space at the production facility.

The VSD offers average energy savings of up to 50% compared to alternative technologies, and features a low noise level. The GHS VSD+ comes delivered with the SMARTLINK connectivity option for maximum uptime, while clear and detailed colour display puts the control in the user's hands. The vacuum pump also has Atlas Copco's Elektronikon for state-of-the-art monitoring, enabling full control that leads to energy savings. Elektronikon can integrate easily to plant management systems thanks to a remote monitoring option.

Atlas Copco's GHS VSD+ 1300-1900 variable speed drive vacuum pump is suitable for meat and poultry packaging and canning, as well as many other applications. A self-assessment can be performed with the Utility Vacuum Application available for free in the App Store and Google Play Store.

**Atlas Copco Compressors Australia**

[www.atlascopco.com.au](http://www.atlascopco.com.au)



## Wireless transmitter upgraded to enable energy harvesting

Emerson Process Management's Rosemount 3051S Wireless Pressure Transmitter has been upgraded to enable energy harvesting. By utilising Perpetuum's Vibration Energy Harvester and Intelligent Power Module solutions, the transmitters are able to convert unused energy, such as vibration from pumps and motors, into electric energy.

The vibration energy harvesters provide external power to the transmitters, decreasing maintenance by extending the life of the power module. Perpetuum's Intelligent Power Module holds the same form, fit and operational capability as Emerson's current Smart Power Module, with the operational enhancement of enabling Emerson's wireless transmitters to accept multiple forms of external power.

The energy harvesting solution is certified to FM (Class1 Div1, Groups A, B, C, D), as well as ATEX and IECEx (Zone 0). It is Intrinsically Safe and classified for use in hazardous areas.

**Emerson Process Management**

[www.emersonprocess.com.au](http://www.emersonprocess.com.au)



## Rotary jet mixer

The Alfa Laval Rotary Jet Mixer performs liquid and powder mixing, gas dispersion and cleaning-in-place (CIP). It combines high blending precision with minimised mixing times and up to 50% reduction in energy requirements, according to the company. Based on rotary jet head technology, it can be used in tanks between 100 and 800,000 L in size.

Equipped with two or four nozzles, the mixer is positioned below liquid level in the tank. Liquid is withdrawn from the tank outlet by a pump and circulated via an external loop to the mixer. A single mixer can handle liquid mixing, gas dispersion and powder dispersion applications — plus tank cleaning — without requiring separate equipment for each process, thereby delivering savings.

**Alfa Laval Pty Ltd**

[www.alfalaval.com.au](http://www.alfalaval.com.au)



# Sustain Quality

No pulsation or meshing rotors, no damage

# Save Product

Improve yields, less contamination

# Save Time

Quick clean, SIP/CIP-able, prevents failure with only 1-shaft and 1-seal



**Ideal for curds,  
whey, yoghurt,  
cottage cheese etc.**

**1300 WMBPUMPS**  
[enquiries@wmftg.com.au](mailto:enquiries@wmftg.com.au)  
[www.wmftg.com.au](http://www.wmftg.com.au)

**WATSON  
MARLOW**

Fluid Technology Group

# GEA constructs earthquake-proof milk drying plant for Fonterra

The small town of Pahiatua in New Zealand's North Island is the ideal location for a milk drying plant. Well located for the dairy farms it serves, there is no need for tankers to traverse the Manawatu Gorge, which can be dangerous in bad weather.

However, the town is located on an earthquake fault line. It was last hit by a major earthquake in 1934 when it was devastated by a 7.6 magnitude shock.

When Fonterra commissioned GEA to build a whole milk drying plant in the town, it therefore presented some unique challenges. Not only its size, which at 15 tons/hour is amongst the biggest in the world; not for the speed of its construction, which at under two years is fast by global standards; but for its construction: the plant at Pahiatua has been designed to withstand a 1/2500-year event without damage. It is believed to be the first plant of its kind in the world to be built in this way.

In an effort to speed the process, and keep costs down, it was agreed not to design a new facility but to build a copy of the company's Darfield 1 Dryer with base isolation that would allow the building to move should a quake hit. There are only a handful of other buildings in New Zealand that are protected in this way, including the parliament building in Wellington and the country's national museum.

GEA supplied all the processing equipment, including: milk reception, storage, wet processing including standardisation and homogenisation, evaporation, drying, powder handling, packing and water recovery. Most of the equipment was built by GEA locally in New Zealand with some specialist items coming from the company's factories in China.

The site includes a reverse osmosis plant capable of processing up to 2,000,000 L/day of 'cow water' (water recovered from the milk drying process) and purifying it for re-use in the plant, making the new plant virtually self-sufficient in water.

"This treated water is returned to the process, keeping disposal costs down and ensuring that Fonterra has no need to increase its water resource consents," said Gary Reynolds, GEA's project manager. "The RO plant will also produce boiler feed water of very high quality using less chemicals to protect the steam system from corrosion, increasing the life expectancy of the plant and reducing operating costs."

## Base isolation

The whole plant weighs upwards of 20,000 tons, including its 40-metre-high drying tower, all of which sits on 50 triple friction pendulum bearings that will allow the whole construction to move up to 900 mm in any lateral direction, enabling the building to withstand a 1/2500 year event without losing its structural integrity. Each 1.4 m square bearing weighs 2.7 tons and has a Teflon centre to reduce friction. The bearings were supplied by a seismic bearing specialist company in San Francisco.

Other key elements of the construction include: 3400 m<sup>3</sup> of concrete reinforced with 400 tons of steel; the



main columns are 17.5 m long and weigh 16 tons each; and the tower walls are constructed using 517 concrete panels each of 9 tons stitched together using poured concrete.

Although the main building is base isolated, the ancillary structures are not, which presented GEA with some engineering challenges. For example, every supply line for steam, acid, milk, gas, chemicals or electricity has to be able to withstand the building moving by up to 900 mm in any plane. "We have used a seismic loop on all the supply lines that gives them enough slack while being supported adequately as well," said Gary.

The human interface zones (corridors between the fixed and base isolated sections) have to be able to move too, as the building operates under critical hygiene conditions making any breach to ambient air unacceptable.

The building is made from pre-cast concrete panels and columns fabricated in Otaki, on the island's west coast, and lifted into position. As well as being quick to erect they also provide excellent sound insulation. Gary explained, however, that the 1200 mm-square main columns were just too big to be made off-site and had to be constructed and poured in situ.

"Our goal was to change the way construction was done in New Zealand," explained Gary. "We brought the whole team together in a 'community' in which GEA and Fonterra work side by side. There had to be absolute cooperation between us, the client and the builder. There was some steep learning, but if we had a problem we just talked it through and found a solution together. It is a very refreshing approach. If we had a disagreement we'd get it out in the open and deal with it." The plant commenced production in August 2015.

GEA Group  
[www.geagroup.com.au](http://www.geagroup.com.au)





## Hygiene monitoring system

The 3M Clean-Trace Hygiene Monitoring System offers rapid, simple and reliable solutions for monitoring biological contamination on surfaces in real time, with results in under 60 s. When combined with the 3M Clean-Trace Data Trending Software, users can track and identify trends and pinpoint where a sanitation problem has occurred.

In two recent studies, conducted by Cardiff Metropolitan University in Wales, UK, and commissioned by 3M, the 3M Clean-Trace Hygiene Monitoring System was the only system that showed stability and repeatability of results across both time and temperature differences.

The study evaluated the impact of time and temperature on the stability and repeatability of results generated by seven ATP systems. The results of these studies demonstrate that all ATP systems do not provide the same quality of results.

The 3M Clean-Trace Hygiene Monitoring System provides accurate and repeatable data to support decision-making.

For more information, visit [www.3m.com.au/foodsafety](http://www.3m.com.au/foodsafety).

**3M Food Safety**  
[www.3m.com](http://www.3m.com)



## Signal tower light

Pfannenbergs' BR50 range of signal tower lights offers a flexible modular design with a sturdy housing suitable for indoor and outdoor applications.

Up to five modules with six lens colours may be used on the signal tower with any combination of continuous LED, blinking LED and flashing xenon elements. A sounder module can be added for an audible alarm up to 85 dB and an ASi bus module is available for network integration.

For safety-sensitive applications, a monitored light module is available in red and yellow. The monitored modules have two separate LED circuits integrated within the module, so if one circuit were to fail an alarm contact is activated warning the operator, while the second circuit continues to operate.

The range has multiple mounting options available, including a simple base mount on a flat surface with 100, 250 and 400 mm tube and stand mounting options also available. IP54 protection is standard and IP65 is available as an option.

**Control Logic Pty Ltd**  
[www.control-logic.com.au](http://www.control-logic.com.au)

# MAGNATTACK™ GLOBAL

## MAGNETS FOR METAL FRAGMENT CONTROL AND FOOD SAFETY



40 years experience in food safety magnetics

AUS 1800 835 858

Email: [magnets@magnattackglobal.com](mailto:magnets@magnattackglobal.com)

[www.magnattackglobal.com](http://www.magnattackglobal.com)



International  
Endorsement  
by HACCP  
Australia





### Inline refractometer

The Anton Paar L-Rix 510 inline refractometer is suitable for use in a wide range of hygienic applications, including measurements on pharmaceuticals, dairy, sugar solutions, syrup, food and beverages containing pulp. Designed to perform with a high degree of accuracy, L-Rix 510 comes ready to install with a preset factory setting that never needs adjustment or recalibration. The sensor's soldered optics need no liquid seals and ensure maintenance-free operation for the first 10 years of service life. Users benefit from 'fit and forget' simplicity for years of continuous performance.

L-Rix 510 efficiently handles from 0 to 100 weight concentrations and provides refractive index and concentration results comparable to those of laboratory refractometers. Once CIP/SIP routines are completed, the sensor reactivates in just minutes to minimise downtime.

L-Rix 510 brings built-in intelligence to production-line monitoring. An intuitive touch-screen interface, available in three versions, makes it easy to set up instrument parameters: the L-Rix 510 version for use with Anton Paar's mPDS 5 evaluation unit, L-Rix 510 OT with built-in operating terminal that displays measured values and L-Rix 510 ROT which displays values on a remote operating terminal.

The L-Rix 510 sensor seamlessly integrates with other equipment and controls via analog output or fieldbus connections using PROFIBUS, Modbus TCP, and PROFINET, DeviceNet or Ethernet/IP protocols. It conforms with ASME Bioprocessing Equipment Standards and NAMUR NE107 diagnostic standards and is EHEDG-certified.

**MEP Instruments Pty Limited**

[www.mep.net.au](http://www.mep.net.au)

### Scraped surface heat exchanger

The Kelstream Scraped Surface Heat Exchanger (SSHE), available from INOX, carefully handles thin, medium and high viscous liquids including particulates up to approximately 25 mm. The heat exchanger is suitable for boiling, cooling, pasteurising or mixing.

The device enables food products to be heated and cooled in a controlled way. It is suitable for a range of foods, including general foods (peanut butter, meat, palm oil, tallow, deboned poultry, hamburger, lard, sandwich cream, sausage, potato mash, sweet potato), fruit products (marmalade, jam, jellies), confectionery products (nougat, fudge, gelatine, candy syrups, caramel, chocolate, chocolate filling), and dairy products (milk, pudding, sour cream, yoghurt, butter, cream cheese, ice-cream, margarine, wafer cream).

**Inox Fabrications Australia Pty Ltd**

[www.inox.com.au](http://www.inox.com.au)

### Hydraulics and pneumatic training

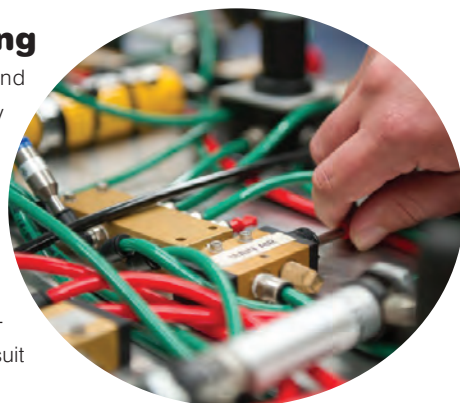
APT Specialist Hydraulics and Training provides nationally recognised and customised hydraulics and pneumatics training, delivered at any location via a mobile practical workshop. All course content, delivery methods and documentation can be customised to suit requirements.

The training range includes: Familiarisation Training, Statement of Attainment, Certificate IV and Diploma. Documentation includes: audits, maintenance/technical manuals, SWPs, FMEA, FMECA, risk assessments and modelling and simulation.

Training delivered at the user's location minimises disruption and cost, while documentation customised to meet compliance requirements will ensure all staff are working from the same information.

**APT Hydraulics**

[www.apthydraulics.com.au](http://www.apthydraulics.com.au)



# AMS

#### Head Office:

Unit 20, 51 Kalma Drv  
Boronia VIC 3155

Ph: 03 9017 8225  
Fax: 03 9729 9604

NSW Ph: 02 8197 2825  
WA Ph: 08 6364 0205  
QLD Ph: 07 3333 2825  
SA Ph: 08 7221 2205

[www.ams-ic.com.au](http://www.ams-ic.com.au)  
[sales@ams-ic.com.au](mailto:sales@ams-ic.com.au)



Oxygen Analysers, Relative  
Humidity Sensors and Meters,  
Dewpoint Measurement



U.V Absorption  
Conductivity  
pH / ORP Colour

## AMS Instrumentation & Calibration Pty Ltd Analytical Process Division



Oxygen Analysers,  
Thermal Conductivity  
Analysers, NDIR  
Analysers, Multigas  
Analysers, OEM Analysers



Industrial Water Analysers  
and Liquid Analytical Products  
(pH, Conductivity, ORP,  
Dissolved Oxygen, etc)



## Pressure transmitter for hygienic processes

Emerson Process Management has introduced the Rosemount 3051HT Hygienic Pressure Transmitter for hygienic applications in which regular clean-in-place/sterilise-in-place (CIP/SIP) regimens can cause measurement devices to become unstable and batch quality to deteriorate.

Routine CIP/SIP and washdown procedures in hygienic processes often cause measurement devices to become unstable or fail, leading to unscheduled maintenance, reduced batch quality and rejected batches. The pressure transmitter utilises pressure sensor technology and a hygienic design to maintain measurement stability for up to five years, enabling repeatable batch quality and high yields.

Pressure transmitters measuring hygienic processes experience regular cycles of high-temperature CIP/SIP cleaning followed by cool-down periods, during which they must return to their original calibration settings. Over time, they can drift incrementally further out of calibration and produce inaccurate measurements, leading to rejected batches, loss of product through tank overflow, or extra processing time in filtration or separation applications. The Rosemount 3051HT stabilises quickly after cleaning cycles, returning to its calibrated settings and allowing manufacturers to produce repeatable batches faster.

**Emerson Process Management**

[www.emersonprocess.com.au](http://www.emersonprocess.com.au)



## Dairy chiller and heat recovery system

Fleming Chillers has released the Fleming Dairy Chiller with an in-built heat recovery system by Industrial Frigo.

Australian dairy farmers require their milk to be cooled from 35°C to 4°C in around 3.5 h, meaning milk cooling accounts for a large percentage of their daily energy costs. The chiller uses a dual bank heat exchanger to precool the milk. In stage one, using available bore or mains water, the milk temperature is brought down from 35°C to around 20°C. In stage two of the process, the integrated glycol chiller further reduces the milk temperature to ultimately achieve the desired 4°C at the vat. The chiller has six outlets for bore water, chilled water and heated water in/out.

Energy savings are significant as the refrigeration technology used delivers high performance with low energy demands. The system is a 'plug and play' design, incorporating precooling, chilling and hot water production, all contained in a single robust frame with one controller, ensuring easy installation and maintenance.

Free hot water is generated by the built-in heat recovery system, which uses superheat from the discharge gas to provide a source of hot water which can be stored and used in shed and plant washdown.

**Fleming Dynamics Pty Ltd**

[www.fleming.net.au](http://www.fleming.net.au)

## ELIMINATE METALLIC FOREIGN MATTER

FORCE 10: SPECIALIST MAGNETS FOR THE FOOD, GRAIN AND DAIRY INDUSTRY

### TARGETING:

- > Protect critical equipment
- > Work hardened 300 Series Stainless Steel fines
- > 400 Series Stainless Steel
- > Contamination that evades metal detection and x-ray
- > Contamination from rotary valves, augers, screws, sifter screens, blowers, fans, ingredients etc
- > Reduced metal detector trips
- > Eliminate recalls



**FORCE10**  
MAGNETIC SEPARATION

NEW ZEALAND | AUSTRALIA | UK | [www.aurora-nz.com](http://www.aurora-nz.com)



## Automatic grape destemmer

The GDM 35 Grape Destemmer is suitable for the automatic destemming of grapes, loosening the grapes without damaging them.

The operating principle is based on two push-pull movements in opposite directions. By generating this movement, two plates will move back and forth in opposite directions from each other. Both plates are placed at an angle, resulting in a wide opening at the top and a narrow exit opening at the bottom. By dropping grapes in between the two plates, the movement will rotate the grapes from the stems and will also transport the grapes towards the exit opening.

To maximise the grip on the grapes, a latex friction cover is placed over the destemming plates. The exit opening can be adjusted by means of a turning wheel. An air-drying unit, placed just above the infed opening of the machine, is controlled via a selection switch. The destemmed grapes are then gently put on a conveyor belt for further processing or end control.

The grape destemmer is said to increase productivity and reduce labour cost. The machine has a capacity of up to 240 kg/h, depending on grape variety

**Reactive Engineering Pty Ltd**  
[www.reactive-eng.com.au](http://www.reactive-eng.com.au)



Biotechnic supplies radially-crimped sanitary hose assemblies to the food and beverage sectors.

We are able to supply custom hose assemblies from 3/4 inch through to 4 inch using FDA compliant hoses.

**TUDERTECHNICA**

We have recently been appointed as the exclusive Australian distributor for Tudertecnica hose from Italy for their Food and Pharma range of hoses.

Email us to be included on our mail list to receive information on new products in 2016, which will include PTFE and Silicone materials. All recipients will receive an *additional* discount on any quotations.

[sales@biotechnic.com.au](mailto:sales@biotechnic.com.au)

Biotechnic Pty Ltd  
 Factory 3/2A Backwell Street  
 North Geelong, VIC  
 Phone : 0418 525 524  
 Email : [sales@biotechnic.com.au](mailto:sales@biotechnic.com.au)

**biotechnic**  
 418-525 5240

## Pasteurisation system helps food waste AD facility achieve PAS 110 certification



Pasteurisation technology supplied by HRS Heat Exchangers has helped international waste-to-product business Shanks Group, gain PAS 110 certification for its Westcott Park anaerobic digestion (AD) facility in Buckinghamshire, UK.

Publicly Available Specification 110 (PAS 110) is a demanding industry specification which verifies the quality of digestate (the organic biofertiliser output from the AD process) and covers the product quality, standards for input materials and the management system for the AD process.

This means that the digestate produced by Westcott Park is of a consistent high quality which can be sold and applied as an agricultural fertiliser. The facility also received a certificate of compliance by Organic Farmers & Growers Ltd, meaning that the digestate can be used by both conventional and organic farmers to provide nutrients and valuable organic matter to their crops.

The Westcott Park facility has the capacity to process 48,000 tonnes of food waste each year, from sources including the retail and catering sectors, and supplies the National Grid with enough electricity to power 6000 homes.

As well as setting limits for physical contaminants, such as plastics, the PAS 110 standard requires pasteurisation of the material before or after it is digested at the AD facility. HRS designed and supplied a HRS3 Tank Batch Sludge Pasteuriser System to pre-pasteurise the food waste feed stock before it is fed into one of the three digester tanks.

The system makes use of heat from the facility's existing combined heat and power engine which would otherwise be wasted, helping to maximise the overall efficiency of the site. It also recovers heat from the hot feedstock, which has been pasteurised, and uses it to pre-warm the feedstock as it enters the pasteuriser system. This provides energy savings of up to 70%.

Ray Natrass, head of process design and engineering at Shanks Waste Management, said the HRS system was chosen because it was a complete pasteurisation solution — with tanks, pumps, control system and control logic built in.

"Our 3 Tank Batch Sludge Pasteuriser System ensured that the facility complied with the requirements for treating animal by-products when it was fully commissioned last year. Now it has been an integral part of achieving PAS 110 certification," said Matt Hale, international sales manager for HRS.

HRS Heat Exchangers Australia New Zealand  
[www.hrs-heatexchangers.com](http://www.hrs-heatexchangers.com)





### Kebab skewering machine

The Compact KKS-860 Kebab Skewering Machine enables customisation of the end product based on specific production needs. Suitable for use in any skewering business, wholesale processed meat suppliers, seafood and poultry processors and Asian food manufacturers, the machine can be used with diced meat, loafed meat, meatballs, fishballs and frankfurts.

Product trays are customised to suit consumer requirements, ensuring processors of a quality and consistent product. Machines are available to suit round, square, flat and paddle skewers. Production ranges from 6000–17,000 skewers/h depending on the type and size of the skewer machine.

**Barnco Sales Pty Ltd**

[www.barncosales.com.au](http://www.barncosales.com.au)

### Sensor for demanding applications

TURCK has expanded its QR24 line of contactless rotary position sensors to include a version with stainless steel housing.

Available in SSI or with incremental outputs, and equipped with 316 stainless steel housing, the variant is built to withstand harsh environments such as those involving chemicals or high-pressure water sprays.

The stainless steel sensor features a fully potted and sealed IP69K/IP68-rated housing to protect against moisture and dust. It also offers flexible parameterisation via IO Link or easyteach, allowing the sensor to adapt to specific application requirements.

The sensor provides users with contactless position detection, executing the same functions but without the need for contact or bearings.

The sensors incorporate precisely manufactured printed emitter and receiver coil systems. The emitter coils are activated with a high-frequency AC field and produce an inductive RLC circuit with the positioning element. The element is inductively coupled with the receiver coils, which are arranged so different voltages are induced in the coils, depending on the position of the actuator. The voltages serve as a measure for the sensor signal.

**Turck Australia Pty Ltd**

[www.turck.com.au](http://www.turck.com.au)



## HYDROFLUX industrial

## What's new in food wastewater treatment?

A European cheese manufacturer has turned their wastewater treatment plant from an eyesore into a garden with an Organica Food Chain Reactor



### Hydroflux Industrial Pty Ltd

Level 26, 44 Market St. Sydney NSW 2000 Australia

EMAIL [info@hydrofluxindustrial.com.au](mailto:info@hydrofluxindustrial.com.au)

WEB [www.hydrofluxindustrial.com.au](http://www.hydrofluxindustrial.com.au)

CALL 1300 417 697



## Mobile odour control system for freezing temperatures

The OdorBoss 60G with Heat, by Dust Control Technology, combines an enclosure with insulation, heat tracing and internal heat generation to protect equipment and components during operation and storage in freezing conditions. The system is suitable for managing outdoor odour vapour from landfills, waste treatment facilities, livestock operations, paper mills, food processing plants and other operations that experience cold weather.

The unit uses a mixture of water and odour treatment agents to distribute a mist over great distances using a powerful fan that propels the treatment into the air, where it can attach to odour vapour. The result is a reduction in both short- and long-range odour, without equipment clogging or downtime from frozen lines.

The system uses a nucleator nozzle and a 10 hp air compressor to create an engineered fog comprising millions of tiny droplets as small as 15  $\mu\text{m}$  in diameter. The droplets hang suspended in the air for long periods of time as they attract and collide with odour-causing molecules, counteracting them in the process.

Powered by a 480 V power source, the open-ended barrel design contains a 25 hp fan that generates 152.4  $\text{m}^3/\text{s}$  of airflow on one end, which propels the fog located at the other end. The device is mounted on a towable trailer that is also fitted with a 1893 L water tank housed in an insulated metal enclosure. The unit can run for 16 h on a single tank filling under normal operating conditions.

**Dust Control Technology**  
odorboss.com

## Pull wire switches

The Schmersal ZQ900 series rugged safety pull wire switches offer emergency stop solutions for use along the length of conveyors or similar types of installations.

The die-cast body of the switch provides protection from harsh environmental conditions and an external watertight collar provides IP65 ingress protection, making it suitable for use in applications ranging from mining conveyors to packaging systems. Up to 75 m can be covered by one single switch when using a tensioning spring, and LED indication is optional for status indication in installations of more than one device.

Integrated safety features include an emergency stop button on the front housing of the switch, offering full emergency stop functionality across the entire protected area. Wire pull and breakage detection ensures the system remains operational at all times.

Installation is made easier by the addition of 3x M20 cable entries on both sides and at the back of the switch body and setting the tension is aided by a transparent indication window on the front of the housing.

**Control Logic Pty Ltd**  
www.control-logic.com.au

**Solitherm Slim Line Series**

Available in Cooling Capacities of 320W - 1500W

NEW STOCK AVAILABLE

**Solitherm Compact Series**

Available in Cooling Capacities of 750W - 4000W

NEW STOCK AVAILABLE

### ENCLOSURE CABINET PRECISION COOLING

Seifert Systems - Precision air conditioning for process control cabinet applications. Designed to keep your electronics cool and operating at optimum performance. Seifert air conditioning incorporates filter less technology. No need to change filter mats means less maintenance and less down time. Cooling capacities range from 200 watt to 2600 watt. Seifert also offer heat exchanges heaters and fan systems - complete thermal solutions.

A 105 Lewis Rd, Wantirna South VIC 3152  
E info@seifertsystems.com.au T +61 3 9801 1906 / F +61 3 9887 0845

[seifertsystems.com.au](http://seifertsystems.com.au)



# Infrared surface disinfection

## for both the bakery and the bread

Infrared radiation can transfer large amounts of energy in a very short time. This combination of features means that bakeries can use the radiation to disinfect both bakery equipment and bread. Shelf-life increases of three or four days have been reported after bread has been subjected to carbon medium wave infrared (IR) radiation for four seconds prior to wrapping.

Infrared is already widely used within the food sector, providing targeted, controllable heat. Typical applications range from browning ready meals to improving and maintaining chocolate quality and reducing the fat content of many fried products by surface sealing.

The technology can also be used for thermal disinfection, reducing the mould, fungi and bacterial load on equipment and products. The penetrating action of the carbon emitters means that thick spore layers, porous surfaces and dust particles do not limit the germ-reducing effect.

Heraeus Noblelight infrared emitters with Carbon Infrared Technology (CIR) offer power densities up to 150 kW/m<sup>2</sup> and response time of the order of seconds. These fast response times allow for very good controllability so that heat is applied for only as long as necessary, drying and disinfection cycles can be programmed and, if there is inadvertent stoppage of the conveyor belt, overheating of the baked goods or the machinery itself is prevented.

### Disinfect the bakery equipment

Studies show that, with carbon infrared emitters, there is sufficient germ reduction of baking trays between 130

and 140°C in less than 30 seconds. The spore reduction is achieved between 120 and 160°C within 10 to 30 seconds, depending on the emitter power, the wetness of the tray and the desired speed of operation. In the bakery sector, Heraeus Carbon Infrared is already allowing simple, quick and safe disinfection of baking trays, conveyors and other bakery equipment, killing germs and spores to eliminate mildew and fungal growth.

Because of the compact construction of an infrared emitter system, it is possible to retrofit infrared disinfection into existing plant. Moreover, muslin tray cloths are also dried by infrared. This is important when a bakery plant is operated round the clock and it is not possible to carry out drying in the idle phases. By carrying out this infrared drying in parallel with the disinfection, the operating life of the muslin cloths is significantly extended, allowing greater intervals between replacements.

For certain applications, infrared is much more practical than ultraviolet disinfection, which is effective mainly on smooth surfaces and requires a high UV dose to destroy mould and fungi. Carbon infrared emitters from Heraeus






are also eminently controllable, with a response time of 1–2 seconds, so that there is no danger of overheating baked items in the event of unplanned conveyor stoppage. They are also extremely compact, allowing easy retrofitting into existing machinery, and emitter fields can be adjusted to match the width of baking trays.

### Disinfect the bread

Mould contamination of the bread surface between baking and packing is a well-known problem in large-scale bakeries. Mould spores are naturally present within a bakery environment and contamination can take place as the bread cools before it is wrapped.

Heraeus Noblelight CIR heating systems have been shown to reduce the formation of mould on baked bread, prior to

packing, significantly extending bread shelf life. Typically, shelf life has been increased by three to four days on breads subjected to carbon medium wave infrared radiation for four seconds.

Heraeus has carried out successful tests, both in its global applications centres and on-site at various bakeries, to demonstrate the effectiveness of infrared as a mould-prevention technology. It has been shown that mould contamination is prevented if the bread is heated for a few seconds before final packing. Because of the short exposure time, there is no detrimental effect on the taste or texture of the bread. 

Heraeus Amba Australia Pty Ltd  
www.heraeus-amba.com.au

# Double Team

## Dangerous Tramp Metals



**NEW**

**Xtreme Metal Detectors**  
remove *Steel, Stainless, Copper & Aluminium*

**ProGrade Magnets**  
remove *Steel*

Teaming Eriez new Extreme Metal Detector with powerful ProGrade Magnets provides the greatest protection against dangerous unwanted metals in your product or process flow.

Catalogues are available by contacting our office

Visit [www.eriez.com.au](http://www.eriez.com.au)



**ERIEZ MAGNETICS  
PTY LIMITED**

ACN 008 451 885

**21 Shirley Way  
Epping VIC 3076**

**Phone: 03 8401 7400  
Email: [sales@eriez.com.au](mailto:sales@eriez.com.au)**



## 19" projected capacitive touch stainless steel panel PC

Interworld Electronics has released the APC-3993P projected capacitive touch stainless steel panel PC from Apex.



The PC is housed in a fanless fully sealed stainless steel IP65 and IP69K certified enclosure with waterproof I/O connectors.

The unit is supplied with an internal 19" 1280 x 1024 resolution LCD that features 350 nits luminance and 1000:1 contrast ratio. A multitouch projected capacitive touch screen makes the product suitable for operator panel and HMI control applications.

The device includes a built-in motherboard with an Intel Atom D2550 1.8 GHz processor that supports up to 2 GB of DDR3 800 MHz memory. An internal 2.5" SATA2 hard drive bay and SD card slot are provided for system and data storage. Rear waterproof M12 I/O connectors provide access to two COM ports, four USB 2.0 ports, one Gigabit Ethernet port and DC Power. The product can operate from an 11–32 VDC power source.

VESA 100 x 100 rear mounting holes allow the panel PC to be securely wall or arm mounted.

The IP69K certification makes the product suitable for laboratory, food processing and industrial high-pressure hosedown environments. For applications requiring a smaller display, the APC-3593P features a 15" LCD while the APC-3793P provides a 17" LCD. Models with resistive touch screens are also available.

**Interworld Electronics and Computer Industries**

[www.ieci.com.au](http://www.ieci.com.au)



## Robot picking solution with 3D vision

ABB and SICK have developed a robot picking solution using 3D vision technology, in order to deal with objects of variable size and thickness arriving on belts in random positions.


Conventional 2D vision systems lack the height and volume information for determining accurate position when goods naturally vary in terms of height and shape. 2D vision systems determine objects using contrast and colour, while a 3D detection system is based on height and volume measurement. This means that objects can be detected more precisely in situations where the contrast between the objects and background is low or varying, the objects vary in height and shape, or when the carrier belt is wide enough to cause position distortions in a 2D system.

Detecting the height of the object increases throughput and reduces the risk of damage. Using this technique, a robot is able to pick up objects more quickly, with greater options for volume and weight inspection and detecting anomalies on the object.

The robot utilises SICK's IVC-3D vision sensor and the 'belt picking toolkit', a piece of software which allows the system to carry out height-based object detection. Based on laser triangulation, the IVC-3D can capture and report data in three dimensions. Data being reported contains both three-dimensional position data and timing information — the combination of these two data sets allows ABB to control the picking process in both 3D space and time. ABB's fast IRB 360 FlexPicker robot and high-performance line master controls are most commonly used. The system is suitable for products requiring gentle handling, such as pasta packed in pillow bags, fresh cheese, nuts, frozen berries and vegetables, bread, fresh fruit and vegetables, and meat.

**SICK Pty Ltd**


[www.sick.com.au](http://www.sick.com.au)




### ONLY ADD WHAT YOU'RE MEANT TO WITH OIL-FREE AIR COMPRESSORS

Our 100% oil-free Z compressors ensure that you only add air to the food you are producing. Speak to us today about our oil-free Z compressors and the options for your business. Call 1800 023 469

*Sustainable Productivity*



**Compressed Air | Vacuum | Blowers | Industrial Gas | Service**



## Sorting technology enhances quality, reduces waste

Over the past 70 years, Sun Valley Raisins has become one of the largest growers and processors of California raisins, processing a wide range of raisin varieties that are primarily supplied to bakeries, cereal companies and health/snack food companies. Sun Valley Raisins processes 27-32 million kg of raisins each year, exporting 45-55% of its product to Europe and Asia.

In 2009, the family built a state-of-the-art processing facility in the San Joaquin Valley in California, comprising over 9000 m<sup>2</sup> of warehouse, processing and packing facilities.

### Control over raisin quality

Being both grower and processor enables the company to have more control over its product quality. The company aims to invest to provide better quality product, grow its customer base and meet increasing demands, while lowering labour costs.

"We have learned that you must have a long-term plan and continuously invest wisely into your business in order to stay ahead of the industry demands," said Doug Moles, CEO, Sun Valley Raisins.

"TOMRA equipment has helped us achieve a level of standard that is above the market demand and our customers appreciate our attention to quality."

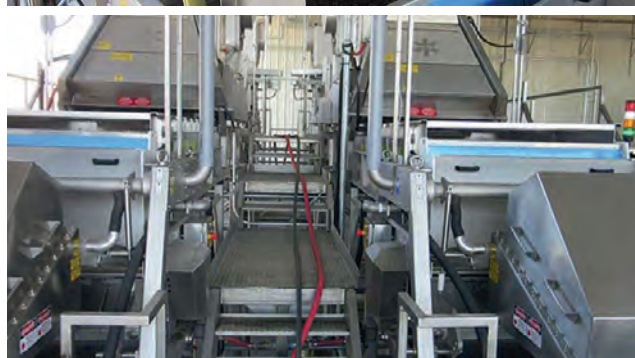
In 2009, Sun Valley Raisins started off with a single Helius laser sorter. Two years later it was ready to expand its processing line and include a second Helius sorting machine and also an Ixus Bulk 800 sorter to help improve on their dense foreign materials such as rocks, glass and metal.

The Ixus sorting machine also provides the ability to find embedded glass and stones that are completely surrounded by good product.

### Reduce good product loss

Sun Valley Raisins, Valley Machine and TOMRA Sorting Solutions have also designed a recovery line to continuously source the good product from that initially rejected, while the main line continues to sort. This has reduced the good product loss, saving Sun Valley Raisins tons of good product while also reducing the labour that would be required to monitor the good product loss.

Recently, Sun Valley Raisins installed a new series of TOMRA sorting machines, consisting of Nimbus free fall laser sorters with double-sided lasers, including an advanced



foreign material detection (AFMD) system that achieves even higher detection results on difficult defects such as cap stems, stems, stalks, stones, plastic and discolourations.

"The equipment is easy to operate and the different levels of operator access allow us to restrict the operator controls to their level of expertise," said Doug Moles.

Heat and Control Pty Ltd  
www.heatandcontrol.com

**Aerofloat**  
Wastewater Treatment Specialists

## DO YOU HAVE A WASTEWATER PROBLEM?

**FIND OUT MORE**  
www.aerofloat.com.au

Aerofloat's world first technology:

- Various models available - Flows from 1-500 m<sup>3</sup>/day.
- Removes up to 97% suspended solids and grease.
- Water quality for sewer discharge standards or wash water reuse.

ray.anderson@aerofloat.com.au  
0419 223 293





# packaging & labelling







Michael B Halley, FAIP

There was a momentous commencement to the October meeting of Australian Institute of Packaging (AIP). Peter Funnell, the Victorian chair of Surface Coatings Association Australia (SCAA), made a presentation to Robert Beth of Ability Building Chemicals, who has just clicked over 50 years as a member of SCAA.

**W**hen Robert, and a number of other AIP members, commenced work, labels were still being attached to parcels using a glue pot and a brush. Even the humble stamp was affixed the same way at the post office counter.

As the meeting's larger-than-usual audience was to find out during the three presentations that followed, the now ubiquitous self-adhesive label needs more than claggy glue to become affixed.

### PSA labels explained

Lance Barlow, BASF industry manager, spoke on PSA label innovations and technologies. PSA stands for pressure-sensitive adhesive, which is much more than it sounds. Simplified, Lance said that a PSA label is adhesive sandwiched between a siliconised release agent and a face stock.

They are permanently tacky at room temperature, adhere to a surface with only light pressure and do not need water or heat to activate the adhesive and create a bond. The uses of PSAs can be found in labels (eg, health and beauty products), graphics (eg, point-of-purchase displays), tapes (eg, painters masking) and in protective films (eg, household appliances).

Lance gave an overview of the application methods and many of the ways that labels or tapes are used in everyday activities. He went on to explain the trends and demands for water-based PSA labels over the years. The coating weights have reduced from 20 to 17 gsm and the tackiness has been lowered to minimise bleed. The adhesion to plastics has improved, as has the clarity and the resistance to water whitening for clear labels on clear bottles. Examples of the latter two

are to be seen in shampoo and wine bottles. Lance then discussed the technical aspects of manufacture and spoke about the various monomers used. The key attributes of emulsion polymers include the environmental advantages, because they are water-based. One aspect that really needs consideration in the marketplace is how a label ages. Labels are subject to heat, ultraviolet and mechanical intrusion, so they have to be durable and cope with the weather aspects of daily life. Lance's mantra was: the secret is to have improved peel and tack at point of application without impacting cohesion too much.

The finale to his presentation was about coater-ready polymers that are compatible with gravure, slot die or curtain coating. The product needs correct surfactant and wetting properties, as well as the correct tackiness. The secret here is to have improved peel and tack at the expense of shear.

In terms of speed, Australia lags behind Germany, where there exists a coating machine that can attain a speed of 1000 m/min and a hot melt coater that runs at 500 m/min.

### Novel applications

Dr Carol Lawrence, FAIP Sustainability & Technical Service Specialist UPM Raflatac Oceania, then gave an insight into pressure-sensitive adhesives for novel self-adhesive labels.

The principles of manufacture of PSA labels are similar to that already described, but Carol was able to expand on what her company calls the label stock value chain. In 2014, global product decoration analysis shows that 39% of sales came from self-adhesives, 37% from pregglued and 17% from sleeves, with the other 7% from in-mould and others. Sleeve labels, mainly used in the beverage industry, are a major



# Better skin packaging

Wanting to extend the shelf life of your products whilst offering premium presentation and minimalistic packaging?

Our MultiFresh™ skin thermoformers are the perfect solution.

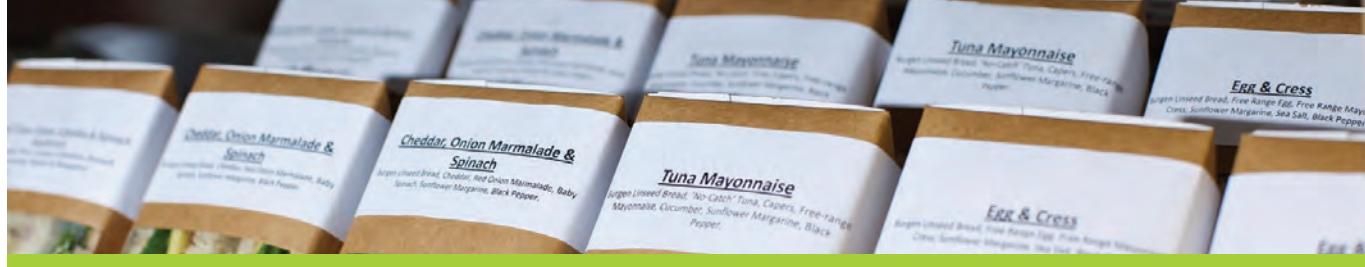
Call Multivac for a no commitment free packaging trial.



**MULTIVAC**  
BETTER PACKAGING

[www.multivac.com.au](http://www.multivac.com.au)

For further information or to speak to our sales team  
please contact [Sales@multivac.com.au](mailto:Sales@multivac.com.au) or contact us on 03 8331 2800



post-consumer problem when used on glass containers. The sleeves become contaminants when glass bottles are crushed to make cullet for new batching.

There are over 12 defined areas where PSA labels are used. It would appear that the applications are as diverse as the materials onto which labels are affixed. PSA labels are affixed to all manner of common items, ranging from motor tyres and lubricants to delicate personal cosmetics.

### What about the ink?

It is all well and good to know how labels are printed, but it all would be very bland without ink. Richard Lau, business manager of DIC Australia, gave a colourful presentation about inks and inking.

Printing inks equate to 30% of a company's production. Richard's agenda was to explain how colour management is evolving and how critical the regulations around food packaging have become.

About the time that claggy glues were being phased out at post offices, there were still some steel nib pens being dipped into inkwells on the counters. Now it is the digital age of colour management — and how different the printing trade has become!

Richard explained that printed samples, wet ink and Pantone books are no longer the final authority of approved colour for major brand owners as digital proofing methods improve.

Colour communication is increasing with embedded artwork files. Data stores in them are being passed on to presses electronically. Everyone in the workflow has value, with higher quality results and faster design, proof and print cycles. It is also more environmentally accepted and the costs are reduced, as is waste.

The digital age was well and truly demonstrated, as Richard also had splendid graphic to demonstrate what he referred to as The Sun-Colour Box. It felt more like *Star Wars* than a packaging seminar. It really is not that daunting, for the whole distribution system of preparation, editing and sign-off is all done using internet technology. Suppliers access common colour data firsthand from Pantone LIVE, utilising enabled production software and the cloud. Once the standards are in the cloud, then the entire packaging supply chain

can connect with an annual subscription. They do this via the production software, which they utilise every day. DIC offers an open ecosystem, which allows multiple partners to get involved and connect their software to the cloud.

The brand owner can control who has access to their special colours via a brand portal. Designers connect via an Adobe Illustrator plug-in, which allows them to see brand-approved colours and enables them to view a design under different conditions.

A case study about Heinz baked beans labelling was demonstrated. Before the company changed over to the digital processing of data, every example tested showed inconsistent colour against the brand owner's original specification.

The second case study discussed by Richard was about the Chesapeake Company.


Richard then addressed the important issue of migration of inks, which is a major global concern. Ink manufacturers seem to have been a victim of the 'law of unintended consequences'. For instance, the recycling of fibreboard has not only contributed to migration of inks but also chemicals from contaminants, such as tapes included in the recycled pulp.

Critical to the necessity to stop migration are the health concerns around food.

Currently there is no EU or Australian legislation specifically defining the acceptable level of migration of ink constituents into foodstuffs. But Richard suggests that the Swiss Food Packaging Ordinance is a positive list of raw materials for use in food packaging printing.

Here are possible solutions:

- Reduced levels = reduced risk.
- Avoid low-molecular-weight monomers and/or oligomers.
- Use materials with a high number of reactive groups to ensure they are chemically locked into the cross-linked ink film.
- Select non-reactive materials so that they are large and can get physically trapped in the cross-linked film.
- Use food-grade additives if possible.

Richard's final summation was that low-migration printing is not just about ink! 

Australian Institute of Packaging  
www.aipack.com.au

## NEW! Dry Vane Vacuum/Pressure Pumps

- Dual purpose for vacuum & pressure
- Compatible for most food packaging & processing machines
- Easier to maintain than oil pumps
- Complete after sales & service support from JAVAC



Contact JAVAC & Speak to our Friendly Sales Team

www.javac.com.au

1300 786 771

 **JAVAC**



## Proficiency testing program for plastic film testing

ASTM International has launched a proficiency testing program for plastic film testing (PFT) with the support by ASTM Committee D20 on Plastics.

This statistical quality assurance tool will help laboratories that want to improve and maintain a high level of performance in conducting a variety of ASTM test methods: tensile properties, propagation tear resistance (pendulum), haze, dart drop impact, tear resistance (graves tear), floss, COF and puncture-propagation tear resistance.

The program enables participants to monitor the strengths and weaknesses of their lab, to compare their test results with other labs worldwide and to help maintain accreditation status.

For each cycle, each laboratory will receive two rolls of film, each made of different materials. These rolls will be 304.8 mm wide with nominal 1 or 2 mm gauge and will contain 15 to 22 m of film to conduct the specified tests. Materials to be evaluated include LDPE, LLDPE and HDPE.

For each test trial, participants will receive two sample materials along with interactive electronic data report forms and test instructions. Labs will conduct the ASTM specified tests of their choice that they routinely run. On completion of testing, each lab will electronically submit its data to the ASTM PTP Center to generate statistical summary reports. Final reports will be electronically distributed within 25 business days of the data submission deadline, containing all test results coded to maintain customer confidentiality, statistical analysis of test data and charts plotting test results versus laboratory code.

**ASTM International**  
[www.astm.org](http://www.astm.org)

## Food or packaging sorting

Pusher mechanisms on divert lines in the food industry are often required to work 24/7 in order to meet demand. Hepco's GV3 linear slides perform over long periods without the need for adjustments. The SL2 stainless steel system can operate with food-compatible grease in areas where food is being directly processed.


The spacer slide is suitable for biscuit divert line applications: where other solutions require support beams spanning the conveyor, the spacer slide needs support only at the ends. Spacer slides are available in widths from 12 to 120 mm, with the choice based on number of carriages, carriage loading and the span to be covered. The most commonly used spacer slides in this application are widths 25 and 44 mm. Individual arms link each carriage with an arm fitted to the carriage to divert the product. The complete assembly is driven by a single motor at the side. The slide's low maintenance is achieved by the use of bearing cap wipers providing lubrication to the V slide surfaces.

**TEA Transmissions Pty Ltd**  
[www.tea.net.au](http://www.tea.net.au)



**Viscofill**

#GermanBlingBling  
#Viscofill

We do more.  **KRONES**

## Effytec provides the ultraclean technology to package baby food

Founded in Hawaii in 1851, Dole Food Company is one of the world's largest producers and marketers of fresh fruit and vegetables, including a growing line of packaged and frozen foods.

One of Dole's products is fruit puree products designed for the baby food market, packaged in a 90 g doypack pouch with top valves. This product requires a stringent hygiene process and high integrity of the pouch seal that preserves the product inside the pouch.

Charged with packaging the baby puree was Dole's contract packaging company Aseptia. Seeking a safe and hygienic packaging process for the product, it selected Effytec's HB-20 Duplex Pouch Filling Machine.

The solution provided included the installation of a laminar flow system over the machine area and hydrogen peroxide

equipment for sterilisation of the valves and packaging equipment. Effytec's patented triple sealing system is able to provide 100% sealing accuracy.

The product filling system comprises two inductive flowmeters with special nozzles for pasty hot filling (85°C) and a pressurised heated hopper with agitation of the product. The production speed of the machine is 110–120 pouches/min. Effytec is represented in Oceania by HBM Packaging Technologies.

*HBM Packaging Technologies*  
[www.hbm.com.au](http://www.hbm.com.au)



## Coating machine for small PET bottles

KHS Plasmax has released the Inn-oPET Plasmax 20QS coating machine for small PET bottles.

The machine is designed to produce bottles with volumes ranging from 100 to 350 mL, with a glass interior coating that enables beverage producers to reduce material costs and achieve a longer shelf life for sensitive beverages.

The reduced-volume coating chambers enable the machine to achieve an output of up to 48,000 PET bottles/h, equivalent to 330 million bottles annually.

The Plasmax coating, a wafer-thin interior coating of pure glass, results in a lighter-weight bottle, which saves up to 30% on materials and cuts PET processing costs, according to the company.

The glass coating enables the production of preservative-free beverages, and KHS Plasmax has developed a FreshSafe-PET logo to communicate this feature to consumers.

The machine is capable of running both the standard Plasmax process for products containing water, acid, fat and alcohol, in addition to the Plasmax process for applications with a high pH and carbonated beverages. The interior glass coating primarily protects sensitive beverages such as juice, wine, beer and carbonated beverages from loss of quality and preserves the flavour and the freshness of the product. The glass layer is virtually unbreakably bonded with the PET, and the bottles can be completely recycled.

**KHS Pacific Pty Ltd**  
[www.khs.com](http://www.khs.com)



## Disposable high-temperature syringe barrels

Nordson EFD has introduced Unity HiTemp disposable 30 cc syringe barrels, which reduce the downtime and maintenance costs often associated with aluminium barrels commonly used in the pneumatic dispensing of hot melt adhesives.

The barrels are available in two models: a standard HiTemp syringe barrel that withstands 125°C for 8 h at up to 6 bar and an Extreme HiTemp syringe barrel that withstands 180°C for 8 h at up to 7 bar. The standard barrels can be used with all hot melt adhesives, including moisture cure polyurethanes (PURs) and silyl modified polymers (SMPs). The extreme barrels can be used with polyamides and other types of hot melts, and block UV light between 200 and 500 nm.

Both models are compatible with all Nordson EFD Optimum metal dispense tips, adapters and end caps. An Extreme HiTemp tip cap is available for applications above 125°C.

The syringe barrels are compatible with both Nordson's dispensing systems and other standard industry hot melt dispensers.

**Nordson Australia Pty Ltd**  
[www.nordson.com](http://www.nordson.com)







# Pack & Seal Solutions for every type of kitchen



Eye catching and inviting food packaging.  
Simple to open and tamper evident.  
Microwaveable, freezable and conventional ovenable.  
Robust, purpose built sealing machines, for busy kitchens.



Free equipment trial:  
<http://ad.confoil.com.au/trial>



## Metal detector system for inline applications

The CEIA THS/RB-800 system from Heat and Control is a CEIA metal detector suitable for use with checkweighers or other inline equipment.

Only 800 mm long, the system includes a CEIA THS/SL21 series slim-line metal detector, round belt conveyor, an optional conveyor speed-sensing encoder and operating controls, all pre-assembled on a sanitary support frame.

The polyurethane cord conveyor is available in three widths and can be removed without tools. Belt speed and aperture height are adjustable to accommodate a range of products.

The system is available with different CEIA metal detectors, including models THS 21, 21E, 21E-3F, and the MS21 which features CEIA's multispectrum technology that eliminates product effect rejects without reducing detection sensitivity. The MS21 typically detects smaller particles of 316 stainless steel, and ferrous and non-ferrous metals in the most challenging applications, such as cheese, wheat tortillas, fresh spinach leaves, ground meat and partially frozen foods.

Standard features of the CEIA MS21 metal detector include: automatic learning and tracking of product defects; high immunity to environmental interference; data memory for 500 products; password-protected access by up to 40 persons; record and signature management compliance, with FDA Title 21 CFR Part 11 for data security, integrity and traceability.

Conformal coated electronic components, a stainless steel casing and keyboard, and specialised aperture seal prevent damage from external moisture.

**Heat and Control Pty Ltd**  
[www.heatandcontrol.com](http://www.heatandcontrol.com)



## Nutritional value calculation and labelling

One factor of success in food processing is the ability to keep up with the high rate of innovation and to implement statutory requirements efficiently.

The CSB-System Value Calculation and Labelling enables food processors to calculate, label and manage all product ingredients, nutritional values, allergens and genetically modified ingredients (GMO) during the entire production process — transparently, efficiently and in compliance with the latest food regulations.

Users link product ingredients to the raw materials in the CSB-System. Based on that, any recipe can be created, with all relevant ingredients directly allocated to the items.

The coding elements (ingredient, nutritional value, allergen, GMO labelling) can be created in different languages. Per product and language, up to six different units can be displayed at the same time. Additionally, users can quickly integrate all national and international ingredient and nutritional value data bases. Based on an item's BOM and its production variants, the ingredient, nutritional value, allergen or GMO labelling is carried out for each item in alignment with its assigned ingredients, taking process losses and additives into account. Definable calculation formulas can be created and derived quantities of basic units can be calculated automatically. In addition, ingredient calculation automatically initialises item labels and product specifications for products.

The system ensures that the product labelling is as transparent as possible.

**CSB System**  
[www.csb-system.com](http://www.csb-system.com)

# FREE SUBSCRIPTION

*What's New in Food Technology & Manufacturing* is **FREE** to industry professionals in Australia & New Zealand.

To **continue** receiving your free copy you will be asked to register every three years.



QUICK REGISTRATION @ [www.FoodProcessing.com.au/subscribe](http://www.FoodProcessing.com.au/subscribe)



# Helping Australian food manufacturers compete through labelling and coding solutions.

Our unique labelling and coding solutions can identify, distinguish and promote your brand and bring it to life. We're confident our leading technologies will make a difference to your bottom line.



Helping Australia Compete.

 [www.insignia.com.au](http://www.insignia.com.au)  1300 467 446  [sales@insignia.com.au](mailto:sales@insignia.com.au)





# Open and shut case:

consumers like reclosability

Benefits of pre-applied zipper packaging film

Reclosable packaging is in a period of rapid growth as many manufacturers realise the added value reclosable features offer consumers. This is especially true in the food industry, where a push towards reclosability has led to the implementation of a number of reseal technologies: traditional zip locks, slider locks, re-usable adhesives and even Velcro-like closures. Pre-applied zipper film can provide a way for companies to make the shift from traditional to reclosable packaging without significant cost or lag time.

**F**lexible reclosable packaging offers benefits both to consumers and end users as well as to manufacturers. For end users, the primary benefit of reclosable packaging is freshness. From food products to cleaning supplies, items packaged in reclosable containers maintain their freshness longer. In this way, reclosable packaging adds value to consumers, and in many cases is more efficient.

Take, for example, frozen food items like chicken nuggets. This product is typically packaged in a carton, often with a plain, flexible plastic bag inside. When consumers use only some of the food items from the original package and wish to store the rest, they must choose between leaving the food items in their original package or in the open plastic bag within, or removing the chicken nuggets from their original packaging and placing them in a freezer-safe container. With the first choice, the customer has opted for ease of use; with the second, they have opted for sustained freshness. Storage efficiency also comes into play in this scenario as flexible packages are more space-efficient than rigid ones.

When the frozen food items in this example are packaged in a reclosable package from the start, consumers need no longer choose. They gain the added value of sustained freshness and

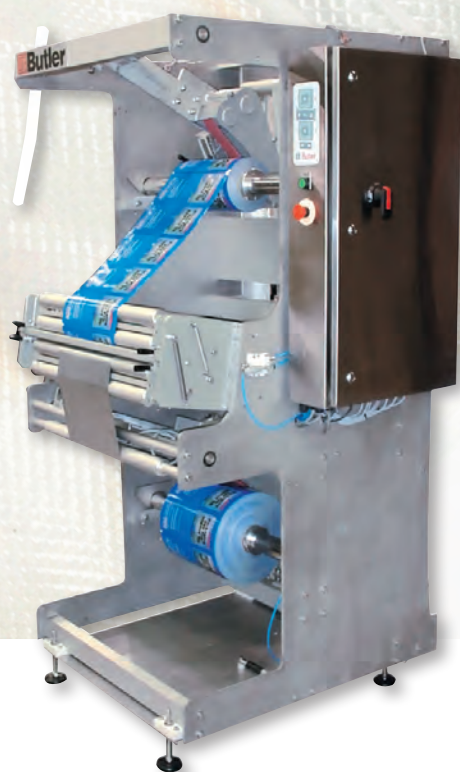
storage space efficiency without compromising ease of use, and without having to purchase additional packaging. Consumers are often drawn to these efficient, value-added packages.

Also, the frozen food manufacturer gains added value from switching to flexible reclosable packaging. Usually the consumer will discard the original carton, with all associated brand recognition, after first use. With the use of reclosable packaging, that likelihood is considerably reduced. Flexible, reclosable packages are better marketing collateral, with improved brand recognition, than other types of packaging that are more likely to be discarded early in the product's life.

## Pre-applied zipper packaging film makes reclosable feasible

While many companies can benefit from packaging their products in reclosable packages, many may not consider making the shift from other types of packages due to the perceived high cost. The change from a traditionally sealed package to a reclosable package requires a significant capital expenditure if the reclosable feature is to be added in to the packaging line. While this investment may pay off for some companies, it is simply too risky for others. Even those companies that decide the capital expenditure is worthwhile must contend with long lag times.





© verusangel / Dollar Photo Club

*Butler Automatic's splicers eliminate roll change downtime, increasing throughput dramatically, particularly in pre-applied zipper applications.*

For those companies for whom inline addition of reclosable features is untenable, pre-applied zipper film offers a more convenient solution. Pre-applied zipper film requires the same packaging equipment as other flexible roll stock. With no need for new equipment, companies can switch to reclosable packaging from other flexible packages without any additional capital expenditure or long lead time. Pre-applied zipper film offers all of the benefits of zipper packaging detailed above, adding value for consumers and manufacturers, and is far 'faster to market' than other reclosable package options.

"Whereas switching from a traditional packaging line to a line that includes the addition of a reclosable feature requires new, costly machinery and time to get that equipment up and running, beginning to package using pre-applied zipper film requires only a few adjustments to existing equipment and then you're ready to run," said Dan Donahue, president of Donahue-Corry Associates, Inc., a US-based company specialising in flexible packaging.

"We have seen a huge amount of growth in reclosable plastic packaging recently, and we see pre-applied zipper film as one of the areas with the greatest growth potential, due to its convenience. It lowers the barrier to entry," Donahue

added. His company, which focuses primarily on customers with unique packaging requirements, prints and supplies the film to a number of customers.

### **Running smoothly with pre-applied zipper film**

As with all types of reclosable, flexible plastic packaging, there is some added expense to manufacturers using pre-applied zipper film due to the added zipper component in the film.

"It is up to each customer to determine whether the added value of reclosable packaging, in the form of improved brand recognition and consumer convenience, is worth the added expense of the film," Donahue noted. "Given the recent and ongoing expansion of products being offered in reclosable packaging, it is clear that for many companies, that added expense is worthwhile," he added.

Pre-applied zipper film is not without its unique challenges, like all kinds of packaging. The zippers in the printed film add bulk and so the film does not roll as tightly as standard roll stock. This leads to a lower roll density than is achieved with standard roll stocks, and therefore fewer impressions per roll. Donahue estimated that a roll of pre-applied zipper film has about one-third as many impressions as a comparable roll of laminated or unlaminated roll stock. This, of course, leads to more frequent roll changes and the potential for added downtime in the packaging line.

"Expiring rolls must be replaced in order to keep the packaging line running. When replaced by hand, as is customary, roll changes can take as long as three to five minutes. When rolls are being changed, say, once every 20 minutes, as may be the case with pre-applied zipper film, that time adds up — over an hour and a half of production time lost in a single 8-hour shift on a single line," said Chris Graff, vice president of sales and marketing, at US-based Butler Automatic. "That's an hour and a half's worth of packages not being made, shipped and sold from that line during each shift."

The problem of roll changes decreasing throughput is common throughout the packaging industry; in fact, roll changes are often the single greatest cause of downtime in a packaging line. That's why, Graff says, Butler Automatic exists. The company is the inventor of what's known as zero-speed automatic splicing — technology that eliminates roll change downtime by allowing operators to perform precise splices at the ideal moment in a roll's lifespan, all while packaging film is fed to the line uninterrupted.

"Eliminating roll change downtime is important in any packaging operation, and is even more important with low-density zipper film rolls," Donahue said. "Combining our top-quality pre-applied zipper film, for instance, with the efficiency of the automatic splicer results in high-throughput production of excellent quality packages."

By automatically and precisely timing splices so as to utilise as much of each roll as is possible, automatic splicers



Reclosable features add value for manufacturers and consumers alike.

like the ones sold by Butler Automatic reduce the amount of film that is wasted. This has an impact on the efficiency and cost of packaging, especially for more costly films like pre-applied zipper film. Additionally, reducing splice time from 3–5 minutes to a matter of seconds, combined with the automatic timing of splices, means that operator staffing demand is greatly reduced. These factors, when combined with the dramatic increase in production throughput, leads to a rapid return on investment for automatic splicers.

Automatic splicing can also help to eliminate the likelihood of catastrophic failures that can result from splice issues. By automatically aligning the path of the film through the machine, automatic splicers can compensate for any web misalignment caused by the awkward winding of pre-applied zipper film rolls. In addition, the integrity of the splice is compromised if it occurs on or too near to a zipper. By automatically initiating splicing within predetermined distances to register marks, the automatic splicer ensures that the splice



Butler Automatic's splicers eliminate roll change downtime, increasing throughput dramatically, particularly in pre-applied zipper applications.

will hold. Without these features, the splice can separate or catch within the machinery, leading to splice failures and significant downtime.

Pre-applied zipper film holds a great deal of promise as a turnkey solution for companies looking to enter into reclosable packaging, with all of its associated benefits, without the worry of high capital expenditures and long lag times. Though the packaging material itself is somewhat more costly than standard alternatives, the improved final package imparts value to consumers as well as to the manufacturer. By implementing automatic splicing along with pre-applied zipper film, packaging downtime can be all but eliminated, leading to a rapid return on the company's investment not only in the automatic splicer, but also in the pre-applied zipper film itself. This innovative packaging solution holds great promise as the use of reclosable packaging continues to grow.

Butler Automatic  
www.butlerautomatic.com



## Flexible packaging line handles diverse portfolio for snack manufacturer

Located in Florida, USA, ARA Food Corporation manufactures snacks and chips, including plantain, yuca root, cassava and white sweet potato chips, pork rinds and pork cracklings.

Because of the diversity of its product range, ARA looks for solutions to minimise overheads wherever possible. The company needed a flexible packaging solution capable of handling different bag sizes quickly and efficiently, with minimum machine downtime.

The answer was a new packaging line featuring tna's robag FX 3ci vertical form, fill and seal (VFFS) system, complete with a tna intelli-weigh 0314 omega multihead weigher, tna metal detector, tna intelli-date date coder and labeller. Used to pack ARA's range of snack chips, the system is designed with flexibility in mind, in order to handle different bag sizes - ranging from 60 to 450 g net weight - as well as work with the various polypropylene BOPP bag film finishes required for each product brand.

"Reducing waste, cutting downtime and preventing overweighing were key requirements from the new packaging system. With two tna robag systems already installed and performing consistently well in our plant, we knew another tna machine was our best option for the additional line," explained Oscar Tanaka, manufacturing coordinator at ARA Food Corporation.



"ARA's new system is fully integrated, customised and built to maximise uptime as well as bring waste down to a minimum. This system sets new standards in OEE (overall equipment effectiveness) including groundbreaking output speeds. We were also able to meet ARA's request to simplify operations with our integrated design - making changeovers and running the system quick, easy and standardised. The net result is what everyone strives for - greater output with less waste," said Jack Newman, tna project manager and regional sales manager.

TNA Australia Pty Ltd  
www.tnasolutions.com



## Filling machine

The Tetra Pak TR/G7 low-cost, easy-to-operate, high-performance filling machine has a capacity of 6500 gable top packages for chilled distribution per hour.

In addition it delivers environmental benefits as it is claimed to cut electricity consumption cut by a third.

Compactly designed and taking up less than 19 m<sup>2</sup> of floor space, the machine is suitable for smaller factories. It is easy to install, use and maintain, and is delivered as a single unit, which means it can be swiftly assembled within four days. This minimises costs and enables production to begin quickly.

Just one person is needed to operate two machines due to its low complexity, and production can be monitored through its touchscreen operator panel. Access to the machine for maintenance has also been simplified to reduce production downtime during servicing.

It is not only suitable for small and medium dairies that are looking for low-cost investment, but also for producers intending to upgrade their existing lines, especially in markets like Europe and Japan.

Developed in collaboration with filling machine producer Galdi, Tetra Pak TR/G7 is designed for a range of extended shelf-life products, including white milk, juice and still drinks, in four package volumes: 250, 500, 750 and 1000 mL. The machine delivers quality and flexibility in packaging production, including the option to tailor the machine for individual customer needs. This includes adding functions such as a cap applicator, waste carton ejection system or a movable oil drop plate to make cleaning easier.

**Tetra Pak Marketing Pty Ltd**

[www.tetrapak.com/au](http://www.tetrapak.com/au)



**DFC Packaging shrink sleeves provide full tamper evidence and 360 degree printable area using latest Gravure printing technology. Sleeves can provide total UV and visible light block.**

**Our range of shrink sleeve application machinery will save you time and money**



DFC Packaging  
Vic.  
22 Summit Rd  
Noble Park, 3174  
03 9701 2000  
[sales@dfc.com.au](mailto:sales@dfc.com.au)  
[www.dfc.com.au](http://www.dfc.com.au)



**dfc**packaging  
[Sleeves] Pty Ltd

ABN: 73 088 253 212

DFC Packaging  
NSW.  
5 Healey Circuit  
Huntingwood NSW 2148  
02 9625 0266  
[sales@dfc.com.au](mailto:sales@dfc.com.au)  
[www.dfc.com.au](http://www.dfc.com.au)

## Clean and safe: the real packaging challenge

The L29 single-beam photoelectric safety switch, developed for the packaging manufacturer MULTIVAC, stops dangerous movements safely if someone reaches into the forming station in a thermoforming packaging machine. Together with MULTIVAC, SICK has developed custom solutions such as inductive proximity sensors, fork sensors, photoelectric retroreflective sensors for transparent objects, encoders and more for packaging machines used in the food industry.

MULTIVAC is one of the leading global suppliers of packaging solutions. Alongside thermoforming packaging machines, the portfolio covers everything from tray sealers, vacuum chamber machines, chamber conveyor belt machines, labellers, quality control systems and automation solutions right up to turnkey lines. With around 4500 employees and more than 70 subsidiaries, the company develops and builds turnkey packaging lines which supply, manage, separate, inspect and label packaged products and their secondary packaging. The processes of a packaging line can be controlled centrally via the HMI 2.0 user interface from MULTIVAC, making it possible to monitor process data and process it further electronically, so that products are traceable.

### Everyone is looking for the ideal solution

The forming station in a thermoforming packaging machine creates packing moulds. The machine uses heat to warp the foil and compressed air and a vacuum to thermoform it. It is then transported to the infeed area where the moulds are filled with the products. This is all done with mechanical movements. This means that the transition from the forming station to the infeed area must be secured in such a way that the machine movement stops as soon as a person enters the area.

As part of the redevelopment of its safety concept, MULTIVAC was on the lookout for a photoelectric switch that fulfilled the new requirements as effectively as possible. Ideally, the photoelectric safety switch should have an evaluation unit. However, the conventional single-beam photoelectric safety switches from SICK were too big. SICK therefore developed a photoelectric safety switch from one of the photoelectric switches used for detection in automation technology.

SICK's L29 single-beam photoelectric safety switch slots seamlessly into the HMI 2.0 user interface from MULTIVAC. The sender axes can be retained as the photoelectric switch

can be fitted in the same position as the previous photoelectric switches, due to its compact size. The L29 has enclosure ratings IP67 and IP69K, as well as Ecolab approval. The VISTAL housing gives the product outstanding mechanical ruggedness. In addition, the housing had to be adapted to the MULTIVAC design and the logo and part number from MULTIVAC had to be visible on the sensors. SICK met all of these requirements.

### Making safety a priority

The L29 photoelectric switch fulfils the requirements of safety classes type 2 (IEC 61496), SIL1 (IEC 61508), PL c (EN ISO 13849) when combined with a test device from the Flexi Classic product family (UE410-MU). As far as electromagnetic compatibility is concerned, stricter threshold values are required. The L29 can achieve these values with some small adjustments to the electronics. For safety reasons, the maximum permitted aperture angle must be observed. If the angle is too large, the sensor cannot detect hands or fingers due to the reflective surface. This is where the L29's PinPoint LED with its highly visible light spot comes into play. The SIRIC optical technology makes this photoelectric switch more powerful than conventional ones. It is not sensitive to any known optical and high-frequency influences such as ambient light, vibrations or electromagnetic influences.

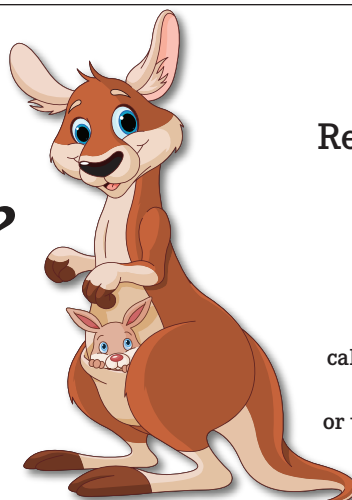
### Strong housing

The L29's VISTAL was one of the key motivating factors behind MULTIVAC's decision to opt for the product. VISTAL is a rugged housing material, consisting of high-strength plastic reinforced with glass fibre. With mechanical properties which exceed those of conventional plastics, the stable and rigid sensor housing is resistant to chemicals, meaning that cleaning agents pose no problem for the sensor. This is essential in hygienic environments in the food sector, where MULTIVAC packaging machines are used. As MULTIVAC did not want the photoelectric safety switch to interfere with the safety concept of the machine, it was also adapted to match the design of the packaging machines. The TÜV, a German certification body, has issued the type test certificate, meaning that all safety requirements had been fulfilled.

SICK Pty Ltd  
[www.sick.com.au](http://www.sick.com.au)

*How will you  
protect your Joey?*

**ZIPPAK**  
We're Uniquely Flexible.



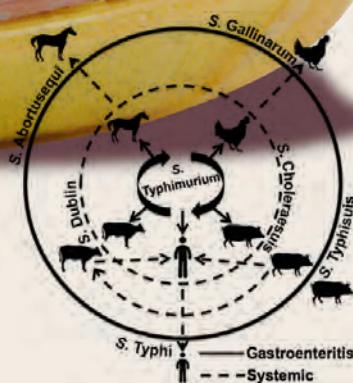
Re-close your pouch with

**VECTOR**  
Resealable Matrix

For more information  
call AUS: 03 9579 3911/NZ: 09 838 5747  
email at [salesausnz@zippak.com](mailto:salesausnz@zippak.com)  
or visit our website at [www.zippak.com](http://www.zippak.com)

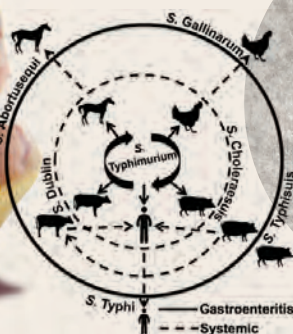



# Salmonella's host specificity



With this statistical support in hand, the researchers went into the lab to test their findings. They chose to closely examine the adhesive properties of the protein FimH encoded by the gene *fimH*, which had shown the most variation in their previous analyses, a total of 17 variants, for their experiments.

“Manipulating bacteria in this way allowed us to show a cause and effect relationship between an SNP in an adhesin gene and the bacteria’s host specificity,” Schifferli said. Further studies expanded this look to more serovars beyond



“The power of bacterial genomic association studies is that they can guide your work in the lab,” he said. 



- Hygiene monitoring
- Pathogen detection
- Microbial swabbing
- Microbial enumeration
- Allergen detection
- Antibiotic residue detection
- Sample collection and transport



**Prodetec Pty Ltd**  
[www.prodetec.com.au](http://www.prodetec.com.au)



Phone + 61 2 9882 3666  
Email [amsl@amsl.com.au](mailto:amsl@amsl.com.au)  
Web [www.amsl.com.au](http://www.amsl.com.au)



# Testing



NEWS



## Bacteriophage effective against deadly bacteria in infant formula

A bacteriophage has showed strong antimicrobial activity against a type of foodborne bacterium that often kills infants after infecting them via infant formula, according to research published in *Applied and Environmental Microbiology*, a journal of the American Society for Microbiology.

The study found that the CR5 phage showed high antimicrobial activity against the bacterium *Cronobacter sakazakii*, as well as against several other species of *Cronobacter* which can also cause dangerous illness, said co-author Sangryeol Ryu, professor in the Department of Agricultural Biotechnology, Research Institute of Agriculture and Life Sciences, Seoul National University, Korea.

The research was conducted using infant formula that had been contaminated with *C. sakazakii*. “Interestingly, CR5 killed *C. sakazakii* quickly, and no *C. sakazakii* was detected in the infant formula after 10 hours had passed,” said Ryu.

Ryu said the phage is safe for humans, noting that his analysis of its genome revealed neither toxin gene nor virulence factor. In 2006, the US Food and Drug Administration approved the use of bacteriophages as biocontrol agents in foods, but the agency does not allow the use of antibiotics in infant formula.

Bacteriophages are abundant in the environment — which means they are ecologically friendly, said Ryu. “They infect and kill only bacteria, which means they could be used as novel biocontrol agents and even as natural food preservatives,” he added, noting that other foodborne pathogens could also be controlled by other types of phages.

*Cronobacter* is a family of closely related species that cause illness in people of all ages. While infection is rare in the US, these bacteria kill up to 40% of infected infants. Additionally, those that survive can face long-term neurological problems, according to the Centers for Disease Control and Prevention.

*C. sakazakii*-contaminated infant formula has been considered an unsolved problem because antibiotics cannot be used, according to Ryu, who added that *C. sakazakii* has been known to have multiple antibiotic resistance genes.

“In this study, we proved that *C. sakazakii*-phage CR5 is an efficient biocontrol agent in infant formula. Therefore, this bacteriophage treatment is a promising approach to solve this problem.”



## #salmonella — tracking foodborne illness with social media

Social media use is booming, and buried among the selfies and Instagrammed food porn, statisticians are beginning to find insightful information that could help improve public safety.

At the 2015 Joint Statistical Meetings in Seattle, biostatistician Elaine Nsoesie presented a method for tracking foodborne illness and disease outbreaks using social media sites such as Twitter and business review sites such as Yelp.

Her study, ‘Digital Surveillance of Foodborne Illnesses and Outbreaks’, set out to assess whether crowdsourcing via online reviews of restaurants and other foodservice institutions could be used as a surveillance tool to augment the efforts of local public health departments. She said that traditional methods of data gathering capture only a fraction of the estimated 48 million foodborne illness cases in the US each year, primarily because they rely on affected individuals seeking medical care or reporting their condition to the appropriate authorities.

Nsoesie’s results showed foods such as poultry, leafy lettuce and molluscs, which were implicated in foodborne illness reports on Yelp, were similar to those reported in outbreak reports issued by the U.S. Centers for Disease Control and Prevention.

“Online reviews of foodservice businesses offer a unique resource for disease surveillance. Similar to notification or complaint systems, reports of foodborne illness on review sites could serve as early indicators of foodborne disease outbreaks and spur investigation by local health authorities. Information gleaned from such novel data streams could aid traditional surveillance systems in near-real-time monitoring of foodborne-related illnesses,” said Nsoesie. Nsoesie said that Yelp data could be combined with additional data from other social media sites and crowdsourced websites to further improve coverage of foodborne disease reports.

© iStockphoto.com/hatfasciock

TESTING

## Automated sampling for yeast fermentations in wine

The Wine Microbiology and Microbial Biotechnology Laboratory at the University of Adelaide has developed a customised solution offering fully automated sampling for yeast fermentations. Based on a Tecan Freedom EVO 200 platform, this system frees researchers from the need to manually aliquot samples day and night for up to three weeks. Dr Tommaso Liccioli Watson, a postdoctoral research fellow in the laboratory, explained: “We use approaches such as directed evolution and mutagenesis to develop novel yeast and bacterial strains to improve the winemaking process. However, these methods are often very time-consuming, requiring large-scale screening of hundreds or even thousands of candidate strains, often from heterogeneous populations. Monitoring the fermentation process for large numbers of samples is very laborious, requiring sampling of fermentation vessels every six hours or so over the course of several days to several weeks.

“Automation was the solution, and Tecan’s Freedom EVO really stood out. We were able to integrate our own custom hardware solutions onto the platform with relative ease, building a walkaway fermentation monitoring solution to generate 96-well microplates ready for loading onto our various



analytical instruments. It only takes half a day to set up a 96-fermentation experiment, which can be remotely monitored via a smartphone from another lab, from home or — because this is Australia — from the beach. Compared to having to be in the lab every few hours, day and night, this is fantastic.”

**Tecan Australia**  
[www.tecan.com.au](http://www.tecan.com.au)



### Same-day test for *Campylobacter*

*Campylobacter* is a pathogenic bacteria and one of the most common causes of food poisoning in Australia.

Symptoms include diarrhoea, abdominal pain and fever that lasts up to two weeks. It is most commonly associated with contaminated poultry, water and unpasteurised dairy.

Current screening methods for *Campylobacter* rely on traditional microbiological techniques, which take up to 3 days and require microaerophilic conditions adding to the complexity of the test.

Veriflow Campy Q from Invisible Sentinel is the latest test available on their molecular flow-based detection platform. The test requires only 10 min sample preparation time and provides quantitative *Campylobacter* species results in around 3 h. Campy Q has been validated for use on poultry carcass rinsates and detects down to 1–2 cfu per mL.

Minimal equipment is required for the Campy Q, and it is user friendly, so the test can be performed at any food processing site or laboratory.

Campy Q is available in Australia from Australasian Medical & Scientific Ltd.

**Australasian Medical & Scientific Ltd**  
[www.amsl.com.au](http://www.amsl.com.au)

### Volatile analyte containing sample concentration

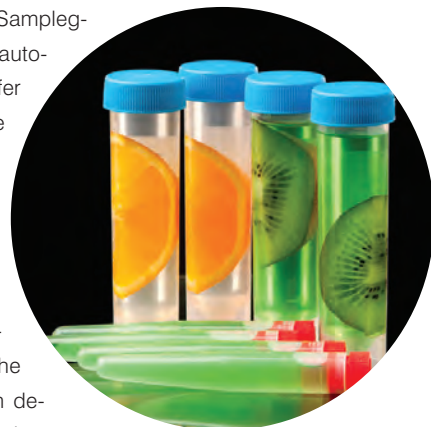
Genevac's evaporator systems can be used to safely prepare samples containing volatile analytes in a wide array of food and beverage applications ranging from testing constituents of beverages and gluten levels in whisky to pesticide analysis of fruit and vegetables, as well as determining vitamin levels in cereals.

Concentration technology in Genevac systems has been developed with leading analytical laboratories worldwide. This, with key technologies like DriPure, ensures that samples are concentrated safely and rapidly.

Genevac EZ-2 and Rocket evaporators, used in conjunction with Samplegenie technology, deliver automation of sample transfer and give good sample recovery and inter-test reproducibility with very low standard deviations.

Samplegenie aids concentration because samples can be concentrated directly into the analysis vial. The system detects when the solvent level enters the vial and, once validated, the method will then concentrate the sample to the required level. If a precise volume is required in the vial, then the sample can be overconcentrated and then made up to the desired level with pure solvent.

**Scitek Australia Pty Ltd**  
[www.scitek.com.au](http://www.scitek.com.au)











# Conductivity measurement:

## a hidden key to dairy industry success

*Philip Edwards, Product Manager, Liquid Analytics, Emerson Process Management*

**As the dairy industry moves to continue to grow and thrive, while remaining globally competitive, one of its biggest challenges will be how well the industry can maintain best practice processes that sustain a high quality focus, while delivering high-efficiency processes that minimise waste and downtime.**

**T**o ensure this consistent product quality, the equipment used in the manufacturing of dairy products is not only made from the highest grade of material, but also needs to be cleaned and maintained in such a way as to minimise any possible contamination when changing from one product to another or from one batch to another. This process is called CIP (clean-in-place).

To remain competitive, it is important to minimise production downtime without compromising on the safety and quality of the end product. In the CIP process, conductivity measurement is used to determine how effectively equipment has been cleaned and flushed. Conductivity in CIP picks up the change in the electric conductivity of a sample stream to indicate when a flushing process has started and ended. On a rinse cycle, for example, low conductivity indicates that all chemicals in the process stream have been flushed out and it's ready for the next batch of product.

### **An interesting case history**

A major global dairy company with plants around the world was experiencing challenges with its liquid analytical systems, particularly as related to CIP. CIP systems thoroughly clean wetted components such as tanks, vessels, fermenters, process

lines and inline sensors. The CIP process controlled the flow of pre-rinse, wash and post-rinse cycles, which include caustic rinse, acid rinse and water rinse cycles.

Conductivity sensors are a critical component in the design of CIP systems. The various cleaning solutions have more conductivity than the water used for flushing and final rinse. Since many systems are a 're-used design', the sensor can monitor the strength of cleaning solutions as chemicals get used up through successive cleaning cycles. Conductivity measurements can indicate the need for replenishment. To ensure that each piece of equipment has been thoroughly sanitised, conductivity sensors are used. Low conductivity indicates rinsing, as well as the completion of the cleaning process.

Any sensors that have to withstand CIP and sterilisation must be able to function under very harsh conditions — not a simple requirement for a sensitive analytical sensor. The dairy company was experiencing up to a 50% failure rate on sensors each year, at an approximate cost of \$1200 per sensor. Much worse, however, was the cost of plant downtime — up to \$100,000 per hour. The significant failure rate called the reliability of every sensor into question after a short usage period. As a preventive measure, every conductivity sensor





was replaced at the end of the season, which required another CIP cycle to be performed, adding even more costs and delay to production. It was preferable, however, to the possible dumping of milk product that would have to occur in the event of a sensor failure during processing.

The company had an equally pressing problem in that it required a supplier that could provide backup stock immediately in the vicinity. Due to the remoteness of the locations worldwide, this issue is more of a problem and requires the costly step of having additional inventory in stock. When the company set out to solve its technical issues, it also required that the new supplier provide backup stock and an agreed-upon price.

### A unique solution

To solve the problem, the company settled on a unique sensor technology designed for CIP in the life sciences and food and beverage industries, using four electrodes rather than the traditional two. The wide dynamic range of the sensor, called the 410VP (1  $\mu\text{S}/\text{cm}$  to 1400  $\text{mS}/\text{cm}$ ), makes it ideal for CIP monitoring.

Instead of two sensors — one to measure the high-conductivity cleaning solution and the other to measure the low-

conductivity rinse water — a single 410VP was used. This is the first single four-electrode sensor that does the complete CIP conductivity measurement. The result is lower initial cost, less space taken up by sensors and analysers, and reduced maintenance and training requirements. In addition to CIP monitoring, the sensor can be used to observe the conductivity of elements and detect liquid interfaces.

All wetted plastics and elastomers in the 410VP sensor are compliant with FDA food contact regulations, and all wetted surfaces except the electrodes have a 0.4  $\mu\text{m}$  Ra finish. The sensor is designed and certified to meet 3A and EHEDG hygienic standards, and is available in 1½" and 2" Tri-Clamp, Varivent N and G-1¼ sanitary fittings. A quick-disconnect Variopol fitting is standard, making removing the sensor from the process piping easy. The sensor is calibrated at the factory, so startup is fast and easy. The 410VP sensor incorporates a Pt1000 RTD for temperature compensation. The RTD makes contact with the sample through a stainless steel interface, so response to temperature changes is rapid. Conductivity accuracy is reliant on temperature compensation, and more rapid temperature measurement provides more accurate conductivity measurement.

All of these features stood out for the company as compared to traditional sensors generally used for these applications. The biggest issue when looking at conductivity in the CIP system is the quick response needed to temperature changes. This is required as they want to pick up the leading edge of the flush water, since this means that less of the flush water is dumped into the chemical reclaim tanks. The traditional probe has its temperature sensor buried in the casing so it reacts more slowly to changes in temperature (up to 3–5 minutes for a 60% change). The 410VP has its temperature sensor mounted on the face of the probe, which means that it gives a far quicker response to changes in temperature (around 15–20 seconds for a 60% change). The other issue when using the traditional probe in smaller lines is that the sensor sits in the line and can create pressure drop problems, whereas the 410VP sits only marginally in the flow so it does not cause the same issues with pressure drop.

### Predicting outcomes

The sensor was used in combination with a unique multiparameter, intelligent analyser (the 1056), which offered the company the flexibility to be able to add an additional measurement to the system at any time through the simple addition of an input card.

That same snap-in process enables fast, easy, inexpensive repairs should any be required. In addition, and perhaps most importantly, the analyser also offers the company a full range of predictive diagnostics. The analyser continuously monitors itself and the sensor(s) for problematic conditions. The display



flashes 'fault' and/or 'warning' when these conditions occur. Information about each condition is quickly accessible by pressing the diagnostic button on the keypad. Help screens are displayed for most fault and warning conditions to guide the user in troubleshooting. The design is very intuitive and easily guides the user through the menus.


### Spectacular results

Selecting the right type of probe as well as a system designed for this kind of application has made great improvements for the user. From the up to 50% failure rate and total replacement policy, the company has literally not returned a sensor for repair, replacement or warranty claim since they were installed many months ago. The company's technicians are coming to rely on the sensor diagnostics, so if a system has a problem, the tech can walk through the diagnostics and get an immediate repair solution either directly from the system or over the phone from the supplier. The analyser's simple operation appeals to this user since they are losing much of their analysis 'brain trust' through the retiring workforce. Even the newest technicians can operate the system using the intuitive user interface and help screens. Emerson also set up backup stock for the company so that, in the event of any failure (which hasn't occurred yet), the sensor or analyser can be replaced immediately. Conductivity measurement is such a time-honoured analytical process, it's easy to believe

that it is a commodity operation. As this case history shows, nothing could be further from the truth. Since production and profits can rise or fall on the success of this single measuring device, it pays to find the analyser and sensors designed for the dairy industry job at hand.

### A few facts about conductivity

The dairy industry is an ideal application for conductivity measurement in that there are conductivity differences throughout each stage of processing. Conductivity is a measure of how well a solution conducts electricity and it provides important indications for the water quality throughout the process.

To carry a current, a solution must contain charged particles, or ions. Most conductivity measurements are made in aqueous solutions, and the ions responsible for the conductivity come from electrolytes dissolved in the water. 

Here are typical electrolytes:

Electrolyte	Description
Salts	Sodium chloride and magnesium sulfate
Bases	Sodium hydroxide and ammonia
Acids	Hydrochloric and acetic

**Emerson Process Management**  
[www.emersonprocess.com.au](http://www.emersonprocess.com.au)

## SICK OF DEALING WITH HIGH FOULING PRODUCTS REDUCING PRODUCTION TIME??

*HRS can help with our unique range of high performance self cleaning heat exchangers*



### HRS R-SERIES... A SCRAPED SURFACE HEAT EXCHANGER WITH A TWIST!

- Helix mixing spiral reduces pressure drop & increases performance
- Removable inner tubes give long service life & ease of maintenance
- Multi-tube options give 3x, 6x or 12x surface area in the same footprint
- Ideal for heating & cooling delicate, high viscosity & high fouling products

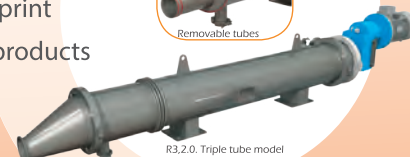
**\*CONTACT US FOR YOUR FREE TRIAL TODAY!!\*** CONDITIONS APPLY



Helix scraping bar



Removable tubes



R3.2.0 Triple tube model

**HRS**

hrs heat exchangers anz  
[info@au.hrs-he.com](mailto:info@au.hrs-he.com) [www.hrs-he.com](http://www.hrs-he.com)

AU 61 3 94891866  
 NZ 64 9 889 6045



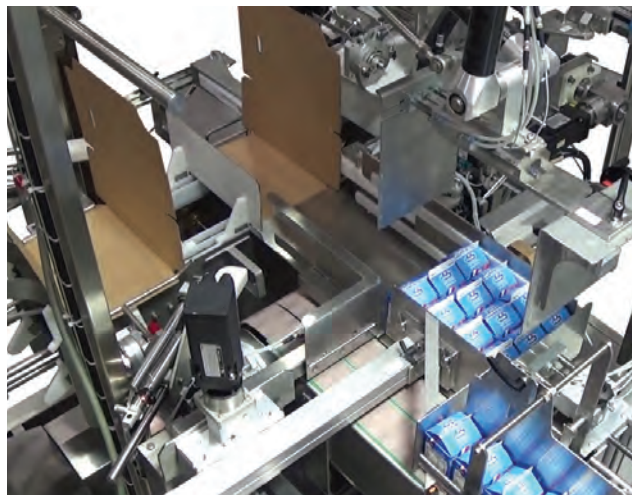
## HMPS customises case packer for dairy products

Parmalat in Nambour approached HMPS in 2014 to engineer a turnkey system consisting of a wraparound case packer and conveyor for the purpose of packing their gable top milk cartons and also for future potential packing PET bottles into shelf-ready cartons.

HMPS5000 fully automatic case packers are designed and built in various forms to suit customers' specific needs. With the current focus on shelf-ready packaging, the case packer allows options for full wraparound and tray with hood capacity. The system erects, loads and seals cartons within one compact fully integrated machine. All frames and major internal components are manufactured in stainless steel ensuring a long-lasting, low-maintenance life.

The system installed at Parmalat currently packages tetra cartons: 300 mL cream, 600 mL cream, 1000 mL white milk and 1000 mL goat's milk at speeds of 120 cartons/min. The machine has been designed for easy modification in the future to run bottles sizes 300, 500 and 750 mL, and 1 L round at 120 bottles/min.

The machine includes a product turning device integrated on the infeed conveyor to ensure correct orientation for shelf-ready presence. The HMPS Wraparound collates products into the required configuration prior to transferring them onto the wraparound blank. As the products are collated, a flat blank



is squared and positioned in the loading station where the collation of products is loaded. Hot melt adhesive is applied to the minor flaps and the carton is held in compression to complete the end sealing. The carton is then side transferred to seal the manufacturer's flap. Firmly bonded cartons are discharged from the machine to await palletising.

HMPS  
[www.hmps.com.au](http://www.hmps.com.au)

# FLEMING Chillers

## Leaders in Water Cooling Solutions 1300 730 736

▶ **High Energy Efficiency**  
across all industries

▶ **Full size range** from  
**1-1500kW** capacity

▶ **Flexible** design options  
to suit all layouts

▶ **Wide range** available  
in stock now

[sales@fleming.net.au](mailto:sales@fleming.net.au)  
[www.flemingchillers.com.au](http://www.flemingchillers.com.au)

**1000kW chiller system  
installed at CSR Minto, Sydney 2015**

# Cheese company cuts energy costs with centralised vacuum supply

DMK Deutsches Milchkontor is one of the largest dairy companies in Germany, processing milk from about 9400 producers to manufacture 6.7 million tonnes of dairy products per year for national and international retailing companies, food manufacturers and large-volume consumers. The company has a wide product portfolio, ranging from basic milk products and cheese, to milk-based food manufacturing ingredients, to baby food, ice-cream and health food.

One of the company's 28 sites is a production facility in Georgsmarienhütte, which manufactures mainly sliced cheese and mozzarella in packaged portions. These products are distributed throughout Germany and exported to other European countries. Other products include milk and whey concentrates, which are mostly used in-house for further processing. The site operates a three-shift system, five days a week, and employs a total of 350 staff.

At the facility, various types of sliced cheese for end consumers are packaged in three packaging lines by thermoforming machines, with products packed as both DMK and external brands. Two additional thermoforming machines package mozzarella in 2.5 kg and 10 kg blocks for further processing by customers.

DMK conducts its energy management according to ISO 50001 standards, leading the company to seek a solution to reduce vacuum system energy consumption. All five thermoforming machines originally had two vacuum pumps each: one to form the foil into the mould, and one to extract air from the packaging chamber.

DMK Energy Manager Yvonne Gödeker wished to reduce the number of vacuum pumps and relocate them away from the production area. The production area is air conditioned, so heat emitted by vacuum pumps was causing increased energy costs.

Busch recommended the installation of a centralised vacuum system, which was ultimately commissioned in October 2014. After a year of operation, the centralisation of the vacuum system had saved about 100,000 kW/h, reducing DMK's energy costs by approximately €5,000.

This saving was achieved by a combination of factors, but a major factor was the vacuum control system: only the vacuum pumps needed to meet current demand are in operation. Vacuum is supplied by a pipework system with three vacuum circuits:

## 1. Rough vacuum

Several vacuum pumps maintain a permanent rough vacuum of between 30 and 40 mbar in the vacuum reservoirs and pipework system. This vacuum is available directly at the packaging point to evacuate the packaging to rough vacuum level. The medium vacuum circuit is then activated.

## 2. Medium vacuum

The medium vacuum modules evacuate the packaging chamber and the packaging from rough vacuum level to the final package pressure of less than 5 mbar. This two-stage evacuation has the advantage of speed: the final pressure is achieved rapidly, allowing short cycle times. The two-stage process is also the most energy-efficient way of achieving a vacuum of less than 5 mbar. Panda vacuum pumps in a medium vacuum unit are used as vacuum boosters.

## 3. Forming vacuum

This vacuum circuit is used to form the plastic foil into trays.



The vacuum level required is between 100 and 200 mbar.

A controller maintains the required vacuum level in all three vacuum circuits, matching the demand created by the individual packaging lines. Vacuum pumps are switched on or off as required, maintaining the desired pressure in the vacuum reservoirs.

The three packaging lines rarely require maximum pumping speed simultaneously, so in general only some of the vacuum pumps are in operation.

In the original decentralised vacuum system, both vacuum pumps were started with the packaging machine and ran continuously at full speed. This maximum output was dimensioned to meet the demand created by the shortest cycle time and largest packaging volume of the machine. The new centralised vacuum system has drastically reduced the running time of individual vacuum pumps, which, in conjunction with the two-stage package evacuation, has resulted in significant energy savings.

The centralised vacuum system is located in an intermediate floor above the production and packaging areas. The relocation of vacuum pumps installed directly to the packaging machines prevents emitted heat from reaching the packaging machines and production area. In addition, no warm air from vacuum pump exhausts is given off to air-conditioned rooms. This has reduced the cooling required by the packaging machine tools, and air-conditioning costs are also lower.

As the centralised vacuum system is now located externally, it is no longer necessary for service personnel to enter the production area. Service technicians can carry out maintenance without interrupting production, as the system has a reserve vacuum unit. Starting this reserve unit allows the first unit to be disconnected from the network and maintenance tasks to be carried out. This has reduced expenditure, as no production time is lost and maintenance is no longer required on weekends when costs are higher.

Gödeker says she is completely satisfied with the Busch vacuum supply energy reduction project, which has exceeded the projected energy savings.

Busch Australia Pty Ltd  
[www.busch.com.au](http://www.busch.com.au)



## Inline macro-nutrient monitoring and control

The Perten NIR DA7300 is a near infrared instrument that can be attached directly into a production stream to monitor and provide feedback for process control based on readings of moisture or macro nutrients like protein or fat content.

The instrument is being used in Germany to monitor and optimise the moisture content in butter manufacturing. In the USA, the measurement of butter fat is the key ROI parameter in butter manufacture. Here, the DA7300 can be used to target the minimum of 80% butter fat that the USDA requires in order to legally be called butter.

The DA7300 can also be used to monitor and control skim milk and whole milk powder production. The purpose of the instrument is to check product specifications of moisture, protein, fat and lactose content (ash content could be measured as well) and thus obtain a more consistent and optimised product.

The equipment has an OPC server which allows defining digital inputs, outputs and alarms to be integrated into a SCADA or process control system. With the user interface software, the results for several parameters can be plotted in control charts, so the operator or the control room staff can observe if results are within specifications or if there is any trend that needs to be corrected. Reports can be generated remotely and also calibration updates and diagnostics can be run over internet through the company network. The unit has USDA approval on the sanitary design, which includes special gaskets that inhibit micro growth.

**Perten Instruments Australia Pty Ltd**

[www.perten.com](http://www.perten.com)




## Milk production from powder

Tetra Pak has extended the application of its OneStep processing technology to milk production from powder. Producers can now prepare UHT milk from powder in one continuous step, reducing operational cost by up to 40% and cutting carbon impact by more than half, according to the company. The technology removes the multiple steps of pasteurisation and intermediate storage in the traditional process of preparing milk from powder before UHT treatment. After a complete redesign using the Tetra Pak High-Shear Mixer and Tetra Alfast in-line blending unit, the process is now streamlined into one continuous step: skim milk powder is mixed with preheated water to make a concentrate, which is then blended with the precise amount of water and fat before undergoing UHT treatment. Enabling complete automation and continuous operations, the technology reduces milk waste traditionally lost between processing steps and improving consistency in product quality.

The milk production technology can be used to produce one single product or configured into multiple streams to produce a number of recipes, giving users flexibility in production. It can also be used to produce formulated milk, which combines liquid milk or powder with fat and flavour to create flavoured and value-added milk or lactic acid drinks.


**Tetra Pak Marketing Pty Ltd**


[www.tetrapak.com/au](http://www.tetrapak.com/au)






# FAM

Cutting edge solutions for food


**When only the best will do!**  
 When high capacity and unrivalled hygiene is a priority.


**The FAM range of cutters will take care of all your slicing, dicing and shredding needs with ease and precision.**



**SUMMIT MACHINERY**

Email: [sales@summitms.com.au](mailto:sales@summitms.com.au)  
 Tel: +61 (0)3 9761 6252

Your Australian and New Zealand agent [www.summitms.com.au](http://www.summitms.com.au)



# CIP cleaning and sanitation in food processing areas

DAIRY

**Cleaning and sanitation of a process plant is one of the most critical aspects of food processing to ensure the health and safety of the consumer. Proper cleaning is essential for the production of high-quality food products, especially those with extended shelf life.**

**C**leaning-in-place (CIP) is now a very common practice in many dairy, processed food, beverage and brewery plants replacing manual strip down, cleaning and re-building of process systems. The primary commercial advantage is a substantial reduction in the time that the plant is out of production and the ability to utilise more aggressive cleaning chemicals in a contained environment that cannot be safely handled with manual cleaning.

The definition of CIP is given in the 1990 edition of the Society of Dairy Technology manual CIP: 'Cleaning in Place' as: "The cleaning of complete items of plant or pipeline circuits without dismantling or opening of the equipment, and with little or no manual involvement on the part of the operator. The process involves the jetting or spraying of surfaces or circulation of cleaning solutions through the plant under conditions of increased turbulence and flow velocity."

## **Design of cleanability**

The design of the process plant must conform to all documented hygienic design standards. It is not usually possible to apply a CIP system to a process plant that was not designed for CIP in the first place. The materials of construction of the entire process plant must be resistant to the food and cleaning chemicals to



be applied, and be non-toxic, smooth, non-porous and free from crevices capable of harbouring bacteria.

### Materials of construction

The most common construction materials are stainless steels (notably grades 304, 316 and 316L) that have good resistance to corrosion in most environments, especially under acidic conditions and in wet washdown areas.

A clean-up process with a high chlorine-based agent requires special materials such as Teflon and PVDF, more commonly known as Kynar.

Seals and gaskets that are necessary to seal various metal parts need to be impervious to aggressive chemicals and high heat temperatures (eg, heat exchanger seals and pipe connections), and the effect that cleaning chemicals can have on them can destroy them over time, leading to unsafe practices and degradation of the seal that enables it to harbour microorganisms.

Elastomers and plastics must be resistant to the food product and the operational conditions in which the cleaning fluids are applied. It must also be demonstrated that there is no leaching of potentially toxic components from the elastomers and plastic materials; this often excludes many regular type plastics used as sealing materials. The most commonly used elastomers include nitrile rubber, EPDM (ethylene propylene diene monomer) for temperatures to 135°C (noting EPDM has poor resistance to oils and fats) and Viton. Also known as fluoroelastomer, Viton has excellent resistance to high temperatures but has reduced elasticity compared to EPDM and so requires more frequent replacement due to its poor memory.

All plastics and elastomer materials must be routinely inspected as part of a preventive maintenance plan and replaced at the first signs of brittleness. Brittleness causes a reduction of elasticity and eventually fails the ability to safely contain process fluids. Signs of discoloration are also indicators that seal failure is imminent. Incorrect sealing material may not have the temperature or chemical resistance required and should be avoided.

### Surface finishes

A smooth surface is generally considered to be easiest to clean, while rougher surfaces require a longer cleaning time due to material adhesion to a rougher type surface. A surface roughness of no greater than 125 ra (roughness average) finish is required for FDA compliance and this finish standard is usually applied to a raw ingredient pumping process prior to pasteurisation; elastomer types are wide and varied, subject to product types being pumped.

High sanitation level pumps require a 32 ra finish and use elastomers such as Teflon, EPDM, Santoprene, Viton, Buna N and a stand that allows the pump to be flipped 180° for draining after the cleaning process.

Highest standard pumps are either EHEDG (European Hygienic Engineering Design Group) or the United States Three A authority. Both have the highest standards of design used in the food industry, including 32 ra finish, EPDM overmoulded diaphragms, EPDM seals or encapsulated EPDM/Teflon seals. Units must be fitted with a leak detector to shut down automatically in the event of a diaphragm failure to avoid product contamination and the stand must be able to rotate 360°. USP Six is a pharmaceutical standard that has a 20 ra finish and must be stainless steel with Teflon elastomers only. The standard is typically associated

with the manufacture of injectable and digestible products for human consumption. It is also a common pump type used in the manufacture of veterinary products.

The FDA standard allows for bolted construction design, HS, EHEDG, Three A and USP Six. All must use Tri-Clover clamps for ease of strip down and reassembly. The concept behind this is so the pumps can be pulled down and reassembled without the use of hand tools that typically mar the surface and can create imperfections that harbour bacteria.

### Chemicals

The choice of chemicals is governed by the materials of construction of the plant. As mentioned previously, the most common material of construction is stainless steel, which is very resistant to most cleaning solutions (with the exception of high-chlorine-based solutions).

In the food industry, the most common form of fouling is the build-up of proteins in the system. These are removed by hot alkali (caustic soda) assisted by wetting agents that break up the protein into water soluble units.

Typically 2% caustic soda will be used at temperatures of up to 85°C. For high build of material on surfaces, solutions up to 4% can be applied. Milkstone and calcium deposits are easily removed by the use of a dilute acid being nitric or phosphoric, which is typically used.

Sanitation is achieved by the use of hot water, hypochlorite or one of the peroxide-based sterilising agents. If sodium hypochlorite is used for sanitising, the strength should not exceed 150 ppm free chlorine, the temperature should be kept below 40°C and the circulation time kept below 20 minutes.

Pumps for transferring the agent to the CIP system should be of PVDF (Kynar) construction.

### Cycle times

The period of circulation depends on the degree of fouling and material build-up, taking into account the type of equipment being cleaned. Typically 20 minutes of caustic circulation is required for pipework and vessels. Pasteurisers and UHT (ultrahigh-temperature) plants which suffer from higher levels of fouling mainly due to the heat applied in the treatment of the food manufacturing process require up to 40 minutes of caustic circulation. Acid circulation is normally 10 minutes. Sodium hypochlorite should be kept below 20 minutes.

### Recommendations

It is clear that within the food, beverages and pharmaceutical industry there are specific technical and engineering criteria that need to be observed to satisfy stringent sanitary requirements. These consist primarily of certain grades of stainless steel to be used with certain types of finishes and specific engineering design for ease of cleaning coupled with particular sanitising solutions and flush methods, including duration of flush times. It is recommended these be strictly observed to maintain health and hygiene for the consumer; this will also avoid potential litigation in the event of a contamination issue arising due to poor practices. Wise purchasing at the outset of equipment acquisition will avoid unnecessary additional cost; when the inadequacies of incorrect equipment are discovered this will lead to costly replacement.



Graco Australia Pty Ltd  
www.graco.com



© freeimages.com/profile/115169

## Energy-efficient milk chilling technology reduces electricity costs at NZ dairy farm

An innovative milk chilling system has both saved the quality of a Waikato farmer's milk and reduced the power bill.

Hamilton-based refrigeration specialist Coolsense designed the Vari-COOL chilling system. The system was part-funded by the Energy Efficiency and Conservation Authority (EECA) as part of its technology demonstration program. Meddo Farm in Waitoa was faced with a problem last summer after water quality issues forced owner Hans Geessink to find a new water supply for his dairy farm. However, when Geessink put down a new bore the temperature of the water he found there was 26°C, six degrees higher than his previous supply.

"We had our hands up against our back," Geessink said. "It meant we could no longer comply with the current milk chilling standards and we ran the real risk of our milk being rejected by the dairy company. We needed to find a milk snap chilling system that could cope with the increased demand without our power bill going through the roof."

After investigating several options, Geessink decided on the Vari-COOL system and it was installed on his farm last May. Immediately there was a marked difference in his milk temperature at time of pick-up, from 8 to 4°C. Moreover, while the higher water temperature increased the milk cooling requirement by 30%, energy consumption on Meddo Farm has remained the same as the previous year.

EECA Projects and Relations Manager Kirk Archibald says high ground water temperatures are a problem for dairy farmers, particularly in the Waikato, Bay of Plenty and Northland. And with new milk cooling regulations coming into effect from mid-2016, he says many farmers will need to take action, with some requiring an upgrade of their milk chilling systems.

"It's expensive to run a dairy farm and the average New Zealand dairy farm spends over \$20,000 a year on electricity," Archibald said. "So any technology that helps reduce this spend is a big bonus for farmers."

Archibald says energy is a controllable cost and makes up about 5% of the cost of running a farm.

"If you can reduce your energy spend the savings can be ploughed back into the farm or used in leaner months to keep the farm going."

The Energy Efficiency and Conservation Authority is the Crown agency that encourages, supports and promotes energy efficiency, energy conservation and the use of renewable energy in New Zealand. EECA provides information to households through ENERGYWISE and to business through EECA BUSINESS.

CoolSense Ltd  
www.coolsense.co.nz



A.B.N. 22 152 305 336  
www.westwick-farrow.com.au

### Head Office

Cnr. Fox Valley Road & Kiogle Street,  
(Locked Bag 1289) Wairoa NSW 2076  
Ph: +61 2 9487 2700 Fax: +61 2 9489 1265

Chief Editor: Janette Woodhouse  
wnift@westwick-farrow.com.au

Publisher: Geoff Hird

Art Director/Production Manager: Julie Wright

Art/Production: Tanya Barac, Colleen Sam

Assistant Editor: Melissa Barks

Circulation Manager: Lora Tomova  
circulation@westwick-farrow.com.au

Copy Control: Mitchie Mullins  
copy@westwick-farrow.com.au

### Advertising Sales

Kerrie Robinson  
Ph: 0400 886 311  
krobinson@westwick-farrow.com.au

Germany, Austria, Switzerland - Eisenacher Medien  
Ph: +49 228 249860 info@eisenacher-medien.de

If you have any queries regarding our privacy policy  
please email [privacy@westwick-farrow.com.au](mailto:privacy@westwick-farrow.com.au)

Subscriptions for unregistered readers  
- price on application



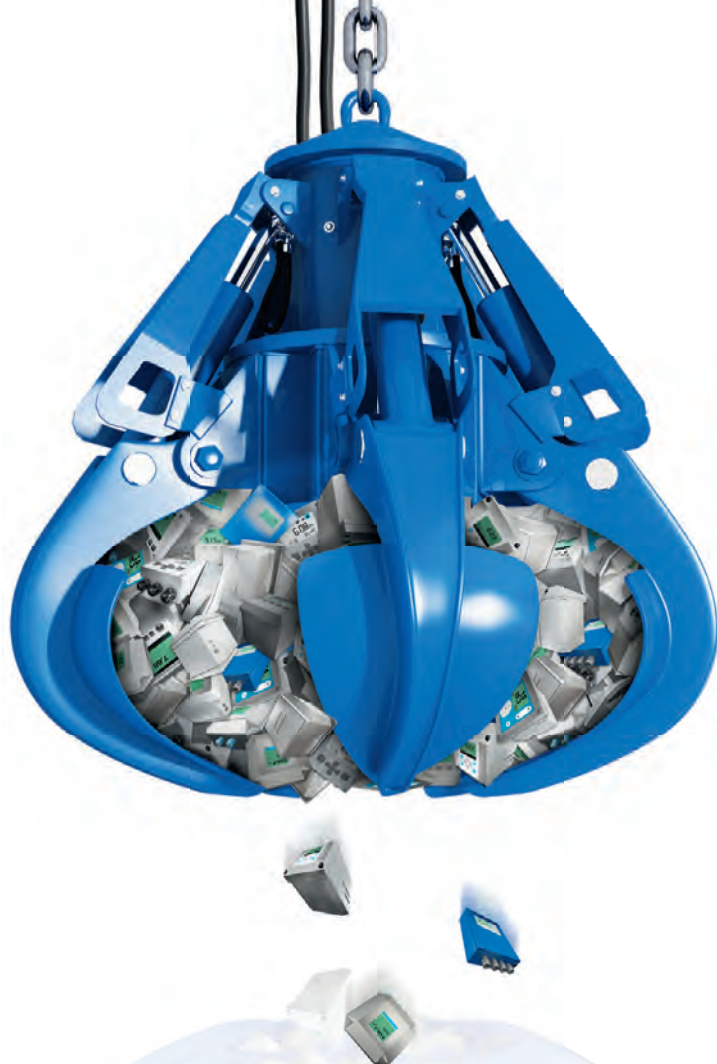
September 2015 total CAB audited circulation (Aust + NZ):  
6443 readers (82% personally requested)

Printed and bound by SOS Print + Media  
Print Post Approved PP100007395  
ISSN No. 1039-8414

### NOTICE:

All material published in this magazine is published in good faith and every care is taken to accurately relay information provided to us. Readers are advised by the publishers to ensure that all necessary safety devices and precautions are installed and safe working procedures adopted before the use of any equipment found or purchased through the information we provide. Further, all performance criteria was provided by the representative company concerned and any dispute should be referred to them. Information indicating that products are made in Australia or New Zealand is supplied by the source company. Westwick-Farrow Pty Ltd does not quantify the amount of local content or the accuracy of the statement made by the source.





# Goodbye transmitters!



## SMARTPAT – The first family of analytical sensors that no longer require transmitters

It integrates all of the transmitter technology in its head. This not only reduces the costs of ownership, eases installation and maintenance but also allows for direct usage in explosive (zone 0) and hygienic areas.

SMARTPAT sensors can be easily configured and calibrated via PACTware™ (FDT/DTM) or HART® DD. Due to the offline calibration and regeneration, they feature accurate measurement and an extended service life.

**So, you see – it's time to say goodbye to your external transmitter!**



# CONVEY

**FLEXI-DISC™ Tubular Cable Conveyors** gently slide fragile foods and non-foods through smooth stainless steel tubing routed horizontally, vertically or at any angle, over short or long distances, dust-free. Single or multiple inlets and outlets.



# DUMP

**FLEXICON® Manual Dumping Stations** allow dust-free dumping of bulk material from bags and other containers. Automatic reverse-pulse filter cleaning allows continuous, efficient operation. Available with integral bag compactors for total dust containment.



# UNLOAD

**BULK-OUT® Bulk Bag Dischargers** unload free- and non-free-flowing solids from bulk bags automatically. Allows untying, discharging, retying and collapsing of bulk bags—all dust-free. Available with weigh batching controls.



# CONDITION

**BLOCK-BUSTER® Bulk Bag Conditioners** loosen bulk materials that have solidified during storage and shipment. Variable height turntable positions bag for hydraulic rams with contoured conditioning plates to press bag on all sides at all heights.



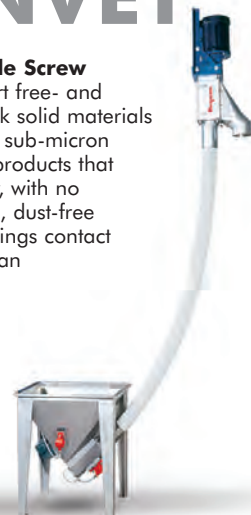
# FILL

**SWING-DOWN®, REAR-POST and TWIN-CENTREPOST™ Bulk Bag Fillers** can fill one bulk bag per week or 20 per hour at the lowest cost per bag. Numerous performance options. Available to industrial or sanitary standards.



# CONVEY

**FLEXICON® Flexible Screw Conveyors** transport free- and non-free-flowing bulk solid materials from large pellets to sub-micron powders, including products that pack, cake or smear, with no separation of blends, dust-free at low cost. No bearings contact material. Easy to clean quickly, thoroughly.



# CONVEY

**PNEUMATI-CON® Pneumatic Conveying Systems** move a broad range of bulk materials over short or long distances, between single or multiple inlet and discharge points in low to high capacities. Available as dilute-phase vacuum or positive pressure systems, fully integrated with your process.



# TIP

**TIP-TITE® Container Tipplers** dump bulk material from drums (shown), boxes or other containers into vessels up to 3 metres high. Dust-tight (shown) or open chute models improve efficiency and safety of an age-old task.



# SUCCEED

**The FLEXICON® Lifetime Performance Guarantee\*** assures you of a successful result, whether you purchase one piece of equipment or an engineered, automated plant-wide system. From initial testing in large-scale laboratories, to single-source project management, to after-sale support by a worldwide network of factory experts, you can trust your process—and your reputation—to Flexicon.



**AUSTRALIA**  
sales@flexicon.com.au  
1 300 FLEXICON

**USA** +1 610 814 2400  
**UK** +44 (0)1227 374710  
**SPAIN** +34 647 670 302  
**SINGAPORE** +65 6778 9225  
**SOUTH AFRICA** +27 (0)41 453 1871  
**CHILE** +56 2 2415 1286

**flexicon®**  
.com.au